



Memorandum

To: Interested Parties
From: New Fuels Alliance
Date: December 10, 2009
RE: Northeast/Mid-Atlantic LCFS—Response to comments by Citizens for Pennsylvania’s Future, Conservation Law Foundation, Environment America, Environment Northeast, Natural Resources Defense Council

In comments submitted to NESCAUM pursuant to the design and implementation of a Northeast/Mid-Atlantic LCFS, the stakeholder groups Citizens for Pennsylvania’s Future, Conservation Law Foundation, Environment America, Environment Northeast, and the Natural Resources Defense Council (hereinafter “Joint Environmental Stakeholders”) take the somewhat unconventional approach of characterizing transactions that occurred between the New Fuels Alliance (NFA) and the California Air Resources Board (CARB), including summarizing certain technical positions of NFA. Many of the characterizations are inaccurate. NFA has prepared the following memorandum to correct the record and believes that it is important to keep discussing the key points of controversy surrounding the LCFS.

A. Review of and Response to Joint Environmental Stakeholder Comments

As outlined in our comments to NESCAUM, NFA believes that the LCFS, if applied in a balanced way, can be an effective tool for achieving meaningful carbon reductions.¹ Our primary complaint about the California approach is that in carbon scoring the baseline and compliance options, it uses different rules for different fuels. In other words, California does not use a consistent carbon accounting metric across the board. The NESCAUM comments submitted by the Joint Environmental Stakeholders directly reference NFA positions and transactions occurring within this context. Please consider the following responses (comments from Joint Environmental Stakeholders are referenced numerically, in italics):

- 1. “... all GHG impacts of a fuel should be included in the carbon intensity scoring. For biofuels, the GHG accounting must include factors such as indirect land use. For electricity, the generation emissions should define the fuel’s score.”***

This is a prime example of different rules for different fuels. On the one hand, according to the statement above, the carbon score for electricity should be determined by its generation emissions; in other words, the coal/natural gas/wind/solar resource actually used to produce

¹ <http://www.nescaum.org/documents/stakeholder-comments-on-the-low-carbon-fuels-standard/northeast-lcfs-comments-new-fuels-alliance.pdf/>

the electron.² But the resource penalty recommended by the Joint Environmental Stakeholders for biofuels is different. Instead of holding biofuels accountable for the land actually used to produce biofuel feedstock (the equivalent of their “generation emissions”), they endorse the California approach, which penalizes biofuels for the forecasted *market response* to using more land for biofuels. Put another way, California uses economic models to predict that more pristine land will be converted to agriculture along the margins of the world agricultural sector if biofuel is produced, then penalizes biofuels for the conversion of this pristine land even though it may be tilled to produce food for humans or cattle. Some analysts call these two different approaches “attributorial” (what you actually use) and “consequential” (what you allegedly cause to be used) carbon accounting. Intentional or not, the Joint Environmental Stakeholders are recommending attributorial carbon accounting for electricity and consequential carbon accounting for biofuels. This is inconsistent and runs counter to their claims about the LCFS being a “technology neutral performance standard.” Switching back and forth between attributorial and consequential carbon accounting, as the CA LCFS does, fundamentally changes the relative carbon intensities of the different fuels.

2. *“Succumbing to the ethanol industry’s call to exclude [indirect land use change] from the regulation would effectively ignore or assign a zero value to these real emissions.”*

