Where California is Going on Gas and Electrification

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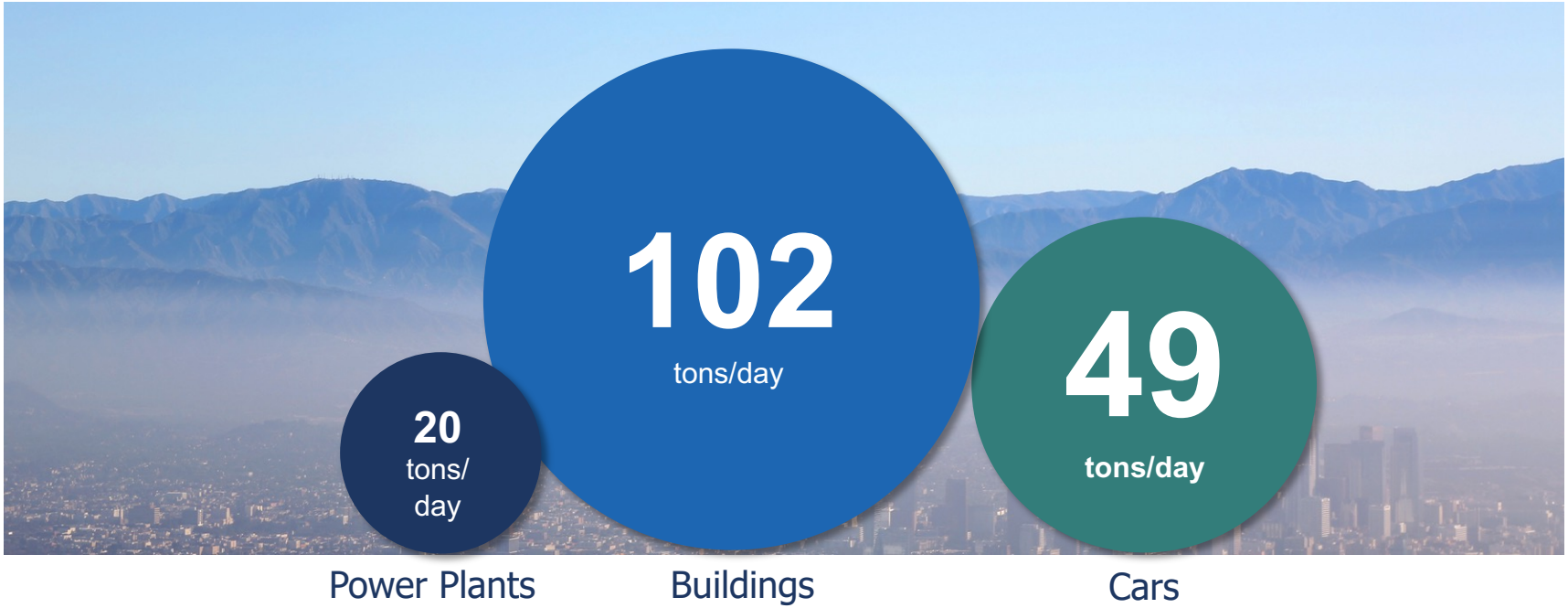
Outdoor Air Quality:
Burning Fossil Fuels in Buildings is a Big Part of California's Ozone/PM2.5 Problem

Nitrogen Oxides (NO_X) in California, 2020 forecast



Source: CARB's Standard Emission Tool Emissions Projections, 2020 forecasted data

