

DOCKETED

Docket Number:	25-EPIC-01
Project Title:	Electric Program Investment Charge 2026–2030 Investment Plan (EPIC 5)
TN #:	270860
Document Title:	Loren Lutzenhiser Comments - Filling Gaps in Decarbonization RD&D Initiatives
Description:	N/A
Filer:	System
Organization:	Loren Lutzenhiser
Submitter Role:	Other Interested Person
Submission Date:	6/18/2026 9:30:06 PM
Docketed Date:	6/19/2026

Comment Received From: Loren Lutzenhiser
Submitted On: 6/18/2026
Docket Number: 25-EPIC-01

Filling Gaps in Decarbonization RD&D Initiatives

Additional submitted attachment is included below.

Filling Gaps in Decarbonization RD&D Initiatives

Many of the goals, objectives and tasks in the proposed EPIC Investment Plan 2026-2030 relate to accelerating decarbonization of residential sector energy use in California at large scale. This aim is a huge lift for policy and society, and it is made even more difficult by five factors that the plan draft begins to address, but leaves notable gaps. These are related to: (1) imagined buildings and consumers, (2) appropriateness of technologies on offer in markets, (3) consumer trust and risk, (4) communities and innovation, and (5) official data deserts and information deficits. All are interconnected and apply to multiple Investment Plan areas.

What policy assumes and overlooks

All public policies have both explicit and implicit targets and mechanisms of action. This is as true whether we're talking about local pet licenses or national corporate tax incentives. California residential decarbonization policy is no different. But here the ambitious goal is to dramatically transform the mix of fuels and curtail the levels of fossil fuel pollution across a population of 13 million+ households.

And, in terms of residential sector decarbonization, policy makers look to an imagined ideal consumer who is concerned about climate change, takes personal responsibility for their own emissions, and makes choices to replace their gas furnace and water heater with heat pump units. This view also takes for granted that this "imagined consumer" has the financial resources and personal capacities to undertake the task, as well as having access to the necessary technologies in the marketplace.

In fact, those actors and circumstances are very hard to find in California (or pretty much anywhere). According to recent data, the vast majority of California residential sector households are dependent right now on natural gas for space heating (73%) and water heating (89%), and are fully invested in natural gas equipment and utility supply systems. Only a very small proportion of residential units (less than 10%) in the state have heat pumps for either heating or water heating. [See the most recent *CEC Residential Appliance Saturation Survey*, 2019.]

And, the single family detached unit (the idealized target building for voluntary decarbonization in the existing housing stock) is the stereotype of the California home. But these units represent only a bit more than half (57%) of the housing stock. And only 46% of total dwelling units are the owner-occupied single-family detached units that might be imagined most likely to be able to decarbonize. When we exclude from that group households with low incomes, persons with handicaps, older residents, and those who are uninterested in climate issues, the remaining target population segment is much smaller—possibly less than 25-30% of all cases. What's more, nearly half of the population (44%) are renters, many living in multifamily housing, who have little or no control over systems in their units (acknowledged several times in the Investment Plan by mention of "split incentives" for owners and renters).

Critical missing trusted resources

Both renters and disadvantaged home owners almost entirely lack credible information about decarbonization technology options, costs, benefits, and risks. And they have virtually nowhere to turn, either in government, the market or non-profit sources, locally or virtually. Trusted sources of high-quality information are scarce. And surveys show that trust is declining in the US, including trust in friends and neighbors, as well as trust in supply chain actors, government officials, political leaders, scientists and engineers, and even religious institutions and figures. [e.g., Pew Research Center, 2025.]

So, the problems confronting state decarbonization strategies in the residential sector are widespread and complex. But is this at all relevant to EPIC? I would strongly argue “yes.” In the past it has been easy to narrowly define the scope of EPIC RD&D investment to devices and models. And many millions of dollars can continue to flow along this trajectory in the next EPIC investment cycle as well. But, without having an accurate and actionable understanding of consumers, and without their informed trust and collaboration in making their own technology investments—absent an environmental catastrophe or unimaginably draconian legal requirements—the chances of large scale decarbonization honestly seem remote.

So, there are real costs in focusing solely on devices and utility systems and models as “technology” for RD&D, and ignoring the people involved in actually adopting and using those technologies. In reality, “technologies” are socio-technical arrangements that inherently involve people designing devices and systems, and people making purchases of devices, and people using those devices and systems in more and less effective and efficient ways.

And a “human dimensions” line of systematic analysis sensitive to this fact has offered many important insights to policy in the past (including through past EPIC-supported research). But it hasn’t fit neatly into the policy frames developed for EPIC by the CEC and CPUC. Nor does the current Investment Plan draft suggest that this approach has significantly changed.

So, in a broad technology policy sense, I would argue that a necessary supplement to an engineering-driven “optimized-technology-development-will-lead-to-decarbonization” framework would also incorporate a more social science-informed “people-choosing-and-using-technologies-imperfectly” framework.

Addressing human-involved technology research gaps

In conclusion, there is a need for specific research in the Investment Plan that cuts across a number of current draft EPIC RD&D areas to include:

- Identifying and understanding the different residential consumer population segments with differential decarbonization capacities depending on combinations of building, infrastructure, systems, income, ownership, knowledge, interest, and trust conditions.
- Mapping these segments onto California’s diverse and dispersed geographies (including nearly 500 incorporated cities and towns, and 9,000 Census Tracts).

- Supporting right-sized and appropriate technologies. Many electrified technologies available to the 13 million California energy-using residential households are designed and sized exclusively for single-family detached housing (e.g., with garages, duct systems, ample electrical panels, large-appliance-kitchens, etc.)—meaning that they are not designed for and don’t fit well into smaller multi-family living spaces. So, it is important to inventory, assess and invest in alternative residential technologies for space heating, cooling, water heating, cooking, plug loads, DER, plug-in solar+storage that are RIGHT-SIZED for the small, mostly multi-family and not-owner-occupied housing situations of the other half of the households in California that are decarbonization candidates.
- Understanding the current and emerging (e.g., AI-shaped) information landscapes that consumers have to navigate and assess how their declining trust, and likely shrinking sources of trusted information about climate, carbon, personal behavior, and household technologies, influence and shape Californian’s decarbonization options.
- Understanding how relevant knowledge is allocated in different sorts of California communities and persons’ social situations. Go beyond one-off funding of scattered local non-profit advocacy group demonstration projects (undertaken a few times in the past and seemingly part of EPIC plans for the future). Identify and build on both EPIC and non-EPIC initiatives at the community level by helping community-based groups communicate their results (failures as well as successes) to similar communities across the state. Identify and communicate information about grassroots energy and decarbonization efforts (e.g., local group-purchase “solarize” projects and mutual-aid decarbonization initiatives) across the state.
- Taking into account the severe shortage of high quality and accessible official information about real-world residential energy use and technologies. This “data desert” has plagued CEC forecasters and policy-makers for decades at the Commission and across the ecosystem of state energy/environmental agencies (CARB, CPUC, etc.). Potentially quite valuable IOU/Muni interval meter data remains largely locked away behind iron confidentiality curtains, while commercial interests harvest vast (and growing) amounts of personally identifying information on everyone and move to integrate it with consumption information (e.g., purchasing patterns, travel behavior, social platform interactions, even energy use) in order to monetize and predict behaviors and energy flows with high granularity. In the meantime, this information is not accessible to the Commission staff, non-profit groups, academics, and the tens of millions of persons whose own data are being harvested, massaged and sold internationally.