This statement does several things. First, it mischaracterizes the opposition to selective enforcement of indirect effects. The ethanol industry, both advanced and conventional, is opposed to the selective enforcement of indirect effects. But the list also includes 112 PhDs, a coalition of clean technology investors, several environmental groups, business groups, and other academics. NFA has compiled these comments.³ Second, the opposition has not called for ignoring the impact. They have called for responsible assessment and use of any impact. This includes assessing it for all fuels, and not enforcing selective indirect effects penalties. It is a subtle but important difference. For example, British Columbia is also going through the process of designing an LCFS. They have decided to incorporate a placeholder for indirect land use change (iLUC), but not enforce it until economically-derived effects are assessed for other fuels and the science becomes more settled. There are ways to address iLUC without going to the extremes of either selectively enforcing only one indirect effect, or ignoring the issue completely. Third, the statement calls these impacts “real,” which implies that excluding them would be excluding something real. They are real in the sense that any action in the world economy has an indirect effect. For example, if an oil company uses a 1,000 barrels of light sweet crude, this crude will not be available for another oil company and a dirtier barrel on the margin will have to be used to meet demand going forward (i.e. this is the “consequential” carbon effect). The Joint Environmental Stakeholders are curiously unconcerned about ignoring this reality. The truly relevant question with regard to iLUC is whether we know enough to

² If this is really their position, it diverges from California. Both electricity and hydrogen have carbon scores that are very high based on today’s generation emissions. California used marginal impacts for electricity and hydrogen, which allowed them to assume higher renewable generation penetration, which in turn improved their scores.

³ See <http://www.newfuelsalliance.org/LCFS%20Public%20Record%20Summary.pdf>.

regulate. California’s results are based on one model and one primary set of assumptions. Regulators have not done any modeling of any other fuel. NFA believes the decision to regulate this one indirect effect, without looking at others, is both arbitrary and premature.

3. *“Ignoring the ILUC emissions would undermine the environmental benefits of the LCFS and set a poor precedent for any future policies attempting to reduce global warming pollution from transportation and other sectors.”*

We have yet to see this position articulated with any detail. This may not be the case when actually looking at realistic compliance scenarios moving forward. If indirect effects are included for biofuels, and the omitted indirect effect for an incremental gallon of oil is significant, the result in the short term will be incenting the use of higher carbon intensity crude oil.⁴ Secondly, NFA believes that the “poor precedent” is asymmetrical carbon accounting, because it invalidates the LCFS. The LCFS must be credible and durable to survive legal scrutiny and catalyze real change. Selective enforcement of indirect effects has very serious public policy and legal issues. As stated by 112 PhDs: “We agree with the sentiment expressed by many experts that while indirect effects are important to understand, enforcing them prematurely and selectively on only certain fuels in a performance-based standard could have major negative consequences, even for GHG mitigation. Put another way, no level of certainty justifies asymmetrical enforcement of indirect effects.”

4. *“Moving ahead with a rule but delaying or omitting the inclusion of indirect land use effects in the model would imply that farmland is limitless, and would ignore the major impacts of agriculture and deforestation on the climate.”*

This argument glosses over the controversy surrounding the selective enforcement of indirect effects. There is nothing unique about the finite nature of land. Crude oil is finite. Natural gas is finite. Electricity is finite. If we use any of these resources, there will be an adjustment on the margins to meet ongoing demand (e.g. potentially more land clearing, more unconventional oil use, more coal to replace gas and electricity pulled from power markets). The decision to include market-mediated effects (i.e. carbon debt extraneous to the supply-chain) in the carbon score of any product is brand new; the literature is just beginning to look at market-mediated effects. Indeed, the science is limited. Regulators should be concerned about finite resources, but not one resource at the exclusion of another for no discernable reason. It is unclear why the Joint Environmental Stakeholders are so unconcerned about the fact that crude oil, natural gas, and electricity are also finite resources. The claim that the indirect effects of other fuels are not significant is not supported by data (because economic modeling has not been conducted for other fuels), and is illogical based on preliminary analysis.⁵

⁴ For a more detailed explanation, see [NFA comments](#), footnote 10.

⁵ The indirect effects of other fuels are discussed later in the memorandum.

5. “The eleven states have an opportunity to help get biofuels right by differentiating between poor-performing, conventional biofuels and the best-performing, advanced biofuels that altogether avoid these tradeoffs.”

