

These notes summarize the October 25 Building Decarbonization Coalition Roadmapping Session #1 facilitated by Gridworks. For a stakeholder list and presentations for this meeting (and for previous meetings), go to <https://gridworks.org/initiatives/building-decarbonization-coalition/> or contact Andrew Spreen at aspreeen@gridworks.org for more information.

Roadmapping Session Meeting Notes

Slides for this meeting are [available here](#)

Participation:

The following individuals participated in person:

- Alejandra Mejia Cunningham, Transcendent Energy
- Alice Sung, Greenbank Associates
- Amy Egerter, RMI
- Andy Bilich, EDF
- Ann Edminister, Design AVEnues, LLC
- Annie Henderson, East Bay Community Energy
- Armen Saiyan, LADWP
- Bruce Severance, Mitsubishi Electric Trane HVAC US LLC
- Dave Weiskopf, Nextgen
- Fong Wan, PG&E
- Jan Berman, PG&E
- Jenna Tatum, Building Electrification Coalition
- Josh Plaisted, Flagstaff
- Leanna Huynh, City of San Jose
- Marc Costa, The Energy Coalition
- Maria Fields, JouleSmart Solutions
- Merrian Borgeson, NRDC
- Nic Dunfee, TRC
- Obadiah Bartholomy, SMUD
- Panama Bartholomy, DDC
- Peter Turnbull, PG&E
- Rich Chien, SF Department of the Environment
- Rick Brown, TerraVerde Energy
- Scott Blunk, SMUD
- Stephanie Wang, California Housing Partnership
- Sudeshna Pabi, EPRI
- Ted Tiffany, Guttman & Blaevoet Consulting Engineers

The following individuals participated over the phone:

- Christine Tam, City of Palo Alto
- Ethan Heil, Point Energy
- Sean Armstrong, Redwood Energy

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- Courtney Kalashian, San Joaquin Valley Clean Energy Organization
- Charles Cormany, Efficiency First California
- Pauline Souza, USGBC
- Karly Zimmerman Fogg, TerraVerde
- Jorge Gonzales - California Energy Commission
- Rachael DiFranco - City of Fremont
- Mark Lessans, Ingersoll Rand
- Kevin Wood, SCE
- Woody Hastings, Center for Climate Protection
- Barbara Hernesman, Western HVAC
- Eric Truskoski, Bradford White
- John Plaggmier, Sierra Nevada Energy Watch

Agenda:

- 10:00 AM - Welcome and Introductions
- 10:15 AM - Overview of the Coalition's Goals and Objectives
- 10:30 AM - Presentation on Building Decarbonization Strategies
- 10:45 AM - Panel Discussion with Industry Experts
- 11:00 AM - Break
- 11:15 AM - Presentation on Policy and Regulatory Updates
- 11:30 AM - Q&A Session
- 11:45 AM - Closing Remarks

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- **Develop specific metrics for assessment**
 - **GHG life cycle emission measures**
 - Emission reduction is a better metric than units of technology sold
- Improve customer perception
- Include induction cooking
- Address refrigerant leakage/emissions (Target swap to CO2 coolants)
- Improve the economics of choosing electric
- Training needs

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- Building should be “Efficient, electric, grid responsive”
- Leverage existing mandates
- Focus on availability of tech
- Seed the market through public sector buildings

Group 2:

Focus on a policy/market environment that facilitates market expansion.

Understand the non-consumer benefits (e.g., grid benefits/load management) and potential revenue streams

Understand “SMART” goals - short-term focused

Create concrete steps/targets to achieve targeted transitions

- Ramp-up numbers for workforce, policy, standard changes (short-medium-long term?)
- Need to address rates (changes to promote equity?)
 - First cost and benefits need to be addressed - surrounding opportunity for all Californians - Jobs, air quality, cost, etc
 - Air quality and cost are central to the larger question on the true cost of gas (carbon tax, interior air quality, unknown methane leakage, explosion potential)

Develop effective business model for installation, develop market.

- Seek to address workforce capacity issues, availability, turnaround time from urgent need to installation
- Trade segments/standards/enforcement

Group 3 (Phones):

Knowledge/Market Penetration

Technical target: Decarb new construction 2020

True cost of natural gas

- Include leakage
- Explosion/fire hazard
- Indoor combustion health risks

Align air quality board goals and climate targets (Indoor air quality targets, decarbonization should be in sync)

On-bill information for consumers - Make the savings and details obvious

Who should carry the capital burden?

Separate incentives based on end-user interaction

- Midstream incentives/installer incentives for HWHP/SHHP
- Consumer side incentives for induction heating
 - Consumer sees/interacts with daily

Establish natural gas prohibition deadlines. Get full turnover

Post-lunch Focus: Existing Barriers to Decarbonization

Strawman barriers presented to the group:

- **Barrier:** Misunderstanding of data and analysis underscoring the importance of building decarbonization
- **Barrier:** Inexperience with heat pumps for space and water heating
- **Barrier:** Lack of a clear economic signal to adopting customers that high efficiency heat pumps are a good value for them
- **Barrier:** Customers looking to adopt hi efficiency space and water heaters aren't presented with a consistent high-quality solution within 72 hours of their need
- **Barrier:** Target audience has not received a consistent message about the importance and benefits of building Decarbonization

Comments from the group during the presentation of the strawman barriers emphasized several different and pertinent points. Heat pump cost coming down is a chicken and egg problem with the existence of a sizable market share. This can be alleviated by potential mandates and other key policy actions that the Coalition should consider. However there are still technical limitations and the laws of physics that place hard limits on the efficacy of heat pumps in the future.

