Net Emissions Analysis Tool (NEAT) Working Group

Formally the Residential Commercial Appliance Life Cycle Analysis Working Group

> Meeting #6 January 16th, 2019



Development Status Update

Sang-Mi Lee, Ph.D. Planning and Rules Division



Working Group Meetings and Comment Letters to Date

- Six working group meetings (including today) and eight comment letters
- Working group meetings
 - Meeting #1 August 30, 2017
 - Meeting #2 November 16, 2017
 - Meeting #3 January 31, 2018
 - Meeting #4 April 18, 2018
 - Meeting #5 September 28, 2018
 - Meeting #6 January 16, 2019

- Comment Letters
 - Sierra Club Nov. 2017
 - PSE Healthy Energy Feb. 2018
 - Sustainable Analysis, LLC Feb. 2018
 - SoCalGas Mar. 2018
 - Sierra Club Apr. 2018
 - Tim Kabat Apr. 2018
 - SoCalGas Jun. k2018
 - Sierra Club Sep. 2018



Development Progress

- Meeting #1 August 30, 2017
 - Initiative to develop a tool to estimate cost effectiveness of emission reductions in residential sector
 - Solar Technology Initiative
- Meeting #2 November 16, 2017
 - Demand segment
 - Solar PV calculator
 - Collecting input data
- Meeting #3 January 31, 2018
 - Electric rate calculator
 - Net metering
 - Emissions from electricity generation

Development Progress (continued)

- Meeting #4 April 18, 2018
 - Natural gas rate calculator
 - Fugitive methane emissions from natural gas use
 - Continued discussions on emissions from electricity generation
- Meeting #5 September 28, 2018
 - Battery storage module
 - Electricity transmission and distribution loss
 - Renewable natural gas
 - Lifecycle Emissions from Gasoline and Diesel



Development Progress (continued)

- Meeting #6 January 16, 2019
 - Implementation of Battery Storage Module
 - Residential Rooftop Photovoltaic Cost Calculation
 - Live Demonstration of NEAT



Comments and Responses (since last meeting)

Scott A. Epstein Ph.D. & Marc Carreras Sospedra Ph.D. Planning and Rules Division



Summary of Submitted Comments

- All comment letters posted to the NEAT website
 - www.aqmd.gov/NEAT
- No comment letters were submitted since last meeting, but we will discuss comments provided during last meeting





Sustainable Analysis, LLC - February 20,

PSE - February 6, 2018 (PDF, 116kb)

Sierra Club - November 28, 2017 (PDF,

2018 (PDF, 590kb)

186kb)

Working Group Meeting #3 Wednesday, January 31, 2018, 2:00 p.m. South Coast Air Quality Management District Conference Room CC-8 21865 Copley Drive, Diamond Bar, CA

South Coast Air Quality Management

21865 Copley Drive, Diamond Bar, CA

Conference Room CC-8

District

91765 Agenda - (PDF, 120kb) Presentation - (PDF, 1MB)

8

Comments and Responses

- Utility-Specific Electricity Transmission and Distribution Loss
 - Use utility-specific loss rates from EIA-861 schedule 2 for all utilities in database
 - We added an option in the tool to use utility-specific loss rates from EIA-861
 - Loss rates are calculated as (total energy losses)/(total disposition)
 - Data from 2008 to 2017 was used for each utility
 - See <u>https://www.eia.gov/electricity/data/eia861/</u> for details
 - Users have the choice to use flat loss rate across all utilities, use hourly loss rate for all utilities, or use utility-specific loss rate



Comments and Responses (continued)

Utility-Specific Electricity Transmission and Distribution Loss

UTILITY NAME	Years Available	Mean Loss Percentage
Azusa Light & Power	9	2.5
Bear Valley Electric Service	9	12.2
Burbank Water & Power	10	3.5
City of Anaheim Public Utilities Department	10	4.9
City of Banning Electric Department	10	6.8
City of Corona Department of Water & Power	10	2.7
City of Riverside	10	5.4
City of Vernon Municipal Light Department	10	3.9
Glendale Water & Power	10	2.7
Los Angeles Department of Water & Power	8	9
Moreno Valley Utility	9	5.5
Pasadena Water & Power	10	4.2
Rancho Cucamonga Municipal Utility	4	2.9
San Diego Gas & Electric	10	4.3
Southern California Edison	10	5.2



Comments and Responses (continued)

- Thermal Storage Heat Pump Water Heaters
 - Include thermal storage heat pump water heater profiles in NEAT
 - We included two additional electric profiles for electric water heating with basic strategies to shift electric load



Electric Thermal Storage Water Heating

- Electric thermal storage water heating is an option to manage residential electrical load:
 - For peak shaving
 - For shifting demand to cheaper electricity rates
- Options include:
 - Electric resistance water heater (ERWH)
 - Heat pump water heater (HPWH)



http://thesunriseguide.com



Electric Thermal Storage Water Heating

- We implemented two basic thermal cycles that are based on the default water heating profile:
 - Fixed profile: water heating is turned off in the evening hours (5pm to 8pm)
 - Flex profile: water heating is turned off when the hourly electrical load is at the top 25% of a given day
- Overall electricity use is calculated using the Unit of Energy Consumption (UEC) that is specific to a given technology (ERWH, HPWH)





Comments and Responses (continued)

• EV Charging Profiles

- Add additional EV charging profiles to NEAT
- We included two basic charging profiles for electric vehicles which correspond to Level 1 and Level 2 home EV chargers



EV Charging Profiles

- We assumed that EV charging follows the strategy Constant Current/Constant Voltage (CC/CV) charging profile
- Vehicles are charged in the evening after 8 pm
- We included 2 charging profiles that represent Level 1 (~1.4 kW) and Level 2 (~5 kW) charging



Ying et al., Renew. Sustain. Energy Rev., 2015



EV Charging Profiles

- Duration of charging cycle depends on the charger level:
 - Level 1: 8 pm to 6 am
 - Level 2: 8 pm to 11 pm
- Charging cycle is assumed to be the same throughout the year



EV Charging Hourly Profiles



Implementation of Residential Battery Modeling in NEAT

> Seungbum Ha Ph.D. Technology Advancement Office



Summary of Previous Work

- Battery model has been developed
- Parameters for the model, test results from EV batteries, has been extracted from database provided by Argon National Laboratory
- Simple charging/discharging has been tested in the model









Required power (Power_solar – Power_elec use) changes every hour.





□ The model

- Parameterizes battery with chargingdischarging behavior from datasheets(experimental results)
- Calculates voltage profile as a function of SOC and input current (power)
- Voltage-SOC profile varies for input current (power)



- Continued



Computation by battery model

- Given the load and PV profile, the model calculates voltage and SOC change for every time step.
- Upper and lower charging/discharging rate limit is applied based on battery characteristics.
- The battery is programmed to discharge (charge) before reaching the minimum (maximum) SOC.



- Continued

Tesla powerwall 1





Stop charging due to upper limit of SOC

Power, continuous and peak	3.3 kW
Energy*	6.4 kWh
Internal Battery Voltage	< 50 VDC
System Operating Voltage	350 V-450 V
Voltage in OFF State	0 VDC
Current	9.5 ADC
Round Trip Efficiency*	92.5% (for a 400 V-450 V DC bus)
Depth of Discharge	100%
Equivalent Cycles	Unlimited cycles
	(provided Powerwall is only used for
	solar self-consumption and backup)



- Stop discharging due to lower limit of SOC
- Use grid power

- Continued

Tesla powerwall 2



• 2x battery capacity

■ Battery profile doesn't reach lower limit of SOC
 → minimizing use of grid power

DC Energy ¹	13.5 kWh
Power, continuous	5 kW (charge and discharge)
Power, peak (10s)	7 kW (discharge only)
DC Voltage Range	350-550 V
DC Current, continuous	14.3 A
DC Current, peak (10s)	20 A
Depth of Discharge	100%
Internal Battery DC Voltage	50 V
Round Trip Efficiency ^{1,2}	91.8%
Warranty	10 years



Implementation of Battery model into NEAT

- Calculation algorithm needs to be optimized to implement into NEAT
- Adoptive charging/discharging control is required to develop
 - Charging/discharging strategy varies by battery characteristics, solar production profile, electricity use profile and Tier rates.

> According to the strategy, electricity cost can be minimized.



- Enough solar production
- Relatively small and stable electricity use



Grid power is rarely used

Air Quality Management District

Summary and Next steps

• Where we are

- Battery model is tested using NEAT specific data
- Two different types of residential batteries are simulated and charging/discharging profile is calculated.

• What needs to be done next

- Battery model will be implemented into NEAT
 - optimizing algorithm
 - adopting improved charging/discharging strategy
- Various scenarios will be tested.
 - Solar production, electricity use profile, battery size, tier rate



NEAT Demonstration

Scott A. Epstein Ph.D. Planning and Rules Division



NEAT will still undergo extensive QA/QC from SCAQMD staff, the workgroup and other beta testers. Do not draw conclusions from demonstration results. Numbers are not final.



NEAT Splash Page





NEAT Starts in "Demand" Section

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Air Quality Management District

Ability to Load Entire Setup of Run or Results



South Coast **Air Quality Management District**

NEAT Starts in "Demand" Section



South Coast

file

Air Quality Management District

NEAT Starts in "Demand" Section



South Coast AOMD Air Quality M

Air Quality Management District

Simple Example: Electrify Hot Water Heating and Add Rooftop PV for Single-Family Homes

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Air Quality Management District

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Hot water h	eating	Kitchen Laundry M	iscellane	ous Poo	Space	heating	and cooling	g Tra	nsportatior	1												
BASELI	NE TE	CHNOLOGY MIX PAR	АМЕТ	ERS		Hover	over Fuel or	Technology	to see selec	ted profile		SCEN	ARIO T	ECHNOLOGY M	IX PAR	RAMETE	RS	View	Tech Defi	nitions	Show Colu	mn Information
Fuel		Technology	UEC	NOX EF	CO2e EF Ur	nit Cost	Install Co	st Lifetin	ne Penet	tration	\square	Fuel		Technology		UEC	NOX EF	CO2e EF	Unit Co	st Insta	all Cost	Lifetime
A Electric	Water	Heat	3169	0	0	361	1 17	00	13	0.0500	=	Electric	Water He	eat		3169	() 0	3	61	1700	13
B Electric	Solar \	Water Heat with Electric Backup	1877	0	0	1411	38	69	13	0	=	Electric	Solar Wa	ater Heat with Electric B	Backup	1877	(0 0	14	111	3869	13
C NatGas	Conve	ntional Water Heater	195	0.0023	11.7600	647	7 19	00	13	0.9050	=	NatGas	Convent	ional Water Heater		195	0.0023	3 11.7600	6	47	1900	13
D NatGas	Solar \	Water Heat with Gas Backup	161	0.0023	11.7600	4349	38	69	13	0	=	NatGas	Solar Wa	ater Heat with Gas Back	kup	161	0.0023	3 11.7600	43	49	3869	13
NEW TE	CHN		;													Sa	ve Baselin	e and Scen	ario Tecł	nnology I	Mix Param	neters to File
# Fu	el	Technology		F	Profile		UEC N	IOX EF	CO2e EF	Unit Co	st	Install Co	st Lifetim	e Notes		Re	eplace Teo	hnology Too	bl			
1 Electric	-	Water Heat		Water Heatin	ng	-	3169	0	0	3	61	17	00	13 General technology	C 🔺	(4	All househ	olds with the	e baselin	e techno	ology will s	witch to
2 Electric	-	Solar Water Heat with Electric	Backup	Water Heatin	ng	•	1877	0	0	141	0.5	38	69	13 General technology	C	th	e replace	ment tech.)				
3 NatGa	-	Conventional Water Heater		Water Heatin	ng	-	194.51	0.0023	11.76	6	647	19	00	13 General technology	C	S	elect base	eline technol	ogy to pl	hase-out	:	
4 NatGa	-	Solar Water Heat with Gas Ba	kup	Water Heatin	ng	-	161.44	0.0023	11.76	434	8.5	38	69	13 General technology	C		A Electric	Water Heat				•
5 NatGa	-	Whole House Tankless System	1	Water Heatin	ng	-	-9999	-9999	-9999	-99	99	-99	99 -99	99 Values not specified			olect tech	nology to up	o instaa			
6 NatGa	-	High-Efficiency Condensing		Water Heatin	ng	-	-9999	-9999	-9999	-99	99	-99	99 -99	99 Values not specified		-	1 Electric	Water Use	e matea	u.		
7 Electric	-	Heat Pump		Water Heatin	ng	-	-9999	-9999	-9999	-99	99	-99	99 -99	99 Values not specified		L	Electric	: water Heat	L	_		•
8 Electric	-	Standard Tank		Water Heatin	ng	-	-9999	-9999	-9999	-99	99	-99	99 -99	99 Values not specified								mplement
0 Electric	-	Point of Lico Tankloce System		Water Heatin	10	-	0000	0000	0000	00	00	00	00 00	Noluce not energified	-							
							View	Profile Def	initions /	Add Tech	nnolo	ogy S	ave List of	f New Technologies to F	File		RETUR		vious	AD	VANCE T	O NEXT 🌩



South Coast Air Quality Management District

Implement Hot Water Heating Change

vusing Cotogony																		
JUSING CAIPOOLV				Climate Zo	ne													
subling outegory				Chinate 20	ing.													
) Single-Family O	Multi-Family OMobile Hom	ie O	Aggregate	06 Coa	astal (08 S. Nea	r-Coastal	○9 N.	Near-C	oastal 🔘	10 S. Inlan	d 🔵 15 S. Desert 🔘 🤆	16 Mountain	• All	CZ MAP		\mathbf{I}	
opulate Baseline and (Scenario Technology Mix Para	ameters					Popu	ulate List o	f New T	echnologies	for Possible	Implementation						2
Load Default Parame	ters							ad Default	t Param	eters	Edit para	meters in "Add Technology	for Scenario	Selection"				
							_		er aram		and imple	ement with "Replace Techno	ology Tool"				South Co	ast
Load Saved Paramet	ters 🔴							oad Saved	Param	eters							AQM	D
																		_
Hot water heating	Kitchen Laundry Mis	cellaneo	ous Poo	ol Space	heating	and cooling	Trans	portation										
BASELINE TECH		METE	RS		Hover	over Fuel or Te	echnology to	see selecter	d nrofile	SCEN				FRS	View Te	ch Definitions	s Show Colu	mn Information
Fuel	Technology	LIEC	NOX FE	CO2e EE II	Init Cost	Install Cos	t Lifetime	Penetra	ation	Fuel		Technology	LIEC	NOX FE		Init Cost	nstall Cost	Lifetime
Electric Water Her	at	3169	0	00202100	361	170	00 1	3 0	0500	Electric	Water Hea	t	3169	0	002021	361	1700	13
Electric Solar Wat	er Heat with Electric Backup	1877	0	0	1411	386	50 10 69 10	3	0	= Electric	Solar Wate	er Heat with Electric Backup	1877	0	0	1411	3869	13
NatGas Conventio	onal Water Heater	195	0.0023	11.7600	647	/ 190	00 13	3 0	.9050	Electric	Water Hea	t	3169	0	0	361	1700	13
NatGas Solar Wat	ter Heat with Gas Backup	161	0.0023	11.7600	4349	386	69 13	3	0	- NatGas	Solar Wate	r Heat with Gas Backup	161	0.0023	11 7600	4349	3869	13
						1				Matodas	Johan Wate	a neat with Gas Backup		0.0020	11.7000			
								-						0.0020	11.7000			
NEW TECHNOL	OGY PARAMETERS							-		•			Sa	ve Baseline	and Scenar	io Technolo	ogy Mix Parar	neters to File
NEW TECHNOL # Fuel	OGY PARAMETERS			Profile		UEC NO	OX EF C	O2e EF U	Jnit Cos	Install Cos	t Lifetime	Notes	Sa	ve Baseline eplace Tech	and Scenar	io Technolo	ogy Mix Parar	neters to File
NEW TECHNOL # Fuel 1 Electric Y Wa	OGY PARAMETERS Technology ater Heat		Water Heati	Profile	•	UEC N0 3169	OX EF CC	02e EF U	Jnit Cos	Install Cos I 177	t Lifetime	Notes	Sa	ve Baseline eplace Tech All househoi	and Scenar nology Tool ds with the b	io Technolo	ogy Mix Parar	neters to File
Fuel 1 Electric • Wz 2 Electric • So	OGY PARAMETERS Technology ater Heat vlar Water Heat with Electric B	ackup 1	I Water Heati Water Heati	Profile	•	UEC NG 3169 1877	OX EF CC 0 0	02e EF U 0 0	Jnit Cos 36 1410.	t Install Co. 1 175 38	t Lifetime 00 13	Notes General technology c	Sa R (t	ve Baseline eplace Tech All househoi he replacem	and Scenar nology Tool ds with the t ent tech.)	io Technolo	ogy Mix Parar	neters to File
NEW TECHNOL # Fuel Water 1 Electric • Water 2 Electric • So 3 NatGas • Co	OGY PARAMETERS Technology ater Heat plar Water Heat with Electric B ponventional Water Heater	ackup 1	Water Heati Water Heati Water Heati	Profile ng ng		UEC NG 3169 1877 194.51	OX EF C(0 0 0.0023	02e EF U 0 0 11.76	Jnit Cos 36 1410. 64	t Install Co. 1 177 5 38 7 19	t Lifetime 00 13 39 13 00 13	Notes General technology c General technology c	Sa R (t s	ve Baseline eplace Tech All househoi he replacem Select baselii	and Scenar nology Tool ds with the L ent tech.) ne technolog	io Technolo baseline tec iy to phase	ogy Mix Parar chnology will a	neters to File
NEW TECHNOL # Fuel Water 1 Electric • Water 2 Electric • So 3 NatGas • Co 4 NatGas • So	OGY PARAMETERS Technology ater Heat blar Water Heat with Electric B ponventional Water Heater blar Water Heat with Gas Back	ackup N	Water Heati Water Heati Water Heati Water Heati Water Heati	Profile ng ng ng ng		UEC NC 3169 1877 194.51 161.44	OX EF CC 0 0.0023 0.0023	02e EF U 0 11.76 11.76	Jnit Cos 36 1410. 64 4348.	t Install Coo 1 177 5 38 7 19 5 38	t Lifetime 00 13 99 13 99 13 99 13	Notes General technology c General technology c General technology c	Sa R (t	ve Baseline eplace Tech All househoi he replacem Select baseli C NatGas C	and Scenar nology Tool ds with the t ent tech.) ne technolog	io Technolo paseline tec 1y to phase Water Hea	ogy Mix Parar chnology will a -out: ater	neters to File
NEW TECHNOL # Fuel Value 1 Electric • Was 2 Electric • So 3 NatGas • Co 4 NatGas • So 5 NatGas • Wr	OGY PARAMETERS Technology ater Heat vlar Water Heat with Electric B onventional Water Heater vlar Water Heat with Gas Back hole House Tankless System	ackup 1 rup 1	Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii	Profile ng ng ng ng ng	* * * * *	UEC N0 3169 1877 194.51 161.44 -9999	OX EF C4 0 0.0023 0.0023 -9999	02e EF L 0 11.76 11.76 -9999	Jnit Cos 36 1410. 64 4348. -999	t Install Co: 1 1 17 5 38 7 19 5 38 9 -99	it Lifetime 00 13 59 13 00 13 59 13 59 13	Notes General technology c General technology c General technology c Values not specified	Sa R (t)	ve Baseline eplace Tech All househol de replacem Select baseli C NatGas C	and Scenar nology Tool ds with the b ent tech.) ne technolog conventional	io Technolo baseline tec jy to phase Water Hea instandi	ogy Mix Parar chnology will a -out: ater	neters to File
Fuel Fuel Electric Electric Solardias NatGas	OGY PARAMETERS Technology ater Heat olar Water Heat with Electric B onventional Water Heater bar Water Heat with Gas Back hole House Tankless System gh-Efficiency Condensing	ackup N Tup N	Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii	Profile ng ng ng ng ng ng ng	• • • • • • • • • • • • • • • •	UEC NO 3169 1877 194.51 161.44 -9999 -9999	OX EF C4 0 0.0023 0.0023 -9999 -9999	02e EF U 0 11.76 11.76 -9999 -9999	Jnit Cos 36 1410. 64 4348. -999 -999	t Install Cos 1 177 5 38 9 -99 9 -99	it Lifetime 00 13 59 13 59 13 59 13 59 13 59 -9999 99 -9999	Notes General technology c General technology c General technology c Values not specified Values not specified	Sa R (t) Sa	ve Baseline eplace Tech All househol he replacem Belect baseli C NatGas C Belect techno	and Scenar nology Tool ds with the b ent tech.) ne technolog conventional ology to use	io Technolo baseline tec iy to phase Water Hea instead:	ogy Mix Parar chnology will a -out: ater	neters to File
Fuel # Fuel Wa 1 Electric • Wa 2 Electric • So 3 NatGas • Co 4 NatGas • So 5 NatGas • Hig 6 NatGas • Hig 7 Electric • He	OGY PARAMETERS Technology ater Heat olar Water Heat with Electric B onventional Water Heater Jar Water Heat with Gas Back hole House Tankless System gh-Efficiency Condensing eat Pump	ackup 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii Water Heatii	Profile ng ng ng ng ng ng ng ng ng	• • • • • • • • • • • • • • • • • • • • • • • • • •	UEC NO 3169 1877 194.51 161.44 -9999 -9999 -9999	OX EF C0 0 0.0023 -9999 -9999 -9999	02e EF U 0 11.76 -9999 -9999	Jnit Cos 36 1410. 64 4348. -999 -999	t Install Co: 1 177 5 38 7 19 5 38 9 -99 9 -99 9 -99	t Lifetime 00 13 39 13 39 13 39 -9999 99 -9999 99 -9999	Notes General technology c General technology c General technology c General technology c Values not specified Values not specified Values not specified	Sa R () Sa	ve Baseline eplace Tech All househol belect baseli C NatGas C Select techno 1 Electric V	and Scenar nology Tool ds with the t ent tech.) ne technolog conventional ology to use Water Heat	io Technolo paseline tec 1y to phase Water Hea instead:	ogy Mix Parar chnology will a out: iter	neters to File switch to
Fuel Fuel Wa 1 Electric • Wa 2 Electric • So 3 NatGas • Co 4 NatGas • So 5 NatGas • Wr 6 NatGas • He 7 Electric • He 8 Electric • State	OGY PARAMETERS Technology ater Heat olar Water Heat with Electric B onventional Water Heater olar Water Heat with Gas Back hole House Tankless System gh-Efficiency Condensing eat Pump andard Tank	ackup 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Water Heati Water Heati Water Heati Water Heati Water Heati Water Heati Water Heati Water Heati	Profile ng ng ng ng ng ng ng ng ng ng ng		UEC NO 3169 1877 194.51 161.44 -9999 -9999 -9999 -9999	OX EF C0 0 0.0023 -9999 -9999 -9999	02e EF U 0 11.76 11.76 -9999 -9999 -9999	Jnit Cos 36 1410. 64 4348. -999 -999 -999	t Install Con 1 177 5 38 9 -99 9 -99 9 -99 9 -99 9 -99	t Lifetime 00 13 59 13 59 13 59 13 99 -9999 99 -9999 99 -9999 99 -9999	Notes General technology c General technology c General technology c General technology c Values not specified Values not specified Values not specified Values not specified	Sa R () Sa	ve Baseline eplace Tech All househol belect baseli C NatGas C Select techno 1 Electric V	and Scenar nology Tool ds with the t ent tech.) ne technolog conventional ology to use Water Heat	io Technolo baseline tec iy to phase Water Hea instead:	ogy Mix Parar chnology will a -out: iter	neters to File switch to

South Coast Air Quality Management District

View Hot Water Heating Profiles (leave unchanged)

emand De	emand Input Summary Power Sup	ply I	Economics	Computat	on	Results												
lousing Catego	ргу			Climate Zone														
Single-Family	ly OMulti-Family OMobile Hom	e () A	ggregate	⊖6 Coast	al 🔿	8 S. Near	-Coastal	○9 N.	Near-Coa	astal 🔿	10 S. Inl	and O 15 S. Desert O 16	6 Mountain	• All	CZ MAP		\square	2
Populate Baseli	ine and Scenario Technology Mix Para	meters					Рори	late List of	f New Tec	hnologies t	for Possib	ble Implementation					\sim	2
Load Default	Parameters							ad Default	Paramet		Edit pa	arameters in "Add Technology fo	or Scenario	Selection"				
							_	aa bolaan	T di di li di		and im	plement with "Replace Technol	ogy Tool"				South Coa	ast
Load Saved	Parameters							oad Saved	Paramete	ers 🧉							AQM	D
Hot water heat	ting Kitchen Laundry Mis	cellaneo	us Pool	Space he	eating a	nd cooling	Trans	portation										
BASELINE	TECHNOLOGY MIX PARA	METE	RS		Hover ov	er Fuel or Te	chnology to	see selected	profile	SCEN	ARIO T	ECHNOLOGY MIX PA	RAMETE	RS	View T	ech Definition	Show Colu	Imn Information
Fuel	Technology	UEC	NOX EF C	O2e EF Unit	Cost	Install Cost	Lifetime	Penetra	tion	Fuel		Technology	UEC	NOX EF	CO2e EF	Unit Cost	Install Cost	Lifetime
A Electric W	/ater Heat	3169	0	0	361	170	0 13	3 0.	0500 =	Electric	Water H	eat	3169	0	0	361	1700	13
B Electric So	olar Water Heat with Electric Backup	1877	0	0	1411	386	9 13	3	0 =	Electric	Solar Wa	ater Heat with Electric Backup	1877	0	0	1411	3869	13
C NatGas Co	onventional Water Heater	PR		11.7600	647	190	0 13	30.	9050 ≠	Electric	Water H	eat	3169	0	0	361	1700	13
D NatGas So	olar Water Heat with Gas Backup	164	0.0023	11.7600	4349	386	9 13	3	0 =	NatGas	Solar Wa	ater Heat with Gas Backup	161	0.0023	11.7600	4349	3869	13
									4									
NEW TECH	HNOLOGY PARAMETERS												Sa	ve Baseline	and Scena	rio Technolo	ogy Mix Paran	neters to File
# Fuel	Technology		Pi	rofile	ι	JEC NO	X EF C	02e EF U	nit Cost	Install Cos	t Lifetim	ne Notes	Re	eplace Tech	nology Tool			
1 Electric	✓ Water Heat	V	Vater Heating)	•	3169	0	0	361	170	00	13 General technology c 🔺	(4	All househo	lds with the	baseline te	chnology will a	switch to
2 Electric	▼ Solar Water Heat with Electric B	ackup V	Vater Heating)	•	1877	0	0	1411	386	59	13 General technology c	th	e replacem	ent tech.)			
3 Electric	✓ Water Heat	V	Vater Heating]	-	3169	0	0	361	170	00	13 General technology c	S	elect baseli	ne technolo	gy to phase	e-out:	
4 NatGas	▼ Solar Water Heat with Gas Back	up V	Vater Heating)	•	161	0.0023	11.76	4349	386	69	13 General technology c		C NatGas C	Conventiona	Water Hea	ater	•
5 NatGas	 Whole House Tankless System 	V	Vater Heating)	•	-9999	-9999	-9999	-9999	-999	99 -99	99 Values not specified	9	elect techni	aloav to use	instead:		
6 NatGas	 High-Efficiency Condensing 	V	Vater Heating)	•	-9999	-9999	-9999	-9999	-999	99 -99	99 Values not specified	ľ	1 Electric	Nater Heat			
7 Electric	▼ Heat Pump	V	Vater Heating)	•	-9999	-9999	-9999	-9999	-999	99 -99	99 Values not specified		Electric	water nedt			-
8 Electric	 Standard Tank 	V	Vater Heating)	•	-9999	-9999	-9999	-9999	-999	99 -99	99 Values not specified						Implement
0 Electric	- Point of Use Tankloss System	M	Nator Heating	•	-	0000	0000	0000	0000	000	00 00	No Values not specified						
						View P	rofile Definit	ions Ad	d Techno	logy Sa	ave List o	f New Technologies to File		RETUR	N TO PREV	ous	ADVANCE T	O NEXT 🔶