This is a common myth associated with iLUC and the LCFS. Advanced biofuels already have a huge advantage over conventional biofuels in an LCFS *without* iLUC, and would therefore garner the most interest from oil companies when available (because oil companies will try to comply with the LCFS while displacing the fewest gallons of their own product). In addition, according to the public record submitted by the advanced biofuel companies trying to “get biofuels right” and the scientists working on advanced technologies, the selective enforcement of indirect effects is counterproductive to the commercialization of advanced biofuels.⁶ Finally, the LCFS is supposed to be technology neutral. The LCFS should endeavor to get biofuels right via accurate carbon accounting, not fuel type based on undisclosed “wrong/right” metrics.

6. “To date, not a single peer-reviewed study has concluded that the indirect land use effect does not exist or is zero.”

The implication of this statement is that there is consensus that iLUC exists, and therefore, making the number zero in the LCFS is the wrong answer. First, this is not an accurate portrayal of where the scientific community is with regard to iLUC. The iLUC debate started in earnest in February 2008 with the Searchinger article. Arguably the foremost expert in lifecycle modeling and author of the GREET model being used for the LCFS (Michael Wang of the Argonne National Lab) immediately rebuked the study.⁷ Dr. Wang asserted that he did not believe there is iLUC in foreign countries, where almost all of the iLUC penalty stems from. Since then, there has been a back and forth in the scientific community. On the one hand, hundreds of scientists are saying that the effect is real, and EPA and CARB are moving forward. On the other, hundreds of scientists are saying it is too early to say if the effect is real, and the European Union and British Columbia are pulling back. There is peer-reviewed work questioning the entire premise of iLUC, and suggesting a number of factors that have been omitted.⁸ Second, the “peer review” argument is misleading because many esteemed (and thoughtful) critics of iLUC are not seeking to get articles published. The list includes Dr. Michael Wang of Argonne National Lab, Dr. Virginia Dale and Dr. Keith Kline of Oak Ridge National Lab, Dr. Bruce Dale of Michigan State, and others.⁹ Third, the “peer review standard” for “good science” can be misleading. NESCAUM should conduct a thorough test of objectivity in all cases. While technical analysis funded by industry should never be dismissed based on superficial grounds, it is not well known that the iLUC modeling used by CARB was funded by BP (via EBI); much of the land use change work coming out of Stanford University is funded by Exxon Mobil; and, much of the land use analysis coming out of UC-Davis is funded by the Institute for Transportation

⁶ <http://www.newfuelsalliance.org/EPA%20RFS%20II%20Letter.pdf>
http://www.arb.ca.gov/lists/lcfs09/111-advanced_biofuels_ltr_to_carb_4-15-09.pdf ;
http://www.arb.ca.gov/lists/lcfs09/67-nfa_arb_luc_final.pdf

⁷ See http://www.transportation.anl.gov/pdfs/letter_to_science_anldoe_03_14_08.pdf

⁸ See <http://pubs.acs.org/doi/abs/10.1021/es802681k>.

⁹ <http://www.newfuelsalliance.org/LCFS%20Public%20Record%20Summary.pdf>.

Studies, which is funded largely by oil and auto companies.¹⁰ Finally, there is the assumption that if the iLUC number is not zero, it should be included in the LCFS. It is not surprising that economic models, holding other variables constant, predict “non zero” land use change when significant volumes of biofuel are added to the agricultural equation. However, to paint an accurate picture in a regulation that values fuels *on a relative basis*, we need to test for market-mediated impacts for crude oil, natural gas and electricity use. For now, zero may in fact be the right answer because, as stated by more than 100 scientists to CARB, “no level of certainty justifies asymmetrical enforcement of indirect effects.”¹¹

7. “The ethanol industry’s protests about the uncertainty miss the important point that this uncertainty is only about the magnitude of these emissions not whether they are real or significant.”

