1

Gary Grimes
09-4-4

Via Electronic Submittal

April 23, 2009

Monica Vejar
Clerk of the Board
California Air Resources Board
Headquarters Building
1001 "I" Street
Sacramento, CA 95812
Electronic Submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

**Re: Comments of Paramount Petroleum For Proposed Low Carbon Fuel Standard Regulations**

Dear Ms. Vejar:

Paramount Petroleum appreciates the opportunity to comment on the proposed regulation. Because it is a non cracking refinery, Paramount will be more significantly impacted by this regulation than the seven much larger oil refining companies operating in California. Paramount supports the LCFS conceptually, but is concerned about the application of the regulation as it is currently drafted, specifically its potential to significantly impact the economic survival of the non cracking refiners in California.

**Background**

Paramount Petroleum (a subsidiary of Alon USA Energy, Inc.) owns and operates two small crude oil refining facilities in Southern California which operate as a single business unit. The main facility located in Paramount, CA has operated continuously since the 1930's through many ownership changes (many years as Douglas Oil – Conoco's West Coast Division) and two bankruptcies. The smaller facility has operated since the 1930's under the name Edgington Oil and Apex Oil.

Paramount is a non-integrated oil refiner with no crude oil production to counter or buffer the cyclical nature of its refining business margins. Although Paramount makes some California cleaner burning gasoline and diesel fuel, because of the nature of its refinery units, Paramount produces a much larger percentage of products other than gasoline and diesel. This difference and the simplicity of its operations substantially distinguishes Paramount from almost all California refineries who use units which consume massive amounts of energy in order to extract the maximimum amount of transportation fuel from each barrel of oil processed.

Paramount is the premier West Coast asphalt supplier and the largest supplier of asphalt for California. The company has proprietary technology for modifying asphalt with polymers or recycled ground waste tire rubber to improve the durability and roadway properties of asphalt. A number of analysts evaluating greenhouse gases have concluded that asphalt is a "green" product in part because it sequesters a significant portion of the crude oil barrel that would otherwise be burnt as motor vehicle fuel. Asphalt is also a "green" option to displace concrete highways, since concrete emits significant CO2 as it is manufactured.

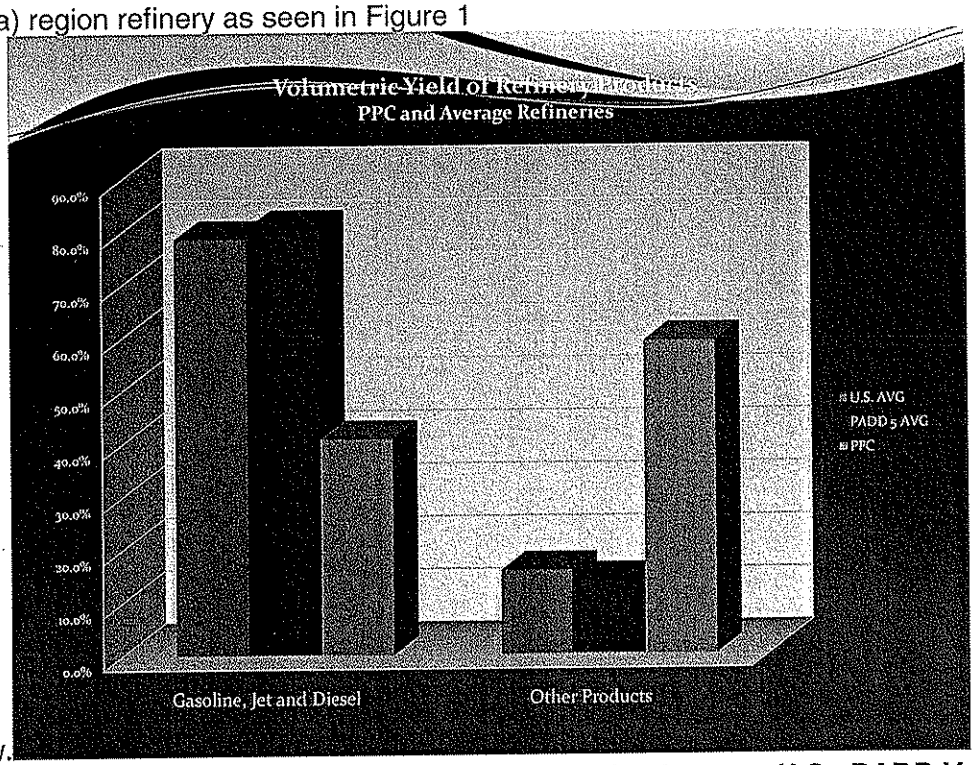
**Low Energy Refining at Paramount Is Being Unnecessarily and Unfairly Competitively Disadvantaged by the LCFS**

