SB 596 Cement Sector Net-Zero Emissions Strategy: Community Meeting

OCTOBER 11, 2023

Meeting Logistics

- Meeting materials and comment docket available at the Cement Sector Meetings and Workshops webpage
- Written feedback may be submitted to comment docket open through November 1, 2023, 11:59 p.m. Pacific Time
- Public comment after presentation
  1. Use the “Raise Hand” function in the toolbar at bottom of your screen
  2. When staff call your name, please “Unmute” and introduce yourself

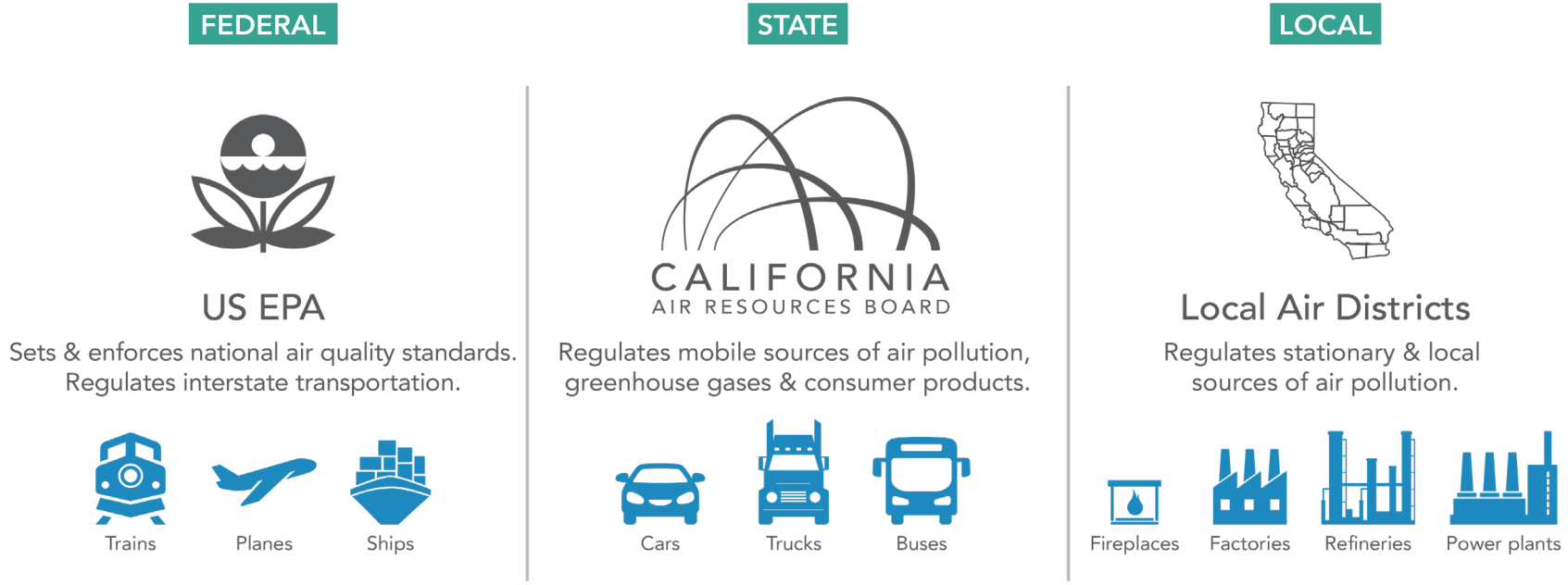
Agenda

- About the California Air Resources Board (CARB)
- Overview of Senate Bill 596 (SB 596) and cement use in California
- Potential impacts to communities related to SB 596
- Request for input and future engagement

About CARB

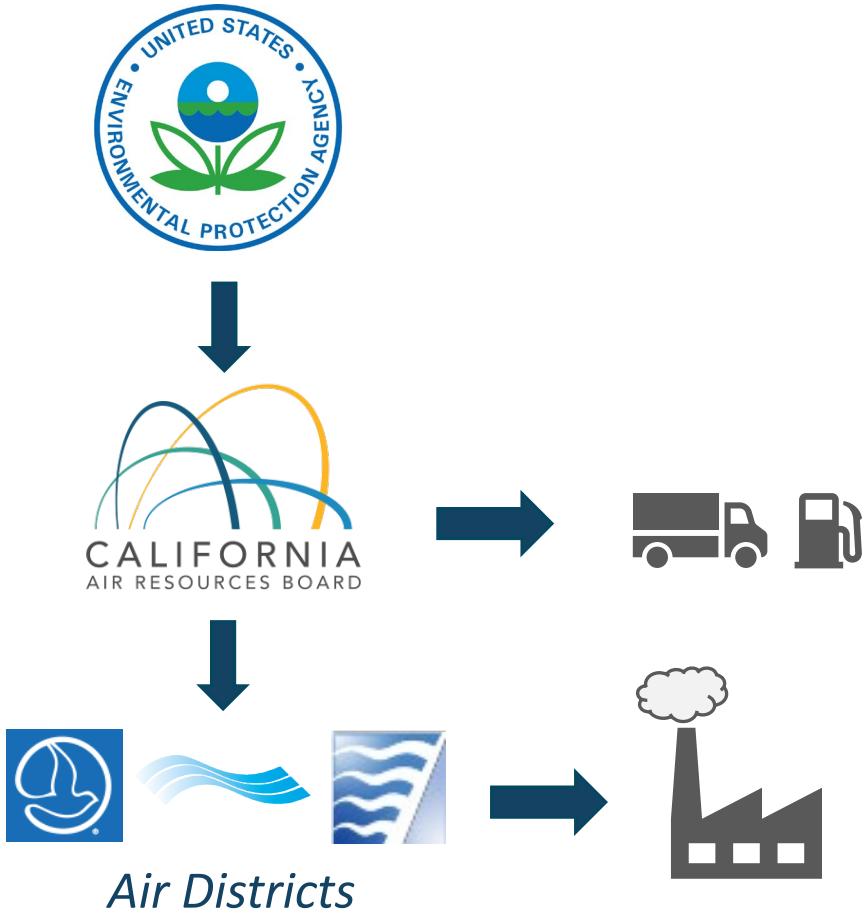
CARB is charged with:

- Protecting public health from harmful effects of air pollution
- Developing programs and actions to fight climate change



CARB's Roles and Local Air Quality

- Climate change programs are under a regulatory framework that is different than local air quality measures
- United States EPA administers the Clean Air Act, which requires states to meet air pollution standards
- The State sets its standards, and CARB oversees implementation and adopts regulations on mobile sources
- To meet federal and state standards, local air districts set pollution regulations and permitting requirements for stationary facilities

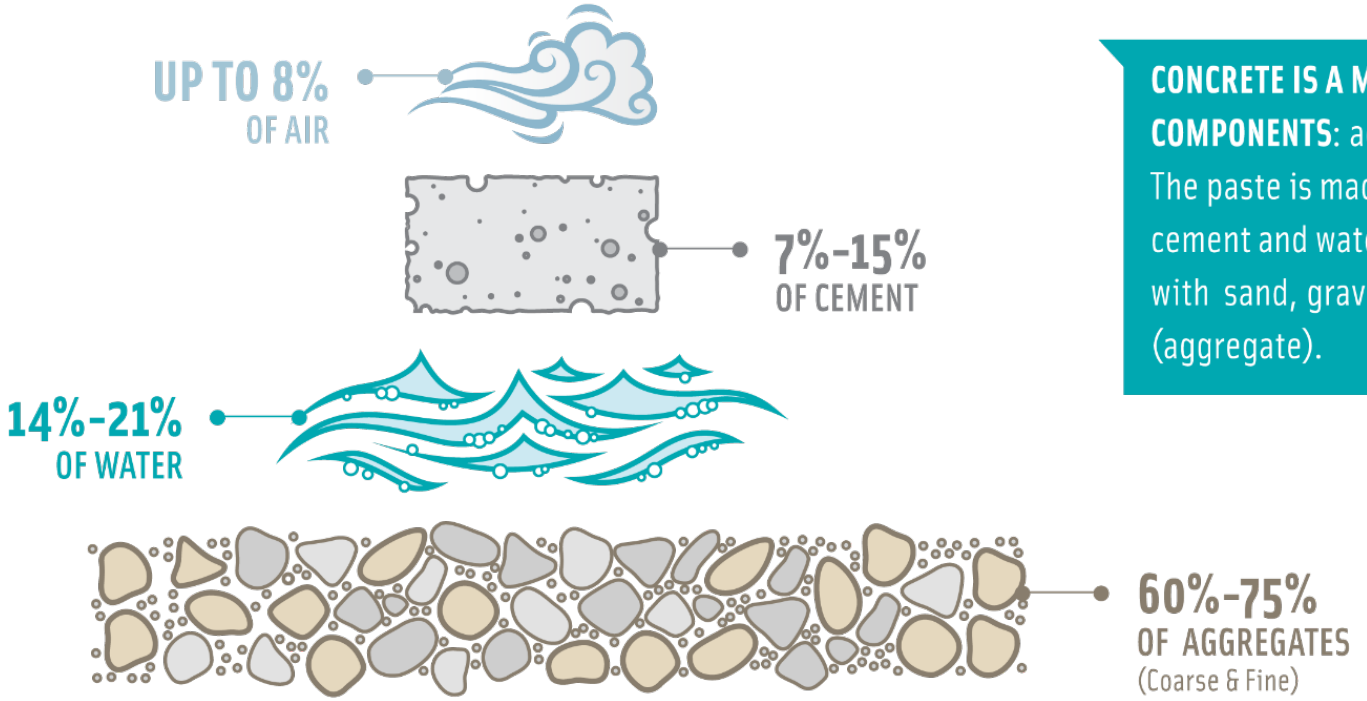


Why is Cement Important?

- Cement is essential for our infrastructure
- California uses about 10 million metric tons of cement per year for buildings, highways, bridges, and other infrastructure
- Cement manufacturing is considered “hard-to-decarbonize”

Why is Cement Important?

