Vinson&Elkins

# Energy Series

## Renewable Fuel

**Alan J. Alexander**

**Matthew Dobbins**

**Michael P. Joyce**

**Chris Rowley**

October 13, 2021

# Meet the Speakers


Alan J. Alexander

**Partner – Energy Transactions & Projects**

Office: Houston

+1.713.758.3353

Email: aalexander@velaw.com



Matthew Dobbins

**Partner – Environmental & Natural Resources**

Office: Houston

+1.713.615.5015

Email: mdobbins@velaw.com



Michael P. Joyce

**Partner – Energy Transactions & Projects**

Office: Los Angeles

+1.213.402.3639

Email: mjoyce@velaw.com



Chris Rowley

**Partner – Mergers & Acquisitions and Private Equity**

Office: Dallas

+1.214.999.7972

Email: Crowley@vwlaw.com

# Agenda

- Introduction
- Types of Renewable Fuel
- Available Credits
- Transactional Structures
- Financing Considerations
- Renewable Fuel Development and Transactions - Risks

# Introduction

# Introduction

- Bioenergy refers to energy produced from biomass, which is organic matter that is burned to produce heat energy or processed into gas or liquid fuel through the following types of processes:
  - Thermochemical (thermal gasification)
  - Biochemical (anaerobic digestion, fermentation)
  - Chemical processes (chemical agents that create liquid fuels)

- Feedstocks can include wood and/or cellulosic-based energy crops (e.g., sorghum), timber and agricultural waste, algae, oil seed crops (e.g., soybean), livestock manures and municipal solid food industry waste (e.g., used cooking oil).

***Photo Credit:*** "Bioenergy Basics." *Energy.gov*, https://www.energy.gov/eere/bioenergy/bioenergy-basics

# Types of Renewable Fuel

# Types of Renewable Fuel: Renewable Natural Gas

- Renewable natural gas is essentially methane generated from renewable sources.
- While raw gas can be used locally to produce on site electricity and heat with limited processing, it must be processed to meet pipeline quality standards so it may be injected into distribution pipelines.
- Renewable natural gas is typically produced from the anaerobic digestion of organic materials. At present the most common material feedstocks appear to be livestock manures (e.g., from dairy farms) and municipal solid waste (i.e., landfills).
- Predominate uses include: (i) thermal applications (e.g., use in boilers, greenhouses and kilns), (ii) generation of electricity, (iii) vehicle fuel, (iv) as feedstock for bio-products (e.g., biodegradable plastic), and (v) hydrogen production.

