

An aerial photograph of a city, likely Seattle, featuring a large body of water in the foreground. In the center, a prominent white building with a dome is visible, surrounded by other urban buildings and greenery. The sky is clear and blue.

ECAP ad hoc Community Advisory Committee

Buildings and Energy Deep Dive

June 25, 2019

Burning fossil fuels is the primary driver of the climate crisis



- In Oakland, we primarily burn petroleum (oil) and natural gas
 - Oil (gasoline, diesel, jet fuel) powers most of our **transportation**
 - Natural gas, which is mostly methane, can be used for electricity generation, powering some vehicles, and **buildings** (residential, commercial, and industrial)

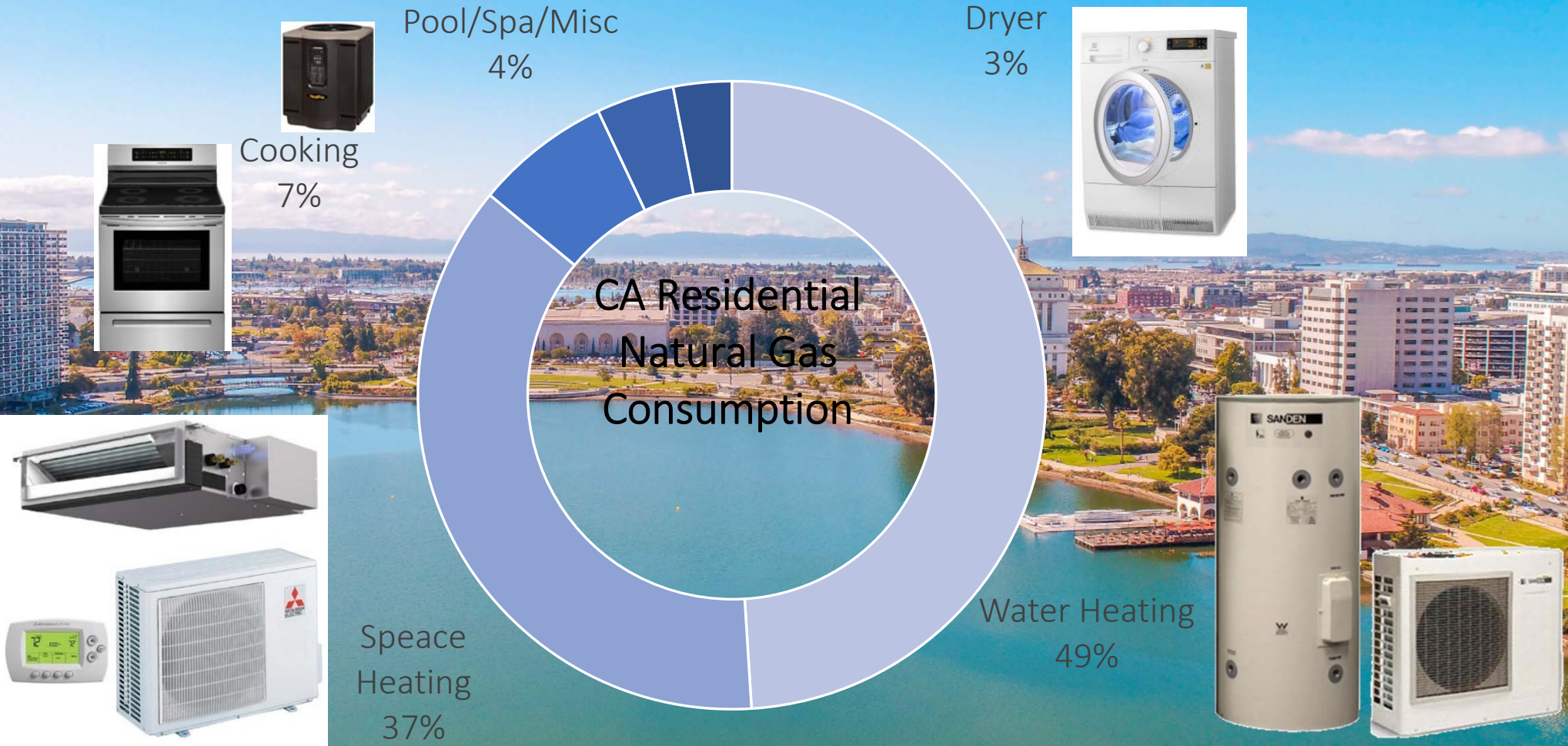
How energy is used in our buildings

- Electricity powers anything that is **wired or plugged in**
- Natural gas can be used in domestic appliances, including boilers, furnaces, water heaters, ranges, ovens, and clothes dryers
 - May also be used in commercial and industrial buildings for specialized processes

