November 10, 2009

Arthur Marin, Executive Director
NESCAUM
89 South Street, Suite 602
Boston, MA 02111

Submitted via electronic mail to: amarin@nescaum.org; lcfs@nescaum.org

RE: New Fuels Alliance Comments Regarding Proposed Northeast/Mid-Atlantic Low Carbon Fuel Standard

Dear Mr. Marin and Interested Parties,

The New Fuels Alliance (NFA) appreciates the opportunity to provide preliminary written comments regarding the proposed Northeast/Mid-Atlantic Low Carbon Fuel Standard (Northeast LCFS).

NFA is a not-for-profit organization that educates political leaders, regulators, public interest groups, businesses, and the general public about the environmental, economic, and other benefits of non-petroleum fuel production and use. Its organizational purpose is to bring together the wide range of groups and sectors that are stakeholders in the development of advanced, non-petroleum fuels to build a broad and diverse base of support for a more sustainable energy future in the United States. NFA works closely with leading researchers and developers of advanced biofuels to support strategies and policies that will provide meaningful fuel diversification solutions.

NFA actively participated in the California LCFS process that was largely coordinated by the California Air Resources Board (CARB). NFA presented at several technical and policy workshops in Sacramento and provided public comments to CARB on April 22, 2009 that focused primarily on asymmetrical carbon accounting metrics, modeling assumptions, baseline fuel characteristics, and the treatment of petroleum.[1] NFA also provided extensive comments to the U.S. Environmental Protection Agency (EPA) on Sept. 25, 2009 as part of the rulemaking for the Renewable Fuel Standard II (RFS II) program.[2] We would like to enter these documents into the record, and strongly encourage policymakers and regulators to review both sets of these comments because many of the issues discussed below are explored in greater detail.

[1] http://www.arb.ca.gov/lists/lcfs09/396-coleman.pdf
[2] http://www.newfuelsalliance.org/EPA%20RFS%20II%20Comments%20New%20Fuels%20Alliance%20FINAL%20(2).pdf

While NFA looks forward to additional opportunities to provide substantive comments in a more formal regulatory context, we have outlined some general themes below for the NESCAUM process. In sum, NFA believes that Northeast policymakers and regulators should make an early commitment to developing a carbon-based fuel standard that adheres to the basic principles of balanced lifecycle analysis (LCA), and "carbon scores" all fuels using consistent methodologies. NFA believes that the initial step for this commitment should be in the Memorandum of Understanding (MOU) that the 11 participating states are expected to sign by the end of 2009. The MOU should make a commitment to balanced and symmetrical carbon lifecycle accounting, including but not limited to the consistent application of market-mediated, indirect effects. The MOU should also commit to a more comprehensive treatment of oil.

A. NFA Supports Goals to Reduce Greenhouse Gas Emissions

NFA strongly supports carbon reductive policies that openly and honestly address the multitude of challenges associated with climate change. NFA is not interested in shielding any fuel, either renewable or fossil-based, from a comprehensive analysis of its greenhouse gas (GHG) emissions. We are, however, concerned about a biased regulation that fails to live up to its potential to facilitate fuel diversification and meaningful GHG reductions.

As an organization that works closely with advanced biofuel researchers, producers, investors and other stakeholders, NFA understands the importance of developing and implementing policies that are designed to spur clean fuel innovations. Clean tech researchers and developers require carbon-based fuel policies and regulations that are durable enough to support long-term investments. NFA urges NESCAUM and regional policymakers to recognize that the advanced biofuel industry is positioned to reduce petroleum dependence, provide carbon reductions in transportation and heating fuel, and stimulate economic development across the region in the near to intermediate term. Biofuels are a complement to longer-term goals encompassing electrification and hydrogen, and remain a critical part of meeting the climate change and fuel diversification objectives of the 11 mid-Atlantic/Northeast states. We hope NESCAUM will take a balanced approach to bio-based alternative fuels in the LCFS.

B. LCFS Model Created in California Incorporates Asymmetrical and Inconsistent Carbon Accounting Methodologies

While the advanced biofuel sector supported the initial concept of the California LCFS, the policy became highly controversial when CARB determined that only biofuels would be subjected to an additional and new category of emissions, known as indirect (or market-mediated) effects. More than 110 PhDs and dozens of respected organizations and institutions raised serious concerns about the California approach (see below).

When unveiling the LCFS policy in 2007, Gov. Arnold Schwarzenegger specifically noted the importance of maintaining balance and not picking winners or losers from a regulatory perspective, stating, *"[t]his first-of-its kind standard firmly establishes sustainable demand for lower-carbon fuels but without favoring one fuel over another."* The Governor emphasized that

the LCFS is a performance-based standard, which implies that all fuels would be held accountable for their supply-chain emissions in an effort to both improve the performance of existing transportation fuels and stimulate investment and commercialization of new liquid fuels. The Executive Order creating the CA LCFS did not establish a specific methodology for determining the carbon intensity value of each of fuel, except that it generally required that all fuels "shall be measured on a full fuels cycle basis."[3]

A fuel's lifecycle carbon score is traditionally determined by adding together the carbon emissions occurring as a result of producing and burning the fuel. These emissions are also called direct carbon emissions, or supply-chain emissions. They include significant upstream emissions such as fertilizer use and land conversion for biofuel feedstock and oil extraction and refining for petroleum. In theory, producers of fuel have some level of control over their direct carbon emissions, because they are directly related to producing the fuel. It is important to note that the land used to produce biofuel feedstock is direct land use (not indirect land use).

