

GHGs Descriptions & Sources in California

IN THIS SECTION

Greenhouse Gases

Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate in order to reduce emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃). The fluorinated gases are also referred to as "high global warming potential gases" in the 2008 Scoping Plan.

A list of all GHGs included in the inventory along with GWPs and lifetimes can be found at [GWP](#).

Make a Difference: Calculate your household carbon footprint, and find ways to reduce your GHG emissions at [CoolCalifornia.org](https://www.coolcalifornia.org).

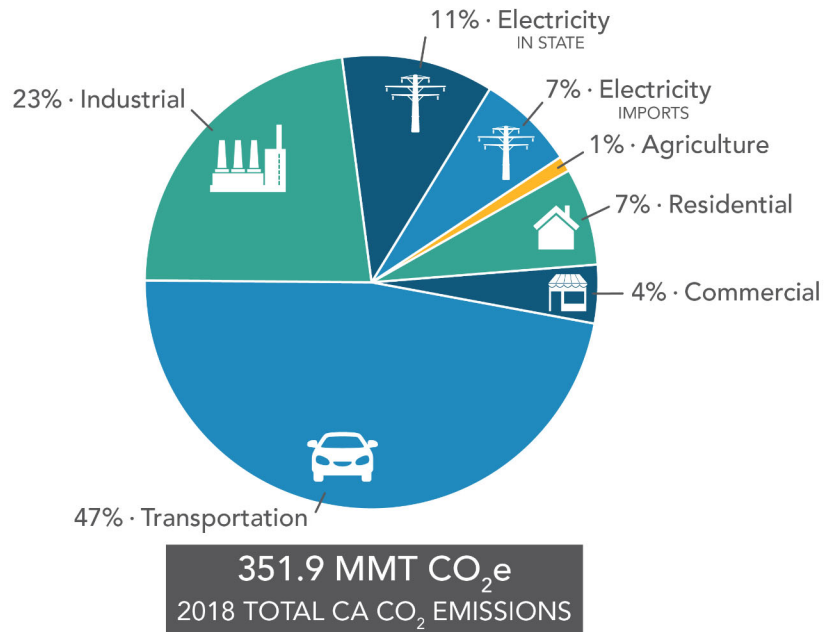
Carbon Dioxide (CO₂)

CO₂ is an important compound for plant and animal life, as part of the carbon cycle, and as a greenhouse gas (GHG). CO₂ is the primary GHG emitted in California, accounting for 83% of total GHG emissions in 2018.

Sources of CO₂ in California

Transportation is the single largest source of CO₂ in California; which is primarily comprised of on-road travel. Electricity production, industrial and residential sources also make important contributions to CO₂ emissions in California.





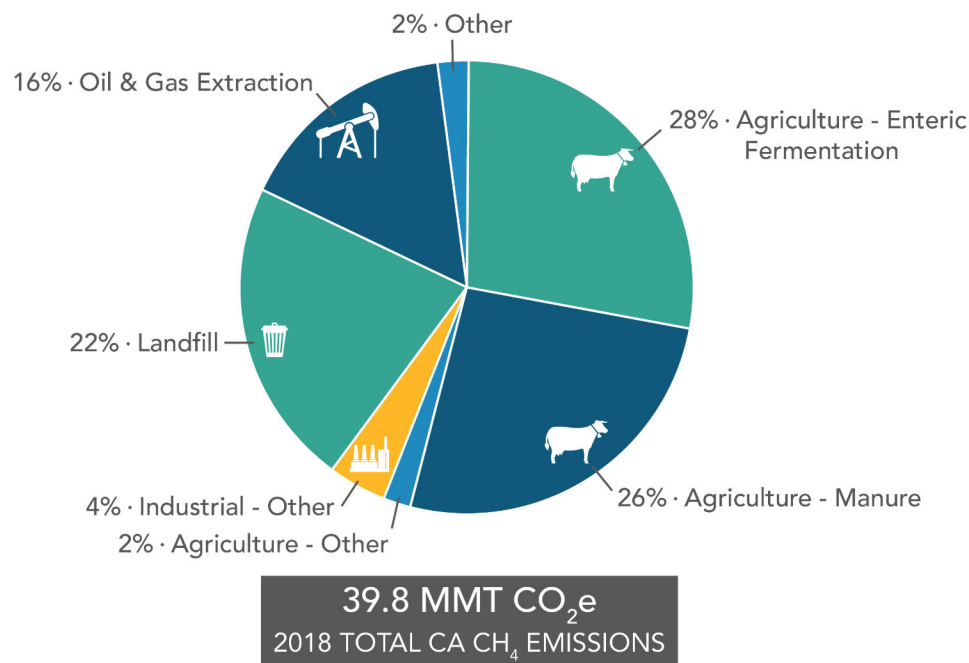
Methane (CH₄)

CH₄ has a global warming potential of 25, indicating one gram of CH₄ is equivalent to 25 grams of CO₂ over a 100-year timeframe. CH₄ is the second highest emitting GHG in California, accounting for 9% of 2018 GHG emissions in CO₂ equivalent units.

Sources of CH₄ in California

Agriculture accounts for the majority of emissions, primarily from livestock enteric fermentation and manure management. Industrial sources and landfills are also important sources of CH₄. Other sources contribute only a small fraction to CH₄ emissions, and include residential, transportation, electricity generation, and commercial sources.





