5.1.0 WHITE PAPER: RFS, RINs, AND NARA REGION IMPLICATIONS

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The emerging biofuels industry in the U.S. has the potential to produce sustainable alternatives to petroleum-based fuels, a development which would decrease dependence on foreign oil, increase national security, stimulate job growth, and improve the condition of the natural environment. Although there have been objections to biofuels by stakeholders in the petroleum industry, this is mostly due to the effects the growth in sustainable biofuels would have on the bottom lines of these petroleum firms. Biofuels has had the support of recent federal administrations and Congresses. This support has been manifested in the original Renewable Fuel Standard (RFS 1), enacted under the Energy Policy Act (EPAct) of 2005, and further expanded into RFS 2 under the Energy Independence and Security Act (EISA) of 2007 (EPA, 2013). RFS 2 sets mandates for biofuels production in the U.S., and if enforced, this mandate could assist in bringing biofuels to commercial scale much faster than if left solely to market forces. The four-state NARA region in the Pacific Northwestern United States, consisting of Idaho, Montana, Oregon, and Washington, and the stakeholders within the NARA community, must consider the policy implications of RFS on the NARA project. This document is an effort to educate these stakeholders on this topic in the hopes that value can be added to NARA with a greater understanding of federal renewable fuels policies. The first part of this white paper addresses some concerns of NARA stakeholders with respect to qualifying feedstock requirements under RFS, while the second part discusses RFS biofuels proposals and the Renewable Identification Number (RIN) system that the Environmental Protection Agency (EPA) intends to utilize to enforce RFS mandates. The report concludes with additional commentary on the dynamic nature of certain RFS policies and the potential effects they have on biofuels markets.

5.1.0.1 Feedstock Requirements Under RFS

The definition of renewable biomass under RFS 2 has direct implications for the NARA region with its woody biomass feedstock concentration. Woody biomass counts as renewable biomass provided that it comes from non-federal lands (including Indian tribal lands), forested or non-forested, where the forested lands are not ecologically sensitive, and where the non-forested lands are actively managed and have not been cleared since December 19, 2007. The EPA definitions below, excerpted from the March 26, 2010 Federal Register, are directly relative to the NARA region (EPA 2010).

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 non-forested and either actively managed or fallow on December 19, 2007.

(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) 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.

(4) 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.

Slash is the residue, including treetops, branches, and bark, left on the ground after logging or accumulating as a result of a storm, fire, delimbing, or other similar disturbance.

Pre-commercial thinnings are trees, including unhealthy or diseased trees, primarily removed to reduce stocking to concentrate growth on more desirable, healthy trees, or other vegetative material that is removed to promote tree growth.

According to the above stipulations, beetle-kill trees from the NARA region qualify as renewable biomass under RFS 2, provided that they do not come from federal lands, which currently automatically disqualifies any biofuels feedstock, both foreign and domestic. (Schnepf et al 2012)

5.1.0.2 EPA Proposals for 2013 for Renewable Volume Obligations and RINs Under RFS

The 2013 EPA proposed volumes for biofuels production in the U.S. are listed below. Table 5.1.1 shows the EPA's proposed volume requirements for renewable fuels production while Table 5.1.2 illustrates the EPA's proposed percentage of renewable fuels as a ratio of renewable fuel production to non-renewable fuel production (EPA 2013). These proposals are open to the public and other stakeholders for comment for 45 days, after which the EPA will consider the feedback provided and finalize the 2013 mandates for biofuels production in the U.S. (Lane 2013). These renewable fuel categories are tiered, which means cellulosic biofuel and biomass based diesel count toward the total advanced biofuels requirements, and total advanced biofuels count toward the total renewable fuels requirements (EPA 2013). Companies that blend fuels for the retail market in the U.S. are obligated to meet the Renewable Volume Obligations (RVOs) for 2013 as shown in Table 5.1.2.

These RVOs are set annually by the EPA. In terms of the NARA project's biojet focus, jet fuel is classified as an "additional renewable fuel" under RFS and does not fall under the total "advanced biofuels" category, which means there is currently no specific volumetric requirement that must be met in terms of annual biojet production (DOD 2011).

