

BERKELEY'S GAS PROHIBITION ORDINANCE

Chris Naso - Office of Berkeley Councilmember Kate Harrison

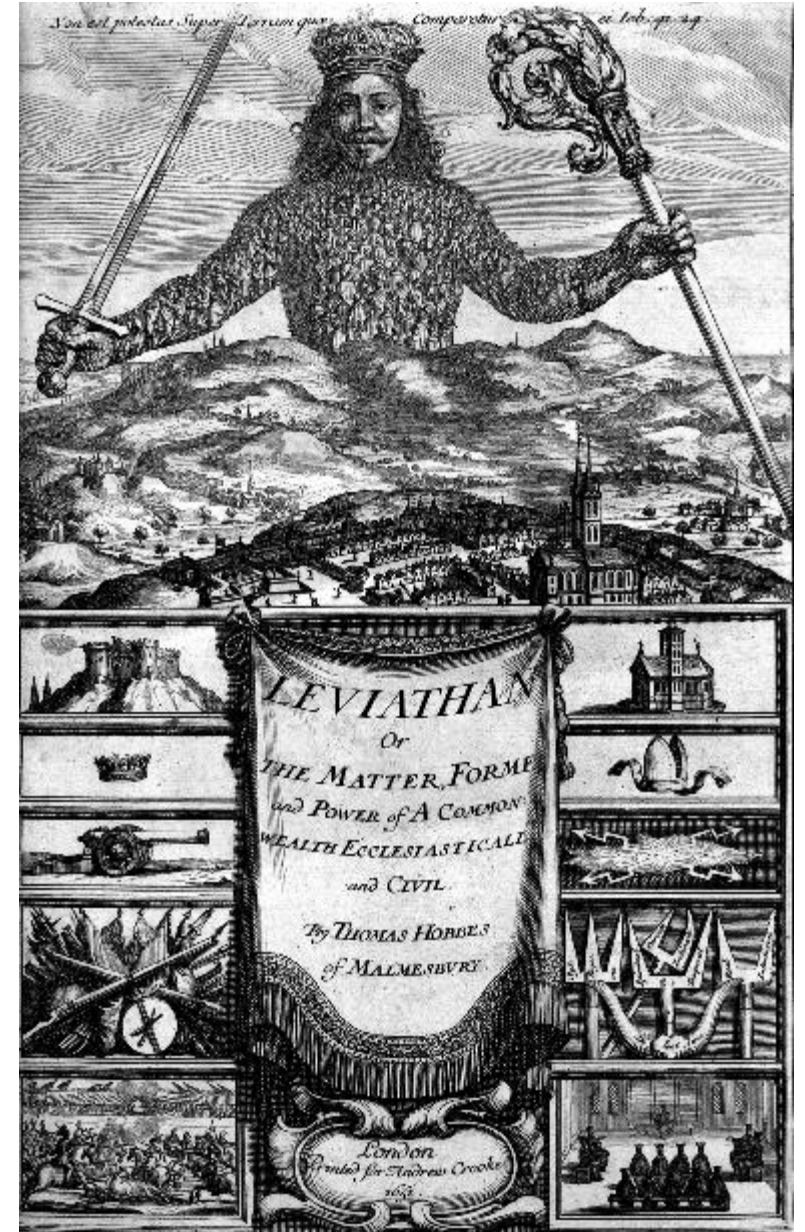
Climate Protection Committee Meeting
September 19, 2019

WHAT DOES IT DO?

- Prohibits internal gas piping (piping behind the gas meter) in all new buildings entitled after January 1, 2020
 - **Temporary Exception:** piping may extend to a limited number of systems that cannot yet be modelled in CEC software (e.g. central heat pump hot water systems)
 - Electric-ready requirement
 - **Public Interest Exemption:** buildings with gas systems that are approved as being in the public interest
 - Electric-ready requirement

HOW? CITIES RETAIN SOVEREIGNTY IN KEY AREAS

- Under the California and United States Constitutions, cities retain police powers to adopt building standards that provide for their community's **health, safety and welfare**.
- **Article XI, Sec. 7.** of the CA Constitution reads: "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."



WHY DID BERKELEY PASS IT?

