Kick-starting the Green New Deal with All-electric Buildings

Berkeley Councilmember Kate Harrison

Fundamental to the Green New Deal: *Our Obligation to Equitably Reduce Emissions Faster than the IPCC's Global Targets*

- **H. RES. 109 - Rep. Ocasio-Cortez (2019)**
  - "… because the United States has … emitted 20 percent of global greenhouse gas emissions … and has a high technological capacity, [it] must take a leading role in reducing emissions through economic transformation;" p. 3

The State's Approach to Date Doesn't Adequately Address the Climate Emergency

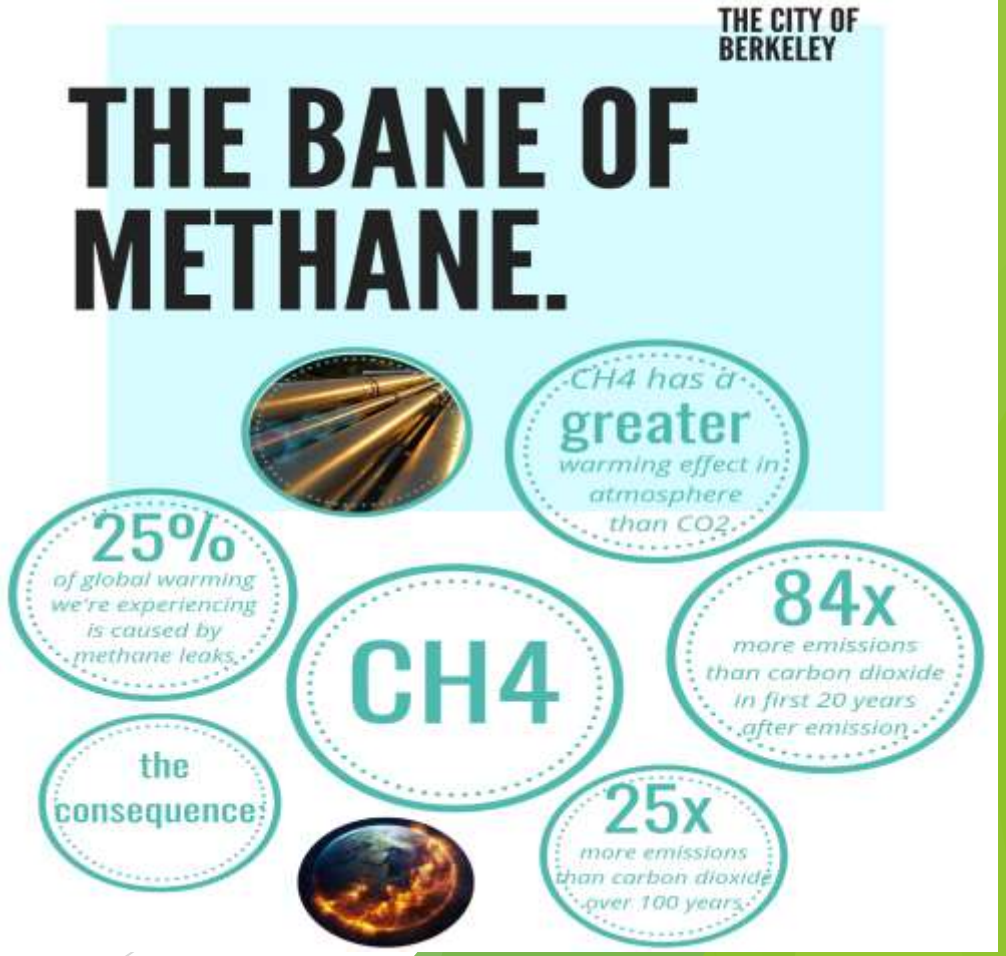
- Energy efficiency (conservation) only *indirectly* lowers carbon
- Vastly undervalues social cost of carbon
  - CEC 2019 Cost of Carbon: $18
  - No consideration of seismic, health or stranded assets
- Other metrics: social cost of $37 and $1,500 per metric ton of CO2
- CEC efficiency standards have historically favored fossil fuel over electricity

Organization	Alternative Social Cost of Carbon
Stockholm Environment Institute study (2012)	**$900** to **$1,500** per metric ton of CO2
Obama Administration (2013)	**$37** per metric ton of CO2
Stanford University study (2015)	**$200** per metric ton of CO2
UC San Diego study (2018)	**$417** per metric ton of CO2
CPUC (2018)	**$123** per metric ton of CO2

Buildings are a primary source but it isn't just the natural gas

On-site natural gas combustion accounts for **15%** of California's GHGs (NRDC)

+27% of Berkeley's GHGs ~**35%** of San Francisco's



Visualizing Berkeley's climate emergency (620,000 MTCO2 Eq.)