In late 2007, policymakers and the media were introduced to the controversial concept of indirect land use change (iLUC). Critics of biofuels argued that the increased demand on agriculture for fuel production would increase the price of agricultural goods, which in turn would spur the clearing of pristine lands in response to higher crop prices. They argued that these economically-derived impacts are significant, based on preliminary modeling runs, and should be added to the carbon score of a gallon of biofuel that uses any type of land. In early 2008, CARB announced its intent to add an iLUC penalty to biofuels under the LCFS. Selective enforcement of indirect effects touched off widespread opposition to the LCFS from a variety of groups, including more than 110 PhDs and a range of respected environmental, academic and cleantech investment entities.[4] One of CARB's responses was to insist that regulators were still using the traditional "cradle to grave" approach.[5] In fact, this is not the case. CARB introduced economically-derived carbon impacts, predicted by economic models, for one type of fuel without analyzing economically-derived effects for other fuels. Importantly, no regulation in the United States, or globally, has ever included these effects.

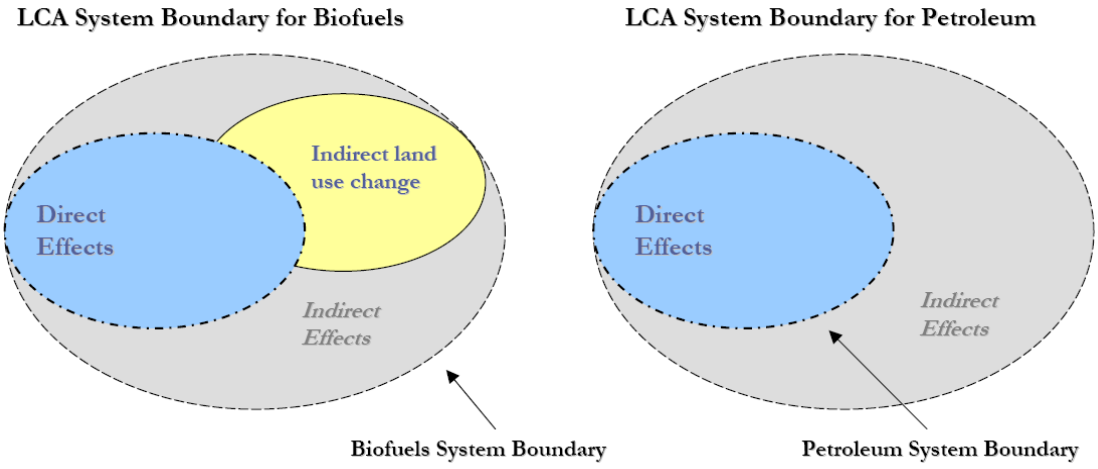
In order to understand the controversy, it is necessary to differentiate direct and indirect carbon effects. As discussed, direct carbon effects are supply-chain emissions. Indirect carbon effects, on the other hand, are an attempt to quantify highly uncertain, price-induced "knock on" effects occurring in the marketplace outside of the actual supply-chain of the fuel. Researchers use computable general or partial equilibrium economic models to forecast this type of effect. For biofuels, it's the possibility of pushing existing agriculture (e.g. food and feed) onto new land; the so-called indirect land use change effect included in the California LCFS. To be consistent, a similar approach would be applied across all fuels under the LCFS; for natural gas it's the disruptive effect of pulling natural gas out of power markets and (likely) forcing more power generation from coal; for electric cars, it means increasing demand on the grid,

[3] http://gov.ca.gov/executive-order/5172/
[4] http://www.newfuelsalliance.org/LCFS%20Public%20Record%20Summary.pdf
[5] http://www.arb.ca.gov/newsrel/nr030509.htm

which in turn could pull more coal plants into electricity production markets; for tar sands it's the market-mediated effects of consuming massive quantities of natural gas to produce the fuel, which in turn reduces the availability of natural gas for power production and incents coal from a price perspective. Petroleum dependence has any number of additional market-mediated effects. But the most obvious adjustment for petroleum – to create consistency with iLUC – would be to debit petroleum for the marginal barrel of oil being forced into the system, as opposed to the average barrel used by oil companies today.[6]

In many respects, the issue distills down to how "resource utilization" is treated under the LCFS. To produce any form of energy requires resource use and allocation. Certainly all fuels, and indeed all products, have indirect GHG effects associated with their production and use. The question is: should new uses be penalized for the actual resource they use, or the resource they allegedly force into use on the margins of the system (by way of the introduction of this new use, or fuel, into the system). This is not a settled issue in the scientific community. What is clear, however, is that using different "resource utilization" rules for different fuels under the same regulation will create asymmetries and bias. For example, and as discussed, CARB uses "California average" for petroleum's resource (crude oil) and "world marginal" for the biofuels resource (land) under the California LCFS.

