



SF Building Decarbonization

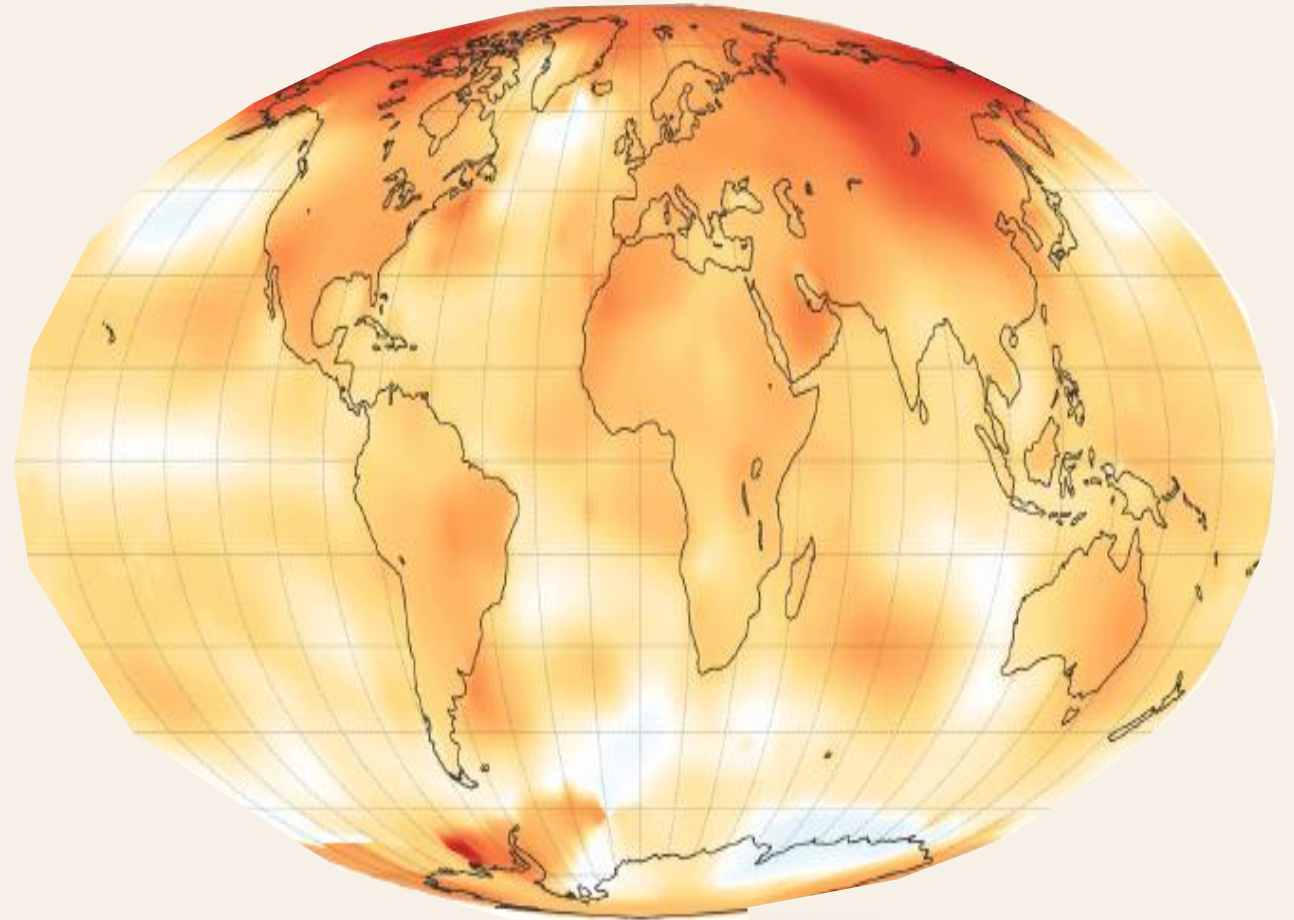
Nik Kaestner
Senior Building Decarb Coordinator

SAN FRANCISCO
ENVIRONMENT
DEPARTMENT

Quiz

Which has been the hottest year on record?

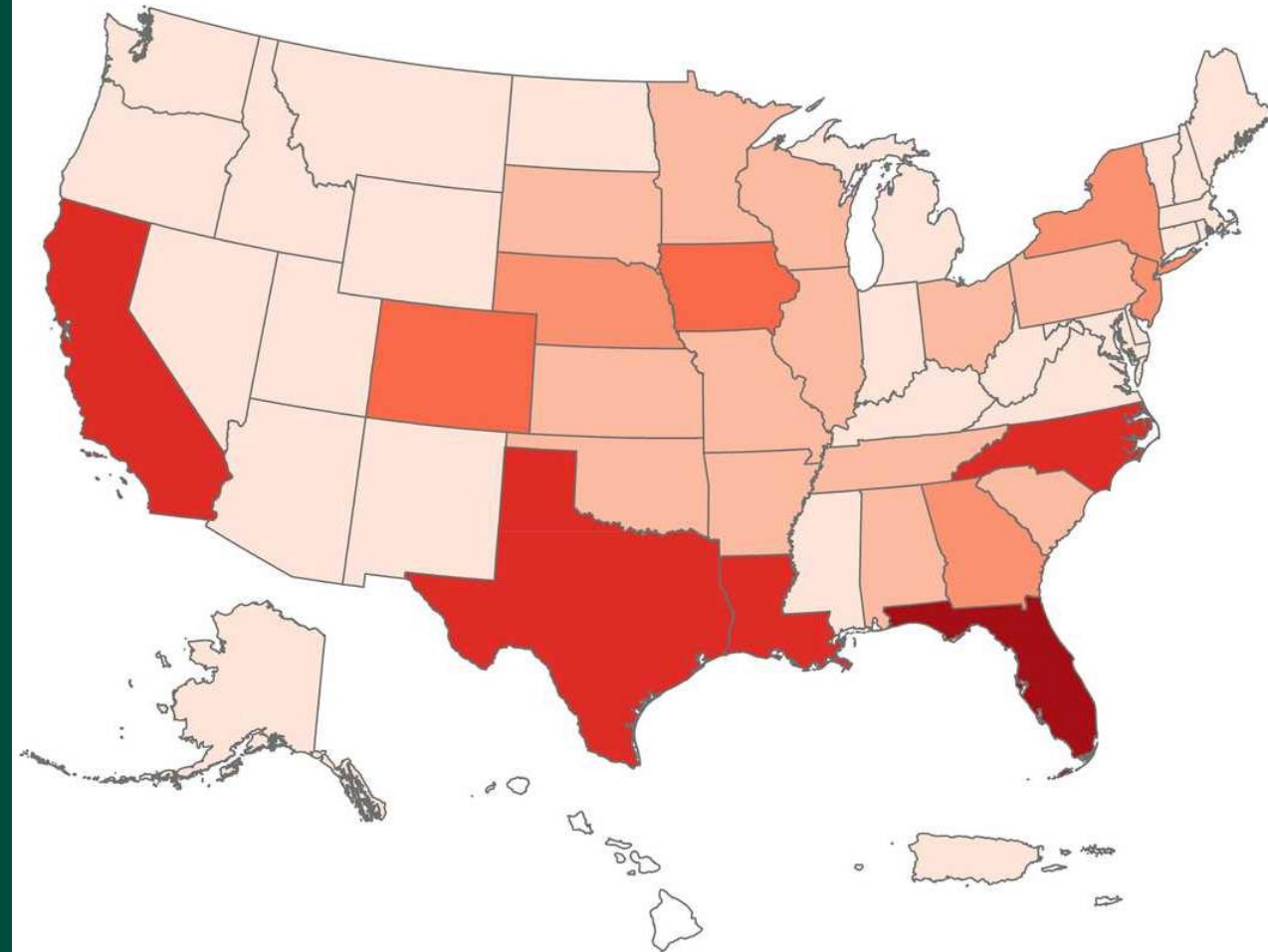
- | | |
|---|---------------|
| a | 2016 |
| b | 2020 |
| c | 2023 |
| d | None of above |



