

# Building Decarbonization

**BOMA OEB**

***Decarbonization: What does it mean for my building?***

September 2023

# What do you mean by decarbonization?

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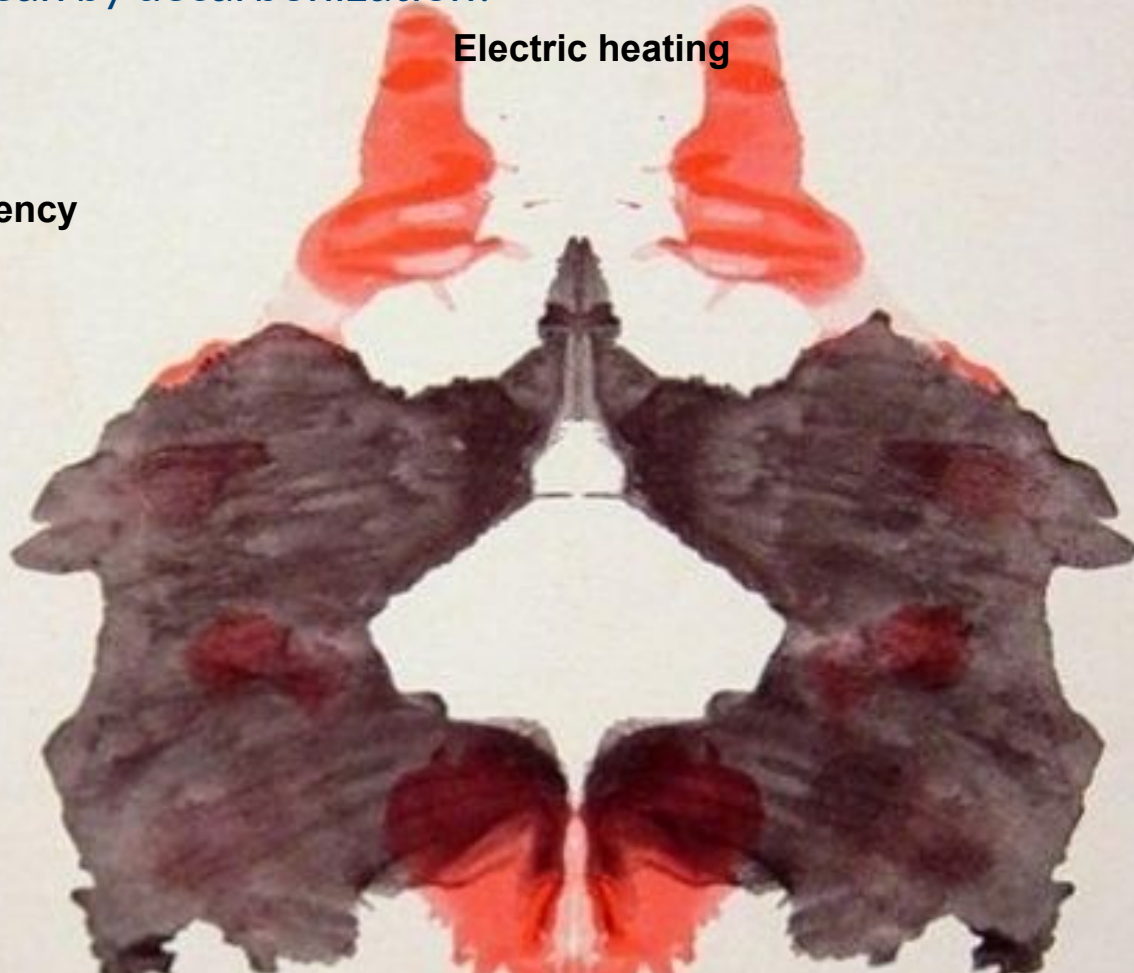
**Electric heating**

