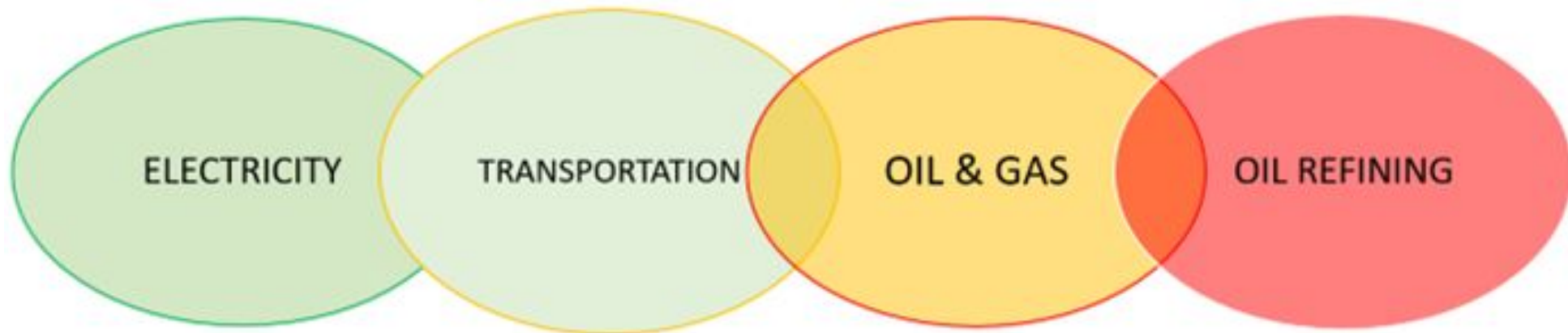


What's unique about Oil Refineries, and Why is there a big gap in phaseout planning?

Julia May & Alicia Rivera,
CBE, July 25th, 2024

COMMUNITIES
FOR A BETTER
ENVIRONMENT
established 1978

In the big Fossil Fueled sectors:
Electricity, Transportation, and Oil Drilling have
some form of phaseout requirements,
Oil Refineries do not.



Electricity is farthest along, Refineries are farthest behind.

Electricity

>1/3 renewable now
Carbon free by 2045



Extraction

PHASEOUT ORDINANCES in LA &
other cities + **STATEWIDE SETBACKS**,
(but under attack, delayed).



100% of new cars & passenger
trucks sold in CA must be
Zero Emission by 2035



Transportation

No phaseout requirement

CA did set *planning* goals in
Scoping Plan & SBX1-2



Refineries

Background:

California is a Major Oil Refining State

Refining of almost 2 million barrels per day of crude oil into gasoline, diesel, jet fuel, coke, etc.

BAY AREA: ~784,000 bpd

- Chevron Richmond
- **Marathon Martinez (going bio)**
- **Phillips 66 Rodeo (going bio)**
- PBF Martinez
- Valero Benicia

SANTA MARIA: 54,000 bpd

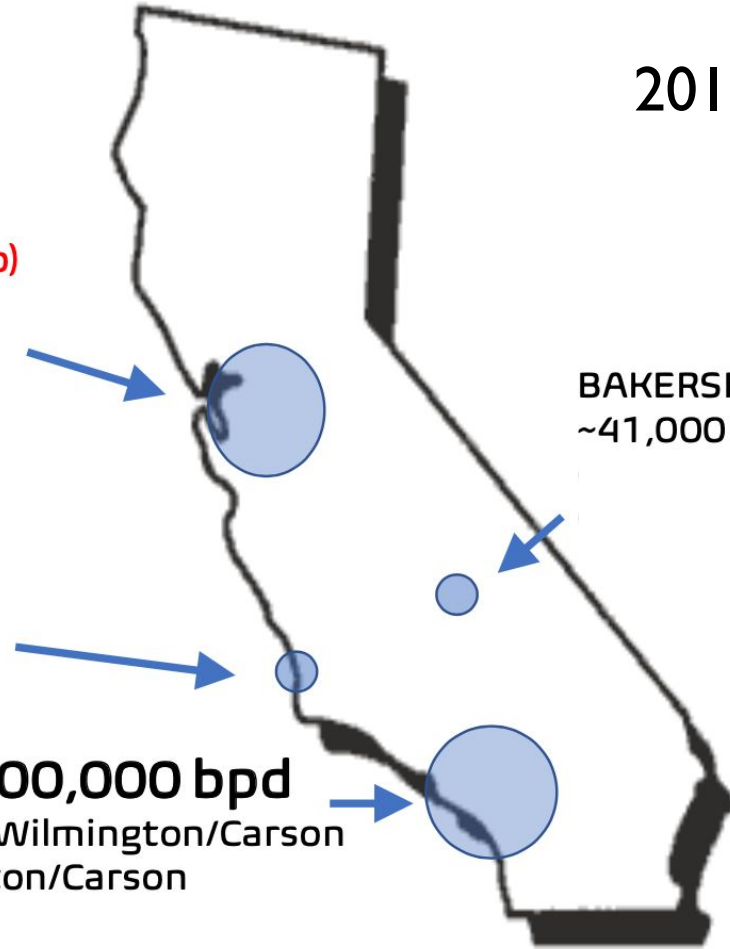
- **Phillips 66 (closing 2023)**
- Greka Energy Santa Maria

LA AREA: >1,000,000 bpd

- Marathon (Tesoro) Wilmington/Carson
- Phillips 66 Wilmington/Carson
- Valero Wilmington
- PBF Torrance
- Chevron El Segundo
- Lunday Thagard