1. CLIMATE EMERGENCY
2. HEALTH & SAFETY
3. ECONOMICS
4. ELECTRIFICATION REVOLUTION

Legal Findings of Necessity				
Climatic Impacts	Impacts from Geologic Events	Health & Safety Impacts	Economic Impacts	Policy Underpinnings
CO ₂ & CH ₄ emissions leading to: <ol style="list-style-type: none"> 1) Sea level rise 2) Fires 3) Extreme heat 4) Drought 5) Flooding 	<ol style="list-style-type: none"> 1) USGS Hayward Fault 7.0 earthquake simulation: <ol style="list-style-type: none"> a) 450 major Bay Area fires (many from gas lines) b) Death c) Loss of residential & commercial building floor area equivalent to more than 52k single-family homes d) Property losses approaching \$30 billion 	<ol style="list-style-type: none"> 1) Toxic air quality <ol style="list-style-type: none"> a) indoor stove exhaust b) outdoor flue exhaust 2) Pipeline explosions 	<ol style="list-style-type: none"> 1) RMI study: <ol style="list-style-type: none"> a) cost savings for new single-family³ - <i>no trenching + plumbing</i> 2) Energy consultant testimony before CEC + NRDC study: <ol style="list-style-type: none"> a) cost savings for new multi-family - <i>no trenching + plumbing</i> 3) Most cost effective during new construction vs. retrofit 4) Future state/federal regulation may lead to stranded utility-owned gas assets – with costs passed to ratepayers 	<ol style="list-style-type: none"> 1) Measure G 2) CAP obligations 3) Climate Emergency Declaration obligations 4) Fossil Free Resolution 5) Prior Council, CEAC, Energy Commission policies

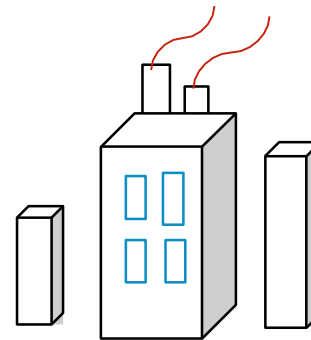
1. CLIMATE EMERGENCY

2018 U.N. IPCC Report:

“Limiting global warming to 1.5°C would require **rapid, far-reaching** and **unprecedented** changes in all aspects of society”



Building Decarbonization?



On-site natural gas combustion accounts for **15%** (NRDC) of CA GHGs
and **+27%** of Berkeley's GHGs

THE BANE OF METHANE.



*CH₄ has a
greater
warming effect in
atmosphere
than CO₂.*

25%
*of global warming
we're experiencing
is caused by
methane.*

CH₄

84x
*more emissions
than carbon dioxide
in first 20 years
after emission.*

**the
consequence**



25x
*more emissions
than carbon dioxide
over 100 years.*

1. CLIMATE EMERGENCY

1. CLIMATE EMERGENCY

The **Warren-Alquist** State Energy Resources Conservation and Development **Act**

THE SHORTCOMINGS OF AN ENERGY EFFICIENCY-CENTRIC APPROACH TO DECARBONIZATION

- Amidst national energy emergency, CEC is established in 1974
 - Established “in order to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy.”
 - Aim: cost-effective and energy efficient building design.

Assembly Bill No. 1575

Passed the Assembly May 16, 1974

Chief Clerk of the Assembly

Passed the Senate May 14, 1974

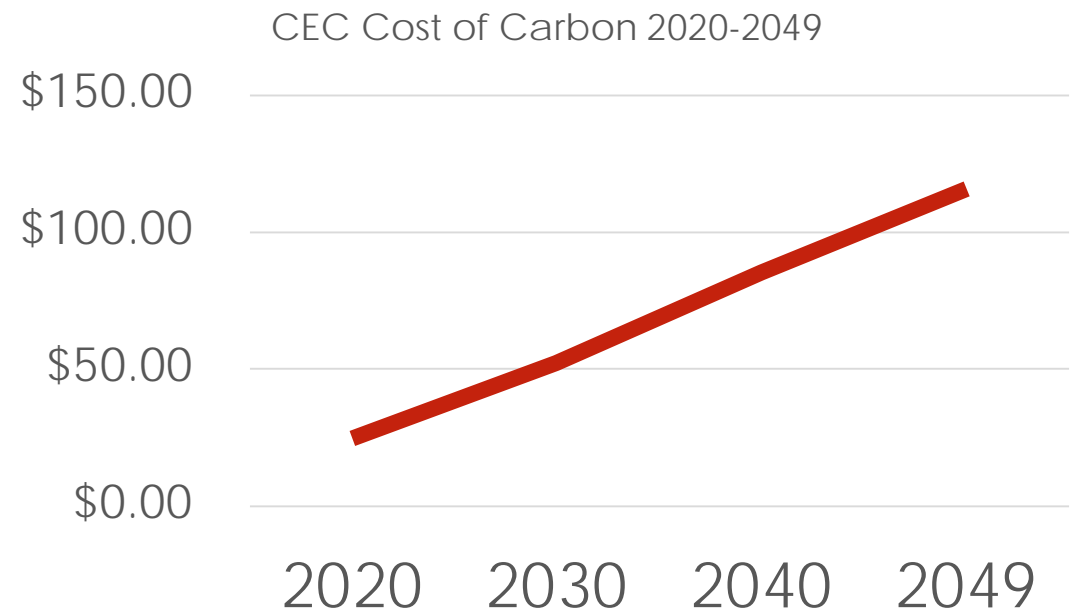
Secretary of the Senate

This bill was received by the Governor this _____
day of _____, 1974, at _____ o'clock ____ M.

