RINSTAR® The Renewable Fuel Registry

STOEL RIVES LLP ATTORNEYS AT LAW

America Advances to Performance-Based Biofuels

The Advanced Renewable Fuel Standard / RFS2

White Paper
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Authors:

Clayton McMartin | Clean Fuels Clearinghouse - Home of RINSTAR®

Graham Noyes | Stoel Rives, LLP

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Contents

Introduction

Earlier this month, the U.S. Environmental Protection Agency ("EPA") released a comprehensive revision of the Renewable Fuel Standard ("RFS"). The new rules were triggered by Congress' comprehensive revision of the RFS that was signed into law by President Bush in 2007. As part of the agency's responsibilities under the Clean Air Act ("CAA"), the EPA was tasked to draft, circulate and finalize the regulations for the new RFS program ("RFS2"). The combination of Congress' new law and the EPA's regulations represents a complete overhaul of the prior legislation.

The three defining characteristics of RFS2 are its massive scale, staggering complexity and demanding requirements.

The three defining characteristics of RFS2 are its massive scale, staggering complexity and demanding requirements. Regarding scale, during the next 12 years, the annual volume requirements under RFS2 increase from 13 billion to 36 billion, and the program is expanded to include off-road, locomotive and marine gasoline and diesel fuel. Within the original RFS1 was a maximum mandated volume of 7.5 billion gallons of renewable fuel. On the issue of complexity, RFS2 mandates obligatory purchase of four types of fuel rather than the single Type under the original RFS ("RFS1"). Perhaps the most profound change, however, is at the fundamental level. Unlike RFS1, where almost all renewable fuel was treated equally, RFS2 mandates analysis and verification of all significant GHG ("GHG") impacts, scores each fuel according to its GHG performance and introduces related upstream and downstream GHG-driven obligations. The introduction of GHG performance marks a first of its kind regulation for the nation's transportation fuel industry and the motoring public it serves.

While RFS2 presents a new set of rules, the EPA has retained the underlying system of compliance from RFS1. Market participants will still be required to utilize Renewable Identification Numbers ("RINs") to track transactions and demonstrate compliance. What has changed is that there are now multiple types of RINs to correspond to new types of fuel. In addition, new GHG-driven EPA rules mandate a well-to-wheels lifecycle analysis ("LCA") that examines all factors impacting GHG performance for a particular fuel. For renewable fuels producers, RFS2 imposes restrictions on where they grow their crops, what process technology they use to produce renewable fuel, the energy they use at their plant and how they keep track of feedstock purchases. As detailed below, these requirements ripple throughout the system in the form of registration requirements, RIN values and the validity of RINs.

Within this changing landscape, this White Paper attempts to describe the legal and practical context for a variety of industry participants. Since this audience is diverse and ranges from renewable fuel producers, importers and product traders to independent petroleum marketers, fuel cooperatives and petroleum refiners, multiple RFS2 topics are discussed in some detail. First, the legal background for the RFS2 is discussed along with the new legal requirements imposed by the legislation. Second, the key compliance system of RINs is reviewed with attention to practical changes to the prior system and compliance obligations. Third, a series of issues important to particular market participants is dis-

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cussed in more detail. These topics include producer obligations, new fuel pathways, importer issues and RIN trading economics. Finally, a series of recommendations for upgrading to RFS2 is provided for market participants.

General Guidance Not Applicable to All Situations

This White Paper has been developed to provide general guidance and an overall understanding of RFS2. As such, this White Paper is not suitable as a basis for reliance regarding any specific legal or compliance issue. Due to the complexity of the regulations, industry participants are advised to seek the advice of legal counsel and regulatory experts to determine their specific compliance and reporting obligations. While it is hoped this White Paper will be a useful resource, it does not include the myriad details and minutiae that ultimately determine compliance and exposure for a particular company under a specific set of facts.

Legal Background

On May 5, 2009, the EPA Administrator released proposed rules based on changes that the Energy Independence and Security Act ("EISA") made to the RFS. These rules established a proposed new regulatory scheme (RFS2) for renewable fuels under the CAA and were published in the Federal Register in the form of a Notice of Proposed Rulemaking ("NPRM").[1] The NPRM triggered a tremendous response with a high degree of criticism from industry participants, within both the conventional and the renewable fuels sectors. As a result of the complexity of the rules and issues, the EPA extended the standard 60-day public comment period to 120 days. During this period, which ended on September 25, 2009, the EPA received written comments from thousands of persons and companies and held a series of related public hearings and workshops. The EPA then took an additional 120-day period to publish the final version of the rule. This Final Rule (RFS2 or "Final Rule") is the subject of this White Paper. The EPA's Preamble to RFS2 ("Preamble") spans 418 pages, and the regulations themselves are 120 pages long ("Regulations"). Given the Final Rule's length and complexity, this White Paper does not attempt to cover all aspects of RFS2 but focuses on describing its overarching structure, key obligations and implications for market participants.

The EPA received written comments from thousands of persons and companies and held a series of related public hearings and workshops.

The Administrator signed the Final Rules for the new regulations implementing RFS2 on February 3, 2010. The EPA developed these rules with active industry participation over the two-year period since President Bush signed the EISA. The Final Rule differs dramatically from the rules proposed by the

1 *EPA, Notice of Proposed Rulemaking, 40 C.F.R. Part 80, RIN 2060-A081 (issued May 5, 2009) (all references to page numbers refer to pagination of the PDF file originally released by the EPA rather than the Federal Register pagination).*

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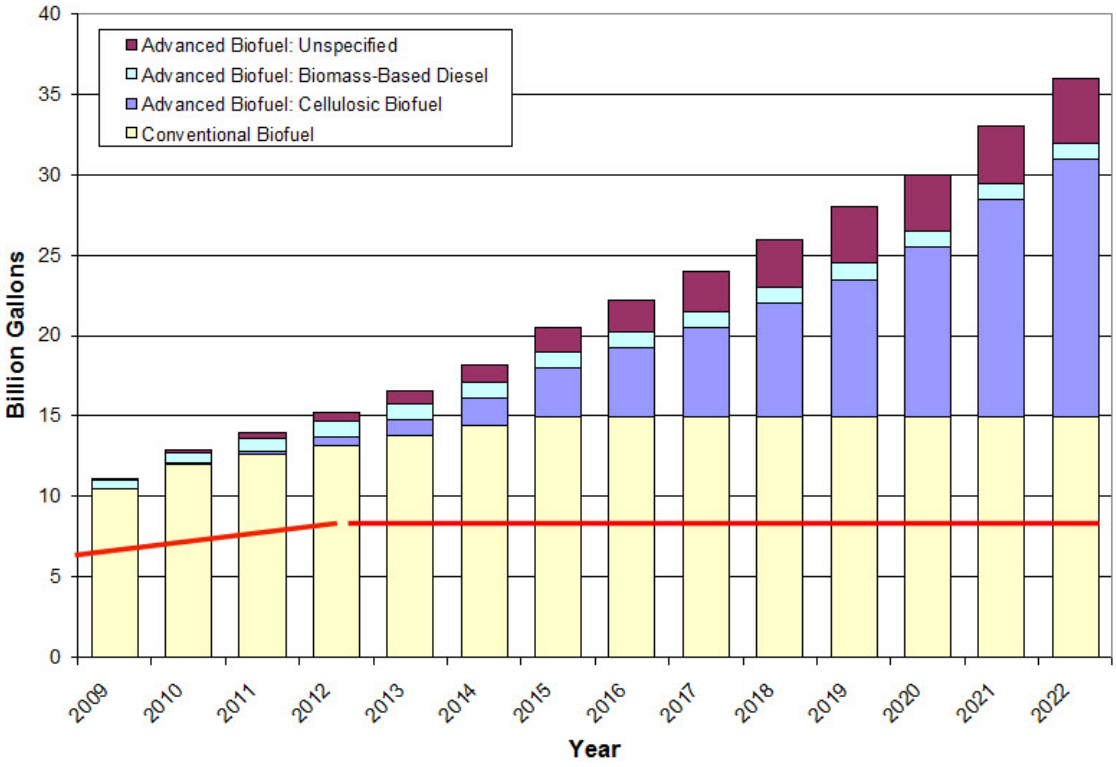
EPA in May 2009, and has been softened in many respects to make the program less stringent, more practical and easier to administer than the previous proposed rule. To its credit, the EPA took industry concerns seriously on many issues and made a series of significant accommodations. In addition, the EPA provided Final Rules on several issues that the agency had left unresolved in the proposed rules.

Table I
Graphical Comparison Of RFS1 Standard And RFS2 Standards



1. RFS2 Program Overview

a. RFS1

RFS1 was adopted by the EPA to implement the provisions of the Energy Policy Act of 2005 ("EPAct"), which added section 211(o) to the CAA. Since its inception, the RFS program has mandated an increasing amount of renewable fuel in the U.S. petroleum fuel marketplace. Under RFS1, the fuel marketplace was measured only by gasoline sales, and the percentage requirements were relatively modest though escalating over time. The typical compliance fuel was ethanol made from corn starch. The obligated parties under the system were petroleum refiners and importers of gasoline. These parties

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were required to generate sufficient RIN credits to show that they had complied with their percentage obligations over the gallons of gasoline that they sold into the marketplace for the compliance period. To the extent that their own sales generated either insufficient or excess RINs, these RINs could be sold to other market participants subject to various restrictions.

b. Integration of RFS1 and RFS2

The integration and transition will present several challenges for the industry as it modifies its business systems and practices to accommodate these changes.

