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## **Socio-political modeling for gas distribution decommissioning**

Transitioning customers from natural gas to electricity with programmatic incentives will not achieve widespread or equitable market adoption. Worryingly, the electrification of a building requires getting rid of all gas end-uses. Natural gas stoves are strongly preferred to electric stoves by customers. This highlights a host of barriers to electrification. Decarbonization advocates assume engineering solutions will solve the problem. They point to research like the 2018 Consumer Reports study where nine of ten top stoves were electric. Yet, fuel switching must overcome the status quo bias, endowment effect, and other behavioral laws that make market adoption difficult if not impossible. Kahneman, et al. 1991. Unless electric stoves can stream Netflix, they are not likely to be widely adopted by customers.

While energy efficiency investments might start the race for state climate targets, only regulatory action will get us across the finish line. These include: Banning new gas hookups to eliminate new gas system investment; Reducing operating and maintenance costs by reducing system pressure; and Planned retirements of portions of the gas distribution system. PG&E is aware of the limitations of targeted energy efficiency and is starting to identify high-priority gas distribution networks for retirement. Retirement implies total gas-to-electricity conversion of existing buildings with gas service. PG&E and E3's modeling is a welcome exercise in technical cost optimization, yet completely ignores the socio-political implications of mandated decommissioning. The recent conflict between National Grid and its New York customers over denied gas connections are more illustrative of the future. To paraphrase President Reagan, "I'm from the government and here to take your gas furnace, is guaranteed to be an unpopular greeting. Thus far, electrification policies have been developed by financial analysts and engineers with no regard for human affect and interactions. Electrify Everything is a socio-political effort without precedent and requires new thinking and analytical approaches to be successful. Rather than a mandate from distant capitals, gas distribution retirements will be politically possible only with buy-in from the grassroots. Our research shows that citizen communication networks and trust in the sponsor of a project are critical to predict oppositional attitudes and behavior. Nelson, et al. 2018.

Local social movements and behavioral programs are going to be essential for diffusing building electrification retrofits on the scale required to retire gas distribution networks.

However, history does not give us any cases with which to make inferences.

Predicting customer uptake of building electrification retro-fits is a techno-social modeling exercise. Computational modeling tools with explicit spatial data that can simulate diffusion behavior and equity outcomes using input from a wide range of stakeholders are required. Nelson, et al. 2015.

We are embarking on a much needed and long overdue re-engineering of the energy sector to mitigate GHGs. Electrify

everything is likely to be what to do for decarbonization, but we are far from understanding how to design and implement it.

The new risks that accompany electrification's benefits need to be identified and managed. Risks from long duration electricity outages have yet to be considered alongside electrification.

Electrification also exposes vulnerable populations to affordability risks from stranded gas assets. Energy efficiency is unlikely to provide a comprehensive risk mitigation strategy.

Deep decarbonization strategies like electrification increase the dependencies among the natural gas, electricity, transportation, and building sectors unlike anything imaginable

even a decade ago. The challenge will be for stakeholders to regulate and incentivize across silos with policies that explicitly consider the social and political dynamics of the coming energy transition.

From:

Nelson, H. (2020). Electrify Everything? Heat and Light in Deep Decarbonization Policies. Public Utilities Fortnightly. Jan. pp. 62-67.

<https://www.fortnightly.com/fortnightly/2020/01/electrify->

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