

May 6th, 2008

Mr. Simeroth, Curtis, and Ms Zhang-Tillman
California Air Resources Board
1001 "I" Street,
Sacramento, CA 95812

Subject: Low Carbon Fuel Standard Proposed Concept Outline

Dear Mr. Simeroth, Mr. Curtis and Ms Zhang-Tillman,
Energy Independence Now would like to thank you for the opportunity to comment on the "Proposed Concept Outline" for the LCFS, as presented to stakeholders on March 25th 2008. We commend you on your work to date in designing this standard, and offer the following comments in the spirit of further improving the LCFS and its ability to meet the State objectives.

The following is a summary of our comments:

1. Applicability of the LCFS

We support the inclusion of hydrogen, if the regulations can be matched with SB1505.

2. Fuel Standards

We urge CARB to review its proposal to track the vehicles which fuel is sold to. We believe this is an unnecessary burden both for obligated parties and for CARB, distracts from the LCFS fuel focus, and could be accomplished using different means. Instead CARB could:

- Use DMV data to calculate a Weighted Average Drivetrain Efficiency adjustment
- Use this figure to adjust both the AFCI AND the targets, to net out changes in vehicle populations and drivetrain improvements.
- For alternative fuels, use an average statewide target with an adjustment to account for the nature of the displaced fuel.

2.9. Volume Obligation for Ultra Low Carbon Fuel.

While we support CARB's attention to ULCF, we are concerned about the practicality of the implementation, and offer an alternative for CARB to also consider.

1. Set a long term target, to align ULCF development with the 2050 goals
2. Define ULCF in relation to that long term requirement
3. Allow ULCF special banking and trading rights, for revenue certainty
4. Design a separate program to address non-financial market barriers to ULCF

We also offer specific comments on the proposed volume requirement.

5.2. Calculation of Carbon Intensity

We urge CARB to be clear and consistent about the terminology used for the efficiency adjustment factors. The Proposal uses the term "vehicle efficiency" for what we understand is actually the "vehicle drive" efficiency discussed in the UC report. A better term would be "drivetrain efficiency" adjustment, to clearly separate it from other vehicle efficiencies.

5.3.6 Sustainability & the RFS

We urge greater attention to incorporation of sustainability safeguards and suggest that a regular process and review of sustainability be incorporated into the LCFS, to incorporate measures from the RFS, SB1240 and other US and international standards as they evolve.

1a. Obligated Parties

EIN supports the inclusion of hydrogen immediately, with the following qualifications to ensure its inclusion does not create a net disincentive for development of the industry:

- Hydrogen should be treated the same under LCFS as under SB1505. In effect this would mean setting an “Applicability Exemption” of 3,500 metric tons/yr, at which point hydrogen would automatically be required as part of the LCFS. The option to opt-in before this should remain open.
- In addition to that state-wide applicability exemption, a threshold for individual hydrogen producers should be set at the same quantity as that set for SB 1505, to ease the necessary development of pilot-level plants & processes. This minimal quantity is 100 kg/month.
- No specific date-based thresholds are necessary or appropriate, either for the state applicability exemption or for individual obligated parties.
- The LCFS requirement which hydrogen producers face should not add any duplicate or burdensome reporting beyond that already required for SB1505, or it may create a net disincentive for development of the sector.

This requires alignment between SB1505 and LCFS on:

- a. The quantity threshold at which reporting becomes required (as stated above).
- b. The definitions of fuel pathways (feedstocks, process, distribution & storage).
- c. Usage of same LCA model for both LCFS and SB1505.
- d. Definitions of obligated party (‘providers’ & ‘producers’) for LCFS and SB1505.
- e. Alignment on reporting frequency and methodology (including the need to distinguish between light and heavy duty, if required by LCFS).
- f. How to include renewable energy credits (RECs), in assessing the carbon and ‘renewable’ nature of the electricity used in hydrogen electrolysis.

A “one-stop shop” should be established at CARB for customers dealing with both regulations, so that decision-making on eligibility, reporting processes, re-defining ‘default value’ can all be done in a coordinated way.