Paramount is a very energy efficient producer of CARBOB gasoline, converting only the naturally occurring gasoline portions of crude oil into automobile fuel by enhancing the octane through a reforming process and/or adding high octane blendstocks. Although this process is energy efficient, it also produces a substantially lower percentage of gasoline from a barrel of crude oil when compared to major oil company refineries in California that produce more gasoline as a result of their much more complex and greater energy consuming processes. The seven major refining companies in California produce only about ¼ of their gasoline through the same low energy process that is used at Paramount. The remaining ¾ of their production is produced by "cracking" the heavier portion of the crude oil barrel (1/2 to 2/3 of the barrel, depending on the crude oil) into smaller, shorter chain molecules that can be used for additional gasoline, jet fuel or diesel blend stocks. This requires a very large investment in facilities and substantially larger energy consumption than Paramount's low energy refining process. Paramount uses less energy to produce a gallon of CARBOB and diesel than the more complex cracking refineries. Accordingly, the carbon intensity of Paramount's transportation fuels is substantially lower than the average established by the LCFS. **The LCFS allows the producers of alternative fuels to establish carbon intensity lower than the "look-up tables" and it is patently unfair to not provide the same opportunity to producers of lower carbon gasoline diesel and gasoline.**

Although Paramount uses an energy efficient method to manufacture CARBOB, Paramount has a large economic disadvantage relative to the major oil companies that have the capital and locations to use and maximize advanced cracking processes. There are three cracking processes generally used to make lighter fuels from heavier portions of the crude oil barrel. These are catalytic cracking, hydrocracking and coking. For Paramount to use one of these cracking processes it would need a capital investment greater than the current value of the existing refineries. In addition, the byproduct of the coking process is petroleum coke, a coal like solid, which isn't suitable to manufacture in the suburban and light industrial neighborhoods near Paramount's facilities.

The lower energy processing used by Paramount results in substantially lower gasoline and higher asphalt/road oil production than the average U.S. or PADD V (West Coast, Hawaii, and

Alaska) region refinery as seen in Figure 1




below.

**Figure 1 – Volumetric Yield of Refinery Products for Average U.S., PADD V and Paramount Petroleum**

The California Energy Commission surveys the California refineries weekly to determine production of gasoline, diesel and other products. The 2006 data in Figure 2 displays the product yield difference between the average California refinery and Paramount Petroleum.

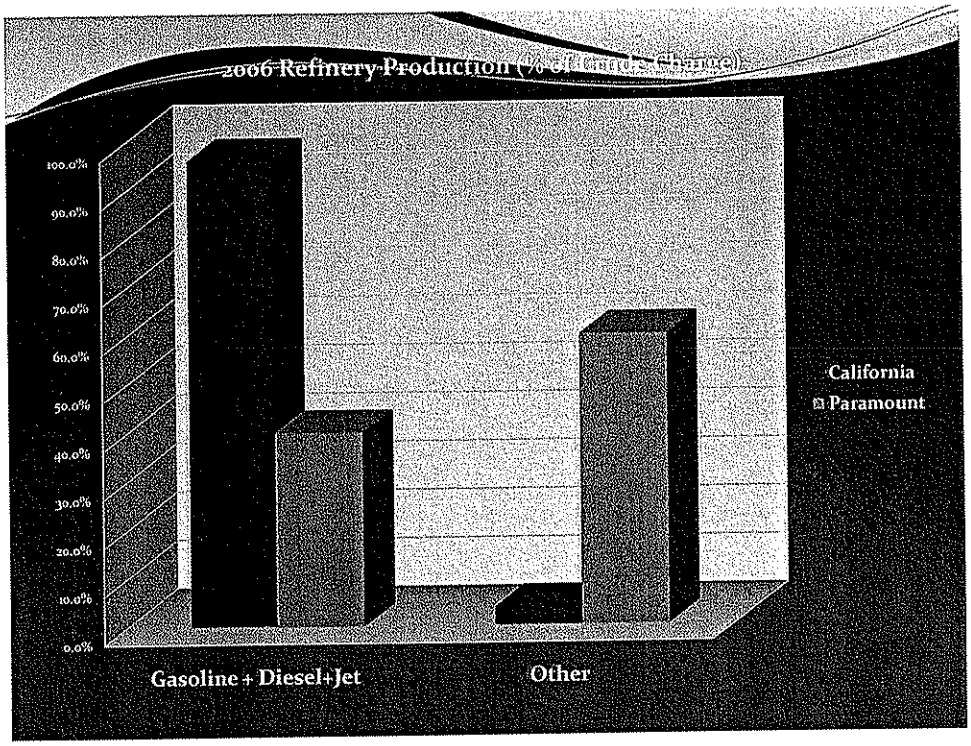



**Figure 2 – 2006 Average California and Paramount Petroleum Refinery Production**

**Refinery Efficiency As Established in the LCFS is Not Correct and Unfairly Punishes Less Complex Refiners**

The starting point used by the GREET model developers (Michael Wang et al, Argonne National Laboratory) to determine refinery process CO2 emissions the model assigns to CARBOB and CARB diesel is based on an estimate of the overall efficiency of the average refinery. The process used is described in the document , "Estimation of Energy Efficiencies of U.S. Petroleum Refineries"http://www.transportation.anl.gov/modeling_simulation/GREET/pdfs/energy_eff_petroleum_refineries-03-08.pdf

