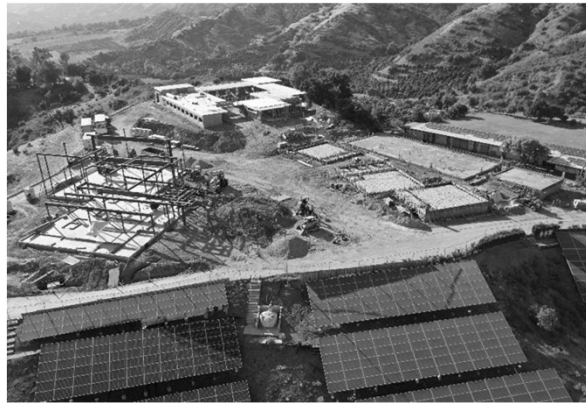


County of Ventura Board of Supervisors

Building Code Updates for the 2022 Ventura County Building Code



Resource Management Agency

Ruben Barrera, County Building Official, Building and Safety Division

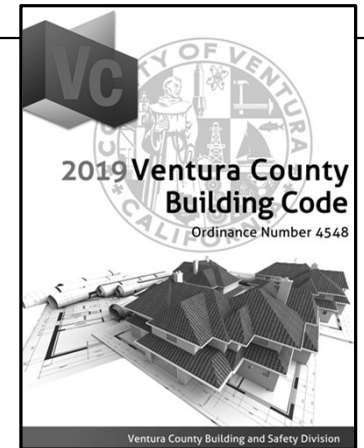
Honey Walters, Principal, Ascent Environmental, Inc.

October 11, 2022

Background

The Ventura County Building Code (VCBC)

- Currently the 2019 VCBC
- Updated every three years
- Contains construction regulations for buildings constructed in Ventura County (unincorporated areas)



The proposed 2022 VCBC becomes effective January 01, 2023

- Adopts the new (2022) editions of the State Building Codes
- Adopts local amendments to the State Codes
- Applies to Building Permit applications after the effective date



Local Amendments to the State Codes

The VCBC updates include:

- Most VCBC provisions from the prior (2019 VCBC)
- Some new provisions are proposed for the 2022 VCBC
- Editorial changes (e.g., formatting, grammar)
- Administrative amendments (e.g., inspection requirements, permit expirations)
- Technical amendments (e.g., structural safety, fire safety, energy conservation)

Proposed Technical Amendments for 2022 VCBC

Significant amendments for the following:

- Existing buildings in Hazardous Fire Areas, constructed prior to 2008
- New construction in Hazardous Fire Areas, where located near tall slopes
- All-electric appliances and equipment for new construction

Other amendments include State provisions for:

- Foundation vents for new buildings located in areas susceptible to radon
- Rodent proofing for new non-residential buildings
- 3D-printed building construction





Proposed Provisions for Fire Safety

Existing Buildings Constructed Prior to 2008

Background and history

- Thomas Fire (2017) and Woolsey Fire (2018) destroyed hundreds of buildings in Ventura County
- Current provisions came into effect in July 2008
- The proposed new provisions would require the gradual retrofit of pre-2008 buildings, over time

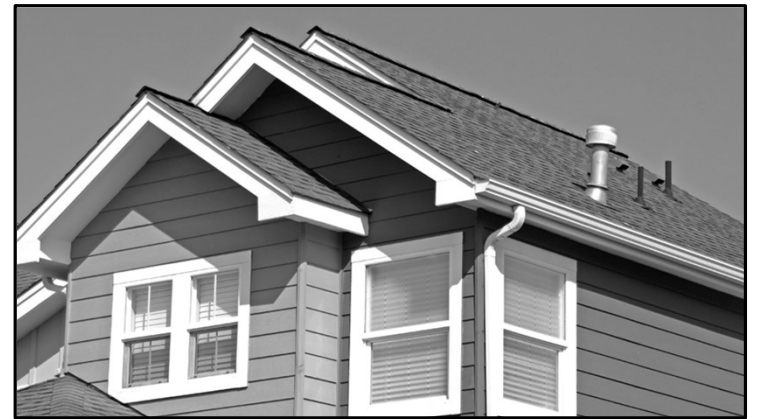
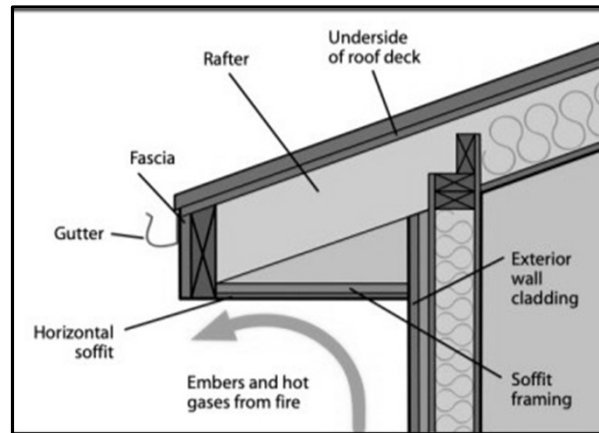


