

Land use permit for the Martinez Refinery Renewable Fuels Project at 150 Solano Way in Pacheco

Land use permit for the Phillips 66 Rodeo Renewable Project at 1380 San Pablo Ave in Rodeo

Letters received for Board consideration

Packet 3

Pg 1	Valerie Ventre-Hutton	5/3/2022	oppose
Pg 2	Rebecca Auerbach	5/3/2022	oppose
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Pg 29	Gail Susan Gordon, LMFT, SEP	5/3/2022	oppose
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Stacey Boyd

From: Valerie Ventre-Hutton <[REDACTED]>
Sent: Monday, May 2, 2022 4:43 PM
To: Clerk of the Board
Subject: May 3rd BOS meeting: Marathon and P66 biofuels projects/FEIRs

Dear Contra Costa Supervisors,

As a long-term resident of Contra Costa County, I ask that you slow down the EIR process on the Phillips 77 and Marathon Refinery biofuels projects and demand EIRs that are significantly more comprehensive, specific, and address community concerns.

Multiple community and environmental groups submitted joint comments on the draft EIRs that included detailed, specific points about numerous technical aspects of the project. In contrast, the final EIRs provide generalized, vague responses and are dismissive of many impacts that require mitigation including:

- *Failure to account for safety and air pollution concerns from potentially increased operational upsets and hazards such as flaring, explosions, gas releases, and increased use of hydrogen*
- *Failure to account for impacts of burning food for fuel due to human food used as "feedstock" in biofuel production*
- *Failure to consider climate impacts, especially in light of CCC's Declaration of Climate Emergency;*
- ***Failure to account for cumulative impacts***
- *Failure to Comply with the CEQA Requirement to Respond to Public Comments*

If one purpose of CEQA is to create actions to mitigate environmental impacts, then the documents submitted are inadequate, potentially in violation of CEQA, and more importantly do not provide the foundational guidance needed to safeguard communities and our county. These projects *must* have a more thorough EIR.

Thank you for your work on behalf of our Contra Costa communities.

Valerie Ventre-Hutton

[REDACTED] Walnut Creek, CA

Stacey Boyd

From: Rebecca Auerbach [REDACTED]
Sent: Monday, May 2, 2022 4:48 PM
To: Clerk of the Board
Subject: Please reject the EIRs for biofuels projects

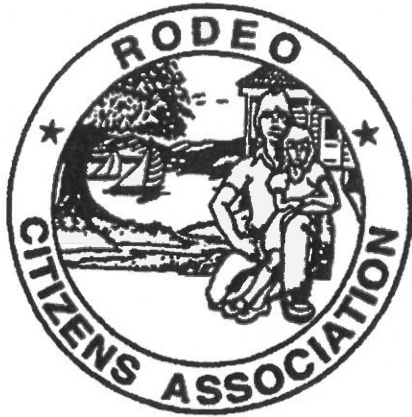
Dear Supervisors,

I am deeply concerned about the proposed biofuel projects at local refineries. Biofuels are a false solution. They offer only a new way to emit greenhouse gasses and threaten the health and safety of frontline communities, in stark contrast, to the real climate solutions in sustainable electrification.

I urge you to reject these land use permits, require more thorough Environmental Impact Reports, and regard these projects with extreme wariness about their effects on our community and the climate.

Regards,

Rebecca Auerbach
Pleasant Hill, CA



5/2/22

To: Contra Costa Board of Supervisors, and,
County Planning Commission of Contra Costa County Dept. Of Conservation & Development

As a group of concerned citizens of the town of Rodeo, we are respectfully requesting an appeal of the Planning Commission's decision to recommend approval of the Phillips 66 Rodeo Renewed land use permit.

Our grounds for appeal are these:

- The details of the Community Benefits Agreement and the conditions of the project are insufficiently defined as to the magnitude and nature of any actual benefit. The decision on this land use permit should be tabled until the details of this agreement are in place. (1)
- Rodeo is classified as a disadvantaged community by Contra Costa County. SB 1000 requires Contra Costa County to integrate environmental justice into the General Plan. This law is based on the understanding that certain communities have experienced a combination of historic discrimination, negligence, and political and economic disempowerment. We here in Rodeo have long experienced a disproportionate burden of pollution and health impacts, noise and odors. (2)
- Phillips 66 has claimed an "extensive odor remediation program" with no details. Details of the plan should be a condition for approval before the permit is granted.
- The hydrogen plant has been ignored in the draft EIR, nor addressed by the Planning Commission. The Air Liquide plant is not capable of the planned increase of methane-fuel consumption, which risks explosion, and at the least, increased flaring events. Investigation of the capability of this plant facility should also be a condition for approval before the permit is granted. Air Liquide has a history of yearly "unit upset" since it went on line in 2009.

Thank you for considering our concerns.

Rodeo Citizens Association, members;

Janet Pygeorge, President; Rodeo

Janet Callaghan; Rodeo

Mike Coody; Rodeo

Elaine Wander; Rodeo

Bod Houseman; Rodeo

Charles Davidson; Hersules

Please respond to RCA:

2108 Drake Lane Hercules CA 94547

(510) 837-8441



And Maureen Brennan; Rodeo

1) The Rodeo Renewed Project is planned on being an 80,000 barrel per day project for refining 1.22 billion gallons per year. At up to \$3.32 per gallon for California Low Quality Fuel Standards credits and Federal Renewable and Blenders Tax credits, up to \$3 billions yearly in subsidies (and in-kind subsidies) could be provided to the refinery to produce renewable diesel. If only one cent per gallon from those subsidies were to be provided to the Town of Rodeo as a community benefits package within a Good Neighbor Agreement, \$12 million yearly could go to community improvements, such as recreation, education, nature and aesthetics.

- Overcapacity Looms as More and More US Refiners Enter Renewable Diesel Market. Stratas Advisors. (June 11, 2020)
<https://stratasadvisors.com/Insights/2020/06112020LCFS-RD-Investment>

2) Demographics: The town of Rodeo, where the Phillips 66 refinery is located, is a minority-majority and working-class community impacted by heavy exposure to pollution and other hazards. Sixty-six percent of Rodeo's population of 8,679 consists of people of color: 34% is Hispanic, 17% is Asian American, and 15% is African American, according to 2018 U.S. Census estimates. Forty-four percent of its population is white.(1) Rodeo is a low-income community, with a per capita income of \$34,356, according to U.S. Census 2018 estimates. The Census places the poverty percentage at 14%, although CalEnviroScreen 3.0 doubles that figure, indicating that 31% of Rodeo's residents live below twice the federal poverty level.(2) A largely African-American community lives in county-owned Section 8 housing located directly at the Phillips 66 refinery fenceline. Little population growth and new home building is expected in Rodeo and there is no supermarket.

It is designated by the State of California, as a Disadvantaged Community by the Office of Environmental Health Hazard Assessment (OEHHA), and assigned a CalEnviroScreen 3.0 percentile of 80-85% (per Sept 2021). This ranking indicates that its residents endure a greater combination of pollution and other environmental stressors than 80-85% of the

state. Healthwise, Rodeo falls within the 98th percentile for asthma and 92nd percentile for low birth weight, and within the 75th percentile for cardiovascular impacts. Its exposure to hazardous waste places it in the 98th percentile, to impaired water within the 86th percentile, and to toxic releases within the 78th percentile. (2) As part of the Rodeo-Hercules Fire Protection District, Rodeo has three times the per capita emergency medical response rate as the adjacent middle-class community of Hercules. In addition to its burden of disproportionate environmental harms and public health deficits, Rodeo is also an unincorporated community with a paucity of available services. The absence of a municipal government and the ongoing inadequacy of material resources are two major factors that contribute to the historic lack of being qualified for additional outside resources.

1. <https://www.census.gov/quickfacts/fact/table/rodeocdpcalifornia,US/PST045218>
2. See <https://oehha.ca.gov/calenviroscreen/maps-data>.

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Environmental Impact Report for the Phillips 66 Rodeo Renewed Project.**
charlesdavidson@me.com Hercules CA. 11 April 2022

11 April 2022 [Updated 4/21/2022]

Re: Appeal of Contra Costa County Planning Commission Certification for the Final
Environmental Impact Report for the Phillips 66 Rodeo Renewed Project (File No. LP20-2040
and the Contra Costa County Code, section 26-2.2406)

To the Contra Costa County Board of Supervisors:

The appellant requests that the Board of Supervisors grant this appeal, to reject certification of the Phillips 66 San Francisco Refinery Rodeo Renewed Project FEIR, and instruct the Contra Costa County Department of Conservation and Development and the Planning Commission to develop a revised DEIR, that meets the requirements of CEQA, to be prepared and circulated for public comment.

The Phillips 66 Refinery's Rodeo Renewed Project Draft Environmental Impact Report (DEIR) and Final EIR did not acknowledge that making refinery biodiesel, or so-called renewable diesel, from hydrogenated vegetable oils and animal fats is as energy-consuming, carbon dioxide (CO₂) greenhouse gas emitting and "carbon-intensive" to refine as the world's dirtiest, most dense and highest sulfur crude oils.

This appeal, is based exclusively upon the refinery portion of the total carbon intensity of renewable diesel and counterintuitively, is solely focused on the exceptionally high carbon intensity needed to process triglyceride oils into renewable diesel fuel. Notably, on a per barrel basis, the Phillips 66 Refinery's anticipated post-Project per barrel Renewable Diesel CO₂ emissions would greatly exceed the per barrel CO₂ emissions of the refinery's current average high-sulfur, heavy petroleum feedstock.

The County planning commission decision to certify the Final Environmental Impact Report FEIR violated the requirements of the California Environmental Quality Act (CEQA), and was not supported by the evidence presented.

This appeal is based on the argument set forth in this appeal letter; the comments submitted concerning the failure of the Draft Environmental Impact Report (DEIR) and Final EIR (FEIR) to provide an adequate pre-project, per barrel carbon intensity baseline, which would demonstrate the post-project, per barrel, carbon intensity increase. The DEIR and FEIR also failed to provide an adequate project description which would justify the Project's renewable diesel product as factually low-carbon.