View Other Appliances (leave unchanged)

mand De	emand Input Summary Power Su	ipply I	Economics	Computa	ation	Results											
ousing Catego	ory			Climate Zor	1e											-	
) Single-Fami	ily 🔿 Multi-Family 🔿 Mobile Hor	me 🔿 A	Aggregate	⊖6 Coa	stal (8 S. Near-	Coastal	09 N. N	lear-Coa	astal 🔾	10 S. Inland O 15 S. Desert O 1	6 Mountain	• All	CZ MAP		\bigcirc	
opulate Basel	line and Scenario Technology Mix Par	rameters					Popu	late List of I	New Teo	hnologies	for Possible Implementation					\sim	2
Load Default	Parameters							ad Default F	Paramet	ers 🥥	Edit parameters in "Add Technology f	or Scenario	Selection"			,	
									-		and implement with "Replace Techno	logy Tool"				South Coa	ast
Load Saved	Parameters							ad Saved P	Paramete	ers 🧲						<u>AQM</u>	D
ot water hea	ting Kitchen Laundry Mi	iscellaneo	us Poo	ol Space	heating	and cooling	Trans	portation									
ASELINE	E TECHNOLOGY MIX PAR	AMETE	RS		Hover	over Fuel or Teo	chnology to	see selected p	profile	SCEN	ARIO TECHNOLOGY MIX PA	RAMETE	RS	View Te	ch Definitions	Show Colu	umn Informatio
Fuel	Technology	UEC	NOX EF	CO2e EF U	nit Cost	Install Cost	Lifetime	Penetratio	on	Fuel	Technology	UEC	NOX EF	CO2e EF	nit Cost In	stall Cost	Lifetime
Electric R	ange Oven Combination	310	0	0	1000	140) 18	3 0.4	200 =	Electric	Range Oven Combination	310	0	0	1000	140	
Electric D	Dishwasher	83	0	0	800	344	12	2 0.7	400 =	Electric	Dishwasher	83	0	0	800	344	
Electric F	irst Refrigerator	827	0	0	1999	108	17.5000)	1 =	Electric	First Refrigerator	827	0	0	1999	108	17.50
Electric S	econd Refrigerator	1286	0	0	1999	108	17.5000	0.3	300 =	Electric	Second Refrigerator	1286	0	0	1999	108	17.50
Electric F	reezer	968	0	0	630	108	3 20	0.2	300 =	Electric	Freezer	968	0	0	630	108	
Electric N	licrowave	133	0	0	180	158	3 12	2 0.9	400 =	Electric	Microwave	133	0	0	180	158	
NatGas R	Range Oven Combination	36	0.0092	11.7600	1890	150	18	8 0.7	170 =	NatGas	Range Oven Combination	36	0.0092	11.7600	1890	150	
										·							
EW TEC	HNOLOGY PARAMETERS											Sav	/e Baseline	and Scenari	o Technolog	y Mix Paran	neters to Fil
Fuel	Technology			Profile		UEC NO	X EF CO	D2e EF Un	it Cost	Install Co	t Lifetime Notes	Re	eplace Tech	nology Tool			
1 Electric	 Range Oven Combination 	li II	nterior Appl	liance Equip	. 🔻	310	0	0	1000	1	40 18 General technology categ	. (4	All househo	lds with the b	aseline tecl	nnology will a	switch to
2 Electric	 Dishwasher 	li li	nterior Appl	liance Equip	. 💌	83	0	0	800	3	44 12 General technology categ	. th	e replacem	ent tech.)			
3 Electric	 First Refrigerator 	h	nterior Appl	liance Equip	. 🔻	827	0	0	1999	107	.5 17.5 General technology categ	. S	elect baseli	ne technolog	y to phase-	out:	
4 Electric	 Second Refrigerator 	li	nterior Appl	liance Equip	. 🔻	1286	0	0	1999	107	.5 17.5 General technology categ		A Electric R	ange Oven (Combination		•
5 Electric	✓ Freezer	li	nterior Appl	liance Equip	. 🔻	968	0	0	630	107	.5 20 General technology categ		elect techno	ploav to use i	nstead:		
6 Electric	 Microwave 	li	nterior Appl	liance Equip	. 🔻	133	0	0	180	157	.5 12 General technology categ		1 Electric E	ange Oven	Combination	1	-
7 NatGas	 Range Oven Combination 	li	nterior Appl	liance Equip	. 🔻	36.333 0	0.0092	11.76	1890	1	50 18 General technology categ		LICCUL	unge over	Johnbination		•
																	Implement
												_					
						View Pr	ofile Definiti	ons Add	Technol	logy S	we List of New Technologies to File		DETUD	TO DODU			



Air Quality Management District

South Coast

All results are preliminary and should be subject to extensive QA/QC before interpreting.
Ability to Add Technologies (leave unchanged)

emand	Demand Input Summary Power Su	upply I	Economics	Computa	tion	Results												
ousing Cate	gory			Climate Zon	е													
) Single-Fa	mily OMulti-Family OMobile Ho	me 🔿 A	ggregate	O 6 Coas	stal	08 S. Ne	ar-Coasta	1 O 9 1	N. Near-C	Coa	stal 🔾	10 S. Inland O 15 S. Desert O 10	6 Mountair	• All	CZ MAP		()	
opulate Bas	eline and Scenario Technology Mix Pa	rameters					Po	pulate List	of New 1	Tech	hnologies	for Possible Implementation					\sim	2
Load Defa								I oad Defai	ut Param	nete		Edit parameters in "Add Technology fo	or Scenario	Selection"				
Loud Dold								Loud Dolat	are reareas	ioto		and implement with "Replace Technol	logy Tool"				South Coa	ast
Load Save	ed Parameters							Load Save	ed Param	ieter	ers 🦷						AQM	D
																		_
lot water h	eating Kitchen Laundry M	liscellaneo	us Poo	ol Space ł	neatin	g and coolin	g Tra	nsportation	1									
															View T	ach Definitions	Show Colu	mo Information
ASELI			RS		Hove	er over Fuel or	Technology	to see select	ed profile		SCEN	ARIO TECHNOLOGY MIX PA	RAMEI	ERS		eon Deminions		in in internatio
Fuel	Technology	UEC	NOX EF	CO2e EF Un	it Cos	st Install Co	st Lifetir	ne Penet	ration		Fuel	Technology	UEC	NOX EF	CO2e EF	Unit Cost II	nstall Cost	Lifetime
Electric	Range Oven Combination	310	0	0	10	00 1	40	18	0.4200	=	Electric	Range Oven Combination	310	0	0	1000	140	
Electric	Dishwasher	83	0	0	8	00 3	344	12	0.7400	=	Electric	Dishwasher	83	0	0	800	344	
Electric	First Refrigerator	827	0	0	19	99 1	08 17.50	000	1	=	Electric	First Refrigerator	827	0	0	1999	108	17.50
Electric	Second Refrigerator	1286	0	0	199	99 1	08 17.50	000	0.3300	=	Electric	Second Refrigerator	1286	0	0	1999	108	17.50
Electric	Freezer	968	0	0	6	30 1	08	20	0.2300	=	Electric	Freezer	968	0	0	630	108	
Electric	Microwave	133	0	0	1	BO 1	58	12	0.9400	=	Electric	Microwave	133	0	0	180	158	
NatGas	Range Oven Combination	36	0.0092	11.7600	189	90 1	50	18	0.7170	=	NatGas	Range Oven Combination	36	0.0092	11.7600	1890	150	
										••								
IEW TE	CHNOLOGY PARAMETERS	5											Sa	ve Baseline	and Scena	rio Technolo	gy Mix Paran	neters to Fil
# Fu	el Technology			Profile		UEC N	IOX EF	CO2e EF	Unit Cos	st /	Install Co	st Lifetime Notes	R	eplace Tech	nology Tool			
1 Electric	 Range Oven Combination 	li II	nterior Appl	liance Equip	-	310	0	0	10	00	1	40 18 General technology categ	(All househo	lds with the	baseline tec	hnology will s	switch to
2 Electric	 Dishwasher 	li li	nterior Appl	liance Equip	-	83	0	0	8	00	3	44 12 General technology categ	t	he replacem	ent tech.)			
3 Electric	 First Refrigerator 	li li	nterior Appl	liance Equip	-	827	0	0	19	99	107	.5 17.5 General technology categ		elect baseli	ne technolo	gy to phase	out:	
4 Electric	 Second Refrigerator 	li li	nterior Appl	liance Equip	-	1286	0	0	19	99	107	.5 17.5 General technology categ		A Electric R	ange Oven	Combinatio	n	•
5 Electric	✓ Freezer	li li	nterior Appl	liance Equip	-	968	0	0	6	30	107	.5 20 General technology categ		oloct to chr	ology to uso	instead:		
6 Electric	 Microwave 	- II	nterior Appl	liance Equip	-	133	0	0	1	80	157	.5 12 General technology categ		4. Electric 5	Dongy to use	Oembinstin	-	
7 NatGas	Range Oven Combination	li li	nterior Appl	liance Equip	-	36.333	0.0092	11.76	18	90	1	50 18 General technology categ		I Electric F	kange Oven	Combinatio	n	•
8 Undefin	ed 🔻 New Technology	L	Indefined		•	-9999	-9999	-9999	-99	99	-99	-9999 Values not specified						Implement
						View	Profile Def	initions (\dd Tech	nok	ogy	ave List of New Technologies to File		RETURI	N TO PREV	IOUS	ADVANCE T	O NEXT



Air Quality Management District

South Coast

Ability to Assign Fuel, Profile, and Parameters to New Technology (leave unchanged)

emand	Demand Input Summary Power Su	ipply	Economics	Comp	utation R	esults												
ousing Cat	tegory			Climate 2	Zone													
) Single-Fa	amily 🔿 Multi-Family 🔿 Mobile Ho	me 🔿	Aggregate	06 C	oastal 🔘 8	S. Near-	Coastal	09 N.	Near-Co	astal (10 S. Inlan	d 🔿 15 S. Desert 🔿 10	6 Mountain	• All	CZ MAP		\square	
																	25	
opulate Ba	aseline and Scenario Technology Mix Pa	rameters					Popu	late List of	New le	chnologies	for Possible	Implementation	- ·					
Load Defa	ault Parameters						Loa	ad Default	Parame	ters 🧧	and imple	meters in "Add Technology fo ement with "Replace Technol	or Scenario Ioav Tool''	Selection"			South Co	ast
Load Sav	ved Parameters						Lo	ad Saved	Paramet	ters 🧲							AQM	D
	•																	
lot water I	heating Kitchen Laundry M	iscellane	ous Poo	Space	ce heating and	cooling	Transp	oortation										
ASELI	NE TECHNOLOGY MIX PAR	AMETE	ERS		Hover over	Fuel or Tec	hnology to s	see selected	profile	SCEN	ARIO TE	CHNOLOGY MIX PA	RAMETE	RS	View Te	ech Definition	s Show Colu	mn Information
Fuel	Technology	UEC	NOX EF	CO2e EF	Unit Cost In:	stall Cost	Lifetime	Penetra	tion	Fuel		Technology	UEC	NOX EF	CO2e EF	Jnit Cost	nstall Cost	Lifetime
Electric	Range Oven Combination	310	0	0	1000	140	18	0.	4200 =	Electric	Range Ove	en Combination	310	0	0	1000	140	1
Electric	Dishwasher	83	0	0	800	344	12	0.	7400 =	Electric	Dishwashe	r	83	0	0	800	344	1
Electric	First Refrigerator	827	0	0	1999	108	17.5000		1 =	Electric	First Refrig	erator	827	0	0	1999	108	17.500
Electric	Second Refrigerator	1286	i 0	0	1999	108	17.5000	0.	3300 =	Electric	Second Re	frigerator	1286	0	0	1999	108	17.500
Electric	Freezer	968	i 0	0	630	108	20	0.	2300 =	Electric	Freezer		968	0	0	630	108	2
Electric	Microwave	133	0	0	180	158	12	0.	9400 =	Electric	Microwave		133	0	0	180	158	1
NatGas	Range Oven Combination	36	EV Chargir	ng		150	18	0.	7170 =	NatGas	Range Ove	en Combination	36	0.0092	11.7600	1890	150	1
			Electric Co	oling														
			Electric Fa	ns														
			Electric HV	/AC														
									4	•								
EW TE	ECHNOLOGY PARAMETERS		Flat										Sa	ve Baseline	and Scenar	io Technolo	ogy Mix Paran	neters to File
F F	uel Technology		Interior App	pliance Ec	uipment	NO	X EF CO	2e EF U	nit Cost	Install Co	st Lifetime	Notes	Re	eplace Tech	nology Tool			
1 Electri	c - Range Oven Combination		Miscelaneo	ous Interio	r Equipment	10	0	0	1000	1	40 18	General technology categ	04	All househo	lds with the l	baseline teo	chnology will :	witch to
2 Electri	ic - Dishwasher		Space Hea	ating		33	0	0	800	3	44 12	General technology categ	th	e replacem	ent tech.)			
3 Electri	ic - First Refrigerator		Water Hea	ting		27	0	0	1999	10	7.5 17.5	General technology categ	S	elect baseli	ne technolo	gy to phase	-out:	
4 Electri	ic - Second Refrigerator		Electric Sto	orane Wat	or Hostor Fiv	36	0	0	1999	10	.5 17.5	General technology categ		A Electric R	ange Oven	Combinatio	n	•
5 Electri	ic - Freezer		Electric Ot	10/		58	0	0	630	10	.5 20	General technology categ		elect techn	alogy to use	instead:		
6 Electri	ic - Microwave		Electric Sto	brage vvat	er meater Fle	× 33	0	0	180	15	7.5 12	General technology categ		1 Electric F	Congo Over	Combinetic	20	_
	Range Oven Combination		Undefined			33 0	.0092	11.76	1890	1	50 18	General technology categ		i Electric F	vange oven	Combinatio		
7 NatGa	i i i i i i i i i i i i i i i i i i i																	



South Coast Air Quality Management District

View Demand Input Summary (leave unchanged)

Deman	d Demand Input Summa	ary P	ower Supply Economics	Computation Results									
Housin	g Category		C	limate Zone									
() Sin	gle-Family 🔘 Multi-Family	y 🔿 Mo	bile Home OAggregate	○ 6 Coastal ○ 8 S. Near-Co	astal (9 N. Near-Coastal 🛛 10 S.	Inland () 15 S. Desert () 16	Mountain) All C	Z MAP			
USE	R-SELECTED TECHNOLO	GY MODI	FICATIONS	F		SCENARI	0	DAG					
	Category	Fuel	Technology	Profile	Fuel	Technology	Profile	UEC		CO2e FF U	nit Cost Insi	all Cost Lif	etime
Hot	water heating	NatGas	Conventional Water Heater	Water Heating	Electric	Water Heat	Water Heating	modified	-0.0023	-11.76	-286	-200	0
								+	RETURN T	O PREVIOU	S ADV	ANCE TO N	EXT 🌩



Modify Methane Emissions from Natural Gas (leave unchanged)

neuriane Emissions nom i	Vatural Gas				Electricity	Generation from Grid		
Natural Gas Leak Rates (As per	entage of usage)	Before Meter	1.27 Before	Meter	Emission Fa	ctor of INCREASED Electricity Use	Emission Factor of REDU	CED Electricity Use
2018 EPA GHG Emissions II The 16 Study Series Synthe Alvarez et al., 2018 Science Custom Value	iventory: 1.27% sis Report: 1.7% Paper: 2.3%	Behind Meter Leak Rate [%] Global Warming Potential	0.5 Distri Leak Ra 34 (20 year) ▼ Heat ([E	ibution ibution ate [%] Content Btu/ft^3]	All additi wind, and All additi dispatcha All additi	onal electricity from centralized photovoltaics, d centralized battery storage onal electricity provided at the Basin-average able power emission factor onal electricity provided by peaker plants scient factor echanges modeled with NIGPID	Reductions in electricit with the Basin-average Reductions in electricit curtailing peaker plant Grid emission factor cl	ty generation emissions determine e dispatchable power emission fact by generation emissions arise by emissions nanges modeled with HiGRID
GHG Emissions from Natu For Advanced Users)	Iral Gas Production	1	Reset to Default	More Information	Transmission	n and Distribution Loss in Power Grid (For Adv	Electricity vanced Users)	Generation Module Documentatio
Type Pathway Su bio landfill bio wastewater	pply Fraction CO2e Emis 0 0	s. (lb/therm) -0.8604 -7.2321 72.4440	I-to-Pump Emis. of Advanced Users)	f Transportation	Use Fla	t Loss Percentage for all Utilities Loss urly Loss Percentage for all Utilities ity Specific Loss Percentages	[%] 5.4	More Informatio
bio manure bio food & green waste	0	-73.1118 NO:	x (lb/gal) CO2e (lb/gal) NOx (lb/gal)		Utility Name	Valid Years	Loss [%]
ossil natural gas	1	6.8368 Die	sel 0.95	76 7.4957e-04	Azusa Light	& Power	ç	2.5
upply Fraction" column					Bear Valley	Electric Service	(12.2
must sum to unity	eset to Default More II	ntormation	Reset to Default	More Information	Burbank wa	nim Public Utilities Department	10	3.5
stributed Seler Dhotoval	toice				City of Room	ing Electric Department	10	4.9
stributed Solar Photovol	laics				City of Ball	ing Electric Department	I. I.	0.0
					City of Coro	na Department of Water & Power	10) 27
Implement Rooftop S	olar PV using PV	Watts	Rooftop Solar PV Modu	le Documentation	City of Coro City of River	na Department of Water & Power	10	2.7
Implement Rooftop S	olar PV using PV\	Watts	Rooftop Solar PV Modu	le Documentation	City of Coro City of River	na Department of Water & Power side	10 10	2.7 5.4
Implement Rooftop S	olar PV using PV\	Watts (Rooftop Solar PV Modu	le Documentation	City of Coro City of River	na Department of Water & Power side Battery Storage	10	0 2.7 5.4
Implement Rooftop S For Advanced Users Solar Cost Function: COST =	eolar PV using PV	Watts (where "X" is d size in KW DC test conditions	Rooftop Solar PV Modu defined as the panel 2 under standard 5.	le Documentation	City of Coro City of River Residentia	na Department of Water & Power side I Battery Storage ent Residential Battery using Ba	10 10 attery Model Resider	1 2.7 2 5.4 *
Implement Rooftop S For Advanced Users Solar Cost Function: COST =	eolar PV using PV	Watts (where "X" is d size in KW DC test conditions	Rooftop Solar PV Modu defined as the panel 2 under standard 5.	le Documentation Reset to Default Test Function ore Information	City of Coro City of River Residentia	na Department of Water & Power side I Battery Storage ent Residential Battery using Ba d Users	10 10 attery Model Resider	1 2.7 5.4 1
Solar Cost Function: COST =	eolar PV using PV	Watts (where "X" is d size in KW DC test condition. Rooftop Area A	Rooftop Solar PV Modu defined as the panel 2 under standard s. Availability Ratio	le Documentation Reset to Default Test Function Ore Information 0.75	City of Coro City of River Residentia	na Department of Water & Power side I Battery Storage ent Residential Battery using Ba d Users Battery Setup A Battery Setup B Battery Setup C Battery P	1(1(attery Model Resider ity [kW-hr] 13.5 ower [kW] 5	1 1400 1 140
Dimplement Rooftop S For Advanced Users Solar Cost Function: COST = Module Type Standard System Loss Value	eolar PV using PV 4466.83 * X + 1859.02 ▼ 0.14	Watts (where "X" is d size in KW DC test condition: Rooftop Area A Usefu	Rooftop Solar PV Modu defined as the panel C under standard S. Availability Ratio	le Documentation teset to Default Test Function ore Information 0.75 25	City of Coro City of River Residentia Implem For Advance Battery System (all fields editable)	na Department of Water & Power side I Battery Storage ent Residential Battery using Ba d Users Battery Setup A Battery Setup B Battery Setup C	10 10 attery Model Resider ity [kW-hr] 13.5 ower [kW] 5	1 tial Battery Module Documentation Installation Cost \$ 1400 Battery Cost \$ 6200 Lifetime [years] 10
Implement Rooftop S For Advanced Users Solar Cost Function: COST = Module Type Standard System Loss Value Inverter Efficiency [%]	eolar PV using PV 4466.83 * X + 1859.02 • 0.14 96	Watts (where "X" is c size in KW DC test condition Rooftop Area A Usefu	Rooftop Solar PV Modu defined as the panel 2 under standard s. Availability Ratio ul Lifespan [yrs] el Tilt [degrees]	le Documentation Reset to Default Test Function 0.75 25 20	City of Coro City of River Residentia Dimplem For Advance Battery System (all fields editable)	na Department of Water & Power side I Battery Storage ent Residential Battery using Ba d Users Battery Setup A Battery Setup B Battery Setup C Battery P	10 attery Model Resider ity [kW-hr] 13.5 ower [kW] 5 Re	1 2.7 2 5.4 1 5.4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



South Coast Air Quality Management District

Modify Renewable/Fossil Natural Gas Mixture (leave unchanged)

Demand	Demand Input Sun	mary Power Supply	Economics	Computation	Results		
Methane	e Emissions from	n Natural Gas					Electricity Generation from Grid
Natural 6	Gas Leak Rates (As p	ercentage of usage)	Before Meter	1.2	Before M	eter	Emission Factor of INCREASED Electricity Use
 2018 The Alva 	8 EPA GHG Emission 16 Study Series Synt rez et al., 2018 Scien	s Inventory: 1.27% hesis Report: 1.7% ce Paper: 2.3%	Leak Rate [%] Behind Meter Leak Rate [%]	0.1	Transmiss Stor 5 Distribu Leak Rate	sion/ age/ 0.35 ition [%]	All additional electricity from centralized photovoltaics, wind, and centralized battery storage
⊖ Cust	tom Value		Global Warmi Potent	ng ial 84 (20 year)	Heat Co [Btu	ntent /ft^3] 1034	All additional electricity provided by peaker plants Grid emission factor changes modeled with HiGRID
GHG En (For Advar	nissions from Na nced Users)	atural Gas Producti	on	Rese	t to Default	More Information	Transmission and Distribution Loss in Power Grid (For Advance
Type bio bio	Pathway landfill wastewater	Supply Fraction CO2e E 0 0	mis. (lb/therm) -0.8604 -7.2321	Well-to-Pum (For Advanced	np Emis. of T _{Users)}	ransportation	Use Flat Loss Percentage for all Utilities Loss [%] Use Hourly Loss Percentage for all Utilities O Use Utility Specific Loss Percentages
bio	manure	0	-73.1118	NOx (lb/gal)	CO2e (lb/gal)	NOx (lb/gal)	Utility Name
fossil	natural gas	1	-17.0455 6.8368	Gasoline Diesel	1.1403 0.9576	6.8343e-04 7.4957e-04	Azusa Light & Power
"Supply Fi	raction" column	Reset to Default Mor	e Information	Rese	t to Default	Nore Information	Burbank Water & Power
Distribut	ted Solar Photov	oltaics	N/Matta	Durfun 0		Desurrentetion	City of Anaheim Public Utilities Department City of Banning Electric Department City of Corona Department of Water & Power
For Adva	anced Users	Solar PV using P	vvalls	Roonop S	olar PV Module	Documentation	City of Riverside
			ubere "	Willia defined as i	Res	et to Default	Residential Battery Storage
Solar (Cost Function: COST	= 4466.83 * X + 1859.0)2 size in l	kW DC under sta	ndard Te	st Function	Implement Residential Battery using Batter
			test cor	nditions.	Mor	e Information	For Advanced Users
Mo	dule Type Standa	d 🔻	Rooftop	Area Availability	Ratio	0.75	Battery Battery Setup A Battery Capacity [kt System Battery Setup B Battery Power
	System Loss Value	0.14		Useful Lifespan	[yrs]	25	editable) Battery Setup C
1	Inverter Efficiency [%]	96		Panel Tilt [degi	ees]	20	



South Coast Air Quality Management District

All results are preliminary and should be subject to extensive QA/QC before interpreting.

Emission Factor of REDUCED Electricity Use

9

10

10

10

10

10

curtailing peaker plant emissions

Advanced Users)

Battery Model

5

RETURN TO PREVIOUS

y Power [kW]

5.4

Valid Years

Reductions in electricity generation emissions determined

with the Basin-average dispatchable power emission factor Reductions in electricity generation emissions arise by

Electricity Generation Module Documentation

Loss [%]

Residential Battery Module Documentation

Installation Cost \$

Battery Cost \$ Lifetime [years] Reset to Default | More Information

ADVANCE TO NEXT 📥

More Information

2.5

12.2

3.5

4.9

6.8

2.7

1400

5.4 *

Modify Well-to-Pump Emissions of Transportation (leave unchanged)

Demand	Demand Input Sum	mary Power Supply	Economics	Computation	Results						
Metha	ne Emissions from	Natural Gas					Electricity	Generation from G	Grid		
			Defere Meter				,				
Natura	Gas Leak Rates (As p	ercentage of usage)	Leak Rate [%]	1.27	Transmiss	ieter sion/	Emission F	actor of INCREASED Ele	ectricity Use	Emission Factor of RED	UCED Electricity Use
	18 EPA GHG Emission	s Inventory: 1.27%	Debied Meter		Stor	age/ 0.35	All add	tional electricity from cen	tralized photovoltaics,	Reductions in electric	city generation emissions determined
○ Th	e 16 Study Series Synt	hesis Report: 1.7%	Leak Rate [%]	0.5	Distribu	ution	wind, a	nd centralized battery sto	rage	with the Basin-average	ge dispatchable power emission factor
	varez et al., 2018 Scien	ce Paper: 2.3%			Leak Nate	5 [70]	All addition of the second	tional electricity provided hable power emission fac	at the Basin-average	Reductions in electric	ty generation emissions arise by
⊖ Cι	istom Value		Global Warmir	1g 84 (20 year)	 Heat Co 	ntent 1034		tional electricity provided	by neaker plants	Grid emission factor	nt emissions
			1 Otenia			////*/3]	Grid en	aission factor changes m	deled with HiGRID		
GHG E	missions from Na	atural Gas Productio	n				O ond en	ission lactor changes int		Electricity	y Generation Module Documentation
(For Adv	anced Users)			Reset	to Default	More Information	Transmissi	on and Distribution Loss	in Power Grid (For Adv	anced Users)	
Type	Pathway	Supply Fraction CO2e En	us (lb/therm)					at Loss Percentage for a		10/1 E 4	More Information
hio	landfill		-0.8604	Well-to-Pum	p Emis. of 1	Fransportatior	OUse F	at Loss Percentage for a	i Ounides Loss [[%] 0.4	More mormation
bio	wastewater	0	-7 2321	(For Advanced U	Jsers)		O Use H	ouny Loss Percentage to	r all Utilities		
bio	manure	0	-73.1118	NOx (lb/gal)	CO2e (lb/gal)	NOx (lb/gal)	• Use U	tility Specific Loss Percer	itages		
bio	food & green waste	0	-17.0455	Gasoline	1 1403	6 8343e-04		Utility Name		Valid Years	Loss [%]
fossil	natural gas	1	6.8368	Diesel	0.9576	5 7.4957e-04	Azusa Ligi	ht & Power			9 2.5
"Supply	Fraction" column	Beerthe Before ()	Information)				Bear Valle	y Electric Service			9 12.2
mus	t sum to unity	Reset to Default More	Information	Reset	t to Default	More Information	Burbank V	Vater & Power		1	3.5
Dictrib	uted Seler Dhotou	oltaica	l				City of Ana	aneim Public Utilities Dep	artment		10 4.9
DISTIN	uted Solar Photov	Uitaics					City of Co	rona Department of Wate	r & Power	4	10 2.7
🗌 lm	plement Rooftop	Solar PV using PV	/Watts	Rooftop So	olar PV Module	Documentation	City of Riv	erside	ar own	1	10 5.4
For Ad	veneed Lieere										
FOLAU	vanceu Osers										
			where "	X" is defined as th	Res	set to Default	Residenti	al Battery Storage			
Sola	r Cost Function: COST	= 4466.83 * X + 1859.02	size in k	W DC under stan	idard Te	est Function	Implei	nent Residential E	Battery using Ba	ttery Model Reside	ential Battery Module Documentation
			test con	ditions.	Mor	e Information	For Advance	ed Users			
							1 of Advant				
N	Iodule Type Standar	d 🔹	Roofton	Area Availability R	Ratio	0.75	Battery	Battery Setup A	Battery Capacit	ty [kW-hr] 13.5	Installation Cost \$ 1400
			riconop i	fired revenues inty in	tutio	0.15	(all fields	Battery Setup B	Battery Po	ower [kW] 5	Battery Cost \$ 6200
	System Loss Value	0.14		Useful Lifespan [[yrs]	25	editable)	ballery Selup C			Lifetime [years] 10
	Inverter Efficiency [%]	96		Popol Tilt (door	0.001	20					apat to Dafault
	[/0]			raner nic (degre	ceol	20				R	
	DC to AC Size Ratio	1.2		Reset to De	efault More	e Information					
										RETURN TO PREVI	OUS ADVANCE TO NEXT 🔶