- Cement is the key ingredient of concrete, one of the most widely used construction materials



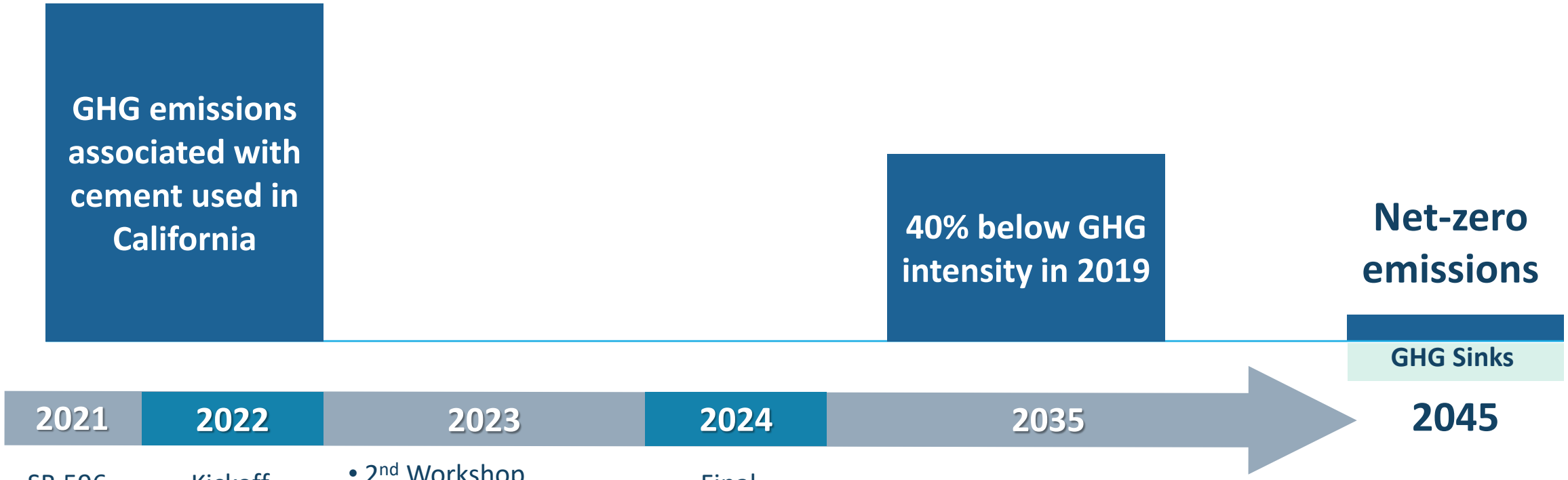
CONCRETE IS A MIXTURE OF TWO COMPONENTS: aggregate and paste. The paste is made up of portland cement and water, which then binds with sand, gravel or crushed stone (aggregate).

Source: Portland Cement Association

SB 596: Cement Net-zero Emissions Strategy

- Achieve net-zero GHG emissions for cement used in California by 2045
  - Interim targets: 40% below 2019 average GHG intensity by 2035
- SB 596 requires CARB to develop a comprehensive strategy
  - Identify actions to overcome the market, statutory, and regulatory barriers to achieve the goal of net-zero emissions
- Key SB 596 elements related to communities
  - Coordinate and consult with local communities
  - Identify GHG emissions reductions that can reduce adverse air quality impacts
  - Support economic and workforce development in communities neighboring cement plants