The technical problem with introducing indirect, economically-derived effects for only one fuel – or, using marginal resource penalties for one fuel and average resource penalties for another fuel – is the resultant lifecycle assessment (LCA) system boundaries become inconsistent. The figure below illustrates the system boundaries CARB used in its LCFS, and that NESCAUM is proposing in the Northeast LCFS, for petroleum and biofuels. As demonstrated, the LCA system boundaries are inconsistent.



[6] It is clearly inconsistent to debit petroleum for the average carbon intensity of crude oil today while debiting biofuels for "marginal" land use (the land allegedly brought into production on the margins of the agriculture sector as a result of using land for biofuels). Put another way, using a barrel of average crude today forces the introduction of a marginal, high carbon intensity value barrel (e.g. heavy oil, tar sand) into the economy.

NFA believes that while the specific details of carbon scoring and LCA can be complex and nuanced, the more basic question of determining the parameters for the LCA of regulated fuels and the petroleum baseline is not difficult, nor should it be cumbersome. In fact, NESCAUM and state regulators should note that the International Organization for Standardization (ISO) has developed a methodological framework for LCA that is widely accepted. ISO 14040, *Environmental Management — Life-cycle Assessment — Principles and Framework*, is a standard that articulates the principles of comprehensive LCA and is used in a range of industrial and consumer applications. Argonne National Laboratory conducted an analysis of the LCA for petroleum and natural gas, as well as ISO 14040, and stated the following about LCA:

> *System boundaries* are formulated based upon the scope of the LCA, and an initial collection of data. The quality of the life-cycle inventory (LCI), and the subsequent life-cycle impact assessment (LCIA), depend on an accurate description of the system and the boundaries drawn.
>
> *Boundaries between the system and the environment*. These identify the types of environmental and economic processes that are included or excluded. Because the processes included and excluded can greatly influence the results of the study, they should be described clearly. [7]
>
> Although the claim that LCAs are scientifically based is usually considered a positive aspect, **unless the LCA follows the standards in ISO 14040, there is no guarantee that the results are actually based on science.** Thus, life-cycle studies that do not follow the steps of a traditional LCA may be criticized as lacking scientific support.[8]

Clearly, different carbon assessment boundaries for different fuels will result in a skewed and invalid comparison between these fuels. As demonstrated by Argonne National Laboratory, the practice of asymmetrical accounting also raises serious questions about the objectivity and scientific relevance of LCAs that do not follow the protocols of ISO 14040. To maintain credibility within the context of the Northeast LCFS, the treatment of system boundaries for biofuels and petroleum must be symmetrical and, as a result, defensible.

The U.S. Environmental Protection Agency (EPA) acknowledges the significance of a properly defined and balanced LCA approach for the Renewable Fuel Standard (RFS II) program by stating on May 26, 2009:

> It is important to establish clear system boundaries in this analysis. By determining a common set of system boundaries, different fuel types can then be validly compared. [9]

[7] Lifecycle Thinking for the Oil and Gas Exploration and Production Industry, Argonne National Lab, Sept. 2007, p. 19 http://www.ead.anl.gov/pub/doc/LCA_final_report.pdf
[8] Lifecycle Thinking for the Oil and Gas Exploration and Production Industry, Argonne National Lab, Sept. 2007, p. 40 http://www.ead.anl.gov/pub/doc/LCA_final_report.pdf
[9] Federal Register Vol. 74, No. 99, May 26, 2009 EPA–HQ–OAR–2005–0161, p. 25024

The issue of inconsistent system boundaries is not just a technical issue; it will have serious real world consequences for climate change. For example, in the immediate term, fuel distributors will have a choice between biofuels and petroleum. With indirect effects selectively applied, biofuels have zero or minimal GHG benefit compared to average petroleum. However, the biofuel gallon will not be replaced in the real world with average petroleum; it will be replaced by the "next available" (or marginal) gallon of gasoline, which may be heavy crude, crude extracted using enhanced oil recovery or tar sands. However, because the California LCFS does not have dedicated pathways for each of these types of petroleum (see below), they are not recognized for being more carbon intensive than average petroleum. As such, an oil company will be using a marginal gallon of petroleum without penalty under the LCFS, and instead of a biofuel gallon that is less carbon intensive than the marginal gallon of petroleum (even with selective enforcement of indirect effects).[10] This is why all fuels must have consistent system boundaries.

The positioning of NESCAUM on this important issue appears contradictory. As you know, representatives from the 11 participating Northeast LCFS states signed a letter to CARB on April 17, 2009 supporting the California LCFS policy.[11] NFA was pleased that the letter acknowledged that the CARB policy should be:

> appropriately designed to let fuels compete in the marketplace, rather than picking winners…(and should) be grounded in the best available peer-reviewed science and appropriately account for all major sources of emissions in the lifecycle of each fuel.

