

# Building Decarbonization

***BOMA OEB***

***The shift towards Electrification & Carbon  
Neutrality***

September 2024

# What do you mean by decarbonization?

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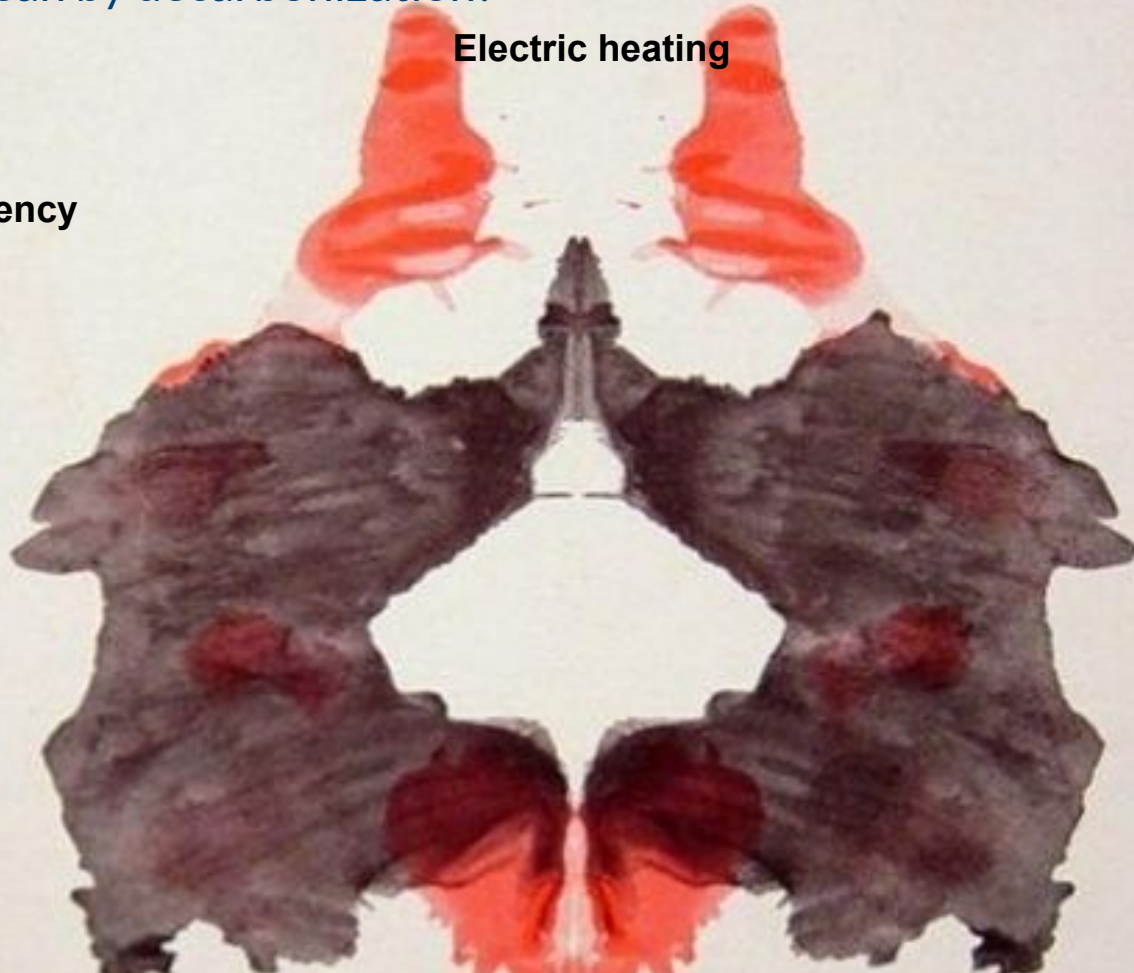
**Electric heating**