2019

BAKERSFIELD:
~41,000 bpd

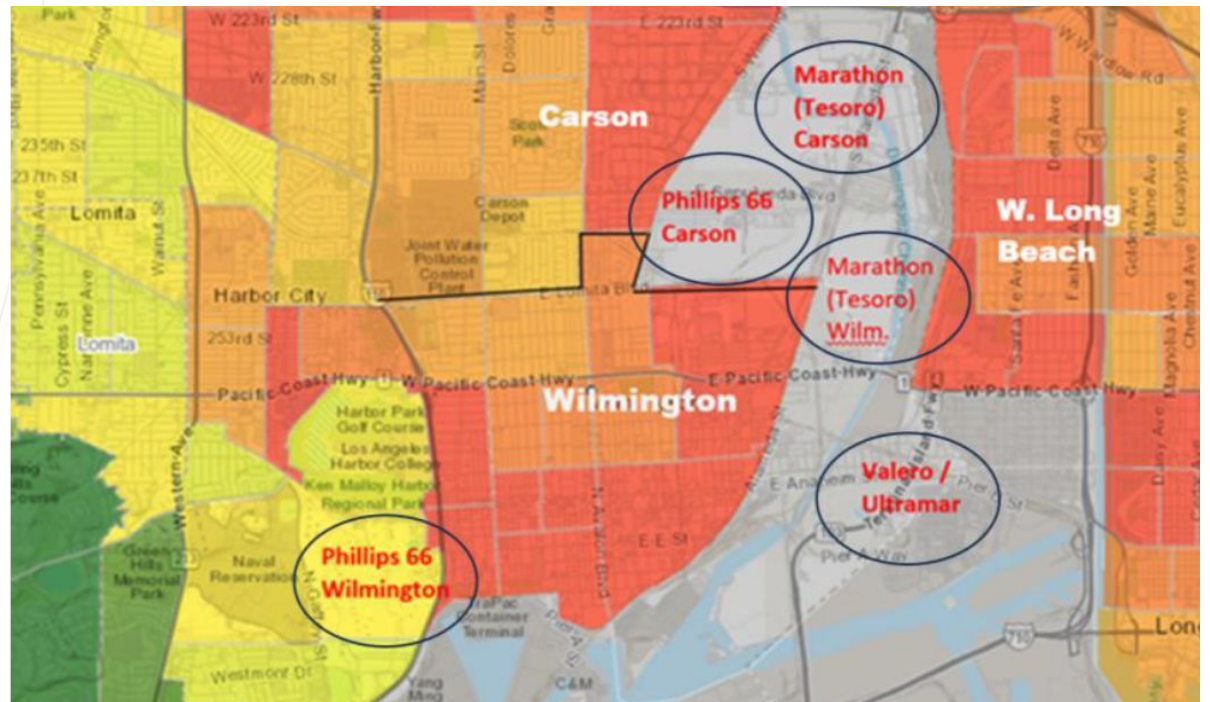
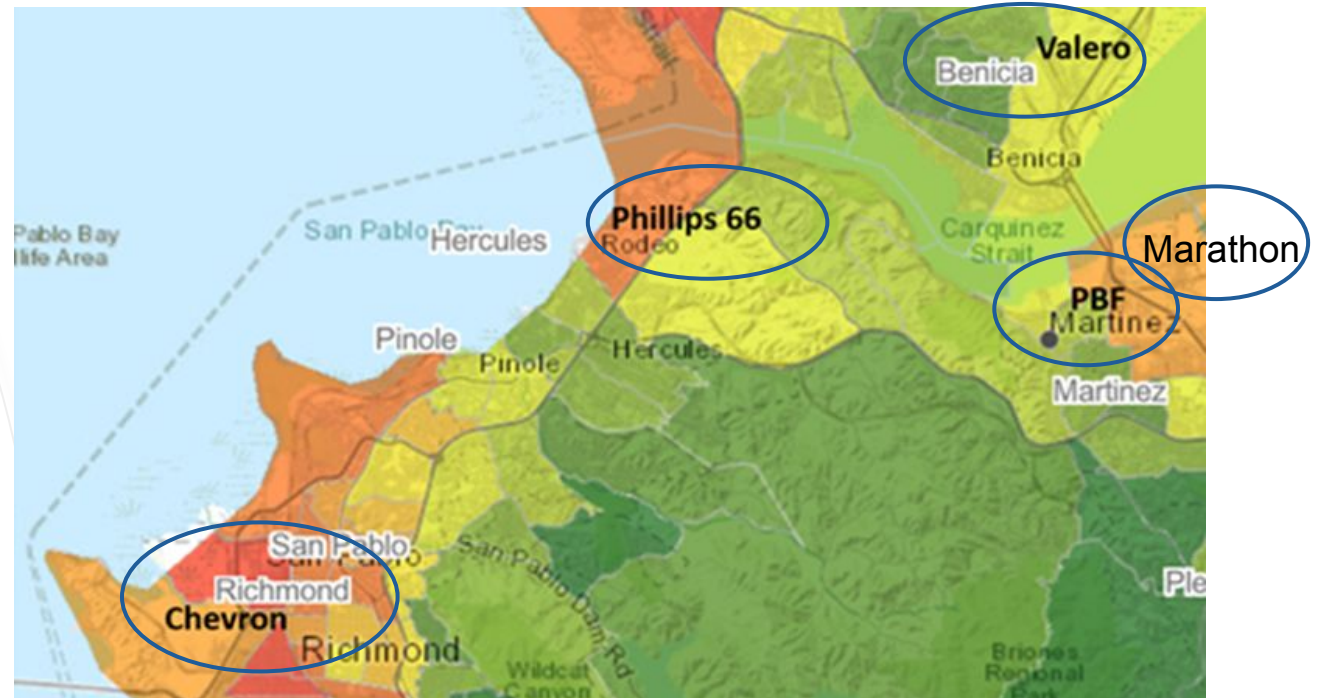


Refinery communities endure Environmental Racism

Almost all tracts near refineries are communities of color with very high Toxic Releases and other vulnerabilities (cumulative impacts).

Black, brown, indigenous communities get the worst refinery impacts.

- CalEnviroScreen



What are Oil Refineries?

- **Refineries use crude oil** □ **to make gasoline, diesel, jet fuel,** (plus butane, propane, petroleum coke, and more).
- **Refineries are designed to *maximize gasoline production.***



Almost half of crude oil input to refineries is to make gasoline:

- ▶ 48% for Gasoline
- ▶ 30% for Diesel
- ▶ 8% for Jet Fuel
- ▶ 15% "Other"

About a third of the crude oil comes from in-state, the rest from out of state, mostly by ship.

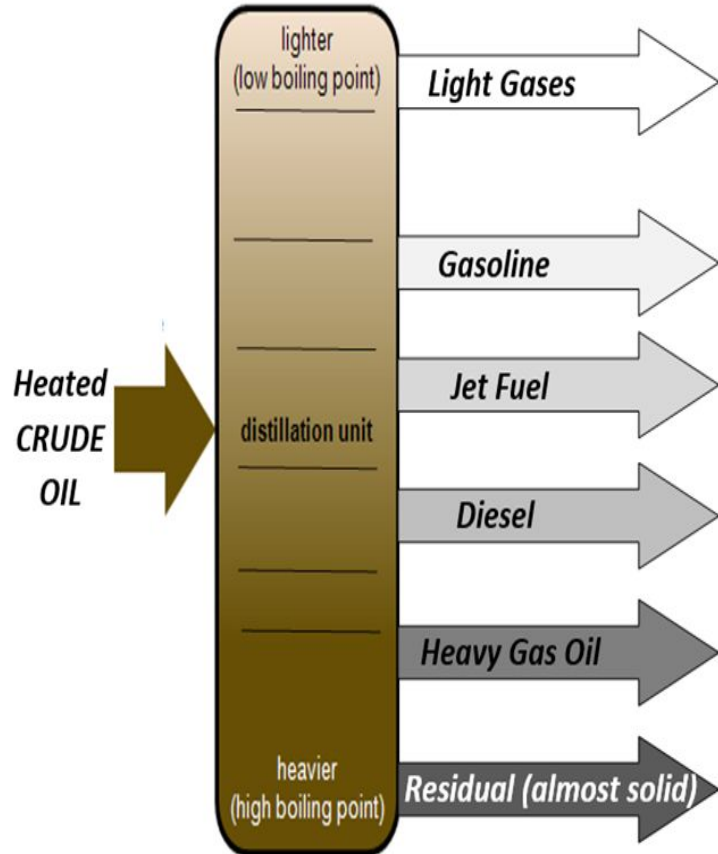


UNIQUELY LARGE: One can cover thousands of acres
Highly dense and complex – refineries are not like other industries.