Passed by Congress in 2007, EISA served as the legislative vehicle for RFS2. With the passage of the EISA, Congress made several important revisions to the prior system. The first issue of importance is the transition from RFS1 to RFS2. The Final Rule applies to all renewable fuel produced on or after July 1, 2010, all RINs generated on or after July 1, 2010 and to all renewable volume obligations and compliance periods starting January 1, 2010.

An important distinction to recognize is that RIN credits of the RFS1 variety will co-exist with RIN credits of the RFS2 variety. Although there are considerable changes in the RIN credit banking and trading approach, the EPA has made no provision, through the new Moderated Transaction System (EMTS), to directly convert RINs of the RFS1 vintage to an RFS2 equivalent. Instead criterion will exist for certain RFS1 RINs to be identified and used for RFS2 compliance. In other words the RFS1 RINs will still exist but must be managed in parallel but separate systems.

Due to the mid-year implementation, the year 2010 will include both varieties of RINs, an RFS1 version from January through June, and the RFS2 version from July through December. Due to the carry forward provision of the credit program, the full transition from RFS1 to RFS2 will run into the year 2013. The integration and transition will present several challenges for the industry as it modifies its business systems and practices to accommodate these changes.

c. Expansion of Obligated Parties

As previously mentioned, RFS2 introduces renewable volume obligations beyond on road gasoline to include all transportation fuel. The RFS has always utilized a percentage approach, i.e. the 2010 obligation is 8.25%. Previously this percentage was measured against only the on-road gasoline pool. With RFS2, it is now measured against the gasoline and diesel pool for on-road, off-road, locomotive and domestic marine sectors ("MVNRLM"). Alaska and U.S. territories have the option whether to opt into the program.

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d. Separate Volume Mandates for Renewable Fuel Categories

A fundamental change in RFS2 is the expansion from the single standard under RFS1 to four standards. Each of these four standards institutes a performance threshold in terms of GHG reduction for the fuel type. The GHG reduction is measured relative to the biofuel's petroleum counterpart. In other words, the GHG performance of ethanol products is measured against that of petroleum-based gasoline, and the GHG performance properties of biodiesel are measured against petroleum diesel fuel.

The four types of fuel are best described as **CBAR**:

Type C Cellulosic Biofuels must meet various requirements including at least a 60% GHG reduction.

Type B Biomass-Based Diesel must meet various requirements including at least a 50% GHG reduction.

Type A Advanced Biofuels must meet various requirements including at least a 50% GHG reduction.

Type R Renewable fuel must meet various requirements including at least a 20% GHG reduction. However, existing ethanol production facilities are subject to grandfathering requirements that exempt them from the GHG performance requirements for a defined period of time.

e. Increased Volume Requirements with EPA Adjustments

There is a substantial and rapid increase in the mandate for cellulosic biofuels in particular.

As mandated by EISA, the Final Rule establishes the framework for the expansion of biofuels as a transportation fuel over the next 13 years. There is a substantial and rapid increase in the mandate for cellulosic biofuels in particular. EISA increased the cellulosic biofuel mandate from 250 million to 1 billion gallons by 2013, with additional yearly increases to 16 billion gallons by 2022. While the program ramps cellulosic fuel up rapidly, the EPA has the authority to adjust GHG levels for some fuel types and adjust fuel mandates. In its first such action, the EPA dramatically lowered the cellulosic biofuel mandate for 2010 from 100 million to 6.5 million gallons. It also used its authority to set the price for credits to cover the cellulosic biofuel RIN shortfall at a price of $1.56 per gallon.

The following table details the requirements for the various categories:

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Table II
Renewable Fuel Volume Requirements for RFS2 (in billion gallons)

	Type C	Type B	Type A	Type R
	Cellulosic Biofuel Requirement	Biomass-Based Diesel Requirement	Advanced Biofuel Requirement	Total Renewable Fuel Requirement
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+	b	b	b	b

a To be determined by EPA through a future rulemaking, but no less than 1.0 billion gallons.
b To be determined by EPA through a future rulemaking.

It should be noted that due to the delayed finalization of RFS2 that the mandates did not go into place during 2009. In the case of Biomass-Based Diesel (Type B), EPA elected to carry the 500 million gallon mandate forward and combine it with the 650 million gallons required in 2010 by EISA. EPA communicated their intent in November of 2008 whenever they issued the 2009 standard. Therefore, the Type B mandate in 2010 will now be 1.15 billion gallons.

It should not be construed by the reader that the mandate guarantees a demand in 2010 for 1.15 billion gallons of production. The fact is that EPA took this retroactive approach further, making special consideration for Type B RINs, from both 2008 and 2009, to be used in meeting the 2010 annual obligation. The rule goes even further and provides for reinstatement of RINs that were retired due to non-road use of the corresponding fuel. And it also provides for special considerations as the obligated parties calculate their 2010 renewable volume obligation (RVO). An exhaustive explanation of all factors impacting compliance with the 2010 Type B mandate is highly dependent on a particular company's business configuration and is therefore outside the scope of this paper. The reader is encouraged to conduct

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further research and/or consult with a professional knowledgeable in this area in order to establish a clear understanding. For your convenience, suggested areas of reading are provided in the section of this paper titled Upgrading to RFS2.

f. Fuel-Specific Analysis of GHG Emission Profiles

Perhaps the most striking new development contained in RFS2 pertains to the requirements that the various renewable fuels achieve GHG emissions reductions compared to a petroleum fuel baseline. The regulations represent a sea change in U.S. policy by both assessing GHG performance and creating GHG based fuel volume mandates for the first time. These innovations are attributable not to the EPA but to Congress and President Bush, who developed the structure and mandates of EISA. With the passage of EISA, the EPA was empowered with the responsibility to create a comprehensive new system of GHG analysis, categorization and enforcement in fuels. The EPA notes that this is the first time it has undertaken such a program. This approach marks the first time in U.S. history where an industry has been evaluated, monitored and regulated based on GHG performance but is likely a harbinger of future EPA action in other sectors. The EPA described its GHG mandate from Congress as follows:

This approach marks the first time in U.S. history where an industry has been evaluated, monitored and regulated based on GHG performance but is likely a harbinger of future EPA action in other sectors.

> The lifecycle GHG emissions means the aggregate quantity of GHGs related to the full fuel cycle, including all stages of fuel and feedstock production and distribution, from feedstock generation and extraction through distribution and delivery and use of the finished fuel. EISA established specific greenhouse gas emission thresholds for each of four types of renewable fuels, requiring a percentage improvement compared to a baseline of the gasoline and diesel used in 2005. EPA must conduct a lifecycle analysis to determine whether or not renewable fuels produced under varying conditions will meet the greenhouse gas (GHG) thresholds for the different fuel types for which EISA establishes mandates… As mandated by EISA, the greenhouse gas emission assessments must evaluate the full lifecycle emission impacts of fuel production including both direct and indirect emissions, including significant emissions from land use changes. [2]

The EPA's regulatory role on these issues requires it to integrate scientific and technical analysis into its categorizations of fuels. Because a lifecycle analysis necessarily encompasses all GHG emissions released and trapped from a wide range of activities in the production and use of a specific fuel, achieving a precise lifecycle GHG analysis for even one fuel is currently impossible, as no scientific consensus has yet emerged regarding methodology. The undertaking becomes even more difficult when magnified across multiple feedstocks, production techniques and fuels. Thus the EPA was charged by

2 *NPRM at 16.*

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Congress under RFS2 to develop its own methodology that it can first defend scientifically and legally, and then implement and enforce. Given the breadth and novelty of the program, it should be no surprise that there was significant change from what was originally proposed by the EPA and that which has been codified in the Final Rule. These changes were a result of extensive public comment, peer review and evaluation. In particular, the EPA deviated downward in its assessment of Indirect Land Use Change ("ILUC"). ILUC assesses impacts to GHG's that are imputed to a fuel based on the anticipated expansion of cropland. Under the NPRM, biodiesel in particular suffered from the anticipated ILUC impact. The National Biodiesel Board ("NBB") and other commenters were successful in moving EPA significantly on ILUC. This resulted in the qualification of soy biodiesel as a Biomass-Based Diesel fuel in the Final Rule though it had been excluded in NPRM.

g. The Requirement of Renewable Biomass

The other novel and substantial change imposed by RFS2 is the requirement that renewable fuels must be produced through the use of renewable biomass. EISA contains a host of definitions and distinctions pertaining to what qualifies as a renewable biomass. As an example, some of the key provisions pertaining to the area of woody biomass are summarized as follows:

The other novel and substantial change imposed by RFS2 is the requirement that renewable fuels must be produced through the use of renewable biomass.

> EISA included several provisions for the RFS2 program designed to address the long-term environmental sustainability of expanded biofuels production. The new law limits the crops and crop residues used to produce renewable fuel to those grown on land cleared or cultivated at any time prior to enactment of EISA, that is either actively managed or fallow, and non-forested. EISA also generally requires that forest-related slash and tree thinnings used for renewable fuel production pursuant to the Act be harvested from non-federal forest lands. [3]

During the public comment period, there was substantial concern raised regarding the need to prove the source of feedstock. In the final analysis, the EPA recognized the potential burden placed on industry participants had they required a full accounting of all renewable biomass. In the cases where renewable fuels are produced from domestic grain crops, the EPA waived the requirement in the Final Rule for these feedstocks to be tracked back to the land. Citing the availability of land records pertaining to agricultural use, the EPA indicated that it would monitor the use of such land and make a future determination if more extensive recordkeeping and reporting requirements would be necessary to prevent an undesirable shift in land use.