The project's DEIR and FEIR described a renewable diesel product which is inconstant with California climate pathways and neither document justified the project's renewable diesel product as qualified for California Low Carbon Fuel Standard (LCFS) credit-based subsidization.

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Failure to provide an adequate project description.
Improper baseline.
Inconsistency with California climate pathways.

I

The DEIR and the FEIR do not clearly demonstrate that the refinery's product is low in embedded carbon dioxide emissions, as required by the California Air Resources Board's Low Carbon Fuels Standard's certification process. The actual numbers published in Phillips 66's own DEIR for their Project, which stipulated expected energy usage, hydrogen requirements and CO2 greenhouse gas emissions, when analyzed, clearly indicate that their renewable diesel (on per barrel basis) is extraordinarily energy-intensive to process and thus, is not a low-carbon product.

Instead of being a feedstock for low-carbon fuel refining, animal fat and vegetable oil molecules are triglycerides (like which physicians measure), and they, counterintuitively, are far more difficult to crack than petroleum oils. The most energy-intensive hydrocracking process for renewable diesel is the hydro-deoxygenation (hydrodeoxygenation) reaction, for which the refinery must greatly expand its hydrogen usage. Renewable diesel fuel produced from a wide array of vegetable oils and animal fats is referred to technically as Hydro-processed Esters and Fatty Acids (HEFA).

In the political or regulatory sphere, if renewable diesel were understood quantitatively as not being a true low-carbon diesel substitute, then such projects would not be certified to qualify for and be approved for California Low Carbon Fuel Standard (LCFS) credits and Federal subsidies.

In the Phillips 66 FEIR master response misleadingly states: "As proposed, the Project would lower facility-wide GHG emissions by about 24,000 MT per year compared to baseline operations. Refer to Table 4.8-5 in the Draft EIR "Annual Project Operational GHG Emissions". This is slightly over only one-percent (1%) of the total project emissions, which is misleading, in that the embedded per barrel CO2 emissions will vastly increase from before the project when refining petroleum feedstock.

However, the basis for the refinery to obtain LCFS credits is that refinery must produce low carbon intensity fuels (on a per barrel basis), although the refinery's DEIR and FEIR only refers to the total refinery greenhouse gas reduction and not the project's future per barrel CO2 emissions increase. LCFS does not require that the whole refinery reduce their total yearly CO2 greenhouse gas emissions, which is due in large part to the decommissioning of obsolete or otherwise stranded assets. In the case of Phillips 66, the reduction in *total* refinery CO2 greenhouse gas derives from decommissioned stranded assets due to the closure of the

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company's San Luis Obispo County refinery (which had serious long-term decreases of crude availability, as it had no sea port), their planned closure of their problem-laden Line-200 pipeline (which delivered semi-processed petroleum from SLO County to Rodeo), as well as closure of the Carbon Plant on HWY 4.

Uniquely, the Phillips 66 refinery in Rodeo Contra Costa County, is planning on being the world's largest Renewable Diesel biofuels refinery in the world and is about 12 miles away from the Martinez Marathon refinery, which is planning on being the world's second largest biofuels refinery.

For its part, Marathon claims a reduction in carbon dioxide greenhouse gasses of 60% in their renewable diesel project. However, that 60% CO₂ reduction comes entirely from the 60% smaller daily throughput specified by the project and is entirely NOT from the decreased carbon intensity of the renewable diesel, itself. (1)

Similar for Phillips 66's decreased stated project throughput, where the refinery will experience a minimum 33% decrease in throughput (from a 4-year pre-COVID average capacity utilization) of 105,000 barrels per day to a maximum of 80,000 bpd. However, for both refineries, the per barrel CO₂ carbon intensities for renewable diesel will actually *increase* significantly (despite the decrease in throughput), because of the corresponding large increase in hydrogen needed for hydrocracking triglyceride oils. (2a-d)

For example, despite the shimmer of Marathon's 60% decrease in throughput, a simple look at their 42% *increase* in total hydrogen production (made from fossil-fuels), combined with their simultaneous *decreased* throughput, results in a 32% per barrel *increase* in carbon intensity. (1)

Again, similar to Marathon, post-Project refinery-wide, Phillips will be producing 35% more hydrogen than with petroleum refining and delivering a renewable diesel product with a 36%-to-55% increase in per barrel Carbon Intensity at the refinery level. (2) [Table 1]

The projected Phillips 66 and Marathon Renewable Diesel products, when compared to the processing energy requirements for heavy petroleum refining, would be twice as carbon intensive as the average U.S. refinery's processing of petroleum and as high or higher than the most carbon intensive refineries. (3-7) [Table 2]

II

"The Petroleum Refinery Life Cycle Inventory Model (PRELIM) is a mass and energy-based process unit-level tool for the estimation of energy use and greenhouse gas (GHG) emissions associated with processing a variety of crude oils within a range of configurations in a refinery."
(6)

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The following analysis closely correlates the carbon intensity of the Phillips 66 and Marathon projected Renewable Diesel products with a characteristic petroleum diesel hydrocracker assessed in the PRELIM database, which was fed with a high-sulfur, heavy petroleum gas oil (API 14.96; Sulfur 3.35%). The hydrogen usage for the PRELIM heavy, high-sulfur fed hydrocracker is (listed in the footnoted references and Table1), is 36% below the much higher values for the average renewable diesel profiled in this paper. (6) [Table 1]

One can see that the pre-project refinery-level carbon intensity values, as kilograms of CO₂ per barrel, for Marathon (49.52 kg CO₂/bbl) and especially Phillips 66 (56.68 kg CO₂/bbl) are close to the PRELIM hydrocracker carbon intensity score (58.97 kg CO₂ /bbl). (1,2 6) Table 2.

These values are well above the average U.S. refinery carbon intensity (40.7 kg CO₂e/bbl), as would be expected from the type of petroleum crude that these refineries currently process. (7)

Starting from these baseline values and based upon the refineries' hydrocrackers projected post-project hydrogen requirements, one can see that post-project carbon intensities for renewable diesel rank at the top end of global crude carbon intensity scores (according to the PRELIM database). The global-weighted refinery-level carbon intensity range for crude oil processing is 10.1 – 72.1 kg CO₂e/bbl. This is true for the projected post-project carbon intensity scores for renewable diesel production for Marathon (65.35 CO₂ kg/bbl) and Phillips 66's Rodeo Renewed Project for both the low estimate 73.53 CO₂ kg/bbl and especially, the high estimate 87.79 CO₂ kg/bbl (for 80,000 or 67,000 barrels per day scenarios, respectively). See Table 2. (8)

III

The California Air Resources Board (CARB) designates and regulates the CO₂ greenhouse gas or carbon intensity (CI) for California transportation fuels, whether they are petroleum based or biodiesel, which includes renewable diesel. According to CARB, "The CI includes the "direct" effects of producing and using the fuel, as well as "indirect" effects that are primarily associated with crop-based biofuels." About 75 percent of the GHG emissions from the well-to-wheel life of California Reformulated Gasoline and petroleum diesel are tailpipe emissions. Fuels and fuel blendstocks introduced into the California fuel system that have a CI higher than CARB benchmark Low carbon Fuel Standard generate deficits. Similarly, fuels and fuel blendstocks with CIs below the benchmark generate LCFS credits as a low-carbon fuel.(8)

Based upon the numbers presented in Phillips 66 Refinery's Rodeo Renewed Project Draft Environmental Impact Report, the calculatable and thus, post-project high refinery-level carbon intensity of renewable diesel is elevated far above the refinery's current average petroleum processing carbon intensity, on a per barrel basis and approach the total well-to-wheel carbon intensity of petroleum diesel refining. According to calculations presented in this appeal, renewable diesel should not qualify for LCFS credits. (8)

Specifically, for the Phillips 66, Refinery, this indicates that the Rodeo Renewed Project's carbon intensity for renewable diesel, 86.77 g/MJ will reach par with CARB's entire well-to-

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wheel petroleum diesel carbon intensity (Low Carbon Fuel Standard) benchmarks in the up-coming calendar years 2024 or 2025, at between 87.89 g/MJ or 86.64 g/MJ, respectively. (8)

Renewable Diesel refinery-level carbon intensity, is also nearly on par with the entire well-to-wheel life cycle assessment of California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB) and greatly exceeds it at the refinery-level. (According to CARB, "CARBOB makes up the petroleum fraction of California reformulated gasoline (CaRFG) before any fuel oxygenate is added; CaRFG is essentially 90 percent CARBOB blended with 10 percent ethanol by volume.") (8)

For comparison of petroleum CARBOB carbon intensity with to the much higher renewable diesel carbon intensity findings presented in this appeal, "CARBOB CI is based on the 2010 average crude oil supplied to California refineries and average California refinery efficiencies. Production of CARBOB at all California refineries adds [only] 15g/MJ to the fuel cycle CI. (8)

Furthermore, the high refinery-level carbon intensity for renewable diesel is similar for the Marathon Renewable Project in Martinez. The refinery-level (midstream) Carbon Intensity scores of the Marathon and Phillips 66 Renewable Diesel projects are 77.11 g/MJ and 86.76 g/MJ, respectively, and are both well over three times the CARBOB refinery-level carbon intensity score, of 15 g/MJ.

The contrast with renewable diesel's high refinery-level carbon intensity is even greater for non-hydrogenated biodiesel, called fatty acid methyl ester FAME, such as made from used cooking oil, which has a very low refinery-level carbon intensity score of 11 g CO₂/MJ. While renewable diesel can entirely substitute for 100% of petroleum diesel in diesel vehicles, FAME has poor flow in cold conditions, and is generally required to be blended with petroleum diesel at no more than a 7% FAME in the EU and 5% in the US, except for up to 20% for some fleets with modified engines. (8) Table 2.

CO₂ GHG emissions from land-use changes (LUC) for both FAME biofuels and hydrotreated renewable diesel production are assumed at 30 g CO₂e/MJ for soybean oil. When soybean oil's embedded 30 g/MJ LUC CO₂ greenhouse gas is added to the projected refinery-level renewable diesel (HEFA) CO₂ greenhouse gas emissions from both the Phillips 66 and Marathon refinery projects, these values significantly exceed the total CO₂ greenhouse gas embedded in petroleum diesel (despite tailpipe CO₂ emissions being discounted for renewable diesel, as for FAME).