However, the Northeast commissioner's letter also supported the inclusion of selective enforcement of indirect effects for biofuels as part of the CARB policy:

> Including direct and indirect land use impacts in its accounting is a key to getting biofuels policy right and achieving our mutual greenhouse gas mitigation goals. Equally important is the development and inclusion of screening criteria for sustainable biofuels production and use to minimize environmental and public health impacts and certification schemes to ensure that sustainability is achieved.

The letter does not seem to recognize the inconsistency of including indirect effects for biofuels without even assessing the indirect effects of other fuels.[12] This is particularly troubling

[10] For example, consider the current spreadsheet for the CA LCFS. Assume corn ethanol (with indirect effects) has a carbon score of 96 g/MJ. Assume average petroleum has a carbon score of 96 g/MJ as well. The oil company does not use corn ethanol, because it has no carbon benefit, but instead uses a gallon of gasoline derived from Venezuelan heavy crude. Heavy crude has a CI value of roughly 105 g/MJ even before accounting for indirect effects. But under the CA LCFS this fuel gets a 96 g/MJ score. **As such, the LCFS actually incents the use of a higher carbon intensity fuel.** The same scenario can be run with all marginal petroleum gallons (Nigeria, TEOR, Iraqi, etc.).

[11] http://www.arb.ca.gov/lists/lcfs09/267-arb_lcfs_ltr_041709.pdf

[12] CARB has repeatedly claimed that these effects are insignificant. However, the LCFS record shows that: (1) they have not released a single study of the indirect effects of other fuels; and, (2) they have not conducted or funded economic modeling for any fuel other than biofuels.

to the advanced biofuel sector and clean tech investors because it establishes inconsistencies and an uneven playing field that will chill investment in all biofuels.[13]

While Northeast commissioners are on record as supporting the CARB policy, it is worth considering that the language used to offer that support is conditioned on the idea that the LCFS does not pick winners and losers. The April 17, 2009 letter to CARB states that: "[a]*s proposed, California's LCFS is appropriately designed to let fuels compete in the marketplace, rather than picking winners.*" NFA agrees that the California program intended to treat all fuels equally, and that the Northeast LCFS could enforce balanced carbon accounting. However, the California policy has drifted significantly from that important goal. The Northeast commissioners should recognize that a biased policy will be less durable over time, and could result in greater petroleum consumption in the immediate term (see footnote 7 above).

While indirect carbon effects should not be ignored, there is also the question of whether it is appropriate to include indirect, market-mediated effects in a performance-based standard. The point of a performance-based carbon regulation is to reward good performance. However, by definition, an indirect carbon effect is the direct carbon effect of another product. For example, the direct effect of a Prius is less fuel consumed per mile and less carbon emissions at the tailpipe. The indirect effect may be more driving because refueling is cheaper. Economy-wide, large numbers of fuel efficient vehicles will reduce the demand for fuel, thereby increasing supply and reducing its price and enabling more driving and more inefficient vehicle purchases (as a market-mediated response to lower fuel prices). The public policy question is: if the high penetration of high efficiency vehicles (or electric vehicles) pushes down the price of fuel, and results in a resurgence of SUVs in response to lower fuel prices (magnitude aside), is that indirect, economically-induced effect part of the performance of a Prius? This is exactly the type of interaction predicted with iLUC. Indirect land use change is the land clearing behavior of others, theoretically induced into making these decisions by the introduction of a certain product into the marketplace. Critics say that these other indirect carbon impacts are not as significant as iLUC, but they do not have the data to support their claim.

C. California's Treatment of Petroleum Under the LCFS Is Highly Problematic

As discussed, the underlying point of a performance standard is the idea that fuel providers should be held accountable for their supply-chain emissions. The alternative is blatantly counterproductive, because it would allow fuels to survive in the system (and potentially out compete better alternatives) without paying for their true carbon impacts.

Yet, in the case of petroleum, this is what we have. The LCFS developed by CARB allows the use of highly carbon intensive oil, such as thermally-enhanced oil recovery and various forms of heavy or sour crude, to qualify as part of the "average" petroleum score. More specifically, the California LCFS has only one fuel pathway for gasoline, which means that all forms of gasoline are treated the same under the LCFS. This is a problem for several reasons: (1)

[13] http://www.arb.ca.gov/lists/lcfs09/308-lcfs_investor_letter_final.pdf, April 21, 2009

all gasoline is not created equal; (2) the average petroleum score will not properly reflect the gallon of petroleum actually used over time; and, (3) petroleum is getting incrementally more carbon intensive over time, which is generally not recognized by the LCFS. The CARB LCFS does have a general guidance framework for tar sands. However, it is questionable whether it has teeth. First, the "high intensity petroleum protocol" does not kick in until oil companies utilize a fuel that has a carbon intensity value that is 15 g/MJ higher than the California average. This is essentially a 15 percent leniency provision not applied to other fuels.[14] Second, it appears there is a loophole in the regulation that would allow a California fuel provider to use tar sand-based petroleum under the average petroleum score, as long as the tar sands crude is cracked at least once outside of California. This defeats the purpose of supply-chain accountability. Third, it is not clear how this provision will be enforced. As written, the oil companies are responsible for disclosing when they use high carbon intensity petroleum. But this type of petroleum cannot be differentiated in the marketplace by fuel enforcement divisions.

