



**Comments on the California Air Resources Board
Draft Proposal for the California Low Carbon Fuel Standard Regulation
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**Dr. Simon Mui, Scientist, Vehicles and Fuels
Roland Hwang, Vehicles Policy Director
Debbie Hammel, Senior Resource Specialist
Nathanael Greene, Senior Policy Analyst**

Natural Resources Defense Council

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On behalf of the Natural Resources Defense Council (NRDC), we thank the California Air Resources Board (CARB) for the opportunity to offer our strong support for the Low Carbon Fuel Standard (LCFS) and to the efforts by staff to develop a rigorous, effective program. The LCFS will help lay the foundation for California to achieve significant reductions in global warming pollution and will spur the needed transformation in the fuels market to sustainable, low carbon fuels. We appreciate the transparent and open public process established by CARB thus far, and we commend CARB staff for their thoughtful, thorough, and hard work to develop the draft rule. We look forward to continuing to provide feedback as CARB releases additional documentation and technical analysis.

Summary of Comments

NRDC strongly supports many aspects of CARB's staff draft proposal. In particular, NRDC concurs with the staff proposal on the following issues:

- The establishment of separate standards for gasoline and diesel fuels.
- No energy efficient credit for diesel fuel as a replacement for gasoline since it is unnecessary and inconsistent with the purpose of the LCFS.
- The intention to establish separate emission factors for fuels derived from non-conventional crude oil sources, especially tar sands.
- The inclusion of the indirect land use change (ILUC) GHG emissions in the alternative fuel carbon intensity (AFCI) emission factors for biofuels.

However, there are other areas we believe the staff proposal falls short and look forward to discussing our recommendations with staff. Specifically, we recommend the following:

- First, the staff proposal fails to provide minimum lands safeguards for biofuel protections that are consistent with analogous federal protections. By doing

so, the LCFS risks creating an incentive to produce biofuels using materials from sensitive ecosystems using practices that do not provide greenhouse gas reductions. To ensure this does not occur, we recommend staff simply set the emissions factor for biofuels not made from feedstocks that meet the definition of “renewable biomass” (as proposed page 36 of the of the staff draft proposal) to be not less than the gasoline or diesel fuel baseline.

- Beyond minimum lands safeguards recommended above, staff should also send a clear signal to the emerging 2nd generation biofuels industry that “sustainability” of the feedstock production will be a critical issue to address as this industry moves forward. Because the development of sustainability metrics is still an emerging field, we recommend CARB help move this process forward by establishing a clear process and near-term timeline for the development and reporting of sustainability metrics, and a longer term timeline of adopting a voluntary, incentive-based standard – based on these metrics - that provides marketplace recognition for producers who meet the standard.
- CARB should provide default emission factors for 2nd generation or advanced biofuels because these fuels can have substantially superior GHG reductions and sustainability characteristics than today’s ethanol and the LCFS should provide appropriate incentives to encourage such production.
- Staff should ensure that new, low-carbon fuel market entrants do not face barriers to trading their credits with obligated parties. We urge CARB to examine how it could help provide as much liquidity to a LCFS credit trading market, perhaps by including “transparency” provisions, or other measures to prevent barriers to the selling or purchasing of credits and practices that allow unfair market power to be exercised.

Areas of Agreement with Staff Proposal

1. We concur with CARB’s current position to not provide credit under the LCFS for selling diesel fuel into the light-duty vehicle market.

As noted in our May 23, 2008 comments on the Proposed Concept Outline, NRDC strongly opposes the application of efficiency adjustment factors for diesel fuel. Inclusion of such is unnecessary because there are two separate standards for gasoline and diesel fuels. We believe that performance based standards for fuels, relative to either gasoline or diesel, is the right approach to ensuring the correct market signals are sent to the fuel markets. The LCFS will help reduce the average carbon intensity of both gasoline and diesel fuel pools while also helping the State reach its goal of replacing 20 percent of on-road fuel consumption by 2020 with non-petroleum fuels.