Because of the general need for more intensive hydrocracking than Renewable Diesel, Sustainable Aviation Fuel made from hydrogenated vegetable oils and animal fats should have a possibly higher refinery-level carbon intensity score and thus, also not qualify of LCFS credit certification.

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Table 1: Renewable diesel versus petroleum refining - per barrel hydrogen requirements

Hydrogen per barrel - scf /barrel	PRELIM	PRELIM +35%	Marathon	Phillips 66	Algal	HT	Karras	Average
	Petroleum	RD - theoretical	RD	RD	RD	RD	RD	RD
Renewable Diesel		2463.35	2497.45	2119.4	3062.5	2451	2270	2480.07
Petroleum	1824.7		655	1000				
Column	1	2	3	4	5	6	7	8
[Reference/footnote]	[6]		[1]	[2]	[4]	[3]	[5]	

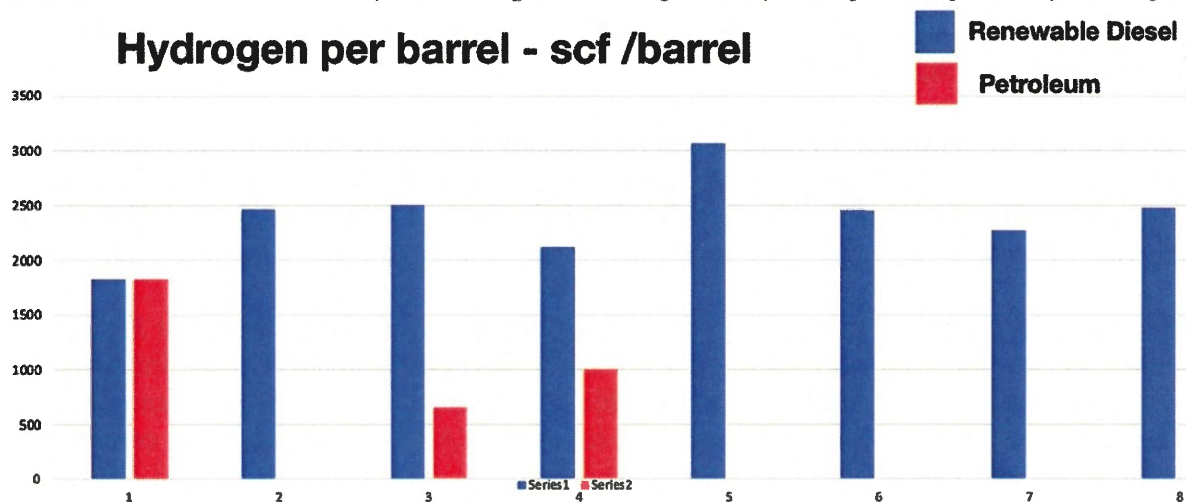
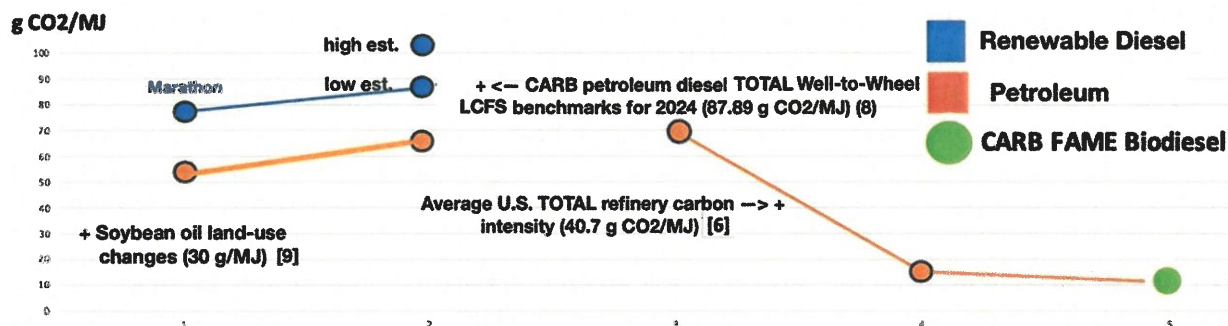


Table 2: Refinery level (midstream) carbon intensity / CO2 greenhouse gas emissions only : g CO2/MJ (kg CO2/bbl)

	MARATHON	PHILLIPS 66	PRELIM *	CARBOS **	CARB Biodiesel ***
Post project Renewable diesel - Marathon and Phillips 66:	77.11 (65.35)	86.77 (73.53)			
Petroleum Diesel* CA gasoline** Non-hydrotreated biofuels***			69.71 (58.97)		15
Pre-project (refinery-wide)	54.36 (46.07)	66.88 (56.68)			11
	1	2	3	4	5
References and footnotes	(1) RD	(2) RD	(6) Petroleum Diesel	(8) Petroleum	(8) FAME: Fatty Acid
		Low estimate	API 14.96; S-3.35%	CA gasoline-No ethanol	Methyl Ester

Refinery-level only Carbon Intensity values



IV

To summarize, the true high refinery-level carbon intensity at a renewable diesel-configured refinery (as grams of CO2 per megajoule and equivalently, the kilogram per barrel CO2 emissions) have not been divulged in plain language, tabular form or graphically in either the Draft EIRs and Final EIRs for the Phillips 66 Refinery's Rodeo Renewed Project (and similarly

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for the Marathon Renewable Project). However, calculations can be performed on the numbers available in the Phillips 66 Draft EIR and other documents which show that renewable diesel, because it is so intensely hydrogenated, has a refinery-level carbon intensity value, on a per barrel- and per Megajoule-basis (as required by the California Air Resources Board), rivalling that of the heaviest globally-available crude oils.

So, what is currently being proposed in Contra Costa County, at the Phillips 66 Refinery, as well as the Marathon Refinery, are very expensive, publicly-funded, carbon-intensive renewable diesel projects, which are erroneously being promoted as sources of low-carbon fuel and so should be disqualified for California Low Carbon Fuel Standard Credits.

As the availability of used cooking oils and waste animal fat markets will be competitive and limited once multiple large refineries enter the renewable diesel business, the default principal feedstock is expected to be soybean oil in the reasonable future. At a yield of only 57 gallons of soybeans per acre, however, Phillips 66 alone could annually use up to 33,000 square miles of soybean acreage or nearly the size of the State of Indiana, for its expected 1.22 billion gallons of renewable diesel produced yearly. (10)

Financially, refinery biodiesel is being funded to the tune of up to \$3.32 per gallon (according to Stratas Advisers, and depending on the feedstock). That could amount to up to \$3 billion *yearly* given to Phillips 66 and \$1.8 billion given to Marathon under false pretenses as producers of low carbon biofuels, which contradicts the massive increase in *per barrel* carbon intensity and global food security. (11)

Finally, the Phillips 66 DEIR states that the refinery's massive delayed coker and catalytic reformer will *not* be decommissioned in this project. Upon this appellant's email request to the refinery's senior engineer, regarding the company's purpose of this retention of equipment, the employee stated that these units' permits will be retained for the purpose of producing battery-grade petroleum coke (i.e., needle coke).

Accordingly, upon Project completion, the senior engineer replied that the retained delayed coker is intended to be used to coke FCC waste "slurry oil" obtained from other refineries in order to produce the battery-grade petroleum coke, Ostensibly, the FCC slurry oil would be a feedstock for subsequent calcining into graphite, at a yet unstated facility, which then would be used for carbon anodes for electrical vehicle batteries.

After the Rodeo Renewed Project is completed, this use of the delayed coker is consistent with the staff's statement that the refinery will no longer be using crude oil, which definitely leaves open the real possibility for a continuation of large-scale petroleum refining beyond the completion of the Rodeo Renewed Project. (12)

As FCC slurry oil is dirtier than the heavy FCC oils from which it is derived, it also contains more toxic heavy metals than the original FCC feedstock, being concentrated from both the FCC

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feedstock oil itself (with nickel and vanadium residues) and from the FCC spent catalyst (with additional nickel). The coker's product is always dumped from the bottom of the coker, in an open-air process and the practice of the Rodeo refinery is to store the petroleum coke in open piles.

Moreover, the light hydrocarbon (naptha) portion of the slurry oil feedstock will exit from a coker port and would likely be sent to the catalytic reformer to produce either branched hydrocarbons (for use as gasoline octane boosting agents) or more likely, if reconfigured, for the production of hydrogen (which could be used for additional on-site biofuel feedstock hydrotreating). This additional hydrogen can be used to produce more renewable diesel or to improve the conversion efficiency of the companies planned renewable diesel production or to make sustainable aviation fuel at some future point (which requires more hydrogen than renewable diesel production). (13)

The retention of Phillips 66's delayed coker and catalytic reformer and their stated plans for their coker, indicate that the refinery has intentionally retained the option for their continued fossil fuel refining and the possibility for producing significantly higher refinery-wide CO2 emissions than stated within the refinery's Draft Environmental Impact Report.