NFA encourages Northeast/Mid-Atlantic states to treat petroleum properly under the LCFS, by developing several different pathways for gasoline and diesel fuel that properly reflect the actual carbon scores of these different fuels. Earlier this year, NFA commissioned a report by Life Cycle Associates that examined the potential magnitude of GHG emissions of petroleum that have been omitted from traditional carbon scoring metrics. The report also took a preliminary examination of some (non-economic) indirect effects associated with the use and production of petroleum and manually calculated these impacts. The report did not conduct economic modeling, yet notes that this type of analysis would be critical to gaining a clearer understanding of the price-induced, indirect effects of oil.

While more work needs to be conducted on this front, the report reaches some interesting conclusions:

> The GHG impact of petroleum estimated herein ranges from 90 to 120 g CO2e/MJ (grams of CO2 equivalent emissions per megajoule (MJ) of gasoline fuel consumed), depending on the source of the petroleum and to what extent indirect emission impacts are included. The high end reflects unconventional resources and heavy oil, which can contribute to over 10% of current supplies. <u>These emission estimates do not include all of the effects discussed in this report as some effects – most notably the broader economic, price-induced effects of the marginal gallon of petroleum – require further analysis.</u> The range of GHG emissions for average petroleum based transportation fuels used in the U.S. is often reported as having an uncertainty band of +/- 1 to 2 g CO2e/MJ. **<u>When indirect impacts, marginal resources, and uncertainties</u>** discussed in this report **<u>are taken into account, the range in emissions is considerably greater</u>**.[15]

[14] http://www.arb.ca.gov/fuels/lcfs/030409lcfs_isor_vol1.pdf page V-25

[15] Unnasch. S., et al. (2009) Assessment of Life Cycle GHG Emissions Associated with Petroleum Fuels, Life Cycle Associates Report LCA-6004-3P http://www.newfuelsalliance.org/NFA_PImpacts_v35.pdf

The report lists several specific areas of omitted direct GHG emissions of petroleum that should be accounted for in future LCAs, including overstatements as they relate to petroleum transportation systems:

> The default GREET assumption for version 1.8b and prior versions indicates a 1,000,000 DWT tanker ship; which corresponds to 4 times the capacity of the typical marine tanker vessel in use today. This implies that the transportation GHG emissions for petroleum may be significantly higher than predicted by GREET.[16]

To create a balanced carbon accounting metric for the Northeast LCFS, state regulators would also need to consider the direct and indirect impacts associated with large scale road building infrastructure projects that accompany many oil extraction activities:

> More important than the direct clear-felling are the indirect impacts of road construction: It is generally recognized that oil activities "opened up" new agricultural frontiers in the Northern Amazon region by building penetration roads into primary forest areas. Roads thus act as local determinants of deforestation, even in advance of their actual construction (Pichón 1997:71). In the first wave, this gives access to industrial logging operations; second, agricultural squatters follow in order to gradually clear the land by "slash and mulch" methods, [Because of the high humidity in the Ecuadorean Amazon, this is an alternative to the "slash and burn" method that is used e.g. in the Brazilian Amazon (Thapa, Bilsborrow & Murphy 1996:1330) utilizing it mostly for commercial crops and extensive cattle ranching.[17]

Similarly, oil sands production in Canada requires the use of natural gas for extraction, which "effectively eliminates a natural gas resource that could be used for power generation (in Alberta, Canada), creating the likely indirect, market-mediated effect of increasing the demand for coal or residual oil for electricity production. This possible indirect effect of oil sands production should be considered closely given the great magnitude of natural gas reserves required to produce petroleum from oil sands."[18] Oil sands also result in the creation and use of ecologically toxic tailing ponds to capture the residual impacts of petroleum production.

> Methane emissions from tailing ponds and peat soils as well as land use impacts are another potential source of GHG emissions associated with oil sands. Residual hydrocarbons from oil extraction operations could degrade to form methane under anaerobic conditions. Tailings ponds that occur on soils with high levels of peat may provide anaerobic conditions that support the decomposition of peat and formation of methane…**Since the global warming potential of methane is 25 times higher than that of CO2, this significant potential source of GHG emissions should be incorporated into the life cycle analysis of petroleum fuels.**

[16] Unnasch. S., et al. (2009). Assessment of Life Cycle GHG Emissions Associated with Petroleum Fuels, Life Cycle Associates Report LCA-6004-3P http://www.newfuelsalliance.org/NFA_PImpacts_v35.pdf

[17] Wunder, S. (1997). From Dutch Disease to Deforestation - A Macroeconomic Link? A case study from Equador. Copenhagen, Centre for Development Research, Danish Institute for International Studies. Page 12 http://dlc.dlib.indiana.edu/dlc/bitstream/handle/123456789/4410/wunder.pdf?sequence=1

[18] Unnasch. S., et al. (2009). Assessment of Life Cycle GHG Emissions Associated with Petroleum Fuels, Life Cycle Associates Report LCA-6004-3P http://www.newfuelsalliance.org/NFA_PImpacts_v35.pdf

It should also be of concern that the impacts of certain refinery co-products, that are extremely high in GHG emissions, are not accounted for in traditional LCAs. Indeed, the Life Cycle Associates report finds that for every thousand barrels of crude oil refined, approximately 90 barrels of equivalent petroleum coke and residual oil is marketable and results in 49 metric tons of GHG emissions. Further, while the indirect impacts associated with these petroleum products have not been measured from a modeling or full LCA perspective, they are clearly not benign.