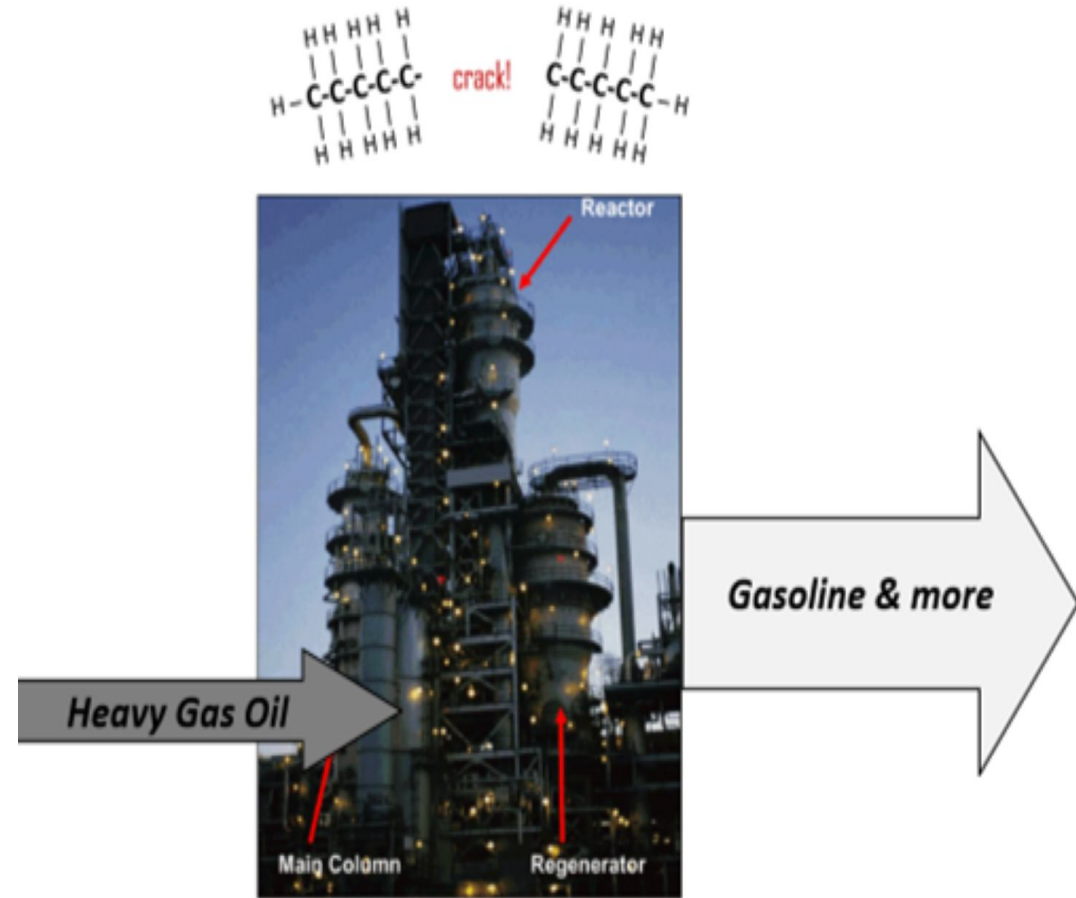


But we can demystify!

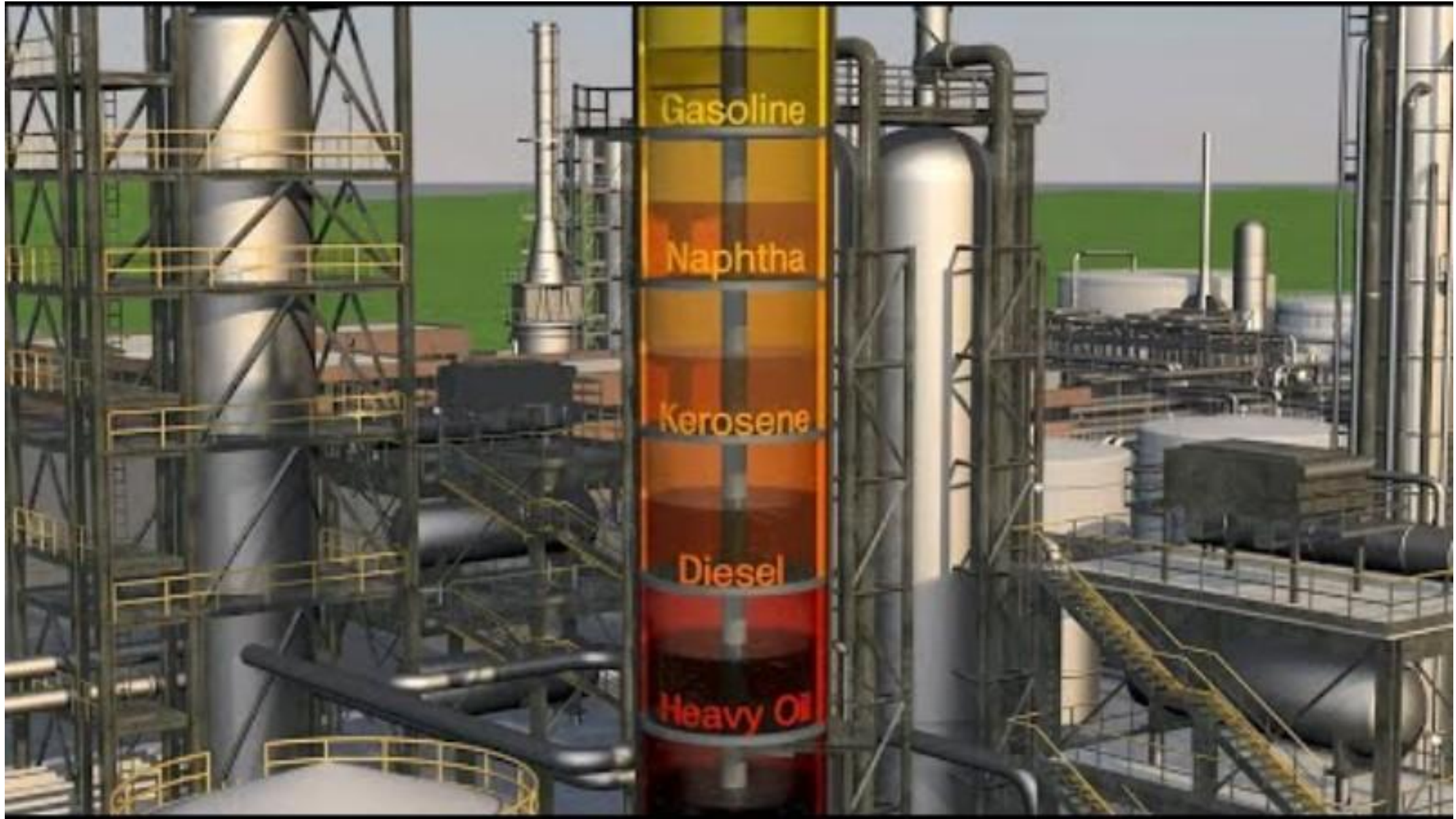
TWO BIG PIECES OF THE REFINING PUZZLE – maximizing gasoline



DISTILLATION (aka the Crude Unit)
(FRONT END separation of Crude Hydrocarbons)



CRACKING
(HEART OF THE REFINERY – most gasoline here)





Other refinery processes:

- Reforming
- Alkylation
- Coking
- Sulfur Recovery
- **HYDROGEN PRODUCTION**
- And MORE

(We have lots more info if you want to DIVE in!)

A photograph of several large, white, cylindrical storage tanks situated in an industrial facility, possibly a refinery or chemical plant, with various pipes and structures visible in the background.

Storage Tanks

A close-up photograph of industrial machinery, showing a network of pipes and valves. A prominent yellow cable or hose is visible, running across the scene.

Valves &
Connectors

A photograph of a large industrial flare stack at night, emitting a bright, intense flame that illuminates the surrounding area. The background shows other industrial structures and lights.

Flares

A close-up photograph of a large, circular, metallic component, likely a part of a boiler or heater, showing a complex, ribbed internal structure.