REFERENCES:

- 1) Marathon Renewable Project (Martinez CA; PowerPoint Presentation):



	Refinery	Renewables	Delta
1 Marathon Martinez			Mtonnes/Yr
2 Capacity (mbpd)	160	48	
3 MPC GHG H2 Production (MTonnes/Yr)	448	687	239
4 AP GHG H2 Production (MTonnes/Yr)	230	275	45
5 GHG H2 Captured & Sold (MTonnes/Yr)	-56	-56	-
8 GHG All Other Combustion (MTonnes/Yr)	1547	239	-1,308
9 Total Direct GHG w/ AP (MTonnes/Yr)	2169	1145	-1,024

~ 60% reduction in GHG as part of project
Will continue to capture & sell 56,000 MT of CO2e

Marathon (calculations based on reference #1 and the DEIR's stated full refinery capacity of 125,000,000 scf/d):

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REFINERY THROUGHPUT:

Pre-Project (Baseline):

Barrels (4-year avg. throughput; 161,000 bbl/d capacity): $129,000 \text{ bbl/d} * 365 = 47,085,000 \text{ bbl/y}$

Decrease in total refinery throughput (4-year avg. throughput; 161,000 bbl/d capacity):

$(129,000 - 48,000 = 81,000) / 129,000 = 0.6 = - 63\%$ decrease in throughput

Pre-Project (Baseline):

Barrels (4-year avg. throughput; 161,000 bbl/d capacity): $129,000 \text{ bbl/d} * 365 = 47,085,000 \text{ bbl/y}$

HYDROGEN PRODUCTION, REFINERY-WIDE:

Full refinery Hydrogen (H₂) capacity: $125000000 \text{ scf/d} / 423 \text{ scf/kg} * 365 \text{ d/y} * 9.3 \text{ kg CO}_2 / \text{kg H}_2 / 1000 \text{ kg/MT} = 1,003,102 \text{ MT/y}$

Hydrogen capacity utilization: $1,003,102 \text{ MT/y} / 962,000 \text{ MT/y} = 0.959 \rightarrow 4\%$ reduced from full refinery capacity

Post-project 962,000 MT/y from pre-project 678,000 MT kg/y

Pre-to-Post project hydrogen production increase (project total):

$962 \text{ MT/y} / 678 \text{ MT/y} = 1.42 \rightarrow + 42\%$ (increase in total H₂-plant CO₂ emissions)

HYDROGEN PRODUCTION, PER BARREL:

Pre-project hydrogen per barrel:

$678,000 \text{ MT kg/y} / * 1,000 \text{ kg/MT} / 365 \text{ d/y} / 9.3 \text{ gCO}_2/\text{gH}_2 / 129,000 \text{ bbl/d} * 423 \text{ scf/kg} = 654.94 \text{ scf/bbl} = 1.55 \text{ kgH}_2/\text{bbl}$

Post-project refinery-made hydrogen per barrel:

$962,000 \text{ MT/y} * 1,000 \text{ kg/MT} / 9.3 / 365 / 48,000 \text{ bbl} * 423 \text{ scf/kg} = 2497.46 \text{ scf/bbl} = 5.9 \text{ kgH}_2 / \text{bbl}$

Pre-to-Post project hydrogen production increase (project total):

$962 \text{ MT/y} / 678 \text{ MT/y} = 1.42 \rightarrow + 42\%$ (increase in total H₂-plant CO₂ emissions)

REFINERY CO₂ EMISSIONS AND PER BARREL CO₂ EMISSIONS:

Decrease in total refinery-wide CO₂:

$1,145,000 / 2,169,000 = 0.5278 = - 53\%$ (decrease in CO₂)

Pre-Project *total* annual refinery CO₂ (Carbon Intensity from GHG-to-bbl/y ratio and g CO₂/MJ):

$2,169,000,000 \text{ (kg CO}_2/\text{y)} / 47,085,000 \text{ bbl/y} = 46.07 \text{ kg CO}_2/\text{bbl} \rightarrow 46.07 * 1.18 = 54.36 \text{ g CO}_2/\text{MJ}$

Post Project *total* refinery CO₂

Barrels: $48,000 \text{ bbl/d} * 365 = 17,520,000 \text{ bbl/y}$

CO₂ Refinery-wide total: $1,145,000 \text{ mt/y} * 1000 = 1,145,000,000 \text{ kg/y}$

Post-project Carbon Intensity (CO₂ GHG/y-to-bbl/y ratio and g CO₂/MJ):

$1,145,000,000 \text{ kg/y} / 17,520,000 \text{ bbl/y} = 65.35 \text{ CO}_2 \text{ kg/bbl}$

Carbon Intensity (g/MJ): $65.35 * 1.18 = 77.11 \text{ g/MJ}$

Pre-to-Post project *per barrel* change in Carbon Intensity (Relative % - refinery-wide):

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$$65.35 / 46.07 = 1.42 \rightarrow +42\% \text{ increase in CI}$$

2a) Rodeo Renewed Project (Rodeo CA; 80 K or 67 K barrels per day); Pre-Project (current 105 K bpd):

Rodeo Renewed Project
Draft Environmental Impact Report

Table 4.8-2. Baseline Annual GHG Emissions (2019)¹

Source Category	Baseline Emissions (metric tons/yr)			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Rodeo Refinery				
Ocean-going Vessels and Harbor Craft	15,137	0.15	0.93	15,418
Trucks	4,466	0.02	0.70	4,676
Rail	1,373	0.11	0.03	1,386
Facility Operations	1,333,341	91.96	11.74	1,338,911
Electricity	9,160	1.30	0.28	9,270
Rodeo Refinery Total	1,363,477	94	14	1,396,661
Air Liquide H ₂ Plant	801,794	--	--	801,794
Santa Maria Site and Pipeline Sites				
Trucks	2,565	0.01	0.40	2,686
Rail	177	0.01	0.00	179
Facility Operations	171,765	17.30	1.43	172,571
Electricity	5,328	0.76	0.16	5,392
Total Statewide	2,345,107	111.62	15.68	2,352,284
Total within BAAQMD	2,165,272	93.54	13.69	2,171,455

¹ 2019 is the CEQA baseline for this analysis for all sources except ocean-going vessels and harbor craft. For vessel emissions, an average of 2017 through 2019 was used.
Rodeo Refinery includes emissions from Rodeo Site and Carbon Plant Site
Air Liquide CO₂e emissions assumed to be entirely CO₂ as the breakdown for CH₄ and N₂O is not available.
Facility emissions GHG reporting for 2019 is based on 21 GWP for CH₄ and a 310 GWP for N₂O. It is expected to change to 25 and 298 respectively for reporting years 2021 and forward.

2b) Rodeo Renewed Project (Rodeo CA); Post-Project (completed):

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Rodeo Renewed Project Draft Environmental Impact Report

Table 4.8-5. Total Annual Project Operational GHG Emissions

Source	Emissions (metric tons/yr)			
	CO ₂	CH ₄	N ₂ O	CO _{2e}
Rodeo Renewed Project Emissions				
Ocean Going Vessels and Harbor Craft	26,195	0.28	1.53	26,657
Rail	8,119	0.64	0.20	8,195
Trucks	2,720	0.00	0.43	2,847
Facility Stationary Sources	1,069,772	84.51	10.79	1,075,100
Electricity	1,180	0.41	0.09	2,889
Total Operational	1,109,661	85.84	13.04	1,115,689
Air Liquide H ₂ Plant	1,031,689	--	--	1,031,689
Total Operational with Air Liquide	2,141,350	85.84	13.04	2,147,378
CEQA Impact Evaluation				
Baseline Emissions within BAAQMD	2,165,272	93.54	13.69	2,171,455
Project Minus CEQA Baseline				-24,077
Significance Threshold				10,000
Exceeds Threshold?				No
Statewide Impact Evaluation (Informational only)				
Baseline Emissions Statewide	2,345,107	112	16	2,352,284
Project Minus Statewide Baseline				-204,905

Notes: Rodeo Refinery includes emissions from Rodeo Site and Carbon Plant. Facility emissions GHG reporting for 2019 is based on 21 GWP for CH₄ and a 310 GWP for N₂O. Based on CARB reporting, it is expected to change to 25 and 298 respectively for reporting years 2021 and forward. Therefore, Project facility emissions are based on 25 GWP for CH₄ and a 298 GWP for N₂O. The GHG emissions for the Air Liquide hydrogen plant are not reduced to reflect the offset provisions of the Settlement Agreement between ConocoPhillips Company and the Attorney General of California, dated September 10, 2007, and amended May 25, 2010. Air Liquide CO_{2e} emissions assumed to be entirely CO₂ as breakdown for CH₄ and N₂O is not available.

2c) Air Liquide Hydrogen Plant H₂ production; Table 15; Attachment B, Appendix B:

Stationary Source Table 15																																		
Air Liquide Hydrogen Plant Emissions Summary																																		
Phillips 66 Company - San Francisco Refinery																																		
Rodeo, CA																																		
CAP and GHG Emissions																																		
Scaling Method		Baseline Activity	Project Activity	Units	Pre-Project Emissions (tons/year)										Post-Project Emissions (tons/year)										Change in Emissions (tons/yr)									
					NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)	NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)	NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)	NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)		
Fuel Combustion		756	987	MMBTU/hr	17	0.010	0.95	1.1	3.8	3.5	--	22	0.013	1.2	1.4	4.7	4.6	--	5.1	0.0031	0.29	0.34	1.1	1.1	--	--	--	--	--	--	--	--		
Hydrogen Production		93.26	120	MMSCF H ₂ /day	--	--	--	--	--	--	801,794	--	--	--	--	--	--	1,031,689	--	--	--	--	--	--	--	--	--	--	--	--	--	229,895		
Total					17	0.010	0.95	1.1	3.8	3.5	801,794	22	0.013	1.2	1.4	4.7	4.6	1,031,689	5.1	0.0031	0.29	0.34	1.1	1.1	229,895									

2d) Unit U110 Phillips 66 Hydrogen Plant H₂ Production; table 13; Attachment B, Appendix B:

Stationary Source Table 13																												
Baseline and Post-Project TAC Emissions from Miscellaneous Project Sources																												
Phillips 66 Company - San Francisco Refinery																												
Rodeo, CA																												
Source ID	Description	Post-Project Status	Emission Type	Baseline Throughput		Post-Project Throughput		Baseline Emissions ^a (tons/year)										Post-Project Emissions ^a (tons/year)										
				Rate	Units	Rate	Units	NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)	NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)	NO _x	SO ₂	CO	POC	PM ₁₀	PM _{2.5}	GHGs (MT)
11	U240 B-201 Heater	Operational	Combustion	58	MMBTU/hr	23	MMBTU/hr	11	13	0.39	1.2	1.8	1.8	29,233	6.8	6.0	0.33	0.71	1.0	1.0	17,492							
12	U240 B-202 Heater	Operational	Combustion	16	MMBTU/hr	24	MMBTU/hr	1.8	3.8	0.43	0.34	0.45	0.45	6,271	2.6	5.9	0.64	0.51	0.71	0.71	13,667							
13	U240 B-201 Heater	Operational	Combustion	125	MMBTU/hr	93	MMBTU/hr	6.9	30	0.87	2.7	3.7	3.7	66,359	3.3	22	0.85	2.0	2.7	2.7	49,541							
43	U240 B-201 A/B Heater	Operational	Combustion	63	MMBTU/hr	24	MMBTU/hr	1.4	0.12	0.32	0.26	0.61	0.61	28,324	0.52	0.06	0.35	0.19	0.31	0.31	13,523							
437	Unit 110 Hydrogen Manufacturing Unit	Operational	Hydrogen Plant	12	MMSCF/day	22	MMSCF/day	--	--	--	--	--	--	100,368	--	--	--	--	--	--	--	177,645						
439	U110 R-1 Furnace (15 Plant Refurbish)	Operational	Combustion	140	MMBTU/hr	225	MMBTU/hr	2.6	4.1	1.3	0.15	4.6	4.6	15,281	5.8	6.7	2.1	0.24	7.4	7.4	25,133							

Notes:

^a Baseline emissions were obtained directly from the facility's 2019 BAAQMD Rule 12-15 Emissions Inventory.

