Building Retrofits for Energy Efficiency

What is this measure?

This measure would provide incentive funding to help Santa Barbara County residents add a variety of energy efficiency and weatherization retrofits to their homes. Specific retrofits/improvements could include insulation, window upgrades, upgrades to heating, cooling and air filtration equipment, energy efficient appliances, and other energy efficiency improvements. Home improvements can be very costly, and incentive funding can help reduce the economic burden and allow more projects to proceed. Long-term energy savings also have long-term greenhouse gas reduction implications, as well as long-term savings to local homeowners.

Why would someone do this as mitigation?

Santa Barbara's housing stock includes many older homes using more energy, in the form of electricity and natural gas, than they have to. More than half of Santa Barbara County's homes were built before California's increasingly stringent "Title 24" energy efficiency requirements came into effect.[1]

Weatherization updates to these homes can greatly reduce the amount of energy used to cool and/or heat a home, as well as the amount of electricity and/or natural gas used by appliances such as washers and dryers, water heaters, lighting and refrigerators. Reducing electricity usage indirectly reduces GHG emissions by drawing less power from the electrical grid; the amount of reductions varies depending on the type of power provided by the local utility, and the amount of renewable power generation that is present on the "grid". Reducing natural gas consumption results in direct GHG reductions by reducing the amount of gas burned in the onsite equipment.

The retrofits described above can also be applied to multi-unit dwellings and institutional buildings. When coupled with onsite renewable energy generation such as rooftop solar photovoltaic panels or solar water heating (also called solar thermal), retrofit projects can do even more to reduce GHGs. Retrofit projects that convert natural gas appliances to electrical appliances, combined with solar photovoltaic or solar thermal, can help bring home energy use closer to being "carbon neutral". Retrofit projects combined with renewable generation can also be designed as "zero-net-energy, in that they generate approximately the same amount of energy as they use.

Improving California's housing stock to be more energy efficient aligns with the state's climate planning goals to reduce energy consumption in the built environment. Including renewable energy generation as part of a building retrofit also aligns with California's goals to increase renewables. [2]

Weatherization retrofits can improve the indoor air quality for building occupants not only by allowing for safer and healthier indoor temperatures in extreme weather conditions, but also by providing for better air filtration and circulation. Insulation coupled with better air circulation and treatment reduces the likelihood that condensation causes moisture build-up and consequently mold problems.[3]

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[1]California Title 24: www.energy.ca.gov/title24/

[2] California Senate Bill 350 calls for establishing annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas end uses by 2030, and also to increase California's use of renewable energy to a 50% renewable portfolio standard by 2030, www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

[3] Molds have been implicated as the cause of a variety of health effects in humans ranging from minor allergic reactions and exacerbation of asthma, to more severe health effects, www.library.ca.gov/crb/01/notes/v8n1.pdf.

A program that targets low-income residents has the ability to realize projects that may not otherwise happen. Homeowners in low-income areas may be have less disposable income to make home improvements; and, property owners of multi-unit dwellings have less incentive to do energy efficiency upgrades if the cost of energy usage is passed along to residents, and the monetary savings will not benefit the property owners.

How would you implement this measure?

Implementing Agency

This type of measure could be implemented in a variety of ways:

- A local land use agency, such as a city or the county, could provide a monetary incentive for qualifying retrofit projects that apply for building permits. Incentives could also be reserved for low-income applicants, or for projects located in certain designated low income and/or disadvantaged communities.
- A local housing authority, or a nonprofit organization that manages government-owned or subsidized housing, could apply mitigation funds directly to building improvement projects that increase energy efficiency and also potentially include solar photovoltaic or solar water heating.
- A city or county could include a measure in a climate action plan that focuses on energy efficiency through building retrofits and the use of renewables.[4]

The District is particularly interested in feedback from other agencies, nonprofit groups, and the public as to who would implement such a program, and how.

Enforceability

If this measure were implemented for CEQA mitigation, it would likely be enforced through conditions of approval, and an implementing agency or organization would be held accountable for developing a plan and following through on the spending of mitigation funds on qualifying projects. A binding document such as a memorandum of understanding or a grant agreement, between the provider of the funds and the implementing entity, would ensure that the program is run properly, and that funds are used to yield the expected GHG reductions.

Interaction with Existing Programs

For several decades, California has implemented aggressive energy efficiency improvements by way of regulation. The California Title 24 energy efficiency requirements are enforced through local building code and permit processes, and are generally only triggered for new buildings or projects that involve significant alterations of existing buildings. Some voluntary programs, such as residential PACE programs,[5] focus on energy upgrades to existing buildings, but they are voluntary, are generally underutilized, and mostly offer financing as opposed to rebates or incentives. Implementing an incentive program that targets projects that would not trip Title 24 requirements, and would not have been done otherwise, is an important consideration for this type of project to be considered adequate mitigation.

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[4] For example, Santa Barbara County has adopted an Energy Climate and Action Plan: longrange.sbcountyplanning.org/programs/climateactionstrategy/climateaction.php

[5] Examples: Energy Upgrade California, www.energy.gov/savings/energy-upgrade-california; Empower SBC: www.empowersbc.org/home

The California Energy Commission is implementing an Energy Action Plan, with 10-year roadmap to transform existing residential, commercial, and public building stock into high-performing and energy efficient buildings.[6] This plan is a comprehensive, long-term strategy that addresses buildings throughout the state, and is currently in the early planning stages. Santa Barbara County may eventually see benefits from this effort; however, it does not currently involve a requirement to do energy efficiency upgrades, nor does it offer monetary incentives for retrofit projects.