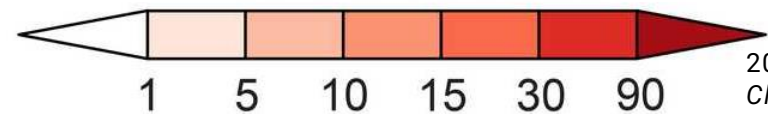
Risk is Increasing

The US now experiences, on average, a billion-dollar weather or climate disaster every three weeks.

Damages by State from Billion-Dollar Disasters (2018–2022)



Billions of US dollars



Agenda

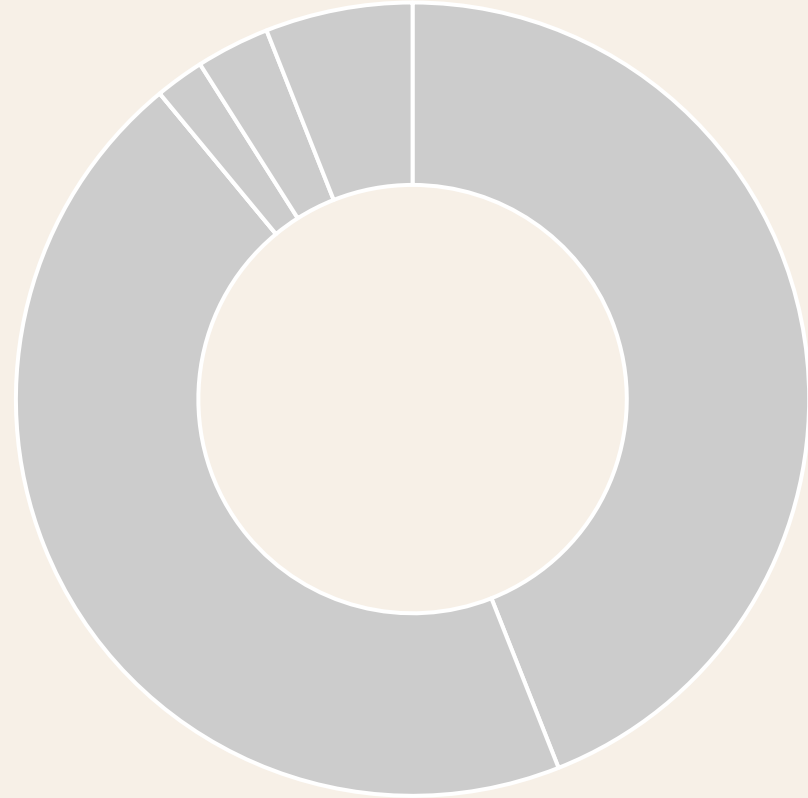
1. SF GHG Emissions
2. Low-Hanging Fruit
3. Climate Action Plan (CAP)
4. Decarbonization Policy
5. Outreach & Engagement