This statement is misleading and frustrating to the advanced biofuel sector. There are very real uncertainty issues related to iLUC science, and it is discouraging to see these issues marginalized using simplistic analysis and characterized as merely ethanol industry concerns. The protest is coming from a wide-range of stakeholders, and if needed, the public record should be more closely examined by the Joint Environmental Stakeholders. For example, Dr. Virginia Dale of Oak Ridge National Laboratory stated in a letter to CARB:

The ILUC estimates carry significant uncertainty because they are based on: (a) a model that was never validated or calibrated for the purpose of estimating land-use change; (b) input data for land use with degrees of uncertainty much larger in magnitude than the changes modeled, casting considerable doubt on the validity of results; (c) one set of modeling results when the same model produced wide-ranging results for indirect land-use change in response to minor adjustments in assumptions and inputs (and there is ongoing debate surrounding the accuracy and validity of many of those assumptions, factors and inputs) as documented in the papers published on the GTAP website and for CARB in the past 24 months; and (d) a hypothesis for indirect land-use change that does not meet the “rules of reason” tests established in US courts for indirect environmental impacts, exposing the LCFS rule to potentially serious implementation obstacles that could be avoided if the ILUC component were postponed until better data and analytical tools are developed.¹²

We are also concerned about the implication that iLUC should be included because the debate is *only* about magnitude. Magnitude *is the point* in a regulation that values fuel based on the relative magnitude of its lifecycle carbon emissions. Small differences in magnitude will be the difference between a company existing and not existing. Current iLUC penalties are

¹⁰ See [ITS Biannual report](#), pp. 44-45. New Fuels Alliance does not seek to impugn the work of these groups based on its funding. The point is to raise questions about work often represented as “university research” by researchers who almost always reference their university rather than industry affiliation.

¹¹ See http://www.arb.ca.gov/lists/lcfs09/66-28-phd_lcfs_mar09.pdf.

¹² See http://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname=lcfs09&comment_num=331&virt_num=209.

game-changing, increasing the carbon score of various biofuels by 40-200+ percent. The truth is, the iLUC models have not been validated, have not been assessed for uncertainty, and have not been run with various sets of assumptions that could more accurately triangulate the outcomes. As noted by Virginia Dale (above), the uncertainty of the assumptions used by models like GTAP and FASOM/FAPRI are often detailed in papers, but were not discussed or remedied during the LCFS process. A recently publicized Public Records Request reveals that GTAP leading author, Dr. Thomas Hertel, communicated to CARB that their use of GTAP results in the regulation is “rather arbitrary,” that the GTAP model “is better suited to generating ... ranges of results” as opposed to point estimates, and that validating the model would be worthwhile.¹³ The CA LCFS was not adjusted to reflect these concerns.

8. “The Northeast and Mid-Atlantic states’ commitment to address iLUC impacts should be memorialized in the MOU.”

As detailed in its comments, NFA recommends memorializing a commitment to balanced carbon accounting, and uniform carbon lifecycle assessment system boundaries, as called for by ISO 14040. Isolating one indirect effect – land use change or otherwise – raises serious questions with regard to bias and consistency.

9. “The EU, despite claims by ethanol lobbyists suggesting otherwise, is currently developing an EU “Low Carbon Fuel Standard” with clear Directives to address iLUC impacts ... [t]he remedy – accounting for these emissions – is not only precautionary in nature, but representative of proper accounting of significant life cycle emissions from biofuels.”