Private Secretary of the Governor

1. CLIMATE EMERGENCY

- Energy efficiency (conservation) is super important but can only *indirectly* lower carbon from fossil fuel combustion
- CEC's Time Dependent Value vastly undervalues social cost of carbon
- No consideration of:
 - seismic costs
 - health costs
 - stranded-asset costs
- CEC efficiency standards have historically favored fossil fuel over electricity



2019 Cost of Carbon: \$18

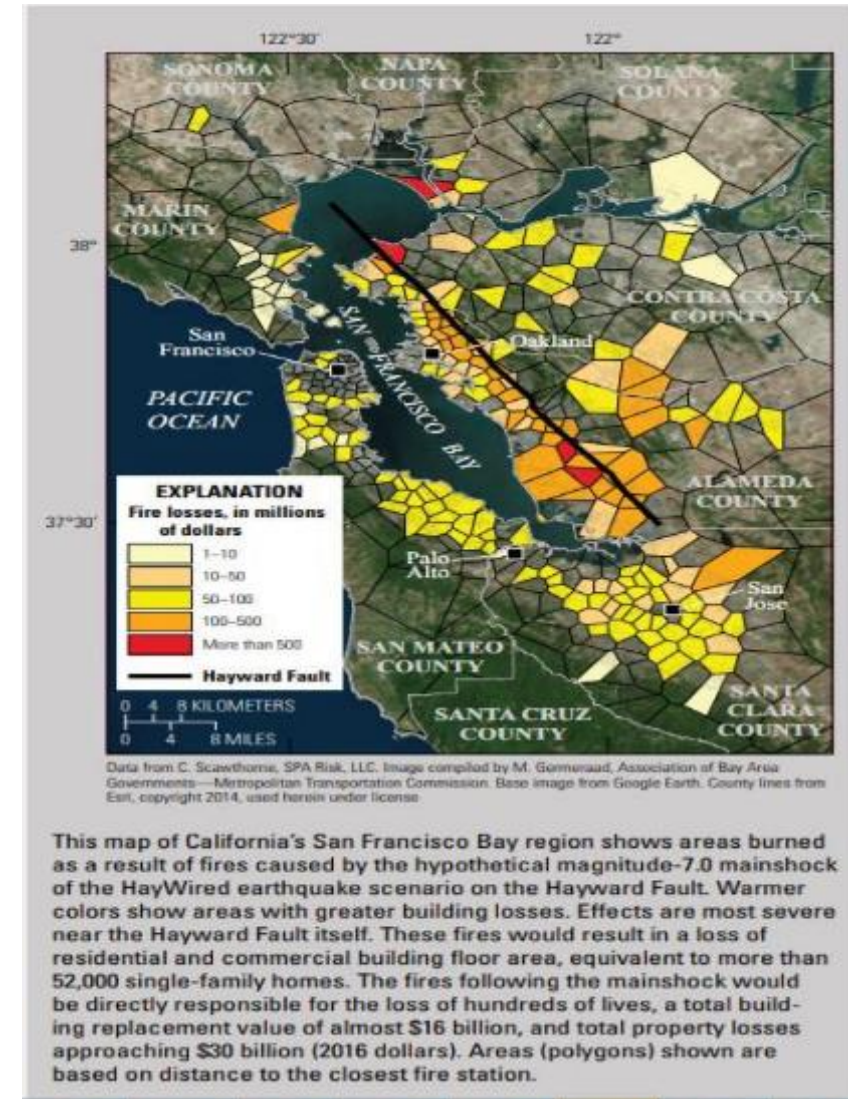
1. CLIMATE EMERGENCY

ALTERNATIVE SOCIAL COSTS OF CARBON

- 2012: Stockholm Environment Institute study estimated a social cost of carbon of \$900 to \$1,500 per ton of carbon.
- 2013: Obama Administration put a social cost of carbon in 2015 of \$37 per metric ton of carbon dioxide (CO₂)
- 2015: Stanford University study concluded "that when accounting for climate impacts on economic growth, the social carbon cost rises to between about \$70 and \$400, with a best estimate of over \$200 per ton."
- 2018: UC San Diego study found "median global social cost of carbon came out to \$417 per ton."
- 2018: CPUC is considering a \$123 per ton social cost of carbon.

2. HEALTH & SAFETY

- Natural gas produces **hazardous levels of nitrogen dioxide, carbon monoxide, formaldehyde** indoors not allowed outdoors, and is made worse with super-efficient buildings
 - We spend 68% of our time in our homes and nearly 100% indoors
- A 2019 CEC study found the economic health-related savings so great 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