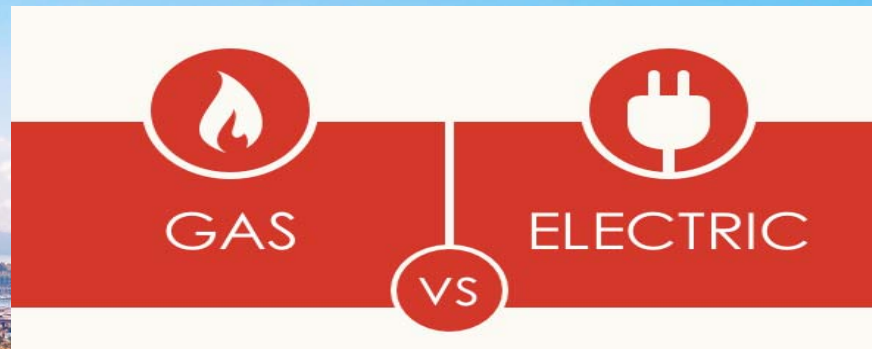
- Buildings are either **mixed fuel** or **all-electric**



How natural gas is used in our buildings:

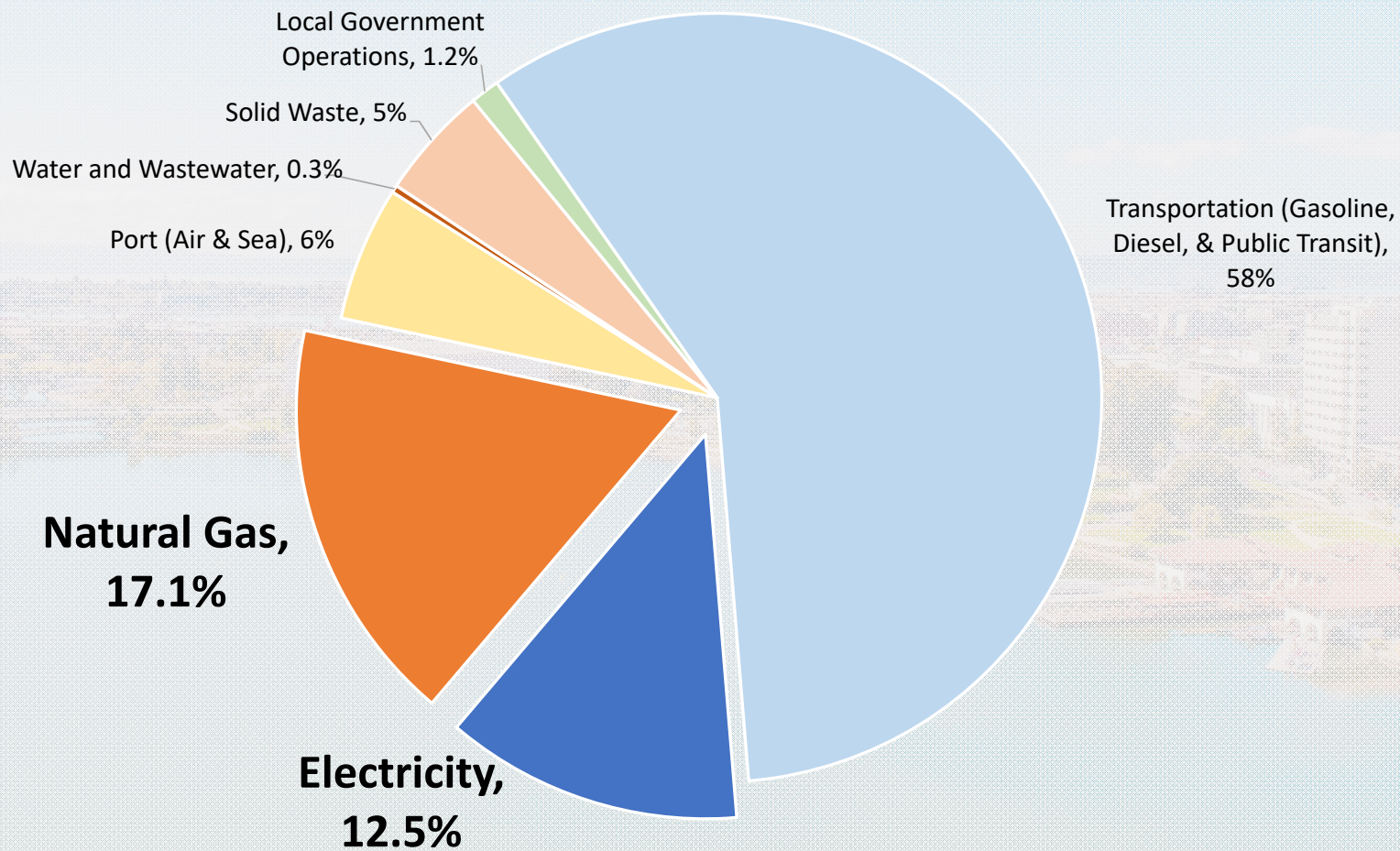


Greenhouse Gas Emissions