It is **equivalent** to consuming **70 million gallons** of gasoline.

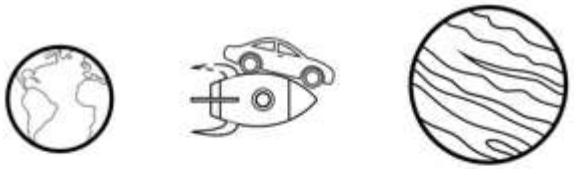
= ten million gallons of gasoline

To sequester these greenhouse gases, **730 thousand acres** of forests would have to be planted.

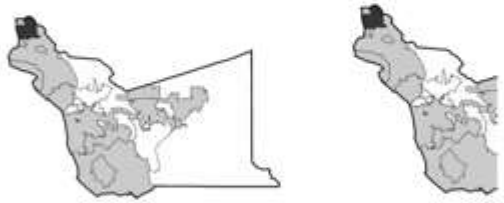
= hundred thousand acres of forest

Key

Transportation
Electricity
Natural gas
Waste



That's equivalent to 1.5 billion miles of driving, or driving to the planet Jupiter and back twice! See more at **bit.ly/ghgcoal**.



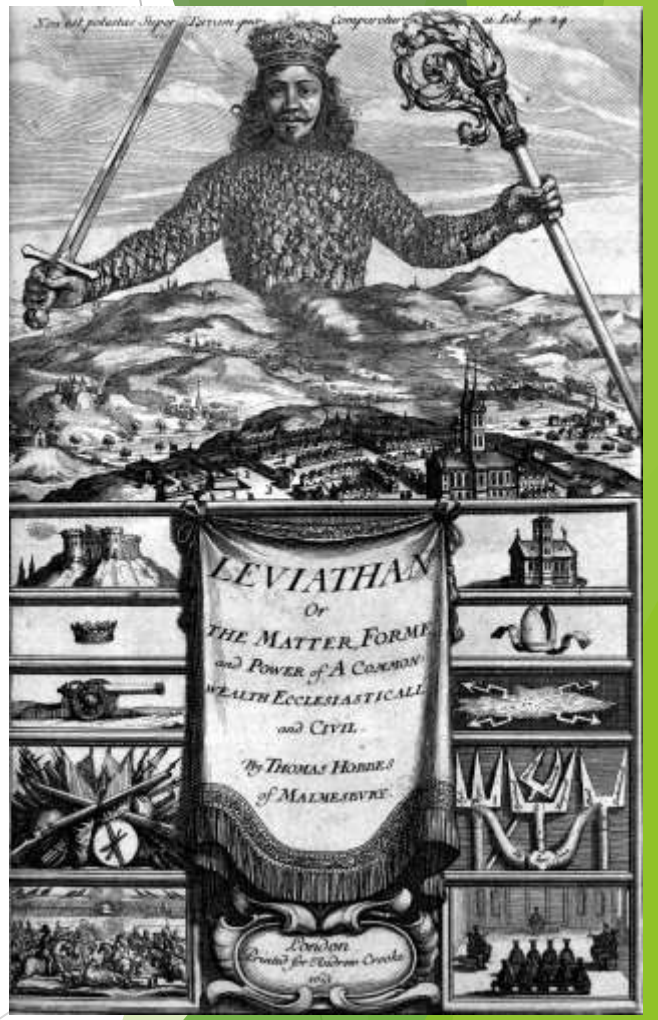
That's an area over 64 times the size of Berkeley and over one and a half times the size of Alameda County! See more at **bit.ly/ghgforests**.