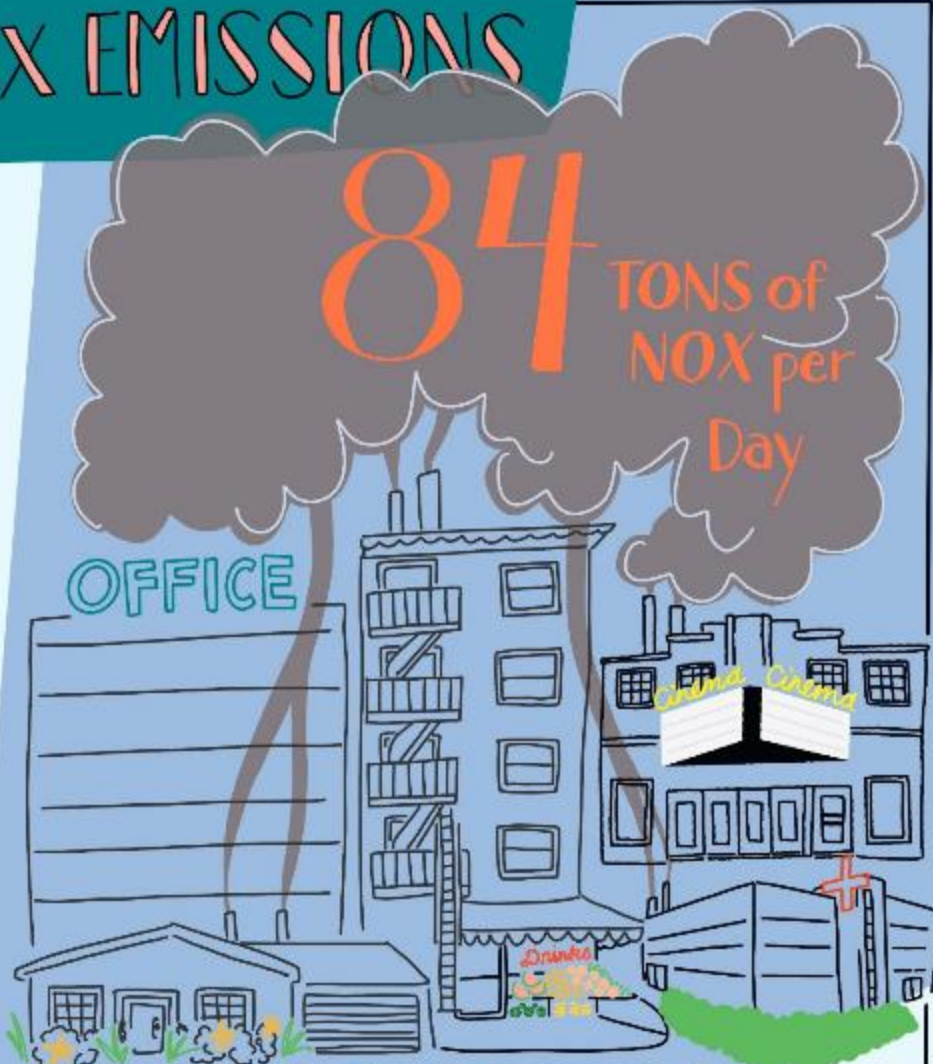
NOX EMISSIONS

10 TONS of NOX per Day



POWERPLANTS
BURNING GAS

84 TONS of
NOX per
Day



OFFICE

HOMES & COMMERCIAL
BUILDINGS BURNING GAS

JESSICA RUSSO, NRDC

2. HEALTH & SAFETY

3. 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
- PG&E has asked the CPUC for a significant gas rate hike to pay for aging gas assets
- Lifecycle utility savings for building owners and renters
- Stranded assets



4. BUILDING ELECTRIFICATION REVOLUTION



29 all-electric restaurants at LAX's International Terminal feed 10 million people



California Universities Are Transitioning to All Electric Buildings

The University of California system and Stanford University are making all-electric buildings the default in new construction.

JUSTIN GERDES | SEPTEMBER 24, 2018



"No new UC buildings or major renovations after June 2019, except in special circumstances, will use on-site fossil fuel combustion, such as natural gas, for space and water heating"

https://www.greentechmedia.com/articles/read/california-universities-are-transitioning-to-all-electric-buildings#gs.QUrSW_E

ehdd.

Casa Adelante, 2060 Folsom, San Francisco

127 Units, under construction



Developers: TNDC/CCDC, Architect: Mithun & YASudio, Association for Energy Affordability