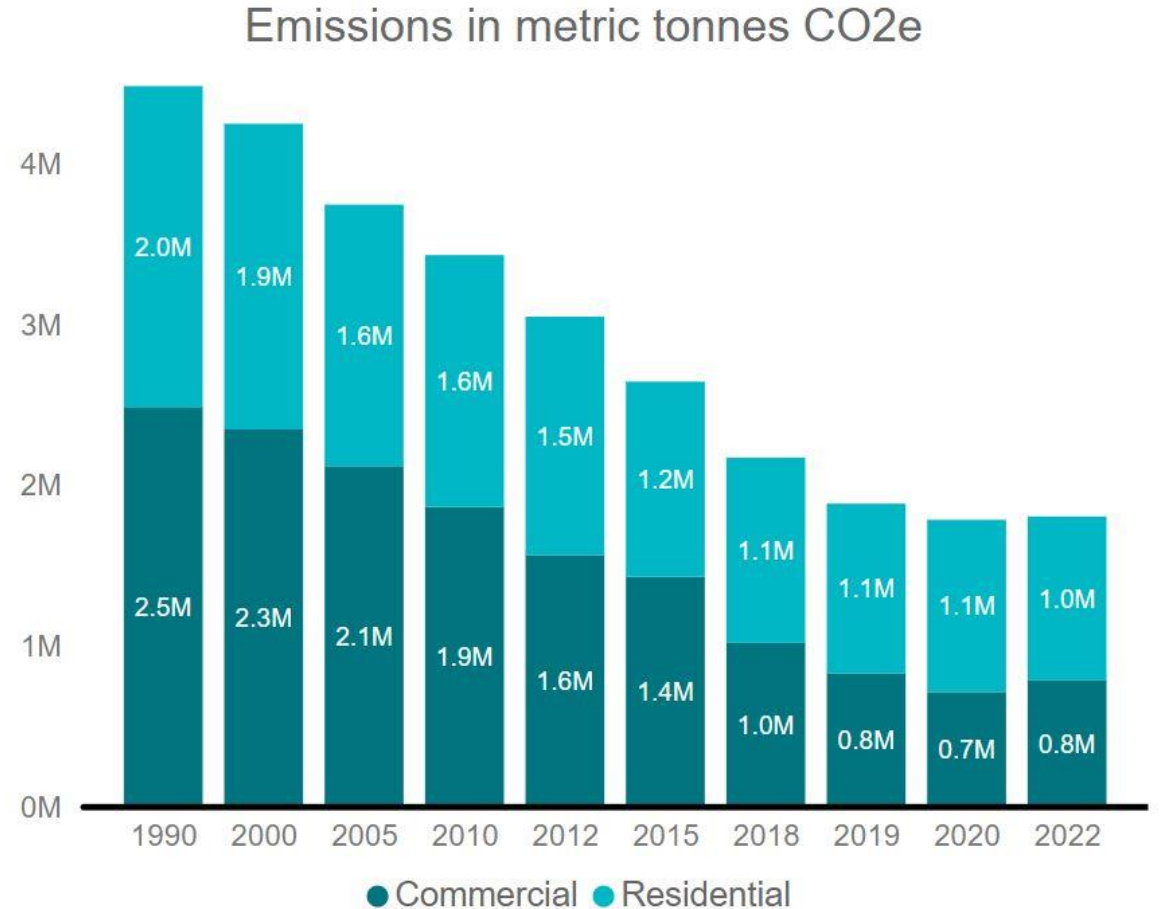
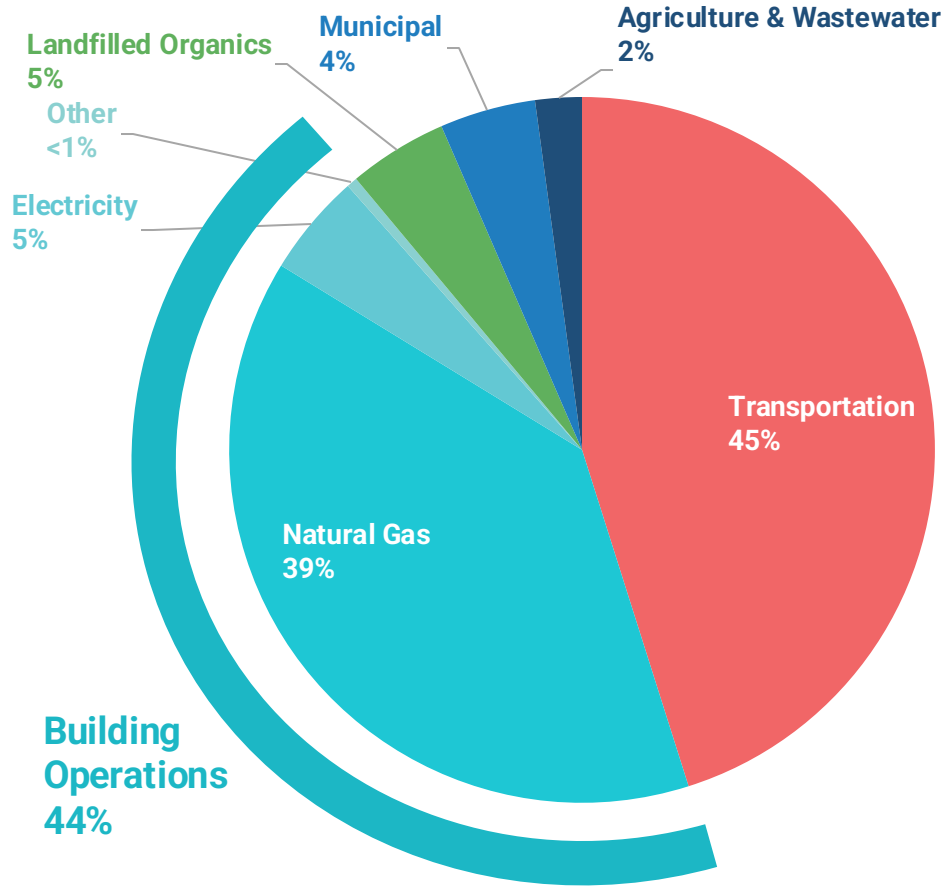
Quiz

What is the largest source of greenhouse gas emissions in San Francisco?