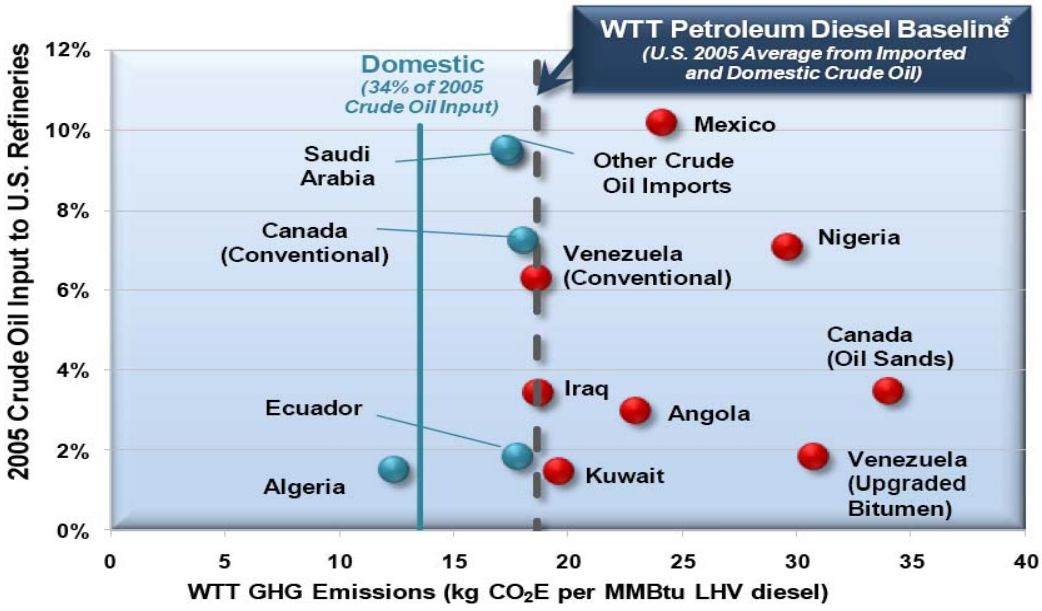
> Residual oil is used as bunker fuel for crude oil transport and as a refinery fuel. Coke is also produced in refineries. The emissions associated with the use of these fuels is included in the life cycle of gasoline in the GREET model. However, the effect of changing residual oil or coke output is not considered in the GREET model because these products are not transportation fuels. Therefore, any emissions associated with processing coke or where coke substitutes for other fuels such as coal are not considered….the effect of bunker fuel and coke that are added to or removed from the market are not considered, and could be a significant source of indirect carbon emissions…Since the combustion of refinery coke and residual oil results in as many GHG emissions as 5% of all of the automobiles in the U.S., the subject of refinery co-products deserves greater attention. A scoping calculation presented here indicates a 2 g/MJ impact for refinery co-products. A high estimate would be 4 g CO2 e/MJ with the high range of assumptions regarding displaced co-products.

A recent analysis of petroleum, authored by the U.S. Department of Energy's (DOE) National Energy Technology Laboratory, states that the U.S. reliance on foreign sourced petroleum results in significantly higher direct GHG emissions. Interestingly, because the LCA for petroleum does not currently account for the differences in petroleum type or origin, it is likely that the direct GHG emissions of oil would be higher if the U.S. increased its use of foreign sourced petroleum, which would certainly occur if the CARB or Northeast LCFS programs were not in place.

> …producing diesel fuel from imported crude oil results in WTT GHG emissions that are, on average, 59% higher than diesel from domestic crude oil (21.4 vs. 13.5 kg CO2E/MMBtu LHV). Imported crude oils are on average heavier and contain higher levels of sulfur, and the controls on venting and flaring during crude oil production are not as good as in domestic operations. Figure ES-1 also shows that Venezuela bitumen, Canada oil sands, and Nigeria stand out as having high GHG emissions compared to other sources. Acquisition costs of the crude oil from these three sources are estimated at $62 billion for 2008.[19]

[19] An Evaluation of the Extraction, Transport and Refining of Imported Crude Oils and the Impact on Life Cycle Greenhouse Gas Emissions, U.S. Dept of Energy, March 27, 2009 http://www.netl.doe.gov/energy-analyses/pubs/PetrRefGHGEmiss_ImportSourceSpecific1.pdf

Figure ES-1. Crude Oil Source-Specific GHG Emissions for Diesel



* Source: NETL report, *Development of Baseline Data and Analysis of Life Cycle Greenhouse Gas Emissions of Petroleum-Based Fuels*, November 26, 2008

It is critical that policy makers and regulators in the Northeast/Mid-Atlantic region recognize the impacts of using more petroleum and also understand where that fuel is likely to originate, from a carbon perspective. Further, the region should commit to treating petroleum the same as other fuels are treated. The DOE report could be used as a framework for the more equitable treatment of petroleum in a performance based fuel regulation, like the LCFS.

