
Following Biogas from Source to Credit Generation



ELEMENT MARKETS

April 2016

CONFIDENTIAL AND PROPRIETARY



Element Markets Introduction

US Emissions House of the Year



Launched in 2005, Element Markets has become a leading marketer of environmental commodities in the U.S., and was selected as Energy Risk *“Emissions House of the Year”* for 2014

- Leading marketer of environmental commodities with a focus on Emissions, GHG, Renewable Credits (Energy and Transportation), and Biomethane
- Over \$1,600,000,000 in environmental commodities transacted since inception
- EM provides Environmental Asset Management Services for over 8,000 MW of generation and 18 Landfill Projects
- Customer base of over 700 companies within the environmental markets

Business Units

Renewable Energy Group



Biogas Marketing



Credit Marketing

Greenhouse Gas (GHG) and Emissions Services



GHG Offset Projects



Credit Marketing

Element Markets Introduction

Key Achievements in RFS and LCFS Markets



Renewable Fuel Standard

- **We have registered 6 pipeline-injected landfill biogas facilities under RFS with 1 more currently pending**
- **Over 40 million RINs** transacted to date
- Registered as a **RIN generator** with several Biogas production facilities
- **EPA-approved system** for demonstrating qualifying use of Biogas for RIN generation

Low Carbon Fuel Standard (LCFS)

- **First to register landfill biogas facility** with a specific Carbon Intensity
- **Registered 7 different pipeline-injected landfill biogas pathways under LCFS with several more pending**
 - All applications and GREET preparations done with in-house staff

Introduction to RFS and LCFS

RFS and LCFS Both Incentivize Renewable Fuels in Transportation



ELEMENT MARKETS

Renewable Fuel Standard (RFS)

- *Goal: to reach 36,000,000,000 gallons of renewable fuel in the fuel pool by 2022*
- Enforced by **EPA** Renewable Identification Numbers (**RINs**) represent 1 ethanol-gallon-equivalent of renewable fuel
- Biogas earns **11.727 RINs/dth**

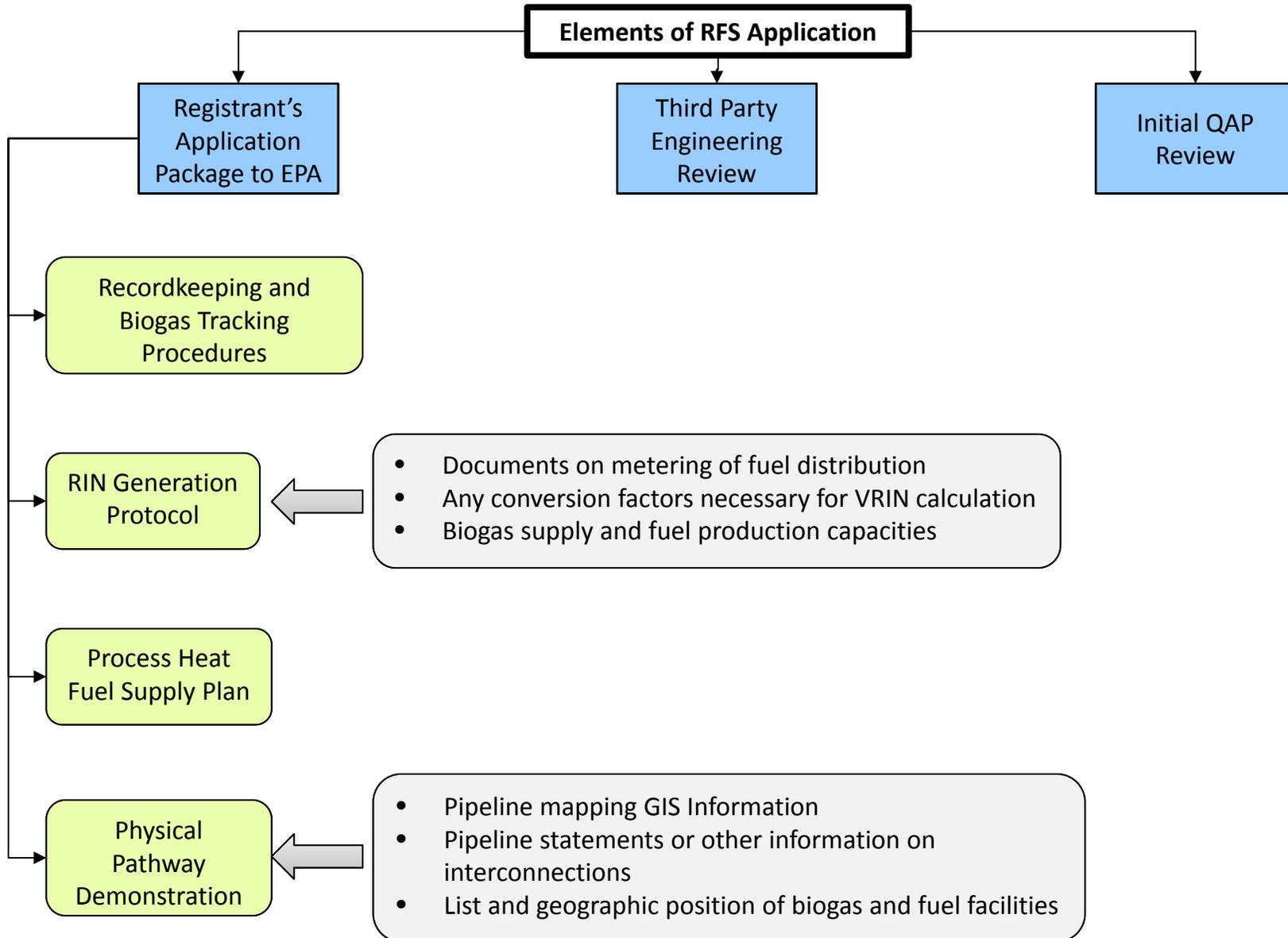
Low-Carbon Fuel Standard (LCFS)