Sources: Berkeley Climate Action Plan Update 2018; Environmental Protection Agency

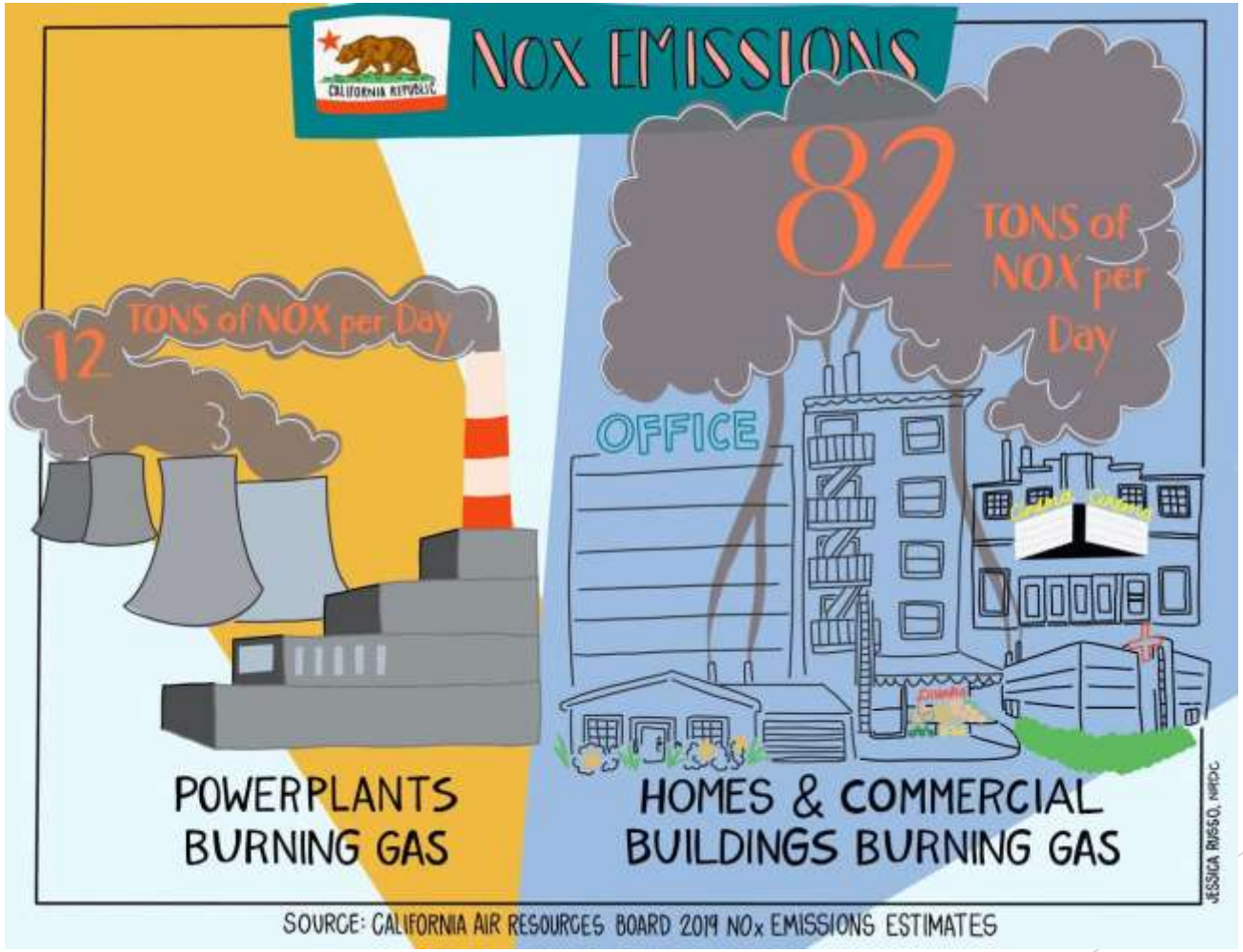
We Cannot Afford to Wait for State & Federal Action; Cities Retain Sovereignty in Key Areas

- The California and United States Constitutions gives cities police powers to adopt building standards that provide for their community's **health, safety and welfare**.

- **Article XI, Sec. 7.** of the CA Constitution: "A county or city may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws."