Maceo May Veterans Apartments, Treasure Island



Balboa Upper Yard Family Apts, San Francisco



Hunters Point Shipyard Block 52, San Francisco



Hunters Point Shipyard Block 54, San Francisco



681 Florida, San Francisco



Santana Row Lot 11



UC Davis Webster Hall Replacement



American Geophysical Union



UC Santa Cruz Student Housing West



Exploratorium, San Francisco



Mark Day School, San Rafael



270 Brannan, San Francisco



Packard Foundation, Los Altos



Boulder Commons



Chatam University Dining Commons



Marin Country Day School, Corte Madera



Lick Wilmerding High School, San Francisco

Cascade Apartments, Seattle

230 Units, 44 floors. At 95% Construction Docs.



Developer is Vulcan, Ankrom Mosian Architects,
Engineering by Ecotope



Kaiser Santa Rosa Medical Office

87,300 SF Medical Office

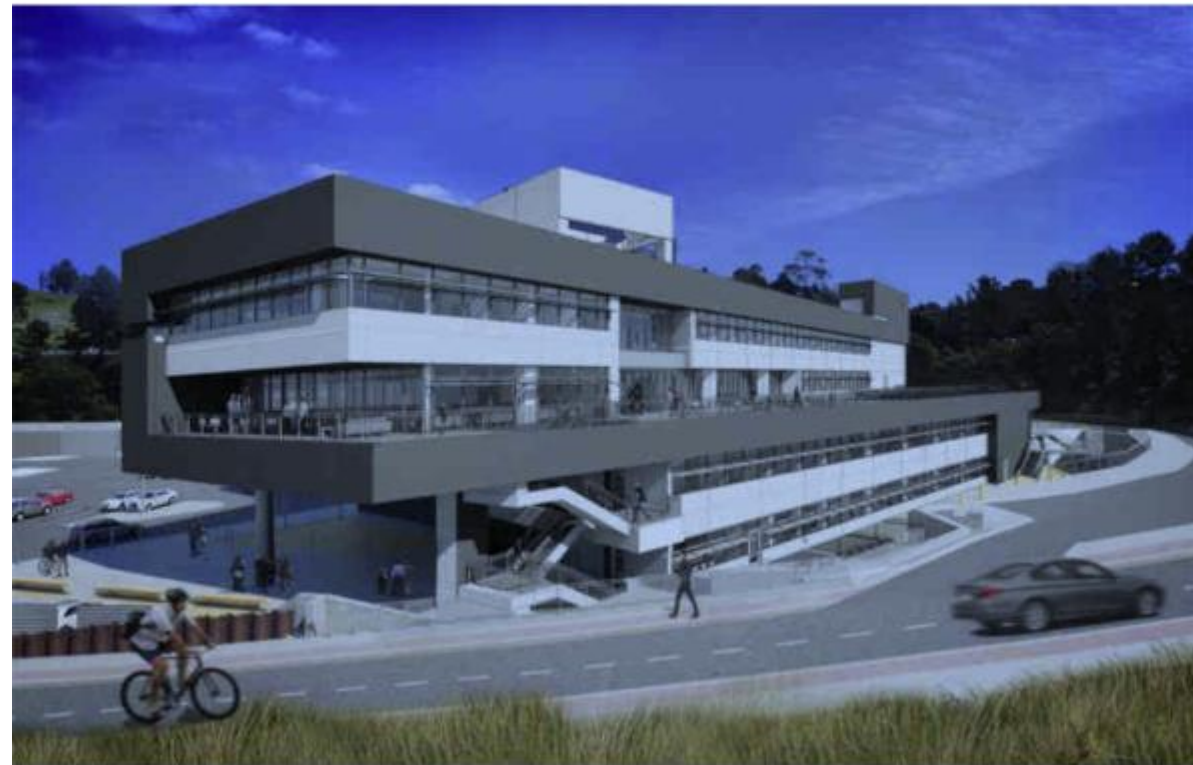
LEED Platinum, ZNE

Hawley Peterson & Sydney, Integral
Group

welcome

LBNL Integrative Genomics Lab

81,000 sf, All Electric



Smith Group+ Integral Group



BioEpic Laboratory, LBNL

70,000 sf, All Electric

- **BioEpic Laboratory**
- 70,000 SF Research Lab
- Smithgroup



An Emerging Coalition

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

THE NEXT STEP: RETROFITTING EXISTING BUILDINGS

- AB 3232
- SB 1477
- \$1 Billion for Fuel Substitution?
 - CPUC's "Three Prong Test" update
- Split incentive
- Panel upgrades
- Grid upgrades
- Equitably decommissioning the gas system

U #1002851997 Store SO SKU #1002796828



Rheem >

Performance Platinum 50 gal. 10-Year Hybrid High Efficiency Smart Tank Electric Water Heater

- Connects to your mobile device for remote adjustments and alerts
- Hybrid electric heat pump saves up to \$475 in annual energy costs
- Shop the Performance Platinum Tank Electric Water Heater

\$1,299⁰⁰ (limit 6 per order)

OR

\$217⁰⁰ per month* suggested payments with 6 months* financing on this \$1299.00 purchase*. ⓘ

Apply for a Home Depot Consumer Card

Nominal Tank Capacity (gallons): 50



Building and Renovation Services

Electric Service

Change Existing Service





THANK YOU

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Update on Region-Wide Fluorinated-Gases (F-Gas Strategy)

**Climate Protection Committee Meeting
September 19, 2019**

**Geraldina Grünbaum,
Senior Environmental Planner**

Fluorinated Gases (F-gases)

Wide range of human-made gases that contain fluorine:

- **perfluorocarbons** (PFCs) – aluminum production, semiconductor manufacturing
- **sulfur hexafluoride** (SF₆) - electricity transmission and distribution, semiconductor manufacturing
- **nitrogen trifluoride** (NF₃) - semiconductor manufacturing
- **hydrofluorocarbons** (HFCs) – refrigeration, air conditioning, insulating foams, solvents, aerosol products