Existing Buildings Constructed Prior to 2008

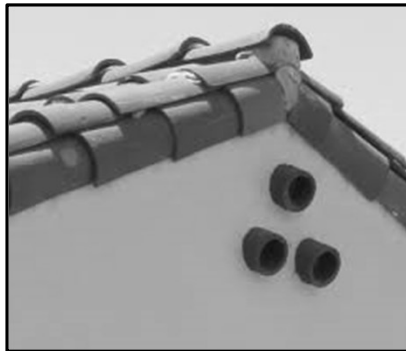
- Retrofits for making buildings less vulnerable include:
 - Replacing combustible roofs or siding with ignition resistant materials
 - Replacing attic vents and underfloor vents having large openings, with small openings
 - Enclosing open eaves at combustible roofs
 - Replacing or protecting combustible accessory structures with ignition resistant materials
- Intended to reduce building losses from ignition by flying embers
- Retrofits would only be required when other work is being done, like an addition or remodel
- The required retrofits would have a cap of 10% of the project cost

Attic and Underfloor Vents and Roof Eaves

- Given the importance of protecting combustible attics and underfloor areas from flying embers, vents should always be retrofitted
- As proposed, vents would have to be retrofitted, even if the cost exceeds the 10% cap
- Requires vent openings to not exceed 1/8th inch
- Roof eaves must be boxed-in and protected with non-combustible materials



Retrofitting Attic Vents

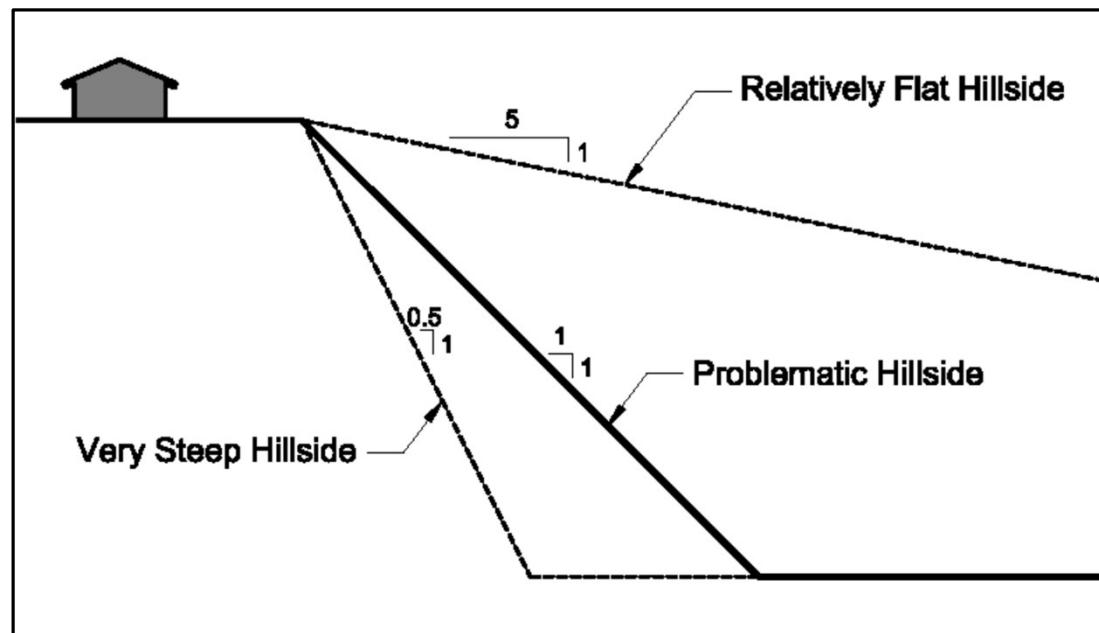


Provisions for Buildings Constructed Near Tall Slopes

- Applicable to new buildings in Hazardous Fire Areas
- Provisions also apply to existing buildings
 - Additions exceeding 50% of the area of main building
 - Remodels exceeding 50% of the estimated value of main building
- Intended to protect buildings from heat and flames near tall slopes
- Protection from flying embers also applies under current code