Heaters &
Boilers

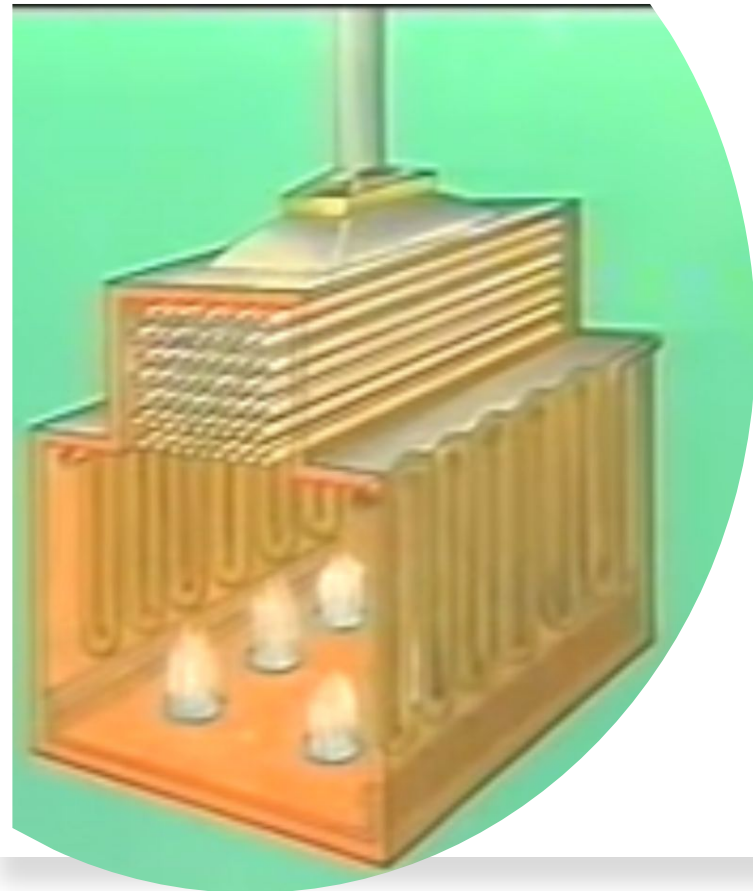
How does the pollution
get out during
NORMAL operation, &
how have we worked
to cut emissions?

An aerial photograph of a large industrial ship, possibly a tanker or refinery vessel, docked at a pier. The ship's deck is visible, showing various structures and equipment.

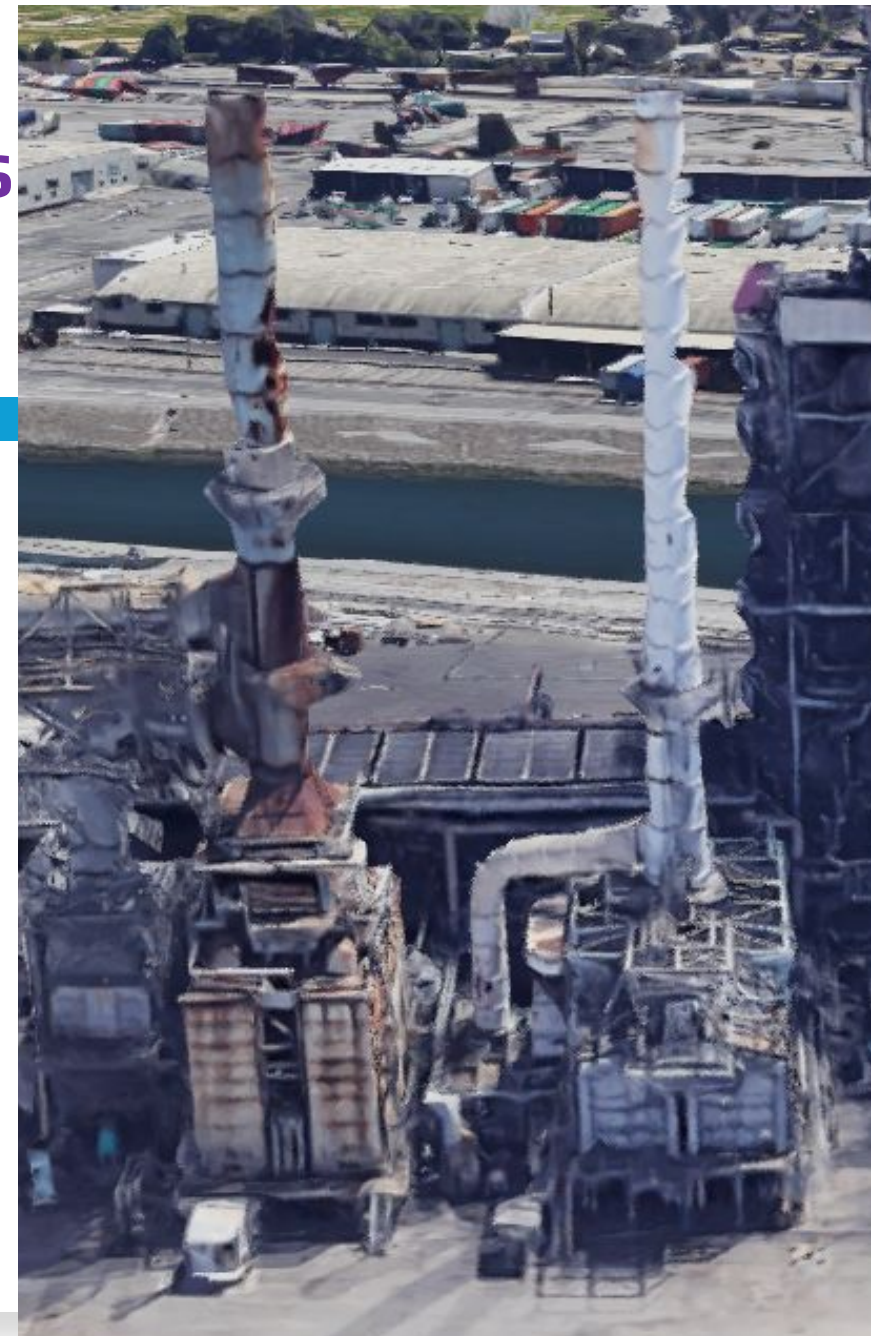
Ships

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Hundreds of massive, polluting **HEATERS & BOILERS** combust fuel, driving energy/heat for the refining processes



- **South Coast alone - 230 massive heaters & boilers emitting tons per day of NO_x, CO₂ & more**
- **Just one can burn >250 million BTUs/hour** (natural gas or refinery gas)
- Selective Catalytic Reduction (SCR) cuts emissions, as in the new South Coast rule.