SB 596 Milestones and Goals



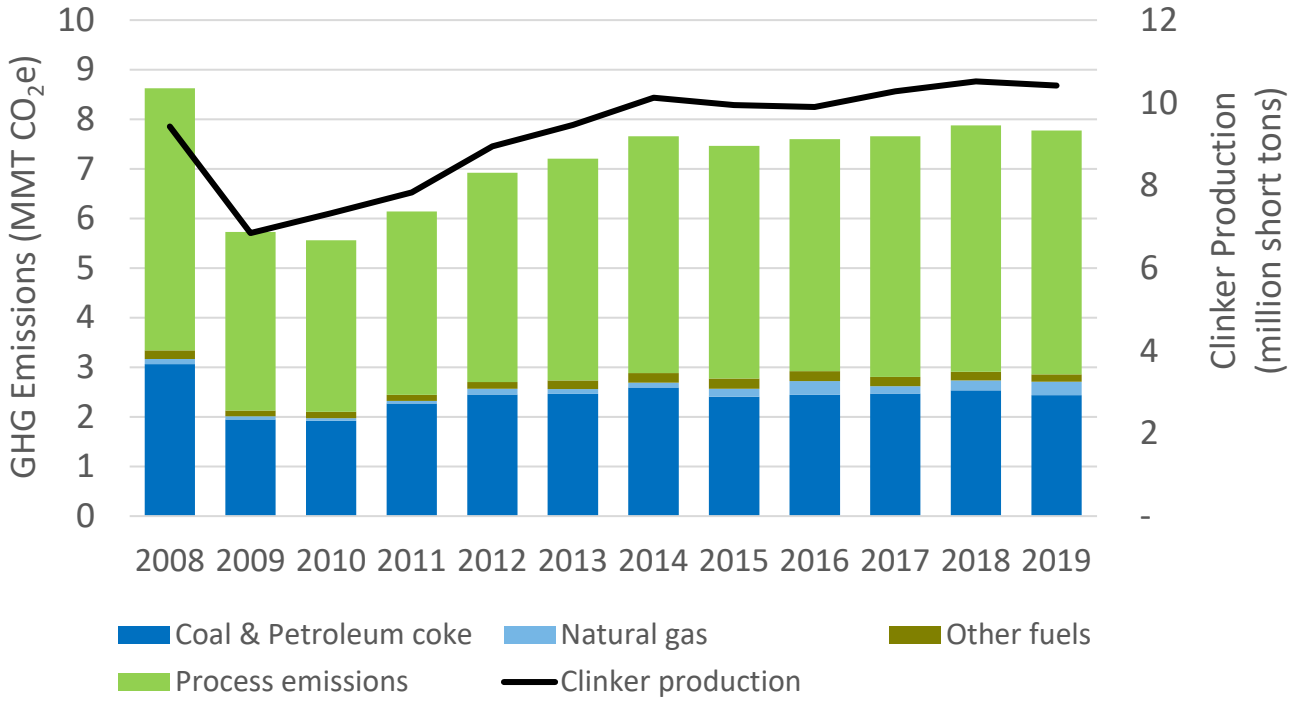
Cement Manufacturing and GHG Emissions

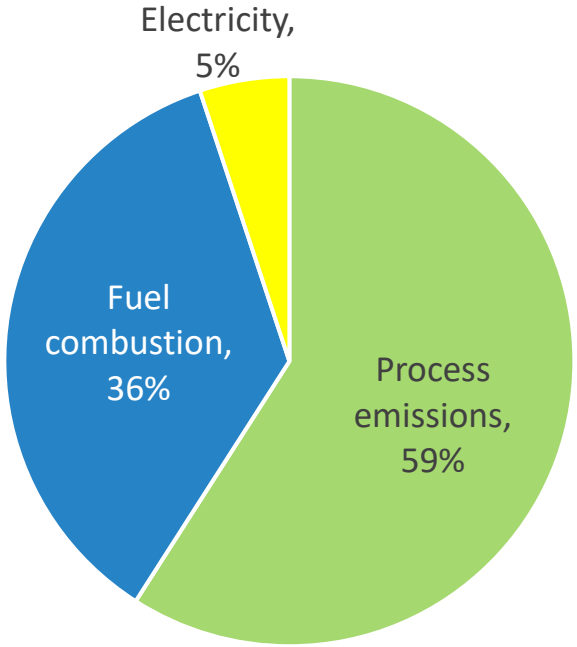
- Limestone and other minerals are processed at very high heat (~1,500 °C) in a rotating kiln to make cement
  - "Clinker" is the key ingredient in cement, both functionally and environmentally
  - High heat requires burning large amounts of fuel
  - Limestone releases carbon dioxide when it is heated

Cement Rotary Kiln AGICO

GHG Emissions from California Cement Plants

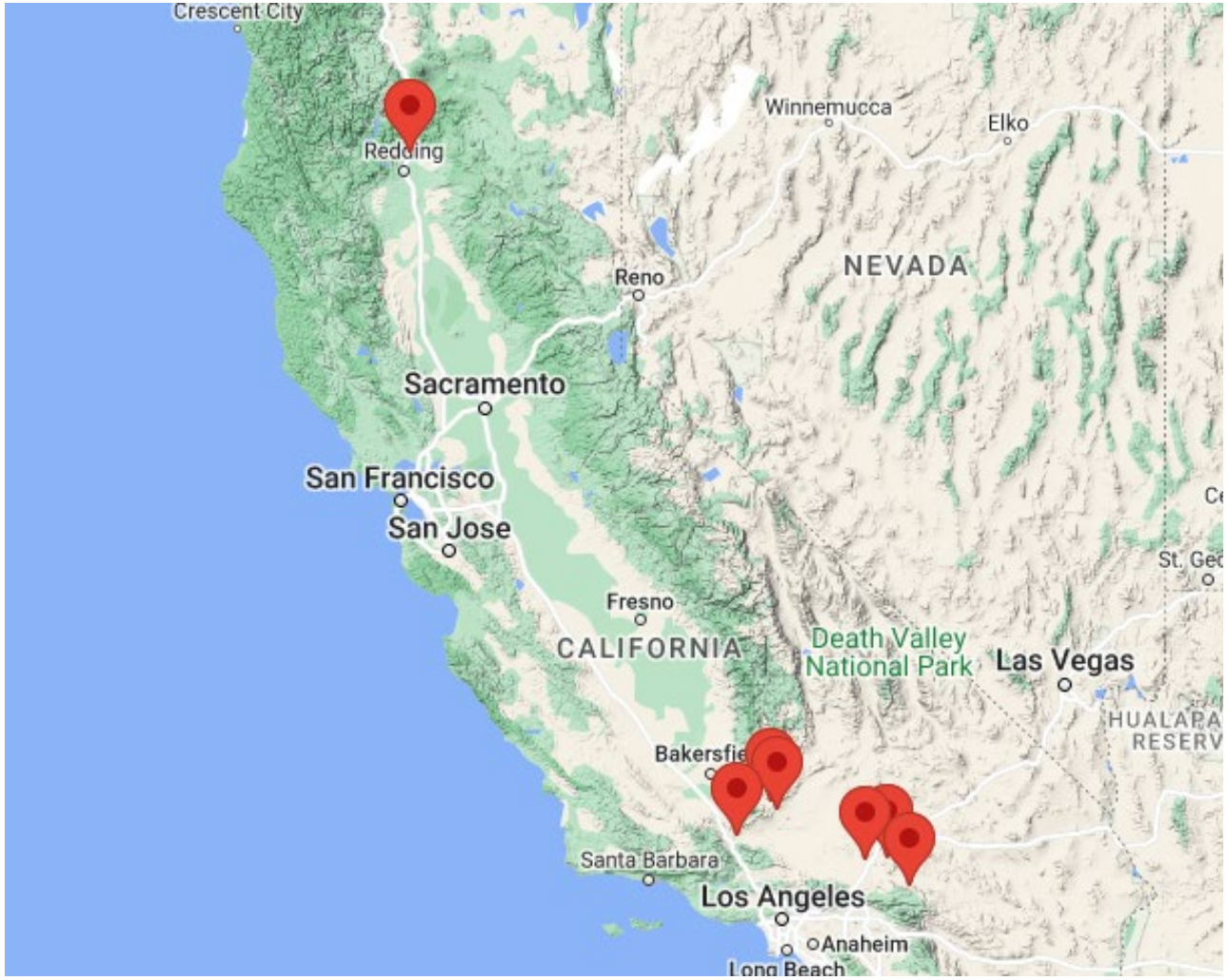
Seven cement plants collectively emit about 7.5 MMT of GHG emissions per year (2008-2019)





