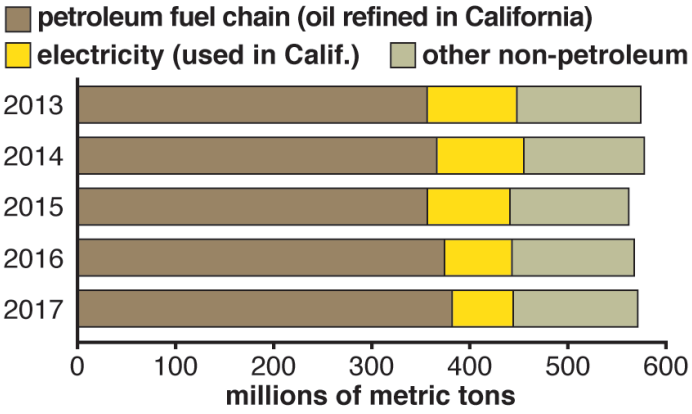
California Climate Emissions 2013–2017

COMMUNITIES FOR A BETTER ENVIRONMENT

State policy has not really cut climate pollution, mainly because of a problem state officials aren't talking about: the increasing pollution caused by extracting more imported oil, refining it here, and burning this excess fuels production for export.

Actual California climate footprint

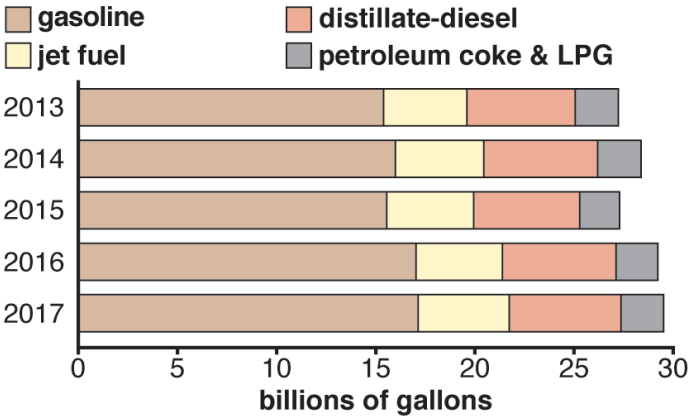
Total greenhouse gas (CO_2e) emissions changed little from 2013–2017, falling only from 574 to 571 million tons per year (Mt/y), even though electricity sector emissions fell from 91 to 62 Mt/y. This is because oil sector emissions increased from 356 to 382 Mt/y. Chart 1. Oil accounted for 67 % of total emissions by 2017. These figures include in-state and out-of-state fuel chain emissions from both oil sector and electricity sector activities here.[1]



1. Greenhouse gas ($CO2_e$) emissions associated with all activities in California, 2013–2017[1]

Expanding oil footprint

Year on year changes in petroleum emissions (Chart 1) reflect those in refinery fuels production (Chart 2). California refinery fuels production rose from 27.2 to 29.5 billion gallons/year during 2013–2017. Gasoline, distillate-diesel and jet fuel drove this refinery production increase.[2] Chart 2. Petroleum fuel chain emissions from extraction, refining, and refined fuels combustion in vehicles and industry increased as more oil was refined.

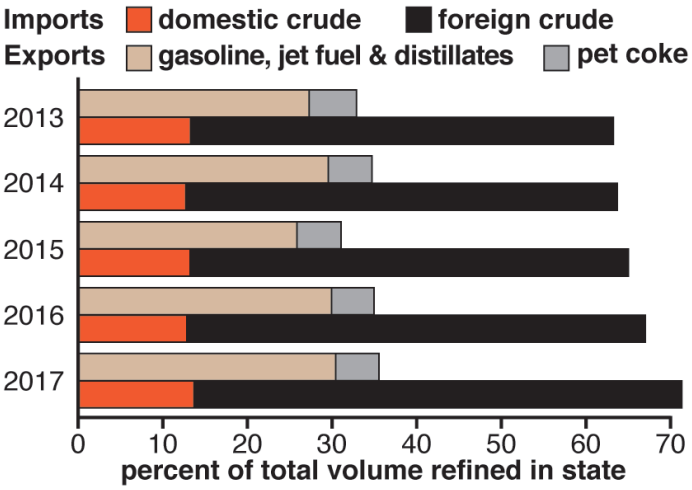


2. California refinery fuels production, 2013–2017[2]

Refining for export

Annual changes in refinery production (Chart 2) reflect those in refined fuels exports (Chart 3). Annual fuels exports rose by 1.53 billion gallons from 2013–2017, with gasoline, distillate and jet fuel exports driving the increase, and reached 35 % of total in-state production by 2017. Feeding this refinery production for export (and more), crude imports rose from 63 to 71 % of total crude refined in California during 2013–2017.[3] *See* Chart 3.