D. Advanced Biofuel Companies and Leading Scientists and Stakeholders Support Balanced Approach to GHG Analysis

The Northeast/Mid-Atlantic region is host to some of the world's leading researchers and developers of advanced biofuels. Numerous advanced biofuel companies and clean tech investors are currently located and doing business in the region. Further, advanced biofuel producers across the country are anxious to provide the 11 states with low carbon fuels and subsequent economic development opportunities. Accordingly, NFA encourages regulators and policymakers to consider the positions articulated by this emerging industry as it relates to future market growth opportunities. More specifically, the advanced biofuel industry has repeatedly stated that the selective enforcement of indirect effects against only biofuels will be detrimental to this emerging industry, which relies on objective policies and level playing fields to survive in a carbon-controlled economy:

> …it is essential that ***all*** regulated fuels are evaluated using the same analytical boundaries…Supporters of enforcing indirect land use effects against biofuel often suggest that this policy decision is necessary to help encourage advanced biofuel production…We have a distinctly different point of view. We are concerned that the

> inclusion of indirect effects penalties for biofuels…will erode investor confidence and market certainty for both first *and* second-generation biofuels. Contrary to the belief held by some, producers of next generation biofuels such as cellulosic ethanol are *not* supportive of selectively including indirect effects in the LCFS.[20]

Also, leading advanced biofuel investors have spoken in opposition to selective enforcement of indirect affects and asymmetrical carbon accounting:

> Some groups have suggested that the current iLUC modeling would help advanced biofuels. This claim is not accurate. Selective indirect effects enforcement against biofuels makes all biofuels, including advanced biofuels, less competitive against the baseline and other alternatives. As investors we are also concerned because selective enforcement adds risk and uncertainty to the advanced biofuels sector by: (a) destabilizing the conventional biofuel sector, which continues to build the infrastructure and support the technological development that is necessary to allow advanced biofuels to reach commercialization; (b) institutionalizing a regulatory bias against all biofuels and sending mixed regulatory signals to the market, which amplifies market risk and will chill investment in advanced biofuels; (c) artificially limiting the type of feedstock available to advanced biofuel producers, which limits the scalability of emerging advanced biofuel companies.[21]

Regulators and policymakers should also consider the following when summarizing the record on the issue of selective enforcement of indirect GHG effects:

- More than **110 scientists, researchers and PhDs** have also spoken on the issue of parity as it relates to measuring the impacts of carbon emissions. These researchers, including several from the National Academy of Sciences, were unanimous in their opposition to selective enforcement of indirect effects against biofuels. In a letter to California Gov. Schwarzenegger, the PhDs cited some of the unintended consequences associated with the selective nature of the CA LCFS: **"This [LCFS] creates an asymmetry or bias in a regulation designed to create a level playing field … Enforcing different compliance metrics against different fuels is the equivalent of picking winners and losers, which is in direct conflict with the ambition of the LCFS**…Adding an iLUC penalty to biofuels will hold the sector accountable to decision-making far outside of its control (i.e. for decisions related to the supply chains of other products), and is unlikely to have any effect on protecting forests or mitigating GHG emissions as a result of land management practices. But because indirect effects are not enforced against any other fuel in the proposed LCFS, an iLUC penalty will chill investment in both conventional and advanced biofuel production…which have the potential to make the agricultural sector far less resource-intensive and could provide a significant carbon negative source of transportation fuel…it is clear that indirect effects should not be enforced against only one fuel pathway."[22]

[20] See http://www.arb.ca.gov/lists/lcfs09/111-advanced_biofuels_ltr_to_carb_4-15-09.pdf, Letter from 12 Advanced Biofuel Companies to CARB, April 15, 2009
[21] See http://www.arb.ca.gov/lists/lcfs09/308-lcfs_investor_letter_final.pdf, April 21, 2009
[22] Letter from 111 PhDs to CA Gov. Schwarzenegger, March 2, 2009 http://www.arb.ca.gov/lists/lcfs09/66-28-phd_lcfs_mar09.pdf

- The **Truman National Security Project**, in collaboration with dozens of respected U.S. military leaders, noted in a letter to Gov. Schwarzenegger the concern that: "… the indirect land use change penalty for biofuels will have an adverse effect on our ability to develop alternative fuels. This is turn will prolong the United States' reliance on fossil fuels and deepen the damage caused by both our reliance on oil and by climate change … No other fuels are penalized for their indirect effects. Singling out one fuel source—in this case biofuels—puts that fuel source at a competitive disadvantage, thereby undercutting investment and the development of new technologies.[23]