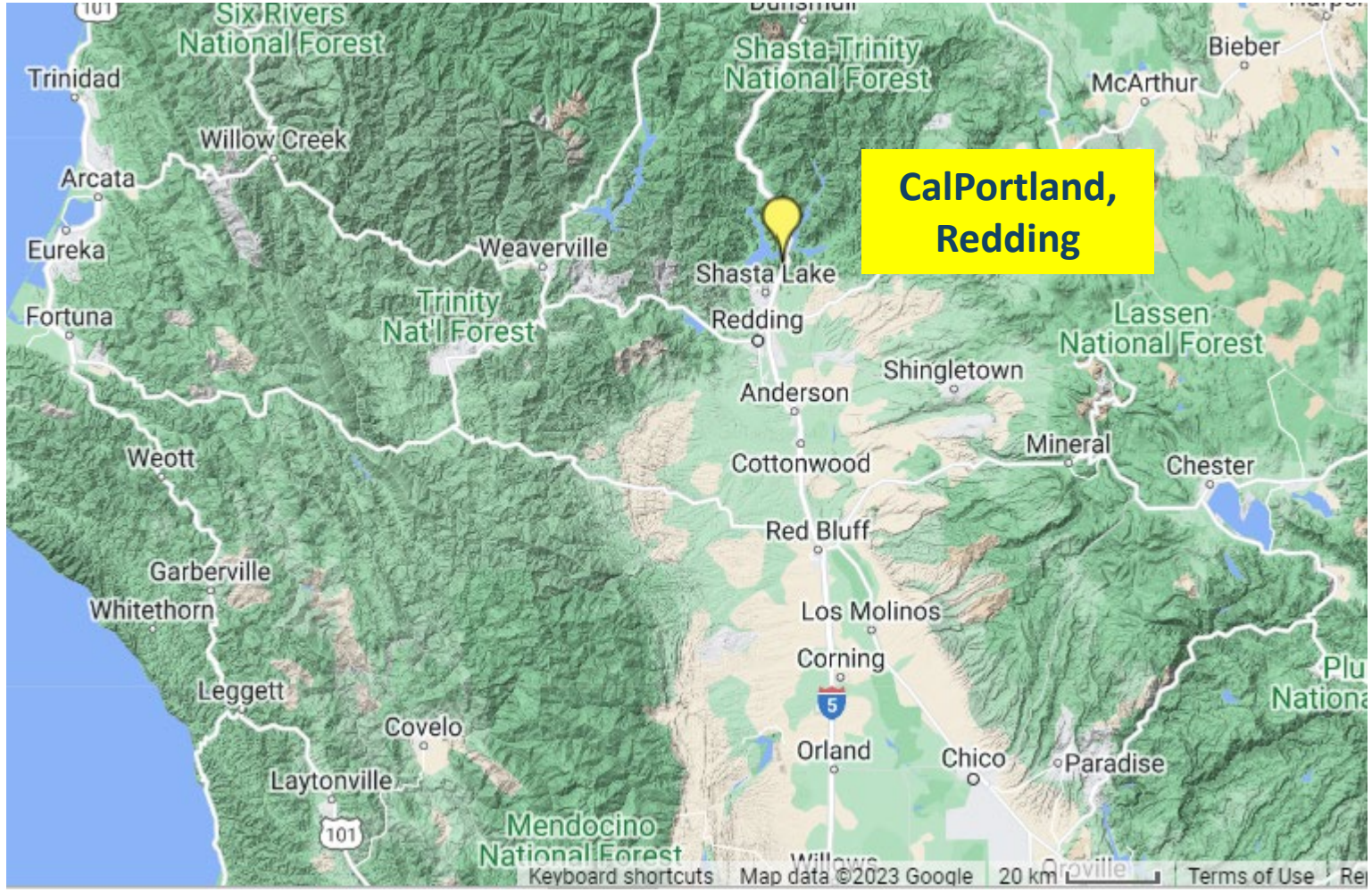
Source: CARB Mandatory Reporting Regulation

