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Building Electrification Ordinance

Board of Supervisors
October 4, 2022

County of Santa Barbara



Presentation Outline

- Background
 - Board Direction
 - Methane Natural Gas
- Why Building Electrification?
 - New Construction
 - Reliability
 - Energy Transitions
- Policy Options and Recommendation
- Applicability & Exemptions
- Outreach & Engagement Plan

Background

Board directed staff to begin to... Develop an ordinance to restrict natural gas infrastructure, increase energy efficiency performance and electric vehicle charging infrastructure for new construction and major renovations (Aug 5)

Natural Gas is Methane

- Methane is 25x more potent than carbon dioxide
 - System leakage rates 1-3%
- Ignition and combustion of methane in the home affects air quality & safety
- Renewable natural gas supply is limited, and should be used for hard-to-electrify sectors



Left: Aliso Canyon Gas Leak (2015)
Right: Researcher samples natural gas

Why Building Electrification?

- "All of the above" strategies will be needed to reach 50% emissions reduction by 2030
- "Electrify and decarbonize the grid"
 - Sarah Saltzer of Stanford University, Stanford Center for Carbon Storage
- Building electrification is:
 - Cost-effective
 - Commercially available
 - Least cost option for avoiding future carbon emissions and stranding assets



What about reliability?

- Extreme heat, wildfire and Public Safety Power Shutoffs, exacerbated by climate change, pose a constant threat
- Gas appliances that rely on electric ignition may also not be operable in the face of electric outages
- Aging methane natural gas infrastructure also remains a critical concern
- New all-electric buildings would not significantly change the overall demand for electricity
- Investments in clean and reliable energy sources and grid infrastructure will continue to be made

California 2022 Energy Code

(Effective Jan 2023)



Commercial

- Establishes **solar PV and battery standards**. (Solar: 60% of the building's electrical loads; Storage: Limits exports to the grid to no more than 10%)
- Establishes **new efficiency standards for commercial greenhouses** (primarily cannabis growing).
- **Improves efficiency standards** for building envelope, various internal systems, and grid integration equipment, such as demand-responsive controls to buoy grid stability.

Residential

- Establishes **energy budgets** to encourage heat pumps over gas-fueled HVAC units.
- Requires homes to be **electric-ready**, with dedicated 240-volt outlets and space (with plumbing for water heaters)
- Increases **minimum kitchen ventilation requirements** so that fans over cooktops have higher airflow or capture efficiency to better exhaust pollution from gas cooking and improve indoor air quality
- Allows exceptions to existing solar PV standards when roof area is not available (such as for smaller homes).

CARB 2022 Scoping Plan

Assumes all electric appliances are standard beginning 2026 (residential) and 2029 (commercial)

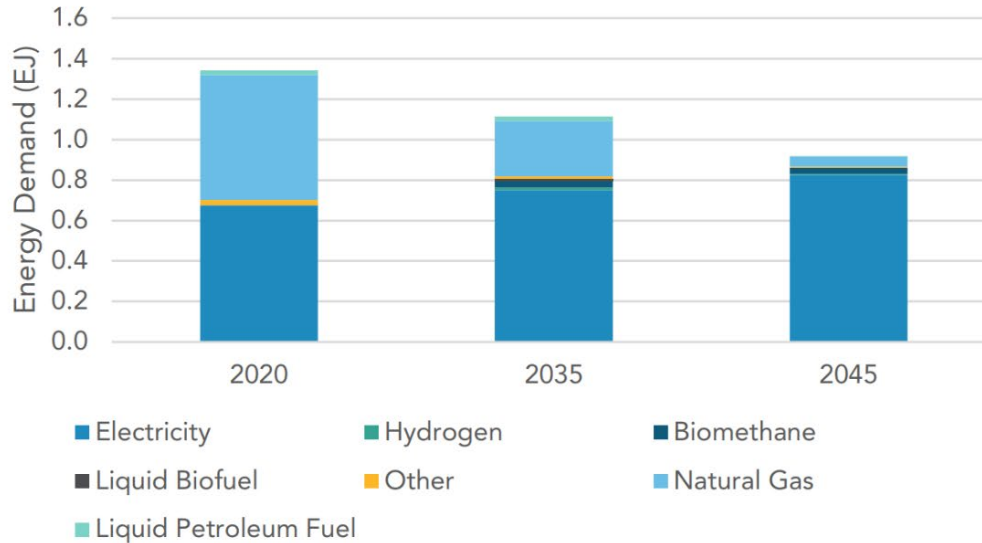


Figure 4-8: Final energy demand in buildings in 2020, 2035, and 2045 in the Proposed Scenario

