

**DOCKETED**

<b>Docket Number:</b>	18-IEPR-08
<b>Project Title:</b>	Energy Equity
<b>TN #:</b>	223812
<b>Document Title:</b>	Sierra Club Comments on CLIMB Action Plan and Workshop
<b>Description:</b>	N/A
<b>Filer:</b>	System
<b>Organization:</b>	Rachel Golden/Sierra Club
<b>Submitter Role:</b>	Public
<b>Submission Date:</b>	6/13/2018 4:48:45 PM
<b>Docketed Date:</b>	6/13/2018

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*Submitted On: 6/13/2018*  
*Docket Number: 18-IEPR-08*

**Sierra Club Comments on CLIMB Action Plan and Workshop**

*Additional submitted attachment is included below.*



March 16, 2018

California Energy Commission  
Dockets Office, MS-4  
1516 Ninth Street  
Sacramento, CA 95814-5512

Subject: Sierra Club Comments on CEC draft staff report, *Clean Energy in Low-Income Multifamily Buildings Action Plan*, and May 29, 2018 workshop (Docket #18-IEPR-08)

Dear Commissioners:

The Sierra Club appreciates the opportunity to comment on the California Energy Commission (CEC) draft staff report, *Clean Energy in Low-Income Multifamily Buildings (CLIMB) Action Plan* and the IEPR Energy Equity workshop on May 29, 2018.

The panelists at the workshop as well as the draft CLIMB Action Plan clearly explain the challenges to improving access to energy efficiency and clean energy resources for low-income residents, particularly in multi-family buildings. As Commissioner McAllister eloquently explained, “If we cannot find ways for all Californians to benefit tangibly from the clean energy economy, we will not be able to claim true success.” Success requires that state agencies and stakeholders prioritize energy equity in clean energy programs and policies across the state.

While visionary and forward looking in many respects, Sierra Club is concerned that the CLIMB Action Plan overlooks a critically important clean energy resource: beneficial electrification or ‘fuel-switching’ from fossil fuels to clean electricity. As such, our comments are focused on laying out the clean energy and non-energy merits of electrification, and the policies and programs necessary to ensure that low-income multi-family buildings have access to this vital clean energy resource.

We strongly recommend that electrification and fuel-switching policies and programs be integrated into and highlighted in Chapter 6 “Improve Existing and Future Program Design,” Chapter 7 “Identify Additional Resources and Deployment Opportunities,” and Chapter 8 “Increase Outreach, Awareness, and Access” of the report.

Our comments are organized as follows:

1. Building electrification is a key energy efficiency, demand response, and clean energy resource
2. Building electrification lowers the cost of new construction and can reduce the operating costs of existing multifamily low-income homes

3. Building electrification provides significant non-energy benefits including improved air quality and health, safety, comfort and climate resiliency, increased investment in local economy, and local jobs
4. New policies are needed to increase access to electrification for low-income multi-family buildings

**Discussion**

**1. Building electrification is a key energy efficiency, demand response, and clean energy resource.**

Electrification of thermal loads (water heating, space heating, clothes drying, and cooking) offer an important opportunity to reduce energy consumption in multifamily homes. Ongoing advances in electric heat pump technology have led to significantly more savings potential from fuel substitution measures than from tradition same-fuel energy efficiency upgrade measures. Figure 1 demonstrates that fuel substitution can more than double the energy savings of the most efficient gas upgrade.

Figure 1: Sample Retrofit Savings Potential for 50 Gallon, Gas-Fired Domestic Water Heater<sup>1</sup>

Gas-to-Electric Fuel Substitution Measure	Annual Site BTU Savings
Existing Conditions Early Retirement (ER) to HPWH, 3.5 EF	15,006,396
Existing Conditions ER to HPWH, 3.24 EF	14,668,608
Code Minimum Replace on Burnout (ROB) to HPWH, 3.5 EF	13,606,396
Code Minimum ROB to HPWH, 3.24 EF	13,268,608
ENERGY STAR, .68 EF to HPWH, 3.5 EF	11,206,396
ENERGY STAR, .68 EF to HPWH, 3.24 EF	10,868,608
Tankless, EF .92 EF to HPWH, 3.5 EF	8,506,396
Tankless, EF .92 EF to HPWH, 3.24 EF	8,168,608
Gas-to-Gas Measure	Annual Site BTU Savings