Producers using woody biomass, and those using waste products such as used cooking oil, animal fats, and greases, and foreign producers using even conventional agricultural products retain the demand-

3 *NPRM at 17.*

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ing requirements of identifying and recording the sources of their renewable biomass sources. Thus while the EPA showed flexibility in response to a strong domestic agricultural response, less traditional sources of feedstocks will bear heavier reporting burdens.

h. Expansion of Renewable Fuel RIN Types

The combination of standards and distinct RIN types will bring an order of magnitude change in the way of program complexity.

EISA created new categories and requirements of renewable biofuels. The RFS2 Final Rule establishes a regulatory system to enforce EISA's requirements. As under RFS1, RINs will be the tool of compliance for obligated parties who are subject to the mandates. Unlike RFS1, there will be five types of RINs, at least initially. These RIN types are not completely distinct, however, with significant overlap between some RIN types and their application in satisfying the four standards, described earlier in this paper as the CBAR fuel categories. The combination of standards and distinct RIN types will bring an order of magnitude change in the way of program complexity.

Before examining the interrelationship between each of the new standards, it is important to have a basic understand of how the RIN credit is used by the EPA for administration of the overall program. To assess the value of RINs under the new system, it is necessary to examine the interaction between the various categories as well as the new approaches to allowances and equivalence values that the EPA has provided. To explain these interrelationships, recall the four standards relating to the CBAR categories or fuel types described above; the overall program has four separate but interrelated standards. Each of these standards can be met with one, or in some cases multiple, RIN types, described as CBAR7. The details of the requirements for valid RINs and the methods for tracking RINs are described in a subsequent section of this paper.

i. Equivalence Value of Fuels for RIN Generation

Under RFS1, RIN values were assigned to qualifying fuels based on their energy value in comparison with ethanol. In addition, the EPA was empowered to establish "appropriate" credit for certain fuels including cellulosic and waste-derived fuels. Under the resulting RFS1 system, corn ethanol received a equivalence value of 1 on a per-gallons basis, butanol 1.3, biodiesel 1.5, non-ester renewable diesel 1.7, and cellulosic biomass ethanol and waste-derived ethanol 2.5 credits. Thus two gallons of cellulosic biomass ethanol would generate 5 RINs. [4]

Under the NPRM, the EPA proposed substantial changes to the equivalence value system. In the end, however, the Final Rule essentially maintained the RFS1 approach to equivalence values with significant distinctions for the Biomass-Based Diesel requirement and advanced ethanol. As regards the Biomass-

4 *NPRM at 96.*

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Based Diesel category (Type B fuel), the EPA reasoned that this standard was set as a diesel standard. For this reason, the gallon obligations for this category are based on a biodiesel-equivalent energy basis. As regards advanced ethanol fuels under RFS1 (waste-derived ethanol and cellulosic biomass ethanol), these fuels lost their special status as a result of the statutory language of EISA and no longer carry a multiplier advantage.

In its migration to RFS2 the energy equivalence methodology continues to place Type B fuel providers in an advantageous position.

It should be noted that the RVO is calculated on a straight volume basis for each of the standards with the exception of Biomass-Based Diesel (Type B). In the case of the Type B Standard, a multiplier of 1.5 is used by EPA to determine that Standard in a given year. To illustrate, consider the published standard of 1.10% for Biomass-Based Diesel from Table I.A.2-1 of the preamble. The volumetric obligation in 2010 for Biomass-Based Diesel is 1.15 billion gallons. However, in order to meet the 1.10% mandate obligated parties will actually need to secure and submit 1.725 billion gallon-RINs. The 1.725 billion gallon-RINs represents 1.15 billion gallons of fuel meeting the Type B criteria.

It is interesting to note that under RFS1 the energy equivalence was used by Congress to provide some advantage or additional incentive to biodiesel producers and those processing waste feedstocks or utilizing heat integrated processes. In its migration to RFS2 the energy equivalence methodology continues to place Type B fuel providers in an advantageous position. Further evaluation of the nested approach to the standards, described throughout section 2 of this paper, will reveal that Type A and Type R mandates can be met with Type B RINs. From a RIN perspective, ethanol and all other renewable fuel products must compete on an energy basis with biodiesel RINs.

This rather complex set of circumstances illustrates the potential for unintended consequences from such an arcane rule. One might expect this to be an area that Congress takes up for further evaluation during their 60 day Congressional review period.

For those closely tracking equivalence values, it is noteworthy that the EPA changed the baseline BTU value of ethanol. Under C.F.R. § 80.145, the EPA has established 77,000 Btu/gallon as the energy content of denatured ethanol, which is slightly different than the previous value of 77,750 Btu/gallon. [5]

j. Penalties

The prohibition and liability provisions of RFS2 are similar to those of RFS1. The proposed rule identifies prohibited acts including failing to acquire sufficient RINs to meet a party's obligations, producing or importing a renewable fuel that is not assigned a proper RIN category, improperly assigning RINs to renewable fuel that was not produced with renewable biomass, failing to assign RINs to qualifying fuel, or creating or transferring invalid RINs. Under RFS2, any person or company who violates any prohibi-

5 *NPRM at 98.*

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As is clear from the content of the regulations, there are many scenarios wherein reasonable market participants could run afoul of the program with no criminal intent.

tion or requirement of the RFS2 program may be subject to civil penalties of $37,500 for every day of each violation and the amount of economic benefit or savings resulting from the violation.

These provisions provide for strict liability and there is no defense even where the willful violation occurred upstream and the downstream participant proceeded in good faith. The penalties extend to failure to comply with reporting requirements.[6] Thus, as under RFS1, the EPA has powerful enforcement tools available to it. As is clear from the content of the regulations, there are many scenarios wherein reasonable market participants could run afoul of the program with no criminal intent. Under RFS1, the EPA has prosecuted only a handful of cases and those have involved alleged deliberate schemes or negligence. Given that simple downstream violations can rapidly result in exposure to millions of dollars in penalties, prudent participants will follow best practices to minimize exposure.

High-Level Description of the Credit Banking and Trading

2. The RIN Credit System

The RIN is commonly referred to as the currency of compliance. The RIN serves as a credit and is used by obligated parties to demonstrate compliance with their pro-rata share of a particular year's mandate. EISA, like EPAct, provided for a credit trading program that is open to more than just obligated parties, provided that the company is registered with the EPA to participate. Whether trading credits or operating within the renewable fuel arena, a thorough understanding of the RIN program is necessary to understand the dynamics of the RFS.

Given that simple downstream violations can rapidly result in exposure to millions of dollars in penalties, prudent participants will follow best practices to minimize exposure.

a. The Credit Banking and Trading Approach

Both RFS1 and RFS2 represent renewable fuel standards where certain parties are required to use a mandated volume of renewable fuel each year. The ultimate requirement is that this renewable fuel be placed into the market along with conventional petroleum products. These mandates were a result of congressional action where legislation was drafted and eventually passed into law through the political process. Once law, the EPA was then charged with implementing and administering the program through the regulatory process.

Faced with the responsibility of administering RFS1, and now RFS2, the EPA expanded on a common scheme used in other programs within the agency's realm known as credit banking and trading ("CBT"). In a CBT approach, the credit is generated when a party demonstrates, or delivers through actual

6 *NPRM at 157.*

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performance, the desired result. The credit is then banked in that party's account. Then when the time comes to demonstrate compliance (annually for RFS1 and RFS2), the individual company can withdraw banked credits from its account and submit them to the EPA to demonstrate compliance with the particular mandate in question.

Flexibility is one of the primary benefits of the CBT approach. A party that has more credits than it needs for its own purpose can trade these credits to a party that would then use them to demonstrate compliance on its behalf. This is the "trading" component of the CBT approach.

Each of these obligated parties must demonstrate compliance at the end of the year by submitting a sufficient number of RIN credits to satisfy their pro-rata share of the overall mandate.

b. Applying CBT to the RFS

To aid application to the renewable fuel mandates, the EPA introduced the RIN with the implementation of RFS1 on September 1, 2007.

Looking first to the mandate, the legislation requires that the petroleum industry use a certain amount of renewable fuel in its product slate each year. In regulatory language this is known as the obligation, and those who bear the burden of this obligation are the obligated parties. Under RFS1, the obligated parties are those who place finished gasoline into the retail marketplace. For all intents and purposes these are U.S. crude oil refiners, such as ConocoPhillips, ExxonMobil, Chevron and Shell, or companies that import gasoline into the United States. Each of these obligated parties must demonstrate compliance at the end of the year by submitting a sufficient number of RIN credits to satisfy their pro-rata share of the overall mandate. Their pro-rata share is based on the volume of gasoline they either produced or imported in that year, divided by the total U.S. consumption, and multiplied by the total renewable fuel mandate. As noted in an earlier section of this paper, RFS2 expands this pool to include diesel use and non-road, locomotive and marine applications.

From a supply and demand perspective, the obligation establishes the demand for the RIN credit in the CBT system. Supply of RIN credits is then generated through the production of renewable fuel. With each gallon of renewable fuel produced, a single credit, or in some cases a multiple of credits, are generated. These RIN credits are then moved from one party to the next, as they pass through the supply chain, until they eventually find their way to an obligated party. An obligated party can obtain RINs either through physical blending of renewable fuels with their petroleum product or through acquisition from those who do place renewable fuels in petroleum products.

c. Activating a RIN as a Tradable Credit

The EPA established a provision in the RIN trading scheme to assure that RINs would move through the entire supply chain and not be stalled in their journey or otherwise be hoarded by producers of renewable fuels. To achieve this objective, the EPA developed rules that caused the RIN to move through

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two states of association. Initially the RIN is "Assigned" to renewable fuel and can only be transferred in concert with the physical transfer of fuel. The RIN is essentially an attribute of the fuel, but not yet a credit that would trade openly.