Gas line subsidies and incentives ending

- California Public Utilities Commission (CPUC) eliminated gas line extension subsidies for customers starting in July 2023
 - Eliminate allowances, refunds and discounts tied to extending gas lines
- CPUC proposal to phase out energy efficiency incentives for most natural gas equipment over the next 10 years
 - Redirect funding towards efficiency measures and programs which reduce consumption without contributing to the installation of new appliances

Building Decarbonization Policy Options (for new construction)

1. Develop a Carbon Impact Fee
2. Lower the Greenhouse Gas Thresholds of Significance
3. Develop a local energy ordinance that discourages or regulates natural gas infrastructure
4. Develop a local ordinance that prohibits natural gas infrastructure

Option 1: Develop a Carbon Impact Fee

- Assess fee through permitting process
 - For example: percent of project or permit cost, or \$/ton of CO₂e
- Allows for choice, but would financially penalize projects that utilize methane gas

Staff do not recommend this option:

- Developing a fee and mitigation program would take a considerable amount of time and resources
- Avoidance of methane natural gas infrastructure is not guaranteed
- Fee would be a limited source of revenue

Option 2: Lower the County's Greenhouse Gas (GHG) Thresholds of Significance

- Thresholds of Significance is a planning tool for larger projects that need to avoid or mitigate local and regional impacts.
- Interim Thresholds (adopted Jan 2021) include a 300-metric ton of carbon emissions threshold
 - Roughly equivalent to 62,000 sq ft of detached single-family housing or 26,000 sq ft of commercial space.
- During the development of the 2030 Climate Action Plan, staff will update the Interim Thresholds to Final

Staff do not recommend this option:

- Projects that receive ministerial review & approval would not be addressed by the Thresholds

Option 3: Develop a local energy ordinance (reach code) that discourages or regulates natural gas infrastructure

- Local energy code that exceeds the requirements of the State
- When requiring increased energy performance, jurisdictions need to:
 - Demonstrate that their requirements are cost effective (the cost of the measure is less than the operational lifetime savings); and
 - Obtain approval from the California Energy Commission (CEC)
- Reach codes could also, and more simply, require all-electric to-code construction
 - Would not require approval from the CEC

Staff do not recommend this option:

- Compliance pathways are complicated for end users
- Avoids time-consuming re-adoption process when State code is updated
- Opens possibility for less regional consistency

Option 4: Develop a local ordinance that regulates natural gas infrastructure in new construction, additions, and major alterations, citing health and safety concerns

- Prohibits the extension of methane natural gas infrastructure utilizing police powers through the CA Health and Safety Code
- Relatively straightforward and simple to adopt and implement, and would be the most effective at ensuring compliance in perpetuity

Staff recommend this option:

- Permanent and most effective
- Provides regional consistency
 - City of Santa Barbara adopted in 2021
 - County of Ventura to develop and adopt
 - Carpinteria & Goleta to consider
- Helps the County meet its 50% reduction target by 2030
 - By restricting new methane natural gas infrastructure in at least residential buildings, staff estimate that the County would avoid over 10,000 metric tons of carbon emissions, or roughly 8% of forecasted methane natural gas emissions by 2030

Policy Options

| | 1) Carbon Impact Fee | 2) GHG Thresholds | 3) Energy "Reach Code" via Energy Chapter | 4) Municipal Code (Ban) |
|----------------|---|--|--|---|
| What/How | Assess fee through permitting process (ex. % of permit cost, or \$/ton of CO ₂ e) | Lowers thresholds for GHG emissions from large projects | A) Increases energy/carbon efficiency requirements, making NG more difficult if not impossible to meet - OR - B) Requires all electric 'to code' construction | Utilizes police powers to restrict infrastructure |
| Pros | <ul style="list-style-type: none"> • Allows choice • Could fund new programs or staff | <ul style="list-style-type: none"> • Allows (perception of) choice • Less 'visible' policy change but still effective | A) <ul style="list-style-type: none"> • Allows choice • Increased applicability options • Can address other design, construction issues B) <ul style="list-style-type: none"> • Simpler to develop, implement | <ul style="list-style-type: none"> • Permanent & most effective • Simpler to develop, implement • Consistency with City of SB, County of Ventura |
| Cons | <ul style="list-style-type: none"> • Fee development can be complicated, and may not yield intended results • Declining source of revenue | <ul style="list-style-type: none"> • Use of offsets would be allowed for unavoidable emissions (hard to electrify systems) • Would not capture ministerial projects | <ul style="list-style-type: none"> • Must be renewed every 3 years • Requires Energy Commission approval • More complicated to develop, implement | <ul style="list-style-type: none"> • Politically challenging • Potential limits in applicability |
| Other examples | City of Watsonville | | 60+ jurisdictions, incl counties of San Mateo, Contra Costa, Santa Clara, Marin | Berkeley, Santa Barbara, SLO City, Petaluma, Santa Cruz |

