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Attachments: 1. Summary Report, 2. Attachment 1: Staff PowerPoint, 3. Attachment 2: Summary-of-Options.pdf

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To: Board of Supervisors

Department or Agency Name(s): Permit and Resource Management

Staff Name and Phone Number: Nathan Quarles, (707) 565-1146

Vote Requirement: Informational Only

Supervisory District(s): Countywide

Title:

2022 Model Building Codes Local Workshop II

Recommended Action:

Conduct a public workshop to consider upcoming code amendments to the California Model Building Codes and to provide direction to staff regarding the triennial building code cycle and emergency or temporary housing options.

Executive Summary:

On April 5, 2022, the Board of Supervisors (Board) conducted a public workshop on building code options for energy conservation and for emergency housing. The Board directed staff to provide potential code options for energy codes and housing options.

The triennial California Model Building codes adoption cycle provides the County with an opportunity to make local amendments. The update must conclude before December 31, 2022. An item of significant interest is tentatively scheduled for November 1, 2022, for the Board to consider the model building codes with final adoption scheduled for December 6, 2022.

Additionally, staff presentation will include discussion on housing code changes available to the Board to address emergency and temporary housing community needs.

Discussion:

Building Code Amendments for the 2022 Code Cycle

Model Building Codes:

The [International Code Council \(ICC\)](https://www.iccsafe.org/about/who-we-are/) <<https://www.iccsafe.org/about/who-we-are/>> revises and publishes

model building codes on a three-year cycle. In about a six-month period after ICC publication, the State of California, through a variety of its agencies, adopts the ICC codes with amendments. The model codes include main branches of construction such as the building, fire, residential, plumbing, mechanical, and electrical codes. Also included are the model codes dealing with energy consumption and efficiency, green building and waste reduction, historic buildings and existing buildings. The formal names include the California Building Code, the California Fire Code, etc.

The [California model building codes were published on July 1, 2022 <https://www.dgs.ca.gov/BSC/Codes>, and will become effective January 1, 2023](https://www.dgs.ca.gov/BSC/Codes). The State of California affords local jurisdictions have 180 days to make any local amendments that are reasonably necessary due to local conditions including climate, geography, and topography. If no local amendments are adopted, local jurisdictions can adopt the model codes without modification. Local amendments that are equal to or more stringent than State provisions can be made; however, local jurisdictions cannot relax State codes. Local amendments must be filed with the State's Building Standards Commission and the California Energy Commission. The effective date of local amendments should coincide with the effective date of the State's model codes, which is January 1, 2023. Amendments or changes to the model codes are administered by the State's Building Standards Commission. Amendments or changes to the energy codes are administered by the State's California Energy Commission.

Reach Codes:

A reach code is any regulation that is more stringent than the current state adopted code requirement. Reach codes are commonly associated with energy codes but apply to any of the model codes. A reach code must meet the following requirements:

1. A reach code must be at least as stringent as the statewide code.
2. A reach code must be cost effective.
3. A reach code must be approved by the California Energy Commission.
4. A reach code needs to be re-approved with each Energy Code update.

There is no mandate or timeframe to adopt reach codes. Local jurisdictions have flexibility on the content and timing of reach codes, provided amendments meet the minimum of the applicable model code.

Reach provisions add to the cost of construction relative to the model codes; however, costs can be recovered over time thereby making the provisions cost effective and save the homeowner money in the long term. Many assumptions and variables go into evaluating costs and savings. Some of these include the number of people in a given house, their behavior, the orientation of the dwelling as related to the sun, shading from trees and other structures, cost and longevity of electric appliances versus gas appliances. As discussed later in this staff report, Sonoma County may need to develop its own cost-benefit analysis.

California Energy Codes:

At the April 2022 building code workshop, the Board of Supervisors directed staff to evaluate the proposed model codes, including potential additional requirements for 100% electric homes.

The 2022 California energy codes will require newly constructed dwellings to be *100% electric ready*. Dwellings will have to be constructed with the infrastructure to accommodate electric stovetops, electric clothes dryers, energy storage (batteries), and heat pumps - but not that these appliances/equipment be installed. In contrast, a 100% electric dwelling would entail the installation of all electric appliances for

cooking, clothes drying, heating/cooling, and water heating. Additional requirements could include mandatory heat pumps, energy storage systems (batteries), or additional solar panels above the energy code requirements.