South Coast Air Quality Management District

Modify Electricity Generation from Grid(leave unchanged)

Demand	Demand Input Sun	nmary Power Supply	Economics	Computation	Results						
Methar	ne Emissions fron	n Natural Gas					Electricity	Generation from Grid			
Natural 20 Th Alv Cu	I Gas Leak Rates (As p 18 EPA GHG Emission le 16 Study Series Synt varez et al., 2018 Scien lstom Value	ercentage of usage) is Inventory: 1.27% thesis Report: 1.7% ice Paper: 2.3%	Before Meter Leak Rate [%] Behind Meter Leak Rate [%] Global Warmin Potenti	1.2 0.3	7 Before M Transmiss Stor 5 Distribu Leak Rate	leter sion/ age/ 0.35 tion 2 [%] ntent 1034	Emission F All addi wind, a All addi dispatc All addi	actor of INCREASED Electricity Us tional electricity from centralized ph nd centralized battery storage tional electricity provided at the Bas hable power emission factor tional electricity provided by peaker	se notovoltaics, sin-average r plants	Emission Factor of REDUC Reductions in electricity with the Basin-average Reductions in electricity curtailing peaker plant e Grid emission factor cha	ED Electricity Use generation emissions determined dispatchable power emission facto generation emissions arise by missions inges modeled with HIGRID
GHG E	Emissions from Na ranced Users)	atural Gas Productio	n	Reset	t to Default	More Information	O Grid en Transmissi	nission factor changes modeled with	h HiGRID Grid (For Advar	Electricity G	eneration Module Documentation
Type bio bio	Pathway Iandfill wastewater	Supply Fraction CO2e En 0 0	nis. (lb/therm) -0.8604 -7.2321	Well-to-Pum (For Advanced	np Emis. of T _{Users)}	ransportation	Use Fl Use H	at Loss Percentage for all Utilities ourly Loss Percentage for all Utilitie tility Specific Loss Percentages	Loss (%	5.4	More Information
bio bio fossil	manure food & green waste natural gas	0 0 1	-73.1118 -17.0455 6.8368	NOx (lb/gal) Gasoline Diesel	CO2e (lb/gal) 1.1403 0.9576	NOx (lb/gal) 6.8343e-04 7.4957e-04	Azusa Ligi	Utility Name		Valid Years 9	Loss [%]
"Supply must	Fraction" column t sum to unity	Reset to Default More	Information	Rese	et to Default	More Information	Bear Valle Burbank V City of Ana	y Electric Service /ater & Power aheim Public Utilities Department		9 10 10	12.2 3.5 4.9
Distribu	uted Solar Photov	voltaics Solar PV using PV	/Watts	Rooftop S	olar PV Module	Documentation	City of Bar City of Con City of Riv	nning Electric Department ona Department of Water & Power erside		10 10 10	6.8 2.7 5.4
For Ad	vanced Users		where ")	X" is defined as t	the panel	set to Default	Residenti	al Battery Storage			
Solar	r Cost Function: COST	T = 4466.83 * X + 1859.02	size in k test con	W DC under sta ditions.	ndard Te Mor	est Function e Information	For Advance	ment Residential Battery	using Batt	tery Model Resident	al Battery Module Documentation
N	Nodule Type Standar System Loss Value	rd 👻	Rooftop /	Area Availability I Useful Lifespan	Ratio	0.75	Battery System (all fields editable)	Battery Setup A Ba Battery Setup B Battery Setup C	attery Capacity Battery Pow	[kW-hr] 13.5 /er [kW] 5	Installation Cost \$ 1400 Battery Cost \$ 6200 Lifetime (years) 10
	Inverter Efficiency [%]	96		Panel Tilt [degr	rees]	20				Res	et to Default More Information
	DC to AC Size Ratio	1.2		Reset to D	efault More	e Information			(ADVANCE TO NEXT



South Coast Air Quality Management District

Modify Elec. Transmission and Distribution Loss (leave unchanged)

Demand	Demand Input Sur	mmany Power Supply	Economics	Computation	Reculte							
Demand	Demand input ou	initiary i ower ouppry	Economics	Computation	results							
Metha	ne Emissions from	m Natural Gas					Electricity	Generation from (Grid			
Natura	l Gas Leak Rates (As p	percentage of usage)	Before Meter	1.2	Before M	eter	Emission F	actor of INCREASED EI	ectricity Use	Emission Fac	ctor of REDUCED) Electricity Use
0 20	018 EPA GHG Emission	ns Inventory: 1.27%	Leak Rate [%]		Transmiss Stor	sion/	 All addi 	tional electricity from cer	ntralized photovoltaics	Reduction	s in electricity de	neration emissions determined
OT	he 16 Study Series Syn	thesis Report: 1.7%	Behind Meter	0.	5 Distribu	ition	wind, a	nd centralized battery sto	orage	with the B	asin-average dis	patchable power emission facto
○ Al	varez et al., 2018 Scier	nce Paper: 2.3%	Leak Rate [%]		Leak Rate	[%]	All addi	tional electricity provided	d at the Basin-average	Reduction	is in electricity ge	neration emissions arise by
. oc	ustom Value		Global Warming	9 94 (20 year	Heat Co	ntent 1024	dispate	hable power emission fa	ctor	curtailing	peaker plant emis	ssions
			Potentia		[Btu	/ft^3]	All add	tional electricity provided	d by peaker plants	Grid emis	sion factor chang	es modeled with HiGRID
GHG	Emissions from N	atural Gas Productio	n				Grid en	hission factor changes m	odeled with HiGRID		Electricity Gen	eration Module Documentation
(For Ad				Rese	t to Default	Nore Information	Transmissi	on and Distribution Loss	in Power Grid /For Ar	dvanced Lisers)		
(FOI AU	Valiceu Osers)	0	in (the file is new)				Transmissi			avanced Osers)		(
Type	Pathway	Supply Fraction CO2e Err	IIS. (ID/therm)	Well-to-Pun	np Emis. of T	ransportation	Use F	at Loss Percentage for a	all Utilities Los	s [%] 5.4		More Information
bio	landilli	0	7 2221	(For Advanced	Users)	•	O Use H	ourly Loss Percentage fo	or all Utilities			
bio	manure	0	-73 1118	NOv (Ib/aal)	CO3a (lb/gal)	NOv (Ib/gal)	• Use U	tility Specific Loss Perce	ntages			
bio	food & green waste	0	-17.0455	Gasolino	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	6 9242o 04		Utility Name		Valid Ye	ars	Loss [%]
fossil	natural gas	1	6.8368	Diesel	0.9576	7 4957e-04	Azusa Ligi	nt & Power			9	2.5 🔺
"Supply	Fraction" column			Dieser	0.0010	1.40010 04	Bear Valle	y Electric Service			9	12.2
mus	st sum to unity	Reset to Default More	Information	Rese	et to Default 📔 🛽 🛚	Nore Information	Burbank V	/ater & Power			10	3.5
Distrib	uted Celer Dhete	velteice					City of Ana	aheim Public Utilities Dep	partment		10	4.9
Distrib	uted Solar Photo	voitaics					City of Co	ining Electric Department	IL Dr. & Dowor		10	0.8
🗌 lm	plement Roofton	o Solar PV using PV	Watts	Rooftop S	Solar PV Module	Documentation	City of Riv	erside	ar ar ower		10	5.4 *
For Ar							Control that					
FULA	Ivanceu Osers						Desidenti					
			where "X	" is defined as	the panel	set to Default	Residenti	al Battery Storage				
Sola	ar Cost Function: COS	T = 4466.83 * X + 1859.02	size in kV	N DC under sta	andard Te	st Function	🗌 İmpler	nent Residential	Battery using B	attery Model	Residential I	Battery Module Documentation
			test cond	litions.	Mor	e Information	For Advand	ed Users				
							0-#	Battery Setun A	Rattery Cana	city [kW_br]	3.5	stallation Cost § 1400
1	Module Type Standa	ard 🔻	Rooftop A	rea Availability	Ratio	0.75	System	Battery Setup R	Dattery Capa	city [Kw-iii]	3.5	
							(all fields	Battery Setup C	Battery	Power [kW]	5	Battery Cost \$ 6200
	System Loss Value	e 0.14	l	Useful Lifespan	n [yrs]	25	editable)					Lifetime [years] 10
	Inverter Efficiency [%] 96		Panel Tilt [deg	irees]	20					Reset to	o Default More Information
	DC to AC Size Ratio	1.2		Depat in D) of out the	Information						
				Reset to L	More	e information				🔶 RETURN	TO PREVIOUS	ADVANCE TO NEXT 📥



South Coast Air Quality Management District

Implement Rooftop Solar PV

Demand Demand Input Summary Power Supply Economics	Computation Results		
Methane Emissions from Natural Gas		Electricity Generation from Grid	
Natural Gas Leak Rates (As percentage of usage) Before Meter Leak Rate [%	1.27 Before Meter Transmission/	Emission Factor of INCREASED Electricity Use	Emission Factor of REDUCED Electricity Use
2018 EPA GHG Emissions Inventory: 1.27% The 16 Study Series Synthesis Report: 1.7% Alvarez et al., 2018 Science Paper: 2.3% Custom Value Global Warmi Reten:	r Storage/ 0.35 Distribution Leak Rate [%]	All additional electricity from centralized photovoltaics, wind, and centralized battery storage All additional electricity provided at the Basin-average dispatchable power emission factor All additional electricity provided by peaker plants	Reductions in electricity generation emissions determined with the Basin-average dispatchable power emission factor Reductions in electricity generation emissions arise by curtailing peaker plant emissions Grid emission factor channes modeled with HIGRID
GHG Emissions from Natural Gas Production	Reset to Default More Information	Grid emission factor changes modeled with HiGRID	Electricity Generation Module Documentation
Type Pathway Supply Fraction CO2e Emis. (lb/therm) bio landfill 0 -0.8604 bio wastewater 0 -7.2321	Well-to-Pump Emis. of Transportation (For Advanced Users)	Transmission and Distribution Loss in Power Grid (For Adva Use Flat Loss Percentage for all Utilities Use Hourly Loss Percentage for all Utilities Use Utility Specific Loss Percentages	winced Users) More Information %] 5.4
bio manure 0 -73.1118 bio food & green waste 0 -17.0455 fossil natural gas 1 6.8368	NOx (lb/gal) CO2e (lb/gal) NOx (lb/gal) Gasoline 1.1403 6.8343e-04 Diesel 0.9576 7.4957e-04	Litility Name Azusa Light & Power Base Kelley Statis	Valid Years Loss [%]
"Supply Fraction" column must sum to unity Reset to Default More Information	Reset to Default More Information	Bear Valley Electric Service Burbank Water & Power City of Anaheim Public Utilities Department	9 12.2 10 3.5 10 4.9
Distributed Solar Photovoltaics Implement Rooftop Solar PV using PVWatts	Rooftop Solar PV Module Documentation	City of Banning Electric Department City of Corona Department of Water & Power City of Riverside	10 6.8 10 2.7 10 5.4
For Advanced Users where ' Solar Cost Eulerion' COST = 4466 83 * X + 1859 02 size in	"X" is defined as the panel kW DC under standard	Residential Battery Storage	
test cor	More Information	For Advanced Users	
Module Type Standard Rooftop System Loss Value 0.14	Area Availability Ratio 0.75 Useful Lifespan [yrs] 25	Battery Battery Setup A Battery Capacity System Battery Setup B Battery Por (all fields Battery Setup C Battery Por editable)	v [kW] 13.5 Installation Cost \$ 1400 wer [kW] 5 Battery Cost \$ 6200 Lifetime [week] 40
Inverter Efficiency [%] 96	Panel Tilt [degrees] 20		Reset to Default More Information
DC to AC Size Ratio 1.2	Reset to Default More Information		RETURN TO PREVIOUS ADVANCE TO NEXT



Air Quality Management District All results are preliminary and should be subject to extensive QA/QC before interpreting.

Implement Residential Battery Storage (leave unchanged)

Methane Emissions from Natural Gas Natural Gas Leak Rates (As percentage of usage) Defore Meter • Other Methane Emissions Strendor, 1.27%, Other Meter Defore Meter • Other Methane Emissions Strendor, 1.27%, Other Meter Defore Meter • Other Methane Emissions Strendor, 1.27%, Other Meter Defore Meter • Other Methane Emissions Strendor, 1.27%, Other Meter Defore Meter • Other Methane Emissions Strendor, 1.27%, Other Meter Defore Meter • Other Meter Other Meter • Other Meter • Other Meter • Other Meter Other Meter • Other Me	emand Demand Input Summary Power Supply Econo	mics Computation Results		
Natural Gas Leak Rates (As percentage of usage) Before Mater Tax Rate (S) Beine Mater Deschall Before Mater Tax Rate (S) Beine Mater Deschall 127 Before Mater Tax Rate (S) Deschall Ension Factor of INCREASED Electricity Usa Nor realization before formed all additional electricity forme centralized baffers formed all additional electricity forme centralized baffers formed all additional electricity forme centralized baffers formed all additional electricity formed all additi	Nethane Emissions from Natural Gas		Electricity Generation from Grid	
Construction of the PA of the Sension Inventory. 127% Construction of the Settle Sension Reset of Construction Values Constrentiation Construction Values Construction Constructi	Natural Gas Leak Rates (As percentage of usage) Befor	e Meter 246 [%] 1.27 Before Meter	Emission Factor of INCREASED Electricity Use	Emission Factor of REDUCED Electricity Use
Child and and the control of the co	2018 EPA GHG Emissions Inventory: 1.27% The 16 Study Series Synthesis Report: 1.7% Alvarez et al., 2018 Science Paper: 2.3% Custom Value Global	d Meter tate [%] 0.5 Distribution Leak Rate [%] Warming Potential 84 (20 year) ▼ Heat Content The structure of the stru	All additional electricity from centralized photovoltaics, wind, and centralized battery storage All additional electricity provided at the Basin-average dispatchable power emission factor	Reductions in electricity generation emissions determined with the Basin-average dispatchable power emission factor Reductions in electricity generation emissions arise by curtailing peaker plant emissions Grid emission factor channes modeled with HiGPID
(For Advanced Users) Reset to Default More Information Type Pathway Supply Fraction 0 0.8644 bio Institution 0 0.8644 More Information (For Advanced Users) Well-to-Pump Emis, of Transportation (Gore (blga) Nox (blga) Oce (blga) Nox (blga) bio on anure 0 -7.2351 (Bore Information) Use Houry Loss Percentage for all Utilities Loss (%) 5.4 Supply Fraction* column Nox (blga) Oce (blga) Nox (blga) Oce (blga) Nox (blga) Base Valley Electric Service 9 2.25 Bear Valley Electric Service 9 2.26 Bear Valley Electric Service 9 2.27 City of Ananced Users Reset to Default More Information 10 6.8 Virplement Rooftop Solar PV using PVWatts Roottop Area Availability Ratio 0.75 Implement Residential Battery Solar Ge	GHG Emissions from Natural Gas Production		Grid emission factor changes modeled with HiGRID	Electricity Generation Module Documentation
Type Pathway Supply Fraction CO2e Emis. (bitherm) bio vasetswater 0 -0.8504 bio westewater 0 -73 tills bio manure 0 -73 tills bio manure 0 -73 tills bio manure 0 -73 tills bio food & green weste 0 -17.0455 Supply Fraction" column must sum to unity Reset to Default More Information Supply Fraction" column must sum to unity Reset to Default More Information Pirplement Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation For Advanced Users where "X" is defined as the panel test conditions. Reset to Default Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Userful Lifespres] 20 DC to AC Size Ratio 1.2 Reset to Default More Information More Information 0.75 Battery Setup A Battery Capacity RW-H1 1.5 Inverter Efficiency (%) 9.6 Panel Tit (degrees] 2.0 Reset to Default	For Advanced Users)	Reset to Default More Information	Transmission and Distribution Loss in Power Grid (For Adva	anced Users)
bio manure 0 -73 1118 bio food & green wate 0 -17 0455 foosili natural gas 1 6.8368 "Supply Fraction" column must sum to unity Reset to Default More information Distributed Solar Photovoltaics 9 2.5 Implement Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation 10 6.8 For Advanced Users where "X" is defined as the panel size in NW DC under standard test conditions. Reset to Default Test Function More information Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespen fyrs] 25 Inverter Efficiency (%) 96 Panel Tilt (degrees] 20 Reset to Default More Information For Advanced Users 0.14 Useful Lifespen fyrs] 25 Installation Cost \$ 1400 System Loss Value 0.14 Useful Lifespen fyrs] 25 Reset to Default Battery Setup A Battery Setup A Battery Setup B Battery Setup C Utetime fyeers] 10	Type Pathway Supply Fraction CO2e Emis. (lb/the bio landfill 0 -0.8 bio wastewater 0 -7.2	Well-to-Pump Emis. of Transportation (For Advanced Users)	 Use Flat Loss Percentage for all Utilities Use Hourly Loss Percentage for all Utilities Use Use Utility Specific Loss Percentages 	6] 5.4 More Information
bid 1000 & gitem finate 0 -17.443 Supply Fraction* column must sum to unity Reset to Default More information 9 2.5 "Supply Fraction* column must sum to unity Reset to Default More information 9 2.5 Distributed Solar Photovoltaics 9 2.5 9 1.2 Distributed Solar Photovoltaics 0 6.83430-04 (Reset to Default 9 2.5 Implement Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation 10 6.8 For Advanced Users State in KW DC under standard test conditions. Reset to Default Reset to Default Test Function More Information Test Function More Information 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 10 12 Reset to Default 25 10 Inverter Efficiency [%] 96 Panel Tit [degrees] 20 Reset to Default 0.75 10 12 DC to AC Size Ratio 1.2 Reset to Default 0.75 25 10 10 10 10 DC to AC Size Ratio 1.2 Reset to Default More Information 10	bio manure 0 -73.1	1118 NOx (lb/gal) CO2e (lb/gal) NOx (lb/gal)	Utility Name	Valid Years Loss [%]
Nossi in addiarigas i 0.8576 7.49576-04 "Supply Fraction" column must sum to unity Reset to Default More Information Distributed Solar Photovoltaics Distributed Solar Photovoltaics Implement Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation For Advanced Users Solar Cost Function: COST = where "X" is defined as the panel Solar Cost Function: Reset to Default Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%) 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	bio tood & green waste 0 -17.0	Gasoline 1.1403 6.8343e-04	Azusa Light & Power	9 2.5
"Supply Fraction" column must sum to unity Reset to Default More Information Reset to Default More Information Distributed Solar Photovoltaics Distributed Solar PV using PVWatts Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation For Advanced Users Implement Rooftop Solar Star 1859.02 Reset to Default Reset to Default Solar Cost Function: COST = 4466.83 * X + 1859.02 Reset to Default Reset to Default Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	iossii naturaigas i 0.8	Diesel 0.9576 7.4957e-04	Bear Valley Electric Service	9 12.2
Inter sum to unity Ited to bottool intermetation Distributed Solar Photovoltaics Implement Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation For Advanced Users Reset to Default Test Function Solar Cost Function: COST = 4466.83 * X + 1859.02 where "X" is defined as the parel size in KW DC under standard test conditions. Reset to Default Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	"Supply Fraction" column Reset to Default More Informati	on Reset to Default More Information	Burbank Water & Power	10 3.5
Distributed Solar Photovoltaics City of Banning Electric Department 10 6.8 City of Banning Electric Department of Water & Power 10 2.7 For Advanced Users Reset to Default 10 5.4 Solar Cost Function: COST = 4466.83 * X + 1859.02 size in KW DC under standard test conditions. Reset to Default 10 5.4 Module Type Standard Rooftop Area Availability Ratio 0.75 Battery Setup A Battery Capacity [kW-hr] 13.5 Installation Cost \$ 1400 Norther Efficiency [%] 96 Panel Tilt [degrees] 20 Eattery Setup A Battery Setup C Eattery Setup C DC to AC Size Ratio 1.2 Reset to Default More Information Control Control Control Control Control Control Control			City of Anaheim Public Utilities Department	10 4.9
Implement Rooftop Solar PV using PVWatts Rooftop Solar PV Module Documentation For Advanced Users	Distributed Solar Photovoltaics		City of Banning Electric Department	10 6.8
Implement Roottop Solar PV using PV watts Roottop Solar PV Module Documentation For Advanced Users			City of Corona Department of Water & Power	10 2.7
For Advanced Users Reset to Default Solar Cost Function: COST = 4466.83 * X + 1859.02 Size in XW DC under standard test conditions. Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	Implement Rooftop Solar PV using PVWatts	Rooftop Solar PV Module Documentation	Citv of Riverside	10 5.4 *
Solar Cost Function: COST = 4466.83 * X + 1859.02 where "X" is defined as the panel size in KW DC under standard test conditions. Reset to Default Test Function Implement Residential Battery using Battery Model Residential Battery Model Residential Battery Model Residential Battery Model Coursentation Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	For Advanced Users			
Solar Cost Function: COST = 4466.83 * X + 1859.02 where X is defined as the panel size in kW DC under standard test conditions. Test Function More Information Module Type Standard Rooftop Area Availability Ratio O.75 System Loss Value O.14 Useful Lifespan [yrs] Panel Tilt [degrees] Reset to Default More Information Implement Residential Battery using Battery Model Residential Battery Module Documentation Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 Reset to Default More Information DC to AC Size Ratio 1.2 Reset to Default More Information More Information		Reset to Default	Residential Battery Storage	
More Information More Information Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 12 Reset to Default More Information	Solar Cost Function: COST = 4466.83 * X + 1859.02	size in kW DC under standard Test Function	Implement Residential Battery using Bat	ttery Model Residential Battery Module Documentation
Module Type Standard Rooftop Area Availability Ratio 0.75 System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information		More Information	For Advanced Users	
System Loss Value 0.14 Useful Lifespan [yrs] 25 Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	Module Type Standard	cooftop Area Availability Ratio 0.75	Battery Battery Setup A Battery Capacit System Battery Setup B Battery Po (all fields Battery Setup C	/ [kW-hr] 13.5 Installation Cost \$ 1400 wer [kW] 5 Battery Cost \$ 6200
Inverter Efficiency [%] 96 Panel Tilt [degrees] 20 DC to AC Size Ratio 1.2 Reset to Default More Information	System Loss Value 0.14	Useful Lifespan [yrs] 25	editable)	Lifetime [years] 10
DC to AC Size Ratio 1.2 Reset to Default More Information	Inverter Efficiency [%] 96	Panel Tilt [degrees] 20		Reset to Default More Information
	DC to AC Size Ratio 1.2	Reset to Default More Information		



South Coast Air Quality Management District

emand Demand Inpu	It Summary Power Supply Econom	nics Computation Re	esults							
Low Income R	ates Qualification			Net Metering						
Load Default Low Inc	come Fractions) 🥚			No Net Metering (default) Use Net Metering) 💿 Sell E	Electricity Back t Electricity Back t	o Grid at Retail F o Grid at Fixed F	Rates Rate (specify)	\$ ().000 /kW-hr
For Advanced Users				Gasoline and Dies	sel Prices	\$				
View/Edit Low Inco	me Fractions			Average Caseline (All Gred	loc) Rotail Dria	- e - 26)5 per gellen		(
Load Saved Low Inc	ome Fractions			Average Diesel (On-Highwa	ay) Retail Price	e \$ 3.0	57 per gallon	Set to Default	View Curren Prices	from EIA
Electricity Rate	es			Natural Gas Rates	S					
Load Default Rate St	tructures			Load Default Rate Structur	res 🥚					
For Advanced Users				For Advanced Users						
View/Edit Rate Stru	uctures			View/Edit Rate Structures	5					
Load Saved Rate St	tructures			Load Saved Rate Structur	es 🔴					
Natural Gas A	ppliance Categorization									
For Advanced Users	(Categori	ze all Natural Gas appliances	for gas rate calculator. Every ap	pliance must be assigned a singl	e category. Us	ed when adding	new natural gas	appliances)	N	lore Information
Category	Technology	Conventional Water Heater	Solar Water Heat with Gas Bac	kup Range Oven Combination	Spa Heat	Pool Heat	Primary Heat	Auxiliary Heat	Dryer	Other
Hot water heating	Conventional Water Heater	\checkmark								
Hot water heating	Solar Water Heat with Gas Backup		✓							
Kitchen	Range Oven Combination			✓						
Laundry	Dryer								✓	
Miscellaneous	Other									✓
Pool	Pool Heat					1				
Pool	Spa Heat				✓					
Space heating and coo	oling Auxiliary Heat							✓		· · · ·
4							FETURN	I TO PREVIOUS	ADVAN	



mand Demand Inpu	t Summary Power Supply Econon	nics Computation Re	sults							
Low Income R Load Default Low Inco For Advanced Users View/Edit Low Incor Load Saved Low Inco	ates Qualification Gree ome Fractions That me Fractions ome Fractions	n light indio Values are l	cates oaded	Net Metering No Net Metering Use Net Metering Gasoline and Diese Average Gasoline (All Grad Average Diesel (On-Highw) Sell E Sell Frices Retail Price ay) Retail Price	Electricity Back f Electricity Back f S e \$ 3.6 a \$ 3.9	o Grid at Retail F o Grid at Fixed F 05 per gallon 57 per gallon	Rates Rate (specify) Set to Default	\$ (View Curren Prices	t and Historical from EIA
Electricity Rate	9S			Natural Gas Rate	S res 🔵					
For Advanced Users View/Edit Rate Stru Load Saved Rate Str	ructures			For Advanced Users View/Edit Rate Structure Load Saved Rate Structure	s es					
Natural Gas A	ppliance Categorization	ze all Natural Gas appliances	for cas rate calculator. Every appli	ance must be assigned a sing	le category. Us	ed when adding	new natural das	appliances)	N	lore Information
Category	Technology	Conventional Water Heater	Solar Water Heat with Gas Backu	Range Oven Combination	Spa Heat	Pool Heat	Primary Heat	Auxiliary Heat	Dryer	Other
Hot water heating Hot water heating Kitchen Laundry Miscellaneous Pool Pool Space heating and coo	Conventional Water Heater Solar Water Heat with Gas Backup Range Oven Combination Dryer Other Pool Heat Spa Heat Ning Auxiliary Heat									
							FETURN	TO PREVIOUS	ADVAN	



nand Demand Inp	ut Summary Power Supply Econor	nics Computation Re	esults							
_ow Income F	Rates Qualification			Net Metering						
Load Default Low Inc	come Fractions) 🔵			No Net Metering (default Use Net Metering) () Sell () Sell	Electricity Back † Electricity Back †	to Grid at Retail I to Grid at Fixed F	Rates Rate (specify)	\$ 0	.000 /kW-hr
For Advanced Users View/Edit Low Inco	ome Fractions			Gasoline and Dies Average Gasoline (All Grad	sel Prices	S e \$ 3.6	05 per gallon	Set to	View Current	t and Historical
				Average Diesel (On-Highw	ay) Retail Price	e \$ 3.9	57 per gallon	Default	Prices	from EIA
Electricity Rat	es			Natural Gas Rate	s					
Load Default Rate S	Structures			Load Default Rate Structur	res 🥥					
For Advanced Users				For Advanced Users						
View/Edit Rate Str				View/Edit Rate Structure						
Load Saved Rate S				Load Saved Rate Structur						
Natural Gas A	ppliance Categorization									
For Advanced Users	(Categori	ze all Natural Gas appliances	for gas rate calculator. Every appli	ance must be assigned a singl	le category. Us	ed when adding	new natural gas	appliances)	M	lore Information
Category	Technology	Conventional Water Heater	Solar Water Heat with Gas Backup	p Range Oven Combination	Spa Heat	Pool Heat	Primary Heat	Auxiliary Heat	Dryer	Other
Hot water heating	Conventional Water Heater	\checkmark								
Hot water heating	Solar Water Heat with Gas Backup		✓							
Kitchen	Range Oven Combination			✓						
Laundry	Dryer								\checkmark	
Miscellaneous	Other									✓
Pool	Pool Heat					1				
Pool	Spa Heat				✓					
Space heating and co	oling Auxiliary Heat							 Image: A set of the /li>		· · ·
										- F
4										



View/Edit Low Income Fractions (leave unchanged)

Rate Selector Analysis Low Income Rates Qualification

Values below represent the percentage of homes in each electric/gas utility combination, climate zone, and housing category that are eligible for low income rates. Default values are estimated with a comprehensive analysis of IPUMS harmonized American Community Survey data from 2016, the most current year on record. Household income, units in structure, Public Use Microdata Area (cross-referenced to climate zone), residents in household, age of residents, public health insurance coverage, welfare income, food stamp recipiency, disability status, and veteran status, and military status are extracted. Residents living in group quarters were removed. The qualification criteria for low income rates for each utility was then identified and cross-referenced with the IPUMS data to determine the fraction of households in each climate zone and housing category that are eligible for the low income rates. In utilities with both California Alternate Rates for Energy (CARE) and Family Electric Rate Assistance (FERA), only CARE rates are analyzed. Some utilities have low income rates that are a flat subsidy. These utilities are ignored in the low income rate analysis because NEAT performs a difference analysis for low income rate appropriate all residents into the "high income" designation for this analysis. The values that are currently stored in memory are initially loaded. Use the "Load Default Values" button to repopulate the table with the default values and then use the "Save to File" button to store the default values in memory. Any edits to the table must also be stored with the "Save to File" button.

