



Local Governments Empowering Our Communities

# **BayREN Policy Calculator:** Options for Existing Single-Family Buildings

November 18, 2021

# Background of Tool

- Created by BayREN and Ardenna Energy
- Based on 2020 white paper about LG policy options to reduce GHGs in single-family residential buildings
- White paper included modeling the impacts of the policy options → wanted jurisdictions to be able to customize to their needs

**Find the tool and white paper at:**

[www.bayrencodes.org/services-resources/energy-policies-and-reach-codes/existing-building-approaches/](http://www.bayrencodes.org/services-resources/energy-policies-and-reach-codes/existing-building-approaches/)

# Policy Options

- Permit Enforcement
- Energy Assessment and Disclosure
- Replace on Burnout
- Time of Major Renovation Reach Code
- Building Performance Standards
- *New Construction Reach Code*
- *End of Gas Flow*



# Policy Impact Dashboard

## Policy Impact Forecast for z-All Alameda, Alameda County

AGENCY	
County	Alameda
City	z-All Alameda

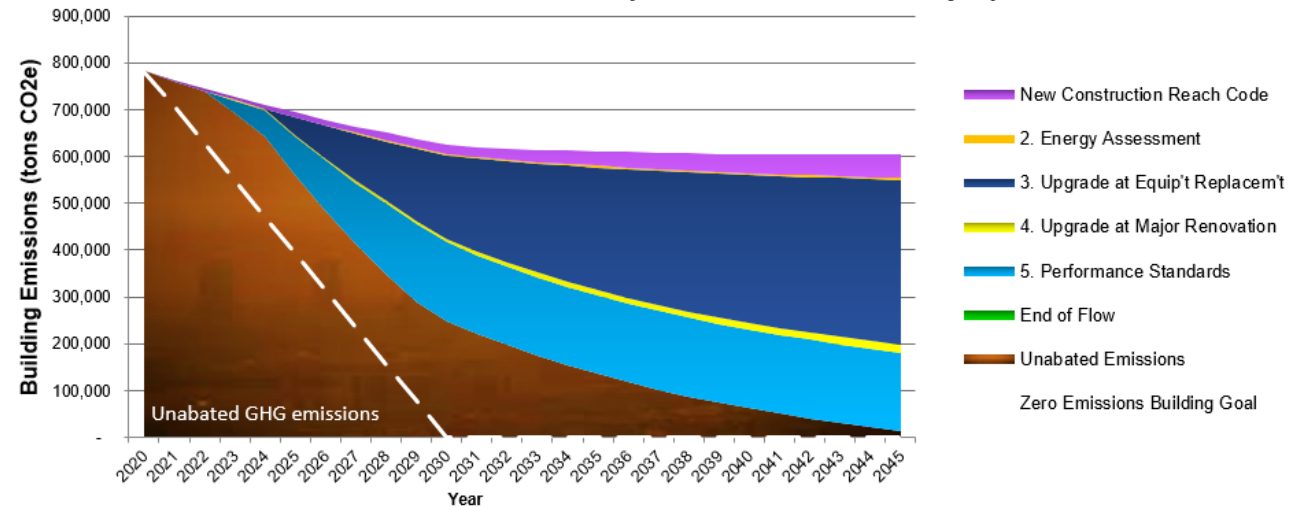
[Customize Housing Stock Inputs](#)  
[Customize Appliance Inputs](#)

Policy Options Analyzed	Include?	Start Year	Compliance	
			Start	Improve to
0 - New Home Reach Code or All-Electric Ordinance	<input checked="" type="checkbox"/>	2021	0%	100%
<a href="#">1 - Code Compliance</a>	<input checked="" type="checkbox"/>	2022	30%	90%
<a href="#">2- Energy Assessment &amp; Disclosure</a>	<input checked="" type="checkbox"/>	2022	0%	100%
<a href="#">3- Upgrade @ Time of Equipment Replacement</a>	<input checked="" type="checkbox"/>	2025	0%	90%
<a href="#">4- Upgrade @ Time of Major Renovation</a>	<input checked="" type="checkbox"/>	2024	0%	100%
<a href="#">5- Building Performance Standards</a>	<input checked="" type="checkbox"/>	2023	0%	90%
End of Flow	<input type="checkbox"/>	2030	0%	100%

