

## MEMORANDUM

**To:** Environment and Energy Policy Committee  
**From:** Richard Moskowitz  
**Date:** September 8, 2009  
**Re:** Low Carbon Fuel Standard

This memorandum explains the concept of a Low Carbon Fuel Standard (LCFS); discusses the potential impact of a LCFS on the trucking industry; and describes various federal and state initiatives to enact a LCFS. The purpose of this memorandum and the upcoming teleconference on Wednesday, September 9<sup>th</sup>, is to provide ATA staff with guidance on the issue, and determine whether existing ATA energy policy needs to be revised to address a LCFS.

### A. Low Carbon Fuel Standard – Description

LCFS is a policy initiative to reduce the life cycle greenhouse gas (GHG) emissions of fuel.<sup>1</sup> To establish a LCFS, regulators first calculate the GHG emissions of today's diesel fuel to determine a current baseline and then require that the carbon intensity be reduced by a specific percentage.<sup>2</sup>

In most cases, the responsibility for ensuring reduced carbon intensity falls on the importer, refiner, blender or fuel distributor (*i.e.*, obligated party). Depending upon the legal requirements enacted as part of the LCFS, the potential tools available to the obligated parties for achieving the LCFS targets include fuel substitution (e.g., natural gas or electricity), fuel blending with lower carbon fuels (e.g., biodiesel), carbon sequestration at the refinery, and purchasing carbon credits or offsets.

Depending upon the feedstock used, biodiesel may be blended into diesel fuel to reduce its carbon intensity; however, biomass based diesel is generally more expensive

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<sup>1</sup> The life cycle carbon emissions of fuel takes into consideration the sum of GHG emissions that are associated with the production, transportation and consumption/combustion of the fuel. The lifecycle analysis associated with biofuels is embroiled in controversy over how to account for indirect land use impacts. The question at the center of this issue relates to how other countries will make up for the reduction of food that the U.S. currently exports as the U.S. begins to use agricultural commodities for domestic energy consumption. As countries that depend upon U.S. agricultural exports clear land to grow their own crops, significant amounts of carbon will be released. There is a debate over how to account for these indirect carbon emissions.

<sup>2</sup> The current estimate of lifecycle GHG emissions from ultra low sulfur diesel is approximately 27 pounds of CO<sub>2</sub> equivalent per gallon.

than ULSD. The cost differential between biodiesel and ULSD depends upon the feedstock used, the production process employed, and the cost of transportation. In addition the use of biodiesel in blends higher than 5% may increase operating and maintenance costs for fleets.<sup>3</sup>

## B. Potential Impact Upon Trucking Industry

A requirement to lower the carbon intensity of diesel fuel could adversely impact the trucking industry. The most direct impact of the LCFS would be a potential increase in the price of diesel fuel stemming from the requirement to use higher cost alternative fuels. LCFS also has the potential to create operational challenges for fleets, especially if alternative fuels do not comply with existing diesel fuel specifications (*i.e.*, ASTM-D975). Finally, a LCFS could adversely impact U.S. energy security, as certain high carbon sources of diesel fuel are declared off-limits (*i.e.*, Canadian oil sands, coal-to-liquids fuels).

## C. Current Low Carbon Fuel Standard Initiatives

### 1. State Biodiesel Mandates

Several states have enacted biodiesel mandates. While most state biodiesel mandates were originally enacted without considering the impact upon fuel carbon intensity, biodiesel has the potential to reduce the carbon intensity of fuel. Several factors impact the carbon intensity of biodiesel, including feedstock used, manufacturing process, and emissions associated with transporting the biodiesel to market.

Most of the biodiesel produced in the United States is derived from soybean oil. There is an ongoing debate over the lifecycle GHG emissions associated with renewable fuels. EPA estimates that soybean-derived biodiesel may reduce GHG emissions by 22 percent or may increase GHG emissions by four percent.<sup>4</sup> The California Air Resources Board estimates that the carbon intensity of soybean based biodiesel is 71 percent less than ULSD and that biodiesel derived from waste grease reduce carbon intensity by 85 percent. Depending upon the final estimates of biodiesel GHG emissions, blending biodiesel may be one of the strategies employed by obligated parties to reduce the carbon intensity of diesel fuel under a LCFS.