Locations of California Cement Plants



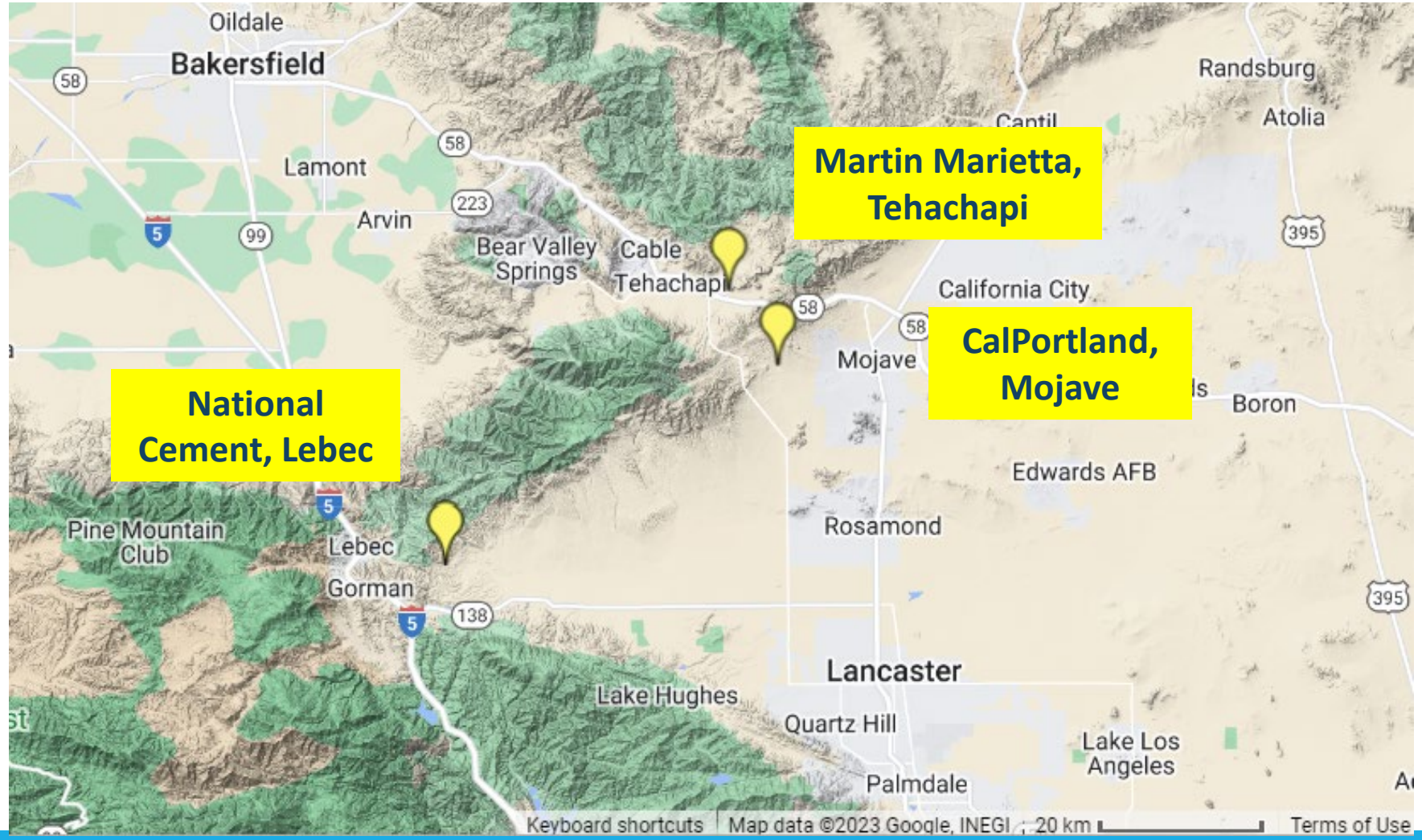
Source: CARB Pollution Mapping Tool (v2.6)

Locations of Northern California Cement Plants



Source: CARB Pollution Mapping Tool (v2.6)

Locations of Southern California Cement Plants Eastern Kern APCD



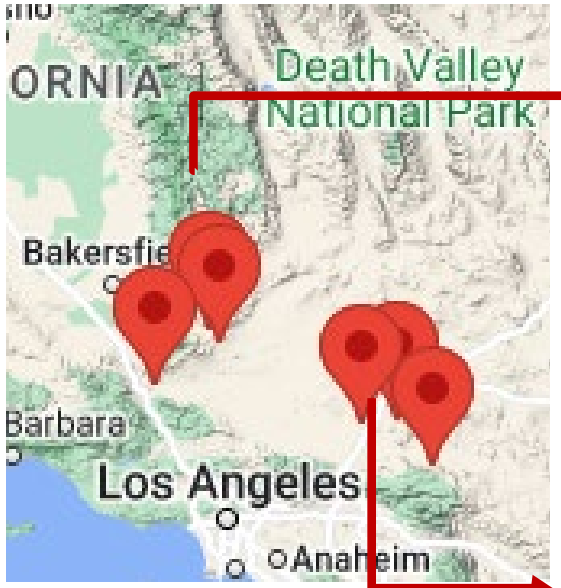
Source: CARB Pollution Mapping Tool (v2.6)