**Energy Efficiency**

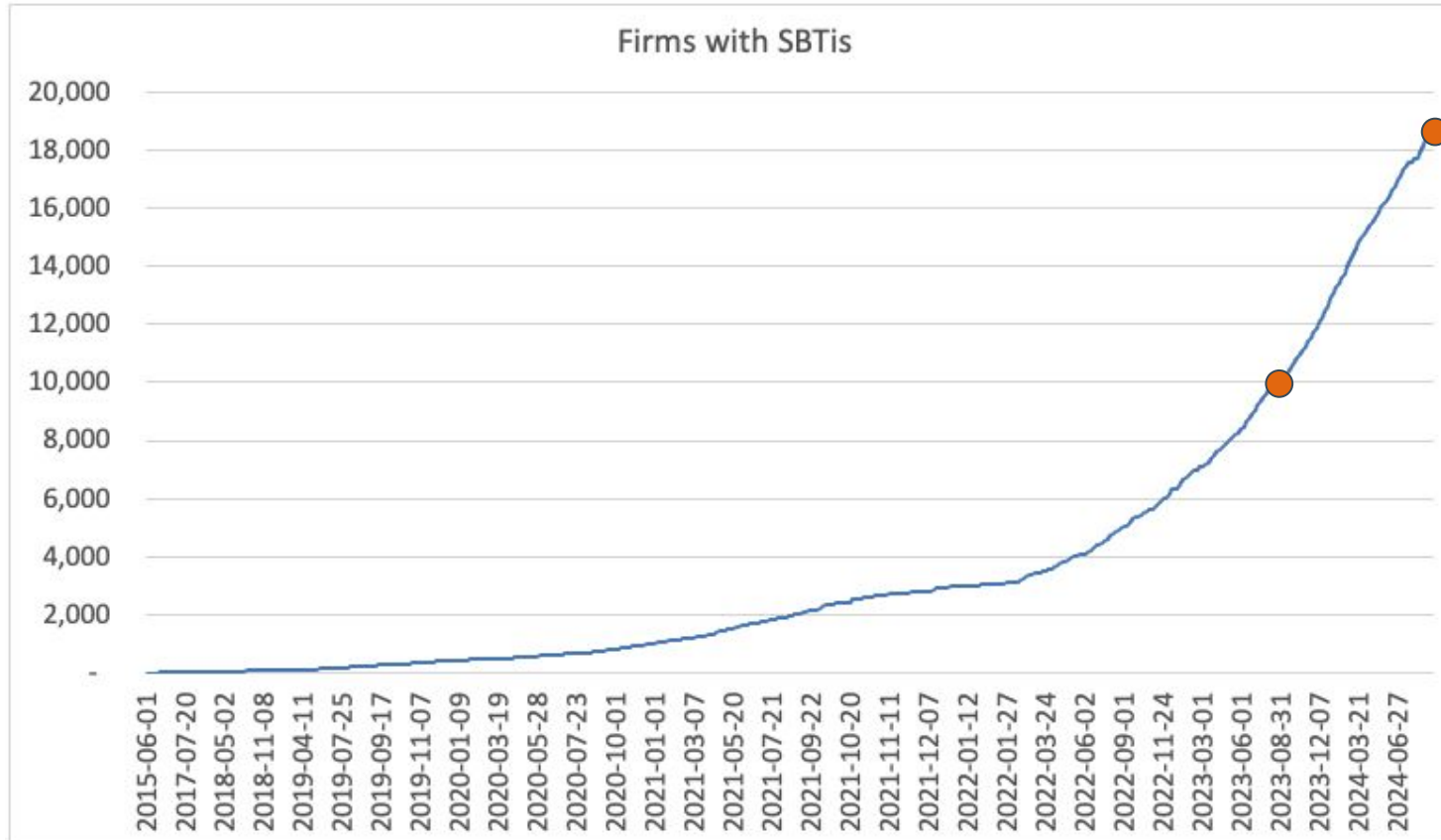
**100% Renewable**

**Net Zero**

**Embodied Carbon**



# Our collective customers are setting targets



# Our governments are setting performance standards

The State of Building Performance Standards (BPS) in the U.S.  
Members of the National BPS Coalition as of July 2024