- a buildings
- b transportation
- c solid waste
- d municipal

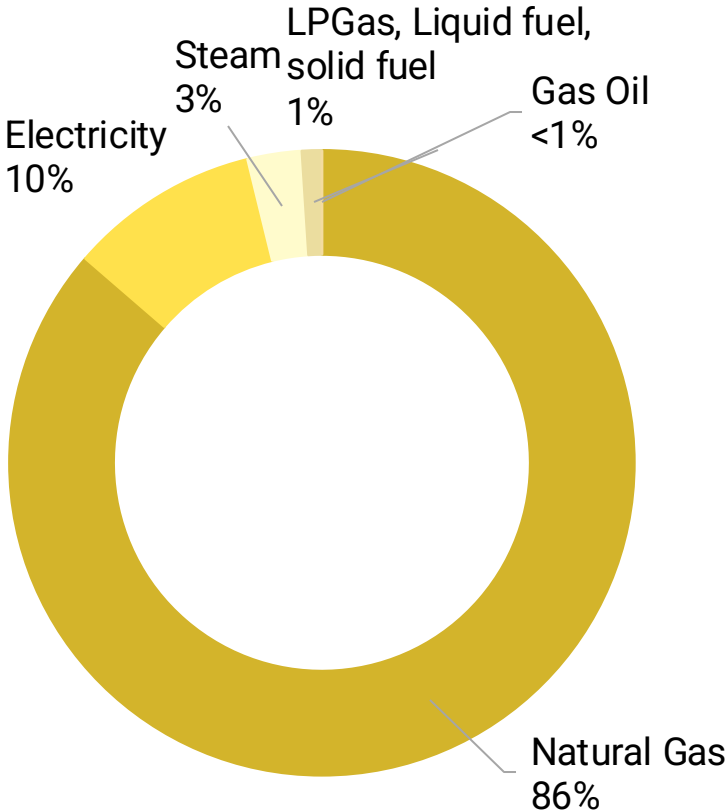


Baseline Data: SF GHG Emissions

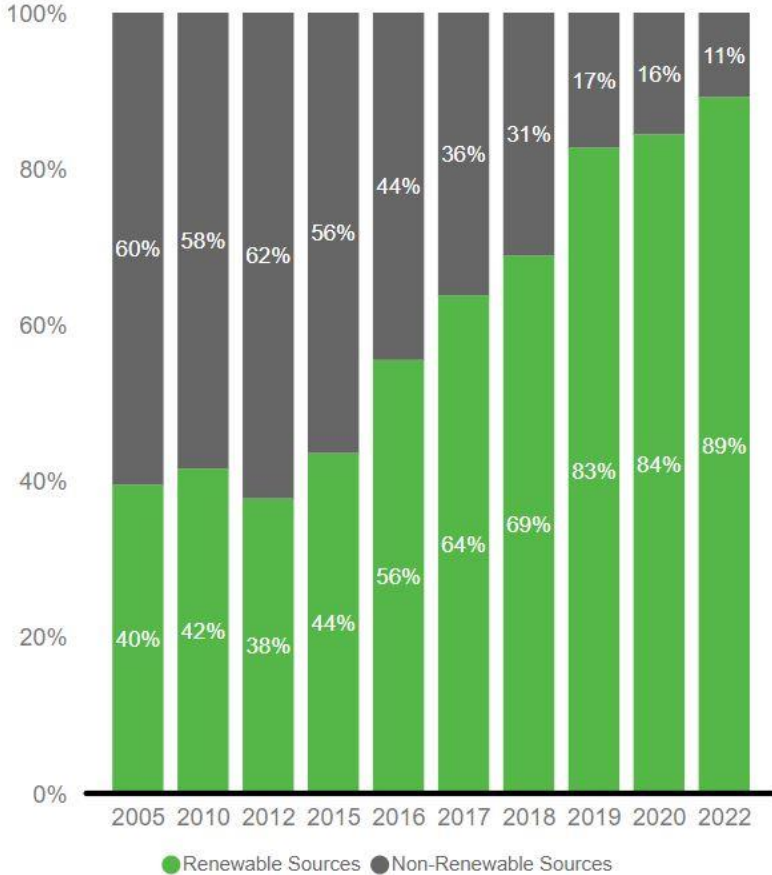


Baseline Data: Emissions Sources

Emission Share by Commodity



Renewable vs Non-Renewable



Quiz

Approximately, how many buildings are there in San Francisco?

- | | |
|---|---------|
| a | 25,000 |
| b | 100,000 |
| c | 150,000 |
| d | 200,000 |





“Low Hanging” Fruit

2012

Existing Building Ordinance
“Energy Benchmarking”

2019

100% Renewable Electricity Ordinance

Existing Building Ordinance

Percent of Total Floor Area

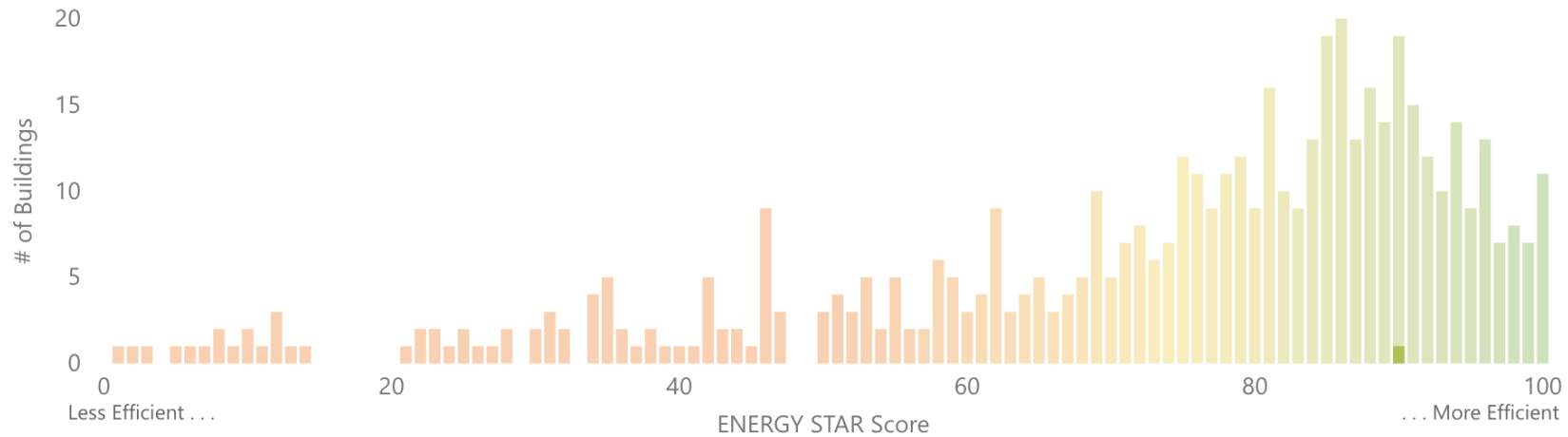


● Arts & Culture ● Education ● Food service ● Healthcare ● Hotel ● Multifamily ● Office ● Other ● Religious ● Retail ● Supermarket ● Technology ● Warehouse