- The **Environmental and Energy Study Institute** questioned the benefit of an unbalanced carbon scoring metric as part of the CARB LCFS and raised significant issues with the scientific methodologies in determining the indirect impacts of biofuels: "…work…done to assess the direct life cycle carbon emissions of various fuels, based upon scientifically sound and generally accepted methodologies, is significantly undermined by the inclusion of indirect carbon emissions from land use changes attributed to biofuels production, about which there is very little consensus in the scientific community … Including indirect emissions from land use change in the LCFS, however, is not likely to promote the stable climate and healthy ecosystems that we all seek. Instead, it will only reduce the political legitimacy of the LCFS as a fair and objective tool for comparing fuel options and unfairly penalize an industry that offers great promise for addressing the nation's climate and energy challenges.[24]

- The non-profit advocacy group **Sustainable Conservation** echoed the concerns articulated by the 112 PhDs to Gov. Schwarzenegger referenced above, and questioned the scientific validity of assigning indirect land use penalties to biofuels: "promulgating an LCFS with selectively enforced indirect effects is warranted if there is sufficient scientific basis for it. We are concerned that may not be the case currently and this could lead to … unintended consequences: 1) the potential for increased CO2 as refiners will be compelled to reduce biofuels use and increase petroleum use in the near term …"[25]

In addition to the critiques outlined above, NFA provides a more detailed summary on its website of individuals and organizations that have expressed similar concerns.[26] NFA strongly encourages NESCAUM and related parties to consider the full breadth of dissent emanating from various disciplines regarding the selectivity of carbon accounting as contained in the California LCFS.

E. MOU Should Commit to a Balanced Regulation for all Fuels

NESCAUM and state regulators have indicated that governors from the 11 participating LCFS states intend to sign a MOU by the end of 2009. The MOU is expected to further define the scope of the regional LCFS and to provide directionality to regulators and stakeholders.

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[23] Letter from Truman National Security Project and U.S. Military Officials to CA Gov. Schwarzenegger, March 24, 2009 http://www.arb.ca.gov/lists/lcfs09/154-trumannational_security.pdf

[24] Letter from EESI to CARB, March 16, 2009 http://www.arb.ca.gov/lists/lcfs09/65-lcfs_iluc_letter_031609.pdf

[25] Letter from Sustainable Conservation to CARB, March 18, 2009 http://www.arb.ca.gov/lists/lcfs09/12-ashley_boren.pdf

[26] http://www.newfuelsalliance.org/LCFS%20Public%20Record%20Summary.pdf

While it is still relatively early in the process, the MOU marks a significant step forward, and also presents an opportunity for the participating 11 governors.

NFA believes that the Northeast is in a unique position to strengthen the California LCFS model by developing a regulation that holds all fuels, including the petroleum baseline, accountable for their respective GHG emissions. California should be commended for taking the risk of establishing a first-of-its-kind carbon based fuel regulation that would be susceptible to criticism. However, there is ample room and the urgent need for refinement, something that policymakers and regulators in the Northeast/Mid-Atlantic region should embrace as we move forward.

As language is developed for the MOU, we encourage state policy makers and regulators to consider the impact of singling out a specific indirect effect for one compliance fuel in a policy that presumes a level playing field for all fuel pathways. NFA believes that a MOU that clearly articulates a message of parity among fuels will gain the necessary support for effective implementation. The final MOU should:

1) Contain language committing to the basic principles of a fair GHG comparison for every eligible fuel;

2) State that all fuels in the LCFS will be subjected to the same system boundaries as defined by ISO 14040;

3) State that if market-mediated indirect GHG effects are measured for one fuel, then they must be measured for all fuels, and;

4) Acknowledge that the LCFS is a performance-based fuel regulation that demands supply-chain accountability.

It is not enough to add indirect effects incrementally, as they are presented, because selective enforcement if indirect effects skews the relative values of all fuels and leaves the regulation open to challenges based on arbitrariness and bias.

F. Conclusion

While NESCAUM and regulators in the Northeast/Mid-Atlantic may have been well-intentioned to look to California for initial guidance on the LCFS, they now have the opportunity to be the leaders in this policy by designing a regulation that creates real carbon reductions and does so equitably.

When measuring the carbon impacts of compliance fuels or the petroleum baseline, the Northeast LCFS should require balanced system boundaries. Inconsistent LCA boundaries could result in greater production and use of more carbon intensive fuels and a destabilization of the advanced biofuel industry. The regional LCFS should also reject the CARB LCFS provision that

gives a preference to oil by allowing petroleum derived from high carbon intensity sources to count as "average" petroleum. It is critical that the MOU reflects these issues and commits to developing a policy that truly establishes a level playing field from a regulatory perspective for all participating fuels.

To be clear, NFA supports the concept of holding all fuels accountable for associated carbon emissions. Further, NFA is optimistic that the LCFS can provide the framework for reducing the intensity of the region's transportation and heating oil fuels. However, NFA and the advanced biofuel sector can only support a carbon-based fuel regulation that is balanced and allows for equal competition among all fuels.

The New Fuels Alliance appreciates the opportunity to provide comment on this important matter. We would be pleased to answer any questions or discuss the issues outlined above in greater detail.

Sincerely,

R. Brooke Coleman
Executive Director
New Fuels Alliance

Andrew Schuyler
Director, Northeast Region
New Fuels Alliance