In the second state of association the RIN is "Separated" from the fuel and in essence becomes activated. It can now trade independently of the fuel and serve as a true paper credit for the purpose of compliance. The separation event occurs whenever the physical product is blended with petroleum products, or whenever an obligated party purchases the renewable fuel. In this way, the regulatory program ensures that the RIN is moved downstream and made available to the marketplace for those who need it for compliance purposes.

The most substantive change to the program will be the greatly expanded responsibilities that the EPA has now assumed.

Here is a simple explanation of how the RIN program works:

(1) The RIN is generated as a result of renewable fuel being produced.

(2) The RIN is then passed along with the renewable fuel from one party to the next through the supply chain.

(3) Reaching the end of the supply chain, the RIN becomes an "Activated Credit" at the point just before the renewable fuel is placed into the consumer market.

(4) The RIN may then trade among registered participants and is ultimately applied toward an obligated party's mandated obligation.

Of course, like any complex regulation, the RIN program has several special circumstances that all affected parties should understand. Two examples are (1) treatment of RINs associated with exported renewable fuel product, and (2) the varied requirements under which a RIN must be retired, making it no longer available to the market.

d. Changes to the RIN Program with RFS2

The EPA has retained the RIN CBT program approach with RFS2, making a limited number of changes. The framework originally developed by the EPA to support the single credit RFS1 program has now been modified and expanded for service with the multiple credit RFS2 program.

The most substantive change to the program will be the greatly expanded responsibilities that the EPA has now assumed. Under its new role as the moderator for all future RIN related transactions, the EPA will have daily involvement in commercial operations. The EPA has developed the Moderated Transaction System ("EMTS"), which will serve as a closed system for the EPA to assign RIN numbers, verify RIN

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inventories and authorize transactions between RIN owning parties. A more detailed description of EMTS is provided in a later section of this paper.

As with the original RFS1 program, the EPA has maintained the 38-character numeric code to describe certain attributes of the RIN credit. Specific to the RIN type, the defining character in the RIN number is what the EPA refers to as the D code. The D code can be found in the 22nd position, starting from the left, of the 38-character number. The RFS1 program originally used two D codes: 1 and 2. The 1 denoted a product meeting the definition of cellulosic derived, and the 2 indicated non-cellulosic origin. The vast majority of RFS1 RINs fall into the second category. RFS2 introduces five more D codes: 3 through 7. Each of these D codes corresponds to one of the characters in the CBAR7 acronym. These new RINs result directly from Congress' approach of incentivizing new classes of second generation renewable fuels. Each new RIN is explained below.

It is interesting to note that RFS1 provided a definition for cellulosic biofuels that was more related to process heat recovery and fuel source than actual process chemistry.

e. Cellulosic Biofuel – Type C RINs – CBAR7

Cellulosic Biofuel "means renewable fuel derived from any cellulose, hemi-cellulose, or lignin that has lifecycle GHG emissions that are a least 60 percent less than the baseline lifecycle GHG emissions." § 80.1401. The EPA's Final Rule maintained the threshold as it was originally proposed in the NPRM.

Type C RINs correspond to a D code of 3 in the RFS2 program. Type C RINs of the 2009 vintage and the RFS1 2010 time period (prior to the July 1, 2010 effective date) are identified with a D code of 1. It is interesting to note that RFS1 provided a definition for cellulosic biofuels that was more related to process heat recovery and fuel source than actual process chemistry. Consequently, cellulosic RINs have been generated under RFS1 and will have an impact on market dynamics for this class of renewable fuel.

The Type C RIN is used to satisfy the Type C Standard as shown in Table I above. It is also important to recognize the "nesting" effect of these standards. For instance, the Type C RIN can be used to satisfy the Type A standard and the Type R standard. The Type C RIN cannot be used to satisfy the Type B standard, as the Biomass-Based Diesel Type B standard is independent of the rest, or what many call a "carve-out." For a graphic representation of the nesting of these standards, see Table I (pay close attention to the formatting of the table).

f. Biomass-Based Diesel – Type B RINs – cBAR7

"Biomass-Based Diesel" (Type B) is defined as a renewable fuel that is either biodiesel as defined by ASTM D6751-07 or a non-ester renewable diesel. Renewable fuel that is co-processed with fossil fuel is expressly defined as not Biomass-Based Diesel. To qualify for the Biomass-Based Diesel designation, biodiesel must qualify for a D code of 4 pursuant to section 80.1426(f). Table III provides the approved

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pathways for renewable fuel production. The pathway variables are the feedstock used and the production process requirements. The chart excludes process technology that co-process renewable biomass and petroleum from the D code designation of 4.

A significant change between the NPRM and the Final Rule was the inclusion of soy-based biodiesel in the Type B classification. As originally proposed only the non-virgin oil pathway would have qualified with a D code of 4, thus any soy or other vegetable oil biodiesel would have been classified as renewable fuel having a D code of 6.

The lifecycle GHG threshold specified for Biomass-Based Diesel under EISA is a 50% reduction. During and following the comment period, the EPA made efforts to more fully evaluate the lifecycle analysis associated with biodiesel production from virgin oil feedstocks. Its findings were that agricultural-based biodiesel production did in fact satisfy the GHG threshold reduction of 50%, and therefore a much greater volume of biodiesel will now fall under the Type B (D code 4) RIN classification. This change will dramatically increase the market supply of Type B RINs, having a downward force on the Type B RIN price.

Type B RINs correspond to D code 4 in the RFS2 program. Type B RINs of the 2008 and 2009 vintage, and the RFS1 2010 time period (prior to the July 1, 2010 effective date), are identified with a D code of 2 combined with an equivalence code of either 15 or 17.[7] Prompted by the EPA's issuance of the 2009 standard in November 2008, sophisticated operators began segregating Type B RINs accordingly in early 2009, reaping financially from their understanding of the changing regulatory approach.

Similar to the Cellulosic Type C category of fuels, the Biomass-Based Diesel category enjoys exclusivity through a carve-out provision in the regulations.

Similar to the Cellulosic Type C category of fuels, the Biomass-Based Diesel category enjoys exclusivity through a carve-out provision in the regulations. The Type B RIN is used by obligated parties to satisfy their Type B standard. The nesting of the standards, described earlier, also expands the use of Type B RINs.

The Type B RIN can also be applied to the Type A obligation and the Type R obligation. Type B RINs may not be applied to Type C obligations. The Type B standard can only be met through the application of Type B RINs and the dual purpose Type 7 RIN. More discussion on the Type 7 RINs is provided at the end of this section.

g. Advanced Biofuel – Type A RINs – CBAR7

Advanced Biofuel "means renewable fuel, other than ethanol derived from cornstarch, that qualifies for a D code of 5 pursuant to §80.1426(f)." Except for the express exclusion of cornstarch feedstock (which exclusion is established by EISA), Advanced Biofuel may be regarded as the most flexible of the

7 *See section 80.1425 for an explanation of equivalence codes.*

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subcategory renewable fuels. The D code of 5 establishes that the EPA has found that the particular fuel pathway meets the RFS2 GHG performance requirements sufficiently to warrant categorization as an "Advanced Biofuel." In effect, the EPA has defined these fuels based on GHG performance criteria and is using the D code as an approval code to signify qualification.

The lifecycle GHG threshold specified for Advanced Biofuels under EISA is a 50% reduction. The EPA had proposed that the GHG threshold be reduced for Advanced Biofuels to 44%. This appears to have been a result of preliminary lifecycle analysis methodology which was more stringent. In the final analysis the GHG reduction threshold was maintained at 50% for Type A Advanced Biofuels.

The Type A RIN is primarily made up of sugar cane ethanol and waste derived ethanol products and is assigned a D code of 5 under RFS2. The criteria necessary to define Type A RINs do not exist in the RFS1 and therefore there will be no Type A RINs prior to the effective date of RFS2. In other words, there are no 2009 Type A RINs and no early year 2010 Type A RINs.

The application of Type A RINs is to the Type A standard or the Type R standard. Type A RINs are excluded from application to Type C or Type B fuel standards.

In the final analysis the GHG reduction threshold was maintained at 50% for Type A Advanced Biofuels.

h. Renewable Fuel – Type R RINs – CBAR_7

Renewable fuel was the basis for all RINs under RFS1 and was defined generally as "any motor vehicle fuel that is used to replace or reduce the quantity of fossil fuel present in a fuel mixture used to fuel a motor vehicle." Renewable fuel remains the broadest category under RFS2 and would encompass all subcategories of fuel under the regulation. The definition of "renewable fuel" has changed substantially to the following (section 80.140 of the Final Rule):

Renewable fuel means a fuel which meets all of the requirements of paragraph (1) of this definition:

(1)(i) Fuel that is produced from renewable biomass.

(1)(ii) Fuel that is used to replace or reduce the quantity of fossil fuel present in a transportation fuel, home heating oil, or jet fuel.

(1)(iii) Has lifecycle greenhouse gas emissions that are at least 20 percent less than baseline lifecycle greenhouse gas emissions, unless the fuel is exempt from this requirement pursuant to §80.1403.