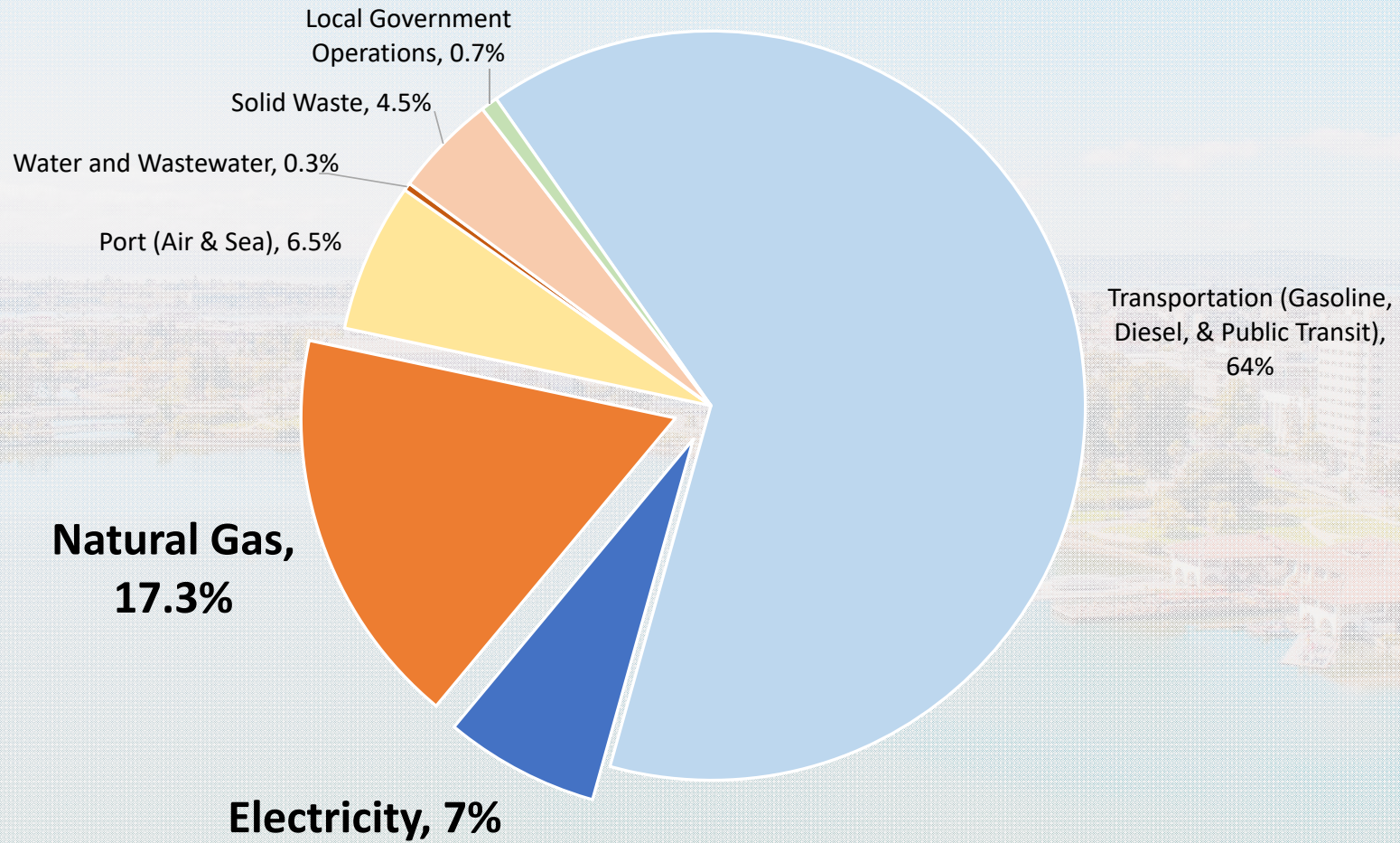


- Emissions from **electricity** depend on how it's generated
 - Increasingly coming from clean, renewable sources
- Emissions from **natural gas** are essentially fixed
 - Leaked + burned