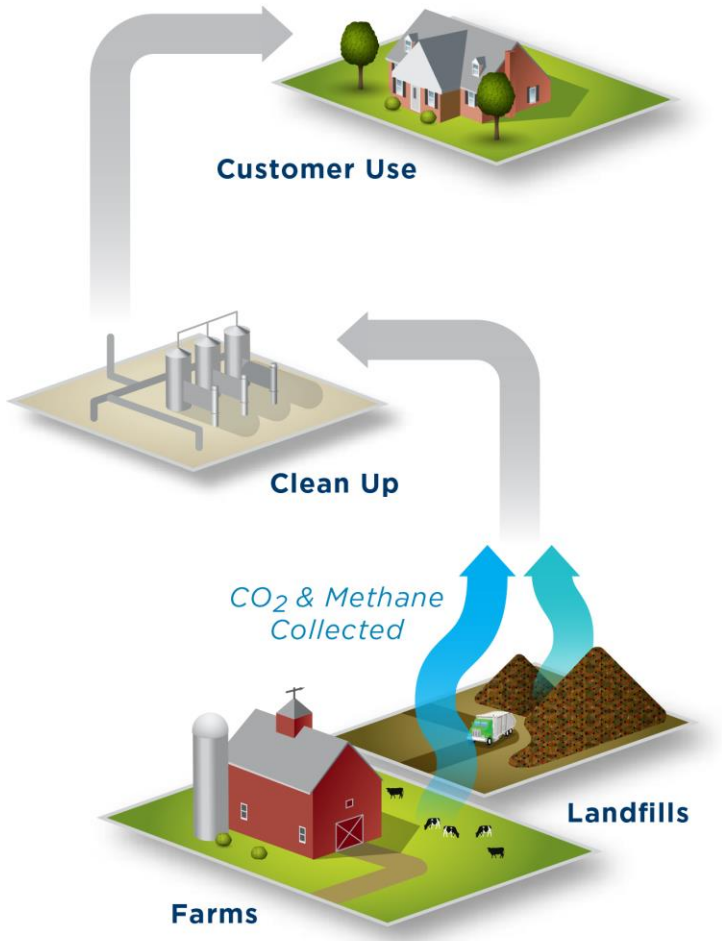



*Photo Credit*: "Renewable Natural Gas." American Gas Association, https://www.aga.org/natural-gas/renewable/.

# Types of Renewable Fuel: Renewable Diesel/Biodiesel

- Biodiesel (or Fatty Acid Methyl Esters) is produced through transesterification, a process in which triglycerides (from vegetable oils or animal fats) are reacted with alcohol to form esters and glycerol.
  - Introduces oxygen (and potentially water) into the fuels, which can lead to operational issues
  - Biodiesel is typically blended into fuels at a 5% to 20% ratio.
- Renewable diesel is produced through hydrotreating then isomerizing triglycerides such as vegetable oils, animal waste, and residue fat as well as other suitable feedstocks.
  - Hydrogen is used to remove oxygen.
  - The result is a molecule that is similar to diesel fuel.
  - **Critically, this enables the ability to blend renewable diesel with diesel in any ratio as a drop-in fuel.**