(2) Ethanol covered by this definition shall be denatured as required and defined in 27 CFR parts 19 through 21. Any volume of denaturant added to the undenatured ethanol by a producer or importer in excess of 2 volume percent shall not be included in the volume

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of ethanol for purposes of determining compliance with the requirements under this subpart.

The change included in subpart (2) of the definition reflects the expansion of RFS to encompass home heating oil, jet fuel, locomotive fuel and other fuels beyond the previous motor vehicle fuel limitation. The renewable biomass requirement in (1) is imposed on the subcategories of renewable fuels described earlier in this paper. As we have discussed, the renewable biomass requirement will have different significance in different contexts depending on the GHG reductions required.

The Type R renewable fuel category may best be described as the lowest rung, catch-all category. Obligated parties are required to meet their specified RIN obligations in the various specific categories and will also be able to use RINs from those categories to satisfy the Type R renewable fuel category.

The Type R standard can be satisfied with Type R RINs. The nesting approach of the rule goes on to allow all other second generation RINs to be applied toward the first generation Type R category. In other words, the Type R standard may also be satisfied by applying Type C, Type B, Type A and/or Type 7 RINs to a party's obligation.

In the case of RFS2 Type R RINs, they will be identified with the D code of 6. RINs from the RFS1 era, i.e., 2009 and early 2010, are identified as those having a D code of 2 and an equivalence code of anything other than 15 or 17. RFS2 permits the Type R standard to be met with current year RINs and up to 20% of prior year RINs. Again, the prior year RINs could be in any of the existing prior year categories, namely Type C, Type B or Type R from 2009 and the first half of 2010.

Overall cellulosic production has not kept pace with the schedule of mandates originally proposed; however, the technology seems to have developed in a new area

i. Cellulosic Biodiesel – Type 7 RINs – CBAR7

One of the more interesting developments since EISA was originally passed, and for that matter since the NPRM was issued in May 2009, is the advancement of cellulosic technology. Overall cellulosic production has not kept pace with the schedule of mandates originally proposed; however, the technology seems to have developed in a new area, namely the production of distillate range products from cellulosic technology.

Since cellulosic biodiesel essentially bridges two of the categories that Congress originally brought forward with EISA, the EPA was faced with a situation that was outside of its authority (creation of a new renewable fuel category), yet saw a need to recognize the attributes of this emerging biofuel product. The EPA's answer was to develop a fifth category of RINs.

Cellulosic biodiesel has a D code of 7 under the Final Rule. Since Cellulosic biodiesel has properties that meet either the definition of Cellulosic Biofuels (Type C category) or Biomass-Based Diesel (Type B cat-

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egory), the Type 7 RIN can be used to satisfy either one or the other, but not both. Some have referred to the Type 7 RIN as having dual use, but it may be better described as having "discretionary" use. It is important to recognize that the discretionary use is limited in the sense that it can only be applied to either the Type B category obligation or the Type C category obligation.

With respect to RFS1 vintage RINs, there will be no Type 7 RINs generated. Type 7 RINs begin generation on the effective date of RFS2 (July 1, 2010 as published) and will be a rarity in the marketplace. Nonetheless, the informed operator should be aware of Type 7 RINs and understand their use and limitations.

3. Topics of Interest to Market Participants

a. Producer Obligation: Comply with Renewable Biomass Mandate

One of the most dramatic changes under RFS2 is the requirement that all qualifying renewable fuels be produced with "Renewable Biomass."

One of the most dramatic changes under RFS2 is the requirement that all qualifying renewable fuels be produced with "Renewable Biomass." No such requirement existed under RFS1. While this obligation is of primary interest to renewable fuel producers, it has direct impacts on other RIN market participants. To the extent that a producer fails to comply with this requirement, the RINs that the producer has generated will be found to be invalid. Thus downstream market participants may suffer exposure to violations from insufficient due diligence about the source of their renewable fuel and RINs.

This Renewable Biomass mandate is enforced by the EPA through the imposition of qualifying feedstock obligations. Producers who make fuel must authenticate that they used qualifying feedstock through the certification process. The obligations imposed by this certificate process vary widely depending on the category of feedstock used. It is necessary to understand in detail the categorization of feedstocks under RFS2 and the varying obligations imposed depending on the category of feedstock. As will be seen, there were substantial winners and losers during the Final Rulemaking, particularly regarding the degree of obligations imposed.

Renewable Biomass is defined under the Final Rule as follows.

Renewable biomass means each of the following (including any incidental, de minimis contaminants that are impractical to remove and are related to customary feedstock production and transport):

(1) Planted crops and crop residue harvested from existing agricultural land cleared or cultivated prior to December 19, 2007 and that was nonforested and either actively managed or fallow on December 19, 2007.

One of the points of criticism by some industry participants was the limited recognition of municipal solid waste ("MSW") under the Proposed Rule.

(2) Planted trees and tree residue from a tree plantation located on non-federal land (including land belonging to an Indian tribe or an Indian individual that is held in trust by the U.S. or subject to a restriction against alienation imposed by the U.S.) that was cleared at any time prior to December 19, 2007 and actively managed on December 19, 2007.

(3) Animal waste material and animal byproducts.

(4) Slash and pre-commercial thinnings from non-federal forestland (including forestland belonging to an Indian tribe or an Indian individual, that are held in trust by the United States or subject to a restriction against alienation imposed by the United States) that is not ecologically sensitive forestland.

(5) Biomass (organic matter that is available on a renewable or recurring basis) obtained from the immediate vicinity of buildings and other areas regularly occupied by people, or of public infrastructure, in an area at risk of wildfire.

(6) Algae.

(7) Separated yard waste or food waste, including recycled cooking and trap grease, and materials described in §80.1426(f)(5)(i).

Regulations, § 80.1401.

One of the points of criticism by some industry participants was the limited recognition of municipal solid waste ("MSW") under the Proposed Rule. The EPA explained the exclusion as follows:

> The statutory definition of "renewable biomass" in EISA does not include a reference to municipal solid waste (MSW) as did the definition of "cellulosic biomass ethanol" in EPAct, but instead includes "separated yard waste and food waste". EPA's proposed definition of renewable biomass in today's proposed rule includes the language present in EISA. As discussed in Section III.B.1.a, we invite comment on whether this definition should be interpreted as including or excluding MSW containing yard and/or food waste from the definition of renewable biomass.

NPRM at 48 (quotation marks in original).

The EPA resolved this issue in the Final Rule by allowing certain portions of MSW to be included as renewable biomass, provided the reasonable separation has first occurred. [8]

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8 *See Preamble at 31.*

In addition to circumscribing the eligible feedstocks, RFS2 imposes the obligation of compliance and recordkeeping on the renewable fuel producers. The EPA states as follows: "In order to make a determination whether or not their fuel is eligible for RINs, renewable fuel producers would need to have at least basic information about the origin of their feedstock." NPRM at 84-85. The EPA considered a range of potential obligations during the rulemaking, some of which were quite extensive and burdensome. This generated a substantial amount of controversy, and the Final Rule will have substantial impact on market participants.

The EPA established three mechanisms for compliance with the Final Rule, but the third option is only available for fuels involving U.S. crops and crop residue:

1. Renewable fuel producers for each individual facility are obligated to maintain renewable biomass recordkeeping and reporting requirements;

2. Renewable fuel producers can form a consortium to fund independent third-party renewable biomass quality-assurance survey, based on a plan approved by EPA; or

3. For fuels involving U.S. crops and crop residue, there is an aggregate compliance approach. This method utilizes USDA's publicly available agricultural land data as the basis for an EPA determination of compliance with the renewable biomass requirements for these particular feedstocks. This option is subject to elimination in the event that EPA finds it is no longer warranted.

Preamble at 29.

Thus producers of renewable fuels made from U.S. crops and crop residues have gained a substantial exemption from the burden of feedstock tracking, reporting and certification requirements.

Thus producers of renewable fuels made from U.S. crops and crop residues have gained a substantial exemption from the burden of feedstock tracking, reporting and certification requirements. For other categories of feedstock, compliance mechanisms that are cost-effective will have to be developed or the feedstock costs will undermine the fuel's economics.

b. Producer Issue: GHG Emission Analysis and Fuel Pathways

1) Policy Development

Underlying the fuel categorization by the EPA is EISA's system of focusing increasing support on the growth of advanced biofuels. Since ethanol's development as gasohol in the 1970s, there has been a steady chorus of biofuels skeptics who question the wisdom and efficacy of biofuels policy. The substance of this criticism is variable but the key issues have been the energy balance of the fuel, whether the fuel uses edible crops, and what the fuel's performance is from a GHG or LCA analysis standpoint. By imposing strict GHG performance and feedstock requirements in RFS2, Congress deliberately supported advanced or next generation biofuels over first generation biofuels.

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2) Watershed Event

Notably, the RFS2 rulemaking represented the first time the EPA was required to develop GHG metrics and performance. Indeed, somewhat surprisingly, the EPA's work in this area is probably more extensive than that of any other domestic administrative agency anywhere in the world. To find comparable efforts, it is likely necessary to consider the GHG work done by the United Nations or the European Union. However, due to EISA, the EPA has done this ground-breaking work and will shortly begin applying it to the entire transportation fuel sector in the U.S. The substance of this work breaks down the GHG requirements in EISA, the methods the EPA uses for assigning GHG values to various fuels, the requirements for fuels to certify their performance, the fuel variables or pathways that have been certified, and the requirements for new fuels to achieve certification.

c. Overview of GHG Methodology

Given that the lifecycle GHG emissions represent the most significant determinant of the various categories, the EPA's approach to GHG analysis is central to understanding the proposed system. The EPA provides detailed information regarding its approach to this analysis. Overall, biofuel is assessed based on the feedstock and the production technology used. For instance, ethanol produced from cornstarch using the same production technology receives the same GHG lifecycle assessment regardless of where the corn was grown or at what facility the fuel was produced. See Table II for fuels and pathways that have been approved by the EPA. [9]

Given that the lifecycle GHG emissions represent the most significant determinant of the various categories, the EPA's approach to GHG analysis is central to understanding the proposed system.