^b Post-project emissions were estimated using baseline throughput and emissions and post-project projected rates.

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Phillips 66 (calculations based on references #2a, 2b, 2c and 2d):

**REFINERY THROUGHPUT; HYDROGEN PRODUCTION: REFINERY-WIDE:
AND PER BARREL:**

Pre-to-Post total refinery-wide project hydrogen production increase (total from Air Liquide and unit U110):

$(120 \text{ mscf} + 22 \text{ mscf}) / (93 \text{ mscf} + 12 \text{ mscf}) = 142 \text{ mscf} / 105 \text{ mscf} = 1.35 \rightarrow +35\%$ (increase in H₂ production)

Pre-project *per barrel* refinery-made hydrogen:

$105,000,000 \text{ scf} / 105,000 \text{ bbl/d} = 1,000 \text{ scf/bbl} [* 1/423 \text{ kg/scf}] = 2.36 \text{ kg CO}_2/\text{bbl}$

Post-project average *per barrel* refinery-wide hydrogen:

$142,000,000 \text{ mscf} / 67,000 \text{ bbl} = 2119.40 \text{ scf/bbl} [* 1/423 \text{ kg/scf}] = 5.01 \text{ kg CO}_2/\text{bbl}$

Pre-to-post average *per barrel* refinery-wide hydrogen production ratio:

$2119.40 \text{ mcf} / 1,000 \text{ scf} = 2.12 \rightarrow 120\% \text{ increase}$

Pre-Project: *total* refinery CO₂ (within BAAQMD area):

Barrels: $105,000 \text{ bbl/d} * 365 = 38,300,000 \text{ bbl/y}$

CO₂ Refinery-wide total: $2,171,000 \text{ mt/y} = 2,171,000,000 \text{ kg/y}$

REFINERY CO₂ EMISSIONS AND PER BARREL CO₂ EMISSIONS:

Pre-Project: *total* refinery CO₂:

Barrels: $105,000 \text{ bbl/d} * 365 = 38,300,000 \text{ bbl/y}$

CO₂ Refinery-wide total: $2,171,000 \text{ mt/y} = 2,171,000,000 \text{ kg/y}$

Pre-Project (within the BAAQMD area) average refinery per bbl and per MJ CO₂:

Carbon Intensity (CO₂ GHG-to-BPY ratio): $2,171,000,000 \text{ kg/y} / 38,300,000 \text{ bbl/y} = 56.68 \text{ CO}_2 \text{ kg/bbl} \rightarrow$

Carbon Intensity (g CO₂/MJ) $56.68 * 1.18 = 66.88 \text{ g CO}_2/\text{MJ}$

Pre-Project (In-State) average refinery per bbl and per MJ CO₂:

$2,353,000,000 \text{ kg CO}_2/\text{y} / 38,300,000 \text{ bbl/y} = 61.44 \text{ kg CO}_2/\text{bbl}$

$2,353,000,000 \text{ kg CO}_2/\text{y} / 38,300,000 \text{ bbl/y} * 1.18 = 72.49 \text{ g CO}_2/\text{MJ}$

Post Project: *total* refinery CO₂ per barrel (low estimate):

Barrels: $80,000 \text{ bbl/d} * 365 = 29,200,000 \text{ bbl/y}$

CO₂ Refinery-wide total: $2,147,000 \text{ MT/y} = 2,147,000,000 \text{ kg/y}$

Carbon Intensity (GHG-to-BPD ratio): $2,147,000,000 \text{ kg/y} / 29,200,000 \text{ bbl} = 73.53 \text{ kg CO}_2/\text{bbl}$

Carbon Intensity (g/MJ): $73.53 \text{ kg CO}_2/\text{bbl} * 1.18 = 86.77 \text{ g/MJ}$

Post Project: *total* refinery CO₂ per barrel (high estimate): clean fuels

Barrels: $67,000 \text{ bbl/d} * 365 = 24,455,000 \text{ bbl/y}$

CO₂ Refinery-wide total: $2,147,000 \text{ MT/y} = 2,147,000,000 \text{ kg/y}$

Carbon Intensity (GHG-to-BPD ratio): $2,147,000,000 \text{ kg/y} / 24,455,000 \text{ bbl/y} = 87.79 \text{ CO}_2 \text{ kg/bbl}$

Carbon Intensity (g/MJ): $87.79 * 1.18 = 103.95 \text{ g/MJ}$

Pre-to-Post project *per barrel* change in Carbon Intensity (Relative %):

a. $73.53 / 56.68 = 1.3 = +30\% \rightarrow 30\% \text{ increase in CI (low est.)}$

b. $87.79 / 56.68 = 1.55 = +55\% \rightarrow 55\% \text{ increase in CI (high est.)}$

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3) Hydrotreating in the production of green diesel. Rasmus Egeberg, Niels Michaelsen, Lars Skyum and Per Zeuthen. *Haldor Topsøe*.

“As the reactions also consume large amounts of hydrogen (for a 100% renewable feed, a hydrogen consumption of 300–400 Nm³/m³ is not unusual), higher make-up hydrogen and quench gas flows are needed even when co-processing quite small amounts.”

$$400 \text{ (Nm}^3\text{/m}^3\text{)} = 400 \text{ (Nm}^3\text{/m}^3\text{)} / 6.2 \text{ (bbl/MT)} * 38 \text{ (scf/Nm}^3\text{/m}^3\text{)} = 2451.61 \text{ scf/bbl} \\ (2451 / 423) = 5.79 \text{ kg/bbl} * 9.3 = 53.85 \text{ CO}_2 \text{ kg/bbl (hydrogen-production only)}$$

$$300 \text{ (Nm}^3\text{/m}^3\text{)} = 400 \text{ (Nm}^3\text{/m}^3\text{)} / 6.2 \text{ (bbl/MT)} * 38 \text{ (scf/Nm}^3\text{/m}^3\text{)} * 0.75 [(300\text{Nm}^3\text{/M}^3) / 400 \text{ (NM}^3\text{/M}^3)] = 1838.70 \text{ scf/bbl} = (1838.7 / 423) = 4.34 \text{ kg/bbl} = 40.36 \text{ CO}_2 \text{ kg/bbl} \\ \text{(hydrogen-production only).}$$

4) PATENTED HYDROCRACKER HYDROGEN USAGE FOR AGAEL BIOFUELS REFINING COMPARED TO SOY OIL. [Pub.No.:US2010/0297749A1 ARAVANIS et al. METHODS AND SYSTEMS FOR BIOFUEL PRODUCTION. Pub.Date: Nov.25,2010] (12)

For comparison of algal oil hydrotreating to soy oil and heavy petroleum hydrotreating, a patented algal biofuels protocol was described for hydrocracking, plus hydroisomerization and feedstock hydrotreating, of 80 barrels per day throughput using 245,000 scfd of hydrogen plant H₂. The total hydrogen volume required for the described “Integrated Biofuels Refinery” for algal oil is 3,063 scf per barrel, which would place the algal fuel hydrocracker hydrogen consumption at the upper (heavy petroleum) end of the 1,000-3,000 scf per barrel range. Similar large- and small-size algal biofuels hydrotreating configurations were described in the patent.

5) Changing Hydrocarbons Midstream. Karras, Greg. Community Energy Resource. Table 2. https://www.energy-resource.com/_files/ugd/bd8505_757a3372387d46358c74d958d158fcb5.pdf

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Changing Hydrocarbons Midstream

Table 2. Hydrogen demand for processing different HEFA biomass carbon feeds.

Biomass carbon feed	<i>Standard cubic feet of hydrogen per barrel of biomass feed (SCF/b)</i>			
	Hydrodeoxygenation reactions		Total with isomerization / cracking	
	Saturation ^a	Others ^{b,c}	Diesel target	Jet fuel target ^d
Plant oils				
Soybean oil	479	1,790	2,270	3,070
Plant oils blend ^e	466	1,790	2,260	3,060
Livestock fats				
Tallow	186	1,720	1,910	2,690
Livestock fats blend ^e	229	1,720	1,950	2,740
Fish oils				
Menhaden	602	1,880	2,480	3,290
Fish oils blend ^e	624	1,840	2,460	3,270
US yield-weighted blends ^e				
Blend without fish oil	438	1,780	2,220	3,020
Blend with 25% fish oil	478	1,790	2,270	3,070

a. Carbon double bond saturation as illustrated in Diagram 1 (a). b, c. Depropanation and deoxygenation as illustrated in Diagram 1 (b), (c), and losses to unwanted (diesel target) cracking, off-gassing and solubilization in liquids. d. Jet fuel total also includes H₂ consumed by intentional cracking along with isomerization. e. Blends as shown in charts 1-D and 1-F. Data from Tables A1 and Appendix at A2.¹ Figures may not add due to rounding.