Setback Requirements for Hillside Buildings

- Buildings near large undeveloped slopes must have a 30-foot setback to the slope
 - Provisions apply only to buildings near tall slopes having a height > 100 feet
 - Exemption for slopes that are relatively flat, or very steep



Exceptions to 30-Foot Setback Rule

- Fire-rated exterior walls, where closer than 30 feet to the tall slope, and
- Fire-rated doors and windows where closer than 30 feet

or

- Fire-rated main structural elements throughout the house (e.g., floors, exterior walls, bearing walls, structural frames, main and secondary structural elements supporting floors & roofs)





Proposed Provisions for All-Electric Buildings

All-Electric Buildings

All-electric appliances and equipment in the building

- Space heating: Heat pumps instead of furnaces and A/C condensers
- Water heating: Electric water heaters
- Clothes drying: Electric clothes dryers
- Cooking: Electric ranges and ovens

Applicable to new buildings and large additions and remodels

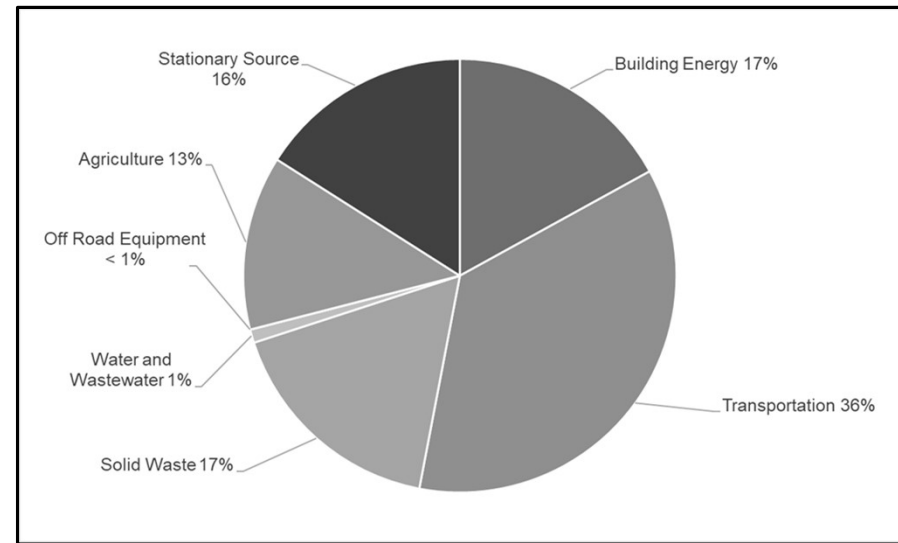
- Additions >50% of size of main building
- Remodels >50% of value of main building

Proposed Exceptions

- Grills, fire pits, fireplaces, pool/spa heating equipment, emergency back-up generators
- Indoor gas fireplaces
- Commercial/industrial equipment having no viable electrical alternate for business use
- Propane appliances and equipment

Why Building Electrification?

- Implements Program HAZ-AA of the Ventura County 2040 General Plan to reduce GHGs
- Building energy accounts for 17% of GHG emissions in Ventura County
- Dominated by natural gas usage due to the global warming potential of methane
- System leakage rates of ~1-3%
- Air quality and safety concerns
- Limited supply