There is currently very little public information regarding the efficiencies of individual refineries. The Argonne methodology uses Energy Information Administration (EIA) public data aggregated to a regional or national level. There are two weaknesses to this methodology that create obvious uncertainty in CARB's proposed carbon intensity baselines for CARBOB and CARB diesel to the LCFS. As the document referenced above states, the EIA does not survey refiners for hydrogen use or natural gas use for captive hydrogen production. Argonne used an estimate of refinery hydrogen useage from the SRI Consulting Chemical Economics Handbook. The method also requires estimates of the average energy content for each refinery feedstock and product listed in the EIA report. These are also numbers that aren't collected by survey, but are estimated because refiners don't measure the energy content of either feedstocks or products, which adds further uncertainty to the calculated refinery efficiency.

Using the described method, the efficiencies of Paramount's facilities were calculated. The results, along with the regional (by geographic PADD) refinery and U.S. averages are displayed

below in Figure 3. The fuels consumed by average refineries in the same regions are displayed in Figure 4 along with Paramount's fuel.

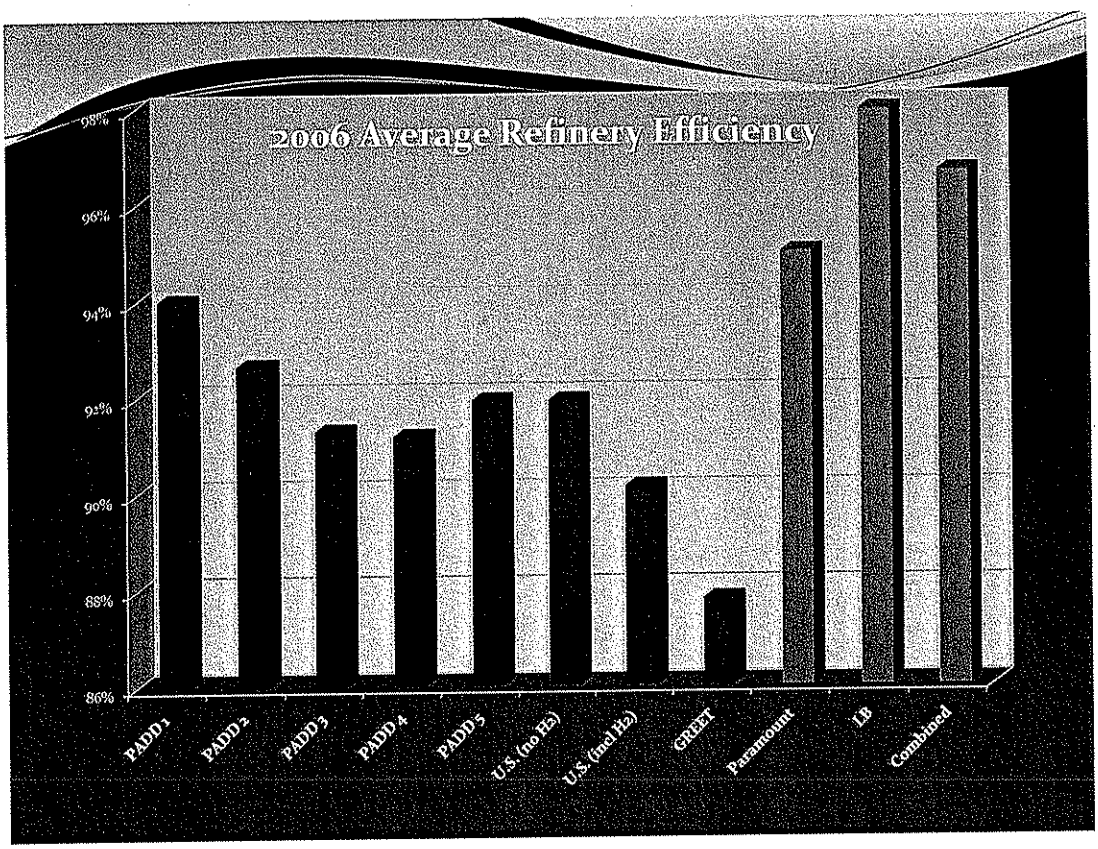