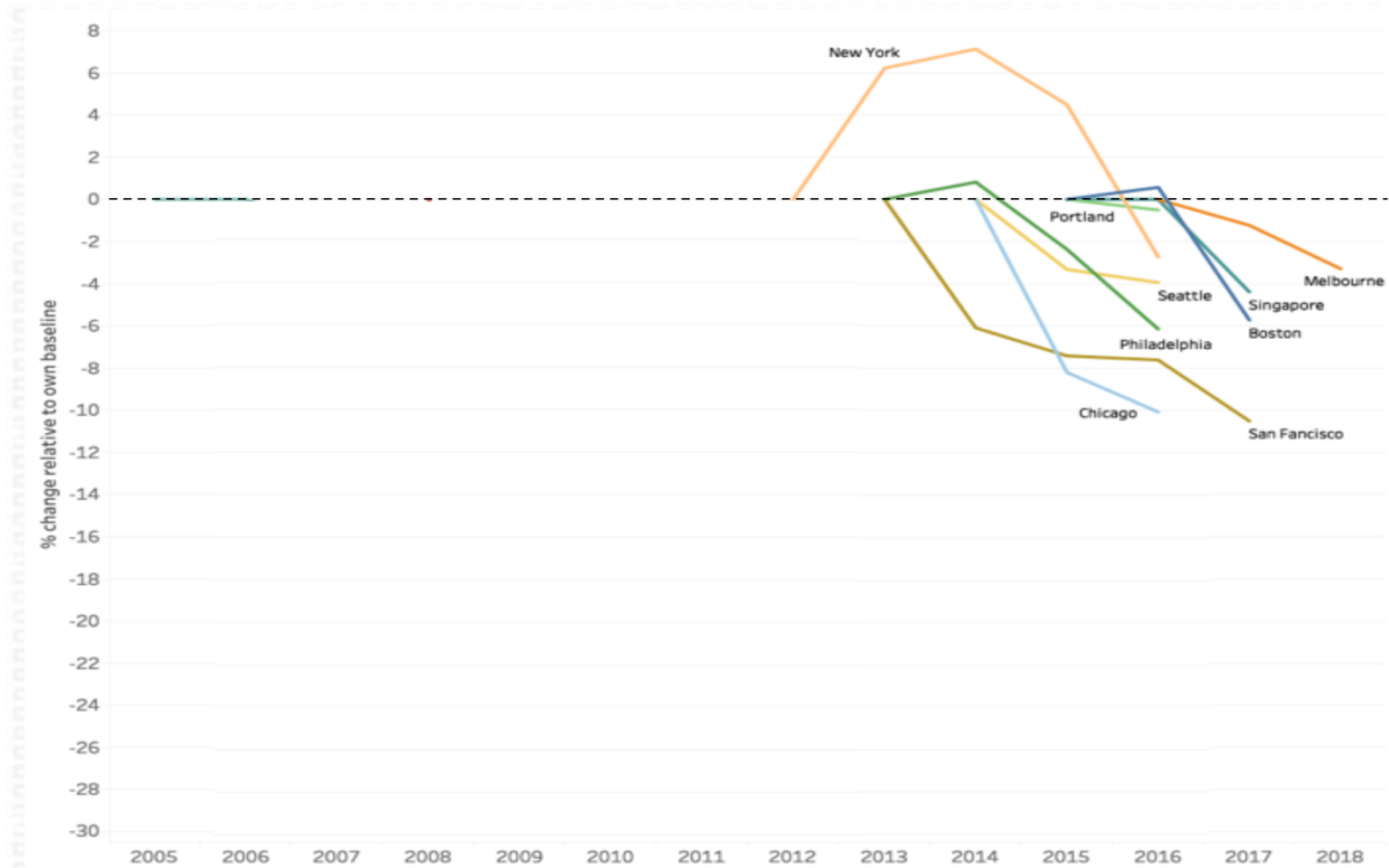


Percent of Total Number of Buildings

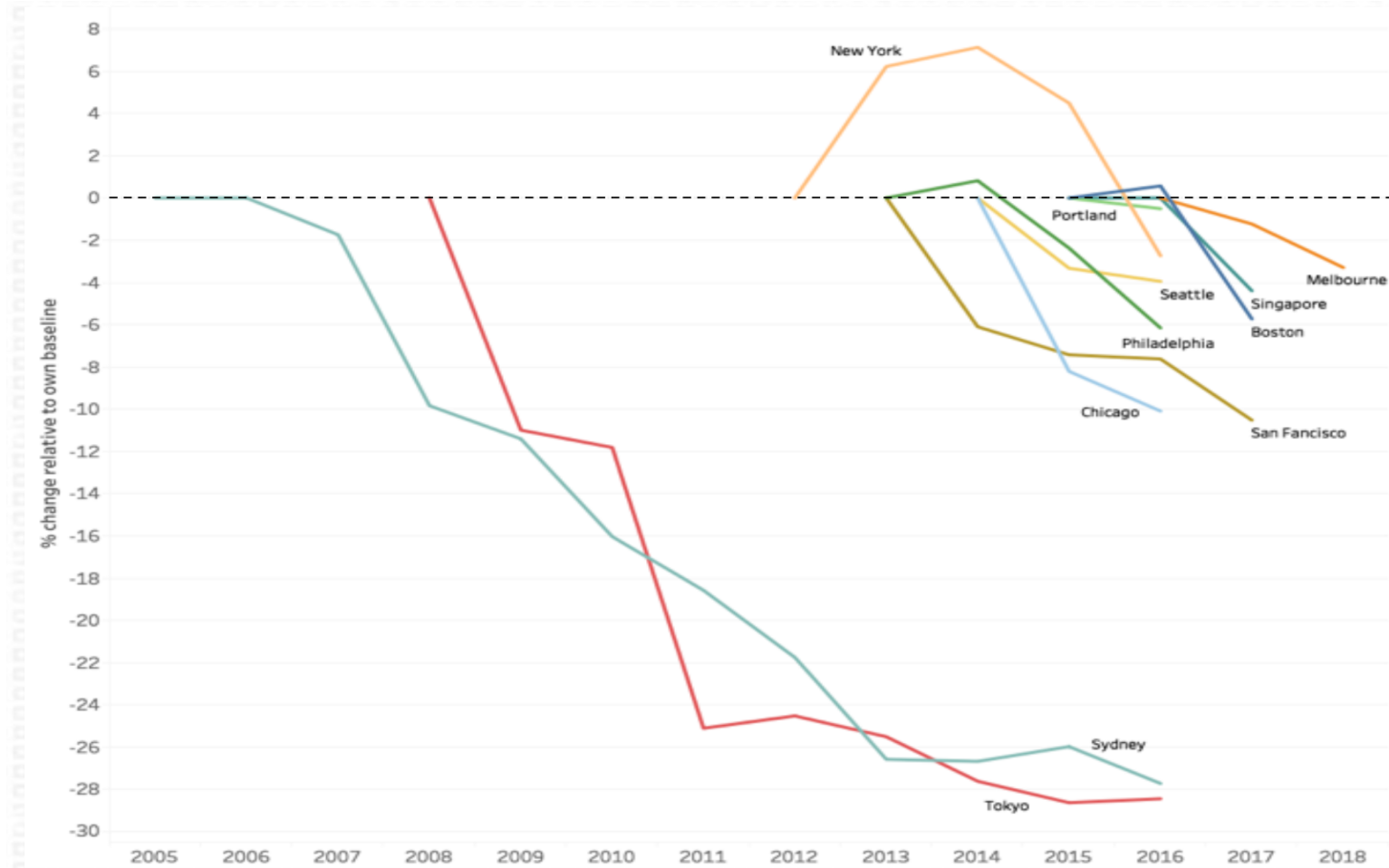
ENERGY STAR Score Distribution



Impact of Monitoring Energy Consumption



Impact of Monitoring Energy Consumption



SF approves legislation requiring renewable sources for commercial buildings



Sarah Ravani

Sep. 17, 2019 | Updated: Sep. 17, 2019 5:41 p.m.



100% Renewable Energy Ordinance

San Francisco Environment Code Chapter 30 (Ordinance 220-19) requires large commercial buildings to obtain all electricity from 100% renewable sources.