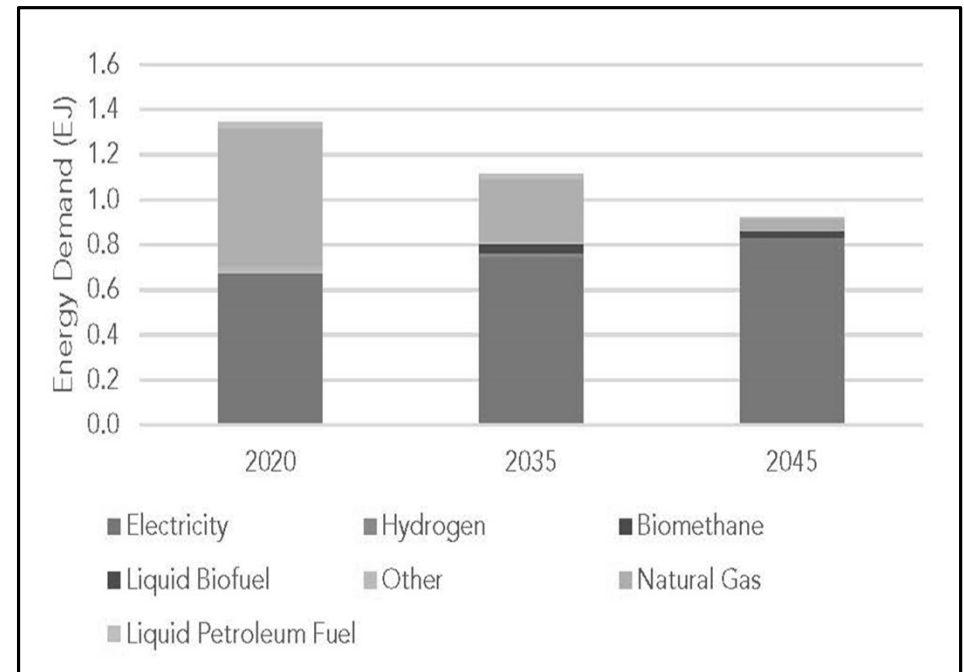
2015 Greenhouse Gas Emissions in Unincorporated Ventura County, by Sector
Source: Ventura County 2040 General Plan, Appendix B: Climate Change

What is happening across the state?

CARB, CPUC, CEC, CA Energy Codes and Standards Team, and experts have stated electrification is necessary

- CARB assumes all electric appliances by 2026 (residential) and 2029 (nonresidential)
- CPUC eliminated gas line extension subsidies (July 2023) and proposes to phase out energy incentives for natural gas equipment (10 years)

40+ California jurisdictions have adopted all-electric/natural gas ban code updates (3 counties adopted and more considering)



Final Energy Demand in Buildings in 2020, 2035, and 2045 in the Proposed Scenario
Source: CARB's Draft 2022 Scoping Plan Update

Adopted Reach Codes with All-Electric/Natural Gas Ban and Exceptions

Jurisdiction	Single-Family	Nonresidential
Contra Costa County	Except ADUs	N/A
City of Ojai	Except ADUs, pool/spa, for-profit kitchen cooking equipment	Except for-profit kitchen cooking equipment
City of San Jose	N/A	Except for hospitals and facilities with distributed energy resource
City of San Luis Obispo	Except ADUs water/space heating if no all-electric alternative is commercially available or viable	Except for commercial kitchens and public swimming pools if no all-electric alternative is commercially available or viable
City of Santa Barbara	N/A	Except for public interest projects, labs, clean rooms, and for-profit kitchen cooking equipment
City of Santa Cruz	Except ADUs less than 750 square feet	Except for industrial heat processes and for-profit kitchen cooking equipment

Preliminary Effectiveness Results

- Based on the Statewide Reach Codes Program's cost-effectiveness reports
- Results show that all-electric buildings are technically feasible and significantly reduce GHGs compared to mixed-fuel buildings (those using both gas and electricity)
- In Ventura County climate zones, the societal-based cost effectiveness ratios are greater than 1 for most building types and GHG reductions are greater than 0

What is the GHG Reduction Potential for Ventura County?

Option	GHG Emissions per Hour (MTCO₂e)	Annual GHG Emissions per Year (MTCO₂e)
No Exceptions	N/A	2,019
Outdoor Cooking (Grills and BBQs)	0.00190	32 (1.6%)
Indoor Fireplaces and Outdoor Firepits	0.00442	50 (2.5%)
Pools and Spas	0.00486	395 (19.6%)

What is the Cost to Customers?