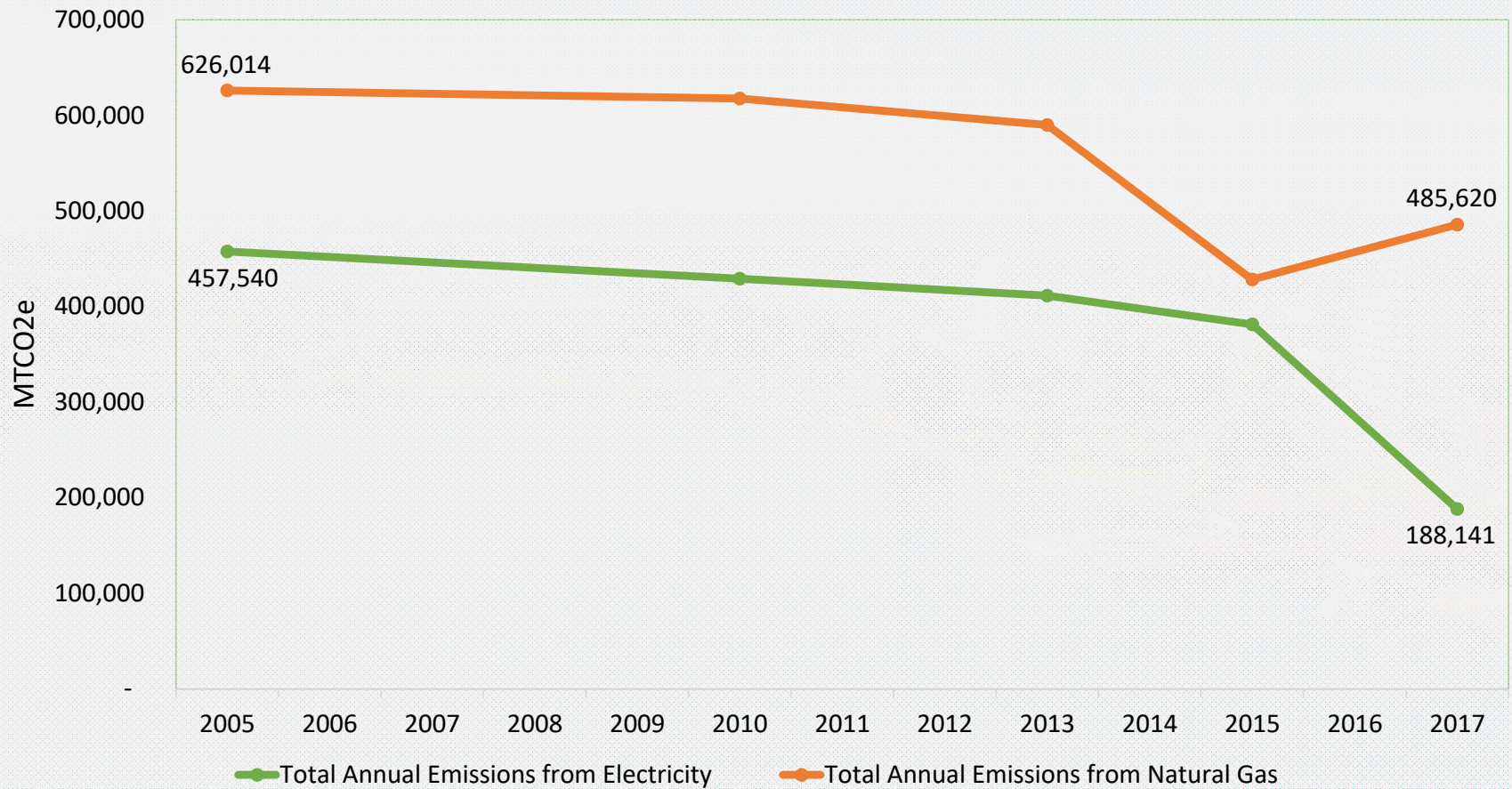
Total Local Emissions by Category - 2005



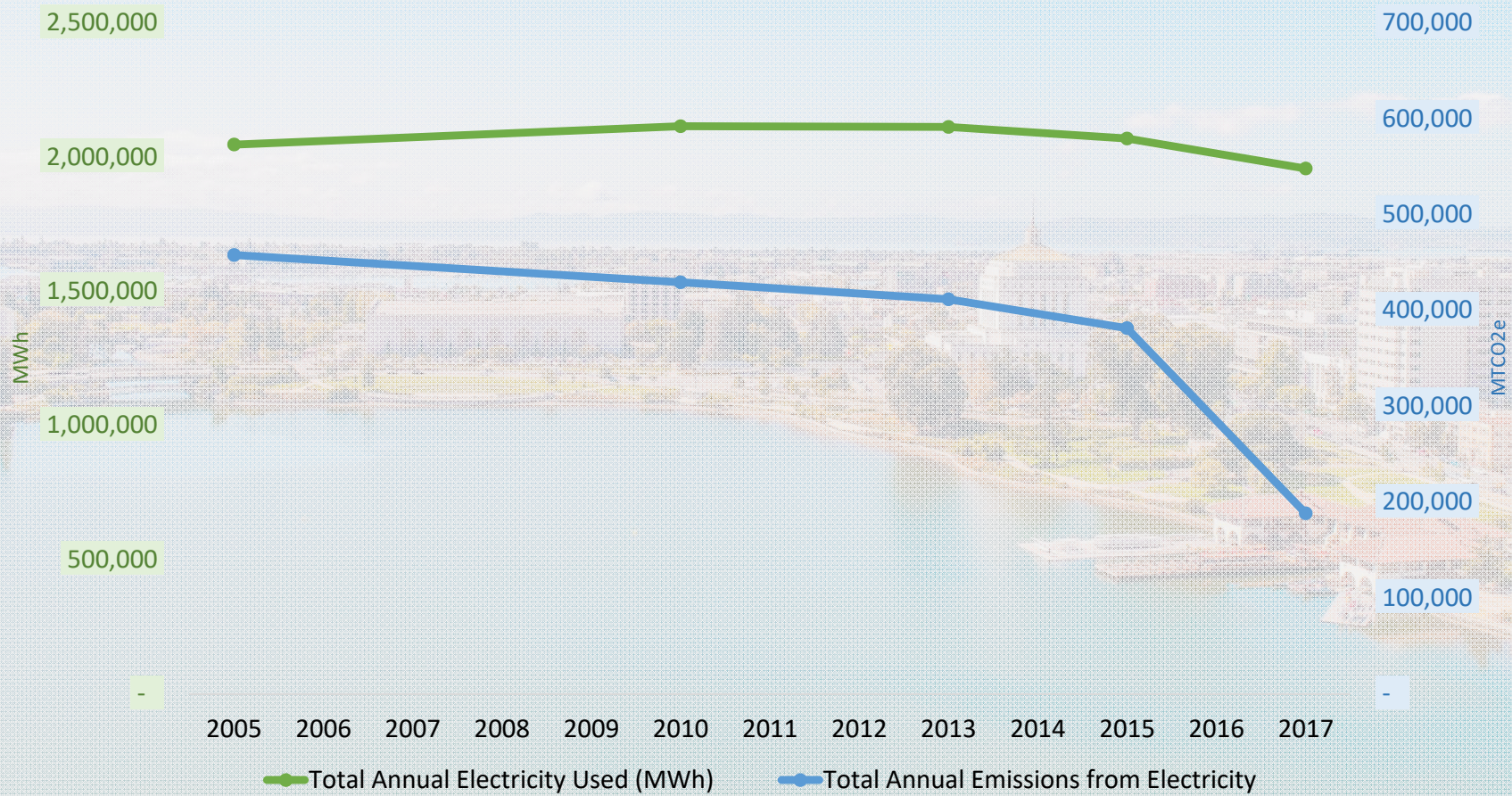
Total Local Emissions by Category - 2017