<sup>1</sup> Per CPUC practice, all water heating savings calculations use DEER unit energy consumption values from the “Updated DEER DHW Calculator Workbook” at <http://deeresources.com/index.php/deer-versions/deer2019-and-june-2017-updates>. Note that DEER values tend to be very conservative. For example, the projected savings value for the gas to electric measure in this example increases to 20,000,000 BTUs if unit energy consumption values from the Northwest Regional Technical Forum are used for the calculations.

Existing Conditions ER to Tankless, EF .92	6,800,000
Code Minimum ROB to Tankless, .92 EF	5,100,000
Existing Conditions ER to ENERGY STAR, .68 EF	3,800,000
ENERGY STAR, .68 EF to Tankless, .92 EF	2,700,000
Code Minimum ROB to ENERGY STAR, .68 EF	2,400,000

Investor owned utilities (IOUs) do not currently offer fuel-substitution measures in Energy Efficiency programs due to the limitations of the California Public Utilities Commission (CPUC) *Three Prong Fuel Substitution Test*. The CPUC is scheduled to review and potentially update the Test in 2018.

There are some important efforts underway including Marin Clean Energy’s *Low Income Multifamily Tenants (LIFT) program*<sup>2</sup> and Sacramento Municipal Utility District’s rebate programs to support electrification and other efficiency upgrades. However, beneficial electrification measures remain a major missed opportunity for energy efficiency in California.

Building electrification also offers an important demand response resource that can support the integration of higher levels of renewables onto the grid and improve overall grid flexibility. For example, electric heat pump water heaters -- whether configured as a central system for the entire building or per unit) can be programmed to heat water in the afternoon, i.e. the belly of the duck curve, when there is ample solar on the grid, and store that hot water in the tank for at least 24 hours, thereby avoiding the need to heat water during peak periods when a gas plant is likely to be the marginal unit of electricity generation. Demand response programs that capitalize on programmable or grid-connected water heating are one area where California is a laggard. Utilities in Oregon, Washington, Florida for example are already employing successful hot water demand response programs.

**Recommendation:** The CLIMB Action Plan should include an action item that state agencies will establish a public process in 2018 for utilities and stakeholders to design programs to offer incentives, financing, education, and/or other support for multifamily building owners, especially those of low-income housing, to electrify end uses.

## **2. Building electrification lowers the cost of new construction and can reduce the operating costs of existing multifamily low-income buildings**

All-electric buildings can reduce the cost of construction of new multi-family affordable housing and also lower the utility bills for tenants, especially when paired with efficiency and solar.

According to analysis conducted by Stone Energy Associates, the cost of extending gas distribution lines to the main is roughly \$600 and when combining this cost with the installation of the gas meter, the cost of bringing gas to the unit increases to roughly \$2200 per multifamily unit.<sup>3</sup> Building all-electric would avoid significant costs of extending gas infrastructure (pipes, meter, and combustion safety equipment), and can lower the cost of new housing construction.

<sup>2</sup> Marin Clean Energy LIFT Program - <https://www.mcecleanenergy.org/lift/>

<sup>3</sup> Source: Stone Energy Associates, 16-BTSD-06: 2019 Building Energy Efficiency Standards, April 27, 2017. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=217420>.

When paired with energy efficiency and/or rooftop solar, all-electric multi-family buildings can also lower monthly utility bills for low-income tenants. Andrew Brooks, Director of West Coast Operations of the Association for Energy Affordability, provided important examples of the tenant bill savings at the CEC IEPR workshop on May 30, 2018. Brooks explained that the potential for increased cost from electrification is still speculative. AEA’s multifamily Low Income Weatherization Program (LIWP) projects that include electrification have resulted in lower utility bills even before rooftop solar was turned on and before electricity bills were adjusted to go to the all-electric heating baseline. Tenants are seeing bill savings with EE and electrification since Day One of project completion.