Applicability & Exemptions

Staff request that the Board provide direction on considerations, such as applicability, exemptions, effective dates, etc.

- Staff recommend applying the ordinance to as many building types as possible where it is feasible and cost effective
- Applicability and exemptions will be vetted and finalized in close coordination internal and external stakeholders
- City of Santa Barbara code exempts:
 - Restaurants
 - Laboratories or clean rooms in medical or scientific buildings
 - Projects where electrification is not feasible or deemed to be in the public interest

Outreach & Engagement

- Work with the utilities, Central Coast Community Energy, the Tri-County Regional Energy Network (3C-REN), cities and interested stakeholders, such as local contractors and builder associations and chambers
 - 3C-REN and the Central Coast Green Building Chapter have hosted a number of trainings, forums and other events to both industry professionals and the general public on building electrification
- Coordinate with jurisdictions that are interested in developing similar ordinances to promote regional consistency
- Advisory Committee, Public Workshops & Presentations



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initiative

Back Up Slides

Where does our electricity come from?

| Power Source | 2021 CA Power Mix (Average) | Central Coast Community Energy | |
|--------------------------|-----------------------------|--------------------------------|------------------|
| | | 3CE Choice (2020) | 3CE Prime (2020) |
| Renewable | 33.6% | 31.1% | 100% |
| Biomass & biowaste | 4.8% | 1.7% | 0% |
| Geothermal | 1.0% | 8.8% | 0% |
| Hydroelectric | 14.2% | 2.8% | 0% |
| Solar | 11.4% | 15.3% | 50% |
| Wind | 3.0% | 2.5% | 50% |
| Coal | 9.2% | 0% | 0% |
| Large Hydro | 9.3% | 55.7% | 0% |
| Natural Gas | 0.2% | 0% | 0% |
| Unspecified Power | 6.8% | 13.2% | 0% |
| Lbs CO2e/MWh | 456 | 151 | 0 |

CCCE's Pathway to 100% Clean and Renewable by 2030

Supporting Affordable Rates, Increasing Renewable Resources, and Accelerating Greenhouse Gas Reduction

CCCE's new energy-supply strategy will provide the following benefits:

CCCE's goal is to reach 60% clean and renewable energy by 2025 (**5 years ahead** of CA's goal) and 100% by 2030 (**15 years ahead** of CA's goal)