**Figure 3. 2006 Average Refinery Efficiency**

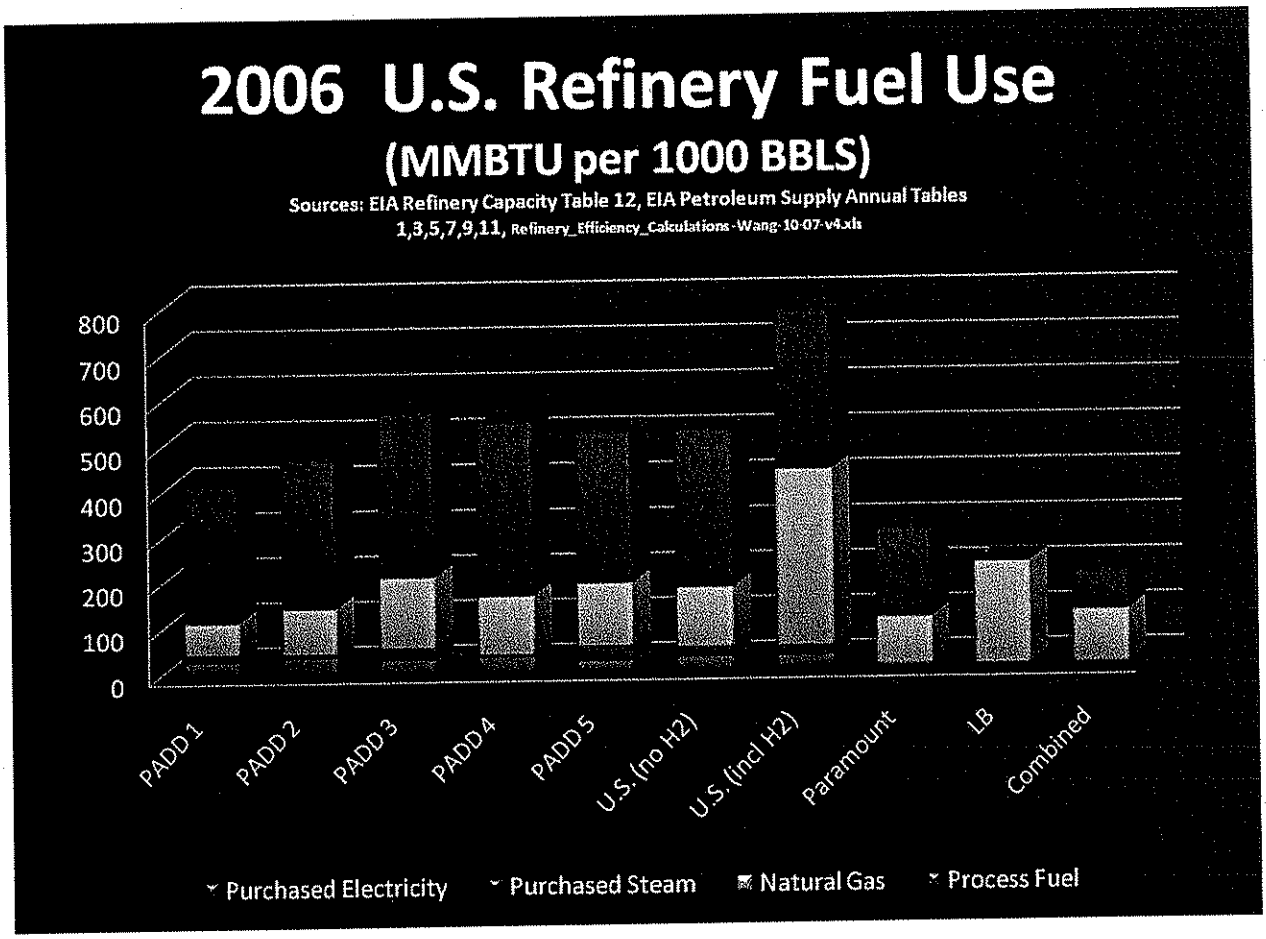



**Figure 4. 2006 U.S. Refinery Fuel Use**

Notice that the bar for the average U.S. refinery efficiency drops significantly to about 90% if hydrogen energy use is included. Since the average California refinery (excluding Paramount and Kern Oil, Bakersfield – the only non-major California refiners that have the capability to produce both CARBOB and CARB diesel and don't use manufactured hydrogen from natural gas for their processes) uses and produces substantially more hydrogen than the average PADD V or U.S. refinery, the California refinery efficiencies are probably well below the 90% U.S average. Argonne uses the 90% U.S. average refinery efficiency to establish the GREET v1.8c fuel efficiency of 87.2% for federal RFG and 89.3% for ultra low sulfur diesel (ULSD). The modified GREET v1.8b that is the basis for CARB's LCFS proposal assumes a 84.5% fuel efficiency for CARBOB and 86.7% for CARB diesel.

The proposed LCFS requires all producers to use the same baseline for the carbon intensity of its gasoline and diesel fuel. Not only are the actual carbon intensities in the LCFS inaccurate reflections of an average gallon of California produced diesel and gasoline, but by requiring all refiners to use an average carbon intensity, refiners who produce less carbon for each gallon of transportation fuel produced are unnecessarily punished.