Outside of LIWP, there are numerous cases across the state of fuel-switching paired with energy efficiency and solar that led to bill savings for low-income families. For example, all tenants in the all-electric multi-family senior housing complex (26 units) in Fort Bragg saved on monthly utility bills amounting to annual bill **payback** of up to \$200/year.<sup>4</sup>

However, similar to other clean energy resources, the split-incentive program between building owners and tenants is an acute issue for multi-family electrification projects.

**Recommendation:** The CLIMB Action plan should direct state agencies and utilities, with input from stakeholder, to assess current tariffs and the potential for new electrification-friendly rates for low-income residents. Local governments should consider adoption of reach building codes to support all-electric new construction. The Title 24 2022 Code Cycle should consider the costs of gas infrastructure for all new construction.

### **3. Building electrification provides significant non-energy benefits including improved air quality and health, safety, comfort and climate resiliency, increased investment in local economy, and local jobs**

Sierra Club agrees with CLIMB Action Plan’s assessment that non-energy benefits are an important result of clean energy programs, particularly in low-income multi-family housing. Building electrification offers several non-energy benefits that should be highlighted in the Action Plan and considered by utilities when designing programs for low-income multi-family buildings.

- **Air quality and health**

The combustion of gas in household appliances like stoves, water heaters, and furnaces produces nitrogen dioxide, carbon monoxide, nitric oxide, formaldehyde, acetaldehyde, and ultrafine particles, all of which are harmful to human health.<sup>5</sup> Gas combustion pollutants can cause minor respiratory irritation and as well as more serious conditions; the California Air Resources Board warns that “cooking emissions, especially from gas

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<sup>4</sup> Kathleen Marshall and Sean Armstrong, “The Cottages at Cypress: A Zero Net-Energy Low-Income Senior Housing Development,” Home Energy Magazine, November/December 2015.

<sup>5</sup> See, Jennifer Logue *et al.*, “Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California” *Environmental Health Perspectives* Vol. 122 No. 1 pp. 43-50, (2013); Victoria Klug and Brett Singer, “Cooking Appliance Use in California Homes—Data Collected from a Web-based Survey.” Lawrence Berkeley National Laboratory (August 2011); John Manuel, “A Healthy Home Environment?” *Environmental Health Perspectives*, Vol. 107, No. 7 1999, pp. 352–357; Nasim Mullen *et al.* “Impact of Natural Gas Appliances on Pollutant Levels in California Homes” Lawrence Berkeley National Laboratory, 2012.

stoves, have been associated with increased respiratory disease.”<sup>6</sup> Young children and people with asthma are especially vulnerable to indoor air pollution. Over 85% of homes in California use gas for thermal end uses.<sup>7</sup> Replacing combustion appliances with all-electric zero-emission appliances will improve indoor air quality and health outcomes for low-income families.

- **Safety**

Gas appliances and pipelines also pose safety risks, particularly because of the fire hazards that result from fugitive methane. The problem of pervasive methane leakage from the gas system has been gaining attention: a recent report for the California Public Utilities Commission estimated that in 2015, over 6 billion cubic feet of methane leaked from the state’s gas system, mostly from “ungraded” or small leaks.<sup>8</sup> Methane leakage can be particularly hazardous for low-income families living in earthquake and fire-prone areas of California. Fires after earthquakes are exacerbated by leaking gas. The California Seismic Safety Commission identified that “the number of post-earthquake fire ignitions related to natural gas can be expected to be 20% to 50% of the total post-earthquake fire ignitions.”<sup>9</sup> Electrifying multi-family buildings is a key precautionary measure to reduce the risk and hazard of fires which can spread quickly between units.

- **Comfort and climate resiliency**

California is experiencing an increasing occurrence of extreme heat waves, with 2017 being the hottest summer on record.<sup>10</sup> Many Californians, particularly low-income families in multi-family buildings do not have air conditioning and are not prepared for heat waves. This is particularly risky for the elderly. Air conditioning is a key co-benefit of replacing gas furnaces with electric heat pump space heaters, as the heat pumps can operate in reverse and provide high efficiency cooling to the apartment in the summer months. Electrification offers low-income families greater comfort, safety, and climate resiliency when temperatures peak.