Table 5.1.1. EPA proposed volumes of renewable fuels for 2013

Cellulosic biofuel	0.014 billion gal
Biomass-based diesel	1.28 billion gal
Advanced biofuel	2.75 billion gal
Renewable fuel	16.55 billion gal

Table 5.1.2. EPA proposed percentage standards for 2013 in terms of a ratio of renewable fuels to non-renewable fuels

Cellulosic biofuel	0.008%
Biomass-based diesel	1.12%
Total advanced biofuels	1.60%
Total renewable fuels	9.63%

5.1.0.3 Renewable Identification Numbers

The mechanisms by which the EPA intends to enforce the RFS mandates are renewable Identification numbers (RINs). RINs are unique 38-character numbers assigned to each gallon of renewable fuel and issued to biofuels producers or importers at the point of production or importation (Yacobucci 2012). An explanation of the characters in a RIN is illustrated in Figure 5.1.1. RINs are generated when the producer or importer of a qualifying biofuel submits an application to the EPA for review, and the EPA subsequently approves it. Currently there is a small producer/importer exemption for producers or importers of less than 10,000 annual gallons of renewable fuels. This exemption has been temporarily extended for up to three years to a less than 125,000 annual gallons level for producers, a change that is an effort to allow pilot and demonstration plants to further develop biofuels technologies (Schnepf et al 2012). RINs remain with the biofuel throughout the distribution channel until the biofuel is blended into the gasoline or diesel supply in the U.S. Blenders and exporters of transportation fuels in the U.S., as obligated parties under RFS , are then required to turn these RINs into the EPA to meet specific RVOs and show compliance with the RFS mandates.

5.1.0.4 RINs Codes

RIN = KYYYYCCCCFFFFFBBBBBRRDSSSSSSSSEEEEEEEE

Where:
K = code distinguishing RINs still assigned to a gallon from RINs already separated

YYYY = the calendar year of production or import

CCCC = the company ID

FFFFF = the company plant or facility ID

BBBBB = the batch number

RR = the biofuel energy equivalence value

D = the renewable fuel category

SSSSSSSS = the start number for this batch of biofuel

EEEEEEEE = the end number for this batch of biofuel

Figure 5.1.1. Renewable Identification Number (RIN) Codes Explanations

5.1.0.5 Equivalence Values

Under RFS1 equivalence values (EVs) were assigned to renewable fuels based on their specific categories with respect to their energy content relative to ethanol, but under RFS2 each category of renewable fuel has its own volumetric requirements; therefore EVs are no longer necessary to incentivize certain biofuels based on energy content (Schnepf et al 2012). EVs will still be utilized to meet the overall advanced biofuels or total renewable fuels requirements, but not within individual renewable fuels categories. EVs for select renewable fuel categories are listed in Table 5.1.3. At the EPA's discretion, additional EVs can be added, for instance as more feedstocks are classified as renewable under RFS regulations, while current EVs are subject to change. The EPA uses an energy content-based formula, shown in Figure 5.1.2, to determine equivalence values for any new qualifying renewable fuels (EPA 2010).

Table 5.1.3. Select equivalence values (EVs) of renewable fuels under RFS1 (Schnepf et al., 2012). Note: This EV was eliminated under RFS2.

Ethanol	1.0
Butanol	1.3
Biodiesel	1.5
Cellulosic ethanol[1]	2.5

Where:

EV = (R/0.972) * (EC/77,000)

EV = Equivalence Value for the renewable fuel, rounded to the nearest tenth

R = Renewable content of the renewable fuel

This is a measure of the portion of a renewable fuel that came from a renewable source, expressed as a percent, on an energy basis

EC = Energy content of the renewable fuel, in Btu per gallon (heating value)

Figure 5.1.2. Energy content-based equivalence value (EV) formula under RFS2 (EPA, 2010)

5.1.0.6 Waiver Credits

The EPA can authorize waiver credits if it is determined that volume requirements under RFS are not going to be met. Once a waiver credit is approved, the EPA makes them available to obligated parties that have not met their RIN requirements at a designated cost. An example of this is the cellulosic biofuels waiver credit, which was offered for purchase at $1.56 in 2010, $1.13 in 2011, and $0.78 in 2012 (Bracmort 2012). Currently cellulosic waiver credits are the only authorized waiver credits, but the EPA has waiver authority to include others in the future (EPA 2010). Waiver credits are only authorized for use in the year they are issued and cannot be banked for future use (Bracmort, 2012).