Using this methodology, Paramount has a calculated efficiency above 96% which is substantially more energy efficient than the average California refinery. Using the average

energy intensity factors from the latest 2008 Argonne work on refinery efficiency (http://www.transportation.anl.gov/modeling_simulation/GREET/pdfs/energy_eff_petroleum_refineries-03-08.pdf) combined with Paramount's refinery efficiency, the Paramount product efficiency factors are calculated as 93.7% for CARBOB and 95.1% for CARB diesel. Even after these efficiencies are adjusted downward by a percent to "California-ize" (the GREET v1.8 model product efficiencies were reduced slightly to account for depentanizer power (for CARBOB) and additional hydrogen (for CARB)), Paramount almost has an **8% higher efficiency** than the values used to establish the baseline value for LCFS. In other words, Paramount (and other non cracking refineries) **use about half the fuel** of the average refinery in California to produce a gallon of crude oil based products. Since the refining portion of the lifecycle for CARBOB represents about 14% of the CO2 emitted, the higher efficiency of Paramount's low energy process means Paramount's products will emit about 7% less CO2 than the LCFS baseline. The grams CO2 equivalent/Megajoule (gCO2e/MJ) for Paramount's CARBOB and CARB are calculated to be less than 90. As a result, we believe Paramount's products are **already more than halfway to the 2020 target goals** of 86.3 and 85.2 gCO2e/MJ as shown in Figure 5. below This reduced complexity is, as previously documented, a competitive economic disadvantage to Paramount. CARB should not also punish Paramount by ignoring the lower carbon intensity of the gasoline and diesel fuel it produces which results in part from its inability to raise sufficient capital to purchase and erect a more complex cracking unit. It is rare that Paramount's economic disadvantage can be beneficial, but in the case of the LCFS, Paramount's relative simplicity results in less energy consumed per gallon of product.

In addition, to require Paramount to reduce the carbon content of its fuels from a lower starting point than the major oil companies is to further penalize Paramount by grouping it with inefficient high energy heavy oil cracking processes used by all major oil companies. Paramount simply wants to be treated equitably in this LCFS adoption process and wants CARB to note that as a result of its simplistic refining process, it bears very little resemblance to larger complex California refineries.

If Paramount's calculated carbon intensity values were correctly identified, because of it's process efficiency Paramount would not be in a credit deficit condition until 2018 as seen in Figure 5.

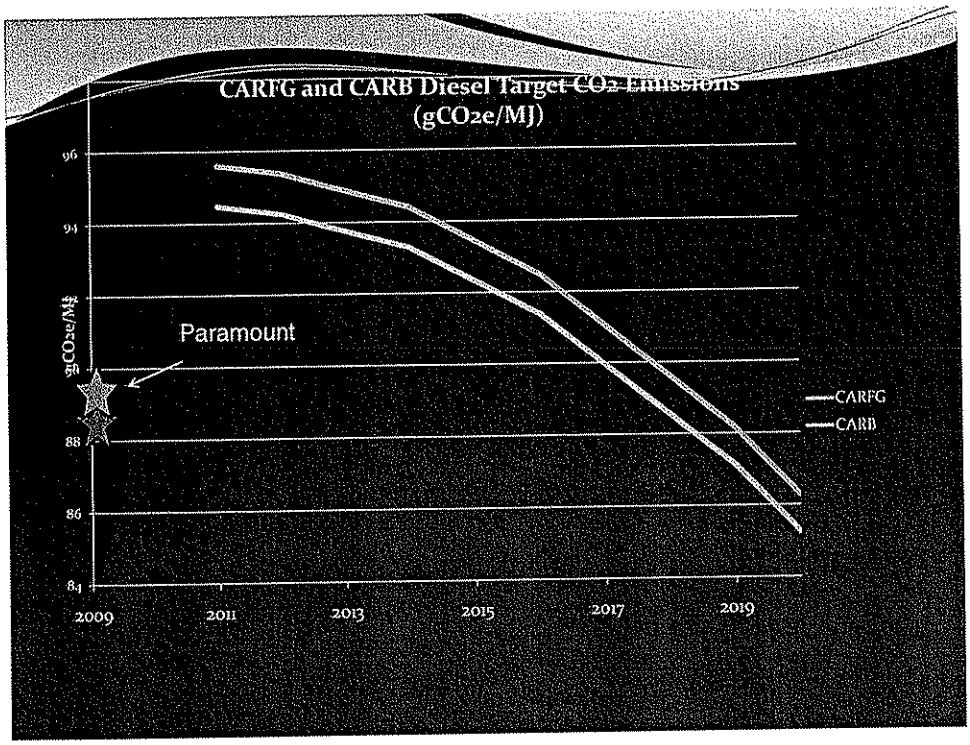



Figure 5. LCFS Target Emissions of gCO2e/MJ

**Paramount LCFS Disadvantages Relative to the Major Oil Companies are Made Even Worse Because of Paramount's Size Limitations, Logistical Limitations and Access to Capital**

Oil refining alone, without the buffer of crude oil production, is a low margin business, where small cost differences of pennies per gallon can determine the success or failure of a company. These cost differences can occur from any and all of the below listed differences between Paramount and the major oil companies. While the staff report claims that the costs of the rulemaking will be passed on to the consumer, the staff report arbitrarily ignores the different situation Paramount is in as a result of its configuration, size and access to capital and infrastructure. Even if the average costs can be passed on, the higher than average cost of compliance cannot. The proposed LCFS creates a double beating for Paramount ignoring the lower carbon intensity of its products and also ignoring the relatively higher costs to Paramount of providing alternative fuels and credits.