- *Goal: to reduce the carbon intensity of California fuels by 10% by 2020*
- Enforced by **California Air Resources Board** (state)
- **LCFS credits** represent 1 metric ton of CO₂ emissions reductions
- **Carbon intensity** is grams of CO₂ emitted per MJ
- Biogas earns ~ **0.034 Incremental LCFS credits/dth**, depending on carbon intensity

Renewable transportation fuels used in California generate both RINs and LCFS Credits so long as the fuel is transported and consumed in CA

How to Become a RIN Generator

Overview of Registration Steps under the RFS



RFS Engineering Review

Main requirements

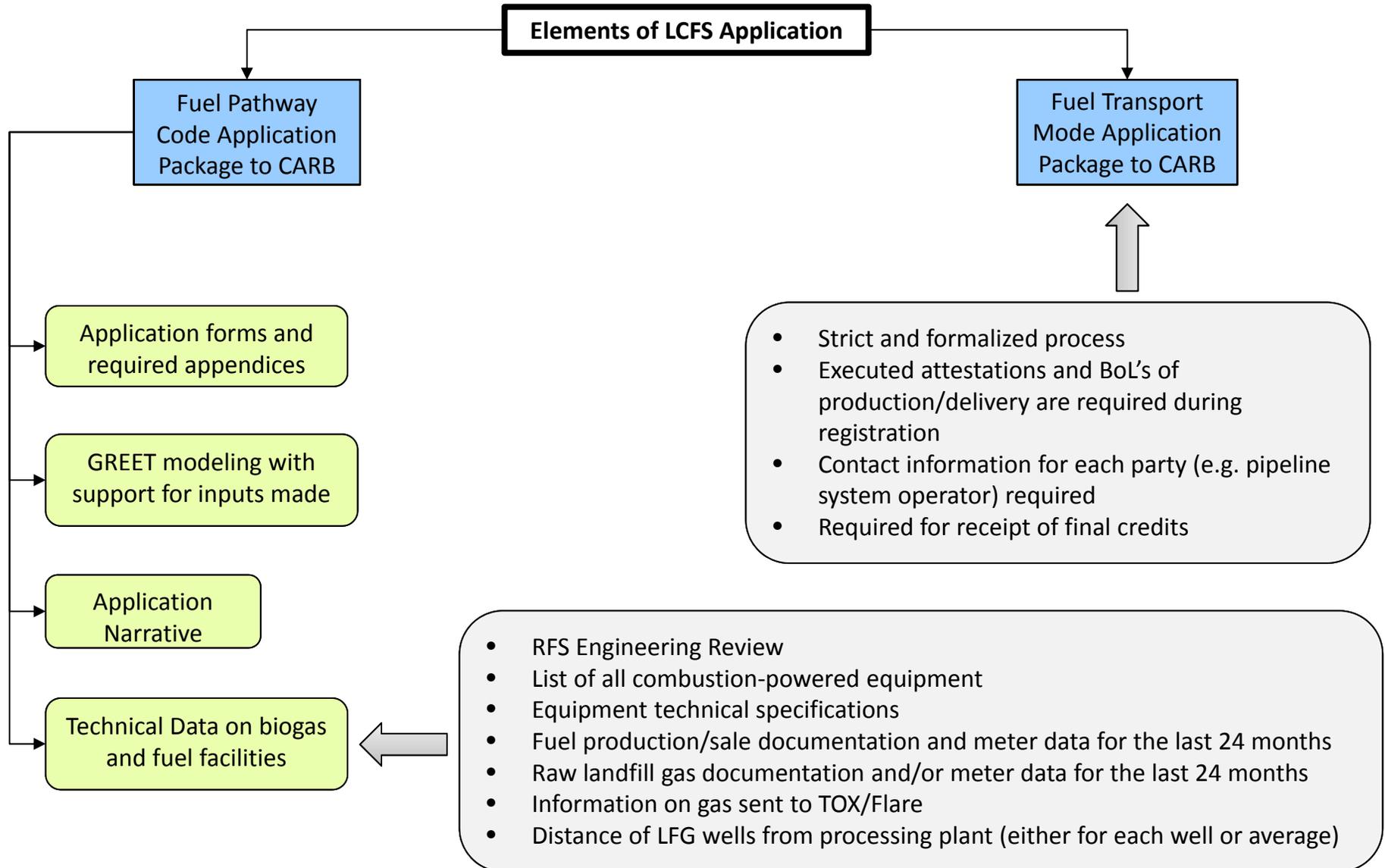
- The review is to be performed by a **third-party Professional Engineer**
- **Site visits are necessary** for all facilities upstream from pipeline gas injection
- During **desk audit**, PE reviews all contracts, proposed recordkeeping and RIN generation protocol