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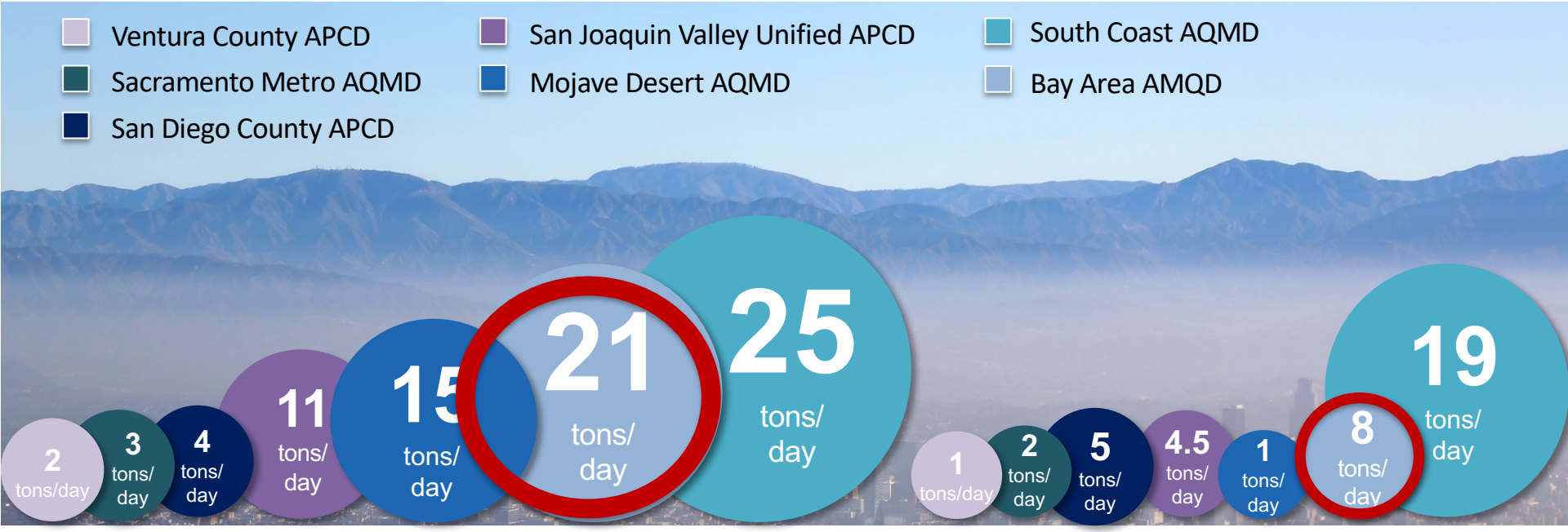


Source: CARB

BURNING GAS IN HOMES RELEASES MORE NITROGEN DIOXIDE (NO_2) AND CARBON MONOXIDE (CO) THAN EPA ALLOWS OUTDOORS

- Causal relationship:
  NO_2 + short term respiratory effects
- EPA has regulated NO_2 and CO outdoors for decades
- LBNL—12 million Californians in homes with gas stoves are breathing levels of NO_2 that are **illegal outdoors** (1.7 million breathing levels of CO that would also be illegal outdoors)
- Profound **equity issue:** higher pollution levels in older, smaller homes, which typically correlates to income/race.

Source: Lawrence Berkeley National Lab

The New York Times

Carbon Dioxide Emissions Hit a Record in 2019, Even as Coal Fades

A pump jack in Stanton, Tex. The United States generates 14 percent of global carbon dioxide emissions.
Brandon Thibodeaux for The New York Times

By Brad Plumer

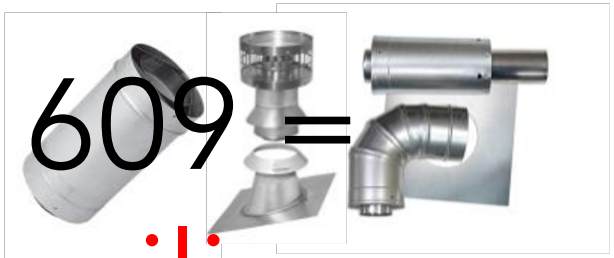
Dec. 3, 2019

"The new data shows that **natural gas**, which is less polluting than coal but still a fossil fuel, **has become the biggest driver of emissions growth globally** in recent years."