NFA, ethanol lobbyists, 112 scientists and others have on several occasions sought to clarify how the European Union (EU) is dealing with uncertainties regarding carbon accounting and iLUC. This statement by the Joint Environmental Stakeholders suggests that the EU is marching forward with iLUC inclusion, and the proper remedy is to include iLUC emissions for biofuels. This is misleading. One year ago, the EU was unequivocal in its position on iLUC. It stated: “In calculating the greenhouse gas impact of land conversion, economic operators should be able to use actual values for the carbon stocks associated with the reference land use and the land use after conversion. They should also be able to use standard values. The work of the Intergovernmental Panel on Climate Change is the appropriate basis for this. That work is not currently expressed in a form that is immediately usable by economic operators.”¹⁴ It is true that the Commission must submit a report by December 31, 2010. It is also true that they have made a non-binding commitment to decide whether to implement the suggestions in the report by December 31, 2012. However, it is misleading to suggest that iLUC inclusion is somehow in harmony with what the EU is doing. The explicit lifecycle accounting provisions of the Directive (Article 7d) do not make any commitment to iLUC inclusion. The Directive offers very significant GHG reductions for most types of biofuels. And the Commission has openly

¹³ Information available upon request.

¹⁴ Amendments to the Renewable Energy Sources Directive, Resolution 11, December 17, 2008.

discussed, in several forums, the wide range of possible ways to prevent land-based ripple effects from using more biofuels, including credits for using degraded and idle land, and sustainability standards. To be clear, the Joint Environmental Stakeholders are recommending the inclusion of iLUC values against biofuels as a precautionary measure moving forward. The EU decided not to do that because the “work is not currently expressed in a form that is immediately usable by economic operators.” The inconsistencies in the “proper accounting” argument set forth by the Joint Environmental Stakeholders are discussed at length elsewhere in the document (see Comment #1).

10. “We ... have yet to see any peer-reviewed science that suggests that other fuels have large indirect sources of GHG emissions.”

In fact, there is peer-reviewed science suggesting that other fuels have potentially large indirect sources of GHG emissions. The most recent article was published by Dr. Adam Liska of the University of Nebraska.¹⁵ Notably, Dr. Liska does not take funding directly or indirectly from industry. Dr. Liska concludes that considering indirect military emissions alone doubles the carbon intensity of Middle Eastern oil, assuming that 10 percent of U.S. GHG emissions are attributable to military, and 26 percent of military expenditures are for protection of oil supply (notably, this is only for expenditures such as pipeline and waterway security, and excludes any expenditures for “offensives” like Iraq). Individuals within the Joint Environmental Stakeholders group have dismissed the inclusion of military emissions based on the uncertain linkage between oil and military engagement. This would be a reasonable argument *before* calls to include indirect land use change for biofuels. In other words, iLUC has the exact same problem. For example, an article published in *BioScience* magazine captures the complexity of indirect effects, as they relate to deforestation: “[a]t the underlying level, tropical deforestation is ... best explained by multiple factors and drivers acting synergistically rather than by single-factor causation, with more than one-third of the cases being driven by the full interplay of *economic, institutional, technological, cultural and demographic variables*.”¹⁶ Modelers of iLUC are doing something that is much more controversial than what Dr. Liska is doing. They are holding otherwise synergistic variables (like policy) constant in an effort to isolate the effect of biofuels; this is known as “single factor causation” rejected by the aforementioned *BioScience* article. Dr. Liska is doing something that is far more transparent and straightforward. He and colleagues are isolating specific expenditures within a publicly-available budget record, and conservatively excluding the more debatable “offensive” military expenditures, in an effort to create an “oil security” cost as a component of the oil carbon score. The Joint Environmental Stakeholders argue that “all GHG impacts of a fuel should be included in the carbon intensity scoring,” but seem to reject the notion that protecting oil pipelines and sea channels for oil tankers is part of the oil carbon score. It is difficult to see how iLUC is certain and proximate enough to include, and resource security military emissions are not. Either way, the disagreement is largely the

¹⁵ A trade group has posted the article: http://www.growthenergy.org/2009/reports/251-2009_liska_perrin_bbb.pdf.