**Energy Efficiency**

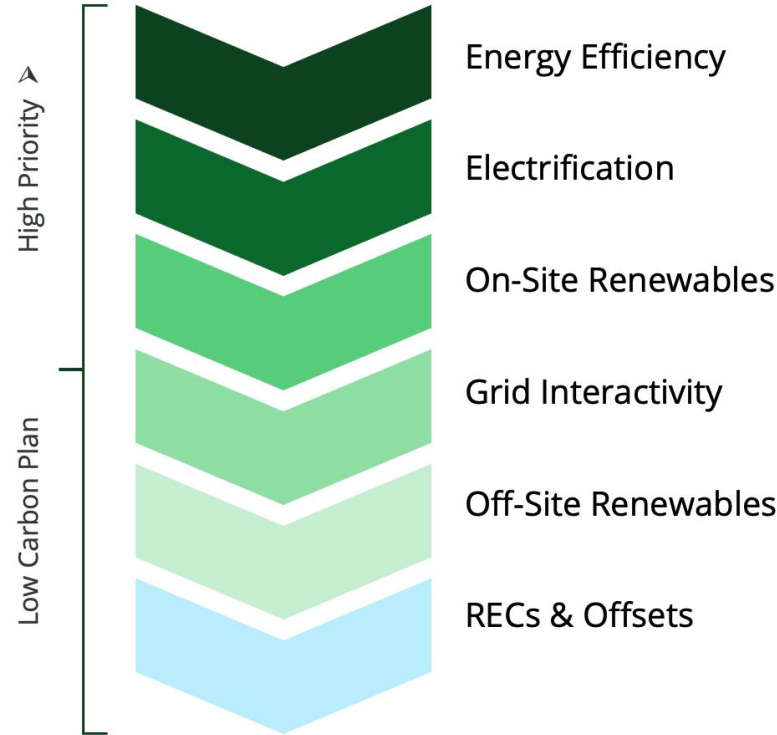
**100% Renewable**

**Net Zero**

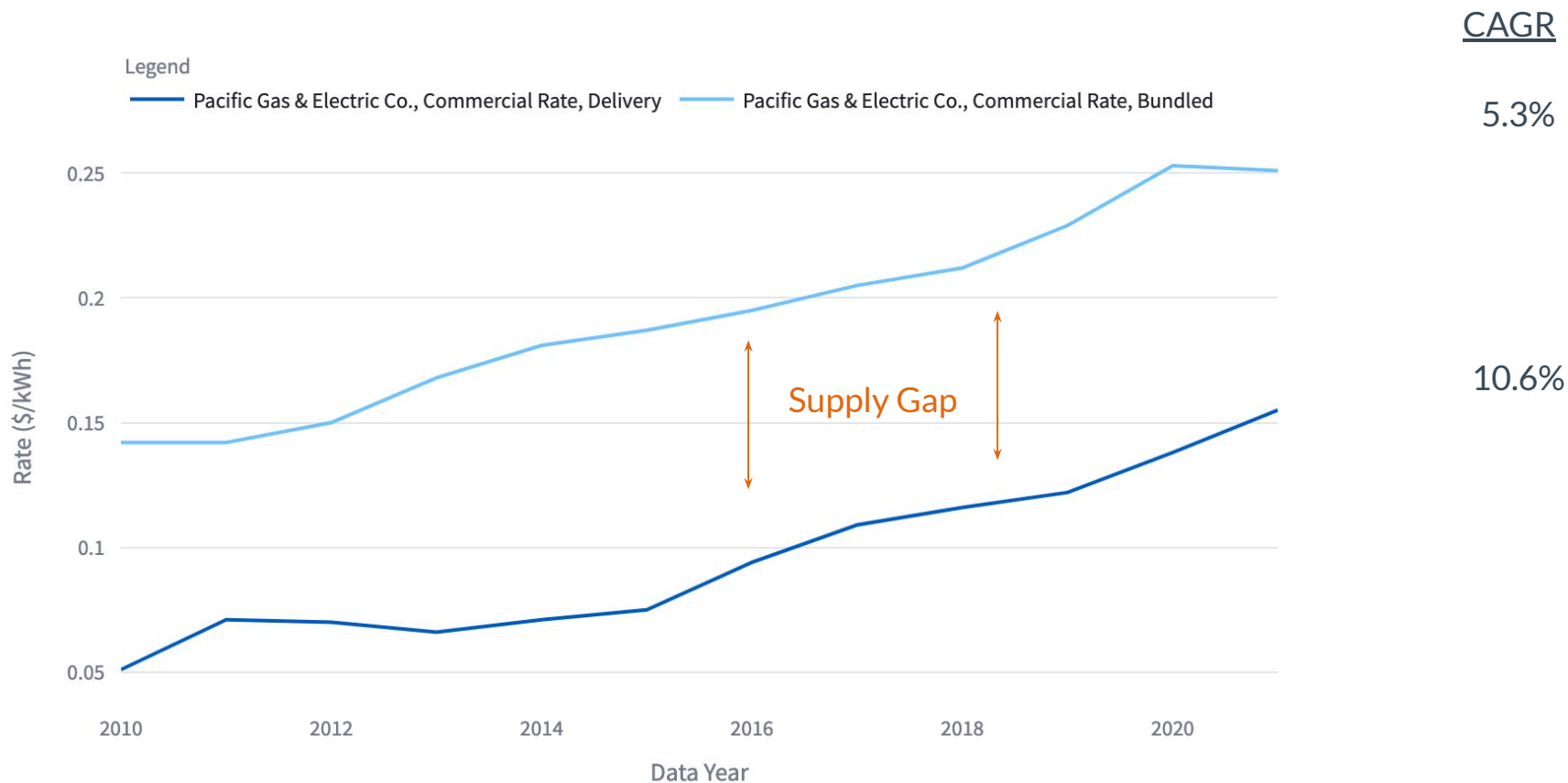
**Embodied  
Carbon**



