



*Kern Oil & Refining Co.*

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April 22, 2009

Clerk of the Board  
Air Resources Board  
1001 I Street  
Sacramento, CA 95814

**Subject: Comments to the California Air Resources Board Low Carbon Fuel Standard (LCFS) Proposed Regulation**

Dear Clerk of the Board:

Please find attached the Kern Oil & Refining Co., comments to the Low Carbon Fuel Standard (LCFS) proposed regulation.

If you have any questions, please call me at (661) 845-0761.

Respectfully,

Robert H. Richards  
EHS Manager

## **Small Refiner Consideration in the AB 32 Low Carbon Fuel Standard (LCFS)**

Kern Oil & Refining Co.

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In 1981 there were 13 small petroleum refiners in the State of California. Today, based on CARB's definition of Small Refiner codified in Title 13, California Code of Regulations, Section 2260(a)(32), there are only two small refiners remaining in California that are producing motor fuels. San Joaquin Refining Co., with a capacity of approximately 25,000 bpd, produces ultra-low sulfur diesel (ULSD), and Kern Oil & Refining Co. (Kern), with a capacity of approximately 27,000 bpd, produces reformulated gasoline and ULSD. San Joaquin Refining and Kern are the only two refiners between California's Bay Area and its South Coast area that are currently producing and supplying motor fuels to the state. And Kern is the only small refinery in California continuously producing and supplying both California Air Resources Board (CARB) Reformulated Phase 3 Gasoline and CARB ULSD. Kern has been determined to be a "Small Refiner" by CARB and the California Energy Commission (CEC).

Small refiners are unique in many ways from the large refiners. Large refiners' refineries located in the Bay Area Air Quality Management District (BAAQMD) and in the South Coast Air Quality Management District (SCAQMD) are significantly larger in capacity and more complex in their processes than small refineries. Many of the large refineries in the Bay Area/South Coast are owned by major integrated oil companies that not only operate the refineries but also own upstream oil and gas production and downstream retail marketing. Most of these large refineries are strategically located in coastal areas allowing the supply of imported crude oil by tanker ships. However, the remaining two small refineries are "land-locked" inland and are dependent solely on domestic crude supply.

The average capacity (daily barrels of crude oil feed to the refinery) of the large refineries in the Bay Area/South Coast is approximately 140,000 bpd and the largest refinery in the Bay Area/South Coast is 260,000 bpd. This compares to the average capacity of 26,000 bpd for the two remaining small refiners that produce motor fuels. Not only do small refiners have significantly less crude feed (capacity), they also produce considerably smaller quantities of gasoline and diesel fuel than large, more complex refiners. In fact, small refiners produced only 0.8% of the total 15.9 billion gallons of gasoline and less than 3% of the total 5.7 billion gallons of diesel produced in the State of California in 2008.

The differences in economies of scale between the large refinery complexes and the small refiners are considerable. Small refiners do not enjoy the economies of scale that major refiners do; nor do small refiners possess the capital necessary to expand with larger, more complex refining process units. This can be demonstrated using Nelson's Complexity Index (NCI), which is used to calculate manpower requirements, investment intensity, cost index and value addition potential of a refinery. Index factors are assigned to various process units within a refinery. Kern has a relatively small NCI factor as compared to the larger complex refineries. Small refiners typically do not



operate high energy intensive units such as Catalytic Hydrocrackers, Fluid Catalytic Crackers, and Cokers, and hence, small refiners have lower emissions and energy usage than the large complex refineries. Simply put, impacts from stationary source regulations and changes in fuel standards with the emergence of renewable fuels regulations will have an additional, disproportionately negative economic impact on the small refiners.

Historically, USEPA, CARB, CEC and other regulatory agencies have recognized the differences and uniquenesses of small refiners and the need for special provisions in rules and regulations to prevent severe economic adversity. For example, recently CARB recognized the need to include a small refiner definition in the AB 32 Regulation for the Mandatory Reporting of Greenhouse Gas Emissions that provided special consideration for small refiners within the refinery fuel gas monitoring provisions of the regulation.