The existing 2019 and proposed 2022 State energy codes require dwellings to have solar panels based on a formula predicated on square footage and climate zone. Sonoma County lies within [climate zones](https://cecgis-caenergy.opendata.arcgis.com/datasets/california-building-climate-zones/explore?location=37.875356%2C-122.532652%2C8.00) [one and two](https://cecgis-caenergy.opendata.arcgis.com/datasets/california-building-climate-zones/explore?location=37.875356%2C-122.532652%2C8.00) where the minimum solar system size is approximately one to two watts per square foot and would generate between two to three and a half watt-hours per square foot. A typical panel ranges from 200-350 watts per panel.

Current code provides an exception to the solar panel requirement for sites and/or structures that cannot accommodate solar panels. The exception is based on factors such as significant tree canopy and steep terrain where limits on sunlight exposure render power production from solar panels ineffective.

The 2022 California energy codes, which will be in effect on January 1, 2023, will expand the solar panel and battery storage requirement to non-residential structures such as schools, office buildings, retail shops, warehouses, groceries and similar occupancies.

Gas Stovetops:

At the Board's April workshop, a health concern regarding the use of natural gas and carbon monoxide emissions was raised. Several literature sources provide guidance:

- Carbon monoxide is a colorless, odorless and poisonous gas produced by incomplete burning of solid, liquid or gaseous fuels.
- Residential natural gas cooking burners (NGCBs) can emit substantial quantities of pollutants, especially if used without venting range hoods.
- Simulation results suggest that regular use of even moderately effective venting range hoods dramatically reduce the percentage of homes in which concentrations exceed health-based standards. 1
- Non-fire carbon monoxide poisoning accounted for up to 1,200 deaths per year making it one of the leading causes of poisoning death in the United States.
- Potential sources of non-fire carbon monoxide include poorly functioning heating systems, improperly vented fuel-burning devices (egg, kerosene heaters, charcoal grills, camping stoves, gasoline-powered electrical generators), and motor vehicles operating in poorly ventilated areas (egg, ice rinks, warehouses, parking garages).

Since 2016, the model building codes have contained local ventilation exhaust requirements for kitchens and bathrooms.

1-Environmental Health Perspectives; Vol. 122, No. 1; <https://ehp.niehs.nih.gov/doi/10.1289/ehp.1306673>

2-UpToDate website; Carbon monoxide poisoning;

<https://www.uptodate.com/contents/carbon-monoxide-poisoning/print#:~:text=The%20case%2Dfatality%20rate%20for,for%20inadvertent%20exposure%20%5B4%5D> <https://www.uptodate.com/contents/carbon-monoxide-poisoning/print>;

3-Local Ventilation Exhaust Requirements [ASHRAE 62.2, Section 5]: In addition to meeting the Whole-Building Ventilation Requirements discussed in the previous section, ASHRAE 62.2 requires that each kitchen and bathroom have a local ventilation exhaust system installed that exhausts indoor air to outside the dwelling.

Topography and Bio-Diversity:

Sonoma County has diverse and varied topography and forestation. While some areas pose little challenge to solar power siting, others have significant tree canopy and steep slopes. Many building sites simply do not receive enough sunlight to make solar photovoltaics an efficient source of energy. If the all-electric codes are adopted, some structures will not have the ability to generate on-site electricity, making them more dependent on the electric grid.

Energy storage systems, or batteries, can supplement power demands (storage in off-peak times and used during peak times) or be used for short-term energy during power outages. Energy for UV restricted sites is generated offsite and delivered to the home.

Off-Site Generation of Electricity:

An all-electric dwelling that is either a UV restricted structure and/or without energy storage systems, would be reliant upon the electric grid for power. Power outages lasting more than several hours would become problematic for heating or cooling, cooking, and in some cases drinking water drawn from on-site wells. In some instances, “boil water” notices or health advisories are issued instructing citizens to boil their water before consumption. Winter storms, localized power outages and boil water notices tend to go together. The need to boil or disinfect water could be problematic for an all-electric dwelling during a power outage.