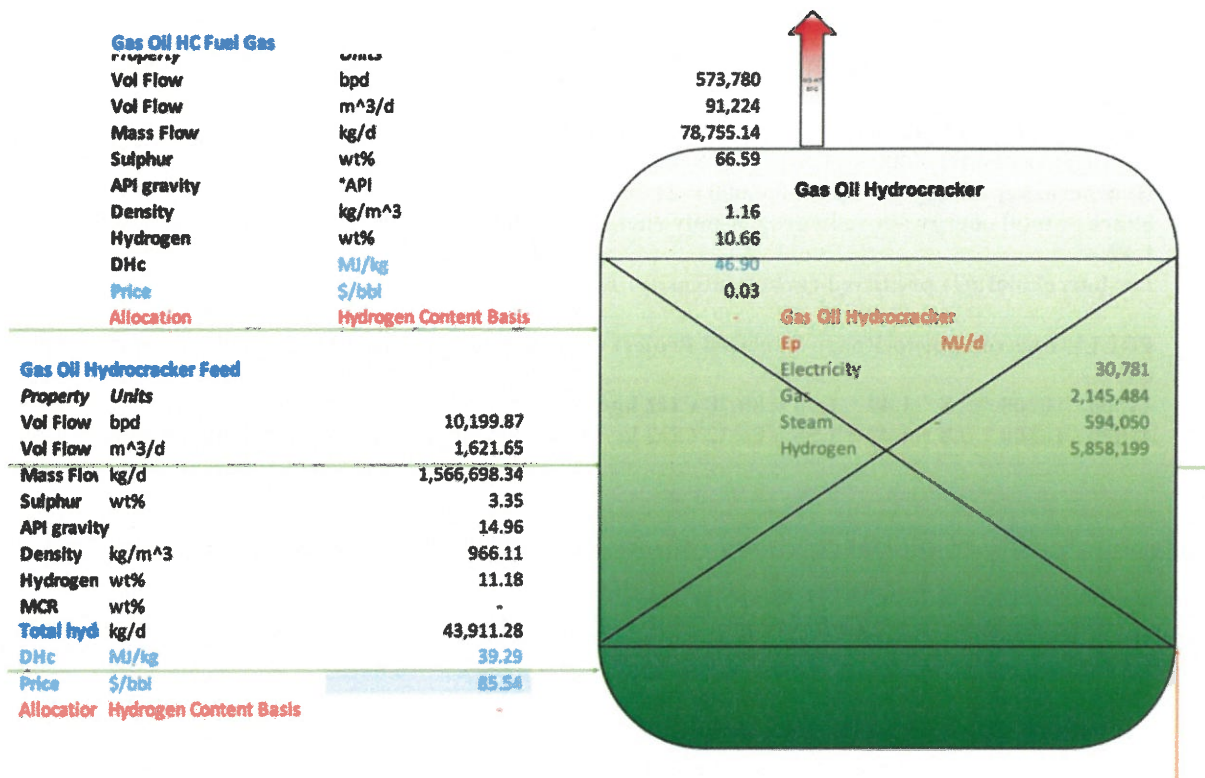
5) ENERGY STAR[®] Guide: ENERGY STAR is a U.S. Environmental Protection Agency Program for Energy and Plant Managers. (February 2015)
https://www.energystar.gov/sites/default/files/tools/ENERGY_STAR_Guide_Petroleum_Refineries_20150330.pdf

The hydrocracker consumes energy in the form of fuel, steam and electricity (for compressors and pumps)...The reactions are carried out at a temperature of 500-750°F (290-400°C) and increased pressures of 8.3 to 13.8 Bar...The hydrocracker also consumes energy indirectly in the form of hydrogen. The hydrogen consumption is between 150 and 300 scf/barrel of feed (27-54 Nm³/bbl) for hydrotreating and 1000 and 3000 scf/barrel of feed (180-540 Nm³/bbl) for the total plant (Gary et al., 2007).

6) Petroleum Refinery Life Cycle Inventory Model (PRELIM) PRELIM v1.3. User guide and technical documentation. Jessica P. Abella et al. [Joule A. Bergerson]
<https://www.ucalgary.ca/sites/default/files/teams/477/prelim-v1.3-documentation.pdf>
PRELIM 1.3 Hydrocracker with heavy, high-sulfur petroleum feedstock:
14.96 API and 3.35% Sulfur

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PRELIM 1.3 heavy petroleum Hydrocracker (Gravity API 14.96 and Sulfur 3.35%):

Hydrocracker carbon intensity (CI) per day (total):

5,858,000 (H₂)+2,145,000 (NG)+594,000 (steam)+31,000(e) = 8,628,000 MJ/d

Share of total hydrocracker energy (CI) above hydrogen-only energy:

8,628,000 MJ/ 5,858,000 MJ = 1.47 (47%)

Hydrogen required, per barrel:

44,000 kg H₂/d / 10,200 bbl/d * 423 scf/kg H₂ = 1824.70 scf /bbl

Hydrogen-plants daily CO₂ emissions per day:

44000 kg H₂/d * 1000 g/kg * 9.3 = 409,200,000 g CO₂/d = 409,200 kg CO₂ /d

Hydrocracker CO₂ emissions per day (total):

44,000 kg H₂/d * 1,000 g/kg * 9.3 gCO₂/gH₂ * 1.47 = 601,524,000 g CO₂/d = 601,524 kg CO₂ /d

PRELIM CO₂ emissions, per barrel: (44,000 / 10,200 * 1.47 = 6.34) * 9.3 = **58.97 kg CO₂ /bbl**

PRELIM Carbon Intensity: 601,524,000 g/d CO₂ / 8,628,000 MJ/d = **69.71 g/MJ**

NOTE: CO₂ mass-to-energy conversion factor (ratio): 69.71 g CO₂/MJ /58.97 kg CO₂/bbl → **1.18**

Phillips 66 predicted carbon intensity from +32% increase (w estimate; 80,000 bbl/d case):

58.97 kg CO₂ /bbl * 1.32 = 77.84 kg CO₂ /bbl

1.18 * 77.84 kg/bbl ⇒ **92.0 g/MJ.**

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Phillips 66 predicted carbon intensity from +55% increase (High estimate; 67,000 bbl/d case):
 $1.18 * 91.4 \text{ kgCO}_2 / \text{bbl} \Rightarrow 108.05 \text{ g/MJ}$

PRELIM petroleum-to-Marathon Renewable Project (+32% increase example; predicted Renewable Diesel CI)

Per barrel biofuels CO2 GHGs +32% inc. over petroleum:

Hydrogen per barrel: $44000 \text{ (H}_2\text{/d)} / 10200 \text{ (bbl/d)} * 9.8 * 1.32 = 55.80 \text{ kg/bbl}$

Hydrocracker energy per day: $5858000 + 2145000 + 594000 + 31000 = 8628000$

Share of total energy above hydrogen-only energy: $5858000 + 2145000 + 594000 + 31000 / 5858000 = 1.47$

Per barrel biofuels predicted carbon intensity: $1.47 * 55.8 = 82.19 \text{ CO}_2 \text{ kg/bbl}$

PRELIM petroleum-to-Rodeo Renewed Project (high and low estimates; predicted Renewable Diesel CI)

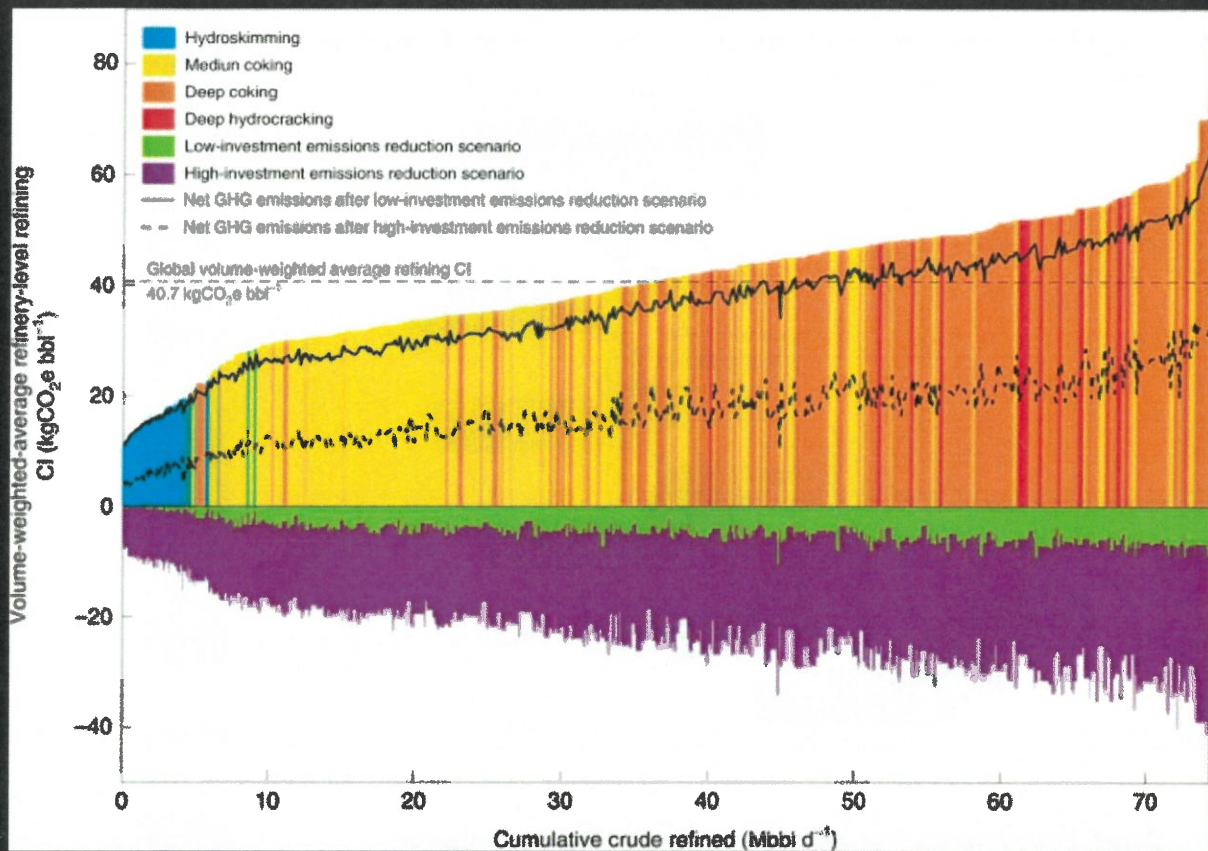
$44000 / 10200 * 9.8 * 1.47 * 1.30 = 80.78 \text{ CO}_2 \text{ kg/bbl}$ (+30% low case est. per 80,000 bbl/d)

$44000 / 10200 * 9.8 * 1.47 * 1.55 = 96.32 \text{ CO}_2 \text{ kg/bbl}$ (+55% high case est. per 67,000 bbl/d)

7) Carbon intensity of global crude oil refining and mitigation potential. Liang Jing et al. [*Nature Climate Change*](#) volume 10, pages 526–532 (J. Bergerson; 2020). The global-weighted carbon intensity at crude level is 10.1 – 72.1 kg CO₂e/bbl, with a weighted average of 40.7 kgCO₂e/kg.