The USEPA has also recognized small refiners as "small entities" and has provided an exemption within the Federal Renewable Fuels Standard (RFS-1) as codified in 40 CFR 80.1141. Although the federal definition of small refiner is slightly different than the California definition, it is clear that the relief provided is intended to limit substantial negative economic and regulatory impacts to the small refining community. USEPA considered the disproportionate impacts of the RFS-1 pursuant to the 2007 Energy Independence and Security Act (EISA). EPA deemed it appropriate to extend the RFS-1 compliance date by five years for small refiners. Currently, EPA is developing the RFS-2 program requirements and is conducting an evaluation under the Small Business Regulatory Enforcement and Fairness Act (SBREFA). The main objective of the SBREFA review process is to explore ways of minimizing burdens on regulated small entities while achieving the public purpose served by the regulatory programs.

Upon review of the proposed LCFS, it appears Kern is being disproportionately impacted by the method CARB has used to develop weighted averages of various stages of the life-cycle analysis. For example, Table 2.01 of the draft GREET Pathway uses "average crude" for CARBOB and diesel, and assigns a weighted average of 7,093 miles for the distance "average crude" supply travels in tankers, 442 miles "average crude" travels by pipeline, and 200 miles "average crude" travels by barge. The vast majority of Kern's crude supply travels only approximately 30 miles from the local oil and gas production fields to Kern's refinery. In addition, Kern processes light San Joaquin Valley low sulfur crude. Yet, in the LCFS assumptions, Kern is being averaged in with larger refiners that process heavy, high sulfur crudes that require significantly more energy to produce, transport and refine.

Because small refiners' plants are less complex and less energy intensive than large refineries, it follows that small refiners produce less GHG emissions. To illustrate, based on EPA AP-42 Compilation of Air Pollution Factors, Volume 1: Stationary Point and Area Sources, it is apparent the large refiners operating fluid catalytic crackers, hydrocrackers, isomerization units and cokers have significantly higher total hydrocarbon emissions factors assigned to those units than small refiners that typically do not operate such complex and energy intensive units. Small refiners operate more energy efficient units such as hydrotreaters and reformers.

Below is an example, using DOE energy use data, comparing the energy use of a typical small refiner to that of a large and more complex refinery. The comparison table below shows that a typical large refiner energy use is 50% greater than that of a "comparable" small refiner.

#### COMPARISON OF ENERGY USE: SMALL REFINER vs. LARGE REFINER

	Capacity	% Crude	Avg. Energy Use
<b>Small Refiner - example</b>	KBtu/bbl <sup>a</sup>	(bpd)	Rate (KBtu/bbl)
Atmospheric Distillation	114	15.45	100
Catalytic Hydrotreating	120	10.70	69
Catalytic Reforming	284	3.60	23
			<b>263.28</b>
<b>Large Refiner - example</b>			
Atmospheric Distillation	114	15.45	100
Vacuum Distillation	92	7.15	46
Delayed Coking	166	1.67	11
Fluid Catalytic Cracking	100	5.20	34
Catalytic Hydrocracking	240	1.30	8
Catalytic Hydrotreating	120	10.70	69
Catalytic Reforming	284	3.60	23
Alkylation Hydrofluoric Acid	401	0.66	4
			<b>394.79</b>

Footnote:

(a) Source: DOE 1998 Energy Use: Petroleum Industry Analysis Brief

#### Small Refiner Proposal

Based on the aforementioned comments, Kern requests CARB to consider special provisions within the proposed LCFS regulation and/or within the GREET model that will provide appropriate relief to California's remaining small refiners.

Kern respectfully proposes the following consideration for small refiners:

1. Reduce the Carbon Intensity reduction goal percentage from 10% to 8% for small refiners.
2. Increase the "significant shortfall" for small refiners from the proposed 10% to 20%.
3. Exempt small refiners from the LCFS compliance schedule for four years; that is until January 1, 2014.
4. Allow small refiners to generate LCFS credits during the first four years (2010-2013).
5. In 2020, EPA shall review and evaluate the LCFS program with small refiners to determine if changes are appropriate.