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<sup>3</sup> For a complete discussion on the impact of biodiesel and renewable diesel on fleets see ATA's Frequently Asked Questions document at: [http://www.truckline.com/AdvIssues/Energy/RENEWABLE%20DIESEL%20%20BIODIESEL/Biodiesel\\_Renewable%20Diesel%20Q%20and%20A.pdf](http://www.truckline.com/AdvIssues/Energy/RENEWABLE%20DIESEL%20%20BIODIESEL/Biodiesel_Renewable%20Diesel%20Q%20and%20A.pdf)

<sup>4</sup> This wide range in GHG emissions for biodiesel depends upon the impact of indirect GHG emissions that result from land use changes and the time period over which the land use calculations are based. The initial change in land use releases significant amounts of carbon, which are then recaptured over time as energy crops are grown on the land that was previously cleared.

The following three states have enacted biodiesel mandates.

- Minnesota – B5 mandate in effect<sup>5</sup> - 10% by May 1, 2012 and 20% by May 1, 2015. While the B5 mandate is year-round, the move to B10 and B20 are seasonal, from April through October.
- Oregon – B2 requirement in effect for nine counties – statewide mandate will begin on October 1, 2009. Diesel fuel consumed by locomotives, marine engines, and home heating is exempt from the biodiesel mandate. Since July 1, 2007, the city of Portland required B5.
- Washington – 2% of total diesel sales must be biodiesel (annual requirement).

The following four states have enacted biodiesel mandates that have not yet taken effect:

- Louisiana – 2% of total diesel sales – in-state production target not yet met.
- Massachusetts – Diesel fuel and home heating oil must contain at least 2% renewable diesel by July 1, 2010, 3% by July 1, 2011, 4% by July 1, 2012 and 5% by July 1, 2013.
- New Mexico – By July 1, 2012, the state requires 5% biodiesel blends.
- Pennsylvania -- In 2008, the state enacted a biofuels mandate. With in-state production triggers now met (40 million gal); the state's B2 mandate will take effect January 1, 2010. The Pennsylvania biodiesel mandate increases to 5% once in-state production reaches 100 million gallons per year, 10% once in-state production reaches 200 million gallons per year, and 20% once in-state production reaches 400 million gallons per year.

Each year about 6 states introduce various forms of state biodiesel mandates. While we have enjoyed a fair amount of success in fighting these mandates, each year one or two states succeeds in enacting a biodiesel mandate. These state mandates compromise the efficient distribution of diesel fuel, may exacerbate fuel shortages, and uniformly result in the consumer paying more money for diesel fuel.

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<sup>5</sup> Biodiesel is typically blended with petroleum diesel fuel. Biodiesel blends are denoted as, "BXX" with "XX" representing the percentage of biodiesel contained in the blend (i.e., B5 is 5% biodiesel, 95% petroleum diesel).

## 2. Federal Renewable Fuel Standard

The Energy Policy Act of 2005 established a renewable fuel standard (RFS) that requires the use of ethanol and other renewable fuels in motor fuel. The Energy Independence and Security Act of 2007 (EISA or RFS2) substantially increased the amount of renewable fuels required and added a specific mandate for biomass-based diesel as part of the program's Advanced Biofuels schedule. The following chart shows all the volume requirements from EISA:

| <b>Renewable Fuel Volume Requirements under EISA (billion gallons)</b> |                                |                                  |                              |                                  |
|--|--------------------------------|----------------------------------|------------------------------|----------------------------------|
| Year   | Cellulosic biofuel requirement | Biomass-based diesel requirement | Advanced biofuel requirement | Total renewable fuel requirement |
| 2008   | n/a                            | n/a                              | n/a                          | 9.0                              |
| 2009   | n/a                            | 0.5                              | 0.6                          | 11.1                             |
| 2010   | 0.1                            | 0.65                             | 0.95                         | 12.95                            |
| 2011   | 0.25                           | 0.80                             | 1.35                         | 13.95                            |
| 2012   | 0.5                            | 1.0                              | 2.0                          | 15.2                             |
| 2013   | 1.0                            | a                                | 2.75                         | 16.55                            |
| 2014   | 1.75                           | a                                | 3.75                         | 18.15                            |
| 2015   | 3.0                            | a                                | 5.5                          | 20.5                             |
| 2016   | 4.25                           | a                                | 7.25                         | 22.25                            |
| 2017   | 5.5                            | a                                | 9.0                          | 24.0                             |
| 2018   | 7.0                            | a                                | 11.0                         | 26.0                             |
| 2019   | 8.5                            | a                                | 13.0                         | 28.0                             |
| 2020   | 10.5                           | a                                | 15.0                         | 30.0                             |
| 2021   | 13.5                           | a                                | 18.0                         | 33.0                             |
| 2022   | 16.0                           | a                                | 21.0                         | 36.0                             |
| 2023 <sup>+</sup>  | b                              | b                                | b                            | b                                |

<sup>a</sup> EPA will determine the amount of biomass-based diesel required after 2012 through rulemaking.

<sup>b</sup> EPA will determine the amount of renewable fuel required after 2023 through rulemaking.

RFS2 requires the blending of 500 million gallons of biodiesel in 2009. This amount increases to 1 billion gallons in 2012. Thereafter, EPA has the discretion to establish the appropriate level of biodiesel under the RFS.

In order for renewable fuels to qualify for the EISA categories, they must meet or exceed minimum carbon reduction thresholds. EPA must conduct a lifecycle analysis to determine whether or not renewable fuels produced under varying conditions will meet the carbon thresholds for the different fuel types for which EISA establishes mandates. While conventional biofuels must have at least a 20% reduction in lifecycle carbon emissions, advanced biofuels must have 50% lower lifecycle carbon emissions. In this regard, the RFS functions similarly to a LCFS.

**Lifecycle GHG Thresholds Specified in EISA**  
(percent reduction from 2005 baseline)

|                             |                  |
|-----------------------------|------------------|
| Renewable fuel <sup>6</sup> | 20%              |
| Advanced biofuel            | 50% <sup>7</sup> |
| Biomass-based diesel        | 50%              |
| Cellulosic biofuel          | 60%              |

Since EPA is estimating the life-cycle carbon emissions of biodiesel (including indirect carbon emissions) to be only a 22% reduction, the proposed RFS2 rule would require soy-based biodiesel to be blended with biodiesel produced from animal fats and waste greases in order to achieve the 50% carbon reduction requirement. The American Petroleum Institute estimates that the RFS2 could reduce GHG gas emissions by 4% in 2022.

3. Federal LCFS

Unlike the RFS, a LCFS does not specifically require the use of a specific amount of renewable fuel and obligated parties are left to determine the best way of reducing the carbon intensity of the fuel they distribute. Initially, the Waxman-Markey climate change bill (ACES) that passed the U.S. House of Representatives contained a LCFS. This section of the bill, which would have required a 5% reduction in transportation fuel carbon intensity by 2023 and a 10% reduction by 2030, was deleted prior to passage. Moreover, these reductions would have been required on top of the reductions that would result under RFS2.

Representative Waxman has expressed his intent to reintroduce a LCFS. Senator Barbara Boxer (D-CA) (Chair of the Senate Environment and Public Works Committee) has stated that she is interested in including a LCFS in the Senate climate change bill, although no text has been circulated. Even if Congress does not establish a LCFS, once EPA determines that carbon emissions endanger human health and welfare, it will have the authority to promulgate a LCFS under the Clean Air Act. If EPA moves forward with a LCFS regulation, it is unclear how the agency would integrate the LCFS with the existing RFS2.