Evaporation & leaks of VOCs, benzene, & H₂S, can happen during:



MARINE LOADING

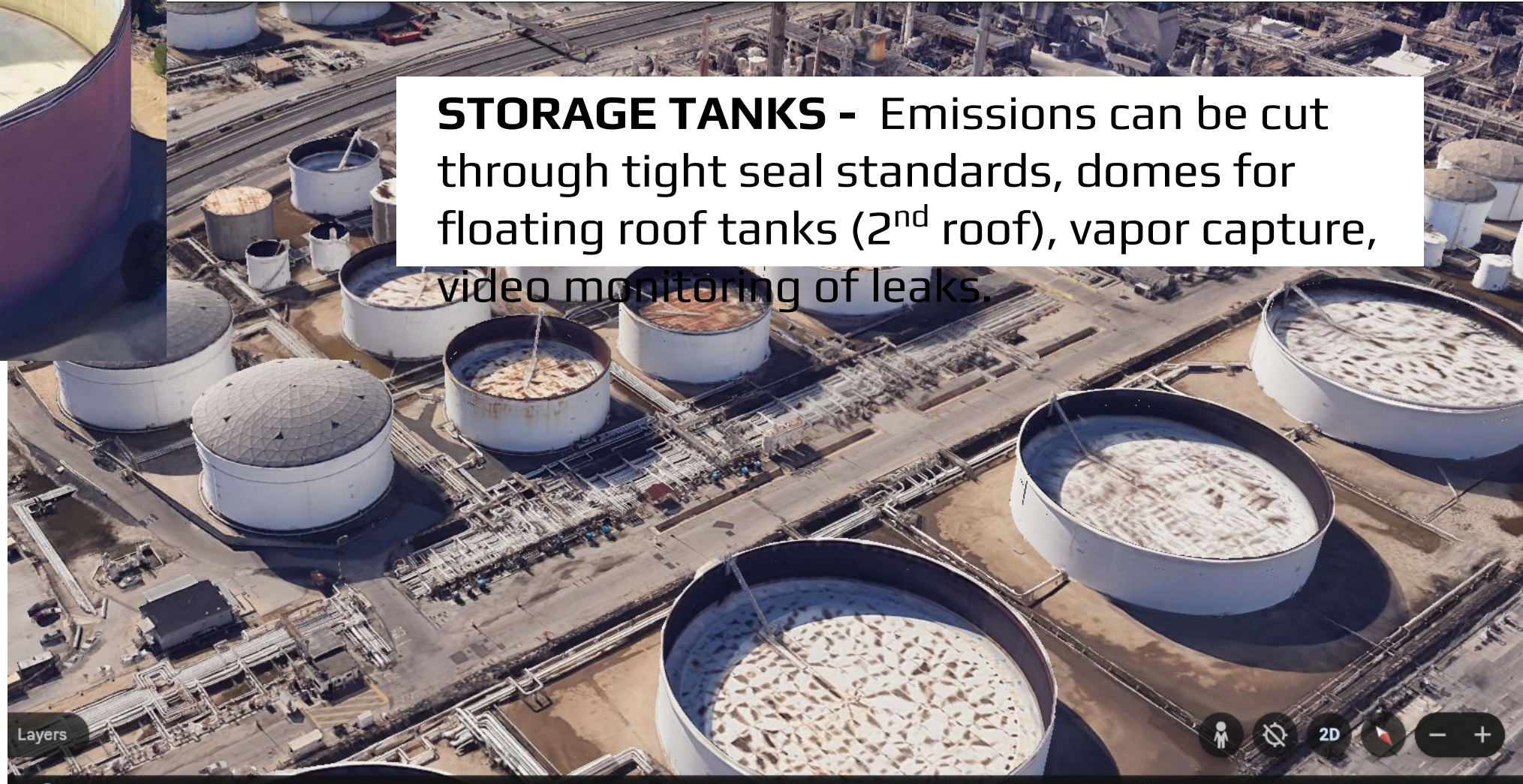
- Large emissions are pushed out;
- Vapor capture can cut emissions.

Slip Number
One



More evaporation & leaks happen at:

STORAGE TANKS - Emissions can be cut through tight seal standards, domes for floating roof tanks (2nd roof), vapor capture, video monitoring of leaks.



And more VOCs are emitted at:



Hundreds of thousands of seals for VALVES & CONNECTORS

- These can be cut through tight standards,
frequent monitoring and repairs

FLARING causes SO_x, VOCs, and smoke,
due to shutdowns from sudden accidents or maintenance :

Recycling gases, preventing repeated breakdowns, monitoring can minimize flaring.



2/9/2024 - Phillips 66, Wilm. CA,



July 11, 2023 - Phillips 66,



7/20/22 - Valero Wilm

For over 40 years, we worked successfully to win regulations & updates that cut Oil Refinery emissions through the Clean Air Act & AB617

It's not nearly enough.

You can mitigate these sources to protect public health, but refineries are inherently polluting, & we must phase out in favor of zero emission options.

On good days, emissions are invisible, but large & continuous



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On bad days it gets visible:

Year after year, It never stops



2009



2010



2012

Tesoro Wilmington Coker fire

(a few South Coast examples)

3-9-2010 Tesoro Wilm. Power Outage 9/15/2012 - ConocoPhillips Wilmington

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2012

Chevron Richmond Crude Unit explosion, 19 workers had to crawl out to escape, and the black cloud went miles through the community



Despite worker diligence, the oil companies have been found to **repeatedly** skimp on maintenance, according to the US Chemical Safety Board.

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2014

**Wilmington
oil spill
from
Phillips 66
pipe**



**2015
Torrance
Refinery**

major explosion,
near miss from
catastrophic HF
release



**2020
Marathon
LA
explosion**

A night-time photograph of an industrial facility, likely a refinery, with a massive fire in the center. The fire is bright yellow and orange, with thick smoke rising from it. The facility is illuminated by various lights, including a prominent blue light on the left and several white lights on the right. The overall scene is dark, with the fire providing the primary light source.

2023
Marathon
Martinez
biofuels refinery

During normal operation & accidents, Refineries emit hundreds of harmful Chemicals

NEUROTOXINS

People nearby may risk chronic exposure to hydrogen sulfide.

OEHHA, p. A-17.

SMOG & TOXICS

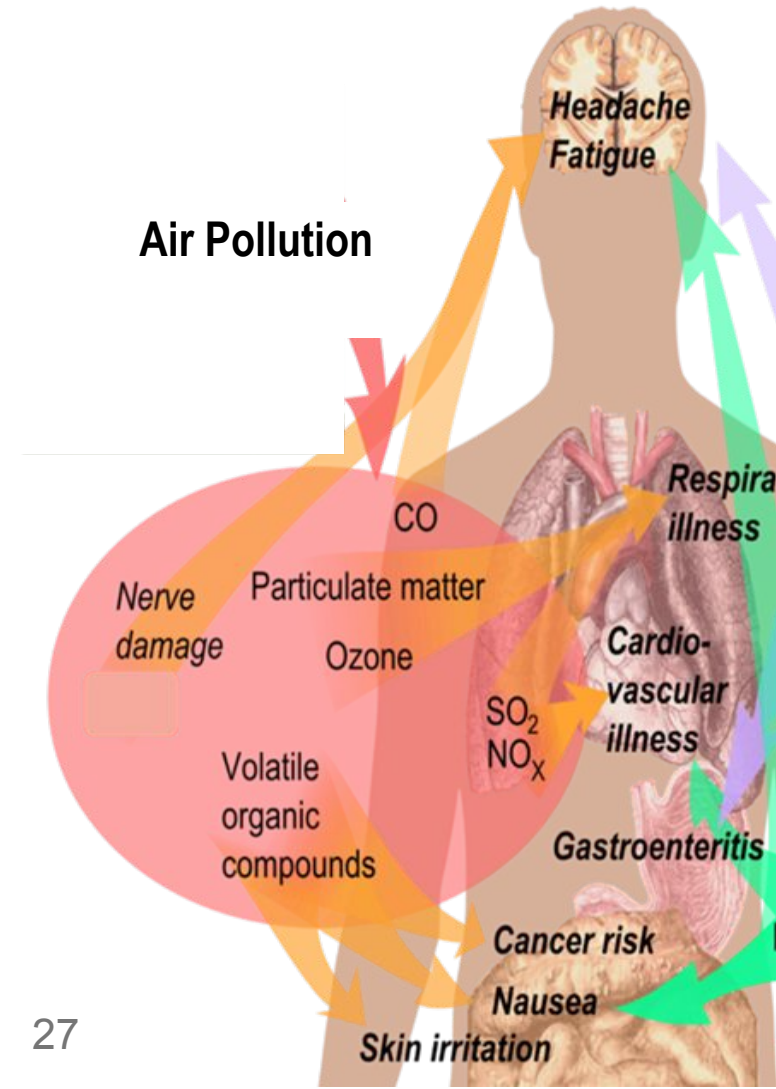
Refineries are the largest sources of VOCs in the Wilmington, Carson, W. Long Beach neighborhood

SCAQMD AB617 plan, p.3b-6

CARCINOGENS:

Benzene emissions were grossly underestimated at every refinery in the South Coast and Texas studies, indicating this is true at most refineries.