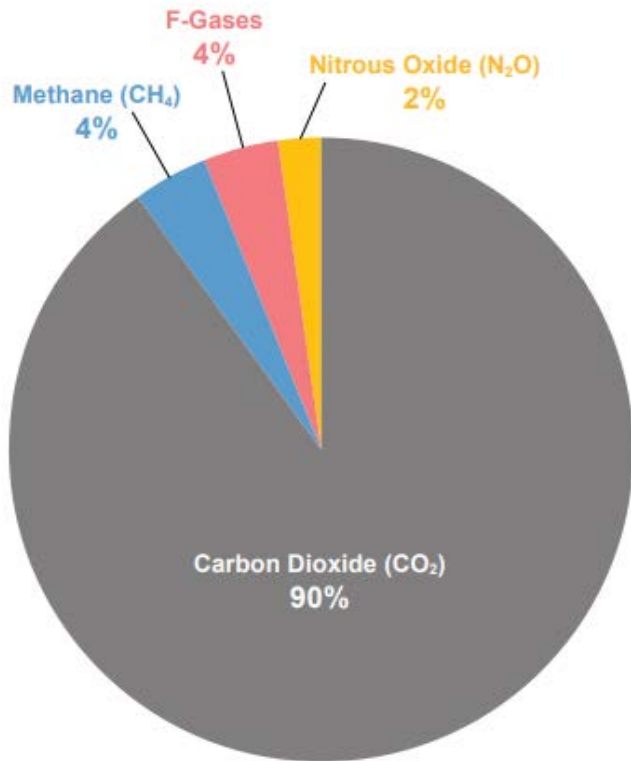
F-gases are very powerful climate-forcing pollutants

F-gas	100-year GWP	20-year GWP
CO ₂	1	1
PFCs	7,390 – 12,200	5,210 – 8,630
SF ₆	22,800	16,300
NF ₃	17,200	12,300
HFCs	124 – 14,800	437 – 12,000
HFC-134A	1,430	3,830
HFC-125	3,500	6,350
HFC-143A	4,470	5,890

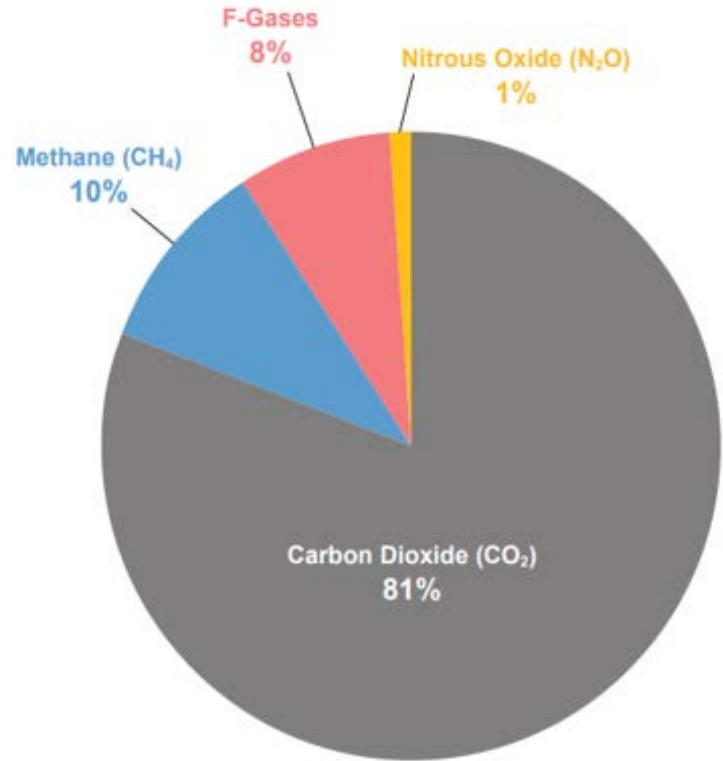


Bay Area F-Gas Emissions

Based on 100-year GWP* (Total – 85 MMT CO₂e)



Based on 20-year GWP* (Total – 94 MMT CO₂e)