Sample data requirements for Third Party Engineering Review – Landfill Gas Facility

- Applicable regulatory permits for landfill and gas processing facility (e.g. Title V)
- Extraction wells map/layout
- Up-to-date process diagram (e.g., P&ID, block diagram, etc.)
- Current analyses of landfill gas and product gas injected into the pipeline
- Gas production records reflecting peak capacity
- Specification of metering system used at pipeline injection point and records of calibration
- Utility bills and/or fossil fuels invoices for energy use by the project

How to Become an LCFS Credit Generator

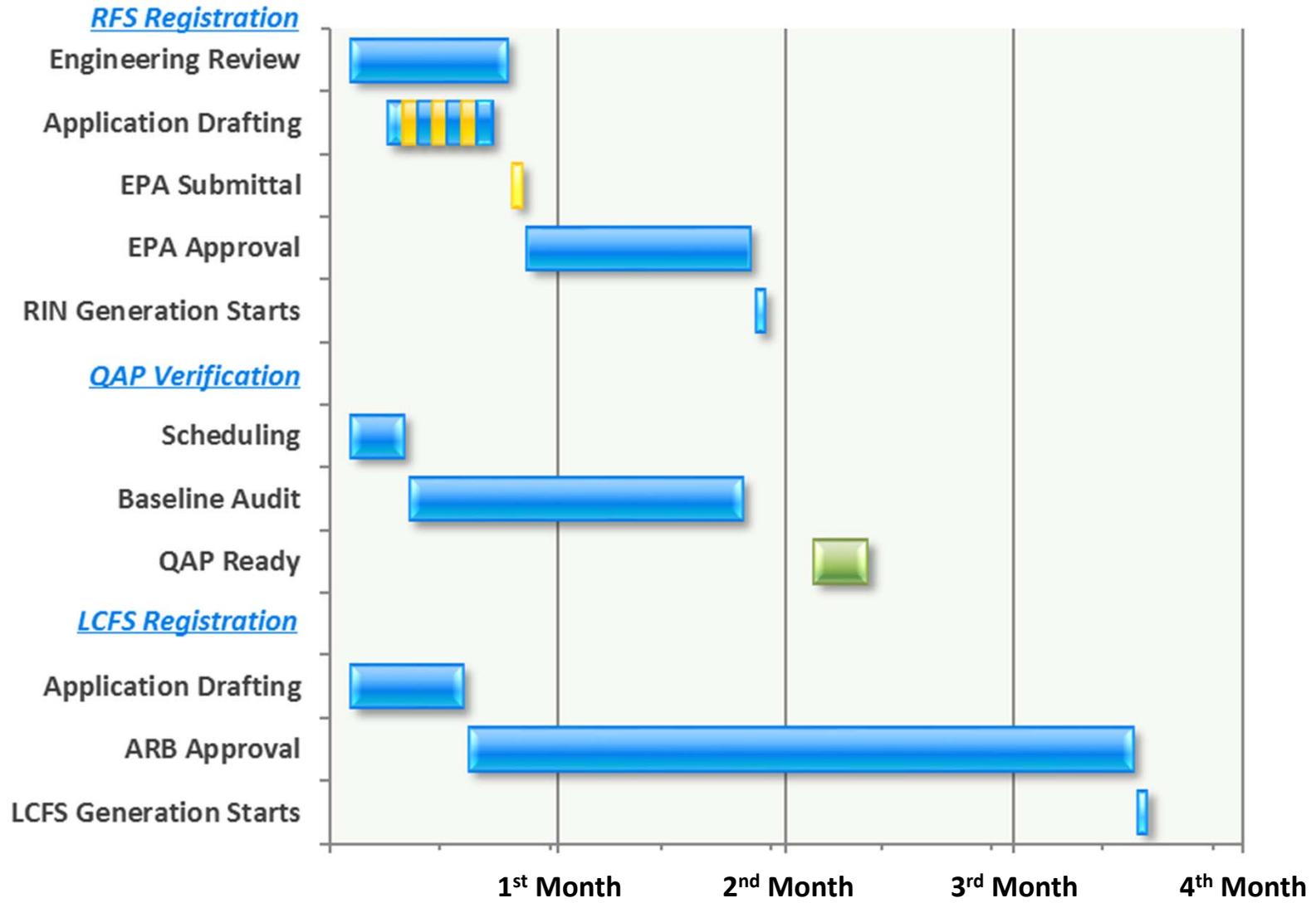
Overview of Registration Steps under the LCFS