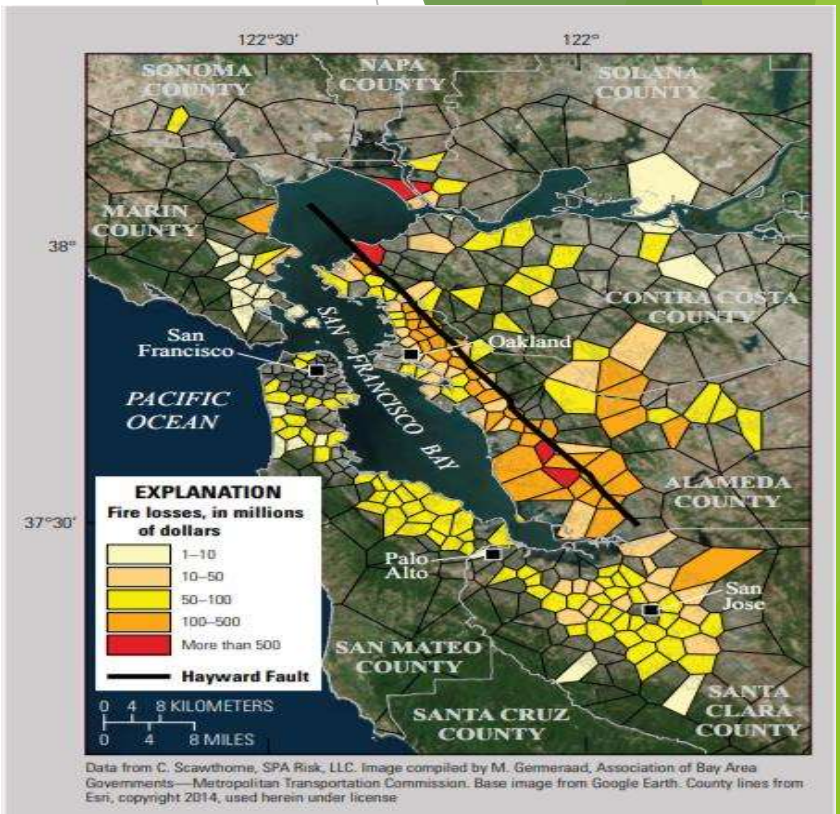


Health & Safety



Health & Safety

- Natural gas produces **hazardous nitrogen dioxide, carbon monoxide, formaldehyde** at levels not allowed outdoors, all made worse with super-efficient buildings
  - We spend 68% of our time in our homes and nearly 100% indoors
- A 2019 CEC study found that statewide decarbonization, including building decarbonization, could be “justified solely on public health grounds.”
- Gas is particularly **dangerous on an earthquake fault**
  - San Bruno pipeline explosion, fires after Loma Prieta
- Electricity is **easier to reinstate** after disasters; more resilient



Data from C. Scawthorne, SPA Risk, LLC. Image compiled by M. Germeraad, Association of Bay Area Governments—Metropolitan Transportation Commission. Base image from Google Earth. County lines from Esri, copyright 2014, used herein under license

This map of California’s San Francisco Bay region shows areas burned as a result of fires caused by the hypothetical magnitude-7.0 mainshock of the HayWired earthquake scenario on the Hayward Fault. Warmer colors show areas with greater building losses. Effects are most severe near the Hayward Fault itself. These fires would result in a loss of residential and commercial building floor area, equivalent to more than 52,000 single-family homes. The fires following the mainshock would be directly responsible for the loss of hundreds of lives, a total building replacement value of almost $16 billion, and total property losses approaching $30 billion (2016 dollars). Areas (polygons) shown are based on distance to the closest fire station.