2. Fuel Standards

We urge CARB to review its proposal to track which vehicles fuel is sold to. We believe this is an unnecessary burden both for obligated parties and for CARB, that it distracts from the LCFS fuel focus, and could be accomplished using different means.

Problems with the Current Approach

We understand that the rationale for creating the current system incorporates several objectives:

- Consistency in the use of drivetrain efficiency adjustments for all vehicle classes.
- Recognize light duty diesel's lower APCI profile, but not rewarding it.
- Reflecting the true impact of alternative fuels, by considering what fuels they replace.

However it appears these objectives have led CARB to design a complicated tracking system for the LCFS. The proposal now defines which standards – gasoline or diesel - each vehicle class should be compared against, and requires that fuel sales be tracked at the level of the vehicle, to identify if it is light-, medium- or heavy-duty. As a result, the LCFS Concept Proposal now reads as much about light duty and heavy duty vehicles as it does about fuel improvement.

We urge CARB to revisit its vehicle tracking approach, and consider the following:

- **Distraction:** Having fuel producers worry about where their fuel goes is a distraction that takes the emphasis off improving their fuel sourcing or refining processes.
- **Rationalization:** Having fuel producers worry about where their fuel goes may lead to unintended rationalization, as companies assess their APCI number and modify their market strategies, distribution & ownership structures rather than make investments in their fuel.
- **Uncertain Investment environment.** This system makes fuel producers responsible for changes in the market place that are beyond their control. Whether it leads to unexpected windfall profits or the opposite, it is an uncertainty which makes fuel-focused investment more costly.
- **Administration:** Requiring obligated parties to be responsible for where their fuel ends up is a heavy administrative burden. The fungibility of the fuels after they leave refineries, and the many layers of distributors and marketers make tracking this difficult for CARB and producers.

Alternative Proposal

We suggest CARB simplify the LCFS, by removing the tracking of vehicle classes, and refocusing the LCFS on changes to the fuel itself. We believe all of the above objectives can be achieved in a simpler way, while improving the investment certainty for all obligated parties.

The following approach could be used to do this:

1. Calculate and use a **Weighted Average Drivetrain Efficiency adjustment: K_{fuel}**
 - Instead of tracking the actual volume of fuel sold to vehicles, CARB could use DMV data on vehicle populations and average fuel usage of heavy duty vs. light duty vehicles to estimate the volume of fuel sold to each vehicle class & drivetrain category.
 - These figures could then be calculated together with the drivetrain efficiencies of each vehicle class & drivetrain into a single number, K_{fuel} , for each fuel. The number would represent aggregate utilization efficiency in converting a given fuel's chemical energy (WTT) into useful motive energy (WTW).¹

¹ See section 5.2 on why “drivetrain adjustment” should be used, not “vehicle-efficiency”.

- The AFCI calculation of a fuel in a given year would then be a simple multiple of the fuel's BAFCI (WTT) figure and this K_{fuel} adjustment.

2. Calculate the AFCI AND the targets using this K_{fuel} figure

- CARB could calculate these K numbers each year, and indicate to industry that these K figures would be used the following year for each fuel type, not only to calculate each fuel's AFCI, but also to adjust the target for that fuel if the K has changed
- This would effectively ensure that *for a given fuel*, any changes in vehicle populations using that fuel, or changes in the drivetrain efficiency of vehicles that use it, would have no effect on the fuel maker's requirement to improve the carbon intensity of that fuel.
- This would avoid any windfall or unexpected penalties for fuel makers due to circumstances out of their control.
- At the same time, it would still account accurately for the true differences *between* fuels and drivetrain classes, in terms of carbon emissions in providing motive energy.