Core Principles



Climate Action Supporting New SF Jobs

Estimates for Key Actions in San Francisco 2021 Climate Action Plan

	Description	Jobs
Building Decarbonization	Energy Efficiency + Electrification of 173K commercial and residential buildings	62,000 - 87,000 job years*
Housing	Building 5,000 housing units a year	30,000 jobs per year
MUNI Capital Projects	Recomendations from ConnectSF Transit Corridors Study and Muni Forward Plan	3,100 - 4,700 jobs over 10 -15 years
Transit Only Lanes + Bike lanes	50 miles of Muni Forward projects + 30 Miles of Transit Only Lanes + 20 Miles for Protected Bike Lanes	520 - 640 jobs per year
EV Charging	8,200 public level 2 chargers and 218 new level 3 fast chargers	280 jobs per year for 3 years

* Total "job years" = one full time job for one year which is equal to 1800 work hours. A job year could provide half-time work for two people or fulltime work for one person.

2023 Updated Climate Action Plan



ENERGY
SUPPLY



TRANSPORTATION
& LAND USE



HOUSING



BUILDING
OPERATIONS



RESPONSIBLE
PRODUCTION &
CONSUMPTION



HEALTHY
ECOSYSTEMS



WATER
SUPPLY

San Francisco's GHG Reduction Targets and Goals

GHG Sector Based Targets

1

2030 - 61% Reduction in GHG Emissions

2

2040 – Net-Zero Emissions

Goals Applicable to the Building Operations Sector

1

2021 – New Buildings Zero Emissions

2

2035 – All Large, Existing Commercial Buildings Zero Emissions



Municipal Buildings



Update Chapter 7 of the Environmental Code to provide a pathway for all existing municipal buildings to be all electric.



Ensure the Capital Plan is updated to reflect the need to replace gas fueled equipment and is aligned with the City's 2040 net-zero goal.



Complete



In Progress



Pending



New Construction & Major Renovations



Require newly constructed buildings to be all-electric with no on-site carbon emissions (ordinance went into effect 7/21).



Update the All-Electric new construction ordinance to include major alterations in the private sector and align with building code update