				SI	IGLE	FAMI	LY HO	OMES	[%]	M	JLTIF	-AMIL	Y HO	MES [%]		MOE	BILE H	HOME	:S [%]	
Rate Type	Electric Utility	Rate Type	Gas Utility	CZ 6	CZ 8	CZ 9	CZ 10	CZ 15	CZ 16	CZ 6	CZ 8	CZ 9	CZ 10	CZ 15	CZ 16	CZ 6	CZ 8	CZ 9	CZ 10	CZ 15	CZ 16
high	Azusa Light & Power	high	CITY OF VERNON GAS SYSTEM	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100 🔺
high	Azusa Light & Power	high	LONG BEACH GAS & OIL	92.23	81.35	84.33	80.77	83.66	85.55	82.06	62.99	68.17	58.99	55.95	64.76	72.66	65.56	61.48	65.35	65.98	75.65
high	Azusa Light & Power	low	LONG BEACH GAS & OIL	7.77	18.65	15.67	19.23	16.34	14.45	17.94	37.01	31.83	41.01	44.05	35.24	27.34	34.44	38.52	34.65	34.02	24.35
high	Azusa Light & Power	high	SOUTHERN CALIFORNIA GAS	92.14	81.07	84.09	80.58	83.47	85.03	82	62.77	67.89	58.42	55.95	64.24	72.14	64.31	60.81	64.85	65.7	74.8
high	Azusa Light & Power	low	SOUTHERN CALIFORNIA GAS	7.86	18.93	15.91	19.42	16.53	14.97	18	37.23	32.11	41.58	44.05	35.76	27.86	35.69	39.19	35.15	34.3	25.2
high	Azusa Light & Power	high	SOUTHWEST GAS CORP.	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
high	Azusa Light & Power	low	SOUTHWEST GAS CORP.	16.05	26.56	24.57	26.64	37.9	29.41	33.6	50.21	46.08	54.43	65.85	57.04	47.75	52.84	56.51	59.48	67.08	56.46
high	Bear Valley Electric Service	high	CITY OF VERNON GAS SYSTEM	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	high	CITY OF VERNON GAS SYSTEM	16.05	26.56	24.57	26.64	37.9	29.41	33.6	50.21	46.08	54.43	65.85	57.04	47.75	52.84	56.51	59.48	67.08	56.46
high	Bear Valley Electric Service	high	LONG BEACH GAS & OIL	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	high	LONG BEACH GAS & OIL	8.29	7.91	8.9	7.4	21.56	14.96	15.67	13.21	14.25	13.42	21.8	21.79	20.41	18.4	17.99	24.83	33.06	32.11
low	Bear Valley Electric Service	low	LONG BEACH GAS & OIL	7.77	18.65	15.67	19.23	16.34	14.45	17.94	37.01	31.83	41.01	44.05	35.24	27.34	34.44	38.52	34.65	34.02	24.35
high	Bear Valley Electric Service	high	SOUTHERN CALIFORNIA GAS	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	high	SOUTHERN CALIFORNIA GAS	8.19	7.63	8.66	7.21	21.36	14.44	15.61	12.99	13.97	12.85	21.8	21.27	19.89	17.15	17.31	24.33	32.79	31.26
low	Bear Valley Electric Service	low	SOUTHERN CALIFORNIA GAS	7.86	18.93	15.91	19.42	16.53	14.97	18	37.23	32.11	41.58	44.05	35.76	27.86	35.69	39.19	35.15	34.3	25.2
high	Bear Valley Electric Service	high	SOUTHWEST GAS CORP.	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	low	SOUTHWEST GAS CORP.	16.05	26.56	24.57	26.64	37.9	29.41	33.6	50.21	46.08	54.43	65.85	57.04	47.75	52.84	56.51	59.48	67.08	56.46
high	Burbank Water & Power	high	CITY OF VERNON GAS SYSTEM	90.18	88.05	87.16	87.59	81.21	81.43	85.27	81.25	80.49	78.38	72.98	75.3	64.15	73.27	64.67	62.34	59.41	58.71
low	Burbank Water & Power	high	CITY OF VERNON GAS SYSTEM	9.82	11.95	12.84	12.41	18.79	18.57	14.73	18.75	19.51	21.62	27.02	24.7	35.85	26.73	35.33	37.66	40.59	41.29
high	Burbank Water & Power	high	LONG BEACH GAS & OIL	85.62	76.03	78.12	75.46	71.28	73.53	74.62	57.79	62.67	52.93	41.63	53.57	55.36	50.49	47.4	44.45	39.85	48.49
high	Burbank Water & Power	low	LONG BEACH GAS & OIL	4.56	12.02	9.04	12.14	9.94	7.9	10.65	23.45	17.82	25.46	31.35	21.72	8.79	22.78	17.27	17.89	19.56	10.22
low	Burbank Water & Power	hiah	LONG BEACH GAS & OIL	6.62	5.32	6.2	5.31	12.39	12.01	7.45	5.2	5.5	6.06	14.32	11.18	17.3	15.07	14.08	20.9	26.13	27.17

IPUMS Data Source: Steven Ruggles, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. Integrated Public Use Microdata Series: Version 7.0 [dataset]. Minneapolis, MN: University of Minnesota, 2017. https://doi.org/10.18128/D010.V7.0

Load Default Values Load Saved Values Save to File



South Coast Air Quality Management District

View/Edit Low Income Fractions (leave unchanged)

Rate Selector Analysis Low Income Rates Qualification

Values below represent the percentage of homes in each electric/gas utility combination, climate zone, and housing category that are eligible for low income rates. Default values are estimated with a comprehensive analysis of IPUMS harmonized American Community Survey data from 2016, the most current year on record. Household income, units in structure, Public Use Microdata Area (cross-referenced to climate zone), residents in household, age of residents, public health insurance coverage, welfare income, food stamp recipiency, disability status, and veteran status, and military status are extracted. Residents living in group quarters were removed. The qualification criteria for low income rates for each utility was then identified and cross-referenced with the IPUMS data to determine the fraction of households in each climate zone and housing category that are eligible for the low income rates. In utilities with both California Alternate Rates for Energy (CARE) and Family Electric Rate Assistance (FERA), only CARE rates are analyzed. Some utilities have low income rates that are a flat subsidy. These utilities are ignored in the low income rate analysis because NEAT performs a difference analysis for low income residents appropriate all residents into the "high income" designation for this analysis. The values that are currently stored in memory are initially loaded. Use the "Load Default Values" button to repopulate the table with the default values and then use the "Save to File" button to store the default values in memory. Any edits to the table must also be stored with the "Save to File" button.

				SIN	IGLE	FAMI	LY HO	DMES	[%]	M	JLTIF	AMIL	Y HO	MES	[%]		MOE	BILE	HOME	S [%]	
Rate Type	Electric Utility	Rate Type	Gas Utility	CZ 6	CZ 8	CZ 9	CZ 10	CZ 15	CZ 16	CZ 6	CZ 8	CZ 9	CZ 10	CZ 15	CZ 16	CZ 6	CZ 8	CZ 9	CZ 10	CZ 15	CZ 16
high	Azusa Light & Power	high	CITY OF VERNON GAS SYSTEM	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100 🔺
high	Azusa Light & Power	high	LONG BEACH GAS & OIL	92.23	81.35	84.33	80.77	83.66	85.55	82.06	62.99	68.17	58.99	55.95	64.76	72.66	65.56	61.48	65.35	65.98	75.65
high	Azusa Light & Power	low	LONG BEACH GAS & OIL	7.77	18.65	15.67	19.23	16.34	14.45	17.94	37.01	31.83	41.01	44.05	35.24	27.34	34.44	38.52	34.65	34.02	24.35
high	Azusa Light & Power	high	SOUTHERN CALIFORNIA GAS	92.14	81.07	84.09	80.58	83.47	85.03	82	62.77	67.89	58.42	55.95	64.24	72.14	64.31	60.81	64.85	65.7	74.8
high	Azusa Light & Power	low	SOUTHERN CALIFORNIA GAS	7.86	18.93	15.91	19.42	16.53	14.97	18	37.23	32.11	41.58	44.05	35.76	27.86	35.69	39.19	35.15	34.3	25.2
high	Azusa Light & Power	high	SOUTHWEST GAS CORP.	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
high	Azusa Light & Power	low	SOUTHWEST GAS CORP.	16.05	26.56	24.57	26.64	37.9	29.41	33.6	50.21	46.08	54.43	65.85	57.04	47.75	52.84	56.51	59.48	67.08	56.46
high	Bear Valley Electric Service	high	CITY OF VERNON GAS SYSTEM	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	high	CITY OF VERNON GAS SYSTEM	16.05	26.56	24.57	26.64	37.9	29.41	33.6	50.21	46.08	54.43	65.85	57.04	47.75	52.84	56.51	59.48	67.08	56.46
high	Bear Valley Electric Service	high	LONG BEACH GAS & OIL	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	high	LONG BEACH GAS & OIL	8.29	7.91	8.9	7.4	21.56	14.96	15.67	13.21	14.25	13.42	21.8	21.79	20.41	18.4	17.99	24.83	33.06	32.11
low	Bear Valley Electric Service	low	LONG BEACH GAS & OIL	7.77	18.65	15.67	19.23	16.34	14.45	17.94	37.01	31.83	41.01	44.05	35.24	27.34	34.44	38.52	34.65	34.02	24.35
high	Bear Valley Electric Service	high	SOUTHERN CALIFORNIA GAS	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	high	SOUTHERN CALIFORNIA GAS	8.19	7.63	8.66	7.21	21.36	14.44	15.61	12.99	13.97	12.85	21.8	21.27	19.89	17.15	17.31	24.33	32.79	31.26
low	Bear Valley Electric Service	low	SOUTHERN CALIFORNIA GAS	7.86	18.93	15.91	19.42	16.53	14.97	18	37.23	32.11	41.58	44.05	35.76	27.86	35.69	39.19	35.15	34.3	25.2
high	Bear Valley Electric Service	high	SOUTHWEST GAS CORP.	83.95	73.44	75.43	73.36	62.1	70.59	66.4	49.79	53.92	45.57	34.15	42.96	52.25	47.16	43.49	40.52	32.92	43.54
low	Bear Valley Electric Service	low	SOUTHWEST GAS CORP.	16.05	26.56	24.57	26.64	37.9	29.41	33.6	50.21	46.08	54.43	65.85	57.04	47.75	52.84	56.51	59.48	67.08	56.46
high	Burbank Water & Power	high	CITY OF VERNON GAS SYSTEM	90.18	88.05	87.16	87.59	81.21	81.43	85.27	81.25	80.49	78.38	72.98	75.3	64.15	73.27	64.67	62.34	59.41	58.71
low	Burbank Water & Power	high	CITY OF VERNON GAS SYSTEM	9.82	11.95	12.84	12.41	18.79	18.57	14.73	18.75	19.51	21.62	27.02	24.7	35.85	26.73	35.33	37.66	40.59	41.29
high	Burbank Water & Power	high	LONG BEACH GAS & OIL	85.62	76.03	78.12	75.46	71.28	73.53	74.62	57.79	62.67	52.93	41.63	53.57	55.36	50.49	47.4	44.45	39.85	48.49
high	Burbank Water & Power	low	LONG BEACH GAS & OIL	4.56	12.02	9.04	12.14	9.94	7.9	10.65	23.45	17.82	25.46	31.35	21.72	8.79	22.78	17.27	17.89	19.56	10.22
low	Burbank Water & Power	hiah	LONG BEACH GAS & OIL	6.62	5.32	6.2	5.31	12.39	12.01	7.45	5.2	5.5	6.06	14.32	11.18	17.3	15.07	14.08	20.9	26.13	27.17 *

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Use Buttons to Load and Save Values Load Default Values Load Saved Values



South Coast Air Quality Management District

All results are preliminary and should be subject to extensive QA/QC before interpreting.

Save to File

emand Demand Inpu	t Summary Power Supply Econor	mics Computation Re	sults						
Low Income R	ates Qualification			Net Metering					
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Natural Gas A	ppliance Categorization	ize all Natural Gas annliances	for das rate calculator. Every annlia	nce must be assigned a single	e category Used w	hen adding new natural g	as annliances)	M	ore Information
Category	Technology	Conventional Water Heater	Solar Water Heat with Gas Backup	Range Oven Combination	Sna Heat P	Pool Heat Primary Hea	t Auxiliary Heat	Drver	Other
Hot water heating Hot water heating Kitchen Laundry Miscellaneous Pool Pool Space heating and coo	Conventional Water Heater Solar Water Heat with Gas Backup Range Oven Combination Dryer Other Pool Heat Spa Heat Ding Auxiliary Heat								
4						RETUR	RN TO PREVIOUS		



Rate Selector Analysis Low Income Rates Qualification						
Select Utility Southern California Edison	•	Next Utility		+ Add Cu	stom Rate	Rate Structure
Select a Rate to view Period Codes and Rate Schedule: More Information	•	Previous Utility	Ĵ	Store Revise	I Check Marks	Weekday Rates Weekend Rates
Standard Rates Low Income Rates						Period Codes
Rate	Zo	ne SingleFam	MultiFa	am MobileHom	e NetMeter	J-
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Time-Of-Use Domestic Tiered Electric Vehicle Charging -TOU-D-TEV, Region 13	13					A
Time-Of-Use Domestic Tiered Electric Vehicle Charging -TOU-D-TEV, Region 10	10					
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Time-Of-Use Domestic Tiered Electric Vehicle Charging -TOU-D-TEV, Region 8	8					- O-
Time-Of-Use Domestic Tiered Electric Vehicle Charging -TOU-D-TEV, Region 6	6					N-
Time-Of-Use Domestic Tiered Electric Vehicle Charging -TOU-D-TEV, Region 5	5					
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Domestic Service: D - Baseline Region 5	5	✓	1	1		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Domestic Service: D - Baseline Region 15	15	✓	1	1		Hour (Fitt Beried Codes)
Domestic Service: D - Baseline Region 16	16	✓	1	1		Edit Period Codes
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Time-of-use Tiered Domestic: TOU-D-T - Region 6	6					Period 0 Period 1 Period 2 Period 3 Period 4 Period 5
Time-of-use Tiered Domestic: TOU-D-T - Region 8	8					Rate information shown for selected period. NaN indicates no rate or maximum at that tier.
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Time-of-use Tiered Domestic: TOU-D-T-Region 10	10					Maximum monthly Usage [kW-hr]
Time-of-use Tiered Domestic: TOU-D-T - Region 13	13					Rate [\$/kW-hr]
Time-of-use Tiered Domestic: TOU-D-T - Region 14	14					Adjustment Rate [\$/kW-hr]
Time-of-use Tiered Domestic: TOU-D-T - Region 15	15					
Time-of-use Tiered Domestic: TOU-D-T - Region 16	16					Power Access Charge (PAC) Store Edited Rate Values
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Rate Structure Selector and Editor tool initialized at 08-Jan-2019 16:56:34. Select a rate t	to view	and edit.				PAC Defined Edit/View PAC Store Edited PAC RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



South Coast Air Quality Management District

	Rate Selector Analysis Low Income Rates Qualification					
	Select Utility Southern California Edison	Next Uti	ity	+ Add Cu	ustom Rate	Rate Structure
	Select a Rate to view Period Codes and Rate Schedule: More Information	Previous U	Jtility	Store Revise	d Check Marks	Weekday Rates Weekend Rates
View/Edit —	Standard Rates Low Income Rates					Period Codes
l	Rate	Zone Single	Fam Multi	Fam MobileHom	ne NetMeter	
both	Domestic Service: D - Baseline Region 13	13 🗸	· .		<u> </u>	F-
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ratos	Time-Of-Use Domestic Tiered Electric Vehicle Charging -TOU-D-TEV, Region 15	15				Š.
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	Time-of-use Tiered Domestic: TOU-D-T - Region 14	14	1 [1 1		Adjustment Rate [\$/kW-hr]
	Time-of-use Tiered Domestic: TOU-D-T - Region 15	15				
	Time-of-use Tiered Domestic: TOU-D-T - Region 16	16				Power Access Charge (PAC) Store Edited Rate Values
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	Rate Structure Selector and Editor tool initialized at 08-Jan-2019 16:56:34. Select a rate to	view and edit.				PAC Defined Edit/View PAC Store Edited PAC
						RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



South Coast Air Quality Management District





Rate Selector	Analysis	Low Income Rates Qualification																				
Select Utility	Southern Cal	lifornia Edison		• N	ext Utility) (+ Add Cus	tom Rate	Tim	ne-Of-U	Jse I	Dome	estic T	ïered	Electric	Vehicle	Charg	jing -TO	U-D-TEV,	Region 10		
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Domestic Servic	ce: D - Baselin	e Region 16		16	1	~	 Image: A set of the /li>													Edit	Period	Codes
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Time-of-use Tier	red Domestic:	TOU-D-T - Region 9		9												Tier	1	Tier2	Tier3	Tier4	Tier	5
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									R	RESET	ALL	то	DEFA	ULT		LOAD	ALL F	ROM FIL	E	SAVE	ALL T	O FILE



Rate Selector Analysis Low Income Rates Qualification			
Select Utility Los Angeles Department of Water & Power	Next Utility + Add Custom Rate	Residential Multi-Family (R-3)	
Select a Rate to view Period Codes and Rate Schedule: More Information	n Previous Utility Store Revised Check Mar	s Weekday Rates Weekend Rates	
Standard Rates Low Income Rates		Period Codes	
Poto	Zono SingleEam MultiEam MobileHome NotMotor		0 0 0 0 0 0 0
Residential Service (R1): Zone 1		F 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0
Residential Service (R1): Zone 2	2		0 0 0 0 0 0 0
Residential Time of Use (R-1)(B)	all		
tesidential Multi-Family (R-3)	all		
		M 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
			1 1 1 1 1 1 1
		Ž J 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1
		A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1
		S 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 1 1 1
			0 0 0 0 0 0
		0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 1 Hour	7 18 19 20 21 22 23
		1001	Edit Period Codes
		Period 0 Period 1 Period 2 Period 3 Period 4	Period 5
		Rate information shown for selected period. NaN indicates no rate or	maximum at that tier.
		Tier1 Tier2 Tier3	Tier4 Tier5
		Maximum monthly Usage [kW-hr] NaN NaN NaN	NaN NaN
		Rate [\$/kW-hr] 0.04182 NaN NaN	NaN NaN
		Adjustment Rate [\$/kW-hr] 0.0727 0 0	0 0
		Power Access Charge (PAC)	Store Edited Rate Values
Rate Structure Selector and Editor tool initialized at 08-Jan-2019 16:56:34. Select a r	ate to view and edit.	PAC Defined Edit/View PAC Store Edited PAC	
		RESET ALL TO DEFAULT LOAD ALL FROM FILE	SAVE ALL TO FILE



Compare Estimated Rate Differences (settings not used for calculation)





Net Metering

Demand [Demand Input Sumr	nary Power Supply	Economics	Computation	Results								
Low In	come Rates	Qualification					Net Metering						
Load Det	fault Low Income Fr	actions					No Net Metering (defa	ult) Sell Sell 	Electricity Back Electricity Back	to Grid at Retail I to Grid at Fixed F	Rates Rate (specify)	\$	0.000 /kW-hr
For Advar	nced Users						Gasoline and Di	asal Prica	2				
View/E	Edit Low Income Fra	ctions					Gasoline and Di		5				
Load Sa	aved Low Income Fr	actions					Average Gasoline (All G	rades) Retail Pric	e \$ 3.6	05 per gallon	Set to	View Curr	ent and Historical
							Average Diesel (On-Hig	nway) Retail Pric	e \$ 3.9	57 per gallon	Default	Price	es from EIA
Electric	city Rates						Natural Gas Rat	es					
Load De	efault Rate Structure	5					Load Default Rate Struc	tures 🥚					
For Advar	nced Users						For Advanced Users						
View/E	Edit Rate Structures						View/Edit Rate Structu	ires					
Load Sa	aved Rate Structure	3					Load Saved Rate Struc	tures					
Natura	l Gas Applia	nce Categoriza	tion										
For Advan	ced Users		(Categorize all	Natural Gas applia	nces for gas	rate calculator. Every a	ppliance must be assigned a si	ngle category. Us	ed when adding	g new natural gas	appliances)	(More Information
0	Category	Technology	Con	ventional Water H	eater Solar \	Vater Heat with Gas Ba	ckup Range Oven Combination	n Spa Heat	Pool Heat	Primary Heat	Auxiliary Heat	Dryer	Other
Hot water	heating C	onventional Water Heater		1									
Hot water	heating S	olar Water Heat with Gas I	Backup										
Kitchen	R	ange Oven Combination					\checkmark						
Laundry	D	ryer										1	
Miscellane	eous O	ther											✓
Pool	P	ool Heat							~				
Pool	S	pa Heat						~					
Space hea	ating and cooling A	uxiliary Heat									✓		· · · · ·
													•
										Ci			
										🔶 🔶 RETURN	TO PREVIOUS	ADVA	NCE TO NEXT 🔶



Select Net Metering

Demand	Demand Input Sum	nmary Power Supply	Economics	Computation	Results								
Low	Income Rate	s Qualification					Net Metering						
Load	l Default Low Income F	Fractions 🔵					No Net Metering (default Use Net Metering) Sell El Sell El 	ectricity Back ectricity Back	to Grid at Retail F to Grid at Fixed F	Rates Rate (specify)	\$	0.000 /kW-hr
For A	dvanced Users							1.0.1					
Vie	ew/Edit Low Income Fr	actions					Gasoline and Die	sel Prices					
Loa	d Saved I ow Income F	Fractions					Average Gasoline (All Grad	des) Retail Price	\$ 3.6	05 per gallon	Set to	View Curre	ent and Historical
							Average Diesel (On-Highw	ay) Retail Price	\$ 3.9	57 per gallon	Default	Price	es from EIA
Elec	tricity Rates						Natural Gas Rate	s		lick to	Select	Net	Metering
Loa	d Default Rate Structur	res					Load Default Rate Structur	res 🥚			001000		
For A	dvanced Users						For Advanced Users						
Vi	ew/Edit Rate Structure	s					View/Edit Rate Structure	s					
Loa	ad Saved Rate Structur	res					Load Saved Rate Structur	res 🔴					
Natu	ural Gas Appli	ance Categorizat	tion										
For Ac	dvanced Users		(Categorize all I	Natural Gas applia	nces for gas	rate calculator. Every app	liance must be assigned a sing	le category. Use	d when adding	g new natural gas	appliances)	(More Information
	Category	Technology	Con	ventional Water H	eater Solar \	Vater Heat with Gas Back	up Range Oven Combination	Spa Heat	Pool Heat	Primary Heat	Auxiliary Heat	Dryer	Other
Hot w	ater heating	Conventional Water Heater		√									
Hot w	ater heating	Solar Water Heat with Gas E	Backup			✓							
Kitche	en	Range Oven Combination					✓		<u> </u>				
Laund	dry	Dryer										~	
Misce	lianeous	Other Deal Hast											
Pool		Pool Heat						-	~				
Space	e heating and cooling	Auxiliary Heat						✓					
4	and booling										.		•
										🔶 RETURN	TO PREVIOUS	ADVA	NCE TO NEXT 🔶
										<u> </u>			



Select Net Metering

Demand Demand Input	Summary Power Supply Econor	nics Computation Res	ults								
Low Income Ra	ates Qualification			Net Metering							
Load Default Low Inco	me Fractions) 🔴			No Net Metering (default Use Net Metering) Sell E Sell E 	Electricity Back f	o Grid at Retai	l Rates Rate (specify)	\$	0.000 /kW-hr	
For Advanced Users											
View/Edit Low Incom	ne Fractions			Gasoline and Dies	sel Prices	3					
				Average Gasoline (All Grad	les) Retail Pric	e \$ 3.6	05 per gallon				
Load Saved Low Inco	me Fractions			Average Diesel (On-Highw	ay) Retail Price	s 3.9	57 per gallon	This se	electi	on looks	for rates
								idontif	ind a	s "not m	otoring" in
Electricity Rate	S			Natural Gas Rate	S			luentii	ieu a	is net n	ietering in
								Flectri	city F	Rate Edit	or If no "net
Load Default Rate Str				Load Default Rate Structur	es			LICCUIT	Cityi		
Fre Advanced Harry				For Advanced Upper				meteri	ing″ i	rate spec	cified uses
For Advanced Users				For Advanced Users	_			meteri	6	face spec	
View/Edit Rate Struc	ctures			View/Edit Rate Structure	s			standa	ird ra	te corre	sponding CZ
Load Saved Rate Stru	uctures			Load Saved Rate Structur	es 🔴						
								and ho	busin	g type	
Natural Gas Ap	pliance Categorization										
For Advanced Lisers	(Categori	ize all Natural Gas appliances fr	r das rate calculator. Ever	v appliance must be assigned a singl	e category Us	ed when adding	new natural da	as appliances)		More Information	
Category	Technology	Conventional Water Heater	Polar Water Heat with Gas	Packup Pango Oven Combination	Cha Llaat	Pool Host	Drimony Hoot	Auxiliany Heat	Davar	Othor	
Hot water beating	Conventional Water Heater				ора пеат	FUUI Heat			Diyei	Ouner	
Hot water heating	Solar Water Heat with Gas Backup	✓									
Kitchen	Range Oven Combination										
Laundry	Dryer								1		
Miscellaneous	Other									Image: A start and a start	
Pool	Pool Heat					~					
Pool	Spa Heat				~						
Space heating and cool	ing Auxiliary Heat							~		► ►	
							🔶 RETUR	N TO PREVIOUS		NCE TO NEXT	



Edit Gasoline and Diesel Prices (leave unchanged)

mand Demand Input S	Summary Power Supply Econo	mics Computation Re	esults							
Low Income Ra	ites Qualification			Net Metering						
Load Default Low Incon	ne Fractions			No Net Metering (default Use Net Metering)	ectricity Back	to Grid at Retail I to Grid at Fixed F	Rates Rate (specify)	\$	0.000 /kW-hr
For Advanced Users View/Edit Low Income Load Saved Low Income	e Fractions			Gasoline and Dies Average Gasoline (All Grad Average Diesel (On-Highw	sel Prices les) Retail Price ay) Retail Price	3 e \$ 3.6 e \$ 3.9	05 per gallon 57 per gallon	Set to Default	View Curre Price	nt and Historical s from EIA
Electricity Rates	S			Natural Gas Rate	S					
Load Default Rate Stru	ictures 🦲			Load Default Rate Structur	res 🔵					
For Advanced Users				For Advanced Users						
View/Edit Rate Struct	tures			View/Edit Rate Structure	5					
Load Saved Rate Stru				Load Saved Rate Structur	es 🔴					
	pliance Categorization	rizo all Natural Gas appliances	for day rate calculator. Every applic	ance must be assigned a single	o catogony Lloy	ad when adding	now patural day		(More Information
Category	Technology	Conventional Water Heater	Solar Water Heat with Gas Backup	Range Oven Combination	Sna Heat	Pool Heat	Primary Heat	Auxiliary Heat	Drver	Other
Hot water heating Hot water heating	Conventional Water Heater Solar Water Heat with Gas Backup									
Kitchen Laundry	Range Oven Combination Drver									
Miscellaneous	Other								•	
Pool	Pool Heat					1				
Pool	Spa Heat				✓					
Space heating and coolir	ng Auxiliary Heat							✓		
							FRETURN	TO PREVIOUS	ADVA	NCE TO NEXT 🔿