3. For Alternative fuel, use a statewide figure and adjustment to account for displaced fuel.

- CARB should continue to keep separate baselines for gasoline and diesel, and to compare gasoline and diesel changes against their own baselines, as outlined in the proposal. This clearly drives innovation for both fuels, without having them compete.
- For all other fuels, a **weighted average "Statewide baseline"** and yearly "Statewide Target" should be used. In the UC technical report, this weighted average baseline is around 87 gCO_{2e}/MJ.
- The statewide target would fall each year, as the actual AFCI of gasoline and diesel changed.
- To account for which fuel is actually displaced by alternative fuels, each fuel could receive an adjustment in its calculation based on whether it is primarily displacing heavy duty diesel use or light duty gasoline use. The same data on DMV vehicle populations & estimated fuel usage would be used for this adjustment.
- While the effect is the same as the CARB proposal, this sends a clear message to alternative fuel producers: they will be rewarded for the drivetrain advantages of the technology that uses your fuel, and for what you are displacing, and the two adjustment factors are clear indicators of these credits.

We believe a system based on the above has many benefits:

- **Administratively easier**, avoiding the need for vehicle sales tracking
- **No incentive for fuel producers to rationalize** or focus on distribution channels.
- **Fuel focused**, with limited discussion of LD vs. HD usage.
- For a given gasoline and diesel producer/blender:
 - A clear focus on that fuel's improvement
 - Not affected by changes in vehicle populations or drivetrain changes.
 - Investment certainty.
- For an alternative fuel producer
 - The efficiency of the drivetrains are accounted for and rewarded.
 - Its impact in displacing gasoline vs. diesel is accounted for and rewarded.

We encourage CARB to develop this concept further, and would welcome an opportunity to discuss it in person.

2.9 Ultra Low Carbon Fuel

EIN applauds the Air Resources Board's consideration and specific attention to the development of ultra low carbon fuel (ULCF).

Rationale for ULCF designation

Before commenting on the specific feedback requested by CARB, we think it is important to reiterate what we believe to be the rationale for a specific ULCF carve-out.

- Ultra low carbon fuels are necessary to reach our long term goals. They must be encouraged now even though they may not be necessary to meet the intermediate 2020 goal of 10% reduction in APCI.
- Greater investment may be required to develop ULCF than to achieve the same 10% APCI reduction using existing biofuels. As explained in the UC recommendation 18, this risks directing investment towards our medium term solutions at the expense of our long term ones, and further locking in our current petroleum dependency.
- Non-biofuel ULCF, which cannot be blended into gasoline and diesel, depend on a functioning market and buyers of their credits to get any value from the LCFS. This is highly uncertain.
- Some ultra-low carbon fuels face a suite of non-financial market entry barriers that need specific attention. The LCFS cannot work if these are not addressed.

Given the above, a ULCF requirement is needed, not to pick a specific technology, but rather to spur ULCF investment, drive diversification, and set the stage for meeting our long term goals.

What is the objective of the carve-out?

Given the rationale above, we support CARB's proposal to specifically address ULCF within the LCFS. However we believe it is premature to select an approach, provide specific definitions of ULCF, or designate volumes or dates which should be mandated, without knowing what CARB's intended objective, mechanism and flexibility for meeting these requirement are.

We urge CARB to communicate its own assessment and rationale for a ULCF program alongside the method it chooses to achieve its objectives. Input should be sought from potential ULCF investors on whether the primary barriers to underinvestment in ULCF are:

1. Lack of long term policy target, making investment for the long term ULCF market less certain.
2. Insufficient financial incentives for ULCF investment, and if credit revenue is too small or too uncertain.
3. Specific non-financial barriers, if market barriers other than financing are impeding their development.

We recognize that the difficulty in defining a single objective is that each ULCF may be facing different types of barriers. For example:

- For ultra low carbon *biofuels*, additional credit may be sufficient to further tilt the R&D and purchasing decisions towards ultra low carbon, 3rd generation fuels. The market trading of LCFS credits is less relevant for these biofuels, as their APCI value will be incorporated into the price of physical biofuel delivered for blending.
- For electric transport, the revenue depends on a buyer of credits, so certainty may be what is needed. In that case, market design and competitive dynamics for the LCFS may be more important than a ULCF carve-out.