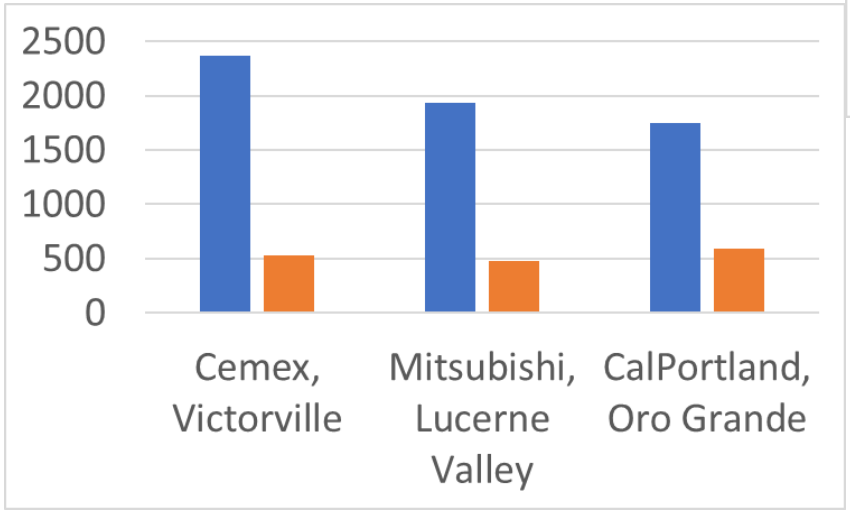
Locations of Southern California Cement Plants Mojave Desert AQMD

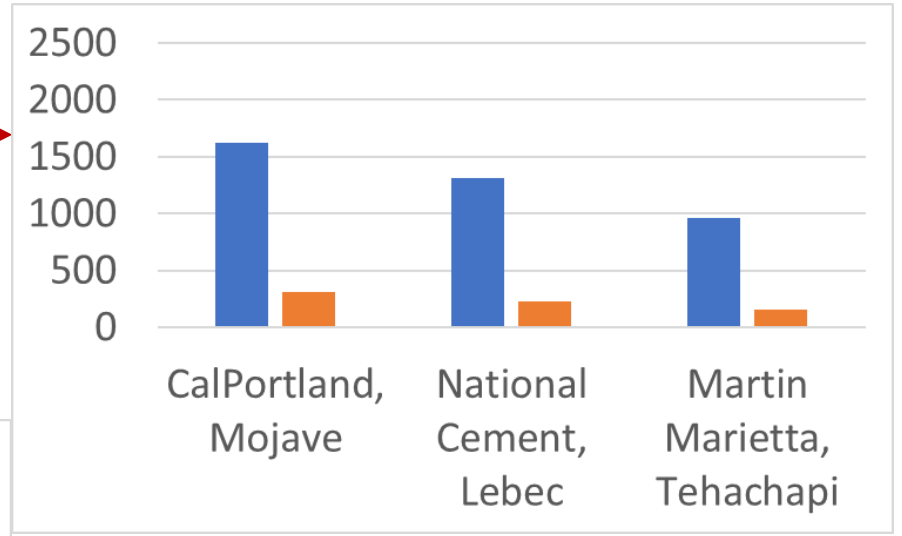
Cement Plants and GHG Emissions

Facility Name	Air District	2019 GHG Emissions (1,000 $MTCO_2e$)
Cemex Construction Materials Pacific LLC - Victorville Plant	Mojave Desert AQMD	1,910
CalPortland Company, Oro Grande Plant	Mojave Desert AQMD	1,251
CalPortland Company, Mojave Plant	Eastern Kern APCD	1,124
Mitsubishi Cement 2000	Mojave Desert AQMD	1,069
National Cement Company - Lebec	Eastern Kern APCD	796
Martin Marietta - Tehachapi	Eastern Kern APCD	556
CalPortland - Redding	Shasta County AQMD	293

NO_x and PM_{10} Emissions (Southern CA)







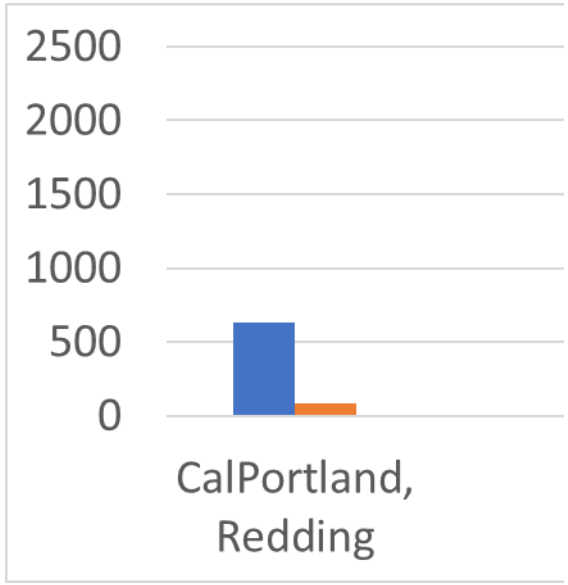
Year: 2019

Blue: NOx emissions (short tons)

Orange: PM_{10} emissions (short tons)

Source: CARB Pollution Mapping Tool (v2.6)

NO_x and PM_{10} Emissions (Northern CA)



Year: 2019

Blue: NOx emissions (short tons)