Gas Infrastructure Costs

$6,000-$15,000

$7,000 X 609 =

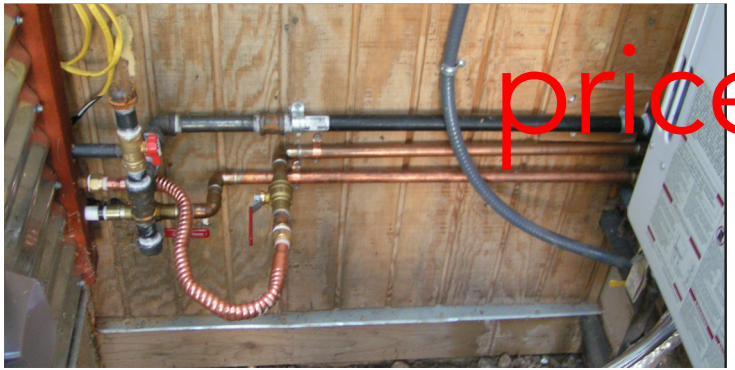


~5,680 families

priced out

$750-$2,400

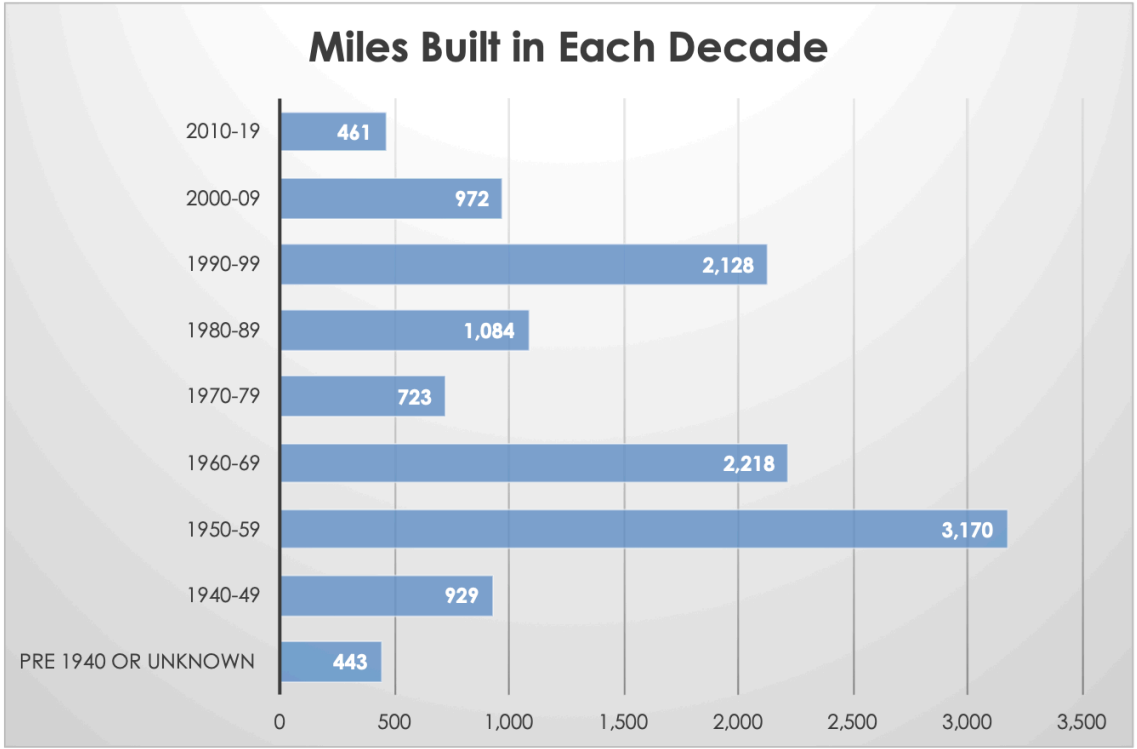
$270-$850



Every $1,000 increase in housing cost price 812 Bay Area households out of the market — NAHB, 2020

Miles of California Gas Transmission by Decade Installed, 2019 (PHMSA)

56% of CA transmission pipelines are at least 50 years old.



So….Gas is….