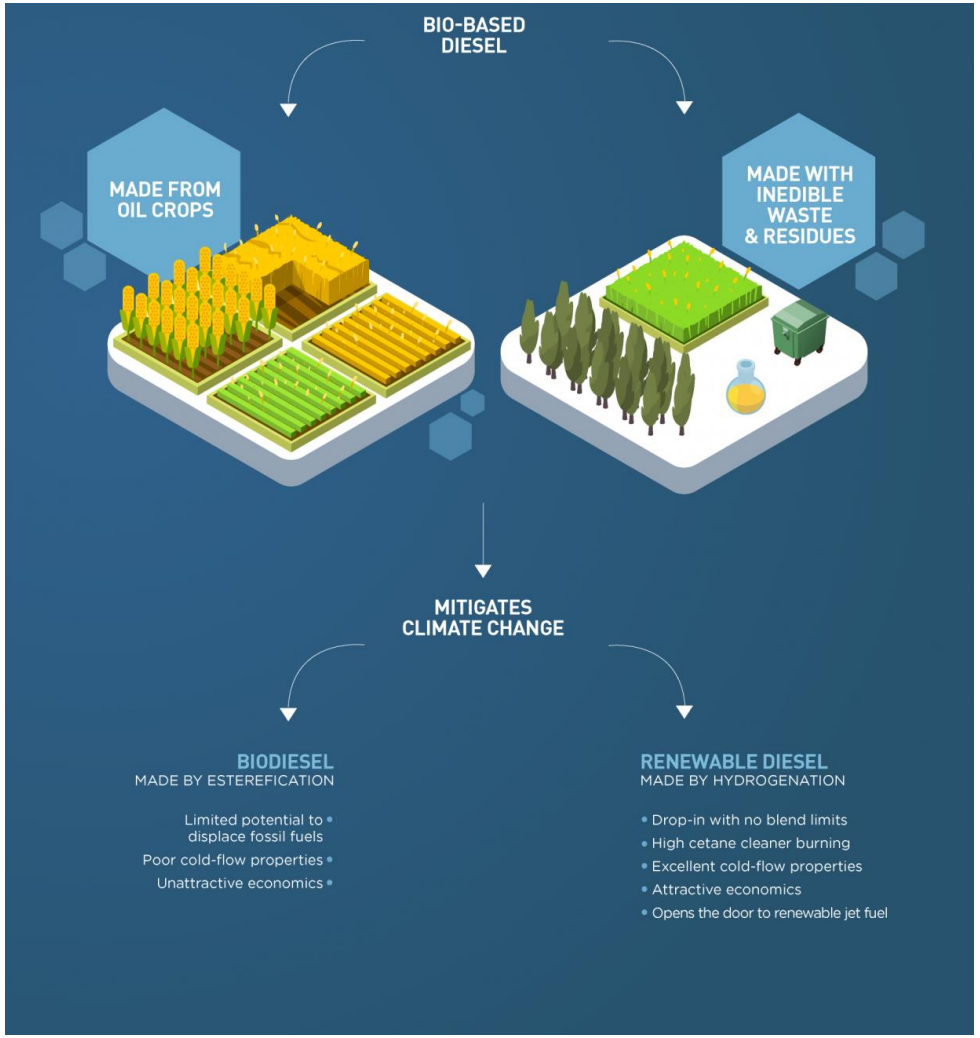



*Photo Credit*: "Renewable Diesel: Fuel For Thought. Fuel For Business." *NextChem*, https://nextchem.it/renewable-diesel

# Available Credits

# Available Credits: RINs

- Renewable Fuel Standard
  - The Environmental Protection Agency ("***EPA***") administers the Renewable Fuel Standard ("***RFS***") and is responsible for
    - evaluating "fuel pathways" and which renewable fuels are eligible for the RFS program
    - establishing the Renewable Volume Obligations ("***RVOs***") (i.e., volumes of renewable fuel that will be required for a compliance year based on the statutory targets)
    - monitoring compliance with the RFS using the system of tradable credits referred to as renewable identification numbers ("***RINs***").
  - The RFS program requires transportation fuel sold in the U.S. to comply with RVOs (i.e., contain a minimum volume of designated renewable fuels).
  - The RVOs required by the RFS are statutory targets through 2022, after which the EPA has statutory authority to determine the target RVOs.
  - In order to generate RINs, a renewable fuel producer must be registered under the RFS program.
- Market Value Drivers
  - Feedstock costs
  - Regulatory factors including compliance costs and rising RFS targets
  - Increase in demand for RINs

| Percentage Standards | |
|---|---|
| Fuel Type | Percentage Standards |
| Cellulosic biofuel | 0.34% |
| Biomass-based diesel | 2.10% |
| Advance biofuel | 2.93% |
| Renewable Fuel | 11.56% |

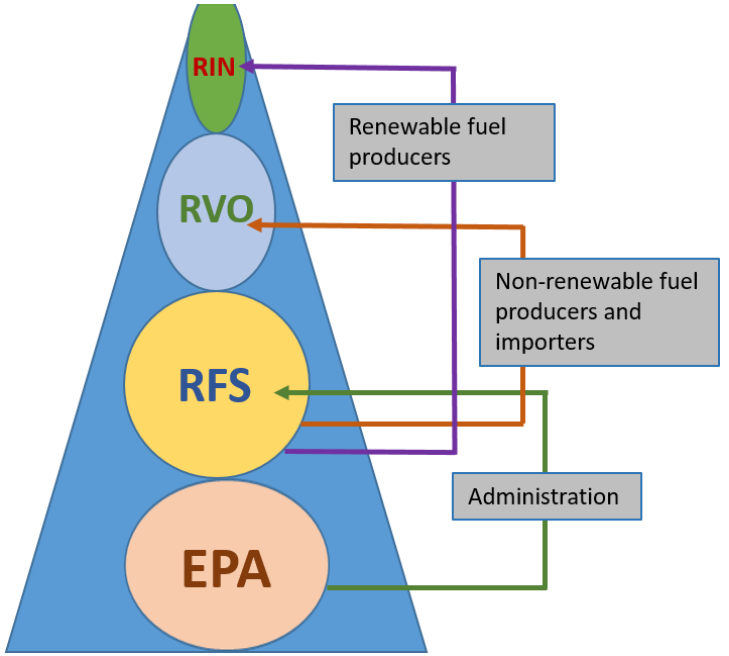



*Photo Credit:* "Feedstock Analysis For RINs Credits." Feedstock Analysis for RINs Credits - Celignis Biomass Analysis Laboratory, https://www.celignis.com/RINs-credits.php