- All-electric buildings are less expensive to construct (e.g., no need for natural gas infrastructure)
- Cost savings compared to a mixed fuel buildings varies 2019 Cost-effectiveness Study
- Low-Rise Residential New Construction


Measure	Incremental Cost (2020 PV\$)				Incremental Cost (2020 PV\$)			
	Single Family ¹				Multifamily ¹ (Per Dwelling Unit)			
	Low	High	Typical (On-Bill)	Typical (TDV)	Low	High	Typical (On-Bill)	Typical (TDV)
Heat Pump vs Gas Furnace/Split AC	(\$2,770)	\$620	(\$221)		Same as Single Family			
Heat Pump Water Heater vs Gas Tankless	(\$1,120)	\$1,120	\$0					
Electric vs Gas Clothes Dryer ²	(\$428)	\$820	\$0					
Electric vs Gas Cooking ²	\$0	\$1,800	\$0					
Electric Service Upgrade	\$200	\$800	\$600		\$150	\$600	\$600	
In-House Gas Infrastructure	(\$1,670)	(\$550)	(\$800)		(\$600)	(\$150)	(\$600)	
Site Gas Infrastructure	(\$25,000)	(\$900)	(\$5,750)	(\$11,836)	(\$16,250)	(\$310)	(\$3,140)	(\$6,463)
Total First Cost	(\$30,788)	\$3,710	(\$6,171)	(\$12,257)	(\$20,918)	\$4,500	(\$3,361)	(\$6,684)
Present Value of Equipment Replacement Cost			\$1,266				\$1,266	
Lifetime Cost Including Replacement & Financing of First Cost			(\$5,349)	(\$11,872)			(\$2,337)	(\$5,899)

¹Low and high costs represent the potential range of costs and typical represents the costs used in this analysis and determined to be most representative of the conditions described in this report. Two sets of typical costs are presented, one which is applied in the On-Bill cost effectiveness methodology and another applied in the TDV methodology.

²Typical costs assume electric resistance technology. The high range represents higher end induction cooktops and heat pump clothes dryers. Lower cost induction cooktops are available.

Incremental Costs – All-Electric Code Compliant Home Compared to a Mixed Fuel Code Compliant Home
Source: California Energy Codes and Standards 2019 Cost-effectiveness Study: Low-Rise Residential New Construction

Single Family All-Electric, Climate Zone 6



Cost Effectiveness Explorer

Cost-Effectiveness Results Summary

Ventura County - Climate Zone 6

Single Family | All Electric

Study Source: Single Family New Construction¹

| Release Date: 09/12/2022


| Newest Version

| Code Cycle: 2022

	Cost-Effectiveness	Per Home Results		
Package	On-Bill ≥ 1.0 is cost effective	Compliance Margin (EDR2eff)	Incremental Cost	Annual Bill Savings (on-bill)
Electrification + Basic EE	1.0	2.5	-\$5,288	-\$269
Electrification + EE	0.9	7.8	-\$3,625	-\$216
Electrification + EE + High Eff HPWH	1.2	11.0	-\$3,625	-\$171
Electrification + EE + PV	5.3	7.8	\$64	\$304
Electrification + EE + PV + Battery	1.0	11.6	\$5,541	\$487

Source: Cost Effectiveness Explorer (<https://explorer.localenergycodes.com/>) on 10/6/22

Single Family All-Electric, Climate Zone 9



Cost Effectiveness Explorer

Cost-Effectiveness Results Summary

Ventura County - Climate Zone 9

Single Family | All Electric

Study Source: Single Family New Construction¹

Release Date: 09/12/2022


Newest Version

Code Cycle: 2022

	Cost-Effectiveness	Per Home Results		
Package	On-Bill ≥ 1.0 is cost effective	Compliance Margin (EDR2eff)	Incremental Cost	Annual Bill Savings (on-bill)
Electrification + Basic EE	1.0	1.2	-\$5,288	-\$269
Electrification + EE	1.0	4.6	-\$4,093	-\$218
Electrification + EE + High Eff HPWH	1.3	6.4	-\$4,093	-\$176
Electrification + EE + PV	8.5	4.6	-\$478	\$292
Electrification + EE + PV + Battery	1.1	9.9	\$5,011	\$511

Source: Cost Effectiveness Explorer (<https://explorer.localenergycodes.com/>) on 10/6/22

Single Family All-Electric, Climate Zone 16



Cost Effectiveness Explorer

Cost-Effectiveness Results Summary

Ventura County - Climate Zone 16

Single Family | All Electric

Study Source: Single Family New Construction¹

Release Date: 09/12/2022

Newest Version

Code Cycle: 2022

	Cost-Effectiveness	Per Home Results		
Package	On-Bill ≥ 1.0 is cost effective	Compliance Margin (EDR2eff)	Incremental Cost	Annual Bill Savings (on-bill)
Electrification + Basic EE	0.4	6.0	-\$3,257	-\$545
Electrification + EE	0.3	9.7	-\$1,943	-\$447
Electrification + EE + High Eff HPWH	0.5	10.9	-\$1,943	-\$381
Electrification + EE + PV	3.1	9.7	\$7,051	\$1,111
Electrification + EE + PV + Battery	1.5	18.1	\$12,497	\$1,119

Source: Cost Effectiveness Explorer (<https://explorer.localenergycodes.com/>) on 10/6/22

What Incentives are Available?