- For ultra low carbon hydrogen and natural gas development, revenue may be important, but very specific infrastructure investments and codes (fire, safety, waste treatment, etc) may be key barriers, as may the timing with compatible vehicles. These barriers may dwarf the additional revenues which a ULCF credit scheme could generate.

While we believe CARB's proposal for the ULCF carve out has merits, we would also encourage consideration of an alternative approach, as outlined below:

Alternative Proposal to the Volume Requirement

1. Set a long-term LCFS requirement

The most important incentive to encourage optimal ULCF investment is to set a long term requirement as a target.

A 2050 target for a 60% reduction in AFCEI, for example, establishes a radically different paradigm than the current 2020 target of 10%. If gasoline and diesel producers expect a target that cannot be met only by incremental technology and low-level blends, they will invest in the revolutionary ULCF technology that is needed. Such a target, although it may not guarantee early investment in ULCF, is a simple, technology neutral, performance-based approach. It also recognizes that many of the investments being considered have a strategic importance for a company that is far greater than the 12 year LCFS horizon.

We therefore urge ARB to take full advantage of its mandate in implementing an early action item of AB32, and establish a long term target that is linked to the achievement of AB32.

2. Define ULCF in relation to that long term requirement

The definition of "Ultra Low Carbon Fuel" should be linked to the target requirement, such that what is exceptional today becomes the norm by then. In the UC Technical Analysis document for the LCFS, the "Reduced Fuel Consumption Scenario", which called for a 70% reduction in fuel use compared to business as usual by 2050, implied a need to reduce the AFCEI to 4kgCO₂/gge in order to meet the AB32 target. We understand this to be equivalent to 30.3 g/CO₂/MJ, or approximately a 33% reduction from the gasoline baseline.

An Ultra low Carbon Fuel, if defined as being anything that is one third or less of the current profile of gasoline, would strike a balance between incorporating many of the currently feasible technologies, and having a logical link to the long term target being sought.

3. Allow ULCF special banking and trading rights, for revenue certainty

Since LCFS credits revenues may be a) insufficient to compensate for ULCF investment, or b) too uncertain to factor in valuing investments, CARB should consider:

- **Limiting AB32 Trading to ULCF.** CARB's proposal to allow the export of over-compliance LCFS credits to AB32 could be limited to ULCF producers. The export would reduce the uncertainty which ULCF producers face in selling them to competing petroleum producers. This would also reduce the danger that LCFS exports would substantially weaken the AB32 target. It may also encourage firms who are currently not in the transport sector but under an AB32 cap to get involved (e.g. Utilities, gas manufacturers, waste facilities).
- **Price Guarantee for ULCF.** If exporting to AB32 is not permitted, CARB should consider another backstop for ULCF revenue. An arrangement whereby the proposed Carbon Trust will guarantee to buy credits, but only from ULCF, would allow investors to place at least

some base value on that revenue stream. This could be defined as a parity price to the AB32 cap and trade price.

- **Banking rights.** In addition, to spur early action, CARB should consider guaranteeing that ULCF credits can bank their credits from the first phase of the LCFS into a phase beyond 2020, whereas others may not.

These preferential treatments would provide some basic revenue certainty to investors supporting the scale up of new fuels. They would be particularly useful to the non-biofuel alternatives which face the insecurity associated with trying to sell their credits to their competitors.

4. Design a separate, complementary program to address other, non-financial market barriers to ULCF.

The LCFS will provide a financial incentive to ULCF development, but this is likely to be insufficient given the many non-financial barriers limiting the entry of new technologies. We recognize that these barriers are technology specific, and not easily incorporated into the performance-based LCFS design.

We would urge ARB to design a parallel, complementary ultra low carbon fuel program to address these non-financial regulatory barriers in a systematic, proactive way.