Options include:

1. Implement the California 2022 model energy codes for 100% electric ready dwellings.
2. Adopt a requirement for 100% electric dwellings.
3. Adopt a requirement for energy storage for power during outages.
4. Adopt an exception allowing natural gas or propane service for cooking.
5. Adopt an exception allowing a natural gas, propane, gasoline or diesel generator.

In 2021, fifty percent of the electricity generated in California was generated with natural gas.

In 2020, it was forty-eight percent. There are energy losses during the conversion of natural gas to electricity and also during the transmission of electricity. Depending on how the electricity is generated and the distance of transmission, using natural gas directly may be a more efficient energy source and have fewer emissions than using natural gas generated electricity from the power grid.

1-California Energy Commission: <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2021-total-system-electric-generation>

2-California Energy Commission: <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation/2020>

Options include:

1. Implement the 2022 model energy code for 100% electric ready dwellings.
2. Adopt a requirement for 100% electric dwellings.
3. Adopt a requirement for solar systems to match the energy demand.
4. Adopt an exception allowing for natural gas or propane service for cooking.

Cost Benefit Analysis:

In the 2019 code cycle, many California jurisdictions adopted reach codes for energy, mainly requiring 100% electric homes. Many of the jurisdictions relied on the same cost-benefit analysis that was produced by a third party thereby reducing the staff effort and expense of adopting the energy related reach codes.

For the 2022 code cycle, most municipalities within Sonoma County (City of Santa Rosa, City of Petaluma, City of Rohnert Park, City of Sebastopol, City of Healdsburg and the Town of Windsor) are all considering the REACH codes to varying degrees. The Cities of Santa Rosa and Petaluma are proposing 100% electric homes and no gas service. The City of Healdsburg is proposing 100% electric homes with an exception for cooking. The other jurisdictions are in the process of evaluating the options.

There are geographical differences between cities and counties. Given the rural nature of many locations within unincorporated Sonoma County, the standardized cost benefit analysis utilized by many jurisdictions within the State may not reflect accurately the topographic and biological diversity of Sonoma County. One example is power outages. Additionally, power is often restored within a city much more quickly than in the rural county.

Given the variation of the energy related reach codes being contemplated, the County may need to create its own cost benefit analysis depending on the Board's direction or it may be possible to utilize the same or similar cost benefit analysis that many other local jurisdictions have relied upon. For example, should the County require 100% electric homes in an area where solar panels are not effective, that would affect the cost benefit analysis and potentially lead to the Energy Commission requiring a revised cost benefit analysis.

Remodels/Additions:

The 2022 code cycle will apply to remodeling of and additions to existing residences in part. For example, there is no requirement to convert appliances to all electric appliances or to install solar panels during a remodel or addition, however the current insulation requirements are applicable. The current building code has thresholds for comprehensive upgrades for flood mitigation and energy conservation. While solar panels are currently required by the State's energy code on new construction, staff found at least one local jurisdiction, the City of Petaluma, that does require 100% electric homes for 50% additions or 50% remodels.

Options include:

1. Adopt the 2022 model energy codes for 100% electric ready dwellings;
2. Adopt a requirement for 100% electric dwellings;
3. Adopt a requirement to convert to a 100% electric ready dwellings within existing dwellings based on a percent improvement;
4. Adopt a requirement to convert to a 100% electric dwellings within existing dwellings based on a percent improvement.
5. Adopt a requirement to install a solar system per the energy code formula based on a percent improvement.

6. Adopt a requirement to install a solar system matching the energy demand based on a percent improvement.
7. Adopt an exception allowing for natural gas or propane service for cooking.

Fire Rebuilds:

Fire rebuilding was exempted from the solar panel requirement using the County's authority under emergency disaster declarations. The 2022 code does not exempt fire rebuilds.

Self-Sustaining Homes:

The 2019 California Energy Code requires photovoltaics (solar panels) for each new dwelling. The amount of solar panels is set by a formula within the energy code and varies mainly based on the square footage of the dwelling and climate zone.

Solar system sizing is measured in watts or kilowatts. The energy code formula requires between one to two watts per square foot of conditioned space.

A 2,000 square-foot home is required to install 2,860 watts of solar panels in climate zone one and 2,460 watts in climate zone two. These solar panels would generate approximately 464 and 413 kilowatt hours per month, respectively, averaged over a year. The estimated average consumption is nearly 1,500 kilowatt hours per month for a mixed fuel dwelling and estimated to be 725 kilowatt hours per month for an all-electric dwelling. The minimum required solar system per the California energy code does not satisfy the electricity demand of an average dwelling.

