US EPA Proposes New Regulations that will Shape the Future of the Renewable Fuels Industry for 2010 and Beyond

On May 26, 2009, the US Environmental Protection Agency issued a proposed rulemaking (RFS NOPR) that would amend and significantly expand the regulations governing the use of renewable fuels in the transportation sector. The proposed regulations, published in the Federal Register at 74 Fed. Reg. 24904, would implement the requirements of the Energy Independence and Security Act of 2007 (EISA), revising the National Renewable Fuel Standard first enacted under the Energy Policy Act of 2005 (EPAct).

The proposal would require significant increases in the volume of renewable fuels utilized, expand the scope of the fuels regulated, and establish new subcategories of renewable fuels. In addition, the regulations would, for the first time, mandate examination of, and reductions in, the lifecycle greenhouse gas (GHG) emissions from the production of renewable fuels. When finalized, the regulations will provide the regulatory framework for the renewable fuels industry in the United States during the next decade and beyond.

The developments under the RFS NOPR should be closely followed by all participants in the renewable fuels industry, including developers, technology suppliers and equity and debt financiers. The determinations under the RFS NOPR will have a direct impact on the viability of hundreds of projects that are in the development pipeline, scientific efforts to develop cellulosic ethanol, as well as existing renewable fuels facilities, including the corn based ethanol industry. In short, under ESIA and the proposed rules, all biofuels are not created equal.

Background

Brief background on RFS is helpful. The EPA Act of 2005 provided for the establishment of a renewable fuel standard to be implemented in the United States (the "RFS1"). The EPAct set out a schedule of targets for volumes of renewable fuels to be incorporated into the transportation fuel supply. It requires a ramp-up from 4.0 billion gallons in 2006 to 7.5 billion gallons of renewable fuel as motor vehicle fuel by 2012 and set annual volume targets for each year leading up to 2012.

In addition, the implementing regulations for RFS1 established the compliance mechanism known as Renewable Identification Numbers (RINs). The RINs system is the reporting mechanism that allows affected parties to demonstrate their compliance with the RFS1 requirements. Under the RINs system, each gallon of renewable fuel is assigned a unique RIN number, which follows such fuel on its path in the fuel supply chain until the RIN is retired through consumption of the associated fuel or is traded to an affected party that applies such RINs to its renewable fuel obligation. The RINs system will be enhanced under the revised renewable fuels standards.

Renewable Fuel Standards 2

EISA, enacted into law in December 2007, made significant changes to both the structure and magnitude of the renewable fuel program. The resulting revised standards are referred to as "RFS2." RFS2 mandates the use of 36 billion gallons of renewable fuel by 2022, nearly a five-fold increase over the highest volume specified by the EPAct and a 10-year extension of the scheduled production ramp-up. While RFS1 focused on "motor vehicle fuels," the RFS2 proposal expands the universe of covered fuels to include all "transportation fuels," which includes not only fuels used in highway vehicles and engines, but also those used in nonroad vehicles and engines, locomotive engines, and marine engines and vessels (excluding ocean-going vessels). Similarly, while the EPAct only mandated the

blending of renewable fuels into gasoline (although allowing credit for renewable fuels blended into diesel fuel), RFS2 contains specific mandates for biodiesel, and includes gaseous and other fuels used as transportation fuels.

The RFS NOPR proposes implementing regulations for the following key areas established under the RFS2: (i) the creation of three new subcategories of renewable fuels (discussed below); (ii) the eligibility requirements to qualify as a renewable fuel, including required lifecycle greenhouse gas (GHG) reductions for the various subcategories of renewable fuels and limitations on feedstocks; (iii) the methodologies which must be followed in calculating the GHG impact for the various categories of fuels, including consideration of impacts on land usage patterns; and (iv) the fuels and facilities that will be exempt from the 20 percent GHG threshold. The RFS NOPR will also evaluate when production of ethanol in the United States will exceed the volume that can practically be blended into gasoline at 10 percent volume level (E10), known as the "blend wall."