The EPA's analysis includes direct and "significant indirect" emissions. Direct emissions are emissions that are emitted from each stage of the full fuel lifecycle including the growing of the feedstock, the distribution of the feedstock, the production of the fuel, the distribution of the fuel and the use of the fuel in a transportation application. Indirect emissions include other emissions impacts that result from fuel production or use, such as shifts in acreage between different crop types or land uses. Indirect land use changes include changes in the usage of land such as from forest to crop use. [10] The EPA asserts that it is legally required to include the international indirect emissions that it determines are significant. [11]

To quantify these emissions, the EPA used multiple existing models to create what it asserts to be a more comprehensive estimate of GHG emissions. These models include, but are not limited to

(1) the Greet Model - GHGs, Regulated Emissions, and Energy Use in Transportation, the spreadsheet analysis tool developed by Argonne National Laboratories;

(2) the FASOM Model - a partial equilibrium economic model of the U.S. forest and agricultural sectors developed by Texas A&M University;

9 NPRM at 274; Preamble at 20-21.
10 NPRM at 275; Preamble at 210.
11 NPRM at 276; Preamble at 211.

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(3) the FAPRI International Model - a worldwide agricultural sector economic model that was run by the Center for Agricultural and Rural Development ("CARD") at Iowa State University;

The EPA acknowledged uncertainty in its modeling and the highest level of uncertainty in the indirect, international emissions.

(4) Data analyses provided by Winrock International to estimate what land types will be converted into crop land in each country; and

(5) the GTAP Model - the Global Trade Analysis Project model, a multi-region, multi-sector computable general equilibrium model that estimates changes in world agricultural production as well as multiple additional models. [12]

The EPA acknowledged uncertainty in its modeling and the highest level of uncertainty in the indirect, international emissions. [13]

d. Fuel Pathways

The GHG lifecycle analysis provides the basis for determining the feedstock, production technologies and fuels that qualify for the various RFS2 categories (or CBAR fuel categories). The EPA refers to these combinations as "fuel pathways." For each of the four categories of renewable fuel, the specific requirements imposed by EISA establish additional requirements for qualification. Using this methodology, the EPA developed the following fuel pathway chart that establishes which fuels will qualify for the various RFS2 categories. [14]

A separate additional column has been added to illustrate the CBAR7 system.

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12 *See NPRM at 278-82; Preamble at 223-44.*
13 *See NPRM at 283; Preamble at 211-12.*
14 *80 C.F.R. § 1426, Table 1*

Table III
Applicable D Codes For Each Fuel Pathway for Use in Generating RINs

Fuel Type	Feedstock	Production Process Requirements	D-Code	RIN Type
Ethanol	Corn starch	All of the following: Drymill process, using natural gas, biomass, or biogas for process energy and at least two advanced technologies from Table 2 to this section.	6	R
Ethanol	Corn starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and at least one of the advanced technologies from Table 2 to this section plus drying no more than 65% of the distillers grains with solubles it markets annually.	6	R
Ethanol	Corn starch	All of the following: Dry mill process, using natural gas, biomass, or biogas for process energy and drying no more than 50% of the distillers grains with solubles it markets annually.	6	R
Ethanol	Corn starch	Wet mill process using biomass or biogas for process energy.	6	R
Ethanol	Starches from agricultural residues and annual covercrops	Fermentation using natural gas, biomass, or biogas for process energy	6	R
Biodiesel, and renewable diesel	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil	One of the following: Trans-Esterification Hydrotreating Excluding processes that co-process renewable biomass and petroleum	4	B
Biodiesel, and renewable diesel	Soy bean oil; Oil from annual covercrops; Algal oil; Biogenic waste oils/fats/greases; Non-food grade corn oil	One of the following: Trans-Esterification Hydrotreating Includes only processes that co-process renewable biomass and petroleum	5	A
Ethanol	Sugarcane	Fermentation	5	A
Ethanol	Cellulosic Biomass from agricultural residues, slash, forest thinnings and forest product residues, annual covercrops; switchgrass, and miscanthus; cellulosic components of separated yard wastes; cellulosic components of separated food wastes; and cellulosic components of separated MSW	Any	3	C
Cellulosic Diesel, Jet Fuel and Heating Oil	Cellulosic Biomass from agricultural residues, slash, forest thinnings and forest product residues, annual covercrops, switchgrass, and miscanthus; cellulosic components of separated yard wastes; cellulosic components of separated food wastes; and cellulosic components of separated MSW	Any	7	7
Butanol	Corn starch	Fermentation; dry mill using natural gas, biomass, or biogas for process energy	6	R

Fuel Type	Feedstock	Production Process Requirements	D-Code	RIN Type
Cellulosic Naphtha	Cellulosic Biomass from agricultural residues, slash, forest thinnings and forest product residues, annual cover-crops, switchgrass, and miscanthus; cellulosic components of separated yard wastes; cellulosic components of separated food wastes; and cellulosic components of separated MSW	Fischer-Tropsch process	3	C
Ethanol, renewable diesel, jet fuel, heating oil, and naphtha	The non-cellulosic portions of separated food wastes	Any	5	A
Biogas	Landfills, sewage and waste treatment plants, manure digesters	Any	5	A

4. Key Additional Provisions and Issues

One of the basic tenets of the RIN program is the requirement that all parties holding title to RINs first be registered with the EPA.

a. Registration Process for Newly Regulated Parties

One of the basic tenets of the RIN program is the requirement that all parties holding title to RINs first be registered with the EPA. In fact, the regulations prohibit a party from transferring RINs to any other party who has not first registered. This requirement remains intact with RFS2. However, registration is expanded on at least two fronts: the inclusion of petroleum-based diesel as a part of the overall obligation, and the inclusion of non-road, locomotive, marine and heating oil use. In doing so, several more companies will need to register for the program. For instance, a construction company using biodiesel to fuel its equipment may now be qualified to separate and sell RINs. Such a company would first need to register with the EPA to participate in the RIN program.

b. Re-Registration Process for Established Domestic Producers

The second and much more encompassing requirement will primarily apply to existing ethanol and biodiesel producers. In these cases, each production facility will need to re-register with the EPA. This re-registration process is prompted by the need to qualify products, feedstocks and the technology used by such facilities to generate the appropriate category of RIN. The CBAR7 RIN categories are described in an earlier section of this paper.

Included in the re-registration process for existing production facilities is the requirement for a third-party engineering review. The EPA writes in the Preamble that "[w]ithout these engineering reviews, we do not believe it would be possible to implement the RFS2 program in a manner that ensured the

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requirements of EISA were being fulfilled." In the case of domestic production, the engineer must be a Professional Chemical Engineer who is based in the U.S. and licensed by an appropriate state agency. The engineering review is required before RINs can be generated under the RFS2 program and every three years afterward.

The registration / re-registration process must be completed by July 1, 2010 and stands to be the primary constraint as the industry and the EPA strive to implement RFS2 in an orderly manner.

The registration / re-registration process must be completed by July 1, 2010 and stands to be the primary constraint as the industry and the EPA strive to implement RFS2 in an orderly manner. Producers will need to look outside of their organizations to meet the requirements and should engage such services as soon as practical.

c. Registration Process for Importers and Foreign Producers

Foreign production facilities will also be required to register with the EPA under RFS2, most for the first time. This is a significant change from RFS1 and has its basis in the fact that EISA limits land use for the generation of renewable fuels. The prior method of an importer assigning the 38-digit RIN number to a volume of fuel will no longer be available under RFS2. The EPA will assign all RIN numbers through EMTS, for both domestic and foreign production. (For more on the EMTS rationale and implementation approach, see the EMTS section of this paper.)

The EPA provides two options for RIN generation pertaining to foreign production. Both require the foreign producer to register its facility, essentially meeting the same requirements described above for domestic producers, with the caveat of acquiring facility certification from an engineer having a license by an authorizing government corresponding to the location of the particular production facility.

One of the most onerous, and likely the determining factor against this approach being used by most, is the posting of a performance bond.

The first option requires the foreign producer to submit the individual batch to the EPA for RIN assignment and ownership. There are more requirements under this option (see § 80.1466). One of the most onerous, and likely the determining factor against this approach being used by most, is the posting of a performance bond. The specifics of these requirements are significant and should be thoroughly understood by any party considering such an approach. Further details related to this option are outside the scope of this paper.

The second option allows the importer to register the batch with the EPA for RIN assignment. The importer is first required to register the import facility, similar to a domestic producer registering its production facility. Further, the importer can only generate RINs for fuel originating from foreign production facilities that are also registered and qualified to generate fuel according to the classifications outlined in RFS2. Records to support any claims to product origin, including feedstocks, must be available and maintained by the importer for a period of not less than five years.

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The importing of renewable fuel will become much more complex with the advent of RFS2. Companies importing today, or considering importing in the near future, should develop a full understanding of RFS2 before undertaking such endeavors.