¹⁶ Helmut J. Geist & Eric F. Lambin, *Proximate Causes and Underlying Driving Forces of Tropical Deforestation*, *BioScience Magazine*, Volume 52, No. 2 (Feb. 2002).

consequence of relying on undefined LCA system boundaries for the fuels being analyzed under the LCFS. But a very basic analysis shows that certain military factors are well within the system boundaries delineated by iLUC inclusion. While iLUC is a definitively indirect effect, in which biofuels are being penalized for the direct land use conversion of (most likely) food, feed and fiber, based on a theory of price-induction, it could be argued that military (at least oil resource protection) is a *direct* effect of oil production (i.e. a component of getting oil to market). If the U.S. spent \$50-200 billion protecting farms that were producing biomass, and railways shipping biomass to biorefineries, would the Joint Environmental Stakeholders call for the substantial carbon emissions associated with this obligation to be included in the biofuel carbon score?

11. *“In California, CARB evaluated the direct land use change from conventional petroleum-based fuels, as requested by NFA, and has found the impact to be insignificant (i.e. on the order of less than 1 percent, as shown in Figure 1-1).”*

NFA did not ask CARB to investigate the direct land use change from petroleum. This analysis would produce a small effect, because the petroleum land footprint is obviously very small compared to the energy extracted. NFA asked CARB to identify and assess price-induced, indirect effects from petroleum. They did not do so. In fact, there is no evidence on the public record that CARB applied economic modeling to any fuel under the LCFS except biofuels. But more importantly, implying that the land footprint of petroleum is somehow relevant to the debate about selective enforcement of indirect effects is misleading. The controversy surrounding iLUC relates to the selective use of economic modeling and the inconsistent and arbitrary enforcement of indirect effect penalties against only one fuel.

12. *“The increased production of corn ethanol has been shown to have a significant impact on corn prices and land use. In contrast, as a first-order estimate, increases in electricity and natural gas under a LCFS program likely would not have a significant impact on demand with respect to their overall markets.”*

This type of analysis oversimplifies the entire concept of indirect effects. Very small changes in existing markets produce potentially large market-mediated effects. This point was made in direct reference to natural gas and electricity by one of the leading advocates for aggressive climate change policy, Climate Solutions, in a letter to CARB:

Are the indirect, price-induced effects of other fuels being fully considered? For example, do the studies take into account the effect of increasing the fleet of compressed natural gas vehicles on natural gas prices, and how this could drive increased use of coal-fired power generation? We note that a 2005 study by R. Weiser et al of Lawrence Berkeley National Laboratory, *Easing the Natural Gas Crisis: Reducing Gas Prices Through Increased Deployment of Renewable Energy and Energy Efficiency*, which averages the results of 13 other studies, found that a one percent reduction in natural gas demand would result in an 0.8-2 percent long-term average reduction of wellhead natural gas prices. Would the obverse be true of increased natural gas demand in transportation and what are the potential knock-on effects

of a significant increase in demand from California and other states in the California clean air regime that will be guided by the CARB finding?

What are the effects of increased electrified vehicle use on the western grid in terms of soaking up low-carbon resources and pushing demand to higher-carbon resources? We note that an [EPRI-NRDC study, *Environmental Assessment of Plug-In Hybrid Vehicles*](#) finds that charging plug-ins with coal achieves a worse emissions result than driving conventional hybrids, and only a marginal comparative improvement when older natural gas power is the charge energy. While we realize the LCFS is a fuel rather than auto technology standard, it is also true we want to achieve the overall most cost-effective carbon reductions. So unless we can direct plug-in toward low-carbon resources through smart charging, it makes little sense to favor plug-ins over lower-cost conventional hybrids. And if we do direct plug-ins to low-carbon resources, what will be the knock-on effects in terms of increasing the use of conventional coal and older gas on the western grid?

It is also worth considering how corn ethanol has been shown to impact corn prices, because it is relevant to why advanced biofuel companies are suspicious of the current iLUC forecasting methodology (which has been applied to advanced energy crops). The oft-cited Searchinger article, which started the debate about iLUC in February 2008, assumed 30 billion gallons of U.S. corn ethanol consumption per year. The U.S. currently uses 10 bgy. Federal law “flat lines” corn ethanol at 15 bgy in 2015. It is absurd to suggest that corn ethanol economics could ever support 30 bgy, even with policy support, but it is not surprising that shocking an economic model in this way produces large results. The equivalent for natural gas and electricity would be to pick a very large (perhaps absurd) future penetration estimate, run the model, then “back cast” the large outcomes to every unit of NG or electricity used today.