View/Edit Natural Gas Rate Structures

Low Income Rates Qualification Lad Default Low Income Fractions Yew/Edit Rate Structures Yew/Edit Ra	emand E	Demand Input Su	mmary Power Supply	Economics	Computation	Results										
Lad Ddfault Low Income Fractions For Advanced Users Vertical Low Income Fractions Lad Saved Low Income Fractions Lad Saved Low Income Fractions Condender Rate Structures Statiss Structures For Advanced Users Vertical Rate Structures Condender Rate Structures Conventional Water Heat with Gas Backup Range Conventional Conventional Water Heat with Gas Backup Range Conventional Conventional Water Heat with Gas	Low In	come Rate	es Qualification					Net Metering								
For Advanced Users Casoline and Diesel Prices Verwitzelit Low income Fractions Average Gasoline (All Grades) Retail Price \$ 3.665 per gallon Electricity Rates Average Gasoline (All Grades) Retail Price \$ 3.605 per gallon Electricity Rates Natural Caso Rates Load Default Rate Structures Image Gasoline (All Grades) Retail Price \$ 3.957 per gallon For Advanced Users Natural Caso Rates Load Default Rate Structures Image Gasoline (All Grades) Retail Price \$ 3.957 per gallon Kerkel Rate Structures Image Gasoline (All Grades) Retail Price \$ 3.957 per gallon For Advanced Users Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edit Rate Structures Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Natural Cas Rates Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edit Rate Structures Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edit Rate Structures Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edit Rate Structures Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edit Rate Structures Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edit Rate Structures Image Gasoline (All Grades) Retail Price \$ 1.957 per gallon Vew/Edi	Load Def	fault Low Income		No Net Metering (default) Image: Sell Electricity Back to Grid at Retail Rates Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electricity Back to Grid at Fixed Rate (specify) Image: Sell Electrici												
Weine all Low Income Fractions Average Gasoline (All Grades) Retail Price \$	For Advan	nced Users						Gasoline and Die	sel Prices	5						
Lead Saved Low Income Fractions Lead Default Rate Structures Load Default Rate Structures Load Saved Rate Structures Load Saved Rate Structures Lead Saved Rate Structur	View/E	dit Low Income F	ractions					Average Geopline (All Cree	doc) Dotail Dria				(
Electricity Rates Load Default Rate Structures For Advanced Users Vew/Edit Rate Structures Load Saved Rate Structures Vew/Edit Rate Structures </td <td>Load Sa</td> <td>aved Low Income</td> <td>Fractions</td> <td></td> <td></td> <td></td> <td></td> <td>Average Diesel (On-Highw</td> <td>ray) Retail Price</td> <td>e \$ 3.00</td> <td>57 per gallon</td> <td>Set to Default</td> <td>View Currer Prices</td> <td>t and Historical</td>	Load Sa	aved Low Income	Fractions					Average Diesel (On-Highw	ray) Retail Price	e \$ 3.00	57 per gallon	Set to Default	View Currer Prices	t and Historical		
Load Default Rate Structures For Advanced Users Vew/Edit Rate Structures Load Saved Rate Structures Load Saved Rate Structures	Electric	city Rates						Natural Gas Rate	s							
For Advanced Users For Advanced Users View/Edit Rate Structures Vew/Edit Rate Structures Load Saved Rate Structures Load Saved Rate Structures Natural Gas Appliance Categorization For Advanced Users (Categorize all Natural Gas appliances for gas rate calculator. Every appliance must be assigned a single category. Used when adding new natural gas appliances) More Information Category Technology Conventional Water Heater Solar Water Heat with Gas Backup Range Oven Combination Spa Heat Oper Other Hot water heating Solar Water Heater Image Oven Combination Image Oven Combi	Load De	efault Rate Struct	ures 🥚					Load Default Rate Structu	res 🔵							
View/Edit Rate Structures View/Edit Rate Structures Lad Saved Rate Structures Load Saved Rate Structures Natural Gas Appliance Categorization Categorize all Natural Gas appliances for gas rate calculator. Every appliance must be assigned a single category. Used when adding new natural gas appliances More Information For Advanced Users (Categorize all Natural Gas appliances for gas rate calculator. Every appliance must be assigned a single category. Used when adding new natural gas appliances More Information Into water heating Conventional Water Heater Diver Other Diver Other Hot water heating Solar Water Heat with Gas Backup Diver Other Diver Other Nitchen Range Oven Combination Diver Other Diver Other Niscelianeous Other Diver Other Diver Other Pool Pool Heat Diver Other Diver Other Pool Signa Heat Diver Other Diver Diver Other	For Advan	nced Users						For Advanced Users								
Load Saved Rate Structures Load Saved Rate Structures Natural Cas Appliance Categorization For Advanced Users (Categorize all Natural Gas appliances for gas rate calculator. Every appliance must be assigned a single category. Used when adding new natural gas appliances) More Information Category Technology Conventional Water Heater More Information Hot water heating Conventional Water Heater Image: Conventional Water Heater Image: Conventional Water Heater Hot water heating Solar Water Heat with Gas Backup Image: Conventional Water Heater Image: Conventional Water Image: Conventional Wat	View/E	Edit Rate Structur	es					View/Edit Rate Structure	s							
Natural Gas Appliance Categorization More Information For Advanced Users (Categorize all Natural Gas appliances for gas rate calculator. Every appliance must be assigned a single category. Used when adding new natural gas appliances) More Information Category Technology Conventional Water Heater Solar Water Heat with Gas Backup Range Oven Combination Spa Heat Other Hot water heating Solar Water Heat with Gas Backup Image: Conventional Water Heater Image: Conventional Water Image: Conventional Water <td< td=""><td>Load Sa</td><td>aved Rate Struct</td><td>ires</td><td></td><td></td><td></td><td></td><td colspan="9">Load Saved Rate Structures</td></td<>	Load Sa	aved Rate Struct	ires					Load Saved Rate Structures								
For Advanced Users (Categorize all Natural Gas appliances for gas rate calculator. Every appliance must be assigned a single category. Used when adding new natural gas appliances) More Information Category Technology Conventional Water Heater Solar Water Heat with Gas Backup Spa Heat Pool Heat Primary Heat Auxiliary Heat Dryer Other Hot water heating Solar Water Heat with Gas Backup Image: Conventional Water Heater Image: Conventional Wa	Natura	l Gas App	liance Categoriza	tion												
Category Technology Conventional Water Heater Solar Water Heat with Gas Backup Range Oven Combination Spa Heat Pool Heat Primary Heat Auxiliary Heat Dryer Other Hot water heating Solar Water Heat with Gas Backup Image: Conventional Water Heat with Gas	For Advan	ced Users		(Categorize all	Natural Gas applia	nces for gas rate calculator	Every applia	nce must be assigned a sing	le category. Us	ed when adding	new natural gas	appliances)		More Information		
Hot water heating Conventional Water Heater Hot water heating Solar Water Heat with Gas Backup Hot water heating Solar Water Heat with Gas Backup Kitchen Range Oven Combination Laundry Dryer Laundry Dryer Miscellaneous Other Pool Pool Space heating and cooling Auxiliary Heat	C	Category	Technology	Cor	ventional Water H	eater Solar Water Heat wit	h Gas Backup	Range Oven Combination	Spa Heat	Pool Heat	Primary Heat	Auxiliary Heat	Dryer	Other		
Hot water heating Solar Water Heat with Gas Backup Kitchen Range Oven Combination Laundry Dryer Discellaneous Other Other Image: Constraint of the second	Hot water	heating	Conventional Water Heater		✓											
Kitchen Range Oven Combination Laundry Dryer Laundry Dryer Miscellaneous Other Pool Pool Heat Pool Spa Heat Space heating and cooling Auxiliary Heat	Hot water	heating	Solar Water Heat with Gas	Backup		1										
Laundry Dryer Laundry Dryer Miscellaneous Other Pool Pool Heat Pool Spa Heat Space heating and cooling Auxiliary Heat	Kitchen		Range Oven Combination					✓								
Miscellaneous Other Pool Pool Heat Pool Spa Heat Space heating and cooling Auxiliary Heat	Laundry		Dryer										✓			
Pool Pool Heat	Miscellane	eous	Other											1		
Pool Spa Heat Space heating and cooling Auxiliary Heat	Pool		Pool Heat							1						
Space heating and cooling Auxiliary Heat	Pool		Spa Heat						~							
	Space hea	ating and cooling	Auxiliary Heat									1				
	4													+		



Natural Gas Rate Structure Editor (leave unchanged)

Rate Selector						
Select Utility SOUTHER	RN CALIFORNIA GAS	Next	Utility	+ Add C	Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
Select a Rate to View Detail	ls:	Previous Utility Store Revised Table		evised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating	
Standard Rates Low	Income Rates					Solar Water Heat with Gas Backup Pool Heat Dryer
Rate	Appliances (use panel to edit>)	Zone	SingleFamily	MultiFamily	MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
GR climate zone 1	All Appliances	1	1		✓ ▲	All Appliances
GR climate zone 2	All Appliances	2	Image: A start of the start		Image: A state of the state	
GR climate zone 3	All Appliances	3	1		1	Southern California Gas Zone Editor (Only Available for Southern California Gas)
GR climate zone 1	Primary Space Heat	1	~		 Image: A set of the /li>	
GR climate zone 2	Primary Space Heat	2	1		1	Edit Zone 🔹 Store Revised Zone
GR climate zone 3	Primary Space Heat	3	1		 Image: A set of the /li>	
GR climate zone 1	Primary Space Heat	1		1		Deviat On the
GR climate zone 2	Primary Space Heat	2		1		Period Codes
GR climate zone 3	Primary Space Heat	3		Image: A start of the start		lan Feb Mar Anr May Jun Jul Aug San Oct Nov Dec
GR all climate zones	Conventional Water Heater, Range Oven Combination, Solar W	. all		Image: A start of the start		Juan reb imai Apr imay bun bui Aug bep bui hov bec
GR climate zone 1	All Appliances	1		Image: A start of the start		
GR climate zone 2	All Appliances	2				
GR climate zone 3	All Appliances	3		Image: A start of the start		Specify a period code between 1 and 4 Store Period Codes
GR climate zone 1	Primary Space Heat, Range Oven Combination	1				
GR climate zone 2	Primary Space Heat, Range Oven Combination	2		Image: A start of the start		Rate Values
GR climate zone 3	Primary Space Heat, Range Oven Combination	3				
GR all climate zones	Range Oven Combination	all		I		Period 1 Period 2 Period 3 Period 4
GR all climate zones	Conventional Water Heater, Solar Water Heat with Gas Backup	all		Image: A start of the start		Rate information shown for selected period. NaN indicates no rate or maximum at that tier.
GR climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Water	1		Image: A start of the start		Tier1 Tier2 Tier3 Tier4 Tier5
GR climate zone 2	Conventional Water Heater, Primary Space Heat, Solar Water	2		1		Maximum daily allowance [therm]
GR climate zone 3	Conventional Water Heater, Primary Space Heat, Solar Water	3		Image: A start of the start		Rate [\$/therm]
GR CARE climate zone 1	All Appliances	1				
GR CARE climate zone 2	All Appliances	2				Store Edited Rate Values
GR CARE climate zone 3	All Appliances	3				
GR CARE climate zone 1	Primary Space Heat	1				Monthly Fixed Charge [\$]
GR CARE climate zone 2	Primary Space Heat	2				Lan Fah Mar Ann May Jun Jul Aug Can Oct Ney Dag
GR CARE climate zone 3	Primary Space Heat	3				Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Gas Rate Structure Selecto	or and Editor tool initialized at 09-Jan-2019 07:40:02. Select a rate	e to view a	nd edit.			Store Edited Monthly Fixed Charges
						RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



	Rate Selector				
	Select Utility SOUTHE	RN CALIFORNIA GAS	Next Utility	+ Add Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
	Select a Rate to View Deta	ils:	Previous Utility	Store Revised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating
View/Edit ——	Standard Rates	Income Rates			Solar Water Heat with Gas Backup Pool Heat Dryer
both	Rate GR climate zone 1	Appliances (use panel to edit>) All Appliances	Zone SingleFa	amily MultiFamily MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
standard and	GR climate zone 2 GR climate zone 3	All Appliances All Appliances	2 3		Southern California Gas Zone Editor (Only Available for Southern California Gas)
low income	GR climate zone 1 GR climate zone 2	Primary Space Heat Primary Space Heat	1		Edit Zone 🔹 Store Revised Zone
rates	GR climate zone 3 GR climate zone 1	Primary Space Heat Primary Space Heat	3		Period Codes
Tates	GR climate zone 2 GR climate zone 3	Primary Space Heat Primary Space Heat	2 3		Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
	GR all climate zones GR climate zone 1 GR climate zone 2	All Appliances	. all		
	GR climate zone 2 GR climate zone 3 GR climate zone 1	All Appliances All Appliances Brimary Sacca Hoat, Banga Oven Combination	3		Specify a period code between 1 and 4 Store Period Codes
	GR climate zone 2 GR climate zone 2	Primary Space Heat, Range Oven Combination Primary Space Heat, Range Oven Combination Primary Space Heat, Range Oven Combination	2		Rate Values
	GR all climate zones	Range Over Combination	all		Period 1 Period 2 Period 3 Period 4 Rate information shown for selected period. NaN indicates no rate or maximum at that fier.
	GR climate zone 1 GR climate zone 2	Conventional Water Heater, Solar Water Heat with Gas backup Conventional Water Heater, Primary Space Heat, Solar Water Conventional Water Heater Primary Space Heat, Solar Water			Tier1 Tier2 Tier3 Tier4 Tier5
	GR climate zone 3 GR CARE climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Hater All Appliances	3		Rate [\$/therm]
	GR CARE climate zone 2 GR CARE climate zone 3	All Appliances All Appliances	2 1		Store Edited Rate Values
	GR CARE climate zone 1 GR CARE climate zone 2	Primary Space Heat Primary Space Heat	1 🗸		Monthly Fixed Charge [\$]
	GR CARE climate zone 3	Primary Space Heat	3	· · · · · · · · · · · · · · · · · · ·	Jan reo wat Api way Jun Jun Aug Sep Oct NOV Dec
	Gas Rate Structure Select	tor and Editor tool initialized at 09-Jan-2019 07:40:02. Select a rate	e to view and edit.		Store Edited Monthly Fixed Charges
					RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



	Rate Selector						
	Select Utility SOUTHER	RN CALIFORNIA GAS	N	lext Utility	+ Add (Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
	Select a Rate to View Detail	ils:	Pre	vious Utility	Store R	evised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating
View/Edit →	Standard Rates Low	Income Rates					Solar Water Heat with Gas Backup Pool Heat Dryer
hath	Rate	Appliances (use panel to edit>)	Zor	e SingleFamily	y MultiFamily	MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
both	GR climate zone 1	All Appliances	1	✓		✓ ▲	All Appliances
standard and	GR climate zone 2 GR climate zone 3	All Appliances	2	1			Osuthers Oslifersis Oss Zees Edites (Oslo Ausilable for Osuthers Oslifersis Oss)
	GR climate zone 1	Primary Space Heat	1	V		✓ ✓	Southern California Gas Zone Editor (Only Available for Southern California Gas)
low income	GR climate zone 2	Primary Space Heat	2	 Image: A start of the start of		✓	Edit Zone 🔍 Store Revised Zone
	GR climate zone 3	Primary Space Heat	3	 Image: A start of the start of		✓	
rates	GR climate zone 1	Primary Space Heat	1		~		Period Codes
Tutes	GR climate zone 2	Primary Space Heat	2		✓		
	GR all climate zones	Conventional Water Heater, Range Oven Combination, Solar W	all		✓		Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
	GR climate zone 1	All Appliances	1		✓ ✓		
	GR climate zone 2	All Appliances	2		· ·		
	GR climate zone 3	All Appliances	3		 Image: A start of the start of		Specify a period code between 1 and 4 Store Period Codes
	GR climate zone 1	Primary Space Heat, Range Oven Combination	1		Image: A start of the start		
	GR climate zone 2	Primary Space Heat, Range Oven Combination	2		✓		Rate Values
	GR climate zone 3	Primary Space Heat, Range Oven Combination	3		√		
	GR all climate zones	Range Oven Combination	all		\checkmark		Period 1 Period 2 Period 3 Period 4
	GR all climate zones	Conventional Water Heater, Solar Water Heat with Gas Backup	all		✓		Rate information shown for selected period. NaN indicates no rate or maximum at that tier.
	GR climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Water	1		✓		Tier1 Tier2 Tier3 Tier4 Tier5
	GR climate zone 2	Conventional Water Heater, Primary Space Heat, Solar Water	2		✓		Maximum daily allowance [therm]
	GR climate zone 3	Conventional Water Heater, Primary Space Heat, Solar Water	3		✓		Rate [\$/therm]
	GR CARE climate zone 1	All Appliances	1				Oters Edited Data Values
	GR CARE climate zone 2	All Appliances	2				Store Edited Rate Values
	GR CARE climate zone 3	All Appliances	3				Moethly Fixed Charge [9]
	GR CARE climate zone 1	Primary Space Heat	1				Wontiny Fixed Charge [0]
	GR CARE climate zone 2	Primary Space Heat	2				Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
	OR CARE climate 2016 5		3				
	Gas Rate Structure Select	tor and Editor tool initialized at 09-Jan-2019 07:51:47. Select a rate	to vie	w and edit.			
							Store Edited Monthly Fixed Charges
							LOAD ALL FROM FILE SAVE ALL TO FILE



Select Utility SOUTHE	RN CALIFORNIA	GAS 🔹	Nex	t Utility	+ Ad	d Custom Rate	Nati	tural Gas	Applian	nces (ra	te is va	lid if hor	me contai	ns only s	elected ga	is applianc	es)	
Select a Rate to View Deta	ails:		Previo	ous Utility	Store	Revised Table		Conventi	ional Wa	ater Hea	ater		Spa H	leat	[Auxiliary	Space	Heating
Standard Rates Low	/ Income Rates							Solar Wa	ater Hea	at with G	Gas Bac	:kup	Pool H	leat	[Dryer		
Rate		Appliances (use panel to edit>)	Zone	SingleFan	nily MultiFamil	ly MobileHome		Range O	oven Co	mbinati	on		🗸 Prima	ry Space	Heat [Miscella	neous (Other
OR climate zone 1	An Appliances		1				· .	All Annli	iances									
GR climate zone 2	All Appliances		2															
GR climate zone 3	All Appliances		3				Sou	uthern Ca	alifornia	Gas Zo	one Edit	or (Only	v Availabl	e for Sou	thern Cali	fornia Gas'		
GR climate zone 1	Primary Space	Heat	1										,					
GR climate zone 2	Primary Space	Heat	2				E	Edit Zone	1		•					Sto	re Revi	ised Zone
GR climate zone 3	Primary Space	Heat	3						_									
GR climate zone 1	Primary Space	Heat	1				Dec.											
GR climate zone 2	Primary Space	Heat	2				Peri	riod Code	es									
GR climate zone 3	Primary Space	Heat	3					lan	Feb	Mar	Apr	May	lun		a Sen	Oct N	ov D	16
GR all climate zones	Conventional W	ater Heater, Range Oven Combination, Solar W	. all					Jan	reb	IVICI	Λµι	iviciy	Juli		ig Sep		00 0	e .
GR climate zone 1	All Appliances		1					2	2	2	2	2	1	1	1 1	2	2	2
GR climate zone 2	All Appliances		2															
GR climate zone 3	All Appliances		3					Specify a	a period	code b	etween	1 and 4	4			Store	Period	d Codes
GR climate zone 1	Primary Space	Heat, Range Oven Combination	1															
GR climate zone 2	Primary Space	Heat, Range Oven Combination	2				Pat	to Values										
GR climate zone 3	Primary Space	Heat, Range Oven Combination	3				T.du	te values										
GR all climate zones	Range Oven Co	mbination	all					Period 1	l Pe	eriod 2	Pe	riod 3	Period	14				
GR all climate zones	Conventional W	ater Heater, Solar Water Heat with Gas Backup	all					Rate in	nformati	on show	n for sel	ected pe	eriod. Nal	l indicates	s no rate or	maximum a	t that tie	er.
GR climate zone 1	Conventional W	ater Heater, Primary Space Heat, Solar Water	1									1	Tier1	Tier2	Tier3	Tier4	Tier5	
GR climate zone 2	Conventional W	ater Heater, Primary Space Heat, Solar Water	2					Maximur	m daily	allowar	nce lithe	rml	0.472	NoN	NoN	NoN	N	aN
GR climate zone 3	Conventional W	ater Heater, Primary Space Heat, Solar Water	3					Maximu	in uany	Dete	ICE [IIIE		0.473	1.0406	NaN	NaN	IN N	aN
GR CARE climate zone 1	All Appliances		1	1		✓				Rate	; [ø/me		.///6/	1.0400	INAIN	INAIN	IN	an
GR CARE climate zone 2	All Appliances		2	1		✓										Store E	lited Ra	ate Value:
GR CARE climate zone 3	All Appliances		3	1		✓												
GR CARE climate zone 1	Primary Space I	Heat	1	1		1	Mor	nthly Fixe	ed Char	ne [\$]								
GR CARE climate zone 2	Primary Space	Heat	2	1		1		intriny i two		90 [4]						1 1		
GR CARE climate zone 3	Primary Space	Heat	3	1		1	-	Jan	Feb	Mar	Apr	May	Jun	Jul Au	ig Sep	Oct N	ov D	lec
							<u> </u>	8.22	7.42	8.22	7.95	8.22	7.95	8.22 8	.22 7.95	8.22	7.95	8.22
Gas Rate Structure Selec	tor and Editor tool	initialized at 09-Jan-2019 07:40:02. Select a rate	e to view a	and edit.														
														ſ	Store Ed	ited Month	y Fixed	d Charges
																	-	-



Click on

rate to

details

view

Rate Selector				
Select Utility SOUTHER	RN CALIFORNIA GAS	Next Utility	+ Add Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
Select a Rate to View Deta	ils:	Previous Utility	Store Revised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating
Standard Rates Low	Income Rates			Solar Water Heat with Gas Backup Pool Heat Dryer
Rate	Appliances (use panel to edit>)	Zone SingleF	amily MultiFamily MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
GR climate zone 2	All Appliances	2		All Appliances
GR climate zone 3	All Appliances	3		
GR climate zone 1	Primary Space Heat	1		Southern California Gas Zone Editor (California Gas California Gas)
GR climate zone 2	Primary Space Heat	2		Pate applies to homes with only
GR climate zone 3	Primary Space Heat	3		Rate applies to nomes with only
GR climate zone 1	Primary Space Heat	1		a start of a wallow and Data taken a
GR climate zone 2	Primary Space Heat	2		Period Codes Selected appliances. Rate labeled
GR climate zone 3	Primary Space Heat	3		
GR all climate zones	Conventional Water Heater, Range Oven Combination, Solar W.,	all		Jan Feb Mar Apr Ma as "All Appliances" covers all
GR climate zone 1	All Appliances	1		
GR climate zone 2	All Appliances	2		2 2 2 2 appliances not directly specified
GR climate zone 3	All Appliances	3		appliances not unectly specified
GR climate zone 1	Primary Space Heat, Range Oven Combination	1		with a rate
GR climate zone 2	Primary Space Heat, Range Oven Combination	2		With a rate
GR climate zone 3	Primary Space Heat, Range Oven Combination	3		Rate Values
GR all climate zones	Range Oven Combination	all		Period 1 Period 2 Period 3 Period 4
GR all climate zones	Conventional Water Heater, Solar Water Heat with Gas Backup	all		Pate information shown for extended period. NaN indicates no rate or maximum at that fier
GR climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Water	1		
GR climate zone 2	Conventional Water Heater, Primary Space Heat, Solar Water	2		IIEr1 IIEr2 IIEr3 IIEr4 IIEr5
GR climate zone 3	Conventional Water Heater, Primary Space Heat, Solar Water	3		Maximum daily allowance [therm] 0.473 NaN NaN NaN NaN
GR CARE climate zone 1	All Appliances	1		Rate [\$/therm] 0.77787 1.0406 NaN NaN NaN
GR CARE climate zone 2	All Appliances	2		Store Edited Pate Values
GR CARE climate zone 3	All Appliances	3		Store Edited Rate Values
GR CARE climate zone 1	Primary Space Heat	1		Monthly Fixed Charge [5]
GR CARE climate zone 2	Primary Space Heat	2		Montally Fixed Charge [a]
GR CARE climate zone 3	Primary Space Heat	3		Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
		· È		8.22 7.42 8.22 7.95 8.22 7.95 8.22 7.95 8.22 7.95 8.22 7.95 8.22 7.95 8.22
Gas Rate Structure Select	tor and Editor tool initialized at 09-Jan-2019 07:40:02 Select a rate	to view and edit		
				Store Edited Monthly Fixed Charges
				RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



Soloct Litility		Nex	t Utility	+ Add (Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
		Provid	Nue Litility	Store B	lovicod Tablo	
Select a Rate to View Det	tails:	Flevic	Jus Ounty	Store N	levised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating
Standard Rates Lov	w Income Rates					Solar Water Heat with Gas Backup Pool Heat Dryer
Rate	Appliances (use panel to edit>)	Zone	SingleFamily	/ MultiFamily	MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
OR climate zone i	Air Appliances	1				
GR climate zone 2	All Appliances	2				
GR climate zone 3	All Appliances	3				Southern California Gas Zone Editor (Only Available for Southern California Gas)
GR climate zone 1	Primary Space Heat	1				Southern Cambrina Gas Zone Editor (Only Available for Southern Cambrina Gas)
GR climate zone 2	Primary Space Heat	2				
GR climate zone 3	Primary Space Heat	3				
GR climate zone 1	Primary Space Heat	1				custom rat
GR climate zone 2	Primary Space Heat	2				Period Codes CuStOIII 1 at
GR climate zone 3	Primary Space Heat	3				
GR all climate zones	Conventional Water Heater, Range Oven Combination, Solar W.	. all				Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov De
GR climate zone 1	All Appliances	1				2 2 2 2 2 1 1 1 1 2 2 2
GR climate zone 2	All Appliances	2				
GR climate zone 3	All Appliances	3				Specify a period code between 1 and 4 Store Period Codes
GR climate zone 1	Primary Space Heat, Range Oven Combination	1				
GR climate zone 2	Primary Space Heat, Range Oven Combination	2				
GR climate zone 3	Primary Space Heat, Range Oven Combination	3				Rate Values
GR all climate zones	Range Oven Combination	all				Period 1 Period 2 Period 3 Period 4
GR all climate zones	Conventional Water Heater, Solar Water Heat with Gas Backup	all				Data information shown for selected period. NaN indicates no rate or maximum at that fier
GR climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Water	1				Tate information shown to selected period. Her maneaus no rate of maximum at matter.
GR climate zone 2	Conventional Water Heater, Primary Space Heat, Solar Water	2				Tier1 Tier2 Tier3 Tier4 Tier5
GR climate zone 3	Conventional Water Heater, Primary Space Heat, Solar Water	3				Maximum daily allowance [therm] 0.473 NaN NaN NaN NaN
GR CARE climate zone 1	1 All Appliances	1			1	Rate [\$/therm] 0.77787 1.0406 NaN NaN NaN
GR CARE climate zone 2	2 All Appliances	2	·		1	Ctore Edited Bate Values
GR CARE climate zone 3	3 All Appliances	3	· ·		-	
GR CARE climate zone 1	1 Primary Space Heat	1	-		-	Marth Stad Obarra (2)
GR CARE climate zone 2	2 Primary Space Heat	2	-		-	Monthly Fixed Charge [5]
GR CARE climate zone 3	3 Primary Space Heat	3	~		-	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
			•		•	8.22 7.42 8.22 7.95 8.22 7.95 8.22 8.22 7.95 8.22 7.95 8.22 7.95
Gas Rate Structure Sele	ctor and Editor tool initialized at 09-Jan-2019 07:40:02 Select a rat	e to view a	and edit			
			and out.			Store Edited Monthly Fixed Charges
						RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