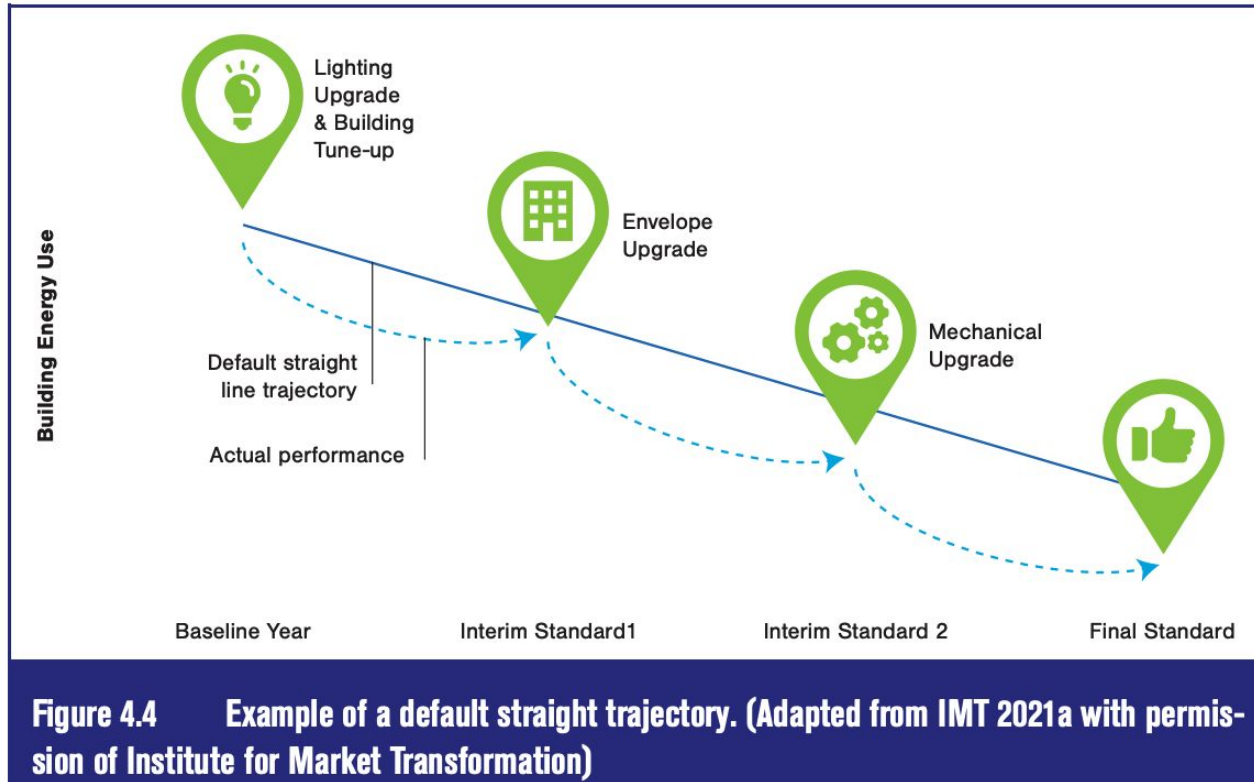
## California Updates

SF and Berkeley teaming up with for BPS, \$20M in IRA funds. San Jose also awarded