# A framework for decarbonization



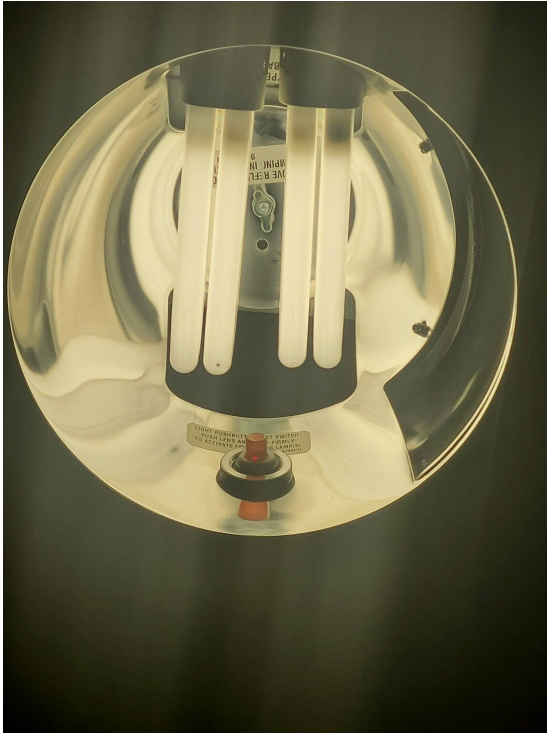
# Why is efficiency first? The return keeps getting better and better