Inflation Reduction Act

- High-Efficiency Electric Home Rebate Act “covers 100% of electrification project costs (up to \$14,000) for low-income households and 50% of costs (up to \$14,000) for moderate-income households”
- Energy Efficient Home Improvement credit “allows for households to deduct from their taxes up to 30% of cost of upgrades”
- Residential Clean Energy credit “deducts 30% of the cost of projects (solar or battery)”

California Energy-Smart Homes

Incentive Lookup for Customers | The Switch Is On Incentive Finder

The Switch is On: An Incentive Finder

 THE SWITCH IS ON

[Learn More](#) [Make the Switch](#) [About](#) [Contact](#) [FAQs](#)

INCENTIVE LOOKUP FOR CUSTOMERS

BUILDING TYPE

☒ SINGLE-FAMILY
☐ MULTI-FAMILY

EQUIPMENT TYPE

☒ HEAT PUMP WATER HEATER

INCOME QUALIFYING?

☐ NO

WHO CAN APPLY?

☐ CONTRACTORS
☐ HOMEOWNERS
☐ RENTERS

93066

Water Heating

SEARCH

CLEAR ALL

SEARCH
for local California
incentives by location,
specialty and more.


CONNECT
with trusted
contractors, in our
contractor directory.

ENJOY
the benefits of your
new electric
appliance.

(-)SINGLE-FAMILY

(-)HEAT PUMP WATER HEATER

3 Incentives Available For 93066

 Save \$2,420 - \$8,450 - Rebate On Heat Pump Water Heater

GET REBATE


LEARN MORE


Single-family

REQUIREMENTS

REQUIREMENTS: Single Family Incentive - with verified savings of 175 therms (1,230 kWh increase). Incentives are paid to program-enrolled contractors/aggregators.

WHO CAN APPLY

 Contractors

 Save \$450 Per Water Heater - Rebate On Heat Pump Water Heater

GET REBATE




LEARN MORE


Single-family

REQUIREMENTS

Removal of gas powered water heater

WHO CAN APPLY

 Contractors
 Homeowners
 Renters

 Save \$1,000 - \$3,100 Per Unit - Rebate On Heat Pump Water Heater

GET REBATE


LEARN MORE

Single-family

REQUIREMENTS

NEEA Tier 3 and/or Energy Star Certified. This rebate is available through contractors registered with TECH Clean California.

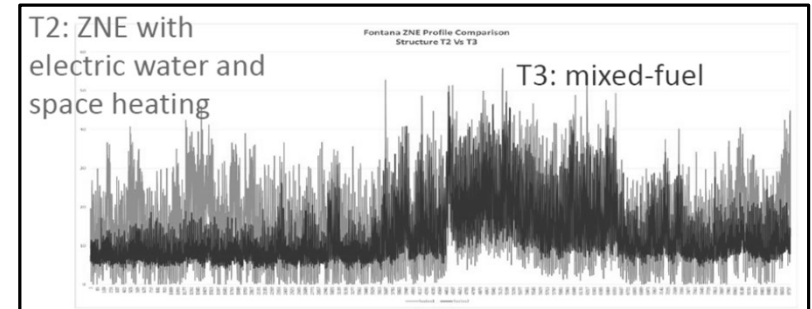
WHO CAN APPLY

 Contractors

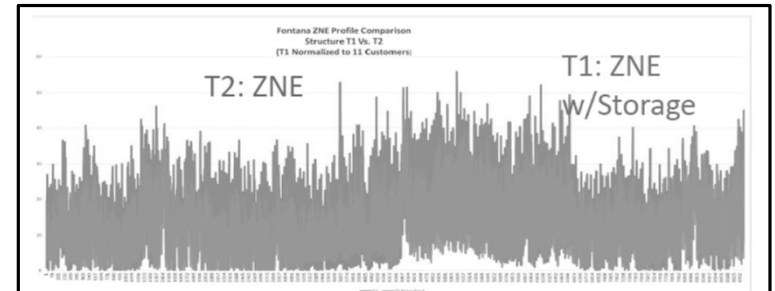
Source: <https://www.switchison.org/>. This example is for single family water heating in zip code 93066.