# Available Credits: RINs Continued

- RINs are generated when a producer makes a gallon of renewable fuel.
  - The number of RINs generated depends on the carbon intensity ("***CI***") of the fuel relative to ethanol
  - Renewable fuels with more energy content per volumetric unit than ethanol can generate more than 1.0 RIN per Gallon (e.g., Biodiesel = 1.5 RINs)
  - A RIN can be traded and/or sold between parties (for purposes of satisfying compliance obligations as discussed below) once it is "separated" from the batch of renewable fuel that generated the RIN.
- "Obligated parties" under RFS are refiners or importers of gasoline or diesel fuel in the United States.
  - Each obligated party is assigned an EPA-specified RVO
  - An obligated party complies by either producing renewable fuels, or by purchasing sufficient RINs for each applicable category of renewable fuels for the applicable compliance year.
  - Under limited circumstances, obligated parties can petition the EPA for a waiver from the RFS's renewable fuel mandates.
  - Up to 20% of an obligated party's RVO for the current year can be met with RINs generated during immediately preceding year.

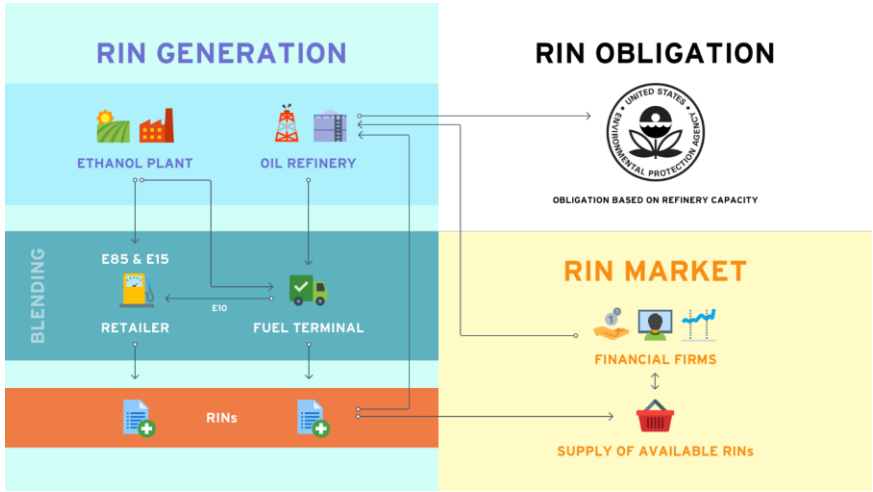



*Photo Credit*: "RINs 101: The Basics of Renewable Identification Numbers." *Growth Energy*, 1 May 2019, https://growthenergy.org/2018/07/24/rins-101-the-basics-of-renewable-identification-numbers/

# Available Credits: RINs Continued

- By statute, the RFS program includes four categories of renewable fuel, each with specific fuel pathway requirements and RIN D-Codes:
- Advanced Biofuel (D-code 5)
  - Can be made from any type of renewable biomass except corn starch ethanol.
  - Must reduce lifecycle greenhouse gas emissions by at least 50%; compared to the petroleum baseline.
    - Historical average price for RINs with transfer date after December 31, 2019:
      - Min price: $.05 - Max price: $ 2.00
- Biomass-based Diesel (D-Code 4)
  - Examples include biodiesel and renewable diesel.
  - Must reduce lifecycle greenhouse gas emissions by at least 50%; compared to the diesel baseline.
    - Historical average price for RINs with transfer date after December 31, 2019:
      - Min price: $.05 - Max price: $ 2.00