Phasing out pollution from refining export fuels we don't use or need here could cut petroleum fuel chain CO_2e emissions by 79–130 Mt/y.[4] That's 14–23 % of California's total emissions in 2017.



3. California refinery crude imports and exports of refined fuels to other states and nations, 2013–2017[3]

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California Climate Emissions, 2013–2017 *continued*

References and notes

(**1**) These figures are based on a consistent "system boundary." Activities in California are associated with out-of-state emissions from producing electricity and crude oil imported for use here, and with burning petroleum fuels that are **refined here for export.** Fuel chain emissions associated with these activities in both sectors, electricity and petroleum, are reported here. In contrast, state officials' emission summaries currently include emissions from producing the electricity imports but not those from extracting imported crude refined here or from burning exported petroleum fuels refined here. The most recent five years of complete data are shown.

In-state emissions were taken from the California Air Resources Board (ARB) **GHG Inventory** and Mandatory GHG Reporting Rule **data**. Emissions from burning all fuels for oil extraction, oil refining, or electric power generation were assigned to those respective activities. All other "end-use" emissions from petroleum fuels (mainly combustion in transportation and industry) were assigned to petroleum fuel chain activities.

Out-of-state emissions: Emissions from burning refined fuels that were exported out-of-state were estimated from the export volume (note 3) and carbon intensity (CI) for end uses of each fuel. CI was calculated from in-state emissions and usage volume (Fuel Activity Rate) data for each fuel from ARB's **GHG Inventory**. Emissions from extracting crude oil out-of-state that was imported and refined in California were estimated by applying the extraction CI of imported crude to the volume of imported crude reported in ARB's **"Crude Oil Carbon Intensity" documentation** for its Low Carbon Fuel Standard (LCFS). The CI of extracting imported crude was estimated at 76% of that for in-state extraction based on ARB **LCFS** and Mandatory GHG Reporting Rule **data.** Emissions from generation of imported electricity were taken from ARB's **GHG Inventory**.

(2) Gasoline, jet fuel, and distillate diesel production were taken from California Energy Commission (CEC) **"Fuels Watch" reports.** Petroleum coke and LPG (propane and N-butane) production were not reported by the CEC and were estimated based on **West Coast production** reported by the US Energy Information Administration and the portions of West Coast refinery petroleum coke and LPG production capacities in California, which were taken from data reported by *Oil & Gas Journal* in its "**Worldwide Refining** Survey."

(3) Gasoline, jet fuel and distillate-diesel exports were estimated from the difference between in-state production reported in the **CEC Fuels Watch** (note 2) and in-state usage reported in ARB's **GHG Inventory Fuel Activity Rates**. Excess in-state refinery gasoline and distillate-diesel production drove most (55%) of the total increase in refinery exports from 2013–2017. Jet fuel exports (42% of total exports) include in-state fueling of cross-border air travel, which was categorized as "excluded" or "international" emitting activities in ARB's Inventory. Petroleum coke exports were estimated from the difference between "marketable" coke production (*see* note 2) and in-state coke usage outside of oil refining, extraction and associated cogen plants reported in ARB's **Inventory.** Exported petroleum coke is typically burned in cement, smelting and power plants.

Crude oil imports refined in-state were taken from foreign and other domestic (as compared with California-sourced) crude volumes refined in-state, reported by ARB in **Crude Oil Carbon Intensity documentation** for its LCFS. Foreign crude (79–81 % of 2013–2017 crude imports) was **sourced globally.**

(**4**) This estimate is based on 2013–2017 mean data (*see* notes 1–3) and conservative assumptions: Fuel chain emissions associated with jet fuel were excluded from the estimate's lower bound based on very conservative assumptions that all exported jet fuel might be used for cross border air travel to and from the state and that low-carbon alternatives to petroleum-fueled air travel might not in the worst case prove feasible. Only the portions of extraction and refining emissions associated with crude used to refine fuel exports (33.8% of fuels production volume; 19.7% excluding jet fuel) were included. The relatively lower imported crude carbon intensity (CI; *see* note 1) was conservatively applied to all of this 33.8% or 19.7% of total crude feed extracted. Finally, as in the total estimate (note 1), end-use emission from each exported fuel was conservatively assumed at its in-state CI.