Select Utility SOUTH	IERN CALIFORNIA GAS	Ne	ext Utility	+ Add C	ustom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)	
Select a Rate to View De	atails:	Prev	vious Utility	Store Re	evised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating	
Standard Rates Lo	ow Income Rates					Solar Water Heat with Gas Backup Pool Heat Dryer	
Rate	Appliances (use panel to edit>)	Zone	e SingleFamily	MultiFamily	MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other	
OR climate zone 1	Air Appliances	1				All Appliances	
GR climate zone 2	All Appliances	2					
GR climate zone 3	All Appliances	3				Southern California Gas Zone Editor (Only Available for Southern California Gas)	
GR climate zone 1	Primary Space Heat	1					
GR climate zone 2	Primary Space Heat	2				Edit Zone 1 V Store Revised Zone	
GR climate zone 3	Primary Space Heat	3					
GR climate zone 1	Primary Space Heat	1					
GR climate zone 2	Primary Space Heat	2				Period Codes	View/edit
GR climate zone 3	Primary Space Heat	3				lan Eab Mar Anr May Jun Jul Aug San Oct Nay Dr	
GR all climate zones	Conventional Water Heater, Range Oven Combination, Solar W.	all				Jan Peb Iviai Api Iviay Jun Jui Aug Sep Oct Nov De	monthly
GR climate zone 1	All Appliances	1					montiny
GR climate zone 2	All Appliances	2					ام میں ا
GR climate zone 3	All Appliances	3				Specify a period code between 1 and 4 Store Period Codes	perioa
GR climate zone 1	Primary Space Heat, Range Oven Combination	1					•
GR climate zone 2	Primary Space Heat, Range Oven Combination	2				Data Values	codes
GR climate zone 3	Primary Space Heat, Range Oven Combination	3				Rate values	coucs
GR all climate zones	Range Oven Combination	all				Period 1 Period 2 Period 3 Period 4	
GR all climate zones	Conventional Water Heater, Solar Water Heat with Gas Backup	all				Rate information shown for selected period. NaN indicates no rate or maximum at that tier	
GR climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Water	1				Tierd Tier? Tier? Tierd Tier5	
GR climate zone 2	Conventional Water Heater, Primary Space Heat, Solar Water	2					
GR climate zone 3	Conventional Water Heater, Primary Space Heat, Solar Water	3				Maximum daily allowance [therm] 0.473 NaN NaN NaN NaN	
GR CARE climate zone	1 All Appliances	1	1		 Image: A start of the start of	Rate [\$/therm] 0.77787 1.0406 NaN NaN NaN	
GR CARE climate zone	2 All Appliances	2	1		 Image: A start of the start of	Store Edited Pate Values	
GR CARE climate zone	3 All Appliances	3	1		1	Store Edited Nate Values	
GR CARE climate zone	1 Primary Space Heat	1	1		1	Marthly Fixed Observ (6)	
GR CARE climate zone	2 Primary Space Heat	2	1			Monuniy Fixed Charge (\$)	
GR CARE climate zone	3 Primary Space Heat	3	-		1	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec	
	· ·		•		•	8.22 7.42 8.22 7.95 8.22 7.95 8.22 8.22 7.95 8.22 7.95 8.22 7.95 8.22	
Gos Data Structura Sal	actor and Editor tool initialized at 00, Jan 2010 07:40:02 . Salect a rat	o to view	and adit				
Gas Rate Structure Ser	ector and Editor tool initialized at 09-041-2019 07:40.02. Select a fai	e to view	r anu euit.			Store Edited Monthly Fixed Charges	
						RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE	



Rate Selector						
Select Utility SOUTHE	RN CALIFORNIA GAS	Next	Utility	+ Add	Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
Select a Rate to View Deta	ills:	Previou	s Utility	Store F	Revised Table	Conventional Water Heater Spa Heat Auxiliary Space Heating
Standard Rates Low	Income Rates					Solar Water Heat with Gas Backup Pool Heat Dryer
Rate	Appliances (use panel to edit>)	Zone	SingleFami	ly MultiFamily	MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
GR climate zone 2	All Appliances	2				A All Appliances
GR climate zone 3	All Annliances	2				
GR climate zone 1	Primary Space Heat	1				Southern California Gas Zone Editor (Only Available for Southern California Gas)
GR climate zone 2	Primary Space Heat	2				
GR climate zone 3	Primary Space Heat	3				Edit Zone 1 Vice Store Revised Zone
GR climate zone 1	Primary Space Heat	1				
GR climate zone 2	Primary Space Heat	2				Period Codes
GR climate zone 3	Primary Space Heat	3				
GR all climate zones	Conventional Water Heater, Range Oven Combination, Solar W	all				Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov De
GR climate zone 1	All Appliances	1				3 3 3 3 3 4 4 4 4 3 3 3
GR climate zone 2	All Appliances	2				
GR climate zone 3	All Appliances	3				Sherify a period code between 1 and 4
GR climate zone 1	Primary Space Heat, Range Oven Combination	1				Store Period Codes
GR climate zone 2	Primary Space Heat, Range Oven Combination	2				
GR climate zone 3	Primary Space Heat, Range Oven Combination	3				Rate Values
GR all climate zones	Range Oven Combination	all				Period 1 Period 2 Period 3 Period 4 View/ed
GR all climate zones	Conventional Water Heater, Solar Water Heat with Gas Backup	all				Data information shown for selected particular line in the information shown for selected particular in the information shown for selected particular in the information shown for selected particular in the information shown in the information sho
GR climate zone 1	Conventional Water Heater, Primary Space Heat, Solar Water	1				Rate monnation shown to selected period. Ware molecules in rate of maximum at marter.
GR climate zone 2	Conventional Water Heater, Primary Space Heat, Solar Water	2				
GR climate zone 3	Conventional Water Heater, Primary Space Heat, Solar Water	3				Maximum daily allowance [therm] 0.473 NaN NaN NaN NaN han tiors for
GR CARE climate zone 1	All Appliances	1	1		Image: A state of the state	Rate [\$/therm] 0.77787 1.0406 NaN NaN NaN LIETS IO
GR CARE climate zone 2	All Appliances	2	1		1	Store Edited Rate Values
GR CARE climate zone 3	All Appliances	3	1		Image: A state of the state	each per
GR CARE climate zone 1	Primary Space Heat	1	1		1	Monthly Fixed Charge [S]
GR CARE climate zone 2	Primary Space Heat	2	1		Image: A state of the state	
GR CARE climate zone 3	Primary Space Heat	3	1		1	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
						8.22 7.42 8.22 7.95 8.22 7.95 8.22 7.95 8.22 7.95 8.22 7.95 8.22
Gas Rate Structure Selec	tor and Editor tool initialized at 09-Jan-2019 07:40:02. Select a rate	e to view ar	nd edit.			
						Store Edited Monthly Fixed Charges
						RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE



Rate Selector							
Select Utility SOUTH	ERN CALIFORNIA	GAS 🗸	Next	Utility	+ Add	Custom Rate	Natural Gas Appliances (rate is valid if home contains only selected gas appliances)
Select a Rate to View De	etails:		Previou	us Utility	Store Revised Table		Conventional Water Heater
Standard Rates Lo	ow Income Rates						Solar Water Heat with Gas Backup Pool Heat Dryer
Rate		Appliances (use panel to edit>)	Zone	SingleFamily	MultiFamily	MobileHome	Range Oven Combination Primary Space Heat Miscellaneous Other
GR climate zone 2	All Appliances		2				All Appliances
GR climate zone 3	All Appliances		3				
GR climate zone 1	Primary Space F	Heat	1				Southern California Gas Zone Editor (Only Available for Southern California Gas)
GR climate zone 2	Primary Space F	Heat	2				
GR climate zone 3	Primary Space F	Heat	3				Edit Zone 1 v Store Revised Zone
GR climate zone 1	Primary Space I	Heat	1				
GR climate zone 2	Primary Space F	Heat	2				Period Codes
GR climate zone 3	Primary Space F	Heat	3				
GR all climate zones	Conventional W	ater Heater Range Oven Combination Solar W	all				Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov De
GR climate zone 1	All Appliances		1				2 2 2 2 2 4 4 4 4 2 2 2
GR climate zone 2	All Appliances		2				
GR climate zone 3	All Appliances		3				Specify a period code between 1 and 4
GR climate zone 1	Primary Space F	Heat Range Oven Combination	1				Store Period Codes
GR climate zone 2	Primary Space F	Heat Range Oven Combination	2				
GR climate zone 3	Primary Space I	Heat Range Oven Combination	3				Rate Values
GR all climate zones	Range Oven Co	mbination	all				Period 1 Period 2 Period 2 Period 4
GR all climate zones	Conventional W	ater Heater, Solar Water Heat with Gas Backup	all				
GR climate zone 1	Conventional W	ater Heater, Primary Space Heat, Solar Water	1				Rate information shown for selected period. NaN indicates no rate or maximum at that fier.
GR climate zone 2	Conventional W	ater Heater, Primary Space Heat, Solar Water	2				Tier1 Tier2 Tier3 Tier4 Tier5
GR climate zone 3	Conventional W	ater Heater, Primary Space Heat, Solar Water	3				Maximum daily allowance [therm] 0.473 NaN NaN NaN NaN
GR CARE climate zone	1 All Appliances		1				Rate [\$/therm] 0.77787 1.0406 NaN NaN NaN
GR CARE climate zone	2 All Appliances		2	-		×	
GR CARE climate zone	3 All Appliances		3	~		×	Store Edited Rate Values
GR CARE climate zone	1 Primary Space	Heat	1	-		-	Marthu Fired Observ (0)
GR CARE climate zone	2 Primary Space	leat	2	-		· ·	Monthly Fixed Charge [5]
GR CARE climate zone	3 Primary Space I	leat	3	-		-	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
				•			8.22 7.42 8.22 7.95 8.22 7.95 8.22 8.22 7.95 8.22 7.95 8.22 7.95 8.22
Gao Bata Structura Sala	actor and Editor tool	initialized at 00, Jan 2010 07:40:02, Salact a rate	to view o	nd odit			
Gas Rale Structure Sele	ector and Editor toor	Initialized at 09-Jan-2019 07.40.02. Select a fate	to view al	nu euit.			Store Edited Monthly Fixed Charges
							RESET ALL TO DEFAULT LOAD ALL FROM FILE SAVE ALL TO FILE

charges

View/edit

monthly

fixed
Categorize Natural Gas Appliances (leave unchanged)

mand Demand Input Su	Immary Power Supply Econo	mics Computation Re	sults							
Low Income Rate	es Qualification			Net Metering						
Load Default Low Income	Fractions			No Net Metering (default Use Net Metering) Sell I Sell I 	Electricity Back to Electricity Back to	o Grid at Retail Rates o Grid at Fixed Rate (specify)	\$	0.000 /kW-hr	
For Advanced Users				Casalina and Dia	ool Drico	2				
View/Edit Low Income F	Fractions			Gasoline and Die	sel Price	5				
Load Saved Low Income	Fractions			Average Gasoline (All Gran Average Diesel (On-Highw	les) Retail Pric ay) Retail Price	e \$ 3.60	5 per gallon Set to 7 per gallon Default	View Curr Pric	ent and Historical es from EIA	
Electricity Rates				Natural Gas Rate	s					
Load Default Rate Struct	ures			Load Default Rate Structu	res 🥚					
For Advanced Users				For Advanced Users						
View/Edit Rate Structur	res			View/Edit Rate Structure	s					
Load Saved Rate Struct	ures			Load Saved Rate Structur	es 🔴					
Natural Gas App	liance Categorization									
For Advanced Users	(Catego	ize all Natural Gas appliances	for gas rate calculator. Every appl	iance must be assigned a sing	le category. Us	ed when adding	new natural gas appliances)	(More Information	Table
Category	Technology	Conventional Water Heater	Solar Water Heat with Gas Backu	p Range Oven Combination	Spa Heat	Pool Heat	Primary Heat Auxiliary Hea	t Dryer	Other	
Hot water heating	Conventional Water Heater	\checkmark								he use
Hot water heating	Solar Water Heat with Gas Backup		\checkmark							
Kitchen	Range Oven Combination									when
Laundry	Dryer							✓		WIICII
Miscellaneous	Other								✓	addia
Pool	Pool Heat					~				auuin
Pool	Spa Heat				~					
space heating and cooling	Auxiliary Heat								• • • •	natura
										J applia
							🛉 🖛 RETURN TO PREVIOU	JS ADVA	ANCE TO NEXT 📥 📗	~~~~



Computation Panel (Run Simulation)

	Demand Input Summary Power Supply Economics Computation Results
	Computation
Push	
"Compute	Cancel Computation Clear History
Results" to	
ctort	
computation	
	← RETURN TO PREVIOUS ADVANCE TO NEXT →



Computation Panel (View Simulation Status)

Demand Input Summary Power Supply Economics Computation Results	
Computation	
Compute Results Save Setur and Results *** COMPUTATION COMPLETED SUCCESSFULLY! *** elapsed time: 301.8611 s	
	արողուղուրողուղուղուղուղուղո
Cancel Computation Clear History	76 78 80 82 84 86 88 90 92 94 96 98 100
09-Jan-2019 09:32:51: *** COMPUTATION COMPLETED SUCCESSEULIXI *** elansed time: 301 8611 s	
09-Jan-2019 09:32:41. Storing Output Data	
09-Jan-2019 09:32:40: Finished expanding sample size to represent all households	
09-Jan-2019 09:32:40: Expanding: Task 6 of 6	
09-Jan-2019 09:32:40: Expanding: Task 5 of 6	
09-Jan-2019 09:32:39: Expanding: Task 4 of 6	
09-Jan-2019 09:32:39: Expanding: Task 3 of 6	
09-Jan-2019 09:32:39: Expanding: Task 2 of 6	
09-Jan-2019 09:32:38: Expanding: Task 1 of 6	
09-Jan-2019 09:32:37: Expanding sample size to represent all households	
09-Jan-2019 09:32:37: Finished computing Well to Pump Gasoline and Diesel Emissions	
09-Jan-2019 09:32:37: Computing Well to Pump Gasoline and Diesel Emissions	
09-Jan-2019 09:32:37: Finished Computing Natural Gas Production Emissions	
09-Jan-2019 09:32:37: Computing Natural Gas Production Emissions	
09-Jan-2019 09:32:37. Finished Computing Natural Gas Leak Rates	
09-Jah 2019 09:52:30. Computing Natural Gals Leak Kates	
09-Jan 2019 09:32:30. Thilbited Calculating Dieber and Gasbillie Rates	
09 Jan 2019 09:32:30. Calculating Diese and Gabonie Rates	
09-Jan-2019 09:32:33: Calculation Natural Gas Rates	
09-Jan-2019 09:32:33 Finished Calculating Optimal Panel Area and Change in Electricity Emissions	
09-Jan-2019 09:32:32: Completed task 1 of 1	
09-Jan-2019 09:32:30: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ16	
09-Jan-2019 09:32:28: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ16	
09-Jan-2019 09:32:26: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ15	
09-Jan-2019 09:32:25: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ15	
09-Jan-2019 09:32:21: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ10	
09-Jan-2019 09:32:15: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ10	
09-Jan-2019 09:32:11: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ9	
09-Jan-2019 09:32:05: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ9	
09-Jan-2019 09:32:01: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ8	
09-Jan-2019 09:31:57: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ8	
09-Jan-2019 09:31:54: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in C26	
09-Jan 2019 09:31:52, Using Utimity-Specific Electricity Transmission/Justinoution Loss Percentage in C26	
09-Jan 2019 09:31:30: Emission Determining WOST Cost Effective P Y Parallel Area	
09-Jan 2019 09:31:201 Determining most cost Ellective FV Fallel Alea	
09-Jan 2013 09-31-201 Gardinama opunian Fandri Alda antivo Orlange III Electricity Ethiosofis	•
Vervenzore velotizore velotizor i menere velocitati Nates	•



Computation Panel (Save Setup & Results)

Compute Results Save Setup and Results	COMPUTATION COMPLETED SUCC	ESSFULLY! ***	elapsed time: 301.8611 s		
Cancel Computation Clear History 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30) 32 34 36 38 40 42 44 46 48 5	50 52 54 56 5	58 60 62 64 66 68 70 72 74 76 78 80 82	84 86 88 90 92 9	94 96
-Jan-2019 09:32:51: *** COMPUTATION COMPLETED SUCCESSFULLY! *** elapsed time: 301.8611 s	Select File to Save Results				×
-Jan-2019 09:32:41: Storing Output Data Jan-2019 09:32:40: Einishad expanding sample size to represent all households					
-Jan-2019 09:32:40: Expanding: Task 6 of 6	$\leftarrow \rightarrow \checkmark \uparrow \square \ll so$	ftware_ver_1_10	→ FinalResults → 🖸 Search Fina	Results	
-Jan-2019 09:32:40: Expanding: Task 5 of 6					_
9-Jan-2019 09:32:39: Expanding: Task 4 of 6	Organize New fold			877	?
J-Jan-2019 09:32:39: Expanding: Task 3 of 6 D- Jan-2019 00:32:30: Expanding: Task 2 of 6		^	N	Die Koll	
-Jan-2019 09:32:38: Expanding: Task 1 of 6	🛨 Quick access		Name	Date modified	ЧУP
-Jan-2019 09:32:37: Expanding sample size to represent all households			allCZallCat Gasify All No DeltaElecEmis	1/7/2019 12:17 PM	RES
-Jan-2019 09:32:37: Finished computing Well to Pump Gasoline and Diesel Emissions	2017	*	allCZallCat Gasify All No DeltaElecEmis	1/7/2010 11·30 AM	RES
-Jan-2019 09.32.37. Computing Well to Pump Gasoline and Dieser Emissions - Jan-2019 09:32:37. Einished Computing Natural Gas Production Emissions	2018	*		1/1/2010 11.30 AM	DEC
-Jan-2019 09:32:37: Computing Natural Gas Production Emissions	Deckton		allCZallCat_Gasify_All_updated.results	1/4/2019 10:44 AM	RES
-Jan-2019 09:32:37: Finished Computing Natural Gas Leak Rates	Desktop	74			
)-Jan-2019 09:32:36: Computing Natural Gas Leak Rates	Downloads	*			
-Jan-2019 09:32:36. Calculating Diesel and Gasoline Rates	General	*			
-Jan-2019 09:32:36: Finished Calculating Natural Gas Rates	V2014				
-Jan-2019 09:32:33: Calculating Natural Gas Rates	Year2014	71			
J-Jan-2019 09:32:33: Finished Calculating Optimal Panel Area and Change in Electricity Emissions - Jan-2019 09:32:32: Completed task 1 of 1	Year2015	2			
-Jan-2019 09:32:32: Completed task 1 of 1	Vear2016	*			
J-Jan-2019 09:32:28: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ16	V 2017				
-Jan-2019 09:32:26: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ15	Year2017	H.			
J-Jan-2019 09:32:25: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in C215 9. Jan-2019 09:32:21: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in C210	Year2018	*			
-van-2019 09:32:15: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ10	- 441	× ·	<		>
-Jan-2019 09:32:11: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ9	File name:				
-Jan-2019 09:32:05: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ9 New 2010 09:32:04. Using Utility Specific Electricity Transmission/Distribution Loss Percentage in CZ9					
-Jan-2019 09.32.01; Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in C28 -Jan-2019 09:31:57; Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in C28	Save as type: (*.res	sults)			\sim
-Jan-2019 09:31:54: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ6					
9-Jan-2019 09:31:52: Using Utility-Specific Electricity Transmission/Distribution Loss Percentage in CZ6	A Hide Folders		Save	Cancel	
-Jan-2019 09:31:50: Finished Determining Most Cost Effective PV Panel Area	A Thide Folders				
-van-2019 09:31:20: Determining Most Cost Elective PV Panel Area 9-Jan-2019 09:31:20: Calculating Optimal Panel Area and/or Change in Electricity Emissions					
9-Jan-2019 09:31:20: Finished Calculating Electricity Rates					



South Coast Air Quality Management District

Computation Panel (Save Setup & Results)

Demand Demand Input Summary Power Supply Economics Computat	ion Results							
Computation File Save Complete Compute Results Save Setup and Results File Save Complete Cancel Computation Clear History 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 64 85 55 56 56 66 68 70 72 74 76 78 80 82 94 96 98 1 0 2 4 6 8 10 92 94 96 98 1 0 2 4 6 8 10 22 24 26 28 30 32 34 30 84 44 46 48 50 52 54 56 86 08 29 94 96 98 1 0 2 4 6 88 1 1 1								
09-Jan-2019 10:03:06: File Save Complete 09-Jan-2019 09:59:18: Saving Results to text File: M:\NEAT\software_ver_1_10\Fina 09-Jan-2019 09:59:09: Saving Setup to Text File: M:\NEAT\software_ver_1_10\Final 09-Jan-2019 09:59:09: Saving Setup to M:\NEAT\software_ver_1_10\FinalResults\C 09-Jan-2019 09:59:07: Saving Results to M:\NEAT\software_ver_1_10\FinalResults\C	IResults\CZ6allCat_ElecWH_Solar_for_mtg_results.txt. This may take a while Results\CZ6allCat_ElecWH_Solar_for_mtg_setup.txt Z6allCat_ElecWH_Solar_for_mtg.results							
09-Jan-2019 09:32:51: *** COMPUTATION COMPLETED SUCCESSFULLY! *** ela 09-Jan-2019 09:32:51: *** COMPUTATION COMPLETED SUCCESSFULLY! *** ela 09-Jan-2019 09:32:40: Finished expanding sample size to represent all households 00-len 2010 09:20:40: Evenediary Topic 6 of 6	Four files are created when clicking "Save Setup and Results"							
09-Jan-2019 09:32:40: Expanding: Task 6 of 6 09-Jan-2019 09:32:40: Expanding: Task 5 of 6 09-Jan-2019 09:32:39: Expanding: Task 4 of 6 09-Jan-2019 09:32:39: Expanding: Task 3 of 6 09-Jan-2019 09:32:39: Expanding: Task 2 of 6 09-Jan-2019 09:32:37: Expanding: Task 1 of 6 09-Jan-2019 09:32:37: Expanding sample size to represent all households	• ("Filename").setup is a binary file containing all the app settings. This can be loaded into NEAT with "File" menu							
09-Jan-2019 09:32:37: Finished computing Well to Pump Gasoline and Diesel Emiss 09-Jan-2019 09:32:37: Computing Well to Pump Gasoline and Diesel Emissions 09-Jan-2019 09:32:37: Finished Computing Natural Gas Production Emissions 09-Jan-2019 09:32:37: Finished Computing Natural Gas Leak Rates 09-Jan-2019 09:32:36: Computing Natural Gas Leak Rates 09-Jan-2019 09:32:36: Computing Natural Gas Leak Rates 09-Jan-2019 09:32:36: Finished Calculating Diesel and Gasoline Rates	• ("Filename").results is a binary file containing the results of the run that can be loaded into NEAT with "File" menu							
09-Jan-2019 09:32:36: Calculating Diesel and Gasoline Rates 09-Jan-2019 09:32:36: Finished Calculating Natural Gas Rates 09-Jan-2019 09:32:33: Calculating Natural Gas Rates 09-Jan-2019 09:32:33: Finished Calculating Optimal Panel Area and Change in Elect 09-Jan-2019 09:32:32: Completed task 1 of 1 09-Jan-2019 09:32:30: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:82: Using Utility-Specific Electricity Transmission/Distribution Los	• ("Filename")_setup.txt is a text file containing all input parameters for use outside NEAT. Could be up to 12 MB.							
09-Jan-2019 09:32:26: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:25: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:21: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:15: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:11: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:01: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:05: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:01: Using Utility-Specific Electricity Transmission/Distribution Los 09-Jan-2019 09:32:01: Using Utility-Specific Electricity Transmission/Distribution Los	• ("Filename")_results.txt is a text file containing all results for use outside NEAT. Could be up to 225 MB.							