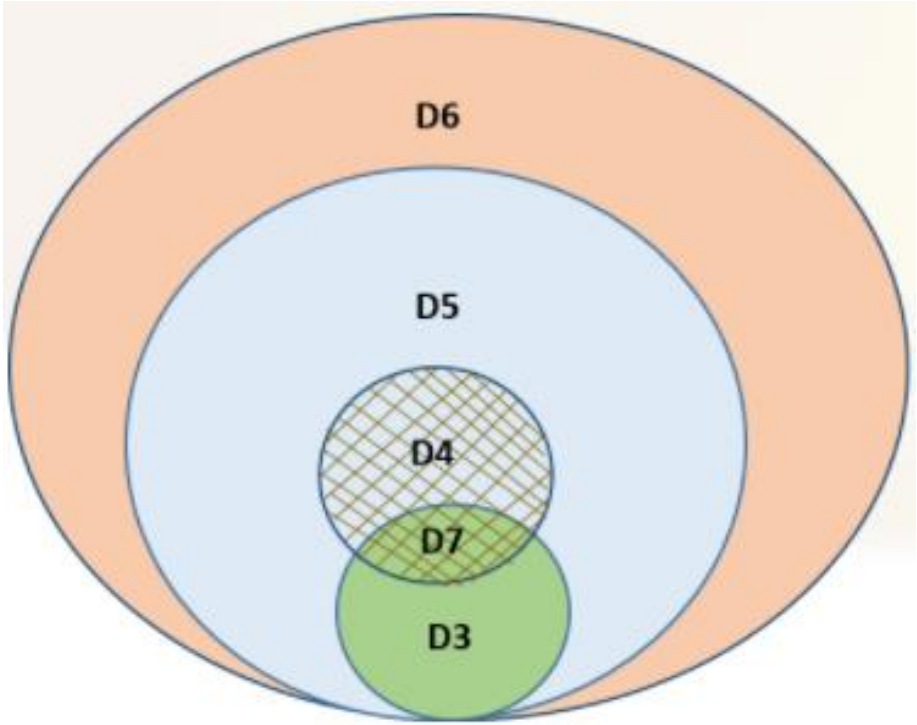



*Photo Credit:* "Feedstock Analysis For RINs Credits." Feedstock Analysis for RINs Credits - Celignis Biomass Analysis Laboratory, https://www.celignis.com/RINs-credits.php

# Available Credits: RINs Continued

- Cellulosic Biofuel and RNG (D-Code 3 or D-Code 7)
  - Renewable fuel produced from cellulose, hemicellulose or lignin.
  - RNG generates D-Code 3 RINs
  - To be eligible for D-Code 7 RINs the fuel must be cellulosic diesel.
  - Must reduce lifecycle greenhouse gas emissions by at least 60%; compared to the petroleum baseline.
    - Historical average price for RINs with transfer date after December 31, 2019:
      - Min. price: $0.05 - Max. price: $3.50
- Renewable Fuel (D-Code 6)
  - Includes ethanol derived from corn starch, or any other qualifying renewable fuel.
  - Fuel produced in new facilities or new capacity expansions (commenced constructed after December 19, 2007) must reduce lifecycle greenhouse gas emissions by at least 20%; compared to the average 2005 petroleum baseline.
    - Historical average price for RINs with transfer date after December 31, 2019:
      - Min. price: $0.01 - Max. price: $2.00