Fluxsense study p. 94, CBE Decoder [here](#),



OIL REFINERIES ARE RESPONSIBLE for these 4 big Fossil fuel subsectors
Together these inputs, outputs, & refining itself causes ~HALF California's Greenhouse Gases.



29%
CARS (Gasoline)



8% Heavy Duty
TRUCKS
(Diesel)



7%
REFINERIES



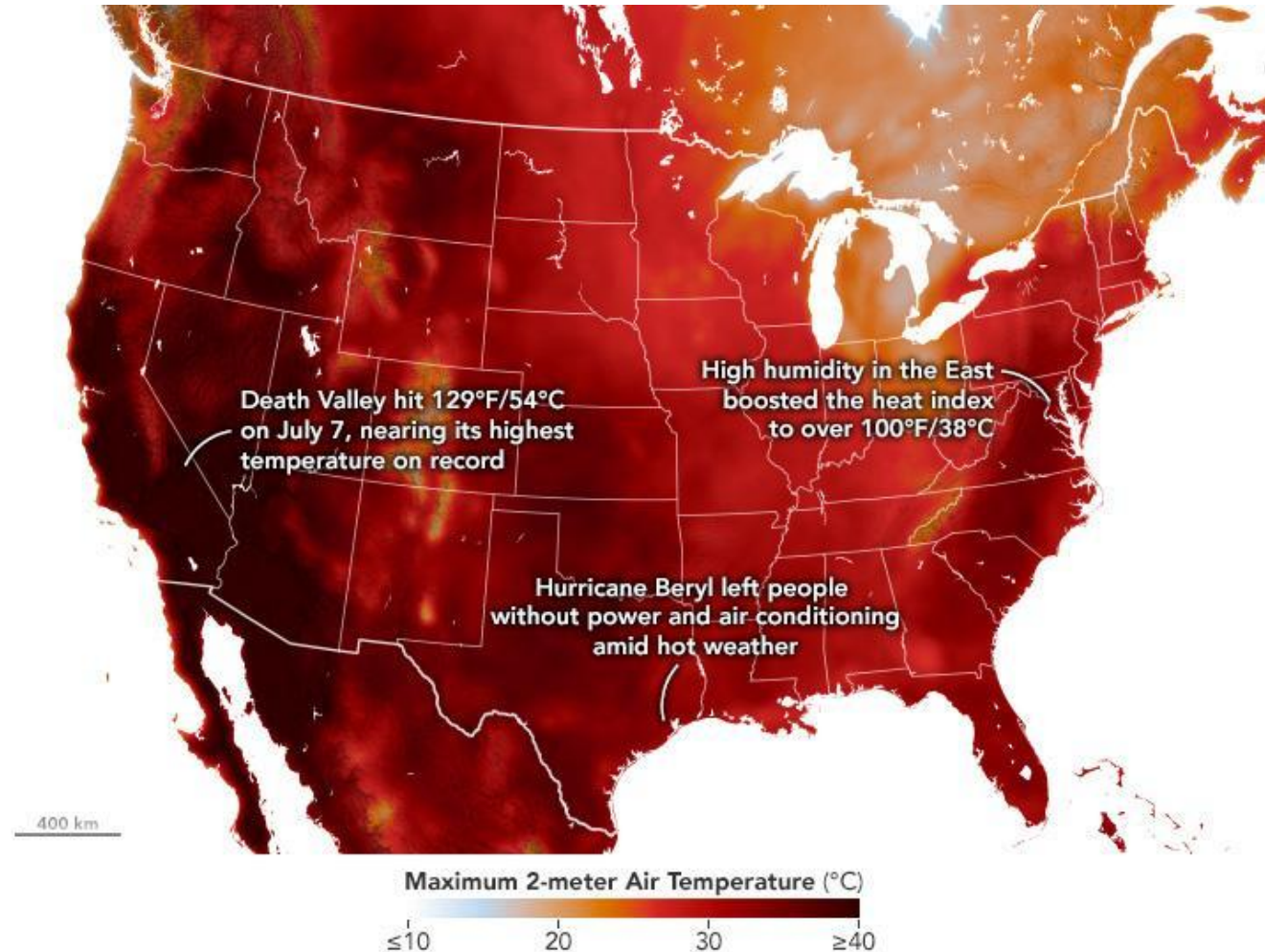
4%
Extractn.
(In State)

*You can't solve
climate or smog
disasters
without phasing
out Refineries*

"Climate change is widespread, rapid, and intensifying"

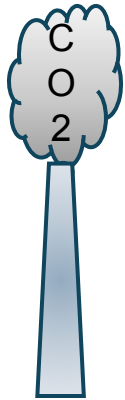
- *A quarter of the U.S. could be practically unlivable in 30 years (frequently reaching over 125° F).*
- Mid-continent of the highest extremes, West Coast risk longest heat waves. And all are at dangerous risk.

First Street, 8/15/22



DESPITE DANGERS –

PARTIAL MITIGATION is *almost always* proposed instead of **Phaseout**:
CAP & TRADE didn't work even to cut refinery GHGs, and neither do new ideas:



CARBON CAPTURE

- Even DOE found **CCS** is “not the solution” for refineries.
- It's not economic & would only cut a fraction of GHGs.
- Other evidence finds it introduces major new dangers.



BIOFUEL TRANSITION

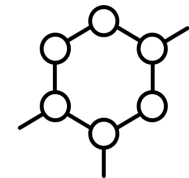
Not zero emission, using biofuels creates smog and **GHGs**, not enough sustainable bio-feed

We have detailed written comments & evidence on all of these – contact us for more.



Expanding **FOSSIL FUEL-MADE HYDROGEN PRODUCTION** or **FUEL SWITCHING** to hydrogen

- >95% in **US** is made from fossil fuels, mainly for refineries
- Switching to combusting hydrogen instead of Natural Gas would actually **increase NOx**. H2 burns at higher temp.



More **PETROCHEM.** or **PLASTICS** feedstocks production

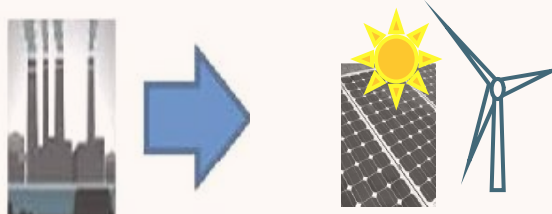
Mainly happening in Gulf Coast.

The solutions to cut GHGs are well-known and straightforward:

1) Energy Efficiency



2) Replace Fossil Fueled Electricity



3) Electrify Transportation



** The Technology Path to Deep Greenhouse Gas Emissions Cuts by 2050: The Pivotal Role of Electricity, Williams et al, Science, 2011*

Oil Refineries and their emissions will not automatically disappear as California electrifies transportation...



Because refineries already export significant amounts gasoline, diesel, and jet fuel *out of the country*, and this is increasing.




We won two steps to start Refinery phaseout planning.