Registration Schedule



Approximate timeframe of registration steps under RFS and LCFS

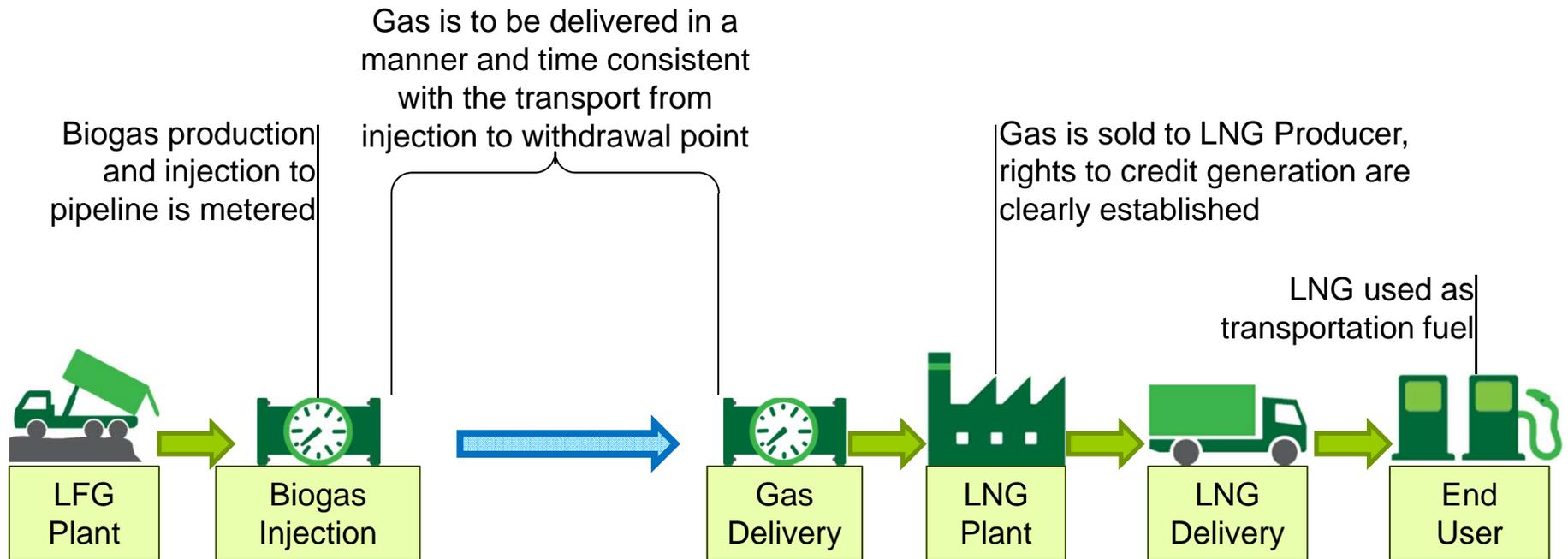


Compliance under RFS and LCFS

Documents and tracking steps necessary for LNG credit generation



ELEMENT MARKETS



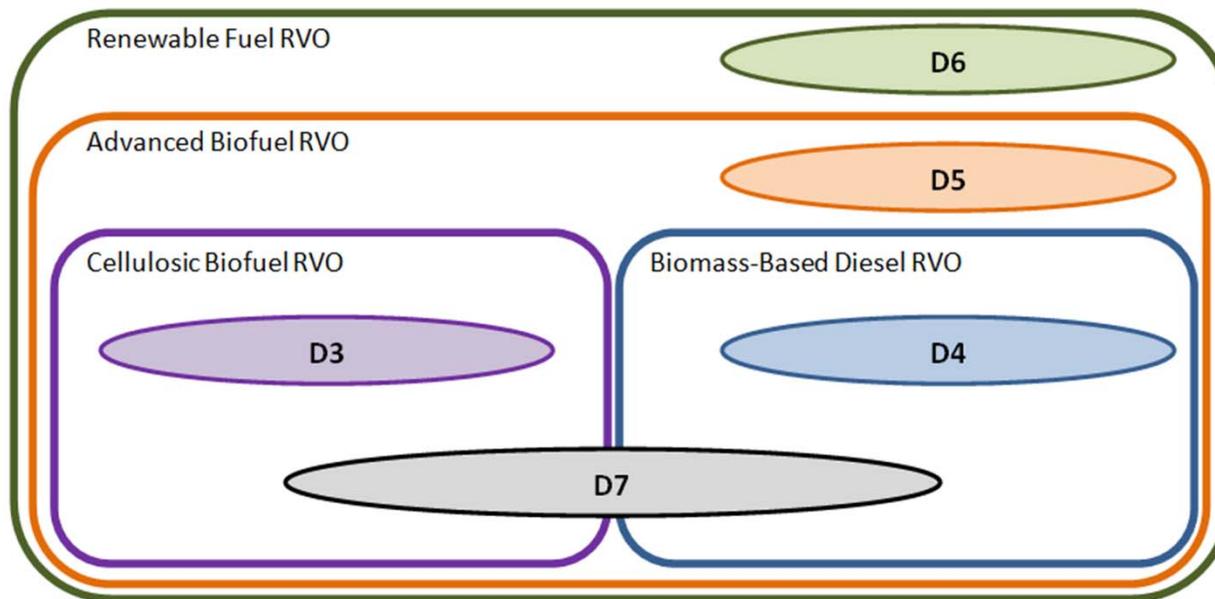
D O C U M E N T A T I O N

<p>Contracts for the sale of biogas rights;</p> <p>Monthly invoices by LFG Plant</p>	<p>Pipeline statements with utility-grade meter data of biogas injection</p> <p>Attestations establishing delivery of biogas rights</p>	<p>Pipeline statements of gas sale and transport</p> <p>Possible Physical Transport Path demonstrated to EPA</p>	<p>Pipeline statements with utility-grade meter data of gas delivery</p>	<p>Contract for the sale of biogas rights;</p> <p>Attestations establishing delivery of biogas rights</p>	<p>LNG Producer's attestation of delivered fuel quantity equal to or greater than the amount of biogas conveyed</p>	<p>Contract or supporting attestation with end user establishing transportation use</p>
--	---	--	--	---	---	---

Structure of the RIN Market

Nested System of RIN retirement