How would you quantify the benefits?

The California Air Resources Board has developed a *Greenhouse Gas Greenhouse Gas Quantification Methodology for the Department of Community Services and Development Low-Income Weatherization Program Single-Family Energy Efficiency & Solar Photovoltaics*.[7]

This methodology provides separate calculations for energy efficiency projects, solar water heaters, and solar photovoltaics. For energy efficiency projects only, the methodology involves developing an assumed amount of GHG reduced per residential unit, per year. Based on historical information, a rate of .46 metric tons per home is assumed. However, different "treatment options" can change this value, and other studies have shown higher rates. The methodology also assumes an average effective project life of 15 years. The methodology is easily scaled to fit different retrofit "treatment options" (e.g., thermostat, attic/roof insulation, air sealing, and other treatments) and correspondingly different GHG reduction rates per residential unit. For any project to proceed, the amount of GHG reductions per unit should be based on the treatment options, GHG intensity of the local utility, and reasonable estimates for project life/effectiveness of measures.

Questions for Discussion

- Which agency or nonprofit group would be best suited to implement this measure?
- Would it be preferable to implement this as an incentive measure, or to directly implement projects?
- What areas in Santa Barbara County would benefit from energy efficiency and/or weatherization retrofits?
- Should this prioritize low income residences? Multi-unit dwellings? Single-family homes?
- Should businesses or commercial buildings be included? Institutional facilities, such as schools or government-run buildings?
- What types of energy efficiency and/or weatherization retrofits would best benefit Santa Barbara County communities?

Input Received

Comments Made at Workshops

Opportunities:

- Combine installing solar PV with energy efficiency retrofits and battery storage.

[6] California Building Energy Efficiency Action Plan: www.energy.ca.gov/ab758/; 2016 Existing Buildings Energy Action Plan Update, docketpublic.energy.ca.gov/PublicDocuments/16-EBP-01/TN214801_20161214T155117_Existing_Building_Energy_Efficency_Plan_Update_Deceber_2016_Thi.pdf.

[7] www.arb.ca.gov/cc/capandtrade/auctionproceeds/csd_liwp_finalqm_15-16.pdf

- Conduct energy efficiency outreach to multi-unit dwellings:
    a. Get lists of HOAs and condo associations and reach out to them about benefits of energy efficiency and EV charging stations.
    b. Give presentations to contractors' associations.
    c. Target new Average Unit Density (AUD) projects.
- Reach out to local realtors about emphasizing the benefits of energy efficiency to prospective buyers and sellers.
- Target low and middle income households for energy efficiency retrofits. Offer more incentive funding for lower income.
- The County of Santa Barbara has a Direct Install energy efficiency program, however, it could be advertised better.
- Direct Install instead of incentives recommended for energy efficiency retrofits.
- Energy efficiency retrofit projects should focus on existing building stock; new homes are already much more efficient and moving towards zero net energy.
- Municipalities could require new residential units to retrofit to zero net energy.
- Could free energy efficiency audits be considered for mitigation funding?
- The County of Santa Barbara already has energy coaches available for single family residences that are very basic. However, there is a big opportunity in the commercial space for energy efficiency audits.
- Schools could benefit by tying mitigation funding to actual energy efficiency projects instead of incentives.

Challenges:

- There is a need to address energy efficiency in addition to solar (energy efficiency retrofit first, and then install solar PV).
- How do you incentivize property managers to install energy efficiency retrofits? Renters and multifamily housing are an untapped potential for implementing energy efficiency retrofits but have unique challenges; property owners are responsible for costs, while tenants enjoy benefits.
- Building codes can be roadblocks for energy efficiency retrofits.
- It is really difficult to quantify energy efficiency GHG reductions – is it going to audits or measures? What kind of measure? Each retrofit option is unique and has a different potential for reducing GHG emissions, and thus, needs to be quantified separately.

Potential Implementers:

- County of Santa Barbara

Comments Submitted in Writing

The Community Environmental Council (CEC) submitted a letter on July 5, 2017.[8] The full letter is available on the District's website. Below is a summary of the comments from the letter related to energy efficiency retrofits:

[8] Comments from the Community Environmental Council (CEC) were received July 5, 2017 (prior to the workshops). Some of the comments were already addressed in the workshop materials, see www.ourair.org/ghgmitigation-sbc/.

- Encourage staff to consider a longer mitigation life for energy efficiency measures. Depending on the suite of energy efficiency retrofits available for local GHG mitigation, a longer mitigation life may be justified.
- It is hard to prove additionality with this measure since some individuals and organizations would move forward with retrofits without incentives for energy efficiency improvements.
- The cost of energy efficiency retrofits present financial barriers to lower-income households, as documented in a recent report from the California Energy Commission[9].
    a. Prioritizing incentives for lower-income households or areas, such as those designated by CARB for the implementation of Assembly Bill 1550, would increase the likelihood of energy efficiency offsets achieving additional GHG emission reductions[10].

Additional District Discussion

At this time, the District has not estimated GHG emission reductions for a hypothetical "energy efficiency + solar" combination measure. However, we recognize that there are potential benefits to retrofitting a unit with energy efficiency upgrades prior to installing solar PV, and encourage lead agencies to explore this option.

[9] SB 350 Low-Income Barriers Study, Part A – Commission Final Report. Adopted December 14, 2016.
[10] Disadvantaged and Low-income Communities Investments - California Air Resources Board. Last reviewed April 20, 2017.