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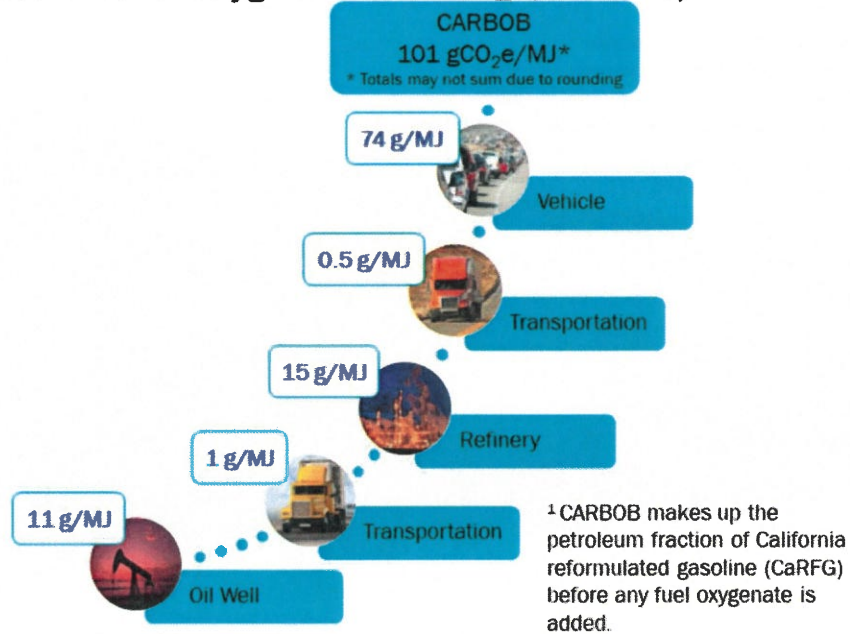


Nature

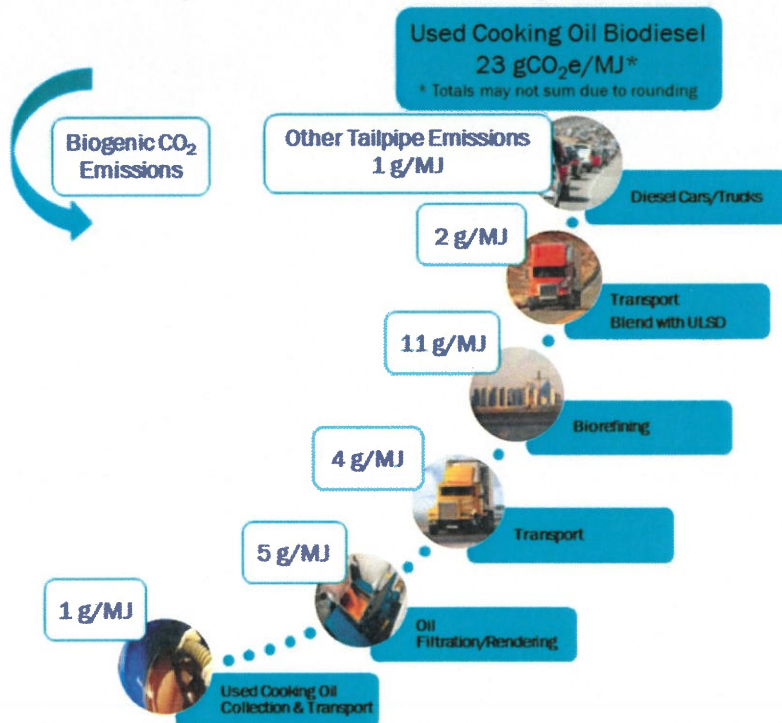
Carbon intensity of global crude oil refining and mitigation potential | Nature Climate Change

8) Low Carbon Fuel Standards. [Basics] <<https://ww2.arb.ca.gov/sites/default/files/2020-09/basics-notes.pdf>>

Fuel Life Cycle for California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB)¹



Fuel Life Cycle for Used Cooking Oil Biodiesel



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9) Cradle-to-Grave Lifecycle Analysis of U.S. Light-Duty Vehicle-Fuel Pathways: A Greenhouse Gas Emissions and Economic Assessment of Current (2015) and Future (2025-2030) Technologies Elgowainy A et al. Argonne National Laboratory ANL/ESD-16-7 Rev. 1. (September 2016) <<https://publications.anl.gov/anlpubs/2016/09/130244.pdf>>

10) Biodiesel. S Sadaka. (FSA1050: DIVISION OF AGRICULTURE RESEARCH & EXTENSION University of Arkansas System). <<https://www.uaex.uada.edu/publications/PDF/FSA-1050.pdf>>

11) Overcapacity Looms as More and More US Refiners Enter Renewable Diesel Market. Stratas Advisors. (June 11, 2020) <https://stratasadvisors.com/Insights/2020/06112020LCFS-RD-Investment>

12) Post-Rodeo Renewed Project Delayed Coker permit retention for possible re-use:

Weinberg-Lynn, Nikolas<Nik.Weinberg-Lynn@p66.com>
Fri 7/23/2021 3:31 PM

To:

- Charles Davidson

Cc:

- Ursino, Adrienne <Adrienne.Ursino@p66.com>;
- Henry, Aimee <Aimee.M.Henry@p66.com>

Mr. Davidson,

Thanks for your participation in the July 22nd RMAC meeting and questions about the Rodeo Renewed project related to the future use of the Coker. Phillips 66 is retaining the coker permit for a possible future evaluation of producing battery-grade coke at the Rodeo site. Battery-grade coke is a key component in the manufacture of electric vehicle batteries (see graphic below) and Phillips 66 is a major global supplier. Feedstock for the coker would be slurry oil, which would be sourced from a different refinery. Once the Rodeo Renewed project is fully implemented, the Rodeo facility will not be permitted to process crude oil. Emissions from a potentially operating Coker will be accounted for in the EIR.

I appreciate your interest in the project and look forward to further discussion,

Nik Weinberg-Lynn
Manager, Renewable Energy Projects
O: (+1) 510.245.4567 | M: (+1) 310.923.1436
RDO-RM 205 | 1380 San Pablo Avenue | Rodeo, CA 94572

13) Catalytic reforming options and practices. Tom Zhou (Fluor Enterprises)
Frederik Baars (Fluor BV). (2010). [Design and practice in catalytic reforming is evolving to

**Appeal of Contra Costa County Planning Commission's Certification for the Final
Environmental Impact Report for the Phillips 66 Rodeo Renewed Project.**

charlesdavidson@me.com Hercules CA. 11 April 2022

meet refinery challenges, including lower gasoline pool benzene content and increased demand for hydrogen.] <https://www.digitalrefining.com/article/1000479/catalytic-reforming-options-and-practices#.Ym7Iji-B034>

[REDACTED]

From: Maureen Brennan <[REDACTED]>
Sent: Monday, May 2, 2022 5:15 PM
To: Clerk of the Board
Subject: Public comment Phillips66 May 3 meeting

Please do not approve this land use permit for Phillips 66 at this time. At the Planning Commission endorsement, they said this permit should be in tandem with a Community Benefits Agreement. The details of any actual agreement have yet to be negotiated. Please table this item until details of the agreement are in place.

There are many details of the draft EIR still unanswered. The hydrogen plant has been ignored, nor addressed by the Planning Commission. The Air Liquide plant is not capable of the planned increase of methane-fuel consumption, which risks explosion, and at the least, increased flaring events. Air Liquide has a history of yearly "unit upset" since it went online in 2009. Investigation of the capability of this plant facility should be a condition for approval before the permit is granted.

Phillips 66 has claimed an "extensive odor remediation program" with no details. Details of the plan should be a condition for approval before the permit is granted.

Rodeo is classified as a disadvantaged community by Contra Costa County. SB1000 requires Contra Costa County to integrate environmental justice into its General Plan. We here in Rodeo and Crockett have long experienced a disproportionate burden of pollution and health impacts, noise and odors.

Please table the current proposal until these items are addressed.

Thank you.

Maureen Brennan

Rodeo, CA

[REDACTED]

From: Nlouse Wolfe <[REDACTED]>
Sent: Monday, May 2, 2022 5:30 PM
To: Clerk of the Board
Subject: Reject Renewable Fuels Project's EIRs

Dear Contra Costa Supervisor,

I urge you to reject the land use permit and require additional EIR reviews for Phillips 66 and Marathon Refinery biofuels projects. Joint comments from multiple environmental groups on the draft EIRs included detailed, specific points about many technical aspects of the project. Responses to these comments **failed to address many of the specific points**, especially those relating to safety and land use. The FEIRs inadequately address the following concerns:

- *Failure to provide an adequate project description.*
- *Failure to account for safety and air pollution concerns from potentially increased operational upsets and hazards such as flaring, explosions, gas releases, increased use of hydrogen.*
- *Failure to account for impacts of burning food for fuel due to human food used as "feedstock" in biofuel production*
- *Failure to consider climate impacts.*
- *Failure to account for cumulative impacts.*
- **Failure to Comply with the CEQA Requirement to Respond to Public Comments**

The Contra Costa County's [Declaration of Climate Emergency](#) commits to fight climate change and to protect the health and safety of vulnerable residents. These projects demand a more thorough EIR.