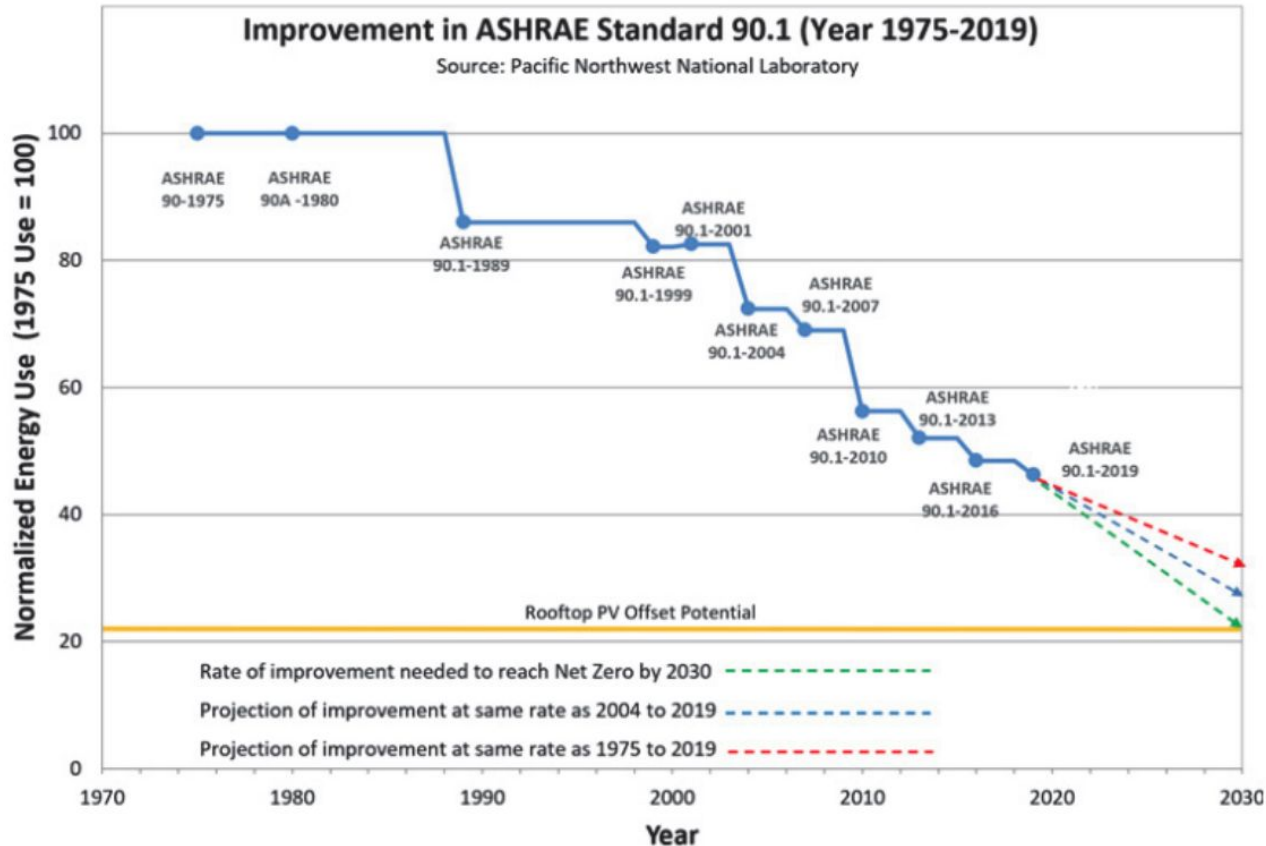
CA SB 48 will deliver statewide BPS by 2026

Likely to be a lot of discussion in next two years, get involved, leverage BOMA

# Building performance standards and trajectories



# Some evidence that we can do this on new build, challenges on retrofits



# Suburban Advantages, now financeable on PG&E Bill

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# Efficiency framework collapses for gas

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## Natural Gas is a Sticking Point

CA Grid emissions are down 25% in last 10 years.

Many building owners mandated to purchase 100% renewables

As grid gets cleaner even condensing boilers increase emissions

Every policy target will accept renewables as zero emissions for “Net Zero”

You can't net out on site combustion.

# Our Governments are going to ban gas for space heating

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BAY AREA AIR QUALITY  
MANAGEMENT DISTRICT