🔶 RETURN TO PREVIOUS

ADVANCE TO NEXT 📥

Results Panel (tools for viewing and analyzing simulation)

Demand Demand Input Summary Power Supply	onomics Computation Results			
Analyze Most Recent Results Analyze Saved Results				
Filter Homes				
Climate Zones				
Housing Category				
Only Single Family Homes Only Mobile Homes Only Multi Family Homes All Housing Types				
Natural Gas Utilities				
IVI Long Beach Gas & Ol IVI Southwest Gas Corp. IVI Southern California Gas IVI City of Vernon Gas System	Dinaso Wait			
Electric Utilities	Fiease Wait			
 Azusa Light & Power Bear Valley Electric Service Burbank Water & Power City of Anaheim Public Utilities Department City of Banning Electric Department City of Corona Department of Water & Power City of Riverside City of Vernon Municipal Light Department City of Vernon Municipal Light Department Glendale Water & Power Los Angeles Department of Water & Power Moreno Valley, Utility Pasadena Water & Power Rancho Cucanonga Municipal Utility San Diego Sas & Electric Southera California Edison 	Loading Most Recent Resu	ts		
Loading Stored Results More Information View CZ MAP ANALYZE	evious computation loaded. Run computed at t	9-Jan-2019.09:32:41	RETURN TO PREVIOUS	ADVANCE TO NEXT 10



Results Panel (tools for viewing and analyzing simulation)

	Demand Demand Input Summary Power Supply	Economics	Computation	Results	
Ontion to	Analyze Most Recent Results Analyze Saved Results				
Option to	Filter Homes				
view	Climate Zones				
	6 Coastal 10 S. Inland				
specific	9 N. Near-Coastal 16 Mountain				
climato	 All Climate Zones 				
ciinate	Housing Category				
zones,	Only Single Family Homes Only Mobile Homes Only Multi Family Homes All Housing Types				
housing	Natural Gas Utilities				
	✓ Long Beach Gas & Oil ✓ Southwest Gas Corp.				
categories,					
and utilitios	Electric Utilities				
and utilities	✓ Azusa Light & Power ✓ Base Velley, Electric Service				
	Bear Valley Electric Service Rurback Water & Rower				
	City of Anabeim Public Utilities Department				
	City of Ranning Electric Department				
	City of Corona Department of Water & Power				
_	✓ City of Riverside				
Press	City of Vernon Municipal Light Department				
((A	Glendale Water & Power				
Analyze	Los Angeles Department of Water & Power				
oftor	Moreno Valley Utility Reserver Vater & Rower				
aitei	Rancho Cucamonga Municipal Utility				
selections	✓ San Diego Gas & Electric				
	Southern California Edison				
are made 🔵					
		Drovious o	omputation la	adad	
	Mara Information View C7 MAD	Previous C	omputation to	aueu.	RETURN TO PREVIOUS ADVANCE TO NEXT











South Coast Air Quality Management District

















Results Panel (Cost Effectiveness)

Demand Demand Input Summary Power Supply	Econom	ics C	omputation	Results										
Analyze Most Recent Results Analyze Saved Results	Select C	ost Effect	iveness Subset	Cost Effec	ctiveness	Appliance Mix	Apply Prescribed I	Funding	Query	Individual Home	S			
Filter Homes		Cost E	ffectiveness of	Homes in Selec	ted Bins [Delt	ta lb / Delta \$] per	year		Cost E	Effectiveness of H	Homes in Select	ed Bins [Delta	\$ / Delta ton] per y	ear
Climate Zones	Region	Species	Mean	Median	Min	Max	# of Homes	Region	Species	Mean	Median	Min	Max	# of Homes
○ 6 Coastal ○ 10 S Inland	Red	NOx					0	Red	NOx			\$	\$	0
	Red	CO2e					0	Red	CO2e			\$	\$	0
0 9 N. Near-Coastal 016 Mountain	Yellow	NOx	-0.00254	-0.00223	-1.03	-0.0005	2686859	Yellow	NOx	\$-991,306.69	\$-896,323.75	\$-3,999,817.3	75 \$-1,945.63	2686859
All Climate Zones	Yellow	CO2e	-3.46e+03	-2e+03	-3.17e+06	-980	2686859	Yellow	CO2e	\$-0.93	\$-1.00	\$-2.04	\$-980.01	2686859
Housing Category	Green	NOx	0.00239	0.00152	0.000664	1.38	241223	Green	NOx	\$1,289,217.00	\$1,313,607.00	\$1,449.88	\$3,010,387.75	241223
Ophy Single Family Hamon Ophy Mahila Hamon	Green	CO2e	204	30	13.1	9.57e+05	241223	Green	CO2e	\$65.36	\$66.72	\$0.00	\$957,123.88	241223
Only Multi Family Homes Only Mobile Homes		1	Cost Effec	tiveness of N	Ox Reductio	ons In Subset			_	Cost Effec	tiveness of N	Ox Reductio	ns In Subset	_
Natural Gas Utilities														
✓ Long Beach Gas & Oil ✓ Southwest Gas Corp	ues (0.8					1	nes	0.1				llı.	
Southern California Gas City of Vernon Gas System	ь Р	16						Hon	0.1				- dilla	
	of F							of l						
Electric Utilities	.u	0.4					-	ion i	0.05					
Azusa Light & Power	ad							ad ad	0.05					1
Bear Valley Electric Service	<u>ب</u> آ).2 ·					1	Ľ.						
Burbank Water & Power														
City of Anaheim Public Utilities Department	-0.1	0 483267	-0.0363267	-0.0243267	-0.0123268	-0.000326775	0.0116732	-3	0 3.42801e+	+06 -2.29861e+0	6 -1.16922e+06	6 -39823.8	1.08957e+06 2.2	21897e+06
City of Banning Electric Department				NOx [2	Δlb / Δ\$]						NOx [Δ	\$ / ∆ton]		
City of Corona Department of Water & Power		2	Cost Effec	tiveness of C	O2e Reduct	tions In Subset				Cost Effec	tiveness of C	O2e Reducti	ons In Subset	
City of Riverside		2			1	'								
City of Vernon Municipal Light Department	w							ω.	1					-
Glendale Water & Power	e .	1.5					1	шe						
✓ Los Angeles Department of Water & Power	Ĥ							Ĥ						
Moreno Vallev Utility	l of	1					-	fof						
Pasadena Water & Power	tior							tior	0.5					1
Rancho Cucamonga Municipal Utility	j a).5 -					-	rac						
San Diego Gas & Electric	ш							ш						
Southern California Edison														
2,968,064 homes meeting filter critera above	-	148952	-119114	-89276.9	-59439.4	4 -29601.8	235.702		1.68059	21.1736	44.0278	66.882	89.7361	112.59
53.5093% of the total homes in SoCAB meet filter criteria				COZe							COZe [
	Previo	us com	putation loa	ided. Run d	computed a	at 09-Jan-201	9 09:32:41							
More Information View CZ MAP ANALYZE										l	RETURN T	O PREVIOUS	ADVANCE	TO NEXT 🌩



Results Panel (Appliance Mix)

Demand Demand Input Summary Power Supply	Economics Compu	tation Resu	ilts									
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectivene	ss Subset	Cost Effectiveness	ctiveness Appliance Mix Apply Prescribed Funding Query Individual H			lomes					
Filter Homes	TECHNOLOGY MODIFICATIONS (hover over Technology to see profile)											
Climate Zones			BASELINE	Ξ		SCENARI	0	P	ARAMETER	CHANGES (SCENARIO - BASI	ELINE)
○ 6 Coastal ○ 10 S. Inland	# Category	Euol	Techn	ology	Euol	Techr	aology	LIEC	NOX EE C	O2o EE Unit	Cost Install Cost	Lifotimo
8 S. Near-Coastal 015 S. Desert	1 Hot water heating	NatGas	Gas Conventional Water Heater		Electric	Water Heat		modified	-0.0023	-11.76	-286 -200	0
9 N. Near-Coastal 16 Mountain All Climate Zones												
Housing Category												
Only Single Family Homes Only Mobile Homes												
Only Multi Family Homes OAll Housing Types												
Natural Gas Utilities												
✓ Long Beach Gas & Oil ✓ Southwest Gas Corp.												
Southern California Gas 🗹 City of Vernon Gas System												
Electric Utilities												
✓ Azusa Light & Power												
Bear Valley Electric Service						029 092 Total Home						
Burbank Water & Power	Pan Left		F	raction of Home	s with Sp	ecified Modificati	ions In Cost Effect	tiveness	Subset			Pan Right
City of Anaheim Public Utilities Department						00						
City of Banning Electric Department	1					0.91						
City of Riverside												
City of Vernon Municipal Light Department	0.8											
Glendale Water & Power	5 0.6											
Los Angeles Department of Water & Power	2ad											
Moreno Valley Utility	0.4									_		
Pasadena Water & Power Pasadena Cusamenga Municipal Utility												
San Diego Gas & Electric	0.2											
Southern California Edison												
2,968,064 homes meeting filter critera above	0											
53.5093% of the total homes in SoCAB meet filter criteria						Modification	n					
	Previous compute	tion loaded.	Run computed	l at 09-Jan-201	19 09:32	:41				DDEVIOUS		
More Information View CZ MAP ANALYZE									CETURN TO	PREVIOUS	ADVANCET	



Results Panel (Appliance Mix) More complex example for this slide only





alyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effectiveness Appliance Mix Apply Prescribed Funding Query Individual Homes	
Filter Homes	Enter Funding Amount [\$] Funding is applied only to households filtered on the "Select Cost Effectiveness Subset"	Cost Share by Homeowner [%] 50
e Zones		
Coastal O 10 S. Inland	Description (click on a variable to view histograms)	Value
S. Near-Coastal 015 S. Desert	Approximate Number of Projects Funded	144
N. Near-Coastal 016 Mountain	Number of Possible Projects in "Cost Effectiveness Subset"	2928082
 All Climate Zones 	SCAQMD Cost to Fund All Projects in "Cost Effectiveness Subset" (only considers purchase and installation costs)	\$20,405,961,360.66
g Category	Overwhite Observation (INA) - Enclosed (INA)	0.000.01
1ly Single Family Homes 🕜 Only Mobile Homes	Cumulative Change in NOX Emissions [Io/yr]	-0.900+01
y Multi Family Homes 🔷 All Housing Types	Cumulative Change in NOA Emissions (TPU)	-9.450-05
I Gas Utilitias	Cumulative Change in CO2e Emissions [ID/Y]	-0.558+07
	Cumunauve Change in CO2e Emissions [TPD]	-8.976+01
ng Beach Gas & Oil 🗹 Southwest Gas Corp.	Average Incentive Amount Provided to Homeowner to Purchase and Install Appliances. PV (if selected) and Rattery (if selected)	\$6.801.27
outhern California Gas 🗹 City of Vernon Gas System	Madian Incentive Amount Provided to Homeowner to Purchase and Install Appliances. PV (in selected) and Battery (in selected)	\$8 411 46
c Litilities	Averane Cost-Share from Homeowner to Functiona and Install Annitances. PV (if selected) and Battery (if selected)	\$6,891,27
	Median Cost-Share from Homeowner to Purchase and Install Appliances. PV (in Selected) and Battery (if selected)	\$8,411,46
usa Light & Power	Average Change in Annual Utility and Euel Costs for Homeowner	\$-261.38
ar valley Electric Service	Median Chance in Annual Utility and Fuel Costs for Homeowner	\$-284.40
bank Water & Power	Average Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (if selected)	\$223.23
of Anaheim Public Utilities Department	Median Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (if selected)	\$278.74
of Banning Electric Department		
of Corona Department of Water & Power	No Plot Available No Plot Av	vailable
/ of Riverside		
/ of Vernon Municipal Light Department		
endale Water & Power	g 0.5 - g 0.5 -	-
Angeles Department of Water & Power		
preno Valley Utility		
sadena Water & Power		
ancho Cucamonga Municipal Utility		
n Diego Gas & Electric	Z _{-0.5} . Z _{-0.5} .	-
outhern California Edison		
064 homes meeting filter critera above		



Demand Demand Input Summary Power Supply	Economics Computation Results	
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effectiveness Appliance Mix Apply Prescribed Funding Query Individual Homes	
Filter Homes	Enter Funding Amount [\$] Funding is applied only to households filtered on the Cost SI "Select Cost Effectiveness Subset"	hare by Homeowner [%] 10
Climate Zones		
○ 6 Coastal ○ 10 S. Inland	Description (click on a variable to view histograms)	Value
○ 8 S. Near-Coastal ○ 15 S. Desert	Approximate Number of Projects Funded	80
9 N. Near-Coastal 016 Mountain	Number of Possible Projects in "Cost Effectiveness Subset"	2928082
All Climate Zones	SCAQMD Cost to Fund All Projects in "Cost Effectiveness Subset" (only considers purchase and installation costs)	\$36,730,730,449.68
Housing Category		
Only Single Family Homes Only Mobile Homes	Cumulative Change in NOx Emissions [lb/yr]	-3.85e+01
Only Multi Family Homes OAll Housing Types	Cumulative Change in NOx Emissions [TPD]	-5.27e-05
	Cumulative Change in CO2e Emissions [lb/yr]	-3.64e+07
Natural Gas Utilities	Cumulative Change in CO2e Emissions [TPD]	-4.98e+01
✓ Long Beach Gas & Oil ✓ Southwest Gas Corp.		
Southern California Gas 🗸 City of Vernon Gas System	Average Incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$12,467.32
	Median Incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$15,140.62
Electric Utilities	Average Cost-Share from Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$1,385.26
Azusa Light & Power	Median Cost-Share from Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$1,682.29
Bear Valley Electric Service	Average Change in Annual Utility and Fuel Costs for Homeowner	\$-266.00
Burbank Water & Power	Median Change in Annual Utility and Fuel Costs for Homeowner	\$-309.44
City of Anaheim Public Litilities Department	Average Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (if selected)	\$44.93
City of Panning Electric Department	Median Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (if selected)	\$55.75
City of Barming Electric Department		
City of Corona Department of Water & Power	No Plot Available No Plot Available	
City of Riverside		
City of Vernon Municipal Light Department		
Glendale Water & Power	g 0.5 g 0.5-	
Los Angeles Department of Water & Power		
Moreno Valley Utility		
Pasadena Water & Power		1
Rancho Cucamonga Municipal Utility		I
San Diego Gas & Electric	Ž _{-0.5} , _ Ž _{-0.5} ,	
Southern California Edison		
2 968 064 homes meeting filter critera above		
53.5093% of the total homes in SoCAB meet filter criteria	-1 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 -1 0 0.1 0.2 0.3 0.4 0.5 0.6	0.7 0.8 0.9 1
	Previous computation loaded. Run computed at 09-Jan-2019 09:32:41	
More Information View CZ MAP ANALYZE	RETURN TO PREVIOUS	ADVANCE TO NEXT 🔶



Analyze Mat Resent Result Analyze Saved Result Oater Indexidual Homes Flor Hoss Enter Funding Amount [S] 000000 Funding Category Cost Share Saved Cost Share Saved Yolan 6 Costal 0 S Share Costal 0 S Share Cost Share Saved To S Share Cost Share Saved Yolan 8 S Nationation 0 S Share Cost Share Saved To S Share Saved Yolan 0 Cost Share Saved 0 S Share Cost Share Saved To S Share Saved Yolan 0 Cost Share Saved To S Share Saved To S Share Saved Yolan 0 Cost Share Saved To S Share Saved To Saved Saved Yolan 0 Cost Share Saved To Saved Saved To Saved Saved Saved Yolan 0 Cost Share Saved Saved Cost Share Saved Saved To Saved	Demand Demand Input Summary Power Supply	Economics Computation Results	
Fitser Homes Exter Funding Amount [§] 500000 Purple of a probability of a probability of a standard of the Select Code Title Retrievanes Subset" Code Share by Homeowner [[4] 500 0 C Costal 10 S. Inand 15 S. Besart 15 S. Besart 719 Values 0 M Cinada Zones 0 M Cinada Zones 719 72808022 72808022 72808022 0 M Cinada Zones 0 M Cinada Zones 0 M Cinada Zones 719 7280802 72808022 719 0 M Cinada Zones 0 M Cinada Zones 0 M Cinada Zones 719 7380444 719 738044 719 0 M Cinada Zones 0 M Cinada Zones 0 M Cinada Zones 719 7380444 719 7380444 719 7380444 719 7380444 719 7380444	Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effectiveness Appliance Mix Apply Prescribed Funding Query Individual Homes	
Circade Zones Circade Zones Circade Zones Circade Zones Second To S. Inland S. Kasa-Cosatal S. N. Kasa-Cosatal C. So All Circade Zones Complexed To Forjects In Cost Effectiveness Subser S. Complexed To Forjects In Cost Effectiveness Subser S. Complexed To Forjects In Cost Effectiveness Subser C. Complexed To Forjects In Cost Effectiveness C. Complexed To Forjects In C	Filter Homes	Enter Funding Amount [\$] 5000000 Funding is applied only to households filtered on the "Select Cost Effectiveness Subset" Cost	Share by Homeowner [%] 50
⁰ Costall ⁰ 10 S. Inland ⁰ All Charles ⁰ N Hoar-Costall ⁰ 15 Desert ¹ 16 Mountain ⁰ All Charles 2008 ¹ 18 Mountain ¹ All Mountain	Climate Zones		Melue
% S Mear-Costall % 15 S. Desert % S Mear-Costall % 15 S. Desert % Number of Postale Projects Funded % 19 % % Number of Postale Projects funded % 20 405,961,300 66 % % S May Castal Family Hones % Mumber of Postale Projects funded % Only Stagle Family Hones % Mumber of Postale Projects funded % Only Stagle Family Hones % Mumber of Postale Projects funded % Only Stagle Family Hones % Mumber of Postale Projects funded % Only Stagle Family Hones % Mumber of Postale Projects funded % Only Stagle Family Hones % Mumber of Postale Projects funded % Only Stagle Family Hones % Mumber of Postale Projects funded % Only Multise Change in NOX Emissions [IDV] % 4484 % Cumulative Change in COX Emissions [IDV] % 4484 % Cumulative Change in COX Emissions [IDV] % 4484 % Cumulative Change in COX Emissions [IDV] % 4484 % Cumulative Change in COX Emissions [IDV] % 4484 % Aurage CostShare form Homeowner to Purchase and Instal Applances, PV (f selected), and Battery (f selected) % Ausus Upht & Power % Ausus Upht & Power % Cury of Anabien CastShare form Homeowner to Purchase and Instal Applances, PV (f selected), and Battery (f selected) % Only Atables Power % Poptonumbary (f selected) % Only Atables Power % Only Anabien Public Utility % Only Atables Power % Poptonumbary (f selected) % Only Atables Power % Only Atables Power % Only Atables R Power	6 Coastal 010 S. Inland	Description (click on a variable to view histograms)	value
 A Mear Coastal A Mountainal A	0 8 S. Near-Coastal 0 15 S. Desert	Approximate Number of Projects Funded	/19
Or All utilities Schuble Cest to Fund All Projects in Cost Emethanese Subset (only considers purchase and installation Costs) Schuble Cest to Fund All Projects in Cost Emethaneses Only Single Family Homes Only Multi Pamily Homes Only Multi Pamily Homes -3.49e-02 Only Multi Pamily Homes Only Multi Pamily Homes -3.49e-02 Only Multi Pamily Homes All Housing Types Witter Gas Multites -3.38e-03 Cong Beach Gas & Oll Southwest Gas Corp Southam Cattornia Gas City of Vernon Gas System Median Incentive Anount Provided to Homeowner to Purchase and Install Applances, PV (if selected), and Battery (if selected) Southanes Maxusa Light & Power City of Banning Electric Department Southamer Followinger Involved to Homeowner Southanes PV (if selected), and Battery (if selected) Southanes City of Ganning Electric Department City of Ganning Electric Department Southanes Public Utilities Southane Cattornia Ediation Southanes	9 N. Near-Coastal 016 Mountain	Number of Possible Projects in "Cost Effectiveness Subset"	2928082
Hausing Category Unulative Change in NOX Emissions [[by/] Only Multip Hamms Only	All Climate Zones	SCAQMD Cost to Fund All Projects in "Cost Effectiveness Subset" (only considers purchase and installation costs)	\$20,405,961,360.66
Only Single Family Homes Only Multi Family Homes Only Multi Family Homes -3-348+02 Only Multi Family Homes All Housing Types -3-348+02 -3-38e+08 Multial Gas Multise Chundhaide Change in NOX Emissions [Iby1] -3-38e+08 Multial Gas Multise -3-38e+02 -3-38e+08 Multial Gas Multise	Housing Category	Overvieting Observe in NOV Enciptions (Indee	2.4002
Only Multi Pannity Homes All Housing Types Autual das Utilities -4.78e-04 Autual das Utilities -4.78e-04 Southern California Gas Q City of Vernon Gas System -4.78e-04 Electric Utilities -4.78e-04 Autual das Utilities -4.78e-04 Autual das Utilities -4.78e-04 Southern California Gas Q City of Vernon Gas System -4.78e-04 Electric Utilities -4.78e-04 Autual das Power -5.78e fm Bear Valley Electric Service -5.78e fm Buthank Verter A Power -5.276.48 City of Anahem Public Utilities Department -5.276.48 City of Anahem Public Utilities Department -5.276.48 City of Anahem Public Utility Department -5.276.48 City of Riverside -5.276.48 City of Riverside -5.276.48 City of Riverside -5.276.48 Sondbern California Edson -5.276.48 Moreion Auter A Power -5.276.48 Sondbern California Edson -5.276.48 Sondbern California Edson -5.276.48 Sondbern California Edson -5.276.49 Sondbern California Ed	Only Single Family Homes Only Mobile Homes	Cumulative Change in NOX Emissions [10/yr]	-3.490+02
Cumulative Change in CO24 Emissions [RDy] Cumulative Change in Co2	Only Multi Family Homes OAll Housing Types	Cumulative Change in NOX Emissions [TPD]	-4.78e-04
Natural das Unities Long Bach Gas & Ol Southwest Gas Corp. Souther California Gas & Oty of Vernon Gas System Souther California Gas & Oty of Vernon Gas System Betackley Electric Utilities Plear Valley Electric Service Burbank Water & Power City of Corona Department Othy of Rwinside City of Corona Department of Water & Power City of Corona Department of Water & Power City of Rwinside City		Cumulative Change in CO2e Emissions [IB/YT]	-3.380+08
 □ Long Beach Gas & Oli Suthwest Gas Corp. □ Southmen California Gas Corp. □ Arrage Incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected) □ Southment Public Utilities Department □ City of Panehmen VWater & Power □ City of Corona Department of Water & Power □ City of Vernon Municipal Light Department □ Souther California Edison □ Souther California Edison □ Souther California Edison □ Southweit Metro Water & Power □ Southweit Criteria /ul>	Natural Gas Utilities	Cumulative Change in CO2e Emissions [TPD]	-4.63e+02
Southern California Gas Oty of Vermon Gas System Average Constraint of Number Vermon Case System Average Constraint of Number Vermon Verm	Long Beach Gas & Oil Southwest Gas Corp.		00.045.07
Median incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected) so Battery (if selec	🗹 Southern California Gas 🗹 City of Vernon Gas Syste	m Average Incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (It selected), and Battery (It selected)	\$6,945.27
Lectric Unitities Verage Costs-State from Homewiner to Purchase and Install Appliances, PV (If selected), and Battery (If selected) Seal Light & Power Bear Valley Electric Service Bear Valley Electric Service City of Anaheim Public Utilities Department City of Anaheim Public Utilities Department City of Anaheim Public Utilities Department City of Corona Department of Water & Power City of Riverside City of Riverside Souther Constraint of Water & Power Sonders California Edion Beas Valley Mater & Power City of Riverside Souther California Edion Previous computation loaded. Run computed at 09-Jan-2019 09:32:41 Previous computation loaded. Run computed at 09-Jan-2019 09:32:41 Previous computation loaded. Run computed at 09-Jan-2019 09:32:41	-	Median incentive Amount Provided to Homeowner to Purchase and install Appliances, PV (it selected), and Battery (it selected)	\$8,411.46
 ✓ Azusa Light & Power ✓ Azusa Light & Power ✓ Bear Valley Electric Service ✓ Burbank Water & Power ✓ City of Anaheim Public Utilities Department ✓ City of Anaheim Public Utilities and Public Costs for Homeowner ✓ City of Corona Department of Water & Power ✓ City of Corona Department ✓ City of Vernon Municipal Light Department ✓ San Diego Gas & Electric ✓ San Diego Gas & Electric ✓ Southern California Edison Øs 064 homes meeting filter criteria above 35093% of the total homes in SoCAB meet filter criteria 	Electric Utilities	Average Cost-Share from Homeowner to Purchase and install Appliances, PV (if selected), and Battery (if selected)	\$0,945.27
 Per Valley Electric Service Average Change in Annual Utility and Fuel Costs for Homeowner Sezda 507 Average Change in Annual Utility and Fuel Costs for Homeowner Sezda 507 Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Annual Utility and Fuel Costs for Homeowner Average Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (If selected) Sz23.56 Morein Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (If selected) Sz23.56 Morein Valer & Power Anoth Occarmong Municipal Utility San Diego Gas & Electric Souther Chalfornia Edison Souther Chalfornia Edison Souther Chalfornia Edison Souther Chalfornia Edison Approver Zimper Average Change in Amortized Applaance Area on a statistical to 9-Jan-2019 09:32:41 	Azusa Light & Power	Median Cost-Share from Homeowner to Purchase and instal Appliances, PV (if selected), and Battery (if selected)	\$8,411.40
Burbank Water & Power Set/0.43 Burbank Water & Power Set/0.43 City of Anaheim Public Utilities Department Set/0.43 City of Banning Electric Department Set/0.43 City of Romon Department Set/0.43 City of Romon Department Set/0.43 City of Romon Municipal Light Department Set/0.43 Glendale Water & Power No Plot Available City of Vernon Municipal Light Department No Plot Available Glendale Water & Power No Plot Available Moreno Valley Utility Pasadena Water & Power Moreno Valley Utility Pasadena Water & Power Souther California Edison Set/0.43 Moreno Valley Utility San Diego Gas & Electric Souther California Edison Set/0.43 Moreno Valley Utility On South California Edison Moreno Valley Utility San Diego Gas & Electric Souther California Edison Set/0.43 Moreno Valley Utility Previous computation loaded. Run computed at 09-Jan-2019 09:32:41	Bear Valley Electric Service	Average Change in Annual Utility and Fuel Costs for Homeowner	5-248.57
City of Anaheim Public Utilities Department City of Banning Electric Department City of Vorona Department of Water & Power City of Vorona Municipal Light Department City of Vorona Municipal Light Department City of Vorona Municipal Light Department Seadena Water & Power Marken California Edison 968. 064 homes meeting fliter criteria above 3.5093% of the total homes in SoCAB meet fliter criteria Department (Vew CZ MAP) Mere Information Localed. Run computed at 09-Jan-2019 09:32:41 City of Verage Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (If selected) S22.3.5 No Plot Available No Plot Available	Burbank Water & Power	Median Change in Annual Utility and Fuel Costs for Homeowner	\$-276.48
City of Canada Department of Water & Power City of Corona Department of Water & Power City of Vernon Municipal Light Department Giendale Water & Power City of Vernon Municipal Light Department Giendale Water & Power Moreno Valley Utility Pasadena Water & Power Moreno Salles Department of Water & Power Moreno Salles	City of Anaheim Public Utilities Department	Average Change in Amortized Appliance Purchase and installation Costs Borne By Homeowner Including PV and Battery (it selected)	\$223.50
Image: City of Corona Department of Water & Power Image: City of Vernon Municipal Light Department Image: City of Vernon Municipal Light Department of Water & Power Image: City of Vernon Municipal Light Department of Water & Power Image: City of Vernon Municipal Light Department of Water & Power Image: City of Vernon Municipal Light Department of Water & Power Image: City of Vernon Valley Utility Image: City of Vernon Municipal Light Department of Water & Power Image: City of Vernon Valley Utility Image: City of Vernon Valley Utility Image: City of Vernon Ve	City of Banning Electric Department	Median Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner including PV and Battery (if selected)	\$270.55
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 City of Viewon Municipal Light Department City of Vermon Municipal Light Department <l< td=""><td>City of Bivorside</td><td></td><td></td></l<>	City of Bivorside		
Clip of Verrion Municipal Light Department I Glendale Water & Power I Los Angeles Department of Water & Power I Los Angeles Department of Water & Power I Moreno Valley Utility Pasadena Water & Power I Sancho Cucamonga Municipal Utility I Sancho Cucamonga Municipal Utility I Sancho Cucamonga Municipal Utility I Southern California Edison 968,064 homes meeting filter criteria above 3.5093% of the total homes in SoCAB meet filter criteria Previous computation loaded. Run computed at 09-Jan-2019 09:32:41 More Information New CZ MAP ANALYZE	City of Versee Musicipal Links Department		
More information View C7 MAP ANALYZE	City of Vernon Municipal Light Department		
More no Valley Utility Pasadena Water & Power Pasadena Water & Power Rancho Cucamonga Municipal Utility San Diego Gas & Electric Southern California Edison	Glendale Water & Power		-
More no Valley Utility Pasadena Water & Power Rancho Cucamonga Municipal Utility San Diego Gas & Electric Southern California Edison	✓ Los Angeles Department of Water & Power		
Pasadena Water & Power Rancho Cucamonga Municipal Utility San Diego Gas & Electric Southern California Edison	Moreno Valley Utility		
Image: Reacho Cucamonga Municipal Utility Image: Reacho Cucamonga Municipal Utility Image: Reacho Cucamonga Municipal Utility Image: San Diego Gas & Electric Image: Southern California Edison Image: Southern Calif	Pasadena Water & Power		
Image: San Diego Gas & Electric Image: Southern California Edison Image: Southern California Edison Image: Southern California Edison Image: Southern California E	Rancho Cucamonga Municipal Utility		
Image: Southern California Edison .968,064 homes meeting filter critera above .3.5093% of the total homes in SoCAB meet filter criteria Previous computation loaded. Run computed at 09-Jan-2019 09:32:41 Image: Computation loaded. Run computed at 09-Jan-2019 09:32:41	✓ San Diego Gas & Electric	Z -0.5	-
	Southern California Edison		
33.5093% of the total homes in SoCAB meet filter criteria 1 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 Previous computation loaded. Run computed at 09-Jan-2019 09:32:41 (ADVANCE TO NEXT +)	2,968,064 homes meeting filter critera above		
Previous computation loaded. Run computed at 09-Jan-2019 09:32:41	53.5093% of the total homes in SoCAB meet filter criteria	0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 0.1 0.2 0.3 0.4 0.5 0.	6 0.7 0.8 0.9 1
More Information View CZ MAP ANALYZE		Previous computation loaded Run computed at 09-Jan-2019 09:32:41	
	More Information View CZ MAP	🔶 RETURN TO PREVIOUS	ADVANCE TO NEXT 🔶