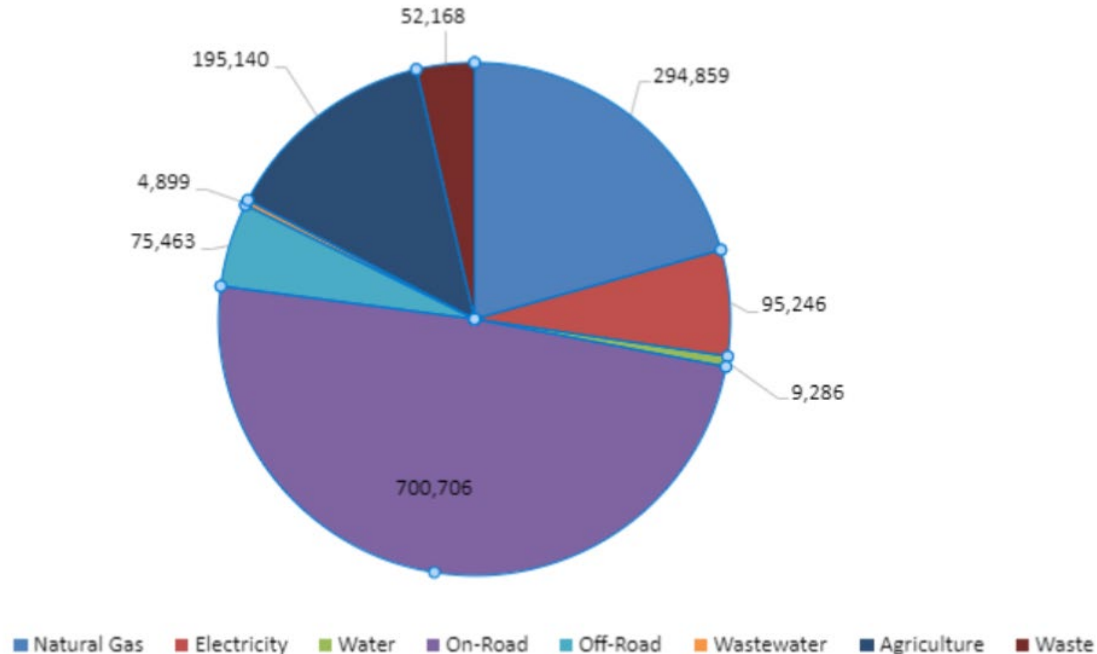
Financially beneficial to customers and CCCE through reduced operating costs of **\$8-15 million/year** allowing for more affordable and stable rates while supporting economic development