The EPA statses: "Incorrect RINs are invalid RINs. If parties in the distribution system cannot track down and correct errors in a timely manner, then all downstream parties that traded the invalid RIN are in violation. Because RINs are the basic unit of compliance for the RFS program, it is important that parties have confidence when generating and using them."

d. EPA's Moderated Transaction System (EMTS)

1) The Need for a New Approach

The complexity associated with the RFS1 RIN program is undeniable. Firsthand experience, with over 600 companies and the associated 15 billion gallon RINs processed through the industry's private registry, has revealed a tremendous number of invalid RINs in the marketplace. The EPA openly recognized this complexity and the shortcomings of RFS1 as it prepared for RFS2 in the Final Rule.

The EPA states: "Incorrect RINs are invalid RINs. If parties in the distribution system cannot track down and correct errors in a timely manner, then all downstream parties that traded the invalid RIN are in violation. Because RINs are the basic unit of compliance for the RFS program, it is important that parties have confidence when generating and using them." Preamble at 136, "Need for the EPA Moderated Transaction System."

Based on prior experience, compounded with four standards, seven RIN types, and three years for complete implementation, the RFS2 program will see complexity increase in orders of magnitude. To the EPA's credit, it has recognized the challenge and has made a fundamental shift in the way the future program is to be administered. Recognizing the benefits of a central registry approach, the EPA has set out to develop a closed system (EMTS). Coinciding with the effective date of RFS2, all parties will be required to submit RIN generation and register all RIN transactions through EMTS.

2) EPA to Control Erroneous and Fraudulent RINs

Producers and importers will no longer generate the 38-digit RIN credits independently, as they did with RFS1, but will instead receive the RIN credits from the EPA under RFS2. Once a producer registers a particular batch of fuel, submits feedstock, co-product, and technology information, along with volumetric data, the EMTS system will verify the data, and either approve or disapprove the batch. Upon verification of the submitted data, the requisite quantity of RINs will then be posted to the producer's account. By controlling the generation of RINs, the EPA anticipates reducing the number of erroneous or fraudulently generated RINs that exist in the marketplace.

3) "Real Time" Interaction with the EPA

Controlled generation of RINs is the first role of EMTS. The second major change brought about by EMTS is the agency's "Real Time" involvement in each RIN transfer. The EPA defines "Real Time" in the

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Preamble as "...within five (5) business days of a reportable event (e.g., generation and assignment of RINs, transfer of RINs)."

Operating companies falling under the RFS2 regulations should consider the following limitations of EMTS as they develop business processes and procedures in the new RFS2 environment.

A new requirement under RFS2 is that both the seller and the buyer must confirm their RIN transactions to the EPA within the five-day period, through EMTS or through a third-party service provider. If the data from both parties do not match, or the seven days is exceeded by either party, the transaction will be considered stale and will be purged from the EMTS database queue. The EPA provides two more days before purging the data, which for all intents and purposes extends the "Real Time" to seven days. These new requirements will have considerable impact on commercial and financial operations.

4) EMTS Is No Panacea

The EPA clearly states that its intention is to bring increased confidence to the marketplace with EMTS. To that end, the EPA has observed the methodology used by some in the private sector and has made a big step in the right direction with EMTS. With that said, it is also important to recognize what EMTS will not provide.

EPA will use its authority to assign and clear RIN transactions, but it does not appear to be expanding its responsibility for many of the other administrative tasks associated with compliance. Operating companies falling under the RFS2 regulations should consider the following limitations of EMTS as they develop business processes and procedures in the new RFS2 environment.

1) EMTS will not accommodate or process any RFS1 RINs. Type B RINs generated in 2008, all RINs generated in 2009, and those generated in the RFS1 period of 2010 (January 1 through June 30, 2010) will need to be managed in a system independent of EMTS.

2) EMTS will not generate a product transfer document ("PTD"). The PTD requirement remains as originally developed under RFS1.

3) EMTS does not serve to replace the quarterly reporting requirements. Reports are to be submitted through a separate system to the EPA each quarter to verify and certify data.

4) EMTS will not satisfy the recordkeeping requirements under RFS2. Historical data and supporting documentation will need to be maintained by each regulated party.

5) EMTS does not eliminate the need for the annual attestation requirements. An independent CPA's services will be required annually.

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6) EMTS does not serve as a "good faith" provision. The EPA says, "An underlying principle of RIN ownership is still one of 'buyer beware' and RINs may be prohibited from use at any time if they are found to be invalid."

The EPA states, "Parties who use EMTS must first register with EPA in accordance with the RFS2 registration program." More details about this process are available in Section II.C of the Preamble to the Final Rule or at section 80.1450 of the regulations. More information is provided earlier in this paper.

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In addition to registering, "parties will also have to create an account (i.e., register) via EPA's Central Data Exchange (CDX), as users will access EMTS via CDX." Every regulated party under RFS2 must have both an active CDX account and an EMTS account by July 1, 2010 or 60 days prior to engaging in any transaction involving RINs, whichever is later.

Recognizing the need to interface with existing business systems, EMTS does provide alternative methods for data transmission. Companies can develop internally, or use third-party RIN management systems, to automate interaction with EMTS through a data transfer method known as a network node. High volume users, or those who simply wish to streamline the regulatory process inside their normal business operations, will likely find such automation beneficial.

e. Implications for the RIN Market

The majority of RINs will continue to trade in association with renewable fuel

The majority of RINs will continue to trade in association with renewable fuel. RFS2 maintains the approach where RINs cannot be separated from renewable fuel until their ownership has been transferred to a party that places the renewable fuel into the consumer market. Consequently there will be no step change in RIN supply as the overall volume of tradable RIN credits will simply increase in direct proportion to the increased mandates.

Demand for RINs will now be spread across the four standards, as described earlier. The nesting of these standards, along with the multiple use of the various RIN types, should result in a RIN price hierarchy that aligns itself with the RIN types in order of GHG reduction attributes. In other words, Types C, B, and 7 RINs should command a market price greater than Type A RINs, and Type A RINs greater than Type R RINs.

History has shown that the RIN market is volatile and can range in price by 100% or more in as little as a week or two. Much of this can be attributed to the lack of market liquidity, limited understanding of the regulations and the impact of the EPA's communications on market stability. The fact that RFS2 will bring even more complexity to the market will most assuredly impact the trading of RINs, creating opportunities for those who fully understand the intricacies of the program.

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f. The EPA's New Role and Its Impact on the RIN Market

This 93.5% reduction was based on the EPA's evaluation and assessment of the marketplace. An unprecedented component of EISA is the fact that such assessments are required each year.

It is notable that the EPA is requiring the reporting of price with each RIN transaction, for both the separated RIN credit and the RIN assigned with fuel. The EPA has received many adverse comments in this area, with many parties claiming that such data is confidential or that the EPA has no right to collect such information. Due to the precedent-setting nature of EISA, and the responsibility of the EPA Administrator to evaluate market conditions in the current year as the agency sets the coming year's fuel standards, the EPA will be collecting prices through EMTS.

Even as RFS2 goes into effect in 2010 we have already seen the Administrator make dramatic changes to standards, most notably in the category of Cellulosic Biofuels (the Type C standard). Through Administrator Jackson's authority, the standard was adjusted from 100 million gallons to 6.5 million gallons in 2010. This 93.5% reduction was based on the EPA's evaluation and assessment of the marketplace. An unprecedented component of EISA is the fact that such assessments are required each year. Depending on timing, such changes may dramatically impact the value for particular RIN types, as the EPA's decision in 2010 certainly has with Type C RINs.

g. Projections for the RIN Market

The RIN market will see numerous changes over the coming year, all of which will have substantial impact on RIN prices. The only certainty with RIN prices is that they will vary from one RIN Type to the next. It is also anticipated that RINs originating from either cellulosic production or Biomass-Based Diesel will fetch a premium to RINs coming from sugar cane ethanol, renewable diesel, waste derived ethanol and starch based ethanol products.

In 2010 we would expect to see RIN prices for Type B RINs to be the highest of all. The most recent RINSTAR® daily report shows 2010 Type B RINs trading at $0.18 each with an upward trend since January. Two factors are contributing to this dynamic: the uncertainty surrounding the now expired $1.00 biodiesel tax credit and the treatment of prior year Type B RINs under the Final Rule. The lack of the tax credit has halted production but the special treatment of the 2009/2010 Biomass-Based Diesel standard and associated Type B credits drive the price down.

There are many other variables that will impact RIN prices in the coming years, not the least of which is, the $1 biodiesel tax credit, blending economics for splash blenders, crude oil prices, tariffs, the ethanol blend wall, VTEEC, crop harvests, corn prices, sugar prices, soy bean prices, waiver requests, food prices, potential extensions of the effective date, technology advancements, GHG legislation, refinery utilization, the value of the dollar, and of course the price of gasoline, to mention just a few. Suffice it to say that the market is still in its infancy, and it will be many years before the modeling systems and requisite understanding will exist that can predict the long-term price for RINs.

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When it comes to predictions it is probably best left at this: it is a certainty that the implementation of RFS2 will cause substantial changes to both the short-term and long-term values of RINs and the prices for the various RIN types will go up and down to reflect this fact.

Upgrading to RFS2

Many elements of RFS2 have the potential to impact the bottom line. Affected parties will be best served by having a thorough understanding of the rules and how they affect the company from both regulatory exposure as well as the commercial implications. Recognizing the importance of the subject, and the fact that each company is unique in its configuration, the authors would encourage operating companies to develop a strong in-house understanding of these rules or engage the services of qualified professionals on these matters.