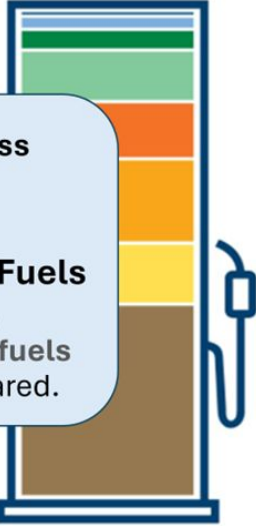
Scoping Plan

To manage phasedown of petroleum refining and oil extraction toward declining in-state demand . . .


“ . . . a multi-agency discussion is needed to . . . plan for the transition to ensure that it is equitable.” p. 101




SBXI-2



- 1) **Stop Price Gouging:** “set a maximum gross gasoline refining margin” and penalty for excessive profits.
- 2) **PLAN PHASEOUT:** a **Transportation Fuels Transition Plan** - reliable, safe, equitable, affordable transition away from petroleum fuels in line with declining demand – must be prepared.





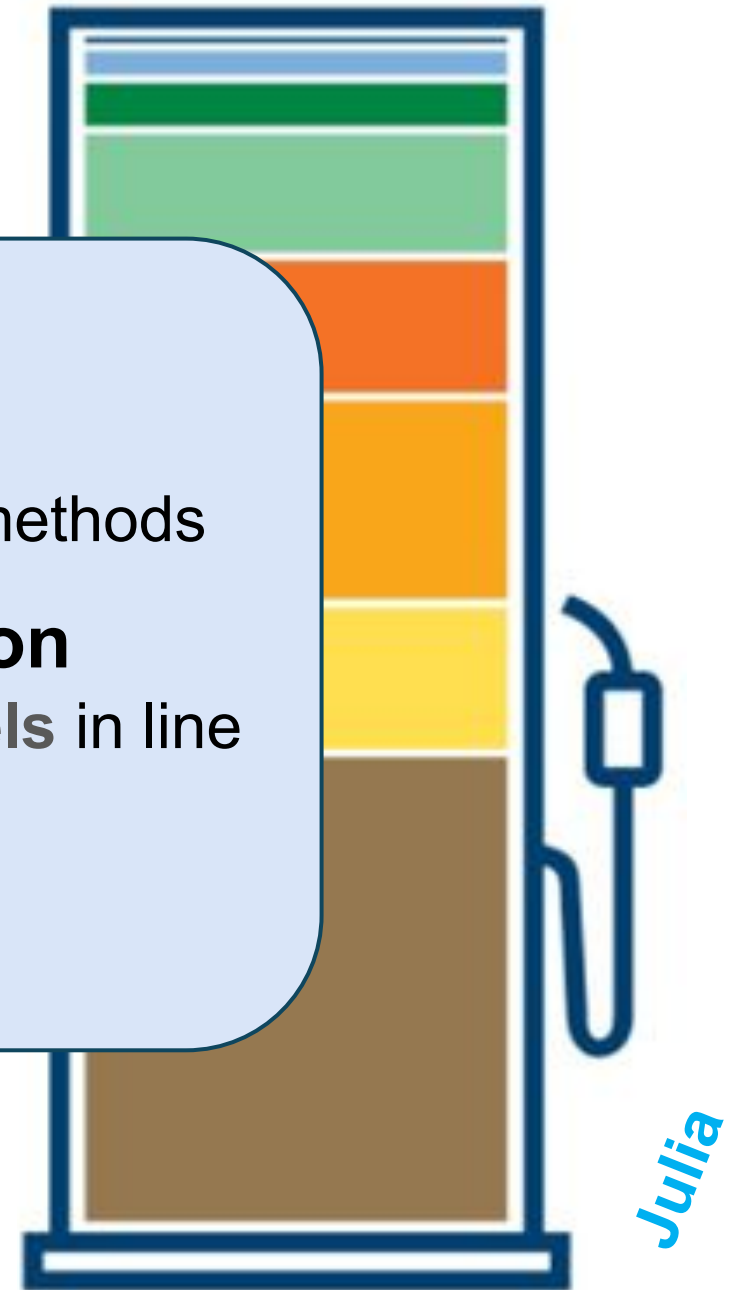
Scoping Plan – unprecedented,
but too generalized

To manage phasedown of petroleum refining & oil extraction toward declining in-state demand a **multi-agency discussion is needed** to ensure that it is equitable. -p. 101




SBXI-2 has more details

- 1) **Stop Price Gouging** through penalties and other methods
- 2) **ALSO PLAN PHASEOUT:** a **Transportation Fuels Transition Plan** away from petroleum fuels in line with declining demand.



SBX1-2: the California Energy Commission started important analysis:

1. **Transportation *Fuels Assessment*** is out (drafted by CEC May 2024).
2. Leads to Transportation ***Transition Plan*** due END OF YEAR, (led by CARB).



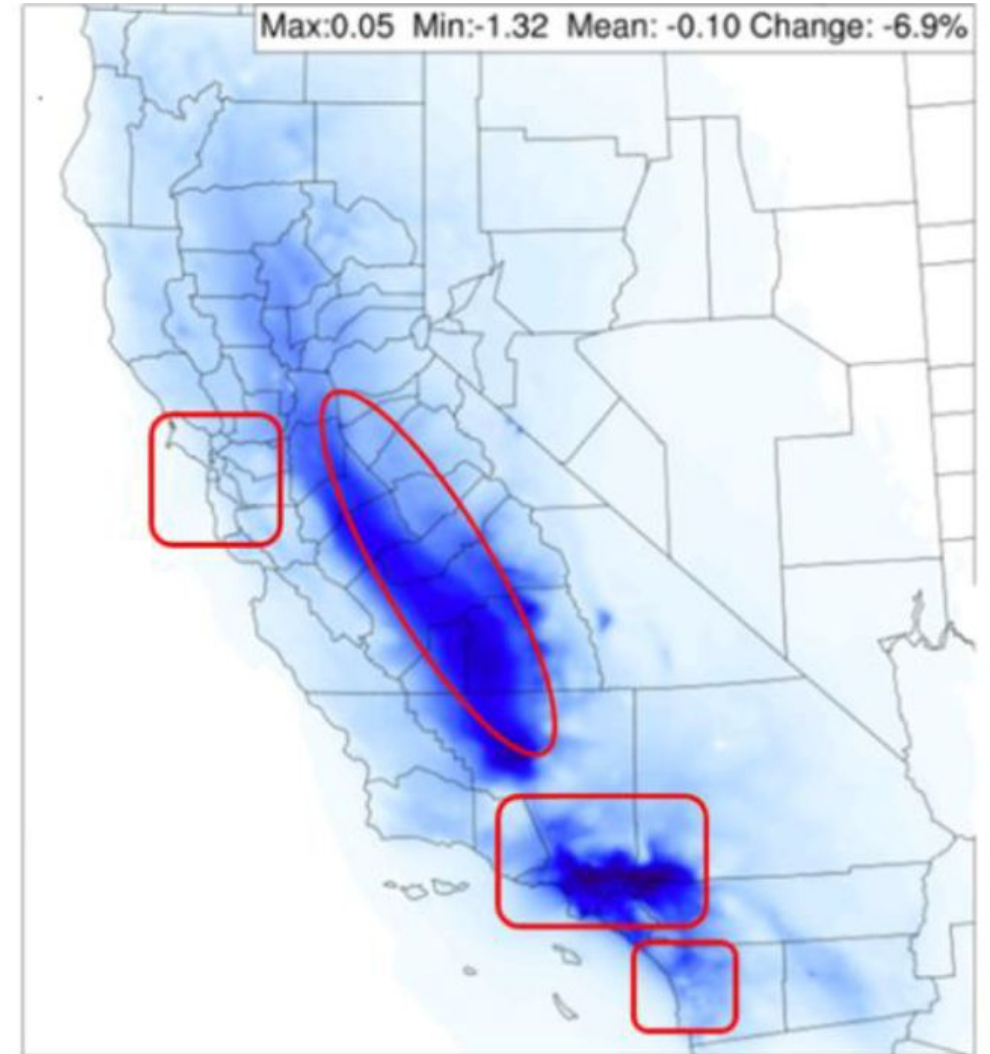
The Fuels Assessment is required to identify methods to “ensure a reliable supply of affordable and **safe** transportation fuels in California.”