- **Investment in local economy and local jobs**

Money spent on utility bills tends to leave the local community. According to Stone Energy Associates, if you spend a dollar on energy, only \$0.28 stays in the local community, whereas on average \$0.75 of a dollar spent on other expenses remains in the local economy.<sup>11</sup> As discussed above, electrification paired with energy efficiency and/or solar can reduce annual utility bills. Spending less on utility bills can improve community

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<sup>6</sup> California Air Resources Board, “Combustion Pollutants” (reviewed Jan. 19, 2017). Available at <https://www.arb.ca.gov/research/indoor/combustion.htm>

<sup>7</sup> California Energy Commission, CEC, “2009 California Residential Appliance Saturation Study Volume 2: Results, October 2010, <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF>, pg. 19.

<sup>8</sup> R. 15-01-008, California Air Resources Board (ARB) and Public Utilities Commission Joint Staff Report, *Analysis of the Utilities’ June 17, 2016 Methane Leak and Emissions Reports Required by SB 1371* (Jan. 2017), p. 3. Available at <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M172/K518/172518969.PDF>.

<sup>9</sup> California Seismic Safety Commission, *Improving Natural Gas Safety in Earthquakes*, (Adopted July 11, 2002), p. 1. Available at [http://ssc.ca.gov/forms\\_pubs/cssc\\_2002-03\\_natural\\_gas\\_safety.pdf](http://ssc.ca.gov/forms_pubs/cssc_2002-03_natural_gas_safety.pdf)

<sup>10</sup> <http://www.climatechange.org/headlines/2017-hottest-summer-california-history>

<sup>11</sup> Nehemiah Stone, *Economics of Affordable Housing*, 2011, <https://www.slideshare.net/NehemiahStone/mf-affordable-economics-2011>

self-reliance, create local “main street” jobs and catalyze local economic investment.<sup>12</sup> Fuel-switching multi-family buildings should also create new local jobs, particularly for electricians, HVAC installers, and contractors.

#### **4. New policies needed to increase access to electrification for low-income multi-family buildings**

In order to ensure that low-income residents in multi-family buildings have access to clean energy, it is vital that the California Energy Commission, Public Utilities Commission, and other state agencies establish policies to spur a transition to clean energy all-electric buildings.

- **Create all-electric or electrification-friendly tariff** – Utilities, particularly IOUs and CCAs, should establish an optional “electrification-friendly rate” that residents can opt-into. This rate would have super low off peak in afternoon (belly of duck) to incentive use of electric appliances when there are ample renewables on the grid. It is critical for affordability that electrification does not bump residents up into higher and more costly tiers. Some utilities (like PG&E and SCE) have all-electric heating rates with a larger baseline allowance. This type of larger baseline allowance is key for electrification to be affordable.
- **Combine solar with EE and electrification** – Combining electrification with energy efficiency, weatherization, and rooftop or community solar programs where feasible is a key way to support access to lower utility bills, greenhouse gas benefits, and the non-energy benefits described above.
- **Incentive program** – Rebates are needed to lower the upfront equipment and installation cost of high efficiency electric appliances like heat pumps. In order to incentive building owners to act, higher levels of rebates are needed for multi-family fuel-switching.
- **Education** – Similar to other clean energy programs, building owner and tenant education will be key to removing barriers and improving access. Given that building electrification is in the early stages of market penetration (unlike rooftop solar for example), a greater focus on education and outreach will be needed to establish awareness and buy-in.
- **Workforce development** – Robust workforce development and training programs will be important to ensure that there are skilled local technicians who can install and service electric technologies like heat pumps over the appliance’s lifetime.

Thank you for considering these comments as you update the CLIMB Action Plan and in subsequent activities to improve access to clean energy.

Sincerely,

Rachel Golden  
Senior Campaign Representative  
Sierra Club

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<sup>12</sup> American Council for an Energy Efficient Economy - <https://aceee.org/portal/local-policy>



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