Companies that were early adapters to RFS1 often found themselves in a position to profit from their knowledge. The same will be the case with RFS2. The following list of items warrant further investigation by companies that wish to prepare in advance for upgrading to RFS2.

Companies that were early adapters to RFS1 often found themselves in a position to profit from their knowledge. The same will be the case with RFS2.

- Producers of renewable fuel should begin the re-registration process immediately. The EPA will be the only party authorized to assign RINs in the future. Producers who do not meet the registration / re-registration requirements will be unable to generate or transfer RINs with their production.
- Producers of renewable fuel from feedstock that is not domestically grown grain should understand the feedstock certification requirements and develop plans to implement compliance regimens.
- Companies that are developing new fuels or new production technologies should understand the existing approved pathways and the process for getting new pathways approved in detail. Whether or not a new fuel generates high value RINs will likely become an important factor from a revenue standpoint.
- Market participants should deliberately plan their PTD process to coincide with RFS2 requirements. Experience has shown that 80% or more of RIN transactions are accompanied with physical fuel, a market dynamic that will not be changing under RFS2. A key element of RFS1 that was poorly implemented by many companies is the requirement that PTDs be transmitted on the same day as the title to fuel is transferred. Many companies currently transmit RIN data weeks or even months later. The involvement of the EPA, through EMTS, will bring this matter to a halt. The disruption to business resulting from this single element will be significant for many parties and should be understood and considered by all before RFS2 goes into effect.

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- Considering the implementation of California's Low Carbon Fuel Standard (LCFS) on January 1, 2011, companies will want to be sure and incorporate the Carbon Intensity (CI) property into their product transfer documents. By doing so now, additional efforts may be avoided in the future.

Companies may find it to their advantage to take proactive steps in defining and specifying the Type of RINs they will or will not accept with a particular product

- Market participants should review their existing and future commercial contracts to properly accommodate the new rules. For instance, companies may find it to their advantage to take proactive steps in defining and specifying the Type of RINs they will or will not accept with a particular product.

- Small volume market participants should look for opportunities in RFS2. The EPA has made accommodations in RFS2 for "Upward Delegation" of RIN separating rights (per section 80.1440). This provision is available for customers of renewable fuel suppliers who limit their blending to not more than 125,000 gallons of renewable fuel each year. In this instance, the downstream party can delegate its RIN separation to its upstream supplier provided that a written agreement exists between the two parties. The parties may wish to agree to share in the RIN revenue, discount the fuel price or make some other accommodation.

- The new price reporting requirement for RINs under RFS2 will cause a fundamental change in accounting practices. At least one of the more sophisticated producers of ethanol has already signaled their intention of pricing RINs separate from their ethanol product, even in those instances that RINs are assigned to the fuel. A move in this direction will cause considerable changes to accounting and invoicing systems. This shift in business practice is a signal of maturity in the RIN market and will certainly bring much need improvement in market efficiency and price discovery. All parties dealing with physical fuel should give this change in business practices their prompt attention.

This shift in business practice is a signal of maturity in the RIN market and will certainly bring much need improvement in market efficiency and price discovery.

- Even more obscure provision exist under RFS2 and should be understood and utilized by market participants. For example, consider the following.
    - If you are an obligated party, biodiesel producer, or party trading Type B RINs, you will be well served to read and understand the method for determining 2010 Type B RVO (§ 80.1427(a)(7)(i)).
    - The regulations provide for a reinstatement of 2009 [15] Type B RINs that were previously retired due to non-road use (§ 80.1427(a)(4)(iv)). This provision will have a considerable impact on the marketplace in 2010.
    - A key provision in the use and application of the various RIN Types resides in the multiple use option for certain RIN types (§ 80.1427(a)(3)(i)).

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15 *The final rule failed to address the reinstatement of RFS1 RINs generated and meeting the same conditions in the year 2010, ie. from January 1 through June 30, 2010. Due to the substantive nature of such a change, this oversight will almost definitely result in a technical amendment to the rule.*

Conclusion

The first generation of renewable fuels had a dramatic impact on the motor fuel industry. The increased use and acceptance of ethanol, and to some degree biodiesel, can be attributed to the Energy Policy Act of 2005 and the resultant fuel standard known now as RFS1. Congress and the EPA set forth the framework required to promote the use of these fuels, and the industry responded with a dramatic growth in renewable fuel production and use.

Prompted by the public's growing interest in energy independence and climate change, the political machinery has once again raised the bar. The Energy Independence and Security Act of 2007 mandated the evolution of the RFS into the new standard, RFS2. Over two and one half years after President Bush signed the act into law, RFS2 will go into effect on July 1, 2010 under President Obama's administration. Touted as a move toward greener jobs, the second generation renewable fuel initiative will bring industry and government together in ways never before experienced by the fuels industry.

Touted as a move toward greener jobs, the second generation renewable fuel initiative will bring industry and government together in ways never before experienced by the fuels industry.

RFS2 provides incentives and opportunities to promote the production and use of renewable fuels throughout America's transportation fuel supply chain. But with this new and enhanced program that mandates GHG performance standards for the first time, industry participants will experience increased government involvement and the associated complexities. The complexity and rigor of the program necessitate that market participants develop comprehensive strategies to benefit from the program while minimizing risks of non-compliance and distraction. It is the intent of the authors that this paper serve as a resource in navigating this course.

About the Authors

This White Paper is a result of the collaborative efforts of Clayton McMartin and Graham Noyes. Both are recognized experts in the field of renewable fuels and each brings his own diverse background and complementing experience to this effort. Mr. Noyes is an attorney whose practice includes representation of renewable fuel companies with a focus on commercializing new fuels, joint venture agreements, mergers and acquisitions, and monetizing federal incentives. Mr. McMartin on the other hand focuses his efforts, and those of his organization, on the tactical implementation of such regulations in order to optimize their clients' daily commercial business.

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Clayton McMartin

is recognized throughout the world as the foremost authority on the practical implementation of the renewable fuel standard and the importance of the fuel credit known as the RIN. As the president of the Clean Fuels Clearinghouse, he conceived and has successfully built the Nation's only private sector registry for renewable fuels and RINs, commonly known as RINSTAR®. Through his leadership, the registry has grown over the past two and one-half years to the point it now interacts with over 500 companies across the entire supply chain every day. Millions of individual transactions accounting for a significant portion of the total industry business, presently number over 15 billion gallon RINs, have been facilitated through the registry.

Mr. McMartin is a Chemical Engineer who began his career 23 years ago, working in the refining industry for Conoco, Pennzoil, and then for Phillips Petroleum company. Over the first 14 years of his career he developed his expertise in the area of refinery operations, economics, and planning. His role in making the daily economic decisions related with plant operations in the heavily regulated refined product industry served as a sound foundation for the formation of the Clean Fuels Clearinghouse.

The Clean Fuels Clearinghouse was formed in 2001 with the clear mission of delivering business solutions for cleaner fuels. Along with his business partner and wife, Melissa Donovan, and a staff of customer oriented associates, the company has built a strong reputation in the industry for their ability to deal with complex regulations while delivering financial results to their clients.

Mr. McMartin holds degrees in Petroleum and in Chemical Engineering from Oklahoma State University. He is an entrepreneur at heart and has been involved in a variety of successful, and sometimes not-so-successful, businesses. An accomplished public speaker, Mr. McMartin is often a featured presenter at technical conferences throughout the industry.

President, Clean Fuels Clearinghouse
www.CFCH.com
CEM@CFCH.com
(575) 377-3369

Graham Noyes

is Of Counsel in the Energy and Telecommunications practice group of Stoel Rives LLP. Graham joined the firm after working for seven years in sales and business development in the biofuels industry and with eight years prior experience as a litigator. While in the commercial sector, Graham was first Vice President of Sales at World Energy Alternatives LLC, then Vice President of Sales and Business Development at Imperium Renewables Inc., the largest biodiesel production facility in the US. Graham also served as Secretary of the Governing Board of the National Biodiesel Board. During this period, Graham gained familiarity regarding the integration of renewable fuels into existing energy markets; and the practical challenges of policy driven markets.

Graham's work with Stoel Rives draws on his direct experience in the renewable fuels sector. Graham counsels clients on issues pertaining to EPA registration issues, barriers to market entry, import and export issues, federal incentives for biofuels and the Renewable Fuel Standard. Graham is considered one of the nation's top legal experts on RFS 2 rules and the RIN system and has spoken and written extensively in this area. Because of his commercial background and network, Graham also assists clients seeking strategic relationships, and works on business modeling issues pertaining to advanced biofuels and cellulosic biofuels.

Graham's other area of practice is project development work for renewable energy companies in the bioenergy, wind, solar and geothermal sectors. Fortune Magazine described Graham as one of the top renewable energy lawyers in the country based on his work for clients seeking funds under the Stimulus Bill. Graham's work in this area encompasses federal tax incentives for renewable energy, federal grants, the DOE Loan Guarantee Program and the monetization of the carbon offset value of projects. Graham draws on the deep specialized experience of the Stoel Rives' energy practice group to assist clients in complex renewable energy project planning and development. Graham's clients range from small start-up ventures to companies developing $350 million projects.

Graham received his B.A. with distinction from the University of Virginia and received his J.D. from the University of California at Davis. He was a member of the Order of the Coif and an Editor of the U.C. Davis Law Review. He is admitted to practice law in California, Washington and the District of Columbia.

Of Counsel, Stoel Rives LLP
www.STOEL.com
JGNoyes@STOEL.com
(206) 386-7615