Equity

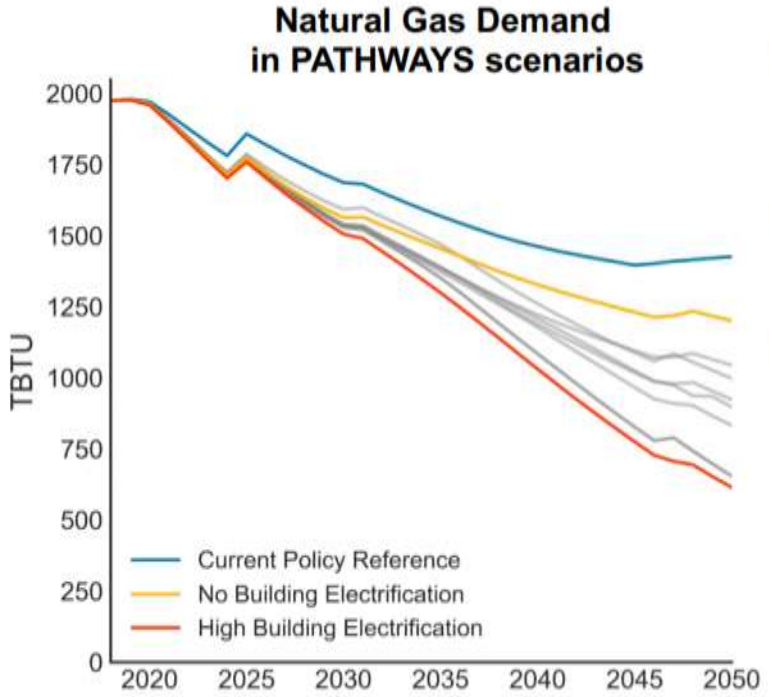
- Reality: new construction is primarily occurring in low-income, already polluted communities
  - New gas infrastructure pollution exacerbates the disparate impact of environmental inequities
- Most Californians are tenants and cannot choose which appliances are installed their homes
- Low-income people will be the most impacted by rising natural gas prices and the impact of stranded assets
  - SoCalGas: requested a 30-percent increase (42-percent nominal) in gas revenue requirement between 2018-2022
  - PG&E: 15-percent (24-percent nominal) between 2019 and 2022

Economics

- Rocky Mountain Institute study: up to **$24k** savings per single-family home
- Statewide Buildings Codes and Standards Team study: average of **$5k** savings per single-family home and **$2k** per multi-family unit
- **Lifecycle utility savings** for building owners and renters
  - **Stranded assets should not continue burdening people in new buildings**
  - PG&E has asked the CPUC for a **significant gas rate hike** to pay for aging gas assets
- Gas prices subject to **volatility** from natural disasters

CEC Study on Gas Prices and Demand

Gas Demand amidst Electrification, Energy Efficiency, and SB 100

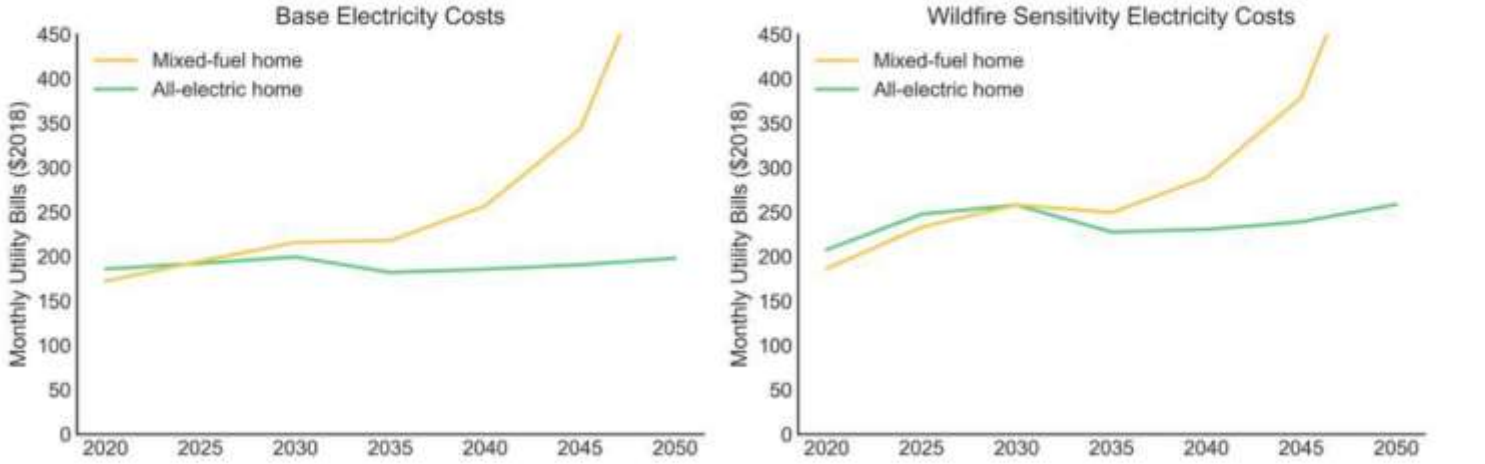


- Gas demand decreases in the Current Policy Reference scenario due to energy efficiency and SB 100
- Intermediate scenarios have differing levels of building electrification
- In the High Building Electrification Scenario, remaining gas throughput in 2050 primarily serves industry