Energy storage systems or batteries can assist with reducing peak demand from the grid. However, energy storage or batteries would not assist in the overall generation or consumption of energy. Additional solar panels would be needed on each dwelling to make the dwelling self-reliant, to reduce the overall burden on the electrical grid, and to reduce the demand on natural gas generated electricity.

Options include:

1. Continue to enforce the proposed energy code solar panel formula
2. Incentivize additional solar panels to meet the energy demand of dwelling
3. Require additional solar panels to meet the energy demand of the dwelling

Building Regulations for Tiny Homes and Emergency Housing

Tiny homes in California Residential Code:

The California Residential Codes defines a "tiny house" as a dwelling 400 square feet or less excluding lofts. These structures are subject to the same building codes as other dwellings with a few differences such as minimum ceiling height, stairways accessing lofts, and lofts used as sleeping areas.

These buildings are permit-able under the building code and can be stick built onsite or built in a factory and transported to the site in whole or in part and assembled. Both building types are allowed under the building code but regulated slightly differently. For site-constructed dwellings, Permit Sonoma conducts a plan review, issues a permit and inspects the construction. For factory-built structures, the State Department of Housing and Community Development (HCD) is the lead agency. Permit Sonoma inspects only the foundation and connections (wall-to-foundation, wall-to-wall connections, connections to infrastructure) for the

manufactured homes or factory-built dwellings. Both types of structures are considered permanent dwellings.

Tiny home on wheels:

The California Building Code also recognizes recreational vehicles, travel trailers, park trailers, something on a trailer or with wheels, self-propelled or towed. There are components that require inspection such as plumbing, electrical wiring, structural integrity, etc. The building code has a process for these structures which requires compliance with the California Vehicle Code and the Department of Motor Vehicle's regulations and requires the proper American National Standards Institute (ANSI) certification. Manufacturers are expected to abide by the regulatory framework, work with HCD and to have their units ANSI certified. There is a pathway for after the fact ANSI certifications, but we recommend going through the process up front. These are allowable under the building code as temporary dwellings.

Permit Sonoma Temporary Housing:

The County currently allows temporary housing in four scenarios: housing during construction; caregiver housing, farm-worker housing and fire rebuilding. The most common housing unit is a mobile home, travel trailer or recreational vehicle. The County requires connection to a water supply and connection to an on-site septic system for the first three types and does allow a hold and haul option for wastewater for fire rebuilds.

Staff recommends adding a fifth use of temporary housing for the general public. Proposed requirements include:

- The unit is to be used only for residential use;
- The owner cannot rent the unit for more than the "Extremely Low Income Rent Limit for a Studio"; and
- The unit shall have the proper insignia or licensing; and
- One unit per parcel in addition to the main residence, and accessory unit and a junior accessory unit.

Existing requirements with section 26-88-010 for other temporary housing which would apply to this proposal include:

- Parcel size of 6,000 square feet or more.
- Placed on a legal parcel with an existing primary residence;
- Connections to existing well or public water system;
- Comply with zoning setbacks; and
- An administrative permit shall be obtained; permit shall expire after one year; permits may be renewed annually

Waterless Toilets:

Each code cycle, Permit Sonoma has historically added a provision requiring flush toilets. To facilitate waterless toilets, staff recommends adding language that affirmatively adds non-flush toilets to this section of the Sonoma County Code.

Waterless toilets solve one component to the total domestic wastewater flows. Other wastewater flows such as showers, laundry and/or kitchen wastewater will be generated and need a system for proper disposal.

Wastewater:

For temporary housing, several options exist including:

1. A hold and haul option similar to the one used for fire rebuilding efforts
2. The evaluation of existing septic systems relative to capacity
3. Exclude reserve areas from evaluation
4. If the existing system does not have the capacity, either an expanded system or a new septic system should be required

For permanent housing, staff recommends the current regulations.

Water Supply:

For permanent dwellings, current regulations treat each dwelling as one connection. Depending on the water availability zone, adding dwellings has no additional regulations (zone 1 and 2) to requiring a well-water yield test (zone 3 and 4).