With regard to GTAP, the model used by CARB to predict iLUC for biofuels, there are several controversial (and some absurd) elements that exacerbate the overseas land use change effect of using any crop for fuel: (1) GTAP has no treatment for idle and marginal land, which is the equivalent of assuming that U.S. farms are running at 100% capacity and efficiency; (2) GTAP ran 2015 ethanol gallons at 2008 yields, even though yield increases every year; (3) iLUC models assume that agriculture produces to equilibrium, in which supply meets demand, which is wrong; (4) iLUC models assume that trees live forever, which omits natural carbon loss from preserved land, conflicts with IPCC guidelines, and has a significant impact on results.

The Joint Environmental Stakeholders use Figure 1-2 to make the case that ethanol is uniquely disruptive. It is not surprising that there is greater market disruption from ethanol because the fuel has achieved significant penetration into motor fuel markets while the comparative fuel systems have not. The real question, not addressed by Figure 1-2, is what the relative indirect, market-mediated carbon effects are among the different fuels, per unit of fuel. This is why all fuels should be modeled, instead of dismissing the potential for effects based on simplistic apples-to-oranges comparisons. There is no question that biofuels require land use. But referencing these increases out of context leaves the wrong impression about the

magnitude of the effect. The following chart, prepared by Informa Economics, puts the corn demand increase cited by the Joint Environmental Stakeholders in proper perspective:

FIGURE 18. SUMMARY OF INFORMA ECONOMICS PROJECTIONS TO 2015/16

		2007/08 Actual	2015/16 Projected	Change
World Total Major Crop Area (Corn, Wheat, Oilseed, Other)	<i>thousand ha.</i>	873,200	903,200	30,000
World Corn Area	<i>thousand ha.</i>	157,600	162,900	5,300
World Wheat Area	<i>thousand ha.</i>	216,800	219,700	2,900
World Oilseeds Area	<i>thousand ha.</i>	198,200	220,300	22,100
World All Other Major Crop Area	<i>thousand ha.</i>	300,600	300,300	-300
U.S. Grain Ethanol Production	<i>m. gallons</i>	8,475	15,000	6,525
U.S. Corn Use for Ethanol (Gross)	<i>m. metric tons</i>	76.2	130.9	54.7
Land Required for U.S. Grain Ethanol Production (Gross)	<i>thousand ha.</i>	8,037	11,417	3,380
Distillers Grains Production	<i>m. metric tons</i>	24	41	17
Land Required for U.S. Grain Ethanol Production (Net)	<i>thousand ha.</i>	5,525	7,849	2,324
% of World Major Crop Area Req'd. for U.S. Ethanol	%	0.63%	0.87%	0.24%

Note: Informa's projections assume distillers grains production reduces the land use impact of corn ethanol by one-third. As discussed elsewhere in this paper, it is likely that the land use "credit" from distillers grains is much higher, which would significantly reduce the net land area required for ethanol.

Finally, it is unclear why the Joint Environmental Stakeholders argue that indirect effects are unlikely for hydrogen, natural gas, electricity and oil based on minimal short-term market disruption, yet support iLUC inclusion for cellulosic ethanol. The iLUC penalties levied against cellulosic ethanol by CARB, using the methodologies discussed above, increase the carbon intensity score of this fuel by 200+ percent under the LCFS. Yet, use of land for these fuels would not even register in the chart above. The New Fuels Alliance believes that all biofuels should be held accountable for their land use behavior, yet selective inclusion of indirect effects and double standards will not result in a durable LCFS.