**Market power**

The seven major oil companies in CA will dominate the markets for both low carbon blendstocks and LCFS credits, since they will be the buyers of over 98% of the blendstocks and credits. Paramount won't have the same access or power in these markets as the next largest California refiner, ExxonMobil. The distribution of 2008 CARBOB manufacturing between companies is estimated and shown in Figures 6 and 7 below.

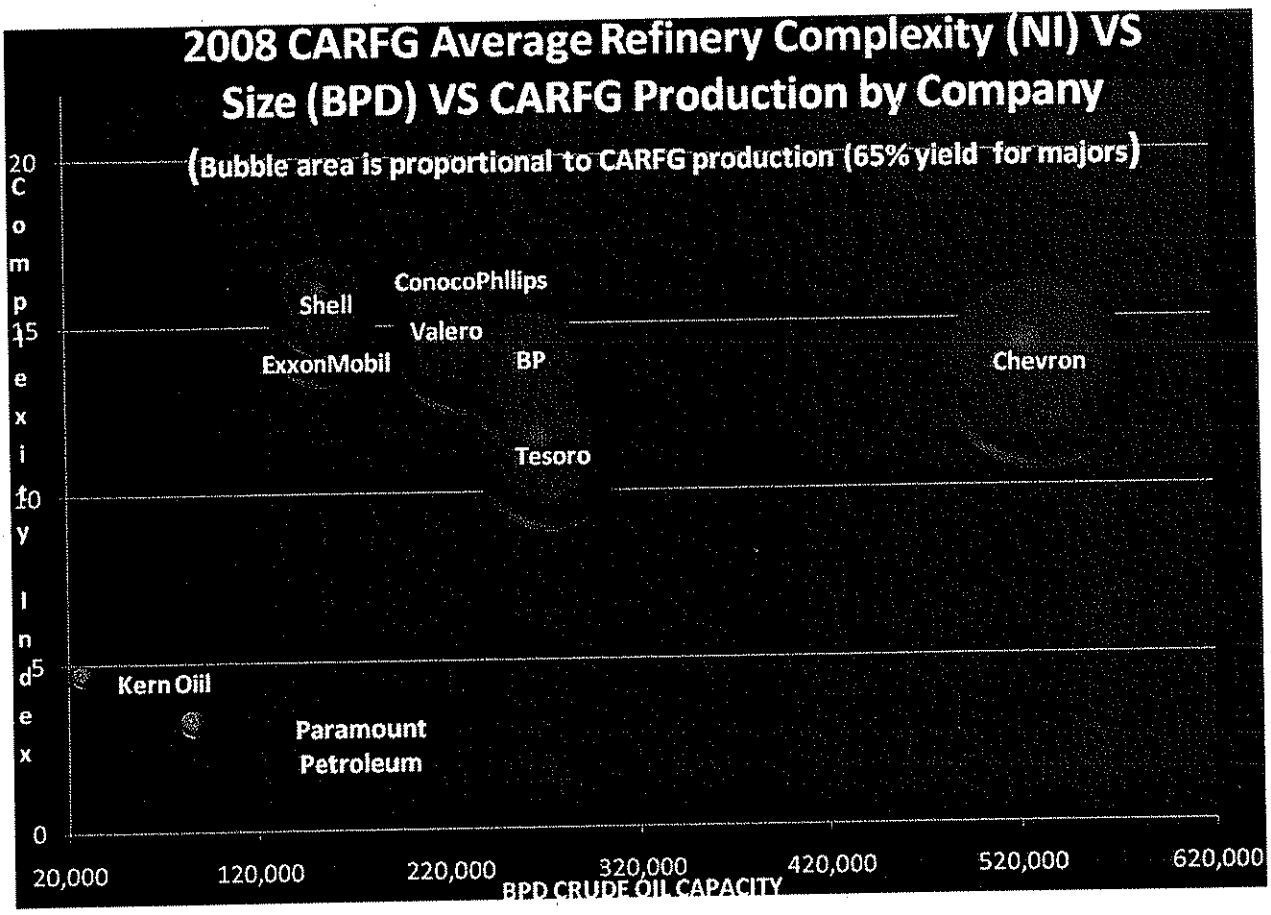



Figure 6. Estimated 2008 CARFG Production by Refining Company (volume indicated by area of the bubbles)