Complete



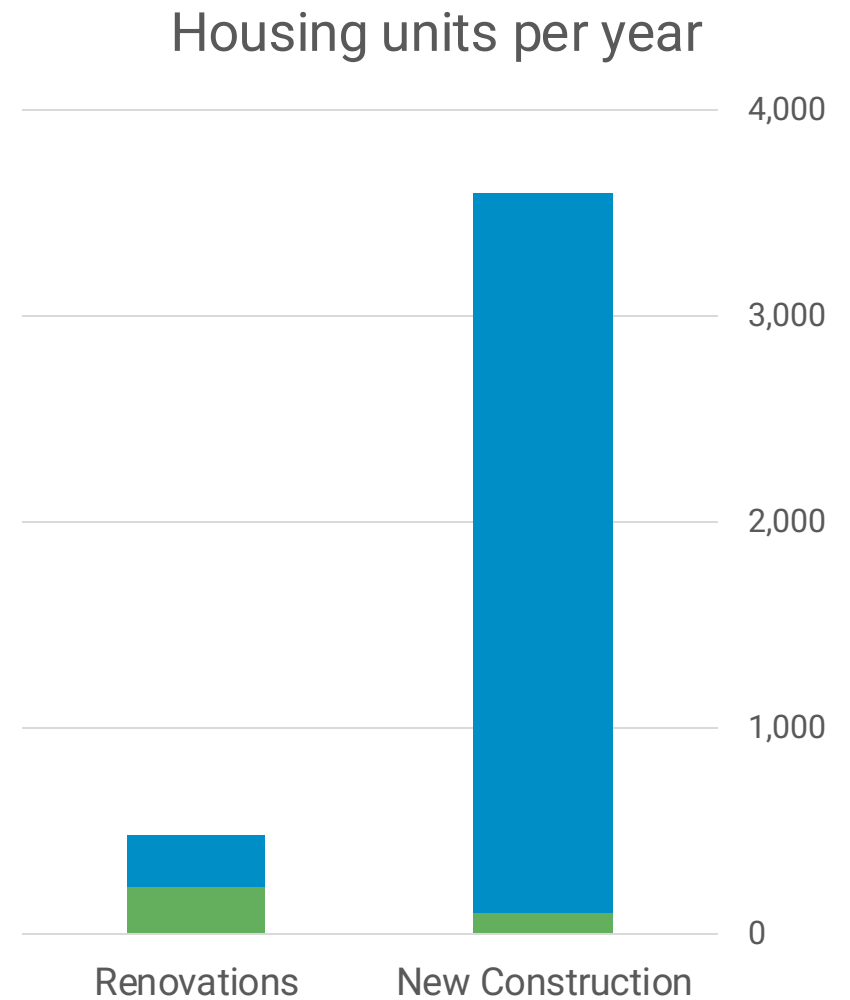
In Progress



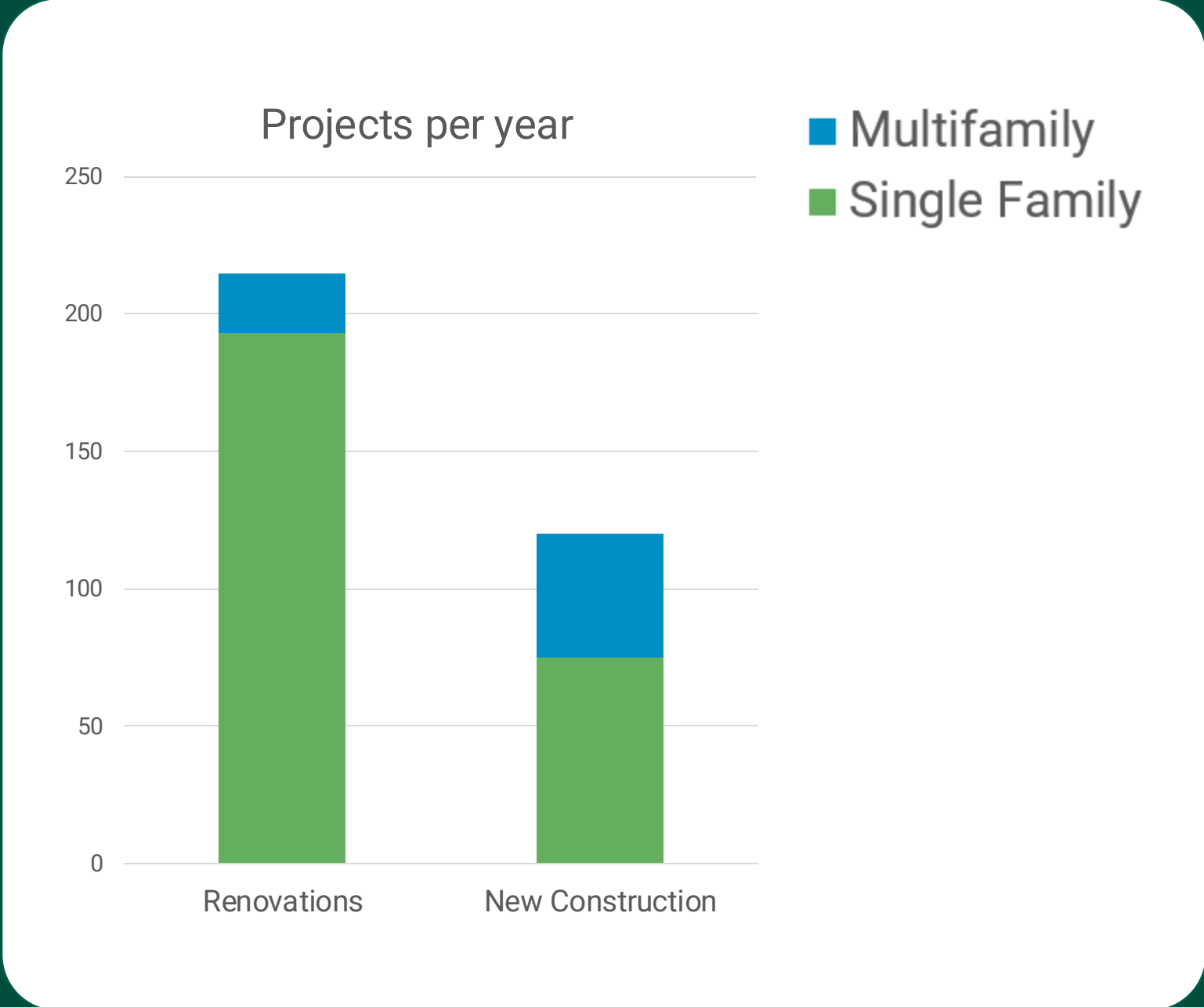
Pending

New Construction
is important...

- Multifamily
- Single Family



...but misses most single-family projects.



New Construction



Mission Rock (Image: SPUR)

Major Renovations



SFE

100 Van Ness (Image: SPUR)

Characteristics

Gut renovation

Major systems updated

Building unoccupied



Image: Nathan Architects

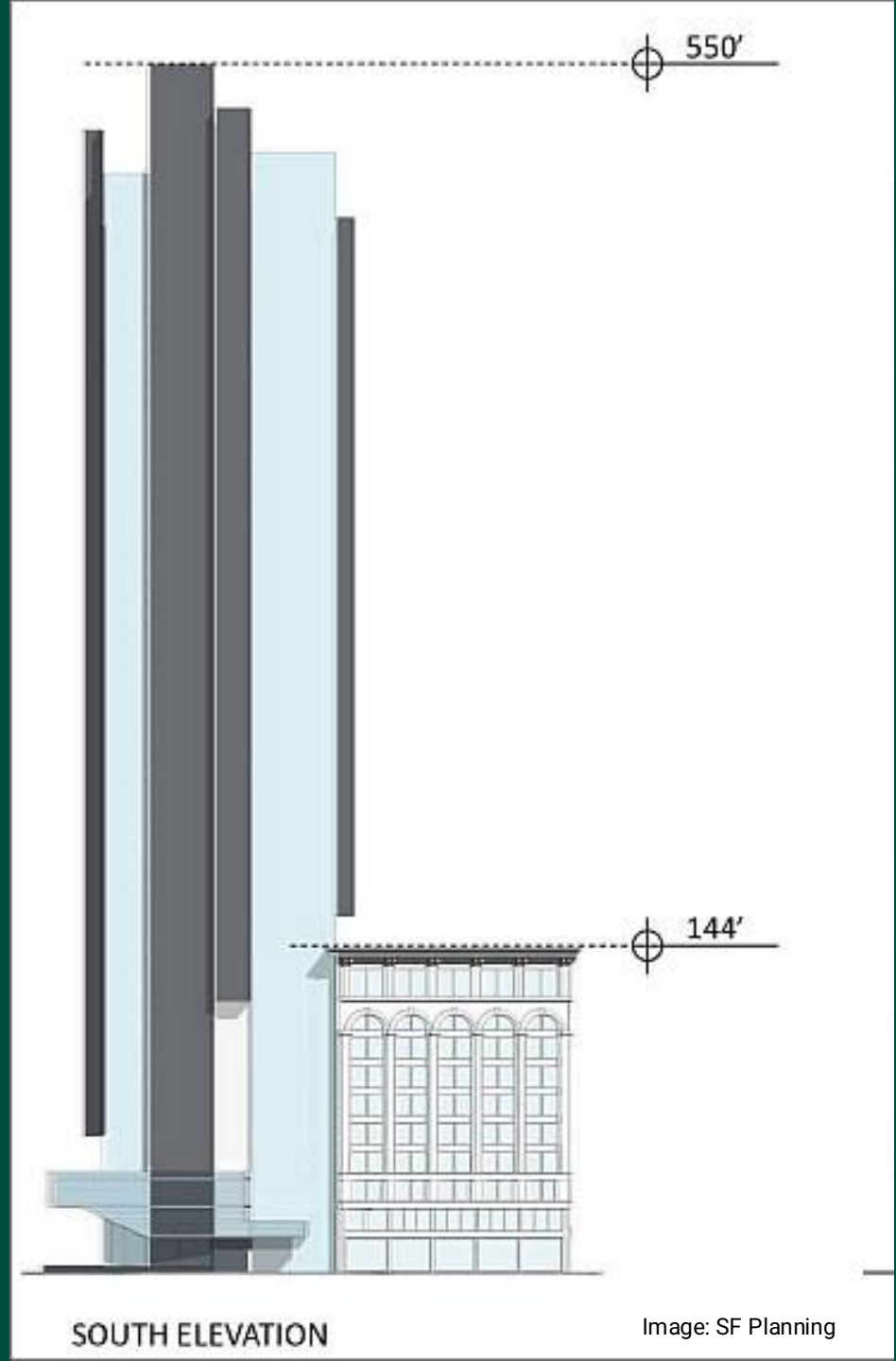
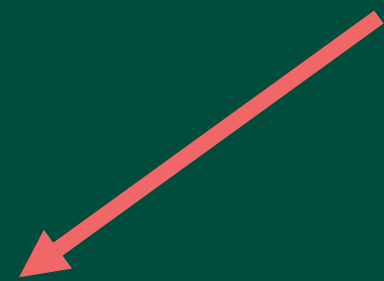
bobcat
INGERSOLL-RAND