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<sup>6</sup> The 20% criterion generally applies to renewable fuel from new facilities that commenced construction after December 19, 2007.

<sup>7</sup> EPA is proposing to exercise the 10% adjustment allowance provided for in EISA for the advanced biofuels threshold to as low as 40%.

#### 4. California LCFS

In April 2009, California Air Resources Board voted 9-1 to enact a LCFS, designed to achieve a 10% reduction in carbon intensity of California transportation fuels by 2020. ATA submitted comments opposing California's plan, arguing for a comprehensive national approach to the issue and pointing out that the California LCFS would simply require renewable fuels produced elsewhere in the country to be transported to California for consumption.

The California LCFS allows blenders, refiners and importers to achieve emission reductions by buying credits from producers of low-carbon transportation fuels. To address the indirect emissions impact from land-use conversions, the regulation will require a review of the issue in 2011.

Obligated parties could opt for several actions to comply. For example, they could improve the efficiency of the refineries and upstream production, purchase and blend more low-carbon renewable fuels, or purchase credits from electric utilities supplying low carbon electricity to vehicles, or diversify and sell low carbon natural gas.

#### 5. Oregon LCFS

On July 22, 2009, Oregon passed a law authorizing the Oregon Environmental Quality Commission (EQC) to adopt rules for the reduction of GHG emissions from transportation fuels. The EQC may adopt a LCFS, which would require a reduction in fuel carbon intensity of 10 percent from 2010 levels by 2020.<sup>8</sup>

#### 6. Northeast LCFS

Thirteen Northeast states are working toward their own LCFS, with a goal of having their governors sign a memorandum of understanding by the end of the year. Nearly all of these states have established targets for reducing GHG emissions. These targets vary state-to-state, but generally require a 20 percent reduction in total anthropogenic GHG emissions by 2020 from 1990 levels and a 50 percent or greater reduction from 1990 levels by 2050. One of the stated approaches to achieving these GHG reductions is a change the properties of transportation fuel.

#### D. Interplay Between LCFS and other Climate Change Initiatives

The interplay between any LCFS and state biodiesel mandates must be evaluated.

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<sup>8</sup> The Oregon law authorizes the EQC to create other programs to reduce emissions, including requirements to reduce aerodynamic drag in medium- and heavy- duty vehicles, tire efficiency standards, and idling reduction requirements for trucks and ships.

Whether a federal LCFS allows biodiesel produced to comply with a state biofuel mandate or the existing federal RFS will impact the amount of biodiesel and other alternative fuels required to be sold in the country.

E. Questions for Discussion in Formulating a Position on LCFS

1. Does a LCFS present a viable alternative to cap & trade for mobile sources?
  - Cap & Trade will make diesel fuel more expensive, as refineries must purchase carbon credits to account not only for their refinery emissions, but also the carbon emitted through the combustion of refined products (gasoline and diesel) – the problem is that the trucking industry does not burn diesel fuel on a discretionary basis.
  - If cap & trade were modified so that the trucking industry were allocated credits equal to the cost increase passed on by refineries, would it be preferable to other carbon control initiatives for mobile sources?
2. Is a combined LCFS, RFS and Cap and Trade system multiple regulation of our industry or can these separate programs be integrated?
3. Recognizing that state preemption may not be politically achievable, how important is preemption in this area (is it a deal breaker)? Can a federal LCFS be viewed as a means to remove the political pressure that states are currently facing to act in this area?
4. For a LCFS to be workable, what should it look like?
  - Achievable carbon reductions that phase in over time using fuels that are commercially available,
  - Alternative fuels that work in all segments of the industry.
  - Compliance with ASTM fuel standards upon which the legacy fleet was designed to operate.
  - Alternative fuels that are cost effective (with some type of safety valve)
  - A distribution system that does not create significant price disparities from state to state.
  - Energy security and the ability to use domestic resources (coal, oil sands).