For easy reference, we repeat our comments from our May 23, 2008 comment below:

Although it is our understanding the structure of the standards is not intended to provide an incentive to increase light duty diesel, we nevertheless offer these perspectives on why we would oppose a system that incentivized the use of diesel fuel:

- Incentivizing the use of diesel fuel is unnecessary because the use of diesel in the light-duty vehicle fleet will already be increasing due to the increased product offerings from automakers, the AB 1493 standards, and the new CAFE standards.
- Providing an incentive to fuel providers is inappropriate because relatively little investment is needed to increase light duty diesel fuel sales, especially compared to renewable fuels. In contrast to renewable fuels, the primary investment obligation to enhance light duty diesel use is on the automakers.
- Finally, the efficiency gap between a diesel engine and gasoline engine is quickly disappearing as gasoline engines become more efficient as either a direct or indirect outcome of federal fuel economy and AB 1493 standards. By 2020, there is likely to be very little, if any, efficiency differences between the two as gasoline engines adopt direct injection, HCCI, downsizing, and turbocharging strategies.

Because of these factors, providing a diesel adjustment factor, effectively treating diesel as a “low carbon fuel”, would simply create a “windfall” of AFCI credits for the oil industry.

The situation is clearly distinguishable for electric drive vehicles (i.e., plug-in hybrids, battery electrics, and hydrogen fuel cell vehicles). Unlike diesel, these vehicles reduce reliance on petroleum and fossil fuels, and require substantial investment by both the fuel and auto suppliers. Moreover, without such adjustment factors, the use of electricity and hydrogen would actually be disincentivized by the LCFS because their unadjusted baseline AFCI’s would actually be higher than the AFCI for the baseline petroleum fuels.

2. We support the establishment of separate default emission factors for fuels derived from non-conventional crude oil sources, including tar sands, coal-to-liquid, and oil shale.

We strongly support the inclusion of separate default lifecycle emission factors for fuels produced from non-conventional oil sources. The purpose of the LCFS is to reduce the carbon intensity of the entire transportation fuel pool. Because of the rising threat of high carbon fuels (tar sands, coal-to-liquid, and oil shale), this goal cannot be achieved without separately accounting for high-carbon fuels. Absent separate emission factors for fuels from non-conventional sources, these high-carbon intensity fuels threaten to offset much of California’s LCFS reductions thereby undermining the State’s overall AB32 targets.¹

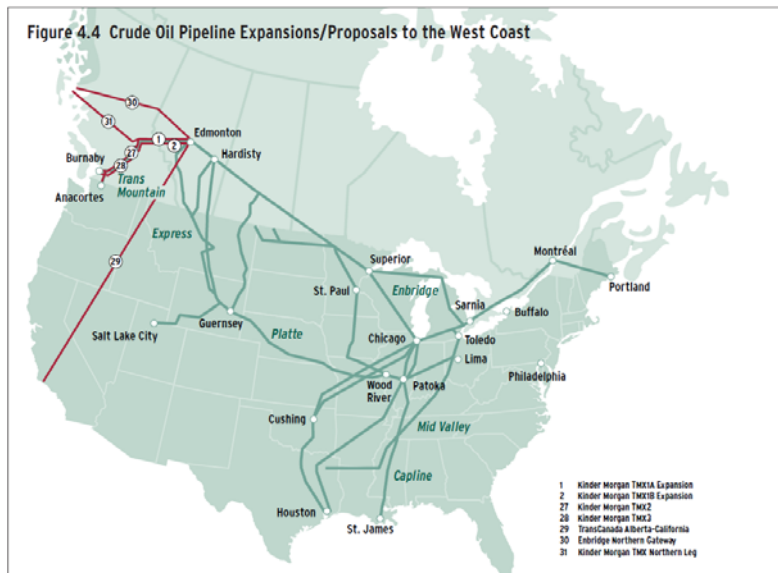
As part of the documentation, we have attached NRDC’s white paper reviewing the current literature on lifecycle analysis of tar sands.² As shown in our white paper, tar sands can be more than 20% percent higher emitting on a fuel lifecycle basis compared to the 2010 baseline for E10. This does not include direct land use change impact from in-situ and mining practices. Our white paper also demonstrates sufficient data currently exists for CARB to establish representative process-specific values or average emission factors for fuels derived from tar sands. CARB should also estimate and incorporate, to the extent possible, emissions from direct land use change associated with the production of tar sands.

¹ See Brandt, A.R. and A.E. Farrell (2007). “Scraping the bottom of the barrel: greenhouse gas emission consequences of a transition to low-quality and synthetic petroleum resources.” *Climatic Change*, 84:241-263

² Simon Mui, Doug Hannah, Roland Hwang, *White Paper: Life Cycle Analysis of Greenhouse Gas Emissions from Tar Sands*, October 10, 2008.