Decisions in the state of California - such as inverse condemnation - may play a role in artificially inflating electric rates, limiting the direct cost/benefit calculation for decarbonization. A related issue will be finding a way to align incentives from utilities with those of the Coalition.

An ongoing issue is inertia for business as usual, a push may be necessary to overcome this inertia. This is also tied to the issue of having a prompt and effective (72 hour window) solution for consumers. Effectively encouraging installers to have high efficiency heat pumps for space or water heating on hand will be a key part of ensuring that decarbonization gains traction.

Breakout Session Summary (Barriers):

Awareness/Communication

- Lack of information, prior bad experiences with old tech
- No clear comparison information, mixed messaging from the industry
- Lack of clear packaging, "Visible do-gooding" with the installation
- Potential to gamify installation/bill savings?

Risk

- Issue in carrying stock that may not turn over quickly
- Risk in early installations while learning the technology
- Overcoming "Business as usual" inertia for installation/existing rates
- Policy should show long-term priorities of the state, not micromanage business models

Upfront Cost

- Current incentive structure don't seem to be driving market in other regions

Awareness of issues

- Need for metrics that reflect life cycle costs and a broader incorporation of issues

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Equipment Availability/Quality

- Quality HVAC and dryer capabilities that go onto a 120V panel are severely limited
- Need for a performance guarantee/unified warranty system?

Misc

- Need to evaluate the existing pipeline allowance
- Legal basis for reach code with no gas connection

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Appendix 1: Photos from Group 1 breakout sessions

OVERARCHING GOALS

- A) STOP BUILDING NEW BUILDINGS / REDUCTION OF CARBON FOOTPRINT (IMBODIED CARBON)
- B) BUILD "BETTER" BUILDINGS
- C) INTEGRATED APPROACH TO TECH/END-USE TURNOVER
- D) FOCUS ON PLANS, NOT TECHNOLOGIES
"BUILDING DECARBONIZATION MASTER PLANS"
- E) METRICS TO ASSESS DESIRED RESULTS
- GAS EMISSION (LIFE CYCLE?)
- % EMISSIONS REDUCED > TECH SOLD
- F) NEED NEW BUILDINGS, EXISTING BUILDINGS

NEW? FIVE YEARS
2020-2025
2025-2030

"DISTRICT" IS GAS FEEL (DANGEROUS)

CREATES FRAGMENTATION
BUT TECHS MAKING

F) CUSTOMER PERCEPTION (GAS COOKING)

- a) INCLUDE INDUCTION COOKING
- b) REFRIGERANT LEAK -> GAS CHASSIS
- c) ECONOMICS OF CHOOSING ELECTRIC
- d) EFFICIENT, ELECTRIC, AND GRID RESPONSIVE
- e) WORKFORCE = STAND ALONE SUPPORTING ACTION

New	2022	2022
	2030 = NO NEW INSTALLATION	2030
EXISTING	2025 = OLD ONES ARE GONE	

STAND ALONE SUPPORTING ACTION

- PUBLIC VS. PRIVATE
- RATE DESIGN (NEED CASE)
- DISTRICT X DISTRICT
- ECONOMICS IMPACT PACKAGES
- TECH AVAILABILITY
- LEVEGADE COORDINATE MANDATES
- WORKFORCE

FUNDAMENTAL BARRIERS

- 1) MISUNDERSTANDING
 - ACTIVELY PROMOTE AWARENESS
 - NEED TO MAP STAKEHOLDERS RESPONSIBILITIES
 - DECISION MAKING PROCESS?
- 2) INEXPERIENCE
 - CONTRACTORS
 - CUSTOMERS
 - MANUFACTURERS PROVIDE TRAIN
 - DON'T WANT TO EDUcate (PLUMBERS)
 - TECHNOLOGY NOT FAMILIAR

CONTRACTORS: DESIGN, ARCHITECTS, PUBLIC INTEREST, POLICY-MAKERS, UTILITIES, MESSASAGE MATTER

WHAT ARE THE BARRIERS? → START FROM RESEARCH

PARTS OF BARRIERS

- LACK OF CONSUMER ADVOCACY
- LACK OF A "STORY"
- LEGAL BASIS FOR NO GAS CONNECTION (REACH TARGETS TARGET)
- DELIVERY: CUSTOMER URGENCY (FEDERAL PRESENTATION)
- HOW TO TARGET TO SAVE \$, POSITIVE OTHER GOALS
- SUPPLY PIPELINE → METHODOLOGY
- DIFFERENT CUSTOMERS, DIFFERENT NEEDS
- RISK TO CONTRACTOR
- BUILDING STOCK IN PIPELINE (BIM NEW: EXISTING) → DEV PLANS
- NEW CONSTRUCTION ENTRY STILL CLOSED → PUMP NOT PRIME
- GRID INTEGRATED
- WRONG METRICS, WRONG INCENTIVES
- INCENTIVES TO: _____ AREN'T THERE?
- AND PREDICTABLE
- WHO PAYS INCENTIVES?
- PIPELINE ALLOWANCE CALCULATIONS (THROUGHPUT ASSUMPTIONS)

CASE STUDIES

- SEQUENTIALLY BUILDER IN LBC

Appendix 2: Photos from Group 2 breakout sessions:



