An Introduction To The Renewable Fuel Standard & The RIN Credit Program
• Renewable Fuel Standard (RFS)
  • Renewable Volume Obligation (RVO)
  • Renewable Identification Number (RIN)
• Registration & Compliance Issues
A Leader In Carbon Credit Realization

- Audits of OVER 150 BIOFUEL PLANTS in 18 COUNTRIES
- OVER 1 BILLION GALLONS OF BIOFUEL CAPACITY UNDER MANAGEMENT
- OVER 50 PRODUCERS have enrolled in RIN COMPLIANCE PROGRAM
- Assisted REGISTRATION & PREPARATION for over 30 LCFS PATHWAY PROJECTS
- TRANSACTED OVER 1.7 BILLION RINS in 2014
- ONE OF THE FIRST USEPA RECOGNIZED RIN Quality Assurance Programs
- 4.7 MILLION RINs PROCESSED EACH DAY on our automated platform

WHY ECOENGINEERS?

ECOENGINEERS People Driven Solutions

[Image with globe and other icons]
Developing Sustainable Solutions For the World

WHAT WE DO:

1. Understand clean fuel regulations & standards
2. Connect our clients to carbon credit and fuel markets
3. Give our clients confidence in the compliance status and value of new investments
4. Help create a world less dependent on fossilized carbon—Design, build, own, operate renewable projects
Global Presence
Midwest Roots

Headquartered in Des Moines, Iowa

Audits of OVER 150 BIOFUEL PLANTS in 18 COUNTRIES
Services

Providing creative solutions to environmental problems and fostering market connections that build sustainable communities.

- Compliance & Regulatory
- Engineering Reviews
- Advocacy
- GREET Modeling
- Studies
- Design
- Pathway Evaluation
- CDX Registration
EcoEngineers RIN Track At 2015 Energy Conference

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Downtown Embassy Suites

WHEN
Sept. 21-23, 2015

WHERE
The Renewable Fuel Standard (RFS2)

The RFS requires the blending of Renewable Fuels with the nation’s motor vehicle fuel supply

- Origins in EISA and RFS1 (2007)
- Promulgated in July 2010
- Created 4 renewable fuel categories
- Set a 36 billion gallon goal for 2022
- Expanded the RIN program
- Developed the EMTS (EPA Moderated Transaction System)
## Fuel Types, RIN Codes & GHG Reduction

<table>
<thead>
<tr>
<th>RIN D Code</th>
<th>Fuel Type</th>
<th>GHG Reduction Requirement</th>
<th>Fuel</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3 / D7</td>
<td>Cellulosic Biofuels</td>
<td>60%</td>
<td>Cellulosic ethanol, cellulosic naphtha, cellulosic diesel, Renewable CNG/LNG, etc.</td>
</tr>
<tr>
<td>D4</td>
<td>Biomass-based Diesel</td>
<td>50%</td>
<td>Biodiesel, renewable diesel, etc.</td>
</tr>
<tr>
<td>D5</td>
<td>Advanced Biofuels</td>
<td>50%</td>
<td>Sugarcane ethanol, renewable heating oil, biogas, etc.</td>
</tr>
<tr>
<td>D6</td>
<td>Renewable Fuel</td>
<td>20% or less</td>
<td>Corn ethanol, etc.</td>
</tr>
</tbody>
</table>
The Nested Nature of the Mandate

Nested Renewable Fuel Categories under the RFS

TOTAL RENEWABLE FUEL
- D6

ADVANCED BIOFUELS
- D5

BIOMASS-BASED DIESEL
- D4

CELLULOSIC BIOFUEL
- D3/7

(from the House Of Representatives Energy and Commerce Committee)
## Original RFS Volume Mandates (BGY)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cellulosic biofuel (D3/D7)</th>
<th>Biomass-based diesel (D4)</th>
<th>Advanced biofuel (D5)</th>
<th>Renewable Fuel (D6)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1.8</td>
<td>tbd</td>
<td>3.75</td>
<td>14.4</td>
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<td>7.25</td>
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<tr>
<td>2017</td>
<td>5.5</td>
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<td>9</td>
<td>15</td>
<td>24.00</td>
</tr>
<tr>
<td>2018</td>
<td>7.0</td>
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<td>11</td>
<td>15</td>
<td>26.00</td>
</tr>
<tr>
<td>2019</td>
<td>8.5</td>
<td>tbd</td>
<td>13</td>
<td>15</td>
<td>28.00</td>
</tr>
<tr>
<td>2020</td>
<td>10.5</td>
<td>tbd</td>
<td>15</td>
<td>15</td>
<td>30.00</td>
</tr>
<tr>
<td>2021</td>
<td>13.5</td>
<td>tbd</td>
<td>18</td>
<td>15</td>
<td>33.00</td>
</tr>
<tr>
<td>2022</td>
<td>16.0</td>
<td>tbd</td>
<td>21</td>
<td>15</td>
<td>36.00</td>
</tr>
</tbody>
</table>

### Notes
- **Aggressive advanced fuel mandate**
- **Starch ethanol capped at 15 BGY**
## Current RFS Volume Mandates (BGY)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cellulosic biofuel (D3/D7)</th>
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<tr>
<td>2014</td>
<td>0.033</td>
<td>1.63</td>
<td>2.68</td>
<td>13.25</td>
<td>15.93</td>
</tr>
<tr>
<td>2015</td>
<td>0.106</td>
<td>1.70</td>
<td>2.90</td>
<td>13.4</td>
<td>16.30</td>
</tr>
<tr>
<td>2016</td>
<td>0.206</td>
<td>1.80</td>
<td>3.40</td>
<td>14</td>
<td>17.40</td>
</tr>
<tr>
<td>2017</td>
<td>tbd</td>
<td>1.90</td>
<td>3</td>
<td>15</td>
<td>24.00</td>
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<td>2018</td>
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- Advanced Fuel volumes reduced
- Starch ethanol volumes reduced
What will advanced biofuel volumes be 2017 - 2022?

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<th>Year</th>
<th>Cellulosic biofuel (D3/D7)</th>
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</tbody>
</table>

The opportunity for biogas and other advanced fuels
# RIN Generation Data

<table>
<thead>
<tr>
<th>Fuel</th>
<th>2013</th>
<th>2014</th>
<th>2015 (As of June 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellulosic Biofuel</td>
<td>810,185</td>
<td>33,072,542</td>
<td>37,056,414</td>
</tr>
<tr>
<td>Biomass-Based Diesel</td>
<td>2,729,681,144</td>
<td>2,702,827,296</td>
<td>954,771,458</td>
</tr>
<tr>
<td>Advanced Biofuel</td>
<td>551,583,652</td>
<td>143,220,826</td>
<td>34,725,859</td>
</tr>
<tr>
<td>Renewable Fuel</td>
<td>13,325,610,271</td>
<td>14,339,412,529</td>
<td>5,989,560,856</td>
</tr>
</tbody>
</table>
# Biogas Pathways

Introduced in 2014

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Feedstock</th>
<th>Production Process Requirements</th>
<th>D-Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>Renewable Compressed Natural Gas, Renewable Liquefied Natural Gas, Renewable Electricity</td>
<td>Biogas from landfills, municipal wastewater treatment facility digesters, agricultural digesters, and separated MSW digesters; and biogas from the cellulosic components of biomass processed in other waste digesters</td>
<td>Any</td>
</tr>
<tr>
<td>T</td>
<td>Renewable Compressed Natural Gas, Renewable Liquefied Natural Gas, and Renewable Electricity</td>
<td>Biogas from waste digesters</td>
<td>Any</td>
</tr>
</tbody>
</table>

Note: The RFS also has liquid fuel pathways that require the use of biogas for process energy.
How The Biogas Pathway Works

Note: RIN Generator is responsible for fulfilling all RFS2 reporting requirements and keeping all records pertaining to each step in the biogas process - from extraction to end-use.
A RIN is Proof That Biofuels Were Blended

Biofuel

Feedstock + Catalyst + Energy

Co-Product(s)

RIN

Attached at birth

- A derivative created by the RFS
- Proof of compliance for Obligated Parties
- Attached to wet gallon at production/import
- Strict rules of separation
An Obligated Party (OP) must acquire RINs to prove biofuel blending obligations were fulfilled.

• An OP is:
  • A refiner that produces gasoline or diesel fuel within the 48 contiguous states or Hawaii during a compliance period
  • An importer that imports gasoline or diesel fuel into the 48 contiguous states or Hawaii during a compliance period.
• A party that simply blends renewable fuel into gasoline or diesel fuel is not an obligated party.
Theoretical RIN Pricing

RIN prices:
• Bridge the delta between supply and demand caused by a mandate
• Attract investments in biofuel production & distribution
Successful Projects Must Manage RIN Volatility

Volatility Caused by Regulatory Uncertainty & Fraud
# How Many RINs Can I Produce?

<table>
<thead>
<tr>
<th>Fuel (1 gallon or equivalent)</th>
<th>Equivalence Value</th>
<th>RIN Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Biodiesel</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Butanol</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Non-ester renewable diesel</td>
<td>1.6 / 1.7</td>
<td>1.6 / 1.7</td>
</tr>
<tr>
<td>Biogas (77,000 Btus)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>Undetermined</td>
<td>Unknown</td>
</tr>
</tbody>
</table>
How to Enter the Market

Planning
Fuel Pathway and feedstock
Eligibility for desired RIN D codes

RFS Registration
Engineering Review
EPA review and approval

QAP (3rd Party Monitoring)
QAP protocol submitted
Review of production records
Review of CNG metering records
Site visits

RIN Generation
Ongoing inputs into EMTS
Quarterly and annual reports to EPA
The EPA Moderated Transaction System (EMTS)

- RINs are generated and transferred in EMTS.
- RINS don’t exist outside EMTS.
- All parties with RFS2 RIN-related responsibilities must use EMTS starting July 1, 2010.
- Allows EPA to monitor the RIN universe

Starting 2015, all RINs are tagged in EMTS as:

- Q-RIN – QAP Verified
- Unverified
- Legacy (status not recorded in EMTS)
Generating RINS

- Information Required to generate a RIN:
  - Quantity of temperature corrected fuel volume
  - Pathway Information: Fuel Type, Process, EV
  - Originating Facility
  - Type of Feedstock utilized
  - Quantity of Feedstock utilized to create fuel
  - Fuel Production Date

RIN Generator

RIN is created → Fuel/RINs are sold → PTDs are created and sent to buyer
1. The physical fuel and the RIN are separated when the fuel is designated, blended and sold / utilized as transportation fuel, heating oil or jet fuel.

2. Once the RIN is separated from the fuel, it can be traded in the secondary market.

3. Obligated Parties purchase RINs from the market and retire the RINs to fulfill their Renewable Volume Obligation (RVO).
RIN Fraud History

- Clean Green Fuels, LLC
  - > 35M fraudulent biodiesel RINs / No production or facility capable of producing biodiesel
  - Feb 2013: Owner sentenced to 12 yrs and ordered to pay > $42M in restitution
- Absolute Fuels, LLC
  - > 48M fraudulent biomass-based diesel RINs / No production of qualifying biomass-based diesel
  - March 2013: Owner sentenced to 15 yrs and ordered to pay > $54M in restitution
- Green Diesel, LLC
  - Alleges > 60M fraudulent biomass-based diesel RINs / Alleges no production of qualifying biomass-based diesel
- 24 obligated parties penalized for use of invalid Clean Green RINs towards their RVOs
RFS Prohibited Acts

• Generate RINs without qualifying renewable fuel
• Create or transfer an invalid RIN
• Produce via a feedstock/process not in the producer’s registration
• Improper RIN separation
• Use an invalid RIN towards an RVO
• Fail to acquire sufficient RINs to meet an RVO
• Cause another person’s violation
• Batch volume inconsistencies
• Incorrect temperature correction procedures
• Incorrect facility IDs, feedstock codes, etc.
• “Fat finger” mistakes
• Any other failure to meet an RFS requirement
EPA Enforcement

- Penalties for each day of violation
- Up to $37,500 per day per violation
- Disgorgement of economic benefit
- Penalties must account for:
  - Gravity of the offense
  - Economic benefit of noncompliance
  - Violator’s size and penalty’s impact on business
  - Violator’s history of compliance
<table>
<thead>
<tr>
<th>What they want</th>
<th>What they are doing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Guarantee that RINs are valid</td>
<td>• Enhanced credit and legal checks</td>
</tr>
<tr>
<td>• Ability to replace invalid RINs</td>
<td>• Trading on a specified RIN generator basis</td>
</tr>
<tr>
<td>• Someone to hold accountable</td>
<td>• Conducting their own audits</td>
</tr>
<tr>
<td>• Third Party Verifications</td>
<td>• RIN QAP</td>
</tr>
</tbody>
</table>
Q-RINs provide an affirmative defense against:

- transferring an invalid RIN (violation of §80.1460(b)(2))
- Using an invalid RIN to meet annual RVOs (violation of §80.1460(c)(1)),

The generator of an invalid RIN is not eligible for affirmative defense.

RINs are marked in EMTS as Q-RINs.
RFS is maturing into adulthood.

- EPA is showing resolve in improving RFS implementation and enforcement
  - Fixing programmatic details for efficiency & transparency in RIN markets (QAP)
- EPA is generally not backtracking on policy
  - 2014-2016 RVOs could be seen as exception
- Staff cuts / furloughs / buyout packages could affect implementation and enforcement ability
- Huge opportunity for Advanced Biofuels to prove that supply is available for 2017-2022