Although currently California refiners do not import tar sands from Canada, pipeline projects are being planned or are underway that would alter the current situation. Construction of pipelines to increase the flow of tar sands into the U.S. is already underway in the Midwest, with current construction of the Keystone pipeline expected to carry nearly 600,000 barrels per day (“bpd”) of Western Canadian heavy crude oil, including tar sands, into the U.S. Efforts are also underway to increase shipments of tar sands to the West Coast including California. The Canadian Association of Petroleum Producers state that:

TransCanada is in discussion with parties to ship 400,000 b/d of Western Canada crude oil by pipeline to California. The estimated in service date is 2014.³



As shown in the above figure, additional pipelines to the coastline of British Columbia and to Washington State are also being planned and would likely allow additional heavy-crude oil supplies to be shipped and used in California.

3. We support the staff’s proposal to include Indirect Land-use Change (ILUC) as both necessary and scientifically sound.

A well designed, effective LCFS must account not only for the GHG reduction benefits of a fuel, but also all significant greenhouse gas impacts, even if those impacts occur indirectly. For this reason, inclusion of indirect land use effects of biofuels production in the overall accounting for GHG emissions is a critical and necessary step in regulating the GHG emissions of different fuels.

³ *Crude Oil Forecast, Markets & Pipeline Expansions*, Canadian Association of Petroleum Producers, June 2008.

While there are ongoing debates about the best approach to model these emissions, peer-reviewed, published scientific papers show that indirect emissions from some sources of biomass are real and large. While some critics argue for ignoring ILUC in the LCFS, omitting or delaying the inclusion of indirect land use effects would be equivalent to assigning these effects a zero value, which the science clearly does not support. This would send the wrong signal to the market and would encourage undesirable ventures that have the unintended consequence of increasing GHG globally.

In its ILUC emission factor methodology, CARB has made well documented and well researched decisions that draw on the best science and economic models available. The three critical aspects of CARB's approach are: 1) the decision to only assess emissions from ILUC among the range of possible economically mediated emissions; 2) the use of GTAP, Woods Hole Research Center data for breaking down land-change by land type on a regional basis and other major modeling assumptions; and 3) the treatment of the model results for emissions over time. Regulators often must make decisions in the face of some scientific uncertainty, sometimes using imperfect and incomplete information. CARB staff is facing such a situation with ILUC, but by using the best science and economic models available, staff's approach results in a reasonable and accurate value for the emissions from ILUC.

The decision to use GTAP, Wood Hole data, and the related model inputs discussed in CARB's supplemental material appear to be carefully researched. GTAP has the advantage of being an open and transparent model and Woods Hole's land-use change is widely respected around the world. These models are currently considered best in class.

ARB's treatment of time - to average total emissions over 30 years and divided it by the total energy (MJ) of fuel produced - has the advantage of simplicity. Thirty years is certainly the longest averaging period that should be considered. This period is about the expected life of an ethanol plant and the uncertainty about both fuel production, feedstock sourcing, and the avoided emissions. That said, we encourage ARB to continue to research other methods for dealing with the value of emissions over time.

Finally, we also recommend that CARB commit to a robust, on-going process to review the state of science and data on ILUC, and update the regulations as necessary.

Areas of Disagreement with Staff Proposal

1. We strongly recommend that the LCFS not provide a GHG incentive for producing biofuels that do not meet the definition of renewable biomass.

We urge the Air Resources Board to include a definition of "renewable biomass" in the LCFS to help prevent potentially negative environmental impacts. We recommend that any biofuel that does not meet the definition of "renewable biomass" be scored the same as the petroleum baseline or its current fuel cycle emissions, whichever is higher.

As the first low carbon fuel standard to be developed in the U.S., the LCFS must not inadvertently incentivize practices that negatively impact sensitive ecosystems or require the conversion of natural forests and native grasslands to produce biofuels. Such unintended incentives would put these important natural lands at risk and conflict with the primary purpose of the LCFS, to reduce global warming pollution.

To ensure maximum consistency between state and federal biofuels policy, the definition of “renewable biomass” should be the same as that set forth in the federal Renewable Fuels Standard (RFS) passed in the Energy Independence Security Act of 2007, with additional protections for natural resources unique to California. The biomass sourcing protections contained in the RFS definition of renewable biomass were carefully crafted through a broad stakeholder process to provide a minimum level of protection for wildlife habitat, natural forests, native grasslands, and important public lands, while allowing biofuels requirements to move forward.