Image: Wikimedia Commons

Additions

46-story addition
to historic
Arosen Building



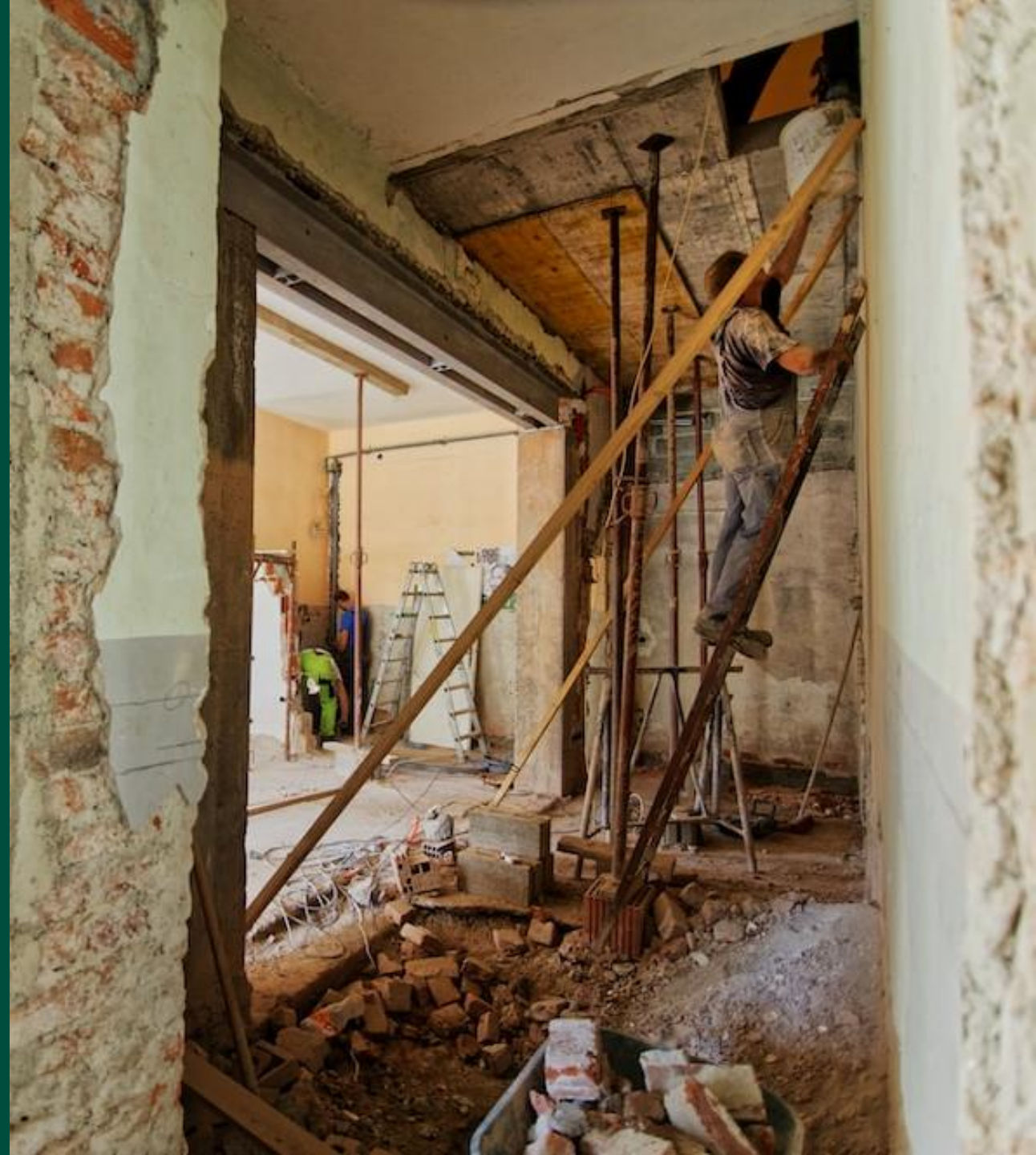
SOUTH ELEVATION

Image: SF Planning

Major Renovations

New mechanical systems

Substantial alterations



“Bringing up to Code”

Fire

Seismic

Accessibility

Energy

Electrification?

SFE



What about Berkeley?



BAAQMD

Furnaces & Hot Water Heaters

CARB

ZE Appliances & Indoor Air
ZE Construction Standard (proposed)

CEC

2025 Energy Code & 6M Heat Pumps

CPUC

Inclusive Utility Investment
Line Extension Subsidies

SFE



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT



Legislation

SB48: State BPS

SB410: Interconnection Speed





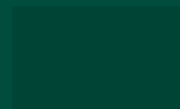
Next Steps



Prepare City residents for regional & CA electrification mandates



Adopt a building performance policy requiring large commercial buildings to be all electric no later than 2035



Complete



In Progress



Pending



Climate Equity Hub



Educate and engage underserved communities on the benefits of electrification



Provide residents with financial and technical support to pursue electrification



Support continued and equitable growth of the electrification industry and workforce

climateequitysf.org



Direct Install Program



Upgrade your home with a free heat pump water heater (HPWH)!

Disadvantaged communities have historically dealt with the worst air pollution, traffic density, heat exposure, and other environmental hazards. San Francisco is transitioning from gas to electric appliances to reduce air pollution, and The Hub is dedicated to making this transition affordable and beneficial in these communities. Our HPWH program is just the first step.

We'll secure up to \$10,785 in rebate funding to fully cover the cost of the upgrade and support you each step of the way.

2024 Electrification Fair

*September 28 (Sat)
10 am - 2 pm
Women's Building*

Including:

- Educational workshops
- Resource fair
- Financial & technical resources
- Induction cooktop giveaway!

For homeowners, renters & contractors!



2024 Electric Home Tours

September 29 (Sun)
1-4 PM

Seeking:

- Fully electrified homes
- Partially electrified homes
- Residents who are eager to share their electric life with the community!

Apply Today!



LIFE'S BETTER ELECTRIC

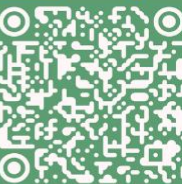
San Francisco

2024

ELECTRIC
HOME TOURS
09/29



Apply today to host a tour of your home!



betterelectric.org

Nik Kaestner

San Francisco Environment Department

SFEnvironment.org

SAN FRANCISCO

ENVIRONMENT

DEPARTMENT

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