In order to qualify as a renewable fuel under RFS2, a fuel must be developed from "renewable biomass" feedstocks, which term is defined so as to significantly restrict the source materials that will qualify. For example, planted crops and crop residue must be harvested from agricultural land that was cleared or cultivated prior to December 19, 2007, is actively managed or fallow, and is non-forested. This requirement will significantly restrict the fuels that will qualify as renewable under the new standards.

Three Sub-Categories of Renewable Fuels

RFS2 contains three subcategories of renewable fuels: Advanced Biofuel, Cellulosic Biofuel, and Biomass-Based Diesel. Advanced Biofuel is a renewable fuel other than ethanol derived from corn starch and which must achieve a lifecycle GHG emission displacement of 50 percent, compared to the gasoline or diesel fuel it displaces. Cellulosic biofuel is any renewable fuel, not necessarily ethanol, derived from any cellulose, hemicellulose, or lignin, each of which must originate from renewable biomass. It must achieve a lifecycle GHG emission displacement of 60 percent, compared to the gasoline or diesel fuel it displaces for it to qualify as cellulosic biofuel. The proposed regulations impose separate volume requirements for each subcategory, as well as an overall volume requirement for total renewable fuels.

Under the proposed rule, "Biomass-based diesel" includes biodiesel (mono-alkyl esters), non-ester renewable diesel and any other diesel fuel made from renewable biomass, as long as they are not "co-processed" with petroleum. The RFS NOPR provides additional detail on the framework for determining if there is "co-processing."

EISA defines "additional renewable fuel" as fuel produced from renewable biomass that is used to replace or reduce fossil fuels used in home heating oil or jet fuel. The EPA proposed to allow RINS assigned to renewable fuel blended into heating oil or jet fuel to be valid for compliance purposes.

Lifecycle Greenhouse Gas Analysis

The proposed regulations establish, for the first time, requirements for lifecycle GHG analysis, and threshold reductions in lifetime GHG emissions that must be satisfied in order for fuels to count toward the required volumes for each category of renewable fuel. Using 2005 as a baseline, this requirement compares the lifecycle GHG emissions for gasoline or diesel to the lifecycle GHG emissions for the renewable fuel used in replacement. The analysis is intended to take into account GHG emissions related to the full fuel cycle, including all stages of fuel and feedstock production and distribution: from feedstock generation or extraction through distribution and delivery of the finished fuel. For biofuels, this would include evaluating indirect emissions from land use changes, including international land use changes as a result of the domestic production or importation of biofuels.

As referenced above, the different categories of renewable fuels are subject to different GHG reduction requirements. For advanced biofuels and biomass-based diesel, a 50 percent reduction in lifecycle GHG emissions would be required, while cellulosic biofuels are subject to a 60 percent reduction requirement. Finally, all renewable fuels produced by new facilities would be subject to a 20 percent reduction requirement for lifecycle GHG emissions. The required percentage of GHG reductions for each category may be lowered if the EPA Administrator determines that achieving the target reductions is infeasible.

Establishing Methodologies to Determine the GHG Reduction Impact of Renewable Fuels

In order to fulfill its GHG reduction mandate under EISA, EPA must demonstrate that biofuels reduce lifecycle GHG emissions by the required percentages relative to the 2005 petroleum baseline, including both "direct" and "significant indirect" emissions, including indirect emissions associated with land use changes. Because no single model can capture all of the complex interactions associated with estimating lifecycle GHG emissions for biofuels, EPA's effort to fulfill this mandate relies upon a complicated array of models to evaluate the impacts of biofuels at various lifecycle stages.

The models and inputs relied upon by EPA include: the Greenhouse Gases, Regulated Emissions, and Energy use in Transportation (GREET) model (used to quantify the GHG emissions associated with the production and use of various fuels and agricultural inputs); the FASOM model (used to estimate the changes in the domestic agricultural sector); the integrated FAPRI international models (used to estimate impacts of biofuels feedstock production on international agricultural and livestock production); Winrock International's analysis of satellite data (used to assess recent land use changes around the world and associated impacts on carbon stocks); the Intergovernmental Panel on Climate Change (IPCC) estimate of impacts of N_2O emissions from fertilizer application; the ASPEN-based process models developed by the USDA and DOE's National Renewable Energy Laboratory (NREL) (used to estimate GHG emissions associated with renewable fuel production and assess the impacts of expected advancement in the field of biofuels); EPA's Motor Vehicle Emission Simulator (MOVES) (used to estimate vehicle tailpipe GHG emissions), and an EPA version of the Energy Information Administration's National Energy Modeling System (NEMS) (used to estimate secondary impacts on the energy market associated with increased renewable fuel production.)