For temporary dwellings, staff recommends no testing for water availability.

For permanent housing, staff recommends the current regulations.

Private Homeless Shelters:

In August 2020, in response to a declared shelter crisis, the Board adopted amendments to the California Building Code (Appendix O) and to the California Residential Code (Appendix X). These two appendices allow options to traditional housing, during times of a declared shelter crisis.

Appendix O and Appendix X include various types of temporary housing to be occupied only during a declared state of emergency, local emergency or shelter crisis. These include sleeping cabins, transportable housing units (recreational vehicles, park trailers, mobile homes, select manufactured homes), tents and membrane structures.

The August 2020 building code adoption included amendments to allow use of Appendix O and Appendix X for housing projects owned, operated, erected, or constructed by, for or on behalf of the County of Sonoma on land owned or leased by the County of Sonoma. At the time, the County was addressing a large number of homeless encampments and was intent on providing government-sponsored beds for these individuals. Nearly two years later, the housing crisis has not abated and additional solutions are being sought.

One option available for consideration may be to expand the application of Appendices O and X to private property. Staff have reviewed legislative history and there does not appear to be any law or precedent to disallow this option.

California Fire Code:

For temporary dwellings, staff recommends no additional fire resistant construction or mitigation measures beyond those required by the model building codes.

For permanent housing, staff recommends the current regulations.

Electric Vehicle Infrastructure Training Program

As your Board considers questions around EV infrastructure and readiness, staff requests direction about requiring minimum training and certification for installers of EV infrastructure. Pursuant to AB 841 (Ting, Statutes of 2020), electric vehicle infrastructure installations that are funded in whole or in part through the California Air Resources Board, the California Energy Commission, or the California Public Utilities Commission must be installed or overseen by at least one electrician certified by the Electric Vehicle Infrastructure Training Program (EVITP); the exact number of certified installers is based on the size and kW capacity of the infrastructure project.

EVITP is a collaboration of industry stakeholders including: automakers, EV infrastructure manufacturers, educational institutions, utility companies, electrical industry professionals and key EV industry stakeholders. Certification by EVITP is available to any state-licensed electrician and costs about \$275, plus class time and studying for the test. A County ordinance could require EVITP certification for County EV infrastructure projects, for EV infrastructure projects funded by the County, or for any EV infrastructure project. In developing a proposed ordinance, staff could evaluate infrastructure safety and reliability issues, cost considerations, and other impacts such as public acceptance, and recommend a preferred path. The cities of Petaluma and Rohnert Park have already approved ordinances requiring EVITP certification for specified EV infrastructure installations, and other cities are considering similar ordinances; staff would evaluate the benefits and impacts of aligning with their requirements.

Recommendations:

Energy Codes:

Staff recommends the following:

1. Adopt the proposed model energy codes as written, i.e. 100% electric ready dwellings per the 2022 model building codes; or
2. 100% electric dwellings
 - Require solar systems to match the energy demand of the dwelling;
 - Provide exception for cooking with propane or natural gas.
 - Provide exception for building sites that are UV limited

Housing:

Staff recommends the following:

1. Follow the California residential and fire codes for small dwellings less than 400 square feet.
2. Follow the California residential and fire codes for tiny homes on wheels (ANSI certifications).
3. Expand use of the temporary housing to include a fifth generalized category for the general public.
4. Require a source of potable water.
5. Require a permanent septic system.
6. Require utility connections for electricity and/or natural gas or propane.
7. Modify Sonoma County Code to allow flush and non-flush toilets.
8. Modify the emergency housing appendixes to allow for private homeless shelters.

Prior Board Actions:

Not applicable

FISCAL SUMMARY

Depending on Board direction and the ultimate code updates, Permit Sonoma staff will evaluate whether additional resources to implement and regulate the Board's direction are needed.

Narrative Explanation of Fiscal Impacts:

Not Applicable

Narrative Explanation of Staffing Impacts (If Required):

Depending on the Board direction and the ultimate code updates, Permit Sonoma will evaluate whether additional staffing resources to implement and regulate the Board's direction are needed.

Attachments:

Attachment 1: Staff PowerPoint

Attachment 2: Summary of Options

Related Items "On File" with the Clerk of the Board:

None