

OIL REFINERY STORAGE TANKS EMIT HARMFUL VOCS INCLUDING CANCER-CAUSING BENZENE

THERE ARE THOUSANDS OF MASSIVE PETROLEUM STORAGE TANKS ACROSS THE STATE OF CALIFORNIA

There are over 1,000 petroleum storage tanks in the South Coast Air Quality Management District alone, the majority of which have a storage capacity over one million gallons each (SCAQMD, [Final 1178 Staff Report](#), Aug. 2023, p. EX-1).

Many other parts of the state also have high concentrations of petroleum tank farms, including the Bay Area (the 2nd largest oil refinery region) and others.

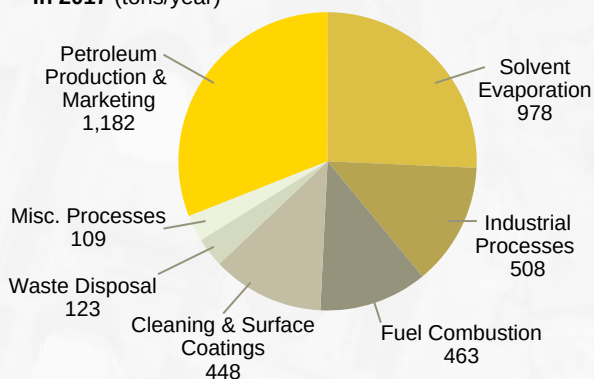
STORAGE TANKS ARE MAJOR SOURCES OF VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS, AND THESE EMISSIONS HAVE BEEN WIDELY UNDERESTIMATED

SCAQMD's 2017 [FluxSense study](#) found that every South Coast refinery had drastically underestimated VOC emissions, including benzene, a cancer-causing chemical. The same study found that standard emission calculations fail to include storage tank degradation over time (see p. 5, 13, 94-5, and [CBE's decoder summary](#)). A [study](#) in Texas reported similar findings, indicating widespread underestimation.

OIL REFINERIES AND STORAGE TANK FARMS ARE THE LARGEST SOURCE OF VOC EMISSIONS IN THE SOUTH COAST

SCAQMD found that Petroleum Production & Marketing (i.e., oil refineries and storage tanks) are the largest sources of VOC emissions in Wilmington, Carson, and West Long Beach (WCWLB).

WCWLB Stationary and Area Source VOC Emissions in 2017 (tons/year)



Source: SCAQMD, Final AB617 [WCWLB CERP](#), p. 3b-6 & 3b-7.

STORAGE TANK SEALS AND DESIGN GREATLY IMPACT VOC EMISSIONS

Internal floating roof designs are considered best, as they reduce VOC emissions to the greatest degree, but all storage tanks can emit significant VOCs. ([CBE Fact Sheet](#)).



Internal Floating Dome



Fixed Roof



External Floating Roof



WHY ARE VOCs, BENZENE, AND OTHER EMISSIONS FROM REFINERY STORAGE TANKS A PROBLEM?

1 Gasoline includes many VOCs, and is highly evaporative, especially as temperatures increase. Storage tank seals, vents, and fittings emit substantial VOCs and other chemicals (SCAQMD Staff Report). Furthermore, the FluxSense found that “tank emissions contribute approximately 2/3 of the total refinery emissions” (FluxSense Study, p. 94).

3 Storage Tank VOCs include toxics that cause cancer or reproductive hazards, including Benzene, Toluene, Xylene, and EthylBenzene (“BTEX”). All of these were measured and found to be greatly underestimated in the South Coast FluxSense study.

- Benzene is a known human carcinogen (IRIS EPA)
- Toluene at low to moderate levels can cause headaches, dizziness, tiredness, confusion, weakness, memory loss, nausea, and may cause reproductive or neurological impacts (ATSDR)
- Xylene can cause irritation of the eyes, skin, and respiratory tract, headache and more (OEHHA, p. 26)
- Ethylbenzene can cause chest, ear, and eye irritation, liver, blood, and reproductive damage (OEHHA, p. 23)

WHY SHOULD WE WORRY ABOUT INCREASING NEW FOSSIL FUEL INFRASTRUCTURE?

2 Breathing VOCs can cause serious health issues. VOCs can irritate the eyes, nose and throat, cause difficulty breathing and nausea, and could damage the central nervous system and other organs (American Lung Association & ATSDR Toxic Substances Portal).

4 VOCs are smog-forming. Large regions in California are in extreme non-attainment with Clean Air Act Health standards due to smog constituents, including ground-level ozone and others.

Ozone in smog exacerbates asthma, causes wheezing, lung disease, and more (California Air Resources Board & American Lung Association).

For more information, contact Julia May at julia@cbecal.org or Bahram Fazeli at bfazeli@cbecal.org