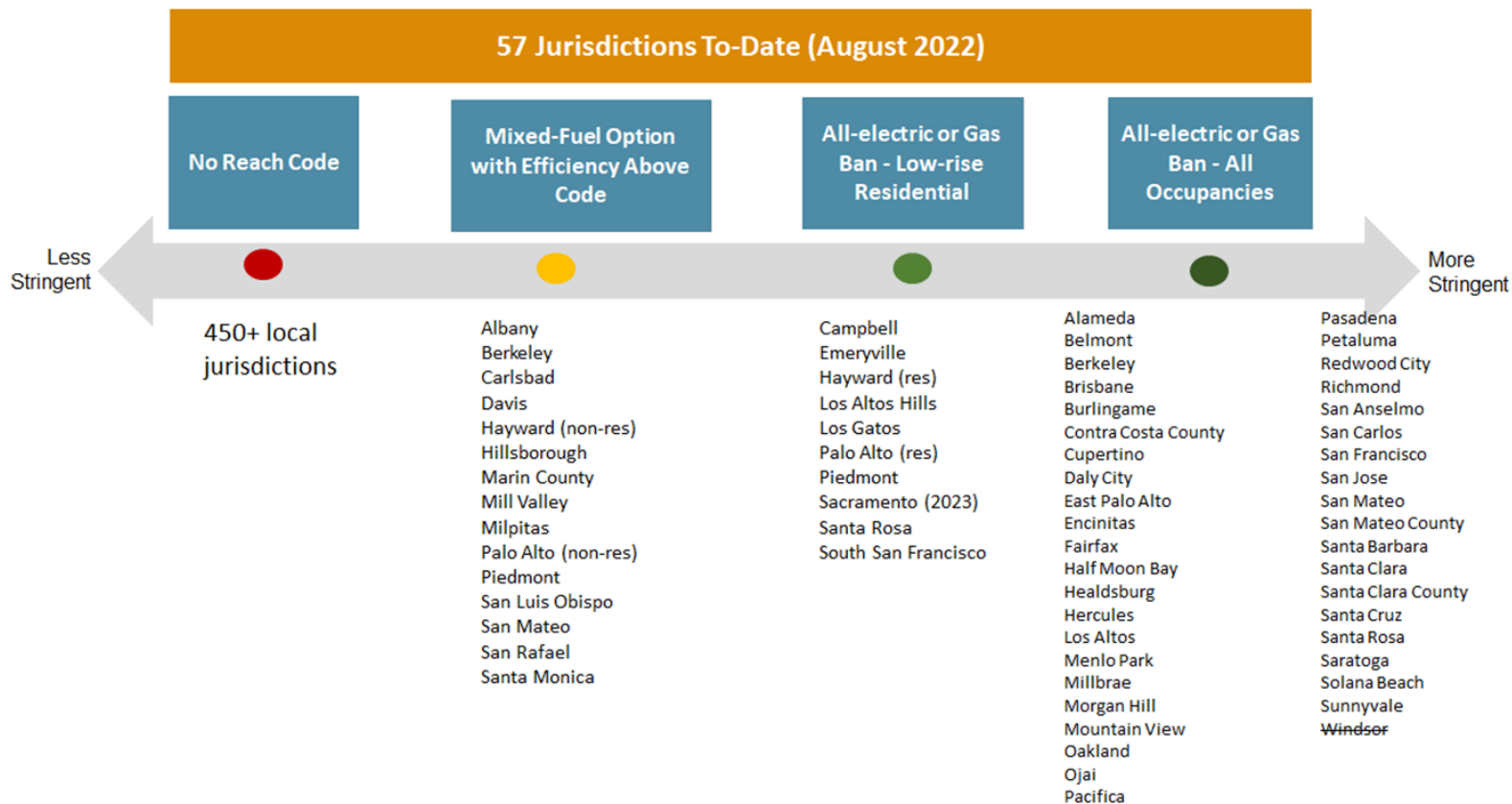
**100%
Renewable**
by 2030

Buildings account for nearly 30% of emissions in the County (unincorporated area)

2018 Community Greenhouse Gas Inventory
(metric tons of CO₂e)



Where have similar policies been adopted?



What about housing costs?

- All-electric buildings are less expensive to construct because they remove the need for methane natural gas infrastructure,
- Cost savings compared to a mixed fuel building are represented by the negative values

| 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.

Incentives: Statewide

- California Energy-Smart Homes
 - Statewide incentive program for all-electric measures
 - Residential new construction and alterations/additions
 - All-electric
 - Numerous prerequisites including an energy efficiency delta EDR of ≥ 1
 - Single family, duplexes, low-rise multifamily, alterations, **additions > 700 sf, and ADUs**
 - Mixed fuel
 - Numerous prerequisites including an energy efficiency delta EDR of ≥ 2
 - Single family, duplexes, low-rise multifamily, and alterations
 - **Incentives are lower than all-electric**
 - Source: <https://www.caenergysmarthomes.com/>

Incentives: Central Coast Community Energy

Electrify Your Home/TECH Program

- For single-family homes:
 - Receive up to \$3,800 for Heat Pump Water Heater equipment and installation
 - Receive up to \$3,500 for Heat Pump HVAC equipment
 - Receive up to \$2,000 for electric panel upgrades/replacements
 - Sites that qualify for CARE/FERA are eligible for an additional \$1,000
- For multi-family units:
 - Incentives for multifamily residential electrification projects. Projects at affordable or low-income housing may be eligible to receive up to two times the incentive amount.

Incentives: Central Coast Community Energy

New Construction Electrification Program

- For all-electric affordable housing projects
 - Including but not limited to water heating, space heating, and cooking appliances
 - Incentives up to \$2,500 per unit. Max \$150,000 per project

Agricultural Electrification Program

- For agriculture customers and customers whose primary business is agriculture production and/or agriculture processing
 - Examples of eligible equipment/project types include:
 - Irrigation pumps, chillers/boilers/refrigeration, other heating and cooling equipment (HVAC),
 - Projects may be eligible for up to 70-100% of the total project cost, not to exceed \$30,000

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Incentives: Central Coast Community Energy

Home Energy Savings Program (HES)

Targets existing buildings, but substantial remodels or rehab projects could be eligible

- For single-family homes:
 - Incentive payments based on metered energy savings from energy efficiency or electrification projects.
 - Enrolled contractors pass through savings to property owner
- For multi-family units:
 - Incentives for multifamily residential
 - Incentive of \$750/per dwelling unit (\$1,500 thru December). Additional incentives for
 - Incentives cover hot water systems, lighting and appliances, heating and cooling systems, insulation. Additional incentives beyond the per unit rebate for certain high-performance measures, such as heat pump water heaters.

Incentives: Inflation Reduction Act

High-Efficiency Electric Home Rebate Act (HEEHRA)

- “Covers 100 percent of electrification project costs (up to \$14,000) for low-income households and 50 percent of costs (up to \$14,000) for moderate-income households”

Energy Efficient Home Improvement credit, or 25C

- “Allows households to deduct from their taxes up to 30% of the cost of upgrades to their homes”
- “Limited to \$600 per measure, up to \$1,200 per household per year” (except limit is \$2,000 for heat pumps & heat pump water heaters)

Residential Clean Energy credit, or 25D

- “Deduct 30 percent of the cost of the [solar or battery] project”