Total Emissions from Electricity Usage vs Total Emissions from Natural Gas Usage



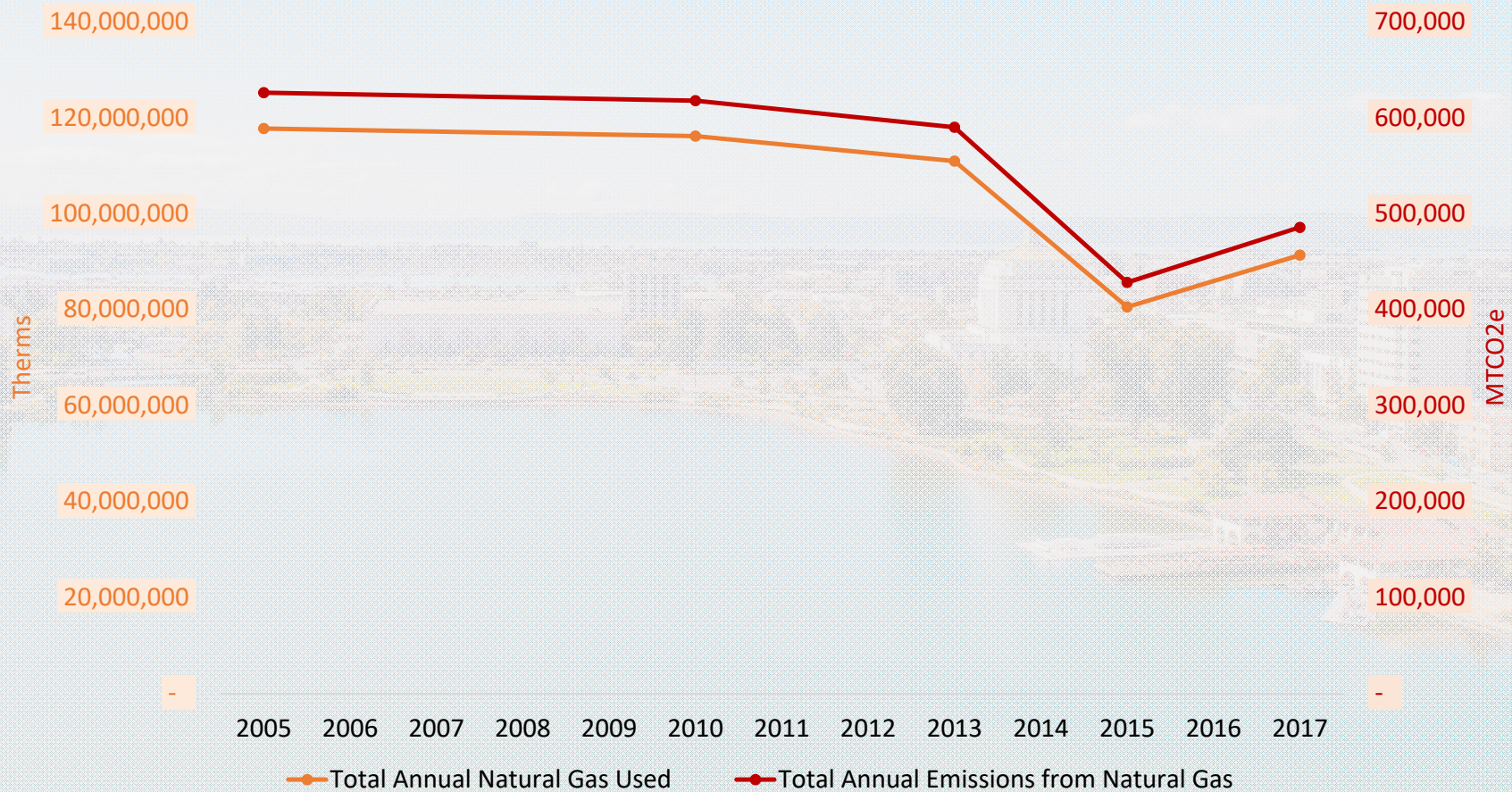
Total Electricity Usage vs Total Emissions from Electricity Usage



— Total Annual Electricity Used (MWh)

