

Harvesting Benefits From Deep Decarbonization (+ Implementation Considerations)

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Estimated Economy-Wide Supply Curve for GHG Mitigation Policies

Economic growth is likely from low(er) cost policies (vertical axis)

Energy Efficiency (RCI) policies also yield largest GHG savings (horizontal axis)

RCI- Demand Side Management Policies for Residential, Comm, Ind

ES- Energy Supply

AFW- Ag, Forestry, Waste

TLU- Transport and Land Use



Source: Nelson, et al (2015) p. 23

Job Equity from Energy Efficiency Policies

Energy efficiency policies (RCI) have

- the lowest initial capital investment per job
- highest job growth potential (blue)

Broad-Based Growth: Sectors with largest job growth in SoCal AB32 simulations were:

 Retail, Restaurant and Accommodation, Health Services, Real Estate, Financial Services, Equipment Manufacturing (Wei and Rose, 2014, p. 110-111) Security Investment and Jobs 2010 - 2030



Source: Delaquil, et al (2015) p. 23

Weatherization as an Equity Strategy for Low-Income Households

Key equity indicator is <u>Energy Burden</u>: The percent of income spent on utility bills

- Inland California renters' annual energy burden are about 34% higher than homeowners all else being equal
- Less attic insulation and lower AC efficiency consistently predict higher energy burden
- Non-energy benefits of low-income weatherization programs are large:
 - Lower occupant mortality and morbidity (including hospitalizations) from lower thermal stress, lower absenteeism, increased food security, reduced predatory borrowing (Tonn, et al, 2014)
 - Present value of \$14k per unit weatherized (p. xvii-xviii)
- Reduced utility arrears
 - Reduced evictions and subsequent homelessness

Harvest Energy Efficiency Co-Benefits by Geo-targeting Demand Response

Avoid future electric distribution investment

Predictive models of program participation based on customer attributes: energy usage, home vintage, home value, etc.

Micro-grids: incentivize electricity storage and distributed generation as possible (resilience)

4. Overlay electric circuits

 Develop statistical models from
ETO/Utility
program data



2. Apply to all 288k Multnomah County residential accounts



3. Identify high probability accounts



- 5. Target high probability households in:
- a) Constrained circuits
- b) Vulnerable areas



Behavioral Interventions will be Required to Reach GHG and Equity Targets

You've

got this

- Low salience of energy amongst all customer groups = Energy Efficiency Gap
- Low-income segment is "Hard-to-Reach"
- Competitions and peer comparisons can engage multifamily and low income stakeholders

Your EUI Usage

Your Efficiency Progress

This section shows your building's average monthly usage per square foot over a three-month period and the percentage-change income usage income percenting. (Please note that your baseline may have been slightly modified due to billing adjuntments, credits, or credits). The data reflects billy your tenand's usage and the usage in your building plus common areas — specifically, what we call Energy Use Internally (EU). We calculately your EUI by combining 12 months of your natural gas, water (when available), and electricity usage, covering it to source energy and divining that number by your building's square fordage. If you see a negative munker, that means you're had successful reduction and are on the right efficiency track. — **lower is better with EUI**

As we mentioned in the initial report, we are unable to include what data on your report, which means your complex in not eligible to compete in the water-related categories of the competition. That's not a game change, though, hou still have nonger and the change is the state of the state Plan, reducing your water use may still help lower your bills—so we encourage you to continue conservation. To keep an ep on your progress, you can access all your reports throughout this competition at defore.emergy and compare.



Your Building Scores This score is where you can see matches up against other made this score using factors like you building data. The scale ranges

This score is where you can see how your building's efficiency matches up against other markomly assigned properties. We taily this score using factors like your building SELD, plaw weather and building data. The scale ranges from 1 to 100 with higher scores reflecting better efficiency So, if you're inching toward 100 right now — you're a major contender in this competition.

We make every attempt to ensure the accuracy of the aggregated consumption data. Reserver, due to certain ansmall billing aduations or other reasons, there is a possibility that actual usage data may vary from aggregated usage data. We assume no liability for any discregarcic between reported data and actual data.

Communities for Conservation behavioral apartment competition funded by CA PUC: 2,000 apartments' energy and water usage benchmarked and competing for prizes.



<u>Suggestion:</u> Leverage Portland's famous social capital for marketing and outreach: A Conservation Competition between Neighborhood Associations

Source: Res-Intel.com

Program Implications: Equity Strategies Require (More) Capital from Multiple Sources

- Grid / demand response benefits need to be capitalized
 - Resilience strategies integrated into programs
- Low income bill assistance (payments) need to be capitalized (principal) for weatherization
 - \$ and GHGs out the window, climate targets will be unattainable
 - Leverage OR state low income funding
- Reduced homelessness: community development block grant funding
- Low interest loans / on-bill finance (Mpower, Savings within Reach)
- Property assessed clean energy funding
- OR health plan / Insurance funding (?): lower mortality and morbidity for low-income residents
 - Improved worker productivity and attendance warrants business tax support (?)

Overarching Implementation Considerations

- **1. Design:** Randomize participation to enable <u>causal</u> claims about effects
- **2. Test:** Test policy interventions (treatment vs control)
- **3.** Learn: Evaluate outcomes (and processes) based on key indicators
- **4. Adapt:** Optimize intervention based on findings
- 5. Scale up: Additional interventions, jurisdictions, participants
- 6. **Replicate:** Diffusion of policy innovations to U.S., World

Be courageous: Early (cheap) failures + learning = long term success

- **Collaborate:** Policy "experiments" reduce the drag of adversarial institutions/history
- **Create:** Research and implementation roadmap based on key evaluative criteria

See Haynes et al, 2012 for summary



Questions and Comments

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Resources

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