Effective, 2031, ban of sale



CALIFORNIA  
AIR RESOURCES BOARD

Proposed 2030, ban of sale



**SF** Environment

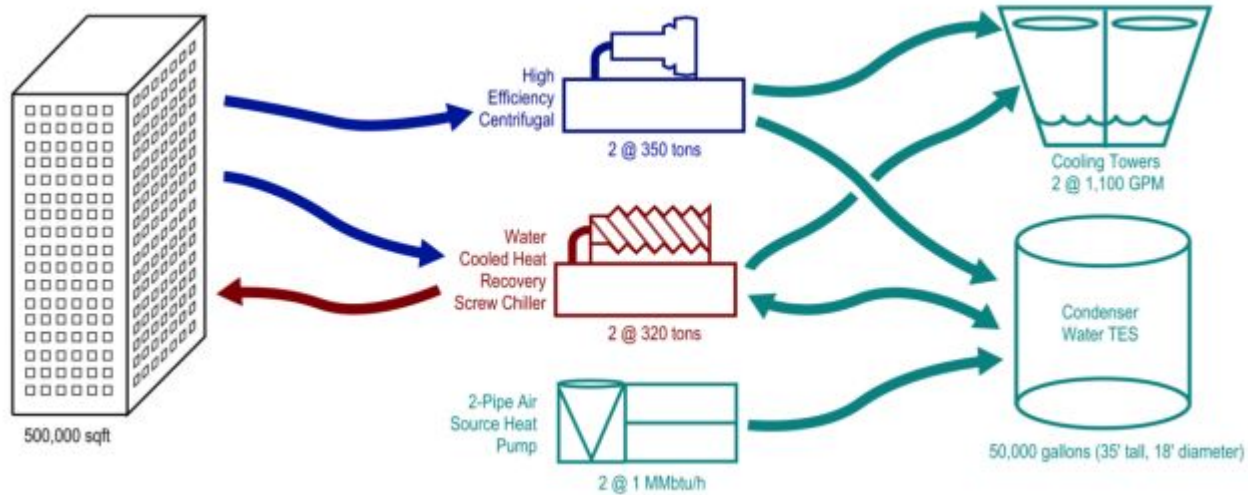
**Our home. Our city. Our planet.**

A Department of the City and County of San Francisco

Expected 2035 ban of use

# Central plant heating that is compatible with Title 24

## Conceptual Electric heating/storage plant



Courtesy Taylor Engineering

## No longer just conceptual, plants active (new build only)

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A new asset tag for many



## Key Building Questions Everybody should know (Chief to Asset Manager)

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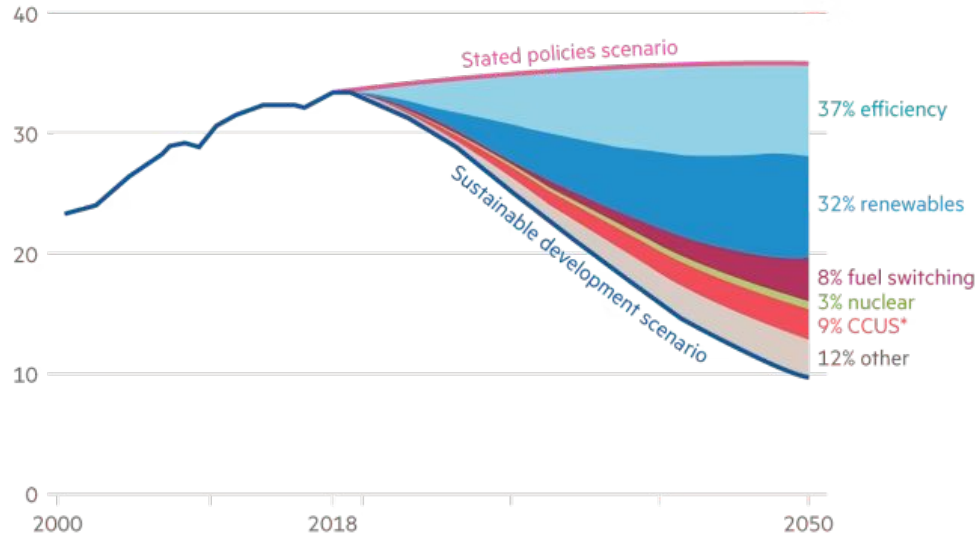
1. How do you heat your building?
2. How do you distribute heat in your building?
3. What is the lowest water temperature your can run and still reach setpoints on cold mornings?
4. How much space do you have for additional mechanical equipment? Rooftop space ratio to volume of building?

**Most BOMA Members:** Hydronic heat, 170F+ water, single pass VAVs, condensing nat gas boilers, limited mechanical space and low rooftop to building volume ratio

# Decarbonization is roughly half efficiency half renewables

## Efficiency measures can be most potent tool to curb CO<sub>2</sub> emissions

Energy-related CO<sub>2</sub> emissions and CO<sub>2</sub> emissions reductions by measure in IEA's sustainable development scenario (GtCO<sub>2</sub>)