13. “NFA also has raised questions regarding the potential for greater use of electricity and natural gas indirectly causing increased use of coal by other sectors. As shown above, this is unlikely since the price of electricity and natural gas would not be expected to be affected in any significant manner.”

This is pure speculation not supported by fact or preliminary analysis conducted to date. The indirect effects of electricity and natural gas may be quite significant, or less than 10 CO₂e-g/MJ. Both outcomes have a significant effect on the relative values of the fuels under the LCFS.

14. “In addition, GHG emissions from the electric sector are capped under the Regional Greenhouse Gas Initiative and are expected to be capped federally soon. Federal legislation also is expected to cap most other significant sources of GHG emissions except land-use. As a result, the potential for economic factors to induce indirect emissions is greatly reduced.”

This statement makes little sense, and provides another example of different rules for different fuels. Capping emissions in a state or region may not prevent price-induced, indirect

effects from occurring in the region, and certainly does not prevent them from occurring outside of the region. In the same way that using only light sweet crude in the northeast would simply shift the tar sands use to other regions, soaking up clean electrons or natural gas in the northeast will push the induced impacts on the margins to other regions (i.e. outside of the cap, and even in the case of a federal cap, to Canada, Mexico and other countries). In addition, roughly 80-90 percent of the iLUC penalty for biofuels is derived from the alleged conversion of lands in foreign countries. So, on the one hand, the Joint Environmental Stakeholders want NESCAUM to consider the worldwide, price-induced, indirect land impact of using more biofuel, but not worry about the national or international price-induced impacts of other fuels because there is a partially implemented regional cap and a possible federal cap. NFA does not see how this argument makes sense in an analytical framework in which the bulk of the effect is traceable to other countries. Further, the Joint Environmental Stakeholders point to existing and prospective “cap and trade” policies to alleviate concerns about future growth in certain fuels, but ignore the fact that the federal RFS requires all new biofuel gallons to reduce GHG emissions by 20-60 percent. The LCFS also ignores federal law applicable to new biofuel gallons.

15. “As a new and growing sector, clean alternative fuels can be an economic engine in the Northeast and Mid-Atlantic states, starting and attracting companies, creating and retaining jobs, and growing the states’ clean energy sectors. For example, cleaner electric supply in the region can facilitate a switch from conventional engines to plug-in hybrid electric and battery electric vehicles.”

NFA supports electrification, and believes that a flex-fuel, HEV/PHEV burning domestically-produced biofuels (when needed) is a viable way to eliminate U.S. dependence on foreign oil. However, it is interesting to see what California did to make electricity an ultra low carbon fuel under the LCFS. The starting point for the electron itself is 124.10 CO₂e-g/MJ, based on CA mix electricity (see LCFS ISOR, p. IV-3). This is worse than gasoline. CARB gets the number to 41.37 CO₂e-g/MJ by assuming a 3X power train efficiency improvement over internal combustion. Certainly, there is an efficiency improvement for electric drive over internal combustion. However, it is at least questionable to cherry-pick vehicle traits for a fuel standard based on the embedded carbon intensity (CI) value of a unit of fuel, considering: (1) California already has a vehicle performance standard in Pavley; and, (2) CARB considered the power train efficiency gains of the vehicle but not the other traits of an electric vehicle, including much higher GHG emission on the production side. CARB achieves the final ISOR electricity CI value of 34.90 CO₂e-g/MJ by assuming policy-induced penetration of renewable electricity production, natural gas, and policy-induced elimination of coal-fired electricity production. Certainly, there is the potential for more renewable electricity production as a result of AB32 and the RPS. However, it is at least questionable to use policy-induction in this one scenario, considering: (1) CARB did not use policy-driven outcomes across the board; and, (2) CARB ignored the GHG standards placed on all new gallons of biofuel under federal law. The New Fuels Alliance is asking for consistency. CARB’s treatment of electricity offers another example of different rules for different fuels.