..and on lighting, CA will kick you over the edge

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**Banned Jan 1, 2024**



**Banned Jan 1, 2025**



# California Assembly Bill 2208: What's Prohibited?

## STARTING JANUARY 1, 2024:

- ^ Screw or bayonet base CFLs

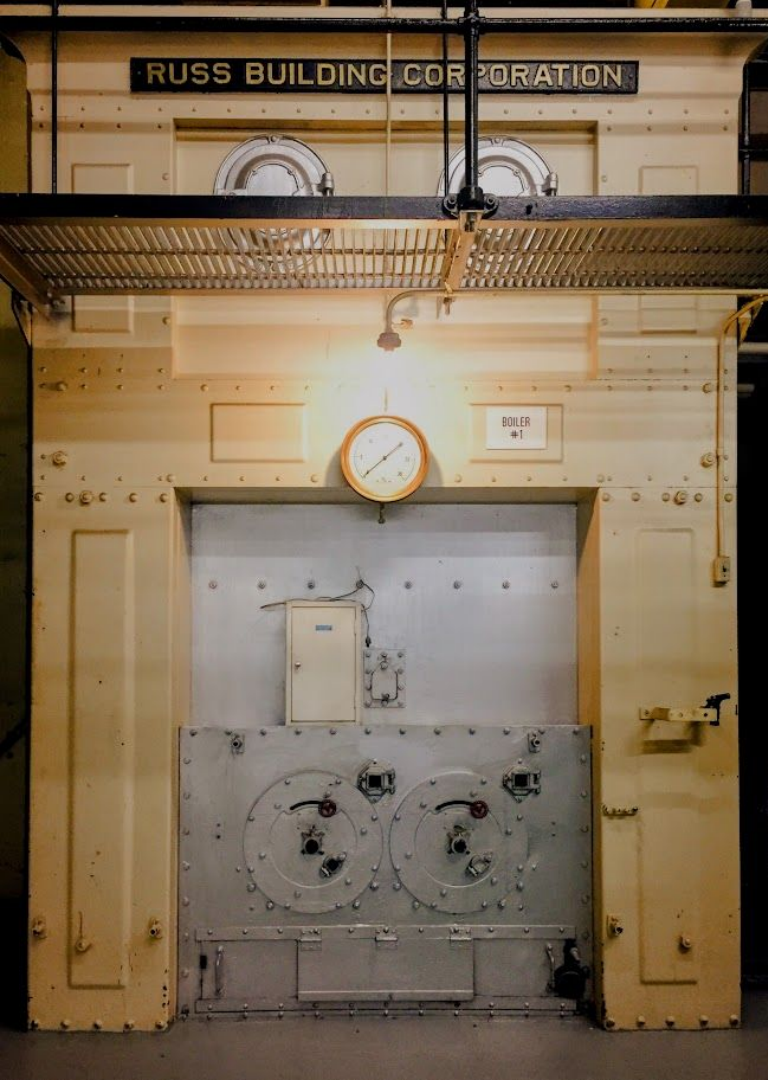
## STARTING JANUARY 1, 2025:

- ^ Pin-based CFLs
- ^ Linear fluorescent lamps (aka fluorescent tubes)

## Official Summary Text

*This bill would prohibit, on and after January 1, 2024, a **screw or bayonet base type compact fluorescent lamp**, as defined, and, on and after January 1, 2025, a **pin-base type compact fluorescent lamp or a linear fluorescent lamp**, as defined, from being offered for final sale, sold at final sale, or distributed in this state as a new manufactured product.*

*The bill would exempt various lamps that meet specified criteria from that prohibition, including lamps used for image capture and projection and lamps used for disinfection.*



## Electrification

- ▲ Technological change is scary, but has happened before:
  - Coal conveyor belt
  - Fuel Oil
  - Natural Gas converted boilers
  - District Steam (Nat Gas powered)
- ▲ All driven by energy economics
- ▲ Next phase is driven by regulation
- ▲ What is next? And how should your building plan?

## Electrification and the pressure to manage GHGs in buildings

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40%

x



100%

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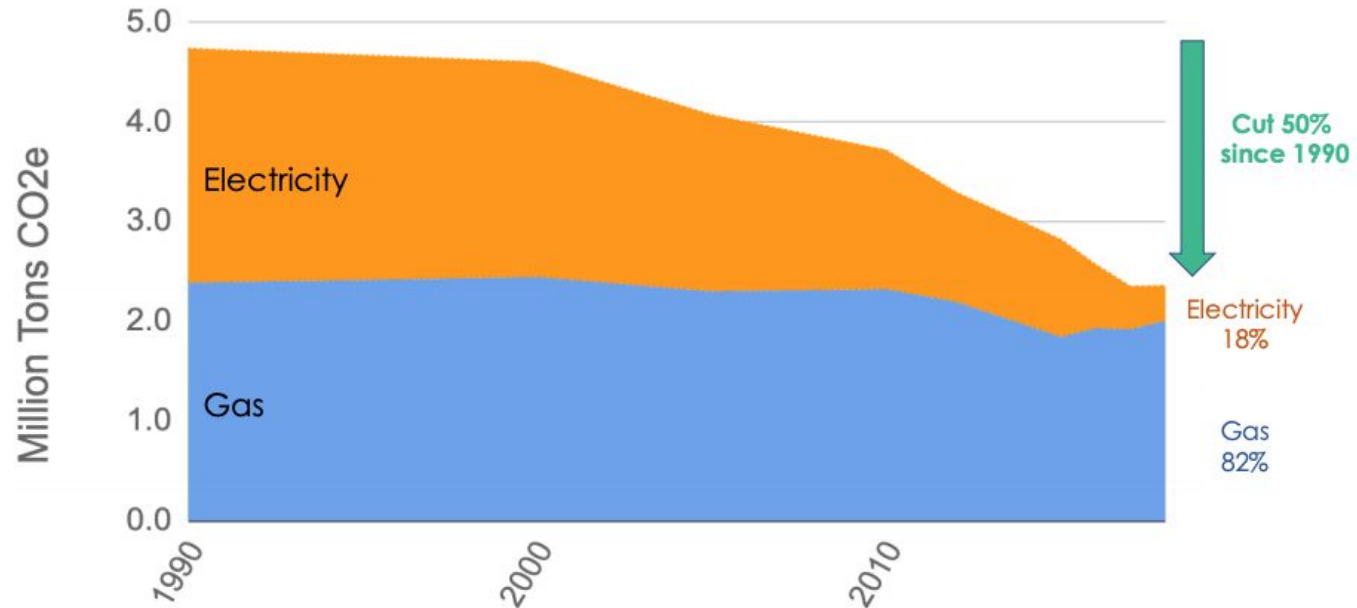
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Net Zero



