

Giant old REFINERY BOILERS & HEATERS

drive refinery energy use, causing constant pollution

Unlike flaring,
this pollution is
mostly invisible



We need BEST TECHNOLOGIES to cut smog & toxics and planning to phase out Fossil Fuels to stop climate disaster

THE LA REGION HAS 7 MAJOR OIL REFINERIES WITH OVER 230 MASSIVE BOILERS AND HEATERS.ⁱ

THEY MAINLY BURN REFINERY GAS (SIMILAR TO NATURAL GAS BUT DIRTIER).

IN ONE HOUR,
EACH ONE CAN BURN THE AMOUNT OF GAS SEVERAL HOMES USE
IN AN ENTIRE YEAR.ⁱⁱ

CBE COMPILED WILMINGTON AND CARSON [AQMD](#) REFINERY BOILER & HEATER 2016 EMISSIONS DATA FROM THE AB617 PLAN:ⁱⁱⁱ

- **NOX: >3.4 MILLION LBS/YEAR** (4.7 TONS/DAY)
- **PM: OVER 420,00 LBS/YEAR** (~0.6 TONS/ DAY)

[DOESN'T INCLUDE EL SEGUNDO & TORRANCE WHICH ADD EVEN MORE!]

- ALMOST EVERY PROCESS HAS THEM (DISTILLATION, CRACKING, ALKYLATION, HYDROTREATING, COKING, ETC.)
- MOST *DO NOT* HAVE MODERN EMISSION CONTROLS SUCH AS [SELECTIVE CATALYTIC REDUCTION](#).
- HEALTH & CLIMATE DAMAGING EMISSIONS:
[>NOX](#), [>SOX](#), [>PM](#), & [>GREENHOUSE GASES](#)
- CONTROLS CAN ACHIEVE >95% EMISSIONS CUTS ([AQMD prsnt. slide 29](#))

- **TESORO HAD HIGHEST EMISSIONS:** 1.6 MILLION LBS/YEAR NOX, ALMOST 300,000 LBS/YEAR PM.
- **PHILLIPS 66:** ALMOST 1.4 MILLION LBS/YR NOX AND 65,000 LBS/YR PM.
- **ULTRAMAR / VALERO:** > 300,000 LBS/YR NOX (BUT INCOMPLETE PM DATA)
- **AIR PRODUCTS AND ECO SERVICES:** NOX - 140,000, SOX - 56,000 LBS/YR.

HOW ARE BOILERS & HEATERS USED IN REFINERIES? (examples):

- In the **Distillation Tower** at the refinery front end, **HEATERS** cause lighter parts of crude oil to evaporate. (Heaviest parts sinks to bottom, lighter liquids rise to the middle (like gasoline), lightest vapors rise to the top, **allowing separation**). And big coker heaters heat up the heaviest part of crude oil to make petroleum coke (similar to coal). Heaters also help a heated chemical process called **Hydrotreating**, to remove corrosive sulfur.
- **BOILERS** create **steam** to help strip out certain gases, or in turbines to generate **electricity** in the refinery.

Don't refineries claim California already has strict standards?

What standards? In the case of refinery NO_x, instead of setting strict standards, AQMD set up a market system of pollution trading called **RECLAIM** (Regional Clean Air Incentives Market). This allowed refiners to either buy or trade-in credits. But pollution credits were so cheap, refiners didn't need to cut their emissions.^{iv} The credit trading system gave them no incentive to retrofit or replace Boilers & Heaters, to cut emissions.

After years of failure, AQMD finally killed ReCLAIM and is going back to **DIRECT REGULATION**—straightforward requirements for best emission standards (using readily-available control technologies). Now AQMD is developing Regulation 1109.1, to control NO_x & SO_x from Refinery Boilers and Heaters (and other refinery equipment). AQMD had expected 7-9 tons/day cuts in NO_x (the biggest AQMD regulation for years), but now is considering proposing a less stringent regulation.

UPDATE – JUN 2021: Refineries are still relentlessly trying to weaken proposed Rule 1109.1!

- **We still need to fight for tight standards, especially for the largest Boiler & Heater emissions sources** – those which burn over 40 million BTUs of gas per hour. These should be required to meet a 2 ppm Nitrogen Oxide (NO_x concentration) standard.
- **We need to ensure these standards apply to each individual large Boiler & Heater at refineries, instead of allowing Alternative Emission Plans**, which could trade pollution inside each refinery. Such plans make it harder to enforce modernizing standards, and can allow game-playing with numbers. We got rid of RECLAIM – let's not go back!
- **There is no excuse for failing to clean up each individual Boiler & Heater – they are massive, and SCR (Selective Catalytic Reduction) can cut more than 95% of NO_x. SCR has been around for decades. Installation would generate many jobs.**

Communities of color and low-income communities are hit worst by this pollution, as shown in [Calenviroscreen](#) (for example, enter Wilmington, CA into address line). And everyone is suffering from smog & climate impacts. In addition to cleaning up big polluters now, we need to begin to phase out oil refineries, oil drilling, and gas-powered vehicles. See CBE's [Decommissioning Refineries](#). For more info contact: julia@cbeval.org or alicia@cbeval.org

COMMUNITIES
FOR A BETTER
ENVIRONMENT
established 1978

ⁱ SCAQMD, [Revised Draft Staff Report – NO_x RECLAIM](#) App. B, p. 76, 10/6/15

ⁱⁱ A million BTUs (British Thermal Units) of heat content is present in approximately 1000 cubic feet of natural gas (which varies a little in energy content). *"In 2012, the average U.S. home consumed 61,200 cubic feet of natural gas (or 62.7 million Btu)."* ([American Gas Association Playbook](#), 2015, p. 78) So a refinery heater rated at 250 million BTUs per hour can burn the same amount of fuel hourly as about 4 homes burn in an entire year. (250/62.7 ≈ 4)

ⁱⁱⁱ AB617 WCWL [Community Emission Reduction Plan](#), SCAQMD, p. Appendix 5b-4. CBE extracted and compiled into spreadsheets, available on request. Also see AQMD presentation for total emissions & reductions, [Slide 40](#).

^{iv} LA Times, Mar 24, 2017, Column: [How refineries' greed sank an environmental program that was saving them millions](#)