- **Regulatory disincentives**, such as those that penalize growth in energy sales in the electricity and natural gas sectors.
- **Specific infrastructure bottlenecks**, be they pipeline standards, storage facility needs, linkages with waste treatment plants, smart meters or incentives at the fuel retail level.
- **Co-ordination:** New fuels require close coordination with vehicles that are able to use them, to overcome the “chicken-egg” type barrier. Addressing any linkages between fuels policy and vehicle policy through this program would further the goals of both.
- **Fuel Regulations.** Fire, safety, waste treatment and other codes for retail stations, which are not applicable to gas or hydrogen storage and delivery systems, would need review.

Specific comments on the Proposed ULCF volume requirement.

As stated earlier, we believe CARB should provide better context on the ULCF carve-out in seeking detailed stakeholder input:

1. **Clearly communicate its assessment of the barriers** ULCF face.
2. **Define its objective more clearly**, indicating if the carve-out is intended primarily to drive revenues to new entrant ULCF producers, or rather to push petroleum producers to diversify.
3. **Specify the details of the compliance mechanism**, including the practical design of the ULCF sub-market system of trading of over/under-compliance credits.

The following are our comments on the proposal as it stands:

1. **Any ULCF requirement should be on each obligated parties, not on a state-wide aggregate.** A state wide aggregate diffuses the responsibility to invest in ULCF, and is difficult to translate into a specific revenue stream for ULCF developers. Furthermore, if the target is not met, it is

unclear who is responsible for making up the shortfall. We therefore support the concept of each obligated party being help responsible for its specific ULCF target.²

2. The flexibility in the mechanism must be known before a target & definition can be set.

The right balance needs to be found in whether the requirement is used to drive revenue towards ULCF manufactures, or to force all producers to do something themselves. Flexibility is the key to this balance, and could include:

- i. Flexibility through trading of ULCF credits. We assume that CARB intends to provide some level of tradable credits for obligated parties to meet their individual ULCF requirement. If so, the trading mechanism for ULCF should be matched to the general LCFS requirements, regarding all aspects of point of regulation, monitoring, reporting, banking and other compliance processes. We would not support a volume requirement that has no trading ability, as it would lead to highly inefficient investment.
 - ii. Flexibility through infrastructure investments. Another option to add to tradable ULCF credits is to allow fuel producers to invest in ULCF-specific infrastructure as an alternative to producing ULCF fuel. However, now that the ZEV trigger mechanism has been oriented to achieve this, this option may be less useful.
 - iii. Flexibility through vehicle-related investments. CARB could also consider if fuel companies could meet their ULCF requirement through investing in other enabling technology for ULCF fuel. For example, this might include conversions of existing vehicles to make them more flexible in their fuel intakes, or optimized to new blending levels or other low carbon formulations. OEM input should be sought by CARB to explore the potential of such a use of the ULCF carve-out.
- 3. The definition of ULCF for a volume requirement depends on the objective of the carve-out.**
If the carve out is aimed at getting a large volume of substantially improved fuels and pathways to market, a loose definition such as 50% of gasoline's AFCI could be used. If the objective is rather to provide a specific push to revolutionary technologies, many still in pre-commercial phase, then a narrow definition should be used. We urge caution against defining ULCF in relation to a moving target, as it would mean a given technology may qualify one year but not the next. Once the definition is set, the AFCI value to qualify should remain fixed.
- 4. Target set in relation to a multiple of LCFS credit value.**
If the intent of the carve-out is primarily to provide a second financially valuable tradeable credit, CARB could consider establishing the target such that the ULCF credit is expected to fetch a given premium above the regular LCFS credit.

² CARB should refer to its experience in defining the SB1505 hydrogen requirement for a 33% renewable requirement. Based on that experience, the language for the ULCF requirement should be clear that each producer, not distributor or retailer would need to meet the ULCF requirement over its average state-wide production.

5.2 Vehicle Drivetrain Efficiency Adjustments (Section 5.2)

CARB should clarify that the efficiency adjustments used are drivetrain-efficiencies, not vehicle efficiencies. We support the use of a drivetrain-efficiency adjustment in the LCFS, and believe clarifying this distinction would benefit the LCFS, reduce the concerns of its overlap with vehicles-focused policies, and secure more widespread support for the methodology.