I am a concerned California resident who is very worried about this precedent setting initiative.

Thank You,

Nanlouse Wolfe
Santa Cruz

[REDACTED]

From: Kathy Kerridge <[REDACTED]>
Sent: Monday, May 2, 2022 5:57 PM
To: Clerk of the Board
Subject: Reject Renewable Fuel Projects' EIRs

Dear Contra Costa Supervisors,

Please reject the land use permits and require additional EIRs for the Phillips 66 and Marathon renewable projects.

The EIRs were inadequate in many ways. They failed to account for cumulative impacts even though these projects are happening at the same time literally miles from one another. They didn't address the impacts of essentially burning food for fuel. Especially now with the breadbasket of Europe under attack we do now want people across the globe to starve so we can drive cars that could be powered by electricity or hydrogen produced through using renewable energy. The climate impacts of this conversion could be devastating if soy oil users turn to palm oil and then more rainforest is destroyed to produce palm oil. If peat bogs are converted it would be a climate bomb. Indonesia recently stopped the export of palm oil because of the impact it was having on food prices.

Please say no. If the refineries can't tell us what percentage of their feed stock will come from used cooking oils, ect. as compared to oil grown instead of food, we can only assume the worst.

Kathy Kerridge

Benicia, CA

[REDACTED]

From: gailsusangordon [REDACTED]
Sent: Monday, May 2, 2022 7:42 PM
To: Karen Mitchoff; Supervisor Candace Andersen; Diane Burgis; District5; John Gioia
Cc: Clerk of the Board
Subject: Items D1 and D2, 5/3/22 BOS Meeting Agenda Public Comment

Dear Chair Mitchoff and members of the Board,

I am writing to urge you to reject the land use permits and require additional environmental impact reviews for the Phillips 66 and Marathon Refinery biofuels projects. Joint comments on the draft EIRs from multiple environmental groups included detailed, specific points about many technical aspects of the project. Responses to these comments **failed to address many of the specific points**, especially those relating to safety and land use. The final EIRs inadequately address the following concerns:

- *Failure to provide an adequate project description*
- *Failure to account for safety and air pollution concerns from potentially increased operational upsets and hazards such as flaring, explosions, gas releases, and increased use of hydrogen*
- *Failure to account for impacts of burning food for fuel due to human food used as "feedstock" in biofuel production*
- *Failure to consider climate impacts*
- *Failure to account for cumulative impacts*
- ***Failure to Comply with the CEQA Requirement to Respond to Public Comments***

The Contra Costa County's [Declaration of Climate Emergency](#) commits to fighting climate change and to protecting the health and safety of vulnerable residents. These projects conflict with that commitment. Please support a more thorough EIR for both proposed biofuel projects.

Gail Susan Gordon,
LMFT
San Pablo CA 94806

1000 Grandmothers for Future Generations

--

Gail Susan Gordon, LMFT, SEP

Licensed Marriage and Family Therapist

Somatic Experiencing Practitioner

1532 Solano Ave, Albany CA 94707

4980 Applan Way, Suite 206, El Sobrante CA 94806

gail@gailsusangordonmft.com

[REDACTED]

From: Kathleen Rodgers <[REDACTED]>
Sent: Monday, May 2, 2022 7:48 PM
To: Karen Mitchoff; Supervisor Candace Andersen; Diane Burgis; District5; John Gioia
Cc: Clerk of the Board
Subject: Items D1 and D2, 5/3/22 BOS Meeting Agenda Public Comment

Dear Chair Mitchoff and members of the Board,

I am writing to urge you to reject the land use permits and require additional environmental impact reviews for the Phillips 66 and Marathon Refinery biofuels projects. Joint comments on the draft EIRs from multiple environmental groups included detailed, specific points about many technical aspects of the project. Responses to these comments **failed to address many of the specific points**, especially those relating to safety and land use. The final EIRs inadequately address the following concerns:

- *Failure to provide an adequate project description*
- *Failure to account for safety and air pollution concerns from potentially increased operational upsets and hazards such as flaring, explosions, gas releases, and increased use of hydrogen*
- *Failure to account for impacts of burning food for fuel due to human food used as "feedstock" in biofuel production*
- *Failure to consider climate impacts*
- *Failure to account for cumulative impacts*
- ***Failure to Comply with the CEQA Requirement to Respond to Public Comments***

The Contra Costa County's [Declaration of Climate Emergency](#) commits to fighting climate change and to protecting the health and safety of vulnerable residents. These projects conflict with that commitment. Please support a more thorough EIR for both proposed biofuel projects.

Kathleen Rodgers, San Pablo
CA

From: Woody Hastings <[REDACTED]>
Sent: Monday, May 2, 2022 7:56 PM
To: Clerk of the Board
Subject: Comments of The Climate Center - Agenda items D1 and D2, May 3, 2022
Attachments: The Climate Center FEIR Comment - 5-3-22.docx.pdf

Dear Clerk of the Board,
Please see attached letter from The Climate Center regarding agenda items D1 and D2 on the Board's May 3, 2022 agenda. If you have any difficulty opening the attachment, please let me know, and please share the comments with the Board.

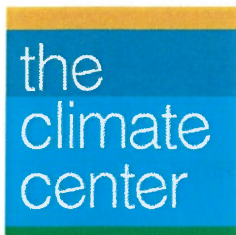
Thank you,

Woody Hastings
Energy Program Manager, [The Climate Center](#)
310-968-2757 (mobile/text)



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Our mission: Deliver speed and scale greenhouse gas reductions, starting in California.



Our mission

Deliver rapid greenhouse gas reductions at scale, starting in California.

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Ai-Chu Wu, PhD

Contact

www.theclimatecenter.org
P.O. Box 3785
Santa Rosa, CA 95402
707-525-1665

May 2, 2022

Contra Costa County Board of Supervisors
1025 Escobar Street, Martinez, CA 94553
Via Email: clerkoftheboard@cob.cccounty.us

Subject: Appeal of Contra Costa County Planning Commission Certification for the Final Environmental Impact Report for the Phillips 66 Rodeo Renewed Project (File No. LP20-2040) and for the Marathon biofuel refining conversion project

Dear Contra Costa County Supervisors,

On behalf of The Climate Center and its supporters in Contra Costa County and throughout California, I urge you to reject the land use permit and require additional environmental reviews for Phillips 66 and Marathon refinery biofuel conversion projects. The Climate Center is a climate and energy policy nonprofit which works for rapid greenhouse gas (GHG) reductions, starting in California.

Joint comments from multiple environmental groups on the draft EIRs included detailed, specific points about many technical aspects of the project. Responses to these comments failed to address many of the concerns, especially those relating to safety and land use. The FEIRs inadequately address the following:

- Failure to consider climate impacts;
- Failure to comply with the CEQA requirement to respond to public comments;
- Failure to provide an adequate project description;
- Failure to account for safety and air pollution concerns from potentially increased operational upsets and hazards such as flaring, explosions, gas releases, increased use of hydrogen;
- Failure to account for impacts of burning food for fuel due to human food used as feedstock in biofuel refining;
- Failure to account for cumulative impacts.

Based on an analysis conducted by the Political Economy Research Institute in June 2021 "[A Program for Economic Recovery and Clean Energy Transition in California](#)," the transition to high road employment in the new clean energy economy can happen without extending the operation of these hazardous and polluting refineries. These refineries have also deleteriously impacted residents in nearby

communities. A rejection by the Board of Supervisors to the proposals does not necessarily translate into lost jobs.

Lastly, Contra Costa County's [Declaration of Climate Emergency](#) commits to addressing the climate crisis in a way that protects the health and safety of vulnerable residents. To be consistent with the County's own climate emergency declaration, these projects demand a more thorough EIR.

Thank you for consideration of our concerns.

Sincerely,

A handwritten signature in black ink, appearing to read 'EMC', with a long horizontal flourish extending to the right.

Ellie M. Cohen
Chief Executive Officer
The Climate Center

[REDACTED]

From: Lisa argento martell [REDACTED]
Sent: Tuesday, May 3, 2022 4:30 AM
To: Clerk of the Board
Subject: Please reject the land use permit and EIR for renewable in Coco county!!

Dear Contra Costa Supervisors,

I am a concerned resident of Contra Costa county and live in Crockett.

I urge you to reject the land use permit and require additional EIR reviews for Phillips 66 and Marathon Refinery biofuels projects. Joint comments from multiple environmental groups on the draft EIRs included detailed, specific points about many technical aspects of the project. Responses to these comments **failed to address many of the specific points**, especially those relating to safety and land use. The FEIRs inadequately address the following concerns:

- *Failure to provide an adequate project description.*
- *Failure to account for safety and air pollution concerns from potentially increased operational upsets and hazards such as flaring, explosions, gas releases, increased use of hydrogen.*
- *Failure to account for impacts of burning food for fuel due to human food used as "feedstock" in biofuel production*
- *Failure to consider climate impacts.*
- *Failure to account for cumulative impacts.*
- **Failure to Comply with the CEQA Requirement to Respond to Public Comments**

The Contra Costa County's [Declaration of Climate Emergency](#) commits to fight climate change and to protect the health and safety of vulnerable residents. This whole project is replacing one dangerous and thoughtless industrial process with another. These projects demand a more thorough EIR.

Thank you for your attention and please forward my serious concerns.

Best regards,

Lisa Argento Martell

[REDACTED]
Crockett, CA 94525

[REDACTED]

From: lisa Sibony [REDACTED]
Sent: Tuesday, May 3, 2022 12:11 PM
To: Clerk of the Board
Subject: Reject Renewable Fuel Projects' EIRs

Dear Contra Costa Supervisors,

I urge you to reject the land use permits and require additional environmental impact reviews for the Phillips 66 and Marathon Refinery biofuels projects.

The Contra Costa County's [Declaration of Climate Emergency](#) commits to fighting climate change and to protecting the health and safety of vulnerable residents. These projects *must* have a more thorough EIR.

For the sake of the entire Bay Area, State of California and well beyond, please reject the permits and stop the refineries from causing more environmental damage.

Sincerely,
Lisa Sibony
Berkeley, CA