Fastest growing climate pollutant

Leading air pollutant

Raising the price of construction

Expensive pipeline replacement coming

Electric systems provide heat more efficiently

Natural Gas Boiler

1 therm input

0.8 therms heating

Electric Resistance Heater

1 kWh input

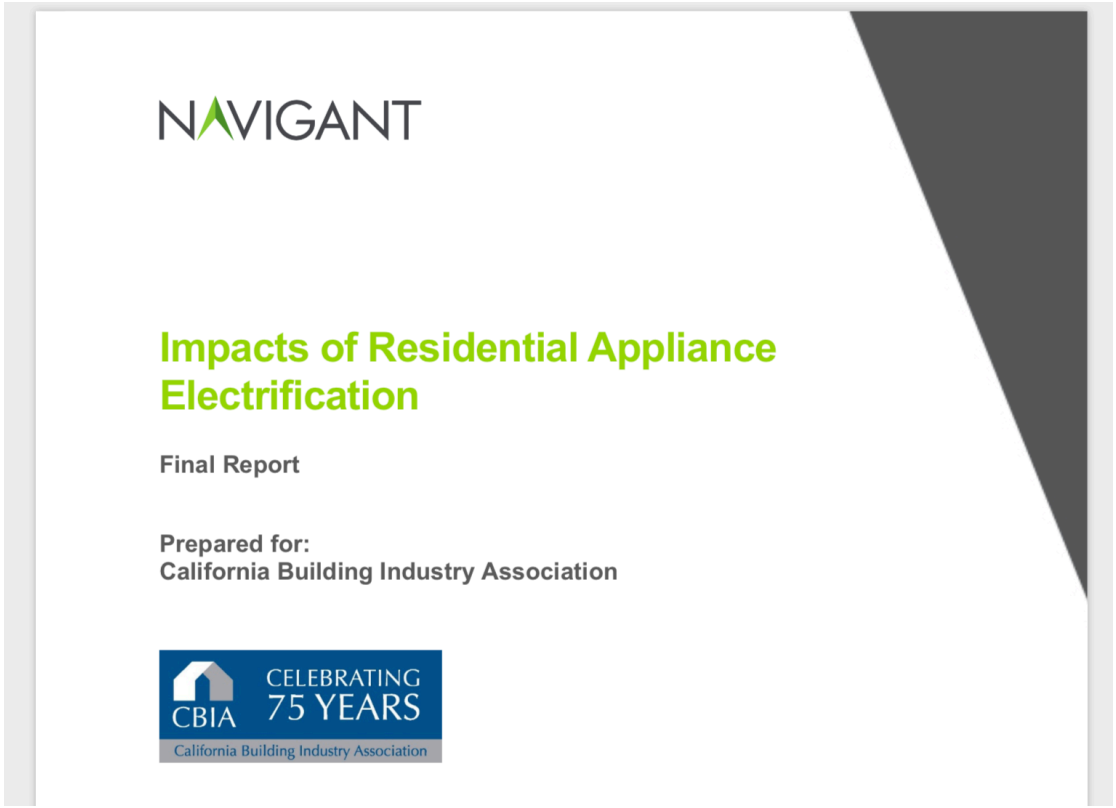
1 kWh heating

Electric Heat Pump

1 kWh input

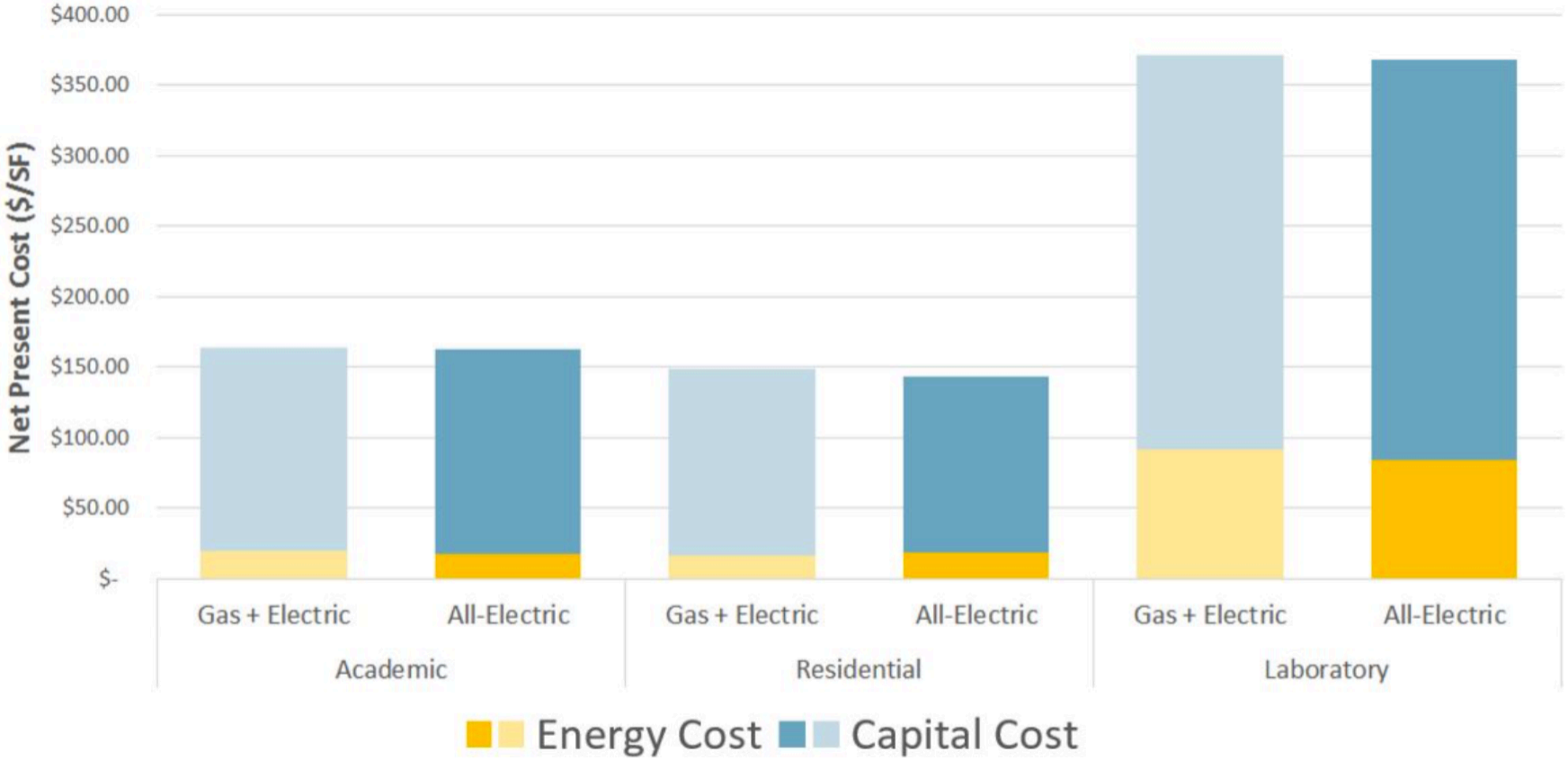
3-4.5 kWh heating


350F



..electric appliances have similar or lower costs than natural gas appliances..

University of California Carbon Neutral Buildings Cost Study



Electric Buildings can be …

Cheaper
Healthier
More Climate Friendly
Safer

California prepares to shift away from natural gas, while keeping power reliable and affordable

By Liane Randolph, Special to CalMatters

The Case for Building Electrification

There is a growing consensus that building electrification is the most viable and predictable path to zero-emission buildings. This consensus is due to the availability of off-the-shelf, highly efficient electric technologies (such as heat pumps) and the continued reduction of emission intensities in the electricity sector.

