

## Key Insights

- Electrifying container glass production in California can significantly reduce emissions.
- Electrifying plastic recycling may reduce energy costs per unit of production.

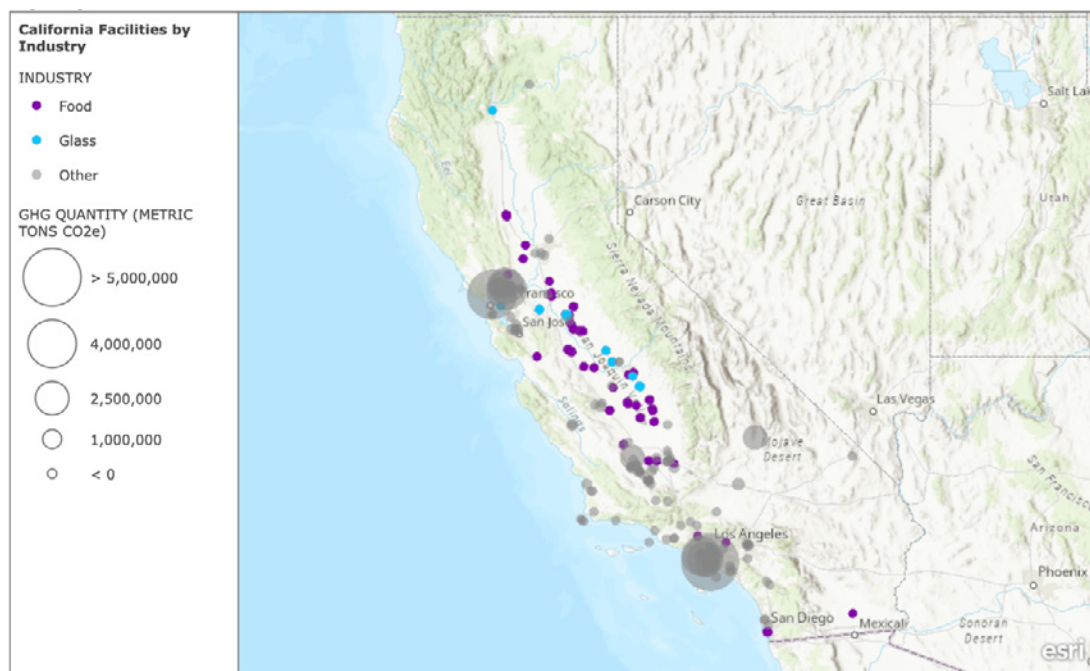
## Quick Facts

- 23% of California's GHG emissions are from industry.
- The state has committed to reduce CO<sub>2</sub> emissions 40% by 2030<sup>1</sup> and achieve net-zero by 2045.<sup>2</sup>
- As of 2022, the manufacturing sector employed 7.57% of the state's nonfarm workforce and accounted for more than 10% of total gross state product.<sup>3</sup>

Electrifying industrial processes offers a significant opportunity to decarbonize California's industrial sector, which accounts for 23% of the state's greenhouse gas (GHG) emissions.<sup>1</sup> Industrial emissions originate from facilities throughout the state as shown in the map below. These emissions must be reduced to meet state's emissions reductions and carbon neutrality goals. In numerous industrial subsectors, electrified technologies can shift production away from carbon-intensive fossil fuels to renewable electricity .

The report [Industrial Electrification in U.S. States](#) analyzes nine of California's industrial subsectors and the changes in energy use, CO<sub>2</sub> emissions, and energy costs that would occur if individual industrial processes were electrified. This report studied California's industrial pulp and paper, container glass, plastic recycling, beet sugar, milk powder, wet corn milling, aluminum casting, beer, and soybean oil sectors.

## California's Industrial Emissions



Esri, USGS | California State Parks, Esri, HERE, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS

Built using ArcGIS online with U.S. Environmental Protection Agency's Facility Level Information on GHGs Tool (FLIGHT) 2020 data. U.S. Environmental Protection Agency, "Greenhouse Gas Reporting Program (GHGRP)," last accessed February 25, 2022, <https://www.epa.gov/ghgreporting>.

This map shows the relative emissions of large industrial facilities. Facility types that are included in the full report analysis are shown in colors while other industrial facility types are shown in grey.

The study found that, among the California subsectors analyzed, the following have the potential to reduce emissions by the largest margins, ranked by the expected decrease in annual emissions by 2050 through electrification:

- Container glass (455 kt CO<sub>2</sub>)
- Beer (165 kt CO<sub>2</sub>)
- Pulp & Paper (146 kt CO<sub>2</sub>)

Deploying electric technologies would result in near-term emissions reductions, and, given the Biden administration's stated policy to achieve a "carbon pollution-free power sector by 2035," electrification could deliver even further decarbonization in the near- and medium-term.

Many electrification technologies considered in this study are commercially available, enabling California to begin electrifying, and realizing emissions reductions, in the near-term. Within California today:

- The container glass industry can electrify using electrically powered glass melters, electric forehearths, and electric annealing lehrs, immediately delivering emissions savings.
- Electrification can bring energy cost savings across three industries, including plastic recycling, milk powder, and beer, if lower renewable electricity cost is used. Additional cost information can be found in the full report.
- Industrial electrification can be advanced by supporting electrified technology demonstration, financially incentivizing electrification, increasing the state's renewable electricity generation capacity, enhancing the electric grid, and developing the workforce. A decarbonized energy grid is crucial for realizing the full benefits of industrial electrification and bringing California closer to its emissions reduction goals.

### Key Actions to Accelerate Industrial Electrification in California

- Open a dialogue with the container glass industry to learn what hurdles prevent manufacturers from adopting commercially available electrified technologies, especially electrically powered glass melters.
- Assist facilities in accessing the Inflation Reduction Act's incentives for electrification, such as the Sec. 48C Advanced Energy Manufacturing Credit and the Advanced Industrial Facilities Deployment Program.
- Leverage federal resources in the Investment in Infrastructure and Jobs Act (IIJA), including opportunities under the Advanced Energy Manufacturing and Recycling Grant Program and the Industrial Emissions Reduction Technology Development Program.
- Ensure sufficient renewable electricity generation resources are built to supply increasing demand and that grid infrastructure can adequately and reliably serve increased loads.
- Engage frontline communities and those working on environmental justice in this industrial transition.

Additional Factsheet Sources:

<sup>1</sup> Fran Pavley, "[California Global Warming Solutions Act of 2006: emissions limit.](#)" Pub. L. No. SB-32, § 38566, Health and Safety (2016).

<sup>2</sup> Brown, Jr., Edmund G, "[Executive Order B-55-18 To Achieve Carbon Neutrality.](#)" Executive Department, State of California, September 10, 2018.

<sup>3</sup> National Association of Manufacturers, "[2021 California Manufacturing Facts.](#)" 2021.

Download the full report and analysis here: <https://www.renewablethermal.org/state-electrification-report> or from here: <https://www.globalefficiencyintel.com/industrial-electrification-in-us-states>