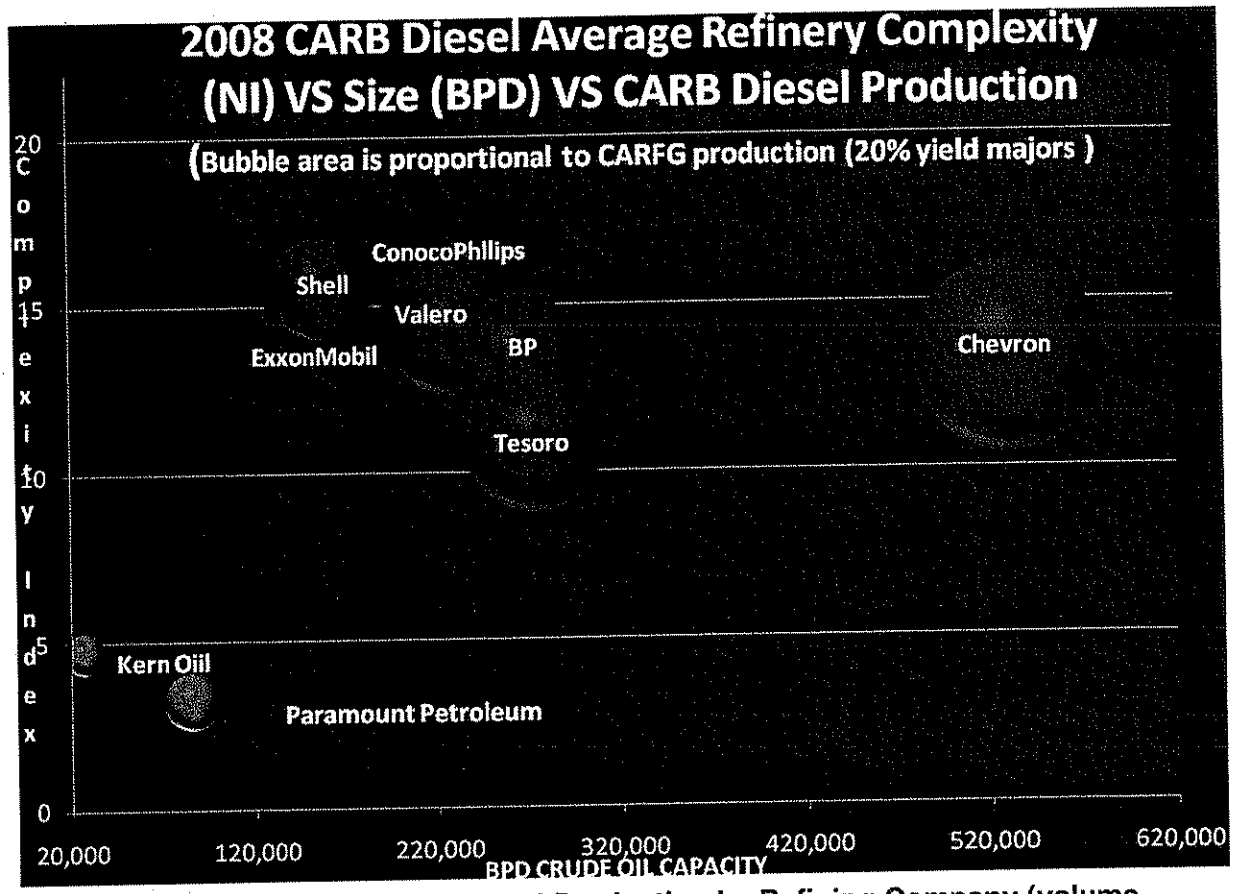



**Figure 7. Estimated 2008 CARB Diesel Production by Refining Company (volume indicated by area of the bubbles)**

**Resource disadvantage** – The seven major oil companies (and particularly the five integrated companies) have significantly more access to capital to invest in alternative fuel manufacturing facilities that will provide them with assured dedicated low carbon blendstock supplies. In addition, they have the resources to hire additional staff to administer the LCFS program, and also have staff to research, plan, design, build and operate new blendstock producing facilities.

**Scale disadvantage** – Because of the much smaller scale production of Paramount's CARBOB and CARB diesel production, Paramount won't have the purchasing power of the major oil companies and won't achieve the same low prices and supply assurances the major oil companies will have. Additionally, the costs of purchasing blendstocks, transportation, blending logistics and operation, quality control, and general administration for physical blending of low carbon fuels will be spread over fewer barrels. If Paramount elects to purchase LCFS credits rather than physically blend to the LCFS standard, there is no assurance that Paramount will be able to purchase credits at the same price as the major oil companies. Because of economies of scale, even if Paramount had exactly the same variable costs associated with LCFS compliance as the major oil companies, any additional fixed costs to plan, monitor, operate and administer the program will cost Paramount fifteen times more per gallon of product than the average major oil companies and approximately ten times the cost per gallon of the next larger California refiner, ExxonMobil. There is a clear break in the scale of production of CARBOB and CARB

diesel between Paramount and all the major oil refiners as can be seen in Figures 6 and 7 above and Figure 8 below.