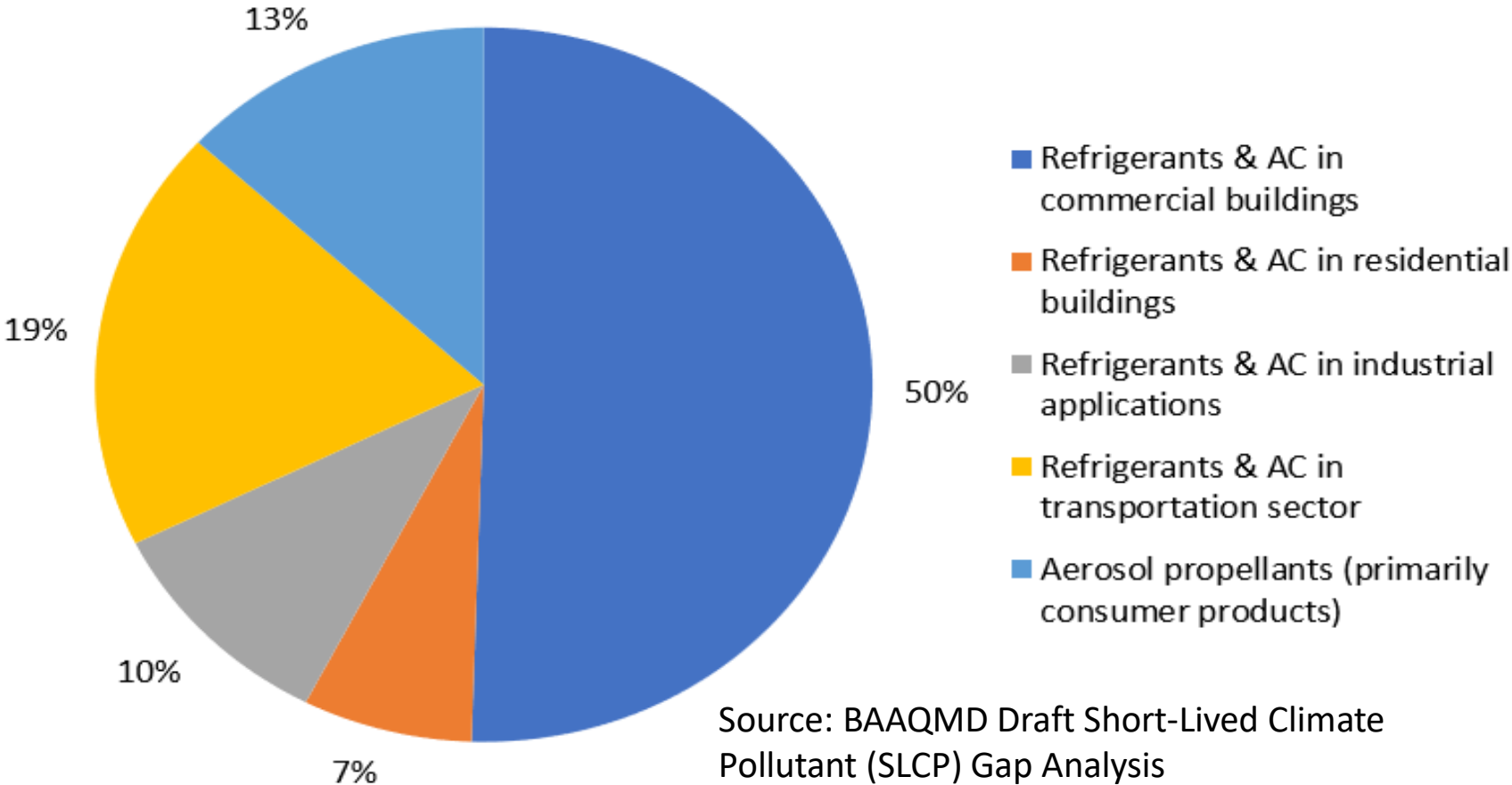
Source: 2017 Clean Air Plan (CAP)

* GWP (Global Warming Potentials)