"[gas] cost impacts are particularly concerning for low-income consumers who are less likely to be able to afford the upfront investments required to adopt electric technologies and are more likely to be renters"

"building electrification appears to be the least-cost outcome from both an economy-wide perspective and from a customer-cost perspective"

Figure 30: Consumer Bills in the High Building Electrification Scenario



Roadmap: Remove Fossil Fuel from Buildings ASAP

1. Ban, with limited exceptions, natural gas piping in all *new* buildings starting *today*.

2. Equitably electrify all *existing* buildings, prioritizing low-income and vulnerable communities, *as soon as possible*.

New Buildings (the easy part)

A. The Berkeley Gas Ban Ordinance

- Prohibits internal gas piping in all new buildings that apply for entitlement after January 1, 2020
  - **Temporary Exception**: piping may extend to a limited number of systems that cannot yet be modelled in CEC software (largely moot given recent CEC updates
  - **Public Interest Exemption**: buildings with gas systems that are approved as being in the public interest
- In all cases, electric-ready requirements

B. Require New Mixed-fuel Buildings in the “Pipeline” to Be More Efficient + Electric-Ready

- Berkeley’s energy ‘reach’ code
  - Requires new mixed-fuel development in the construction pipeline to be:
    - 10% more efficient than code for nonresidential buildings, high-rise residential buildings, and hotel/motels
    - Meet 10 total Energy Design Rating points for single-family or low-rise residential
    - Must be electric-ready
      - Require enough wiring, conduit and raceways
      - Require sufficiently sized panels and transformers for future full-building electrification

C. Other Low-carbon / Green Building & Energy Standards

- For example:
  - Low-carbon concrete
  - Low-carbon building materials and practices
  - Construction/demolition debris diversion
  - EV-readiness measures
  - Amnesty for illegally built units

2. Approaches to Existing Buildings (the hard part)

Local Funding/Policy Makes a Difference

- **A market-only approach will not work**
  - Explore investing public funds (transfer taxes & bonds) for electrification of existing buildings:
- **State and regional utility-based incentives can help**
  - CPUC's $1 billion in energy efficiency funds can now be used for fuel substitution)
- **The federal/state government will not save us**
  - We are already nearly four years into the 12-year IPCC window.

Other Local Incentives

- **Local Subsidies / Programs**
  - Each currently lack union/local/high road jobs requirements:
    - **BayRen:** $1K for water heater; $300 for induction; 300 for dryer
    - **EBCE:** $1k for water heaters
    - **SMUD:** 3k for heating & cooling; 2.5k for water heaters; up to 2.5k bonus for **panel upgrade** and adding EV/water heater circuits.
    - **Electrify Marin:** $1-2k for water heaters; $1k for central heating; $500 for cooking; $500 for **panel upgrade**

Evolving Berkeley Approach

- **Berkeley Measure HH Climate Equity Action Fund** (2020)
  - Would have eliminated UUT tax completely for ~5,000 very low income Berkeleyans
  - While raising $2.4 million/year for equitable climate action, including electrification
  - Instead applying $600,000 in Federal stimulus funding
- **Building Energy Saving Ordinance** Energy Audit (Time of Listing)
  - Mandatory electrification upgrades paired with incentives
- **Existing Building Subsidy Program using transfer tax revenues and requiring local/union jobs**
- **Existing Building Retrofit Study – what segments to prioritize & how to fund**

