California Air Resources Board

Sacramento, CA

RE: Comments on Public Health and Energy Efficiency presentations, Scoping Plan workshop, Nov. 7, 2016.

Please assess the energy-related and non-energy benefits of accelerating energy efficiency efforts in existing homes, where much of California's GHG emissions come from. Without some careful analysis and consideration of this opportunity, stakeholders and the public in general cannot evaluate how well the draft Scoping Plan will meet the goals for 50% energy use reduction and weatherization of all eligible homes, and improvements in human health and environmental equity.

Also, with likely reduction in federal support for low income weatherization programs in the near future, California may fall even shorter of its GHG reduction targets and climate adaptation than planned.

Here are a few examples of information to consider on the benefits and need to weatherize existing homes, especially for vulnerable populations.

* Wx programs funded by DOE and states have a long history of success in reducing energy use, lead exposures, moisture problems, combustion safety hazards, and safety hazards for vulnerable populations.
* Potential IEQ and health problems can be avoided in Wx programs if they follow current best practices: "Build Tight, Ventilate Right, and Don't Suck (depressurize)".
* A recent national survey by ORNL found that homes in DOE's WAP program, which puts a limit on air sealing of existing homes unless a ventilation system is provided, at one year after Wx the households reported a wide array of health and well being improvements (co-benefits or non-energy benefits) ([Hawkins and Tonn, 2016)](http://homeenergy.org/show/article/nav/weatherization/id/2134).
* Furthermore, fewer clients reported behaviors that produce indoor air pollution, and more clients reported increased thermal comfort and reduced draftiness, moisture, mold, and mildew. The monetized value of the health- and household-related benefits for the US was estimated to be $3.8 B (PY 2010, present value, not including large multifamily buildings).
* A recent study using similar methodology was conducted for the Massachusetts low income Wx program ([Hawkins et al., 2016](http://ma-eeac.org/wordpress/wp-content/uploads/Low-Income-Single-Family-Health-and-Safety-Related-Non-Energy-Impacts-Study.pdf)) Substantial non-energy benefits were identified and monetized. Reduced numbers deaths and hospitalization from thermal stress (extreme heat or cold) were major factors.
* Major risk factors in heat wave deaths and hospitalizations are the lack of air conditioning (and presumably the lack on insulation, efficient windows, external shading, etc.), and the inability to afford using the AC.
* Vulnerable populatons such as the growing number of elderly receive most of their heat exposure indoors. UCLA and Arizona State University are currently using property tax records to model and map the thermal and cooling system characteristic of existing Los Angeles and Phoenix housing stock and how long the homes will stay habitable in a heat wave. This type of information, or preferably actual field data on the housing stock, should be used to target the most vulnerable neighborhoods for weatherization and other adaptation and mitigation measure for extreme heat. Such mapping of housing stock and heat exposure has already been done in the UK, Toronto, and Houston.

Source: [Chester et al., Sept. 28, 2015 presentation](http://urbansustainability.lab.asu.edu/heat.php#presentations)**. Prioritizing Cooling Infrastructure Investments for Vulnerable Southwest Populations**. Los Angeles Technical Advisory Team.

* In a modeling study of indoor and outdoor heat hazards in Berlin, Germany, trees, facade and roof greening, cool roofs and cool pavements had a low impact only on indoor hazards. Measures at the building level, namely cool roofs and facade greening, performed best. "However, passive cooling and air-conditioning were most effective. To reduce the number of excess deaths in a changing climate, combined measures are necessary." ([Buchin et al., 2015](http://www.sciencedirect.com/science/article/pii/S0378778815300657). **Evaluation of the health-risk reduction potential of countermeasures to urban heat islands.**).

In addition to opportunities in existing homes and other buildings, please consider nor integrated adaptation approaches to saving energy, improving public health, and creating jobs, e.g.:

* Weatherization Plus Health, e.g.,  [Washington state](http://www.commerce.wa.gov/growing-the-economy/energy/weatherization-and-energy-efficiency/matchmaker/) is matching additional funding to improve the home environments for children and adults with asthma (plus weatherizing the homes).
* Inclusion of resilient design measures for future extreme heat and other highly probable climate changes.  Current building design standards are unlikey to provide thermally comfortable and safe buildings over their life cycle as our heat waves increase in frequency, duration, intensity, and, in some cases, humidity.
* Identifying and targeting buildings and populations most likely to be vulnerable to extreme heat. The UK has done this in their extreme heat plan to protect public health.
* Neighborhood-scale residential and commercial Wx (Colorado is piloting this approach)
* Industrialized approaches for multifamily homes to scale up Wx, reduce costs, and accelerate GHG reductions. The Netherlands has implemented such an approach, and a program in the UK has started to do so recently.

Sincerely,

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