60+ CA Local Governments Developing Zero-Emissions Codes

Northern California

Bay Area
- **Alameda County**: Albany, Berkeley, Dublin, Fremont, Hayward, Oakland
- **Marin County**
- **Santa Clara County**: Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alto, San Jose, Sunnyvale
- **San Mateo County**: Brisbane, Burlingame, East Palo Alto, Menlo Park, Millbrae, Portola Valley, Redwood City, San Mateo City and County
- **San Francisco**
- **Sonoma County**: Cloverdale, Petaluma, Santa Rosa, Sebastopol, Sonoma, Windsor, Healdsburg

Central Valley
- Sacramento, Davis

Humboldt: Arcata

Mendocino: Fort Bragg, Point Arena, Willits

Santa Cruz: City of Santa Cruz

Southern California

Central Coast
- City of San Luis Obispo

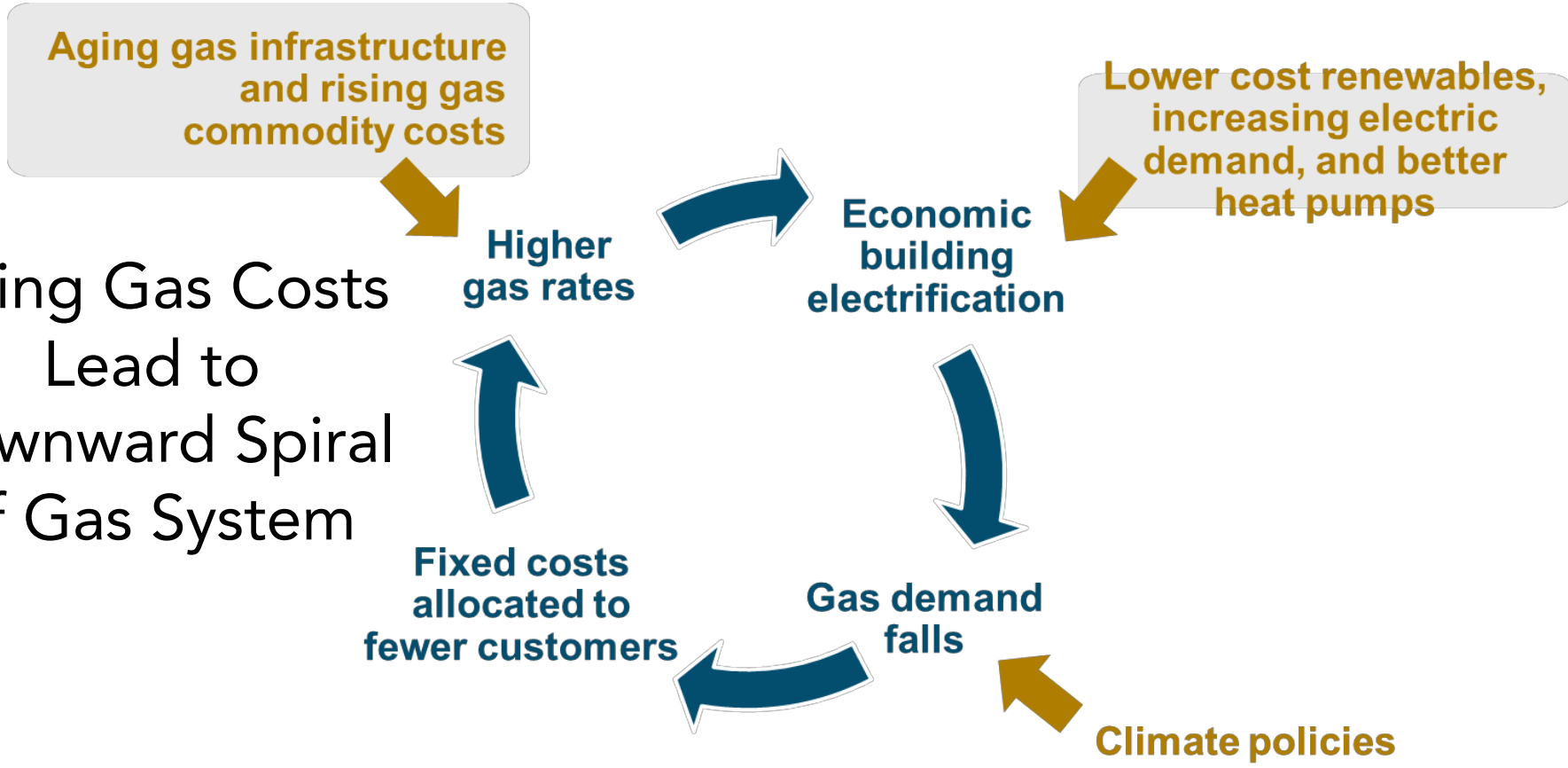
Santa Barbara
- Santa Barbara, Goleta

Ventura
- Ojai, Thousand Oaks

Los Angeles
- City and County of LA, Santa Monica, West Hollywood, Malibu

San Diego
- Carlsbad (adopted!), Chula Vista, Encinitas, Escondido

Rising Gas Costs Lead to Downward Spiral of Gas System

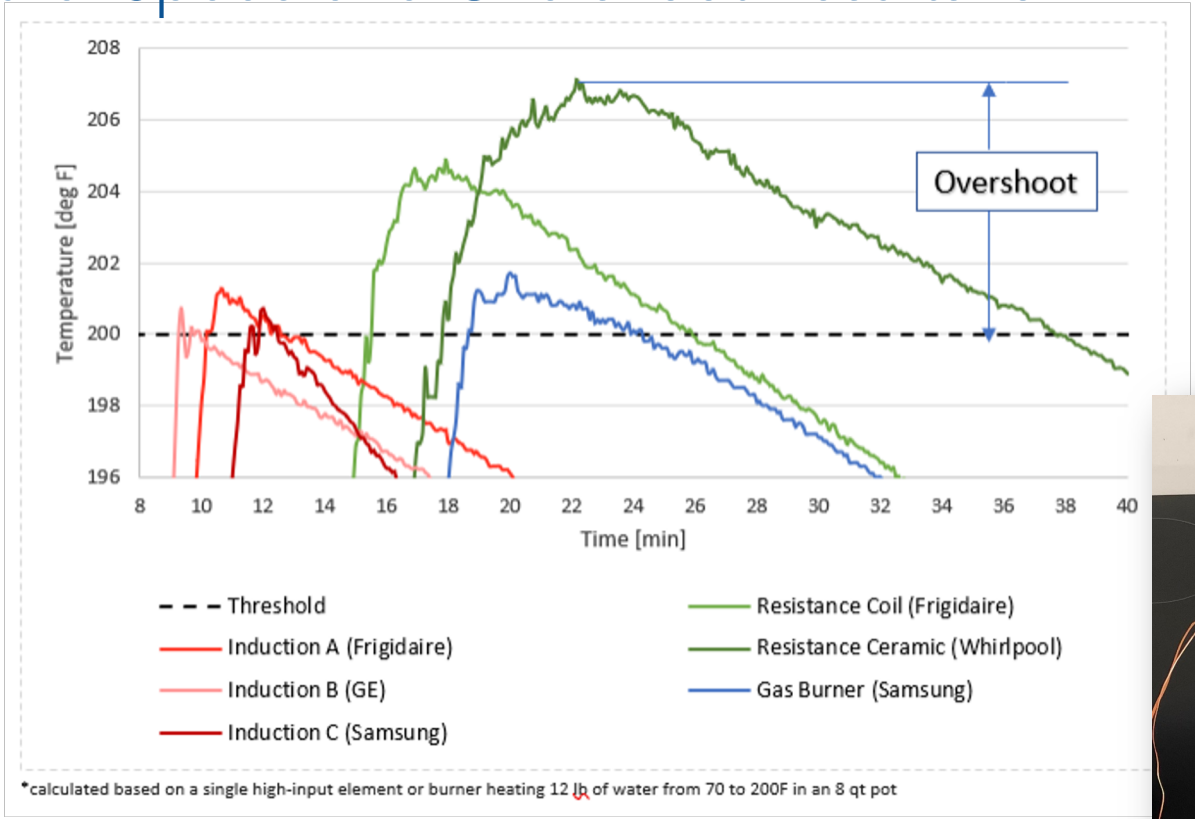


Thank you!

Buildingdecarb.org/join

Induction Is Better Study

Temperature Speed and Overshoot Results for 12 lbs of Water



*calculated based on a single high-input element or burner heating 12 lb of water from 70 to 200F in an 8 qt pot