Demand Demand Input Summary Power Supply	Economics Computation Results								
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effectiveness Appliance Mix Apply Prescribed Funding Query Individual Homes								
Filter Homes	Filter Homes Enter Funding Amount [\$] 5000000 Funding is applied only to households filtered on the "Select Cost Effectiveness Subset" Cost Share								
Climate Zones	Description (aliak on a variable to view biotecrome)	Value							
0 6 Coastal 0 10 S. Inland	Description (Lick on a variable to view instograms)	710							
0 N Near-Coastal 016 Mountain	Approximate Number of Projects Punded Number of Projects Punded Number of Projects Punded	2029092							
All Climate Zones	Number of Possible Flightus III Cost Ellectiveness Subset" (only considers nurchase and installation costs)	\$20,405,961,360,66							
	Contains cost to rain and rejects in Cost Electroness Subset (only considers parenase and installation costs)	020,403,301,300.00							
ousing Category	Cumulative Change in NOx Emissions [lb/yr]	-3.49e+02							
Only Single Family Homes Only Mobile Homes	Cumulative Change in NOx Emissions [TPD]	-4.78e-04							
Only Multi Family Homes O All Housing Types	Cumulative Change in CO2e Emissions [lb/yr]	-3.38e+08							
latural Gas Utilities	Cumulative Change in CO2e Emissions [TPD]	-4.63e+02							
✓ Long Beach Gas & Oil ✓ Southwest Gas Corp.									
Southern California Gas V City of Vernon Gas System	Average Incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$6,945.27							
	Median Incentive Amount Provided to Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$8,411.46							
Electric Utilities	Average Cost-Share from Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$6,945.27							
✓ Azusa Light & Power	Median Cost-Share from Homeowner to Purchase and Install Appliances, PV (if selected), and Battery (if selected)	\$8,411.46							
Bear Valley Electric Service	Average Change in Annual Utility and Fuel Costs for Homeowner	\$-248.57							
Burbank Water & Power	Median Change in Annual Utility and Fuel Costs for Homeowner	\$-276.48							
City of Anaheim Public Utilities Department	Average Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (if selected)	\$223.56							
City of Banning Electric Department	Median Change in Amortized Appliance Purchase and Installation Costs Borne By Homeowner Including PV and Battery (if selected)	\$276.55							
City of Corona Department of Water & Power	Change in Annual Utility Costs (all homes) 181 Change in Annual Utility Costs (homes with	funded projects) [\$]							
City of Riverside	3.5 [10] Change in Annual ounity Costs (an nones) [3] Change in Annual ounity Costs (an nones) [3]	indiaed projects) [3]							
City of Vernon Municipal Light Department									
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Moreno valley ounty A Pasadana Water & Power									
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San Diego Gas & Electric									
Southern California Edison									
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3.5093% of the total homes in SoCAB meet filter criteria									
	-1200 -1000 -000 -000 -000 -200 0 200 400 -1000 -000 -400 -200	0 200 400							
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More Information View CZ MAP ANALYZE	RETORN TO PREVIOUS								

Click on cost to view histogram



Demand Demand Input Summary Power Supply	Economics Computation	Results						
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset	Cost Effectiveness A	Appliance Mix	Apply Prescribed Funding	Query Individual Homes			
Filter Homes	Specify Regions of Cost Effectiven	ess Space Home Det	tails					
Climate Zenes	Green NOx Green C	O2e Costs		Variable			Parameter	
	Yellow NOx Yellow	CO2e Evel Lise	Hous	ing type				
S Near-Coastal 10 S. Inland		Ze Emissions	Clima	ate zone				
9 N. Near-Coastal 16 Mountain	Specify Units of Cost Effectiveness	Emissions	Elect	ric Utility				
All Climate Zones	💿 [Delta lb / Delta \$] 🛛 [Delta	\$ / Delta ton]	Elect	ric rate low/standard income				
Housing Category	Select a home to populate panels	on right:	Base	-case electric rate description				
Only Single Family Homes Only Mobile Homes	Sort NOx Sort CO2e S	ort # Homes	Gas	iario-case electric rate descripti Utility	ion			
Only Multi Family Homes O All Housing Types	NOx Cost Eff. CO2e Cost Eff.	# Homes	Gas	rate low/standard income				
	0.0017 34.2706	1.	Base	-case natural gas rate descript	ion			
Natural Gas Utilities	0.0012 23.6398	1	Base	-case natural gas rate appliand	ce criteria			
Long Beach Gas & Oil Southwest Gas Corp.	0.0012 23.2581	1	Scen	ario-case electric rate descripti	ion			
Southern California Gas 🗹 City of Vernon Gas System	-9.5786e-04 -1.3044e+03	1	Rase	-case natural das rate annliand Reseline Annlia	nce Mix	Sc	cenario Appliance Mix	*
Electric Utilities	-0.0018 -1.5781e+03	1	E	Annlianc	e Quantity	Fuel	Annliance	Quantity
Azusa Light & Power	-0.0019 -1.6369e+03	1		on Appliano	Gudunuty	1 401	rippitanoo	determiny
Rear Valley Electric Service	-0.0025 -2.1880e+03	1						
Bedriverey Electric Service	-0.0016 -1.4112e+03	1						
City of Anaboim Rublic Utilities Department	-0.0026 -2.2454e+03	1						
City of Panning Electric Department	-0.0032 -2.78616+03							
City of Daming Electric Department	-0.0017 -1.4795e+03	1						
City of Corona Department of Water & Power	-0.0020 -1.7238e+03	<u> </u>						
City of Kiverside	-0.0031 -2.6562e+03	1						
City of Venton Municipal Light Department	-0.0035 -3.0074e+03	1						
Gieridale Water & Power	-0.0017 -1.5007e+03	1						
Moreno Valley Utility	-0.0019 -1.6268e+03	1						
Residence Water & Power	-0.0023 -1.9854e+03	1						
Rancho Cucamonga Municipal Litility	-0.0029 -2.4687e+03	1						
San Dieno Gas & Electric	-0.0022 -1.9284e+03	1						
Southern California Edison	-0.0018 -1.56510+03	1 v						
2 968 064 homes meeting filter critera above	4	•						
53.5093% of the total homes in SoCAB meet filter criteria	2,928,082 homes selected							
	Previous computation load	ed. Run computed a	it 09-Jan-201	9 09:32:41				
More Information View CZ MAP ANALYZE						RETURN TO PREVIO	DUS ADVANCE TO NE	XT 🌩



Demand Demand Input Summary Power Supply	Economics	Computation	Results								
Analyze Most Recent Results Analyze Saved Results	Select Cost Effect	ctiveness Subset	Cost Effecti	veness Appliance	e Mix	Apply Prescribed I	Funding	Query Individual Homes			
Filter Homes	Specify Regions	of Cost Effective	ness Space	Home Details							
Climate Zenes	Green NOx	🖌 Green	CO2e	Costs			Variable			Parameter	
	Yellow NOx	Yellow	CO2e	Fuel Lise	Housi	ng type					
S Near-Coastal 10 S. Inland	Red NOx	Red C	OZe	Emissions	Climat	te zone					
9 N. Near-Coastal 16 Mountain	Specify Units of	Cost Effectivenes	8 5	Enlissions	Electri	ic Utility					
All Climate Zones	[Delta lb / Delta \$] [Delta \$ / Delta ton]		Solar & Battery	Electric rate low/standard income							
Housing Category	Select a home to	populate panel	ls on right:		Base-	case electric rate d	lescription	-			
Only Single Family Homes Only Mobile Homes	Sort NOx	Sort CO2e	Sort # Homes		Gas II	irio-case electric rai Itility	ite description	n			
Only Multi Family Homes OAll Housing Types	NOx Cost Eff	CO2e Cost Eff	# Homes	1	Gas ra	ate low/standard inc	come				
Complete and provide a start of the start of	1 3704	2 7197e+04	1	-	Base-	case natural das ra	ate descriptio	n			
Natural Gas Utilities	1.3794	2 7197e+04	10		Base-	case natural gas ra	ate appliance	criteria			
🗹 Long Beach Gas & Oil 🛛 🗹 Southwest Gas Corp.	1.0627	8.8239e+05	7		Scena	rio-case electric rat	te description	n			
🖌 Southern California Gas 🖌 City of Vernon Gas System	0.8650	7.3347e+05	3		Rase-	case natural das ra	te annliance	criteria		Cooperio Appliance Mix	•
Electric I Itilities	0.7057	1.3913e+04	2		Euo	Dase			Euol		Quantity
Azusa Light & Power	0.7057	1.3913e+04	10		Fue	1	Appliance	Quantity	Fuel	Appliance	Quantity
Azusa Ligiti & Fower	0.6505	1.2825e+04	1								
Deal Valley Electric Service	0.4366	8.5955e+03	3								
✓ Burbank water & Fower ✓ Other of Apphaim Public Utilities Department	0.4366	8.5955e+03	5								
City of Ananeim Public Ouncies Department	0.3248	2./239e+05	4								
City of Banning Electric Department	0.3105	9.57120+05	2								
City of Corona Department of Water & Power	0.2900	5.8822e+03	2								
City of Riverside	0.2946	2 4458e+05	6								
City of Vernon Municipal Light Department	0.2623	2.1778e+05	6								
Glendale Water & Power	0.2543	5.0147e+03	1								
Los Angeles Department of water & Power	0.2543	5.0147e+03	10								
Moreno Valley Utility	0.2507	4.9521e+03	6								
Pasadena Water & Power	0.2507	4.9521e+03	27								
Rancho Cucamonga Municipal Ounty	0.2415	1.1765e+05	4								
San Diego Gas & Electric	0.2370	7.3055e+05	1								
2 060 064 homes meeting filter critera shove	4	1 32139703	▶								
53.5093% of the total homes in SoCAB meet filter criteria	2,928,082 homes	selected									
More Information View CZ MAP ANALYZE	Previous con	nputation loa	ded. Run co	omputed at 09-Ja	an-2019	09:32:41		•	RETURN	TO PREVIOUS ADVANCE TO N	EXT 🌩



Demand	Demand Input Su	ummary Po	wer Supply	Economics	Computation	Results								
Analyze Mo	ost Recent Results	Analyze Sav	ved Results	Select Cost Eff	ectiveness Subse	t Cost Effect	iveness Appliance	e Mix 💦 A	pply Prescribed Funding	Query Individual Homes				
	Filter H	omes		Specify Region	s of Cost Effective	eness Space	Home Details							
Climate Zor	nec			Green NOx	Greer	CO2e	Costs	Costs Variable			Parameter			
	atal		4	Yellow NO	Yellov	v CO2e	Fuel Lise	Housing	type		SingleFamily			
	siai ear-Coastal	10 S. Inian	u rt	Red NOx	Red NOX Red CO2e			Climate zone			CZ16			
00 0. N	ear-Coastal	15 0. Dese	'n	Specify Units of	f Cost Effectivene	ss	Emissions	Electric	utility		Bear Vall	ey Electric Service		
000		All Climate	Zones	(Delta lb /	Delta \$] (Del	ta \$ / Delta ton]	Solar & Battery	Electric	ate low/standard income		standard			
Heusing Os	atagan	0		Select a home	to populate pane	els on right:		Base-ca	se electric rate description		D Domes	stic Service Single Family Accomodation	n	
Housing Ca	ategory			Sort NOx	Sort CO2e	Sort # Homes		Scenario	-case electric rate descripti	on	D Domes	stic Service Single Family Accomodation	n	
Only Si	ngle Family Homes	Only Mob	ile Homes	Gonthox			1	Gas Util	ty		Southwe	st Gas Corp.		
Only Mu	ulti Family Homes	All Housin	ig Types	NOx Cost Eff.	CO2e Cost Eff.	# Homes		Gas rate	low/standard income		standard			
Natural Gas	s Utilities			-1.027	9 -3.1683e+06	i 1 -		Base-ca	se natural gas rate descripti	ion	GS-10 B	ig Bear		
L ong De	aaab Caa & Oil	Z Southwort G	as Corn	-1.027	8 -3.1680e+06	1		Base-ca	se natural gas rate applianc	e criteria	All Applia	ances		
Cong Be	each Gas & Oli ⊻	City of Vornov	as Corp.	-1.001	0 -8.3111e+08	7		Scenario	-case electric rate descripti	on 	GS-10 B	-10 Big Bear		
✓ Souther	m California Gas 🛛	City of vernor	i Gas System	-0.865	4 -7.1853e+05	5 7		Base-ca	se natural gas rate applianc	e criteria	All Applia	ances		
Electric Util	lities			-0.776	5 -6.4476e+05	7			Baseline Appliar	nce Mix		Scenario Appliance Mix		
Azusa I	Light & Power			-0.495	6 -4.2023e+05	3		Fuel	Appliance	Quantity	Fuel	Appliance	Quantity	
Bear Va	allev Electric Servic	e		-0.404	9 -3.3622e+05	/		NatGas	Conventional Water Heat	er 1 🔺	Electric	Water Heat	1	
Rurban	k Water & Power			-0.334	3 -2.8035e+05	4		Electric	Dishwasher	1	Electric	Dishwasher	1	
City of	Anaboim Public Liti	lition Dopartmo	ot	-0.332	5 -2.7886e+0	4		Electric	First Refrigerator	1	Electric	First Refrigerator	1	
City of I	Reasing Fleetric Dr	nites Department		-0.243	1 -7.49200+00			Electric	Second Retrigerator	1	Electric	Second Refrigerator	1	
City of I	Danning Electric De	epartment t sélvistes 0 De		-0.224	4 67207			Electric	Microwave	1	Electric	Microwave	1	
City of	Corona Departmen	t of water & Po	wer	-0.210	4 -67207	1		NatGas	Range Oven Combination	1 1	NatGas	Range Oven Combination	1	
City of	Riverside			-0.210	4 -6 7306e+04	1		Electric	Ciotnes washer	1	Electric	Clothes washer	1	
City of	Vernon Municipal L	ight Departmen	t I	-0.210	4 -6.7306e+04	1		Electric	TV	1	Electric	Diyei	1	
 Glenda 	ale Water & Power			-0.218	4 -6 7306e+05	1		Electric	Outdoor Lighting	1	Electric	Outdoor Lighting	1	
Los Ang	geles Department o	of Water & Pow	er	-0.218	4 -6.7306e+05	1		Electric	PC	1	Electric	PC	1	
 Moreno 	o Valley Utility			-0.218	4 -6.7306e+05	1		Electric	Other	1	Electric	Other	1	
Pasade	ena Water & Power			-0.218	4 -6.7304e+05	2		Electric	Pool Pump	1	Electric	Pool Pump	1	
Rancho	o Cucamonga Muni	cipal Utility		-0.218	4 -6.7304e+05	i 1		Electric	Furnace Fan	1	Electric	Furnace Fan	1	
🖌 San Die	ego Gas & Electric			-0.218	4 -6.7304e+05	i 1		NatGas	Primary Heat	1	NatGas	Primary Heat	1	
 Souther 	ern California Edisor	n		0.210	4 6 72040±06			Electric	Attic Ceiling Fan	1	Electric	Attic Ceiling Fan	1	
2,968,064 h 53.5093% o	omes meeting filter of the total homes in	critera above SoCAB meet f	ilter criteria	2,928,082 home	es selected	•		Electric	Central Air Conditioning	1 -	Electric	Central Air Conditioning	1	
More Infor	rmation View C	Z MAP	NALYZE	M:\NEAT\so Run compu	oftware_ver_1 ted at 09-Jan	_10\FinalRe -2019 10:56:	sults\CZ6allCat_l 25	ElecWH_	Solar_for_mtg.result	ts loaded.	F RETUR	IN TO PREVIOUS ADVANCE TO	NEXT 🔿	



Click on

home to

view

details

Demand Demand Input Summary Power Supply	Economics Computation Results			
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effective	veness Appliance	Mix Apply Prescribed Funding Query Individual Homes	
Filter Homes	Specify Regions of Cost Effectiveness Space	Home Details		
Climata Zanas	Green NOx Green CO2e	Costs	Utility Cost Description	Cost [\$]
	✓ Yellow NOx ✓ Yellow CO2e	Evolution	Annual Change in Electricity Cost	-313.76
0 6 Coastal 0 10 S. Inland	Red NOx Red CO2e	Fuerose	Annual Change in Natural Gas Cost	-251.92
9 N Near-Coastal 16 Mountain	Specify Units of Cost Effectiveness	Emissions	Annual Change in Gasoline Cost	0
All Climate Zones	[Delta lb / Delta \$] [Delta \$ / Delta ton]	Solar & Battery	Annual Change in Diesel Cost	0
Housing Category	Select a home to populate panels on right:		Net Change In Utility Cost	-565.68
Only Single Family Homes Only Mobile Homes	Sort NOx Sort CO2e Sort # Homes		Appliance Cost Description	Cost [\$]
Only Multi Family Homes OAll Housing Types	NOx Cost Eff CO2e Cost Eff # Homes		Increased Yearly Cost of Replacing Appliances at Beginning of Life	158.54
	-1 0279 -3 1683e+06 1		Increased Yearly Cost of Replacing Appliances at 50% of Lifetime	68.112
Natural Gas Utilities	-1 0278 -3 1680e+06 1		Increased Yearly Cost of Replacing Appliances at 75% of Lifetime	7.8284
Long Beach Gas & Oil Southwest Gas Corp.	-1.0010 -8.3111e+05 7		Increased Yearly Cost of Replacing Appliances at End of Life	-37.385
🖌 Southern California Gas 🖌 City of Vernon Gas System	-0.8654 -7.1853e+05 7		Cost of Installing and Purchasing New Appliances	2061
Electric Litilities	-0.7765 -6.4476e+05 7		Cost of Installing Rooftop PV per year [ammortized by lifetime]	603.7
Electric Onintes	-0.4956 -4.2023e+05 3		Cost of Installing Residential Battery Storage per year [ammortized by lifetime]	0
Azusa Light & Power	-0.4049 -3.3622e+05 7		Change in Monthly Electricity Cost [Scenario - Baseline]	
Bear Valley Electric Service	-0.3343 -2.8035e+05 4		20 ₀₂ 1 1 1 1 1 1 1 1 1 1 1	· · · · · · · · · · · · · · · · · · ·
Burbank Water & Power	-0.3325 -2.7886e+05 4		10	
City of Anaheim Public Utilities Department	-0.2431 -7.4920e+05 1			
City of Banning Electric Department	-0.2242 -1.9058e+05 1			8
City of Corona Department of Water & Power	-0.2184 -673071 1		ta -10	
City of Riverside	-0.2184 -0/30/1 1			
City of Vernon Municipal Light Department	-0.2184 -0.73000+05 1			1
Glendale Water & Power	-0.2184 -6.7306e+05 1		英 -30 -	
Los Angeles Department of Water & Power	-0.2184 -6.7306e+05 1			
Moreno Valley Utility	-0.2184 -6.7306e+05 1		-40 -	
Pasadena Water & Power	-0.2184 -6.7304e+05 2		-50 -	
Rancho Cucamonga Municipal Utility	-0.2184 -6.7304e+05 1			
San Diego Gas & Electric	-0.2184 -6.7304e+05 1		-00	
Southern California Edison	0.2104 6.72040±05 1			
2,968,064 homes meeting filter critera above 53.5093% of the total homes in SoCAB meet filter criteria	2,928,082 homes selected		J F MI A M J J A S Month	U N D
More Information View CZ MAP ANALYZE	M:\NEAT\software_ver_1_10\FinalRes Run computed at 09-Jan-2019 10:56:2	sults\CZ6allCat_E 25	ElecWH_Solar_for_mtg.results loaded.	DVANCE TO NEXT 🔶



Demand Demand Input Summary Power Supply	Economics Computation Results		
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effective	ctiveness Appliance Mix Apply Prescribed Funding Query Individual Homes	
Filter Homes	Specify Regions of Cost Effectiveness Space	Home Details	Fuel Lies
Climate Zones	Green NOx Green CO2e	Costs Descline electricity use flaw bel	Fuel Use
	Yellow NOx ✓ Yellow CO2e	Fuel Use Scenario electricity use [twi-tit]	1/079
0 8 S. Near-Coastal 0 15 S. Desert		Emissions Scenario electricity use with PV and Battery (if selected) [kw-hr]	10413
0 9 N. Near-Coastal 0 16 Mountain	Specify Units of Cost Effectiveness	Solar & Patteny Baseline natural gas use [therms]	453.38
All Climate Zones	[Delta lb / Delta \$] [Delta \$ / Delta ton]	Scenario natural gas use [therms]	258.38
Housing Category	Select a home to populate panels on right:	Baseline gasoline use [gal]	509.35
Only Single Family Homes Only Mobile Homes	Sort NOx Sort CO2e Sort # Homes	Scenario gasoline use [gal]	509.35
Only Multi Family Homes OAll Housing Types	NOx Cost Eff. CO2e Cost Eff. # Homes	Baseline diesel use [gal]	0
Natural One UNIVer	-1.0279 -3.1683e+06 1	Scenario diesel use [gal]	0
	-1.0278 -3.1680e+06 1		
Long Beach Gas & Oil Southwest Gas Corp.	-1.0010 -8.3111e+05 7	1400	
Southern California Gas 🗹 City of Vernon Gas System	-0.8654 -7.1853e+05 7		· · · · · ·
Electric Utilities	-0.7765 -6.4476e+05 7	₹ 1200	
Azusa Light & Power	-0.4956 -4.2023e+05 3	8	
Bear Valley Electric Service	-0.4049 -3.3622e+05 7		
Burbank Water & Power	-0.3343 -2.8035e+05 4	Baseline Profile	
City of Anabeim Public Utilities Department	-0.3325 -2.78800+05 4	Scenario Profile with P	V and Battery
City of Banning Electric Department	-0.22431 -7.49208103 1	W 600	
City of Corona Department of Water & Power	-0.2184 -673071 1	J F M A M J J A S C) N D
City of Riverside	-0.2184 -673071 1	Network Case Destile	
City of Vernon Municipal Light Department	-0.2184 -6.7306e+05 1		
Glendale Water & Power	-0.2184 -6.7306e+05 1	Baseline Profile	
I os Angeles Department of Water & Power	-0.2184 -6.7306e+05 1	£ 60 Scenario Profile	
Moreno Valley Utility	-0.2184 -6.7306e+05 1		
Pasadena Water & Power	-0.2184 -6.7306e+05 1	0 40	/
Rancho Cucamonga Municipal Utility	-0.2184 -0.7304e+05 2		
San Diego Gas & Electric	-0.2184 -0.7304e+05 1		
Southern California Edison	0.2104 6.72040-05 1		
2,968,064 homes meeting filter critera above 53.5093% of the total homes in SoCAB meet filter criteria	₹ 2,928,082 homes selected	Month	
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Demand Demand Input Summary Power Supply	Economics Computation Results					
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effect	iveness Appliance	e Mix Apply Prescribed Funding	Query Individual Homes		
Filter Homes	Specify Regions of Cost Effectiveness Space	Home Details		mission Type	Racolino [lb]	Scenario [lb]
Climate Zones	Green NOx Green CO2e	Costs	Costs Deint of use MOu Emission Type			5 0/12
○ 6 Coastal ○ 10 S Inland	Vellow NOx Vellow CO2e	Fuel Use	Point-of-use CO2e Emissions		1/93/	125/1
		Emissions	Well-to-nump NOx Emissions from	Gasoline and Diesel	0.34811	0 34811
○ 9 N. Near-Coastal ○ 16 Mountain	Specify Units of Cost Effectiveness	Solar & Pattony	Well-to-pump CO2e Emissions from	n Gasoline and Diesel	580.81	580.81
 All Climate Zones 	[Delta lb / Delta \$] [Delta \$ / Delta ton]	Solar & Battery	Fugitive Natural Gas CO2e Emissio	ons from Residential Gas Use	1.2e+06	6.8387e+05
Housing Category	Select a home to populate panels on right:		Natural Gas Production and Distribu	ution CO2e Emissions from Residential Gas	3099.7	1766.5
Only Single Family Homes Only Mobile Homes	Sort NOx Sort CO2e Sort # Homes					
Only Multi Family Homes O All Housing Types	NOx Cost Eff. CO2e Cost Eff. # Homes					
Natural Gas Litilities	-1.0279 -3.1683e+06 1 🔺	-		Emission Type	Chan	ge in Emissions [lb]
	-1.0278 -3.1680e+06 1		Change in NOx Emissions from Ele	ectricity Generation		-0.18119
Long Beach Gas & Oil Southwest Gas Corp.	-1.0010 -8.3111e+05 7		Change in CO2e Emissions from El	lectricity Generation		-2645.9
Southern California Gas 🖌 City of Vernon Gas System	-0.8654 -7.1853e+05 7		Change in CO2e Emissions from Fu	ugitive Methane in Electricity Generation		-460.79
Electric Utilities	-0.7765 -6.4476e+05 7					
Azusa Light & Power	-0.4956 -4.2023e+05 3					
Rear Valley Electric Service	-0.4049 -3.3622e+05 7					
Burbank Water & Power	-0.3343 -2.8035e+05 4					
City of Anahoim Public Litilities Department	-0.3325 -2.78866+05 4					
City of Papping Electric Department	-0.2431 -7.49200+05 1					
City of Carena Danatmant of Water & Pewer	-0.2242 -1.90366+03 1					
City of Corona Department of Water & Power	-0.2184 -673071 1					
City of Riverside	-0.2184 -6.7306e+05 1					
City of vernon municipal Light Department	-0.2184 -6.7306e+05 1					
Giendale Water & Power	-0.2184 -6.7306e+05 1					
Los Angeles Department of Water & Power	-0.2184 -6.7306e+05 1					
Recordence Water & Dewar	-0.2184 -6.7306e+05 1					
Pasaderia Water & Power	-0.2184 -6.7304e+05 2					
Rancho Cucamonga Municipal Ounty	-0.2184 -6.7304e+05 1					
✓ Sall Diego Gas & Electric	-0.2184 -6.7304e+05 1					
2 069 064 homos mosting filter critera shove						
53.5093% of the total homes in SoCAB meet filter criteria	2,928,082 homes selected					
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More Information View CZ MAP ANALYZE	Run computed at 09-Jan-2019 10:56:	25 –	v	🔶 RETURN TO PRI		E TO NEXT 🔶



Demand Demand Input Summary Power Supply	Economics Computation Results				
Analyze Most Recent Results Analyze Saved Results	Select Cost Effectiveness Subset Cost Effecti	veness Applianc	e Mix Apply Prescribed Funding	Query Individual Homes	
Filter Homes	Specify Regions of Cost Effectiveness Space	Home Details		Parameter Description	Value
Climate Zones	Green NOx Green CO2e	Costs	Approximate optimum DC panel sol	ar size that minimizes installation and utility cost	3
	Vellow NOx Vellow CO2e	Fuel Use	Solar panel installation cost to ache	ive the optimum DC installtion size amortized by panel lifetime	603.7
8 S. Near-Coastal 15 S. Desert		Emissions	Solar panel installation cost to ache	ive the optimum DC installtion size	15092
○ 9 N. Near-Coastal ○ 16 Mountain	Specify Units of Cost Effectiveness	Solar & Pattony	Battery Installation Cost per year [a	mmortized by battery lifetime]	0
 All Climate Zones 	[Delta lb / Delta \$] [Delta \$ / Delta ton]	Solar & Dattery			
Housing Category	Select a home to populate panels on right:				
Only Single Family Homes Only Mobile Homes	Sort NOx Sort CO2e Sort # Homes				
Only Multi Family Homes OAll Housing Types	NOx Cost Eff. CO2e Cost Eff. # Homes				
Natural Cas Utilities	-1.0279 -3.1683e+06 1 🔺				
	-1.0278 -3.1680e+06 1				
Long Beach Gas & Oil Southwest Gas Corp.	-1.0010 -8.3111e+05 7				
Southern California Gas 🗹 City of Vernon Gas System	-0.8654 -7.1853e+05 7				
Electric Utilities	-0.7765 -6.4476e+05 7				
Azusa Light & Power	-0.4956 -4.2023e+05 3				
Bear Valley Electric Service	-0.4049 -3.3622e+05 7				
Burbank Water & Power	-0.3343 -2.80356+05 4				
City of Anaheim Public Utilities Department	-0.2431 -7.4920e+05 1				
City of Banning Electric Department	-0.2242 -1.9058e+05 1				
City of Corona Department of Water & Power	-0.2184 -673071 1				
City of Riverside	-0.2184 -673071 1				
City of Vernon Municipal Light Department	-0.2184 -6.7306e+05 1				
Glendale Water & Power	-0.2184 -6.7306e+05 1				
Los Angeles Department of Water & Power	-0.2184 -6.7306e+05 1				
Moreno Valley Utility	-0.2184 -6.7306e+05 1				
Pasadena Water & Power	-0.2184 -6.73066+05 1				
Rancho Cucamonga Municipal Utility	-0.2184 -0.73040+05 2				
San Diego Gas & Electric	-0.2184 -0.7304e+05 1				
Southern California Edison	0.2104 6.72040±05 1				
2,968,064 homes meeting filter critera above 53.5093% of the total homes in SoCAB meet filter criteria	2,928,082 homes selected				
More Information View CZ MAP ANALYZE	M:\NEAT\software_ver_1_10\FinalRes Run computed at 09-Jan-2019 09:32:	sults\CZ6allCat_ 41	ElecWH_Solar_for_mtg.resul	ts loaded.	NCE TO NEXT 🄶





- Full integration of battery module
- Intensive QA/QC of the tool
- Beta version to be released to working group members

Discussion and Public Comment