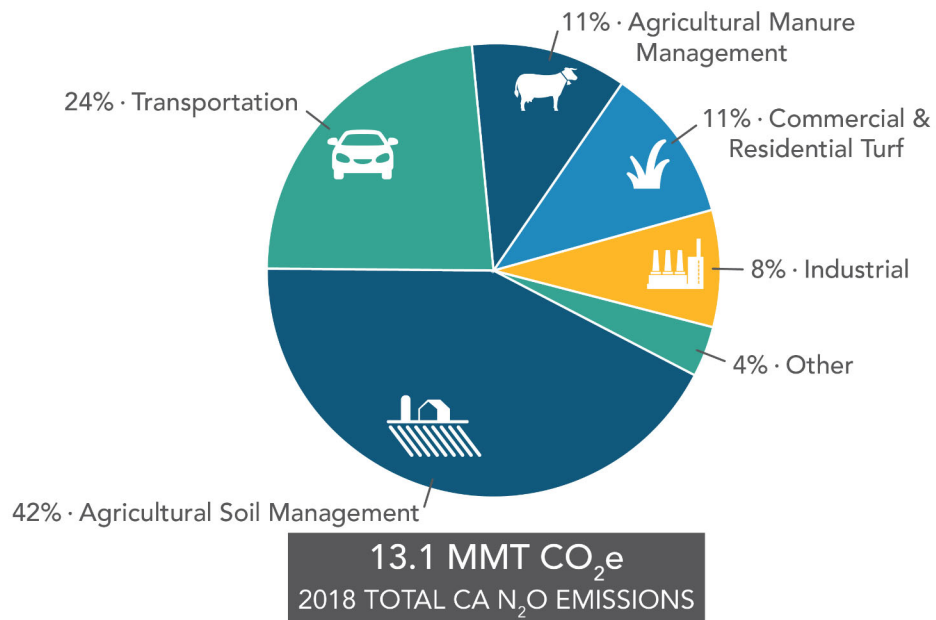
Nitrous Oxide (N₂O)

N₂O has a global warming potential of 298, indicating emission of one gram of N₂O is equivalent to 298 grams of CO₂. N₂O accounts for 3.1% of 2018 statewide GHG emissions in CO₂ equivalent units.

Sources of N₂O in California

Agriculture accounts for the majority of N₂O emissions, primarily from fertilizer and manure added to soil. Commercial and residential use of nitrogen fertilizer on turf and transportation are also important sources of N₂O. Industrial sources of N₂O include solid waste and wastewater treatment, manufacturing, refining and other sources.





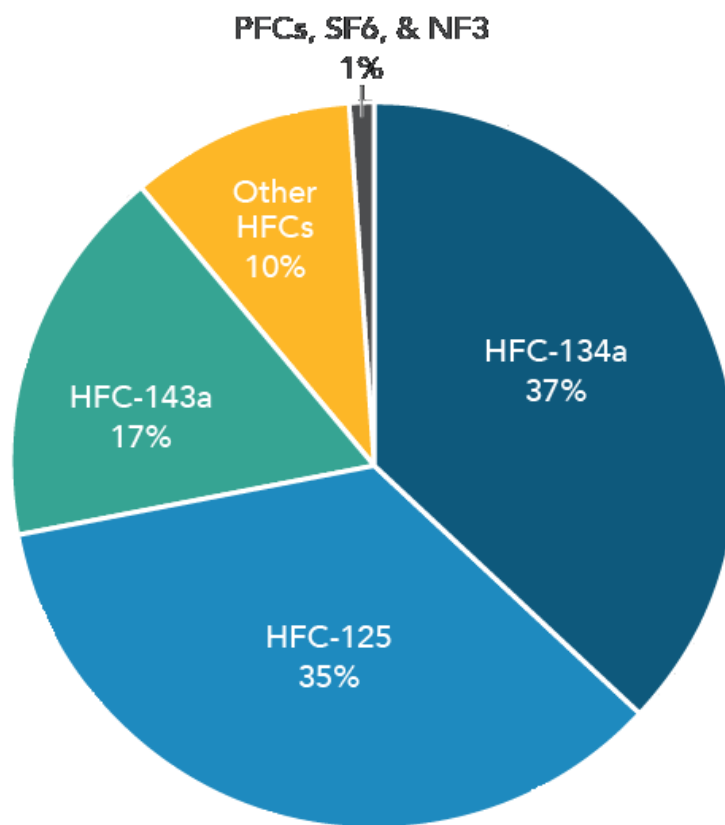
High Global Warming Potential Gases (High-GWP)

High global warming potential (High-GWP) greenhouse gases are fluorine-containing gases including sulfur hexafluoride (SF₆), nitrogen trifluoride (NF₃), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). High-GWP gases account for 4.8% of California's 2018 GHG emissions. It is important to track these compounds due to their long lifetimes, and high global warming potentials. HFCs account for 98.7% of High-GWP gas emissions.

Sources of High-GWP Gases

PFCs and HFCs are used as substitutes for chlorofluorocarbons (CFCs) which destroy stratospheric ozone. SF₆ is used in electricity transmission and distribution and in semiconductor manufacturing. Semiconductor manufacturing also emits a small amount of NF₃ which was added to the inventory as required by California Senate Bill 104 passed in 2009, because it is a potent GHG.





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