The use of multiple models, and the number of assumptions that necessarily go into each, raises questions regarding the accuracy and reliability of the modeling outcomes. Not surprisingly, given the large number of models utilized, EPA has, as of yet, been unable to conduct a sound, statistically based uncertainty analysis. EPA is specifically seeking peer review of several aspects of its modeling efforts, including the use of satellite data to project future land use changes; the land conversion GHG emissions factors estimates utilized for different types of land use; its estimates of GHG emissions from foreign crop production; the methods used to account for the variable timing of GHG emissions; and the manner in which the models relied upon are used together to provide overall lifecycle GHG estimates.

Time Periods and the Discount Rate Issue

In order to measure GHG lifecycle impacts, EPA must first define the appropriate time frame during which impacts will be considered. In addition, EPA must determine what discount rate, if any, to apply when quantifying the effects of future impacts. The discount rate is a means of taking into consideration the time profile associated with each fuel's GHG emissions stream.

Based on its lifecycle GHG analysis for the proposed rule, EPA estimates that the payback period for corn ethanol produced in a natural gas-fired dry mill is approximately 33 years. In order to address both shorter-term and longer-term lifecycle impacts, EPA analyzed two different time periods for its lifecycle analyses — 100 years and 30 years.

For its analysis with a 100-year time frame, EPA discounts the value of future GHG emissions changes using a 2 percent discount rate to assess the present value of GHG emissions changes that occur over a 100-year time frame. In its analysis using a 30-year time frame, EPA applies no discount rate, so that all emission releases and uptakes during this time period are valued equally. In its proposal, EPA ultimately relies upon the 100-year time frame with a 2 percent discount rate, finding this time frame to be consistent with the Office of Management and Budget, EPA guidance, and discount rates used in scientific literature.

The issue of whether a discount rate should be applied and, if so, what rate is appropriate, has garnered significant attention, and EPA has specifically requested comment on the issue. In addition, EPA plans to convene a peer review of the range of time periods considered in the proposed rule, and to seek feedback on all of the issues related to measuring impacts on GHG emissions, including how to determine the most appropriate time periods for consideration in the final rule.

Grandfathering of Ethanol Facilities

Under EISA, renewable fuel produced at existing facilities where construction was commenced on or prior to December 19, 2007, are exempt or "grandfathered" from the 20 percent GHG reduction requirement that applies to renewable fuels produced at new facilities. Renewable fuel produced at ethanol plants that commenced construction in 2008 and 2009, and which are fired with natural gas and/or biomass, are likewise exempt from the 20 percent requirement.

The RFS NOPR seeks comment on the appropriate duration of this exemption, proposing options including expiration after 15 years or upon reconstruction, expiration of exemption after 15 years with an additional limitation to a baseline volume, and an indefinite exemption with no limits on the exempted volume. The option selected will have significant implications for existing corn-based ethanol production facilities and their ability to compete with alternative renewable energy sources.

Conclusion

Participants in the renewable fuels industry should keep abreast of developments under the RFS NOPR. Determinations made under this technical rule-making will have a differential impact on various flavors of renewable fuels, which in turn will impact the commercial viability of projects under development and renewable fuels facilities. EPA will hold a public hearing on June 9, 2009, in Washington, DC, which will be followed by a two day workshop on June 10-11, 2009, also in Washington, DC, to present details of the EPA's GHG life cycle analysis. Participants may also wish to consider submitting comments to the EPA during the 60-day notice period to address issues that may be unique to the particular type of renewable fuel or feedstock source they are developing.

For more information about the issues discussed in this Client Update, or for information regarding renewable fuels project development, environmental and environmental and climate change matters please contact one of the following lawyers.

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