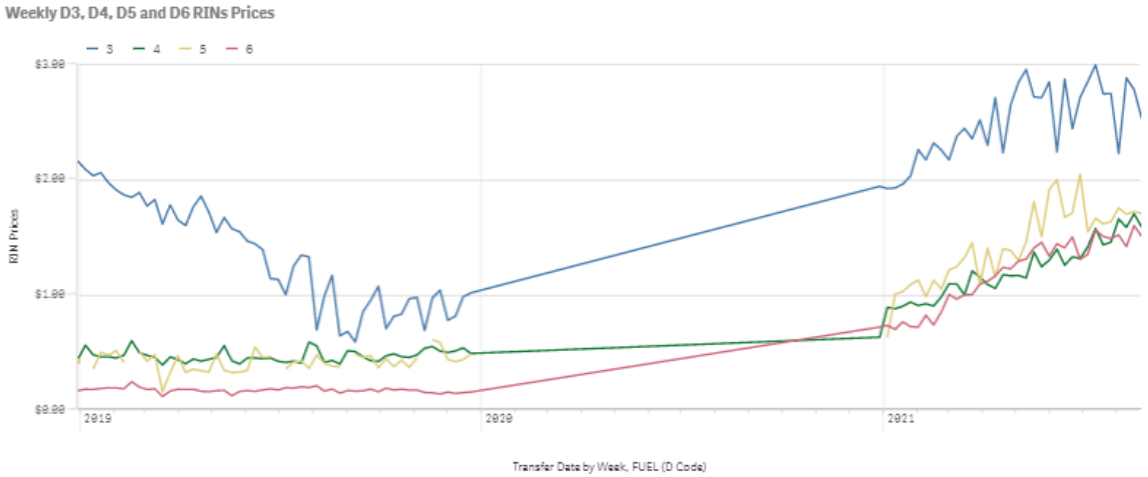



*Photo Credit:* "RIN Trades and Price Information." *EPA*, Environmental Protection Agency, https://www.epa.gov/fuels-registration-reporting-and-compliance-help/rin-trades-and-price-information.

# Available Credits: California Low Carbon Fuel Standard

- California's Low Carbon Fuel Standard ("***LCFS***") is administered by the California Air Resources Board ("***CARB***")
  - Encourage the use of cleaner, low-carbon transportation fuels in California, encourage the production of those fuels, and thereby reduce greenhouse gas ("***GHG***") emissions
  - Decrease petroleum dependence in the transportation sector consistent with California's 2030 GHG emission reduction target.
  - Complex regulatory framework, but potentially generates the most value for parties delivering fuels to, and using fuels in, California.
  - Fuel producers, importers, and certain other parties in the State of California, are subject to the LCFS.
  - Parties that sell or offer for sale transportation fuels in California are required to meet annual carbon intensity reduction targets or buy LCFS credits to meet the standards.
- LCFS standards are based on the measured CI of gasoline and diesel fuel and their respective substitutes.
  - CI is measured in terms of grams of carbon dioxide ("***CO2***") equivalent per megajoule of energy (gCO2e per MJ).
  - Low carbon fuels below the CI benchmark generate credits, while fuels above the CI benchmark generate deficits.
- Producers can generate both LCSF credits and RINs under these frameworks.