- The LCFS should encourage the development of fuel pathways that are more carbon-efficient in the overall transformation of primary energy into transportation services. As such, we agree with CARB that including a drivetrain efficiency adjustment is critical in recognizing and rewarding some of the long term alternative fuels we seek, since electric engines, with or without fuel cells, are significantly more efficient in that transformation than internal combustion engines, regardless of the weight & shape of the vehicles they power.
- CARB should revise its terminology and clarify to stakeholders that the efficiency adjustment it will use is a drivetrain efficiency, not a vehicle efficiency adjustment. In that case, the Megajoule designation in the AFCI number (gCO₂e/MJ) refers neither to the energy content of the fuel, nor to the miles travelled, but to the motive energy. This was clearly outlined in the UC Technical report section 2.4, but is less clear in the current proposal.³
- As such, the overlap with vehicle efficiency policies (such as Pavley) is limited to drivetrain efficiency, and does not include the many other aspects of vehicle efficiency that vehicle policies reward: hybridization, aerodynamics, weight, system optimization, etc. All of these other parameters optimize how the motive power obtained from the fuel & engine combinations translate into miles travelled and other services (comfort, safety, utility). We note that much time is wasted at workshops due to this misunderstanding and urge CARB to clarify it.

5.3.6 Sustainability:

The current designation that the LCFS will be based on the sustainability criteria of the RFS is not sufficient. Though we would generally support incorporating the RFS safeguards into the LCFS, additional language will be required to cover state jurisdiction, as well as impacts from non-biofuels, water impacts, air quality impacts and more.

For sustainability in the LCFS, CARB should:

1. **Organize a dedicated stakeholder workshop** to seek stakeholder input on the breadth, boundaries, options and sources for shaping the sustainability provisions of the LCFS.
2. **Establish a periodic review of the LCFS sustainability provisions**, to incorporate developments from other state, national and international sources. We urge CARB to consider the provisions of SB210 and the proposed SB1240 as an initial platform, as they already incorporate significant stakeholder input.
3. **Outline the breadth of the sustainability provisions it will be developing** (air, water, biodiversity, etc), as well as working definitions of the key terminology that will apply to the

³ Please note that we echo the concerns of others with the use of the energy measure “gasoline gallon equivalent” (gge). In the LCFS context, the term’s reference to both gasoline and to volume is confusing. Megajoules should be used instead.

LCFS. For the latter, the RFS should be used as a initial definition of renewable fuel and renewable biomass.

We recognize that incorporating sustainability in any policy is a challenge, but urge CARB to give this area much greater attention, and set up a clear process for continual improvement of the sustainability safeguards of the LCFS. As it stands, the limited attention to sustainability is a glaring weakness in the LCFS, and jeopardizes the environmental justification for the standard.

Other: Interaction of RFS & LCFS.

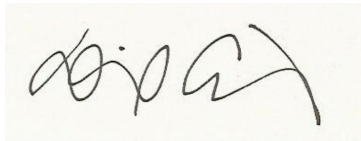
We have concerns that the combined effect of the RFS and LCFS will have unintended impacts on the efficacy of the LCFS in meeting its objectives. Specifically, CARB needs to outline a framework on how fuels will qualify for both regulations. This may require limits that ensure a balance between at least three objectives:

- Preventing excessive rationalization of US biofuels (in which the lowest carbon intensity fuels are shipped to California while the others go elsewhere),
- Sending a significant price signal upstream that indicates Californians pay a premium for low carbon biofuel, so investment will be rewarded
- Continuing to promote Californian biofuel production.

This is a non-trivial challenge that must be addressed in an open forum.

We hope that the above comments and suggestions are helpful to you and your staff as you continue to develop the LCFS regulation, and look forward to further engagement with your team to follow up or explore these proposals in greater depth.

Sincerely,



Daniel Emmett
Executive Director



Remy Garderet
Clean Transportation Program