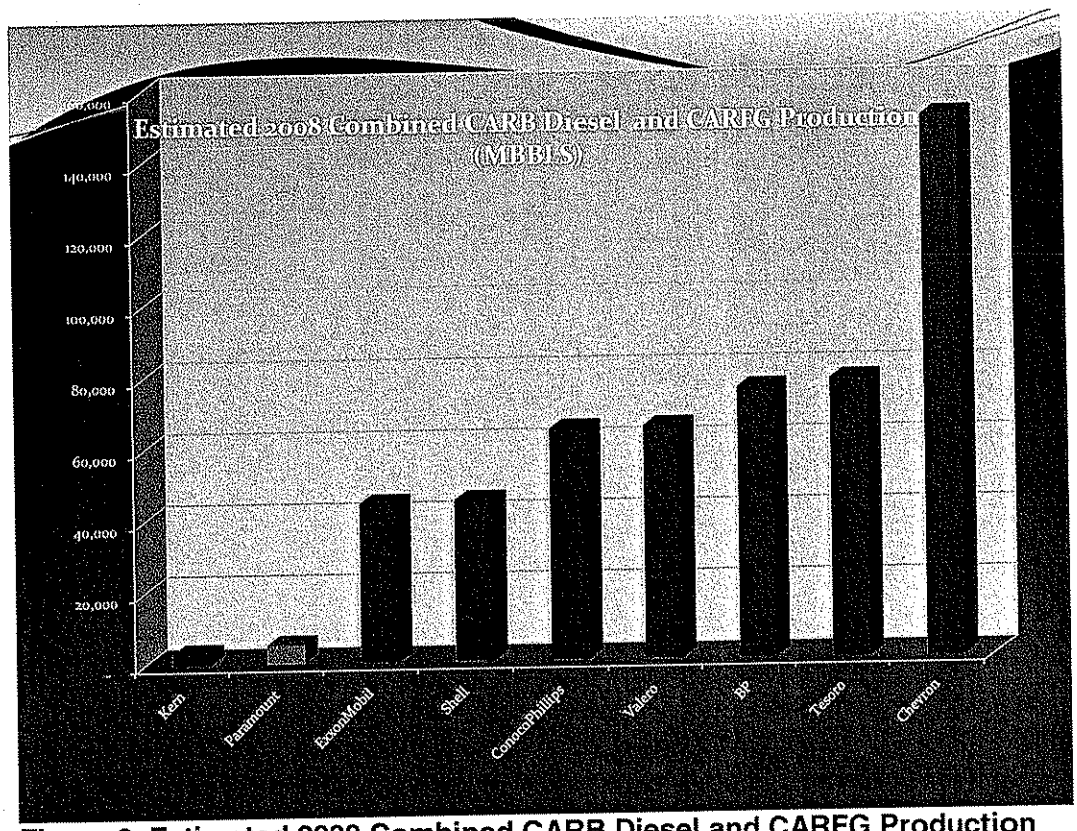



**Figure 8. Estimated 2008 Combined CARB Diesel and CARFG Production**

**Logistics disadvantage -** Paramount is not physically located near the coast and does not have dock and tank facilities to obtain blendstocks by the cheapest transportation mode. The major refineries have this capability. Paramount will likely purchase blendstocks from a major oil company that owns or controls these facilities and thus Paramount will be at the mercy of competitors for its very survival. Any seller that will be willing to provide this service or access to a competitor will most probably do it at a substantial mark up.. Additionally, the smaller volume requirements of blendstocks needed by Paramount would require inefficient delivery employing the use of smaller, less available vessels that are controlled by the sellers, or Paramount will have to share loads with the major oil companies. Paramount is also constrained by space for blendstock storage. The existing footprint of Paramounts' facilities can't be extended to provide additional tank storage and existing tanks are heavily utilized. Thus additional storage, if available must also be made available by its competitors.

**Paramount Recommends that CARB Establish a Threshold Below Which Producers of Gasoline And Diesel Fuel Will Not Be Subject to the LCFS**

Many rules and regulations enacted by CARB have a threshold at which compliance is required. Paramount recommends that CARB establish such a threshold in the LCFS. As discussed above, the low energy processes used by Paramount and other non cracking refiners to manufacture CARBOB and CARB diesel puts the CO2 equivalent emissions of their fuels more than halfway to the 2020 target. Additionally the small volume of fuels produced at these facilities (less than 1% of the CARBOB and 3% of the CARB diesel produced in California) will have little impact on achieving the 2020 goal for all fuels in California.

The relatively large uncertainty inserted in the Baseline target carbon intensity as a result of the estimates (instead of true measurement) used by Argonne to determine average refinery efficiency as well as the "Rule of Thumb" basis used for the product energy allocation dwarfs the very small change (approximately .1 gCO2e/MJ) in the 2020 goal that would be required to exempt the non-cracking refiners from this regulation. The uncertainties in other portions of the LCFS such as indirect land use and ethanol by-product allocation create much greater uncertainties in the results of LCFS than this very tiny change. Effort should be directed to the improved accuracy of the many unknowns in the LCFS determinations to increase the confidence of achieving the goal rather than to penalize already efficient fuel suppliers.
In the alternative, CARB should consider adopting a new pathway for low energy, non cracking refineries to avoid punishing such refiners for their lower carbon intensity processes and ensure that they are not further economically disadvantaged by requiring refiners such as Paramount to acquire LCFS credits or supply alternative fuels.

**Biocrude Oil**

As the LCFS is currently structured, it does not encourage the use of biocrude oil in refineries. California has billions of dollars of existing functioning large scale oil refining hardware which could be used to process biocrude to make future consumer fuels. The use of these available facilities to process biocrude should be encouraged to minimize fuels costs to California consumers and to do so, these refinery assets must be maintained. Refiners should have the option of using biocrude feedstocks to achieve the LCFS standard rather than having to blend in products manufactured from new expensive biorefineries.