# Available Credits: California Low Carbon Fuel Standard Continued

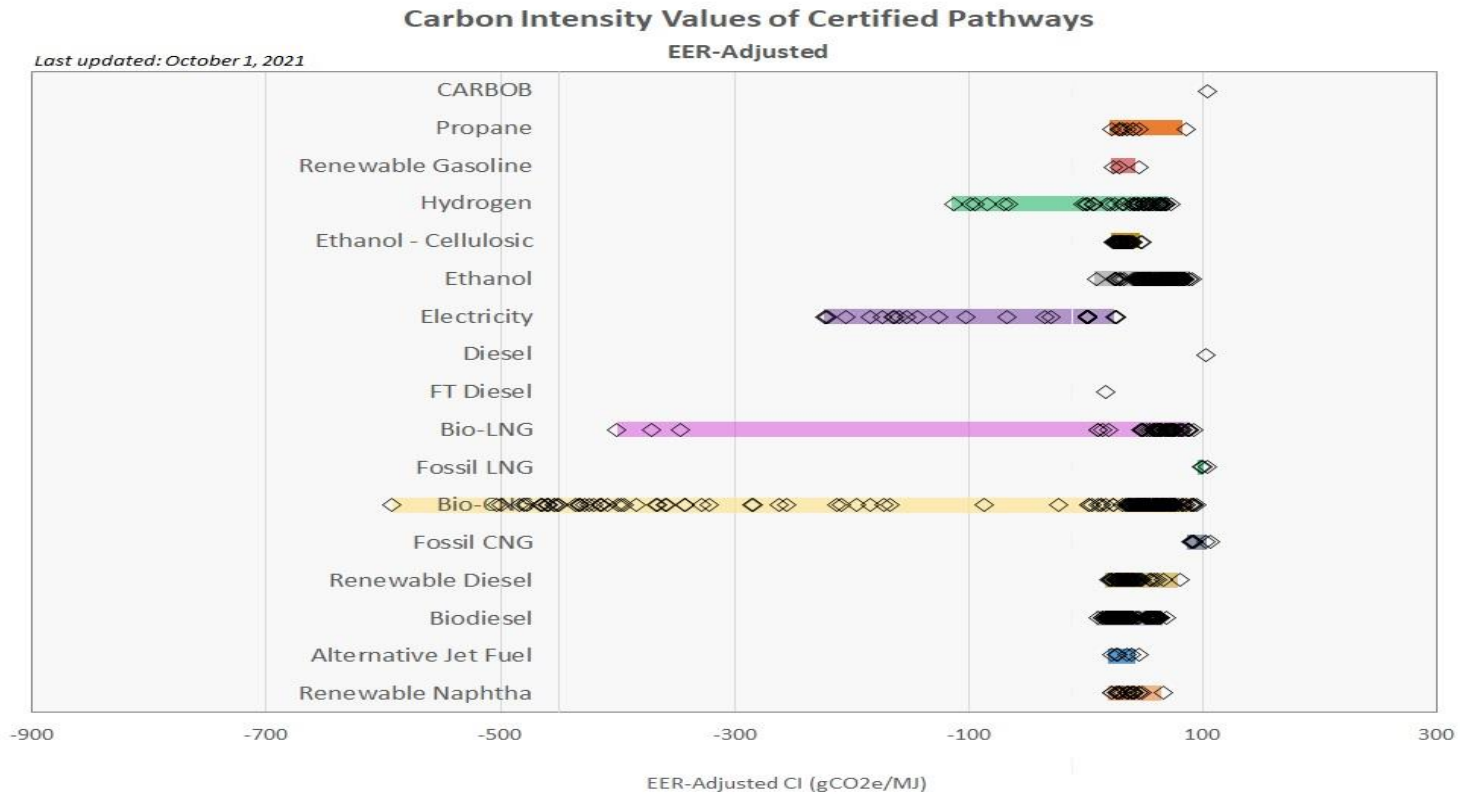



*Photo Credit*: "California Air Resources Board." *LCFS Pathway Certified Carbon Intensities | California Air Resources Board*, https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities

Credits and deficits under the LCFS are denominated in metric tons of GHG emissions (avoided or emitted based on the baseline and the corresponding reductions) and credits can be sold, banked, or used to satisfy a compliance obligation.

# Available Credits: California Low Carbon Fuel Standard Continued

- States / Provinces with LCFS
  - CA
  - OR
  - BC
  - WA
- States/ Provinces / Countries Considering LCFS
  - CO
  - SD
  - MN
  - IA
  - NY
  - NS
  - NL
  - PE
  - NB
  - NB
  - QC
  - ON
  - MB
  - NU
  - SK
  - AB
  - NT
  - YT