\*Carbon capture, utilisation and storage

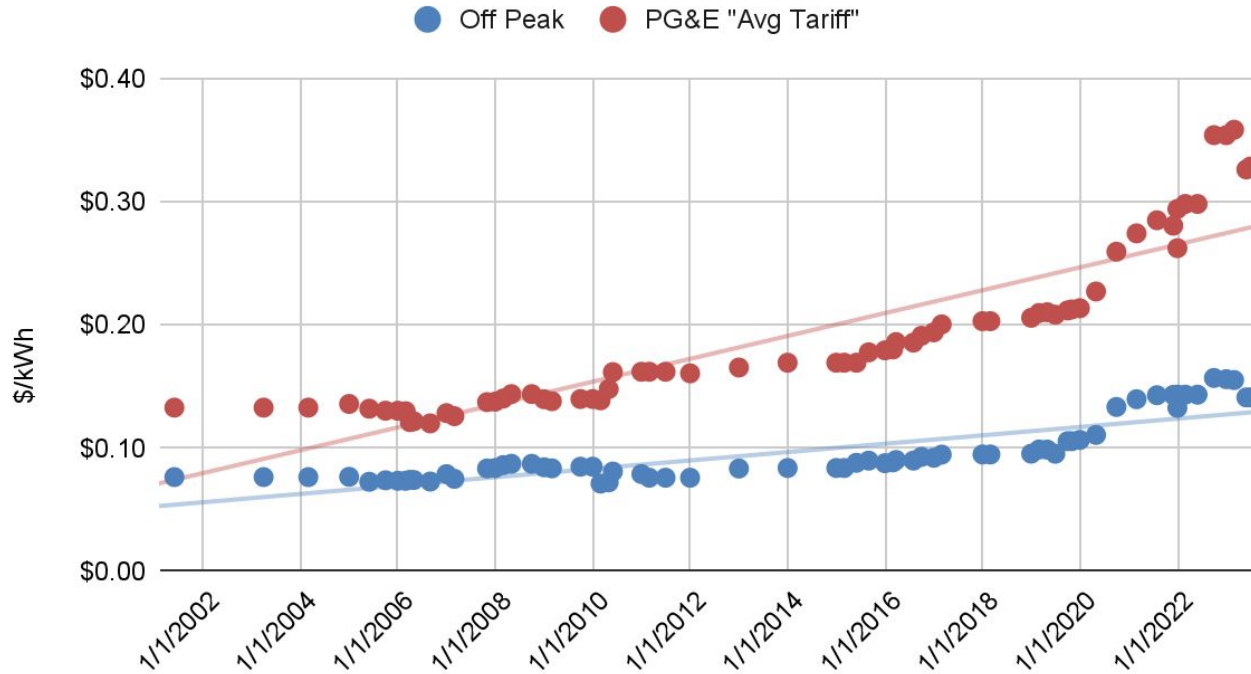
The stated policies scenario describes the predicted path taken based on governments' current policies and measures to mitigate CO<sub>2</sub> emissions. The Sustainable Development Scenario describes the path required to reach the goals set by the Paris Climate Agreement

Source: Global Commission for Urgent Action on Energy Efficiency

© FT

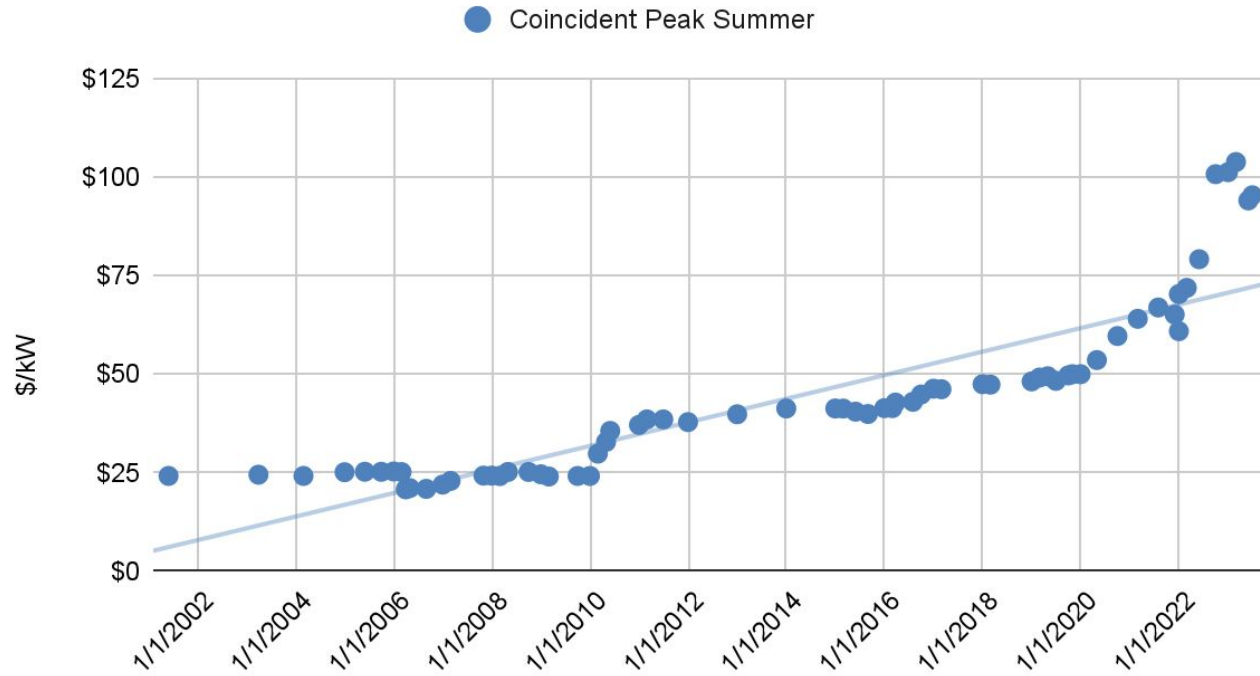
# PG&E Rate Trends: 6.4% CAGR on System Avg