- Obligated parties meet compliance by submitting a quantity of **Renewable Identification Numbers (RINs)** equivalent to their **Renewable Volume Obligations (RVOs)** for each of the four standards
- RINs are measured in ethanol equivalent gallons
- Each batch of renewable fuel generated is assigned a “D Code”, based on the feedstock and the fuel production process



- **A Biogas RIN qualifies as a D3 RIN (Cellulosic Biofuel), which satisfies both the D3 and the D5 (Advanced Biofuel) categories, so the sales price for a D3 RIN is a negotiated discount value to the D3 Waiver Credit Value + the D5 Value.**

THANK YOU



Randall Lack
Element Markets, LLC
3555 Timmons Lane, Suite 900
Houston, TX 77027
Office: 281-207-7200
rlack@elementmarkets.com
www.elementmarkets.com

WORLD FINANCE



“Emissions House of the Year – 2010 & 2014” by Energy Risk

Energy Risk Environmental Rankings

- #1 U.S. Regional Greenhouse Gas Dealer
- #1 U.S. Voluntary GHG Credit Dealer
- #2 Renewable Energy Credit Dealer
 - #1 NOx & SO2 Dealer

Environmental Finance Magazine

- Best Trading Company in North American Renewable Energy
- Runner- Up, Best Trading Company of North American GHG Markets (California)
 - Best Trading NOx & SO₂ Company Emission Credits