## Example emissions accounting: San Francisco

### Carbon Emissions from San Francisco Buildings



## East Bay: Berkeley case is central to ongoing legal disputes

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## Bay Area and Nat Gas Regulation – will east bay cities follow?

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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

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

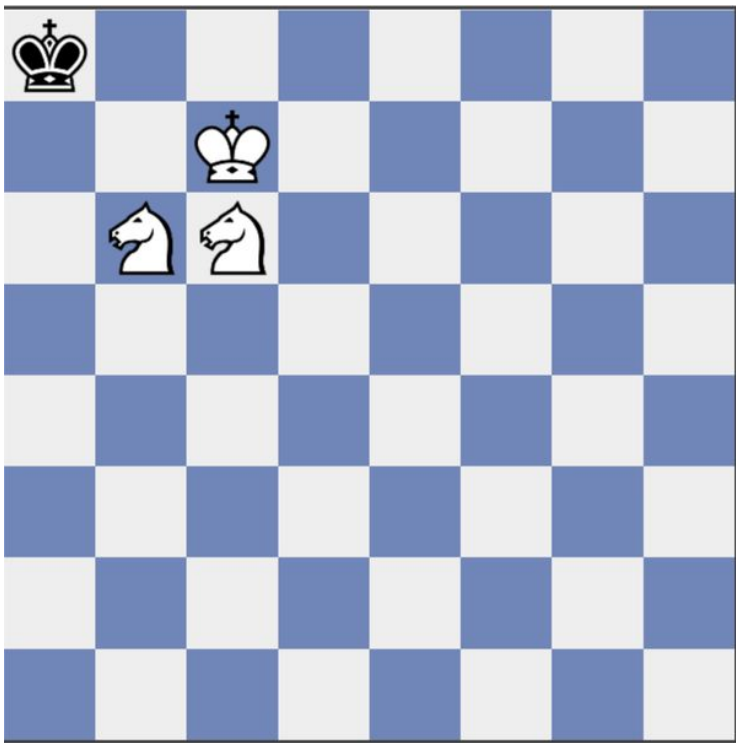
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1. How do you heat your building?
2. How do you distribute heat in your building?
3. What is the lowest water temperature your can run and still reach setpoints on cold mornings?
4. How much space do you have for additional mechanical equipment? Rooftop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