## PG&E Off Peak and Average (B-19)



# PG&E Rate Trends: 10.4% CAGR on Demand Charges

## PG&E Summer Non-Coincident Demand Peak (B-19)



How most people think rates are set...

**Only about 20% of your PG&E bill is the actual commodity costs!**



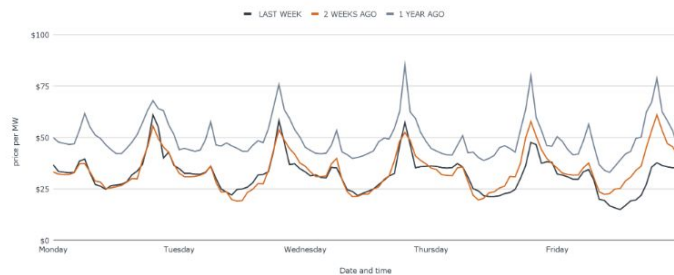
# The Irony of the Energy Transition

## NP-15 CAISO

### NP-15: AVERAGE CAISO PRICES (\$/MWh)

|                     | Last Week     | 2 Weeks Ago   | 1 Q Ago       | 6 Mo Ago      | 1 Yr Ago      |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| <b>Week Ending:</b> | <b>Aug 23</b> | <b>Aug 16</b> | <b>Jun 07</b> | <b>Mar 01</b> | <b>Aug 25</b> |
| on-peak             | \$30.86       | \$33.43       | \$22.98       | \$32.59       | \$51.01       |
| % difference        | -             | -8%           | 34%           | -5%           | -40%          |
| off-peak            | \$34.23       | \$34.63       | \$28.79       | \$32.11       | \$46.47       |
| % difference        | -             | -1%           | 19%           | 7%            | -26%          |

CAISO - WEEKLY PRICES (NP-15)