Sources of HFCs

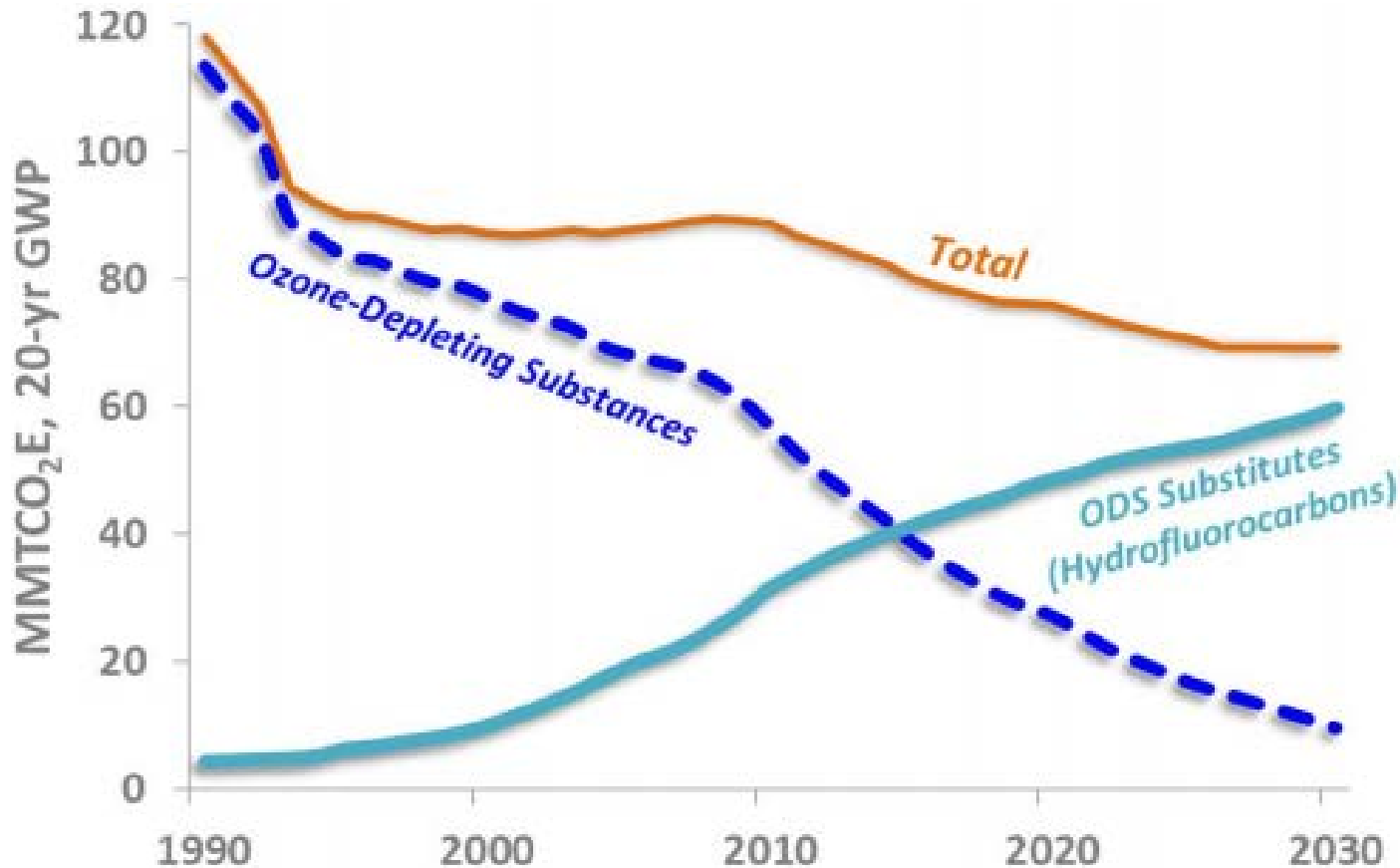
Bay Area HFC Emissions by Sector



Source: BAAQMD Draft Short-Lived Climate Pollutant (SLCP) Gap Analysis

Future Increases in HFCs

Emissions of ozone-depleting substances (ODS) and ODS substitutes (hydrofluorocarbons) using 20-year GWPs



Source: California Air Resources Board (CARB) SLCP Reduction Strategy (Appendix C)



Opportunities to Reduce HFCs

- At inception, when system is installed/retrofitted:
 - Is there an opportunity to influence type of refrigerant used?
- During lifetime of equipment:
 - Maintenance and repair to reduce and prevent leaks
- At end of equipment life:
 - Capture/disposal/recovery/recycling of refrigerant

A background image showing a city skyline with various buildings and a body of water in the foreground. The title is overlaid on the right side of the image.

State's Short-Lived Climate Pollutant Reduction Strategy

- Statewide target of HFC reduction of 40% from 2013 levels by 2030
- Range of options to accelerate emission reductions of short-lived climate pollutants (SLCP, or super-greenhouse gases (GHGs)):
 - Prohibition of sale of very high GWP refrigerants
 - Prohibition on new equipment with high-GWP refrigerants
 - Incentives for early adoption of low-GWP refrigerants



F-Gas Strategy: Purpose & Focus

- Supports goal of 2017 CAP to reduce GHGs by prioritizing emissions of super-GHGs
 - Comprehensive approach to address F-gas emissions
- Complements CARB's SLCP Reduction Strategy
- Three areas of activity:
 - Regulation and enforcement
 - Incentives and funding
 - Education and local government support



Regulation & Enforcement

- Existing F-gas-related efforts:
 - Enforce CARB's Refrigeration Management Program (leaks)
 - Vehicle Buy Back Program (refrigerant capture)
- Potential new rule-making opportunities:
 - Build upon best practices
 - Regulate what is not covered by CARB rules
 - 'Incorporate rule by reference' – better enforcement
- Track CARB HFC-rule development
 - <150 GWP limit in new refrigeration systems (1/2022)
 - <750 GWP limit in new residential/commercial ACs (1/2023)



Incentives & Funding

- Expand/replicate Climate Protection Grant Program HFC-related projects
 - Small refrigeration system repair/maintenance:
 - Energy efficiency improvements and leak prevention
 - Household fridge/freezer recycling:
 - Certified disposal; refrigerant capture
- Track developing CARB incentive program
 - To promote adoption of low-GWP technologies



Local Government Support

- Increase public knowledge and awareness of F-gas reduction opportunities
 - Importance of leak detection and avoidance
 - Proper disposal for air conditioning, fridges
- Develop policy support resources
 - Promote appropriate HFC disposal
 - Model ordinance, best practices, guidance, etc.
- Technician Training: e.g., for natural refrigerants



Next Steps

- Continue to track and engage with CARB on development of HFC rules and incentive program
- Determine viable and effective HFC-related rules
- Assess impacts and cost-effectiveness of HFC-related grant projects