What is the Impact to the Grid?

- The electric grid is designed to accommodate “peak demand,” plus a margin
- All-electric neighborhoods do not have a noticeably higher peak compared to mixed-fuel
- SCE conducted case studies on two all-electric neighborhoods, one in Fontana and one in Irvine
- Adding batteries can “flatten” the demand curve for all-electric homes



Results of Fontana case study, comparing demand profile of mixed-fuel (red) to all-electric (blue). Note how the two peaks are similar.
Source: SCE



Results of Fontana case study, comparing demand profile of all-electric with only-solar (blue) to all-electric with solar-plus-storage (green).
Source: SCE

How Will Progress be Monitored?

- Public reporting on GHG strategy progress
- GHG inventory updates
- GHG strategy amendments

Programs	Implements Which Policy(ies)	Responsible	2020 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
		Supporting Department(s) or Agencies					
6. CONSERVATION AND OPEN SPACE ELEMENT							
COS -Z	Public Reporting on Greenhouse Gas (GHG) Strategy Progress	COS-10.1 COS-10.2 COS-10.3 COS-10.4	RMA CEO				
The County shall prepare public reports on the results of GHG Strategy implementation and monitoring and present these reports to the Board of Supervisors. The first report shall be submitted to the Board of Supervisors two years after the approval of the General Plan, after which the Board of Supervisors will determine the appropriate reporting interval. The County shall also present a more detailed progress report to the Board of Supervisors, including results of the latest GHG inventory update, every five years.							
CAP							
COS -AA	Greenhouse Gas (GHG) Inventory Updates	COS-10.1 COS-10.2 COS-10.3 COS-10.4	RMA CEO				
The County shall update the County's GHG emissions inventory at least every five years.							
CAP							
COS -BB	Greenhouse Gas (GHG) Strategy Amendments	COS-10.1 COS-10.2 COS-10.3 COS-10.4	RMA CEO				
The County may amend the GHG Strategy to ensure that the County is on track to achieve its 2030 target and making substantial progress towards achieving its longer-term, post-2030 goals.							
CAP							

California Environmental Quality Act

Exempt pursuant to Title 14, section 15061(b)(3)

- It can be seen with certainty that there is no possibility that this ordinance may have a significant negative effect on the environment.

Categorically exempt pursuant to Title 14, section 15308

- The proposed 2022 VCBC consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for the protection of the environment.

No exceptions in section 15300.2 preclude use of the Class 8 categorical exemption.

Public Outreach and Comments

Public Workshops on August 18 and August 23, 2022

- Bilingual notices were sent to stakeholders, posted at public counters, Hall of Administration main entry, and online
- Press release to promote the workshops
- Interpretive services were made available
- Workshop recordings in English and Spanish available online

Stakeholders Notified of the Proposed Code Updates (see Exhibit 6)

- Building Industry Association
- American Institute of Architects
- Ventura County Coalition of Labor, Agriculture and Business (CoLAB)
- Local developers and regional contractor's associations
- Local climate groups, including Climate First: Replacing Oil and Gas (CFROG)

Public Comments (see Exhibit 7)

Recommendations

1. Open a Public Hearing, introduce and read in title only the attached Ventura County Building Code Ordinance, receive public testimony, waive further reading by a majority vote, and continue the matter, together with the Resolution adopting express findings regarding modifications of the California and International Codes (Exhibit 4), for final adoption on November 1, 2022.
2. At a second Public Hearing on November 1, 2022, receive public testimony and adopt the proposed Ventura County Building Code Ordinance to become effective on January 1, 2023; adopt Resolutions of express findings regarding modifications of the California and International Codes which regulate building design and construction subject to the State Building Standards Law and the State Housing Law, and direct that the findings be filed with the California Building Standards Commission.
3. At the second Public Hearing, determine that the proposed Ventura County Building Code Amendments are exempt from the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines sections 15061(b)(3) and 15308, and that no exceptions set forth in CEQA Guidelines section 15300.2 preclude use of the Class 8 categorical exemption.
4. Direct the Clerk of the Board to publish Ordinance summaries as required by law.



Questions of County Staff and Consultant