— Total Annual Emissions from Electricity

Total Natural Gas Usage vs Total Emissions from Natural Gas Usage



— Total Annual Natural Gas Used — Total Annual Emissions from Natural Gas

How do these trends inform our work



- **Electricity grid** is cleaner
 - East Bay Community Energy is cleaner, cheaper, and has easy opt-up options for 100% clean/renewable
- **Buildings** are getting more efficient – in other words, they’re being built better so that less energy is needed for lighting and heating
- **Appliances** are getting more efficient
- Emissions from natural gas follow usage: You can’t “clean” a fossil fuel

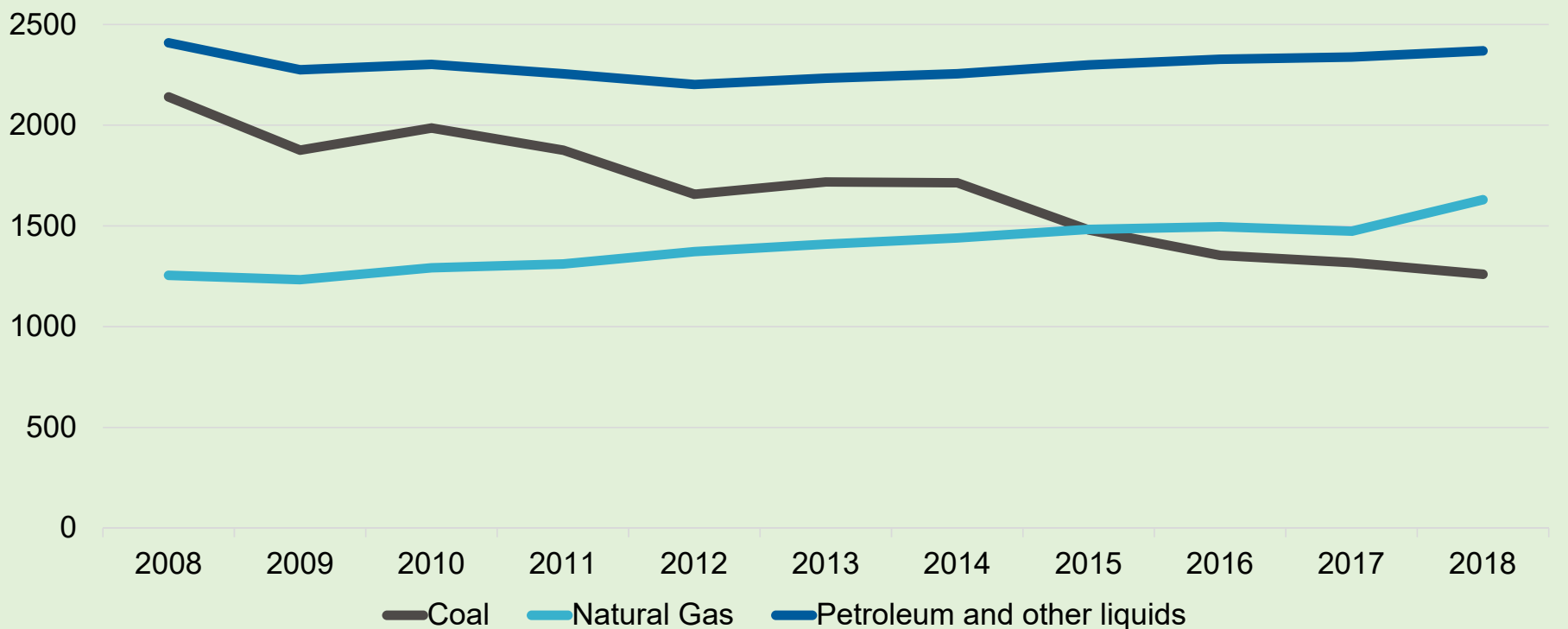


2018 US carbon emissions up – largely from increased use of “natural gas”

Gas Co₂ emissions exceed coal since 2017

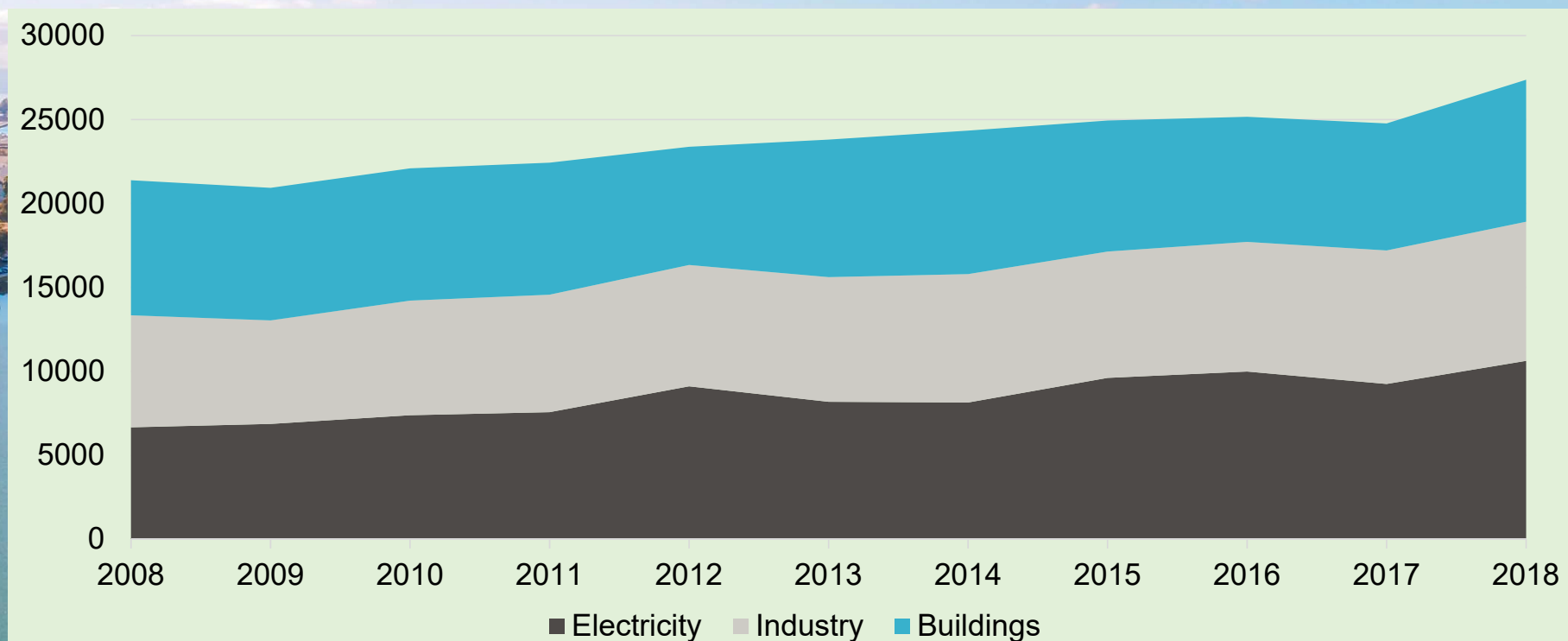
U.S. energy-related carbon dioxide emissions by fuel

Million metrics tons CO₂



“Natural gas” is used in three sectors:
Buildings, electricity, and industrial processes

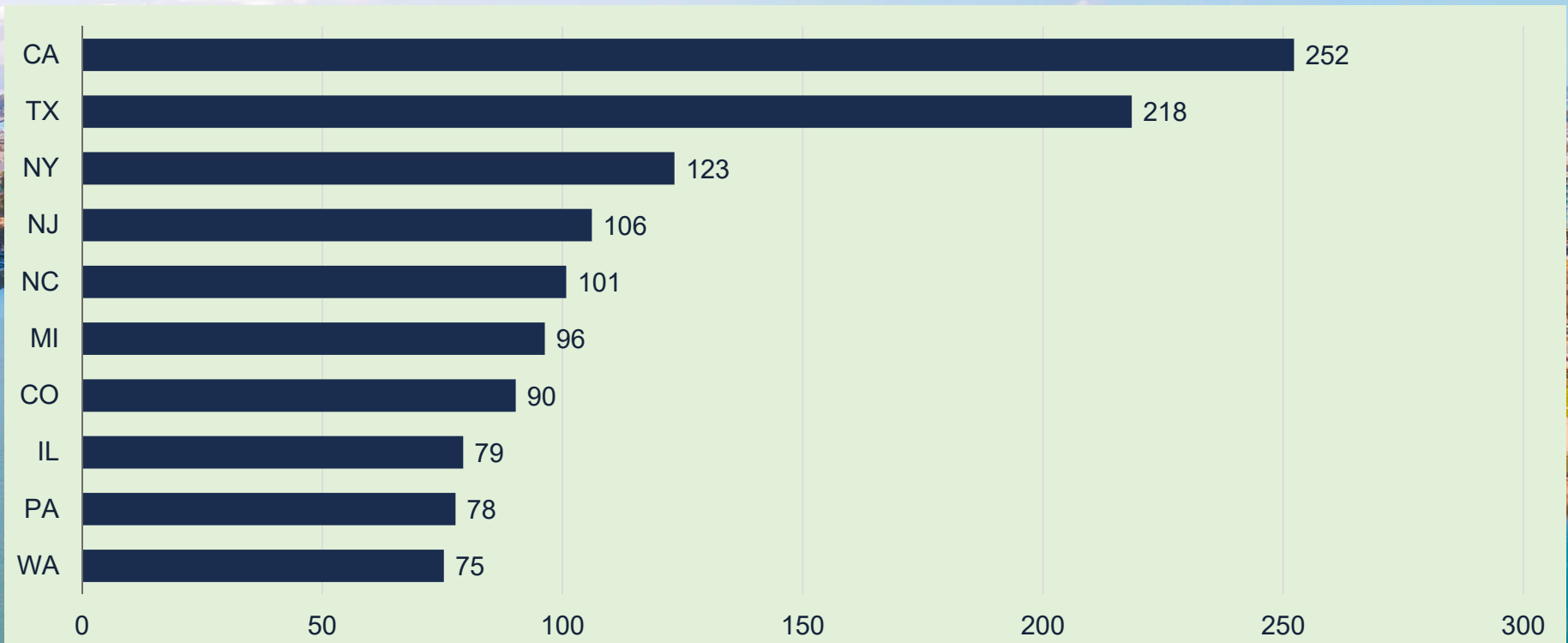
U.S. Natural Gas Consumption by Sector: Billion Cubic Feet