It is important to understand the following of our recommendation:

- Including a definition of renewable biomass in the LCFS is not equivalent to a ban on the use of such fuels in California. Rather, it simply ensures that the LCFS does not provide an incentive to produce fuels that harm California’s forests and other sensitive ecosystems.
- The RFS protections do not significantly affect what is likely to be the most economic resource base for biofuel production such as existing tree plantations and slash and pre-commercial thinnings on private forestlands.
- The exclusion on the use of thinnings from federal forestlands outside of wildland urban interface zones is consistent with current science, which fails to show an overall greenhouse gas (GHG) benefit from fuels management in the general forest.
- The RFS protections allow for the use of biomass from the immediate vicinity of buildings, camps, and infrastructure where thinning for wildfire protection is needed for community protection.

2. We recommend that the LCFS regulations set forth a near-term rule development process for the further development and reporting of sustainability metrics.

We respectfully request that the LCFS regulations incorporate a near-term rule development process for the further development and reporting of quantifiable sustainability metrics. Such action is key to promoting the sustainable development of low carbon fuels - including sustainable biomass based alternative fuels - over the long-term, and preserving our public forests, agricultural systems, waters, and critical ecosystems.

While we recognize that the development and reporting of detailed sustainability metrics may be difficult for the LCFS at the outset, this does not negate the need to clearly state intent to develop detailed metrics, and to provide a clear and timely process for such development and a corresponding reporting mechanism. This clarity is important in signaling to fuel producers that sustainably produced fuels will be required as part of

the LCFS and provide the foundation for the longer-term development of a voluntary, incentive-based mechanism that would reward and recognize producers who meet a sustainability standard. NRDC is committed to working with you to develop sustainability metrics and a reporting system for the LCFS that is practical, meaningful and could provide the basis for a future incentive-based framework. Several sustainability frameworks have been and continue to be developed, such as the Roundtable on Sustainable Biofuels.

Emerging technologies are improving our ability to produce transportation fuels with significantly lower greenhouse gases than the fuels in use today. However, these technological advancements also increase the potential to degrade biodiversity, habitat, water quality, and soil quality, if fuels and feedstocks are grown, harvested, or produced in an unsustainable manner. Incorporating basic sustainability metrics into a LCFS reporting system that could then be used to provide marketplace differentiation – on a voluntary basis - would indicate to investors that there exists a future opportunity for the commercialization of alternative fuels that would be deemed highly desirable in the marketplace.

3. CARB should provide default emission factors for 2nd generation or advanced biofuels

To ensure that inclusion of indirect effects will illustrate which second-generation feedstocks incur the least indirect land use change, we recommend ARB develop a detailed assessment of the promising feedstock sources and feedstock management practices. This assessment should carefully assess the ability of these sources and practices (individually and mixed and matched) to minimize or avoid emissions from ILUC and maximize the direct emissions reduction or sequestering.

There are ample supplies of biomass that incur little or no emissions from indirect land-use change to comply with the requirements of the LCFS. Properly done, accounting for indirect land-use will improve the ability of investors and developers to distinguish promising approaches from dead ends and drive investments and innovation towards these feedstocks and technologies. If new modeling runs are not available in time for the final rule, we believe that both the environmental and business community would be well served by a commitment to do so shortly thereafter.

4. We urge CARB to examine how it could help provide as much liquidity to a LCFS credit trading market, perhaps by including “transparency” provisions, or other measures to prevent barriers to the selling or purchasing of credits and practices that allow unfair market power to be exercised.

We believe that CARB should work to ensure a competitive, transparent market exists for LCFS credits. Ideally, all LCFS credit generators would sell or purchase into the market at a single commodity price and LCFS credit or price discrimination would be prevented.

We encourage CARB to monitor bilateral transactions to ensure that there are no significant differences in the LCFS credit price at a given point in time, which could signal unfair competition occurring in the LCFS market. Provisions could be added to the LCFS to signal this intent or to provide mechanisms to monitor, and as needed, to take action to remedy market barriers. For instance, we would urge CARB to take action if some credit generators are not able to find buyers or if price discrimination does occur. This is conceivable particularly because many of the LCFS generators would be expected to be relatively small or new entrant firms. One possible mechanism would be to have transactions posted electronically to allow for real-time pricing information to be signaled through the market.