# Electric Resistance

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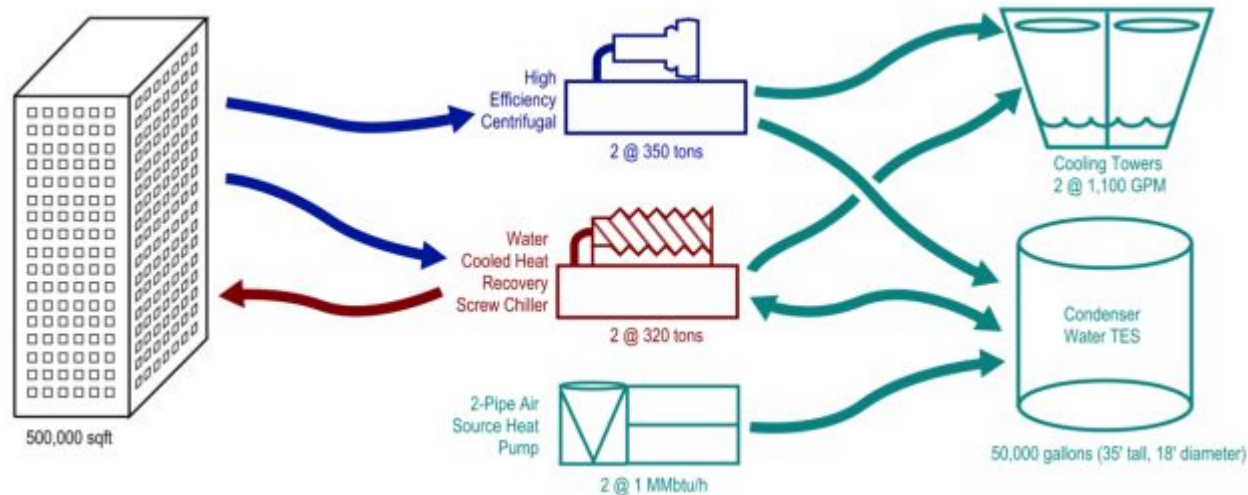


## Why not just an electric boiler?

- ▶ Easiest technical solution. 4x fuel costs, but similar capex costs to nat gas.
- ▶ Title 24 forbids, but allows city to provide waiver
- ▶ Would require city waiver – will your local city waive?
- ▶ Electric reheat VAVs a pathway, but require performance based exception to Title 24

# Making Heat from Ice: \$20/foot capex and complete overhaul of central plant

## Conceptual Electric heating/storage plant



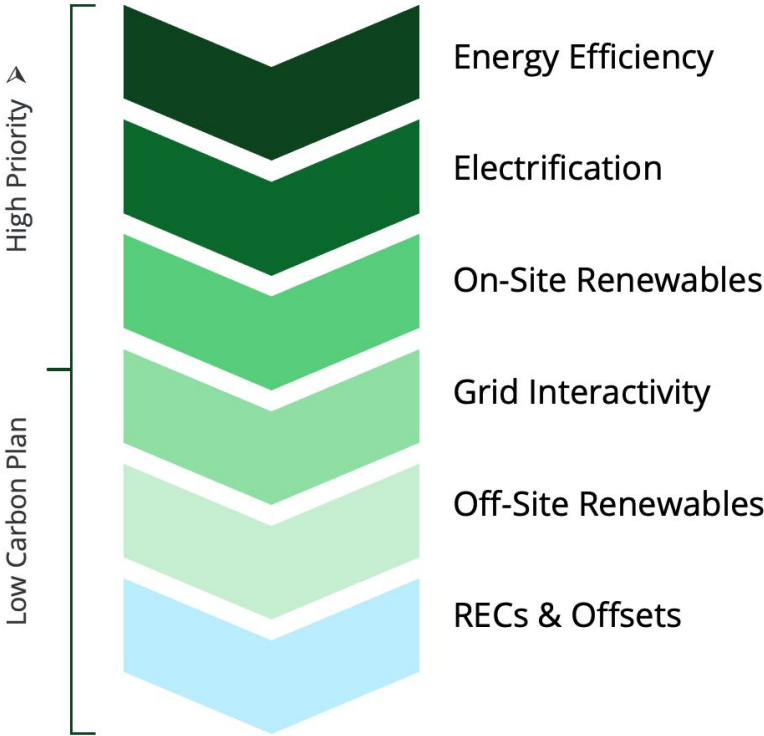
Courtesy Taylor Engineering

## Some advice for all building owners

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- ▲ Understand what you have
- ▲ Be skeptical of natural gas investments
- ▲ Dance with delight if you use district steam
- ▲ Start thinking about the path to electrification
- ▲ Advocate for policy *through BOMA*

# A framework for decarbonization – what are you going to focus on?





# Thank you!

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