5.1.0.7 RIN Markets

A RIN market has developed for the buying, selling, and trading of RINs once they are separated at blending. RINs are valid for two years, and blenders or exporters that have met RFS mandates may opt to sell their excess RINs, or keep them for the following year's requirements, but no more than 20% of a specific year's Renewable Volume Obligation (RVO) requirements may be met by previous year's RINs (Yacobucci 2012). This could be an additional revenue stream for blenders or exporters, which could stimulate the markets to quicker biofuels adoption.

Speculators may also opt to purchase RINs and resell them, something akin to a trader on the stock market. With respect to NARA, the fact that biojet does not currently have an annual volumetric mandate under RFS means that blenders that produce jet fuel blends do not have to turn those specific RINs into the EPA to meet any volumetric obligations. These RINs could subsequently be sold on the RIN market at 100% profit to the blender. The blender could opt to use these RINs to meet other volumetric mandates under RFS if it was economically more beneficial to do so.

5.1.0.8 RIN Fraud and QAPs

The EPA is currently not fully enforcing the RIN requirements under RFS due to some fraudulent RINs appearing in the marketplace. The appearance of these fake RINs has temporarily jeopardized the integrity of RFS . Under the current RFS structure, purchasers of fraudulent RINs are liable to the EPA for fines, while still obligated to acquire the necessary RINs to meet their respective requirements, so "let the buyer beware." The EPA recently said that it was working on a voluntary Quality Assurance Program (QAP) that would serve as a legitimate defense for companies against RIN fraud (EPA 2013).

5.1.1 COMMENTARY

Many of the RFS and RIN topics discussed above must be continuously reexamined, as the fluid nature of the fledgling biofuels policies in the U.S. could turn an advantageous position into a disadvantageous one relatively quickly. The EPA continuously updates several "moving targets" under RFS, including Renewable Volume Obligations (RVOs) and equivalence values (EVs). RVOs are updated annually, while EV s can be changed as the EPA sees the necessity to update its policies. As new biofuels emerge, the EPA assigns EVs to determine their volumetric equivalents in the "total renewable fuels" and "total advanced biofuels" categories. This EV policy does not seem to have the same impact under RFS2 as it did under RFS1, as each biofuel now has its own distinct category with specific gallon for gallon RVOs, as opposed to ethanol equivalent values, nevertheless, the EVs will still be applied to the biofuels totals as stated above. These "moving targets" can influence which biofuels producers decide to make, and a company like Gevo, that potentially has the ability to switch between different platforms, could have a distinct competitive advantage in the biofuels field.

In terms of RIN markets, the demand for these biofuels identifiers will fluctuate based on a variety of market conditions, including changing biofuels supplies, the successes or failures of companies in meeting RVOs, and updated government policies. A biofuels RIN that is worth $2.50 today may be $5.00 or $0.50 six months or a year from now, and the organizations and stakeholders that stay abreast of these shifting markets can better position themselves in the rapidly changing biofuels industry. As the EPA's voluntary Quality Assurance Program (QAP) materializes, RIN traders will gain confidence in these RIN markets knowing that they have a better chance of defending themselves against the penalties associated with counterfeit RINs.

5.1.2 SUMMARY

Although the RFS and its RIN tracking mechanisms are still currently in a debugging phase, and are not being fully enforced, a greater understanding of these policies and procedures will assist stakeholders in the NARA region with the future development of the biofuels industry in the Pacific Northwest. That being said, the dynamic nature of biofuels policies in the U.S. must be monitored, understood, and, when possible, leveraged into advantageous opportunities by NARA stakeholders. By staying abreast of these shifting biofuels policies, the NARA team will be better positioned moving forward with NARA project goals and objectives.

5.1.3 REFERENCES

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