Fossil TRANSPORTATION shatters HEALTH & SAFETY – phase it out

Electrifying transportation would
prevent

2,265 premature deaths/year, + avoided
hospitalizations, los school day, asthma, &
\$20 billion a year in costs.

Quantifying Air Quality Impacts of Decarb. & Distrib. Energy in CA, pp. 6-7



SBX1-2 requires: Safe, Affordable, Reliable, Equitable Transportation

We propose uplifting 4 principles . . .

1



Add **SAFETY**
framing

- avoid smog & climate
disaster due to fossil
fuels

2



Begin

REGULATION

to **Lower**

Refinery

Production &

Emissions (gradually)

3



Expand programs to
CUT DEMAND for
gasoline & diesel
(EVs, transit,
walk/bike)

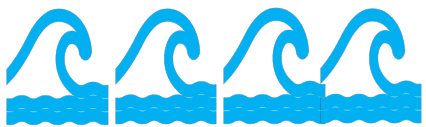
4 - SMOOTH OUT & REQUIRE the lowering of gasoline & fossil fuel supply, matching lowering demand (avoid disruptions & price gouging while ensuring phaseout)

4a

Evaluate

EXPORTS

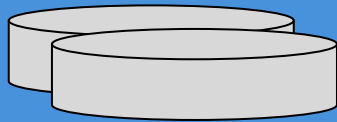
- may cause Cal. shortages & price gouging



4b

Require **FUEL RESERVES**

Storage ahead of refinery maintenance shutdowns



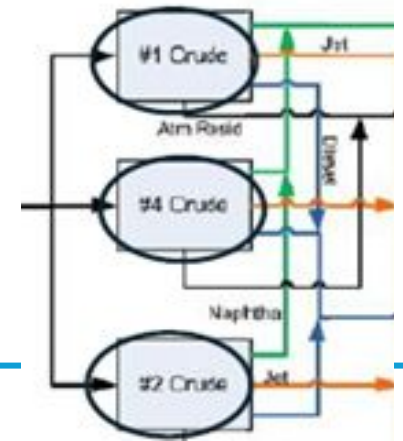
4c

Penalize **PRICE GOUGING**, pay low-income consumers



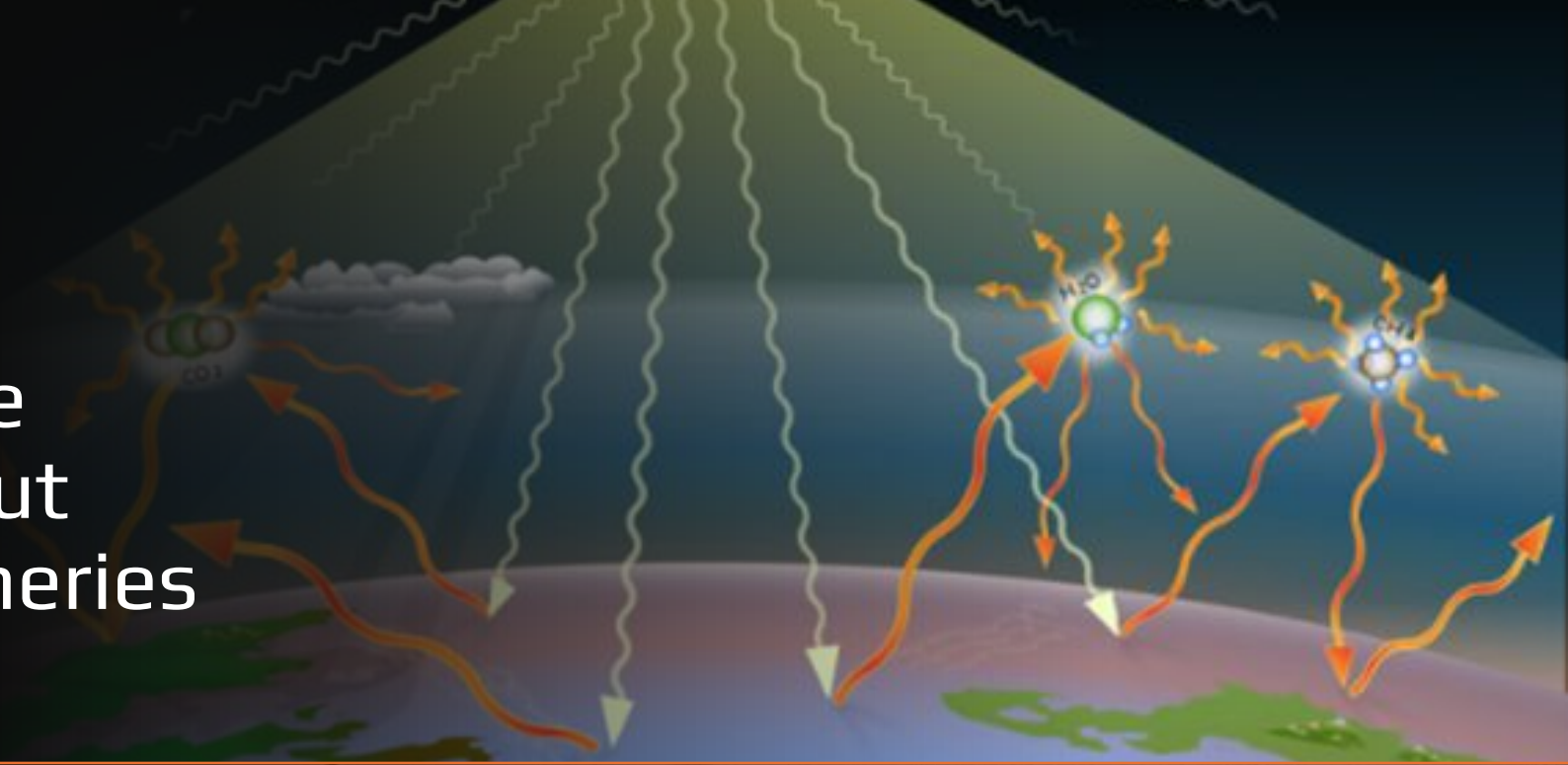
4d

Use **PARTIAL SHUTDOWN pathway** (shut duplicate units first)



You can't reach state
Climate Goals without
phasing out Oil Refineries

▪



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You can't meet Clean Air Act Smog goals.

The South Coast District found the only way to meet Clean Air Act smog standards is Zero Emission energy for both ***stationary AND mobile*** sources. -- [2022 S Coast AQMP](#) Ex. Summ.

And you can't
meet
Environmental
Justice goals
without phasing
out Oil Refineries
and fossil fuels.



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Communities for a Better Environment

–www.cbecal.org

Huntington Park, Wilmington.

Richmond, East Oakland

COMMUNITIES
FOR A BETTER
ENVIRONMENT
established 1978

QUESTIONS?