Reducing Inequality as We Green

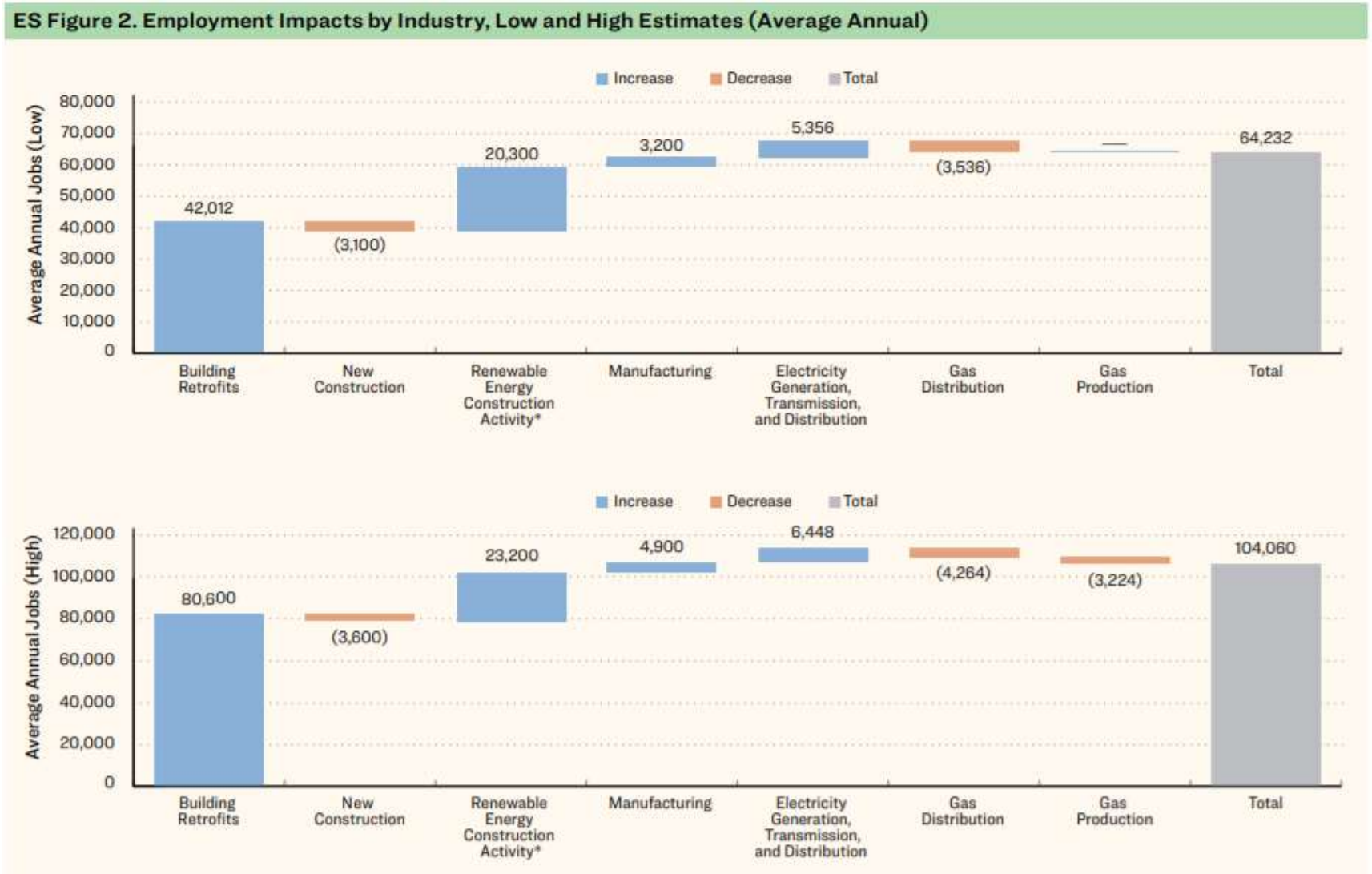
- **Environmental Justice**
  - Prioritize electrification retrofits, including panel upgrades, for low-income households and neighborhoods facing historic environmental injustices.
- **Renter Displacement Protections**
- **Community-Led Decision-Making**
- **Consider Equitable Repayment plans at Sale and/or On-Bill, and/or Property Tax**
- **Consider Weatherization Upgrades During Electrification**
- **Coordinate Electrification with Required Transformer/Distribution Upgrades**

See 2019 Greenlining Institute Report: Equitable Building Electrification A Framework for Powering Resilient Communities

Expanding Opportunity

- **Just Transition**
  - Invest in workforce development and training programs for fossil fuel workers transition to electrification-related fields with wage protection.
- **Centering Labor**
  - Project-labor agreements: ensure living wages, pathways for including people that have been historically shut out of the building trades, prioritize local communities.

2019 UCLA Luskin Center for Innovation Labor Study (statewide)



An Emerging Coalition

- Architects, engineers, energy consultants
- Environmental justice groups
- Doctors
- Realtors
- Business owners
- Concerned residents
- The California Energy Commission
- Utilities

Thank you

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