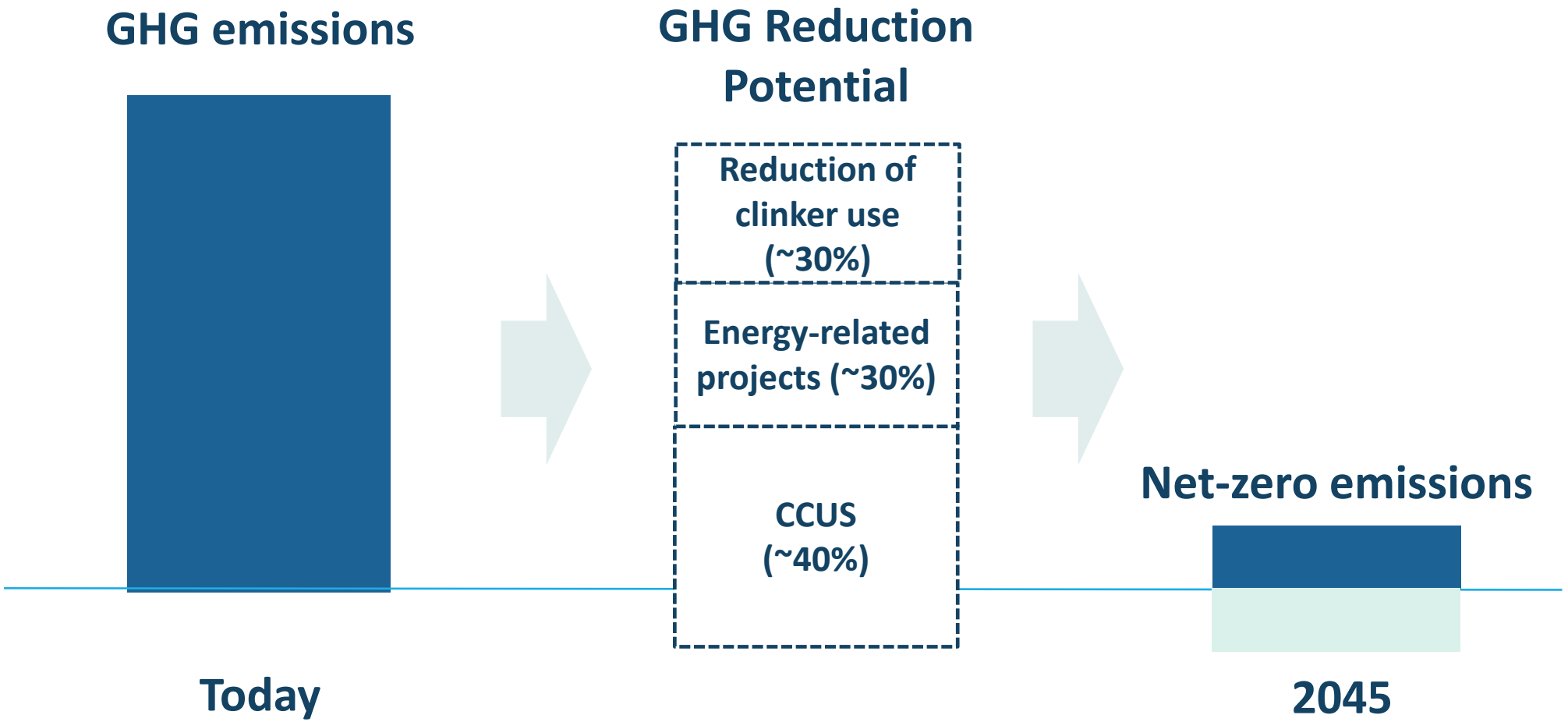
Orange: PM_{10} emissions (short tons)

Source: CARB Pollution Mapping Tool (v2.6)

Potential GHG Reduction Options

- Reduce combustion GHG emissions at cement plants
  - Use of lower carbon fuels
  - Increased use of electricity from cleaner sources
  - Increased efficiency
- Reduce process GHG emissions at cement plants
  - Carbon capture, use, and sequestration (CCUS)
- Reduce clinker used in cement and concrete
  - Use of increased amount of low-carbon additives for cement and concrete
  - Emerging technologies to make cement using carbon-free materials

Potential GHG Reduction Options



Potential Community Impacts

AT CEMENT PLANTS

- Additions of new equipment, such as carbon capture units
- Modifications to existing equipment or processes, such as upgrading emissions control equipment or switching fuels
  - Potential reduction in air emissions
  - SB 596 requires CARB to identify actions that can reduce adverse air quality impacts

OUTSIDE CEMENT PLANTS

- Carbon dioxide sequestration requires geological sequestration sites and pipelines to transport captured carbon dioxide
  - Potential environmental impacts
  - Public health concerns
- New materials to replace clinker will potentially be mined, produced, and processed in California
  - Potential environmental impacts
  - Potential reduction in air emissions

❖ All changes are subject to relevant permitting requirements, including CCUS where rules are under development

❖ Projects with physical changes can lead to ground disturbance, increased traffic, and new job opportunities

Request for Input

1. What topic(s) discussed today would you like more information or details on?
2. What should CARB know about your community, its needs, and its connection to local cement plants?
3. What actions under this strategy might support economic and workforce development in communities near cement plants?
4. What concerns or opportunities do you see with the different options to reduce GHG emissions from cement use?
5. What kind of community engagement would you prefer going forward? (e.g., virtual meetings, in-person meetings, newsletters, or other)

Contact Us

- For more information, go to the SB 596 webpage
- Past workshop presentations and recordings are found on SB 596 Meetings & Workshops page
- Comments can be submitted to our online docket through November 1, 2023
- Additional questions contact us at: cement@arb.ca.gov
- We look forward to hearing from you!

Thank you!