Show gas emissions	<input checked="" type="checkbox"/>
Show electric emissions	<input checked="" type="checkbox"/>
Zero emissions electricity deadline	2030
Zero emissions buildings goal	2030

Progress Towards Emissions Budget **75%**

## Forecast of Cumulative GHG Emission Impacts from Selected Policy Options



## FORECAST OF ANNUAL POLICY OUTCOMES

	Inspections	from Inspections	Electricity	(Mtherms)	Reductions (Mt)	Affected	Housing Stock	Market
<b>1 - Code Compliance</b>	18,932	\$7,572,691	Code Compliance improves performance of other policy options			371,994	90.0%	1.1
<b>2- Energy Assessment &amp; Disclosure</b>	18,932	\$946,586	406	30	166	18,932	4.6%	21.8
<b>3- Upgrade @ Time of Equipment Replacement</b>	30,207	\$12,082,712	(15,661)	3,174	16,713	30,207	7.3%	13.7
<b>4- Upgrade @ Time of Major Renovation</b>	900	\$360,000	(9)	142	752	900	0.2%	459.3
<b>5- Building Performance Standards</b>	19,661	\$7,864,528	10,040	-	23,857	16,492	4.0%	25.1

# Customization Options

- Trigger points (time of sale, rental, remodel, etc.)
- What is required? (audit, HPWH, energy efficiency, etc.)
- Year policy passed
- Inspection or enforcement options
- Compliance rate
- Permit or application fees
- Housing stock affected

# Time of Burnout Customization

## Time of Replacement Inputs for z-All Alameda, Alameda County

[Back to Policy Impact Dashboard](#)

A time of replacement policy requires that a natural gas-fueled appliance be replaced with a high-efficiency electric option (such as heat pumps) either at burnout or an early replacement. This policy prevents natural gas emissions from being locked into a home for 10-20+ years (average useful life of equipment). While this policy option has the ability to be very effective, there are concerns with the cost and availability of heat pumps in comparison to status-quo natural gas options. Additionally, switching from gas to electric may require panel or electrical wiring upgrades, which can delay installation and deter homeowners who may be replacing their appliances in a burnout scenario. This policy does not include stoves and dryers, since while the capping of the gas line and new electrical requires a permit, the appliances change-out itself does not.

← Brief description

Replacement requirement applies to:	
Furnace replacement	<input checked="" type="checkbox"/>
Furnace replacement with AC replacement or addition	<input checked="" type="checkbox"/>
Water heater replacement	<input checked="" type="checkbox"/>
Permit fee	\$400

} Policy requirements

← Fees/costs

Equipment Replacement Outcomes	Total
Number of covered equipment change-outs	33,563
Number of annual appliance permit inspections	30,207
Annual City Permit Revenue	\$12,082,712
Performance improvement per home	Impacts due to Electrification
Annual kWh savings per home	(616)
Annual Therm savings per home	125
Annual GHG reductions per home (Mt CO <sub>2</sub> e)	0.66
Total Energy Assessment Environmental Impacts	
Annual electricity savings (MWh)	(15,661)
Annual gas savings (Mtherms)	3,174
Annual GHG reductions (Mt CO <sub>2</sub> e)	16,713

} Detailed impacts

Note: since permit evasion is a concern for most jurisdictions, the impacts of this policy increase when paired with policy 1-code compliance

← Helpful notes

# Policy Considerations & Comparisons

- When to pass policy?
  - Ultimate emissions goals, political climate, market-readiness, cumulative emissions
- What will compliance be like?
  - Potential for politically challenging policies to not have a large GHG impact w/o enforcement
- How to touch all housing?
  - It may take decades for every home to cycle through one trigger point, layering speeds up saturation
  - Cannot turn off gas flow until all homes retrofitted for electric

Thank you!

**Emily Alvarez**

Program Manager, StopWaste

Alameda County BayREN Rep

[ealvarez@stopwaste.org](mailto:ealvarez@stopwaste.org)