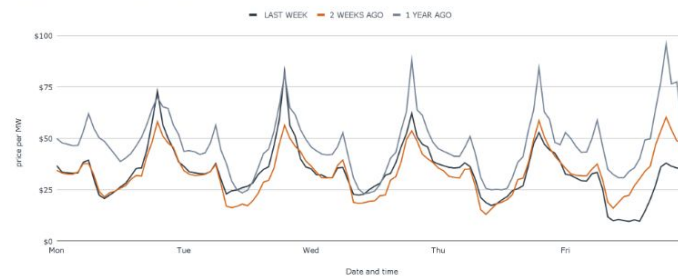


## SP-15 CAISO

### SP-15: AVERAGE CAISO PRICES (\$/MWh)

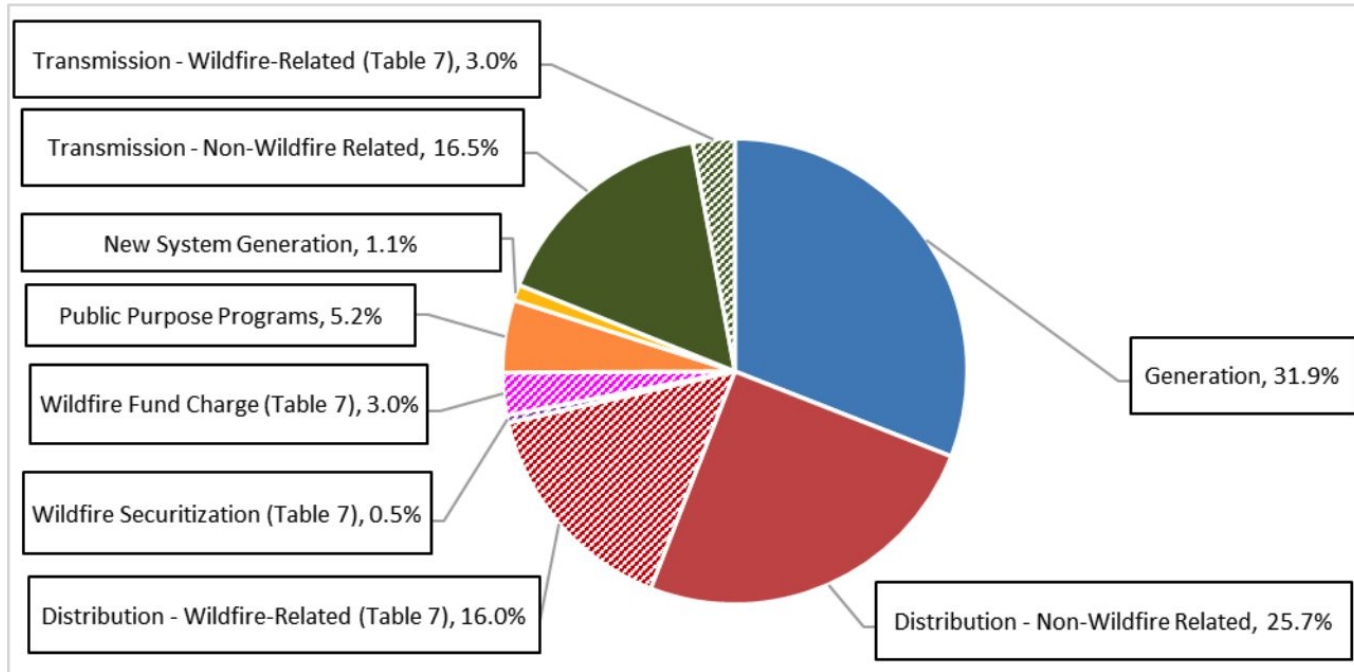
|                     | Last Week     | 2 Weeks Ago   | 1 Q Ago       | 6 Mo Ago      | 1 Yr Ago      |
|---------------------|---------------|---------------|---------------|---------------|---------------|
| <b>Week Ending:</b> | <b>Aug 23</b> | <b>Aug 16</b> | <b>Jun 07</b> | <b>Mar 01</b> | <b>Aug 25</b> |
| on-peak             | \$32.75       | \$32.39       | \$15.26       | \$13.97       | \$47.22       |
| % difference        | -             | 1%            | 115%          | 134%          | -31%          |
| off-peak            | \$35.24       | \$35.34       | \$29.88       | \$31.79       | \$47.06       |
| % difference        | -             | 0%            | 18%           | 11%           | -25%          |

CAISO - WEEKLY PRICES (SP-15)



## 2022: 23% of PG&E's revenue requirement driven by wildfire expenses

**Figure 10: PG&E 2022 Year-End Total System Revenue Requirement by Rate Component with Additional Wildfire-Related Revenue Requirement Breakout**



What does next year look like?

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6.3%

*Depending on CPUC judgement, Direct Access and CCA rates might increase as much as 15% due to soaring reliability costs*

## Summing it up

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- ▲ **The E in ESG shows no signs of slowing down**
- ▲ **You are likely to have to manage to a BPS**
- ▲ **You probably already bought your last boiler**
- ▲ **It will be very difficult, but you will have to figure out to heat without gas**
- ▲ **Energy Efficiency will only get more profitable as rates structurally rise, even though energy is cheap**
- ▲ **We will depend even more on talented engineers for the energy transition in buildings**

# Thank you!

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