CA is #1 for lock in of new gas infrastructure and new gas customers

New Gas Customers, 2013-2017

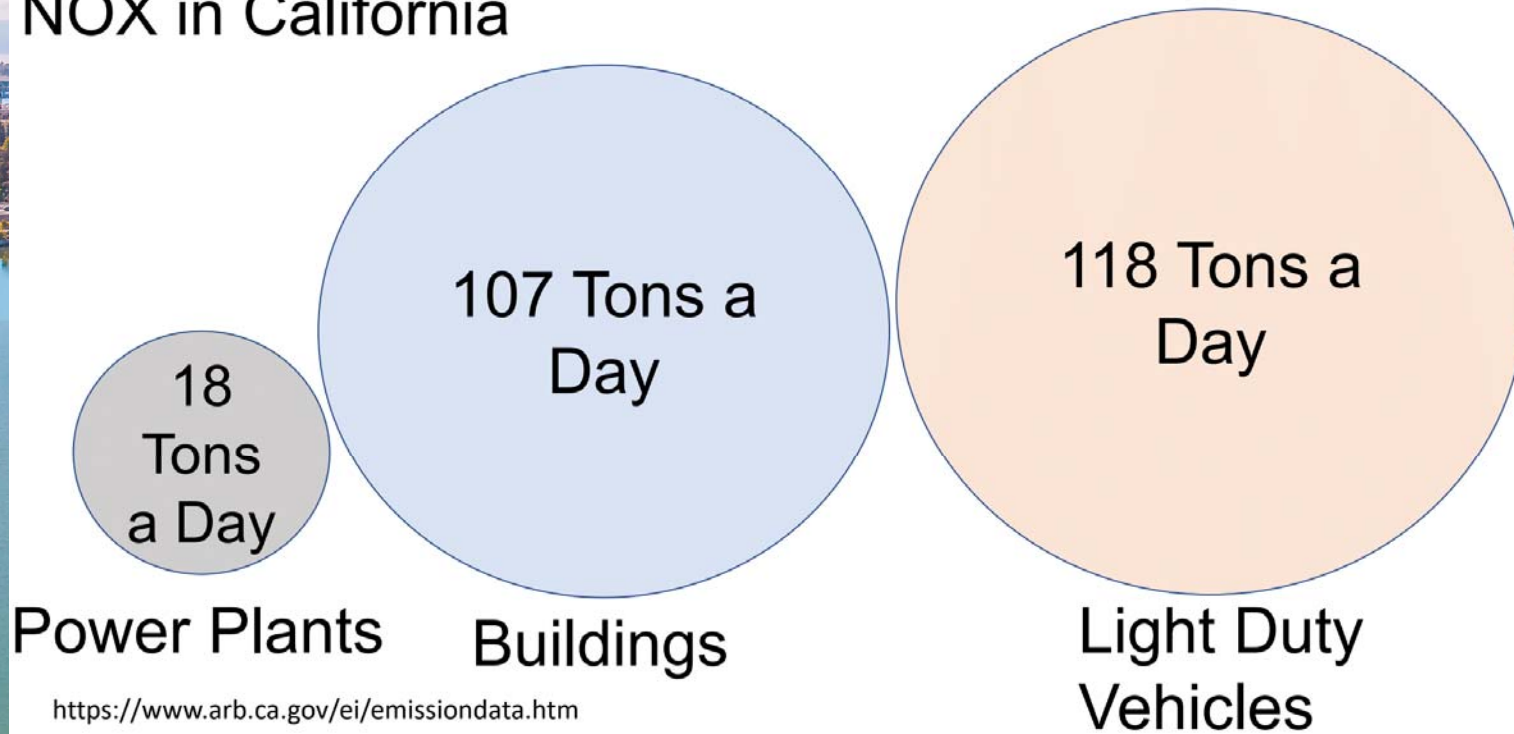
Residential and Commercial Sectors, thousands of customers



Focus on Natural Gas

Burning of gas in our buildings is big part of California's outdoor smog problem

NOX in California



Power Plants

Buildings

Light Duty
Vehicles

<https://www.arb.ca.gov/ei/emissiondata.htm>

Burning gas in our homes releases nitrogen dioxide – a “toxic gas” says EPA

- NO₂ – causes asthma attacks and other respiratory diseases, may cause asthma in otherwise healthy individuals
- For 50 years EPA has regulated NO₂ and in 2010 updated the standards – outdoors
- In 2015 Lawrence Berkeley Labs found that 12 million Californians in homes with gas stoves are breathing levels of NO₂ that exceed outdoor standards



Alternatives are plentiful, safer, and more efficient



Focus on Natural Gas

Where we are now

- Changing role of Energy Efficiency and solar from the goal of energy climate policy to tools that will help us electrify faster and cheaper.
- EBCE supporting cities in building and transportation electrification – e.g. Oakland & Berkeley working together on reach code
- ECAP = Opportunity to set ambitious electrification goals

Discussion

- New Buildings: Do we want to dig the hole deeper, or stop building new NG infrastructure now?
- Existing buildings: What do we do with the 170,000 buildings in Oakland
 - Buildings
 - Appliances
- How do we do this equitably, focusing on jobs and affordability?