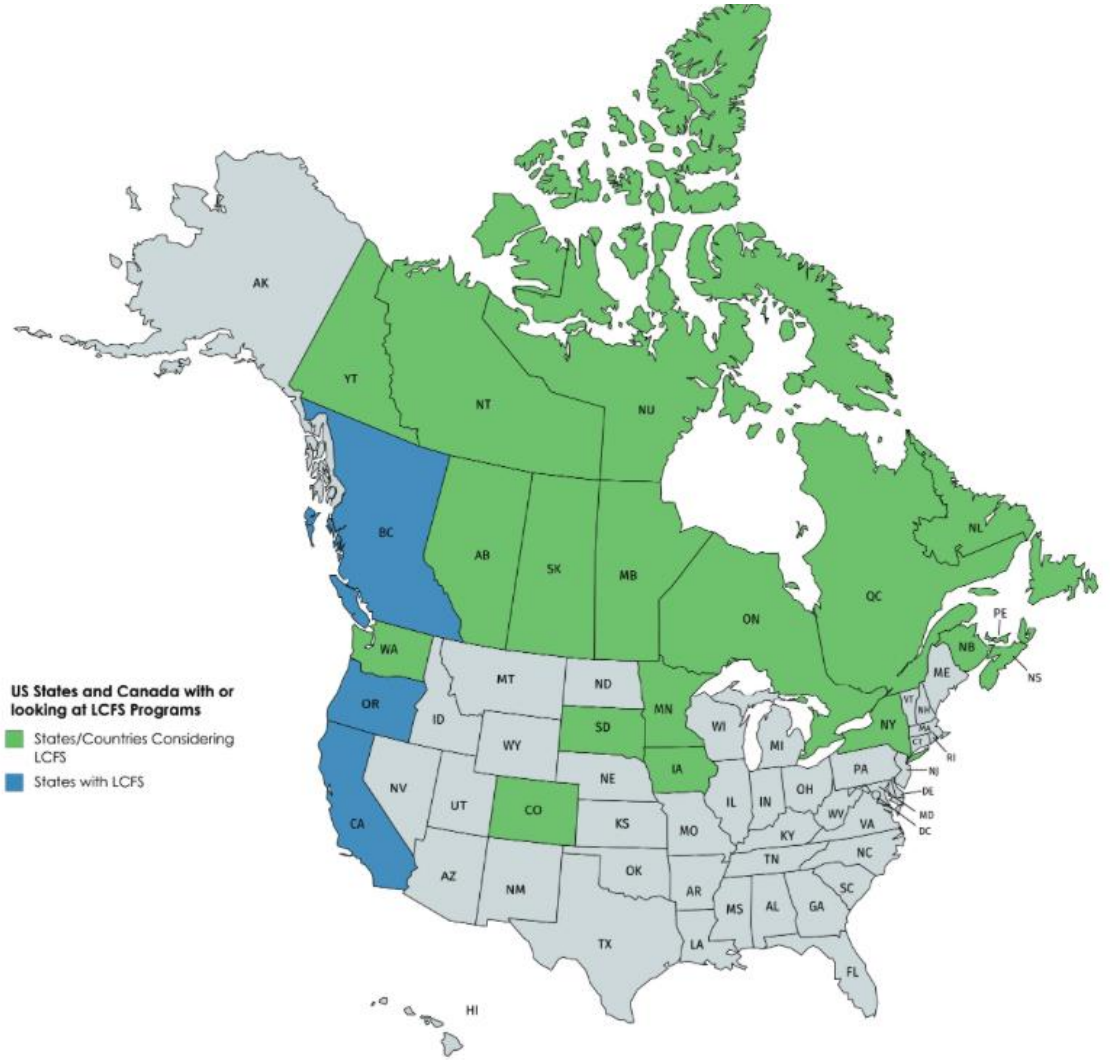



*Photo Credit*: Lane, Bob. "Insights: States with Low Carbon Fuel Standards & Those Considering One." *The Jacobsen*, 16 Nov. 2020, https://thejacobsen.com/news_items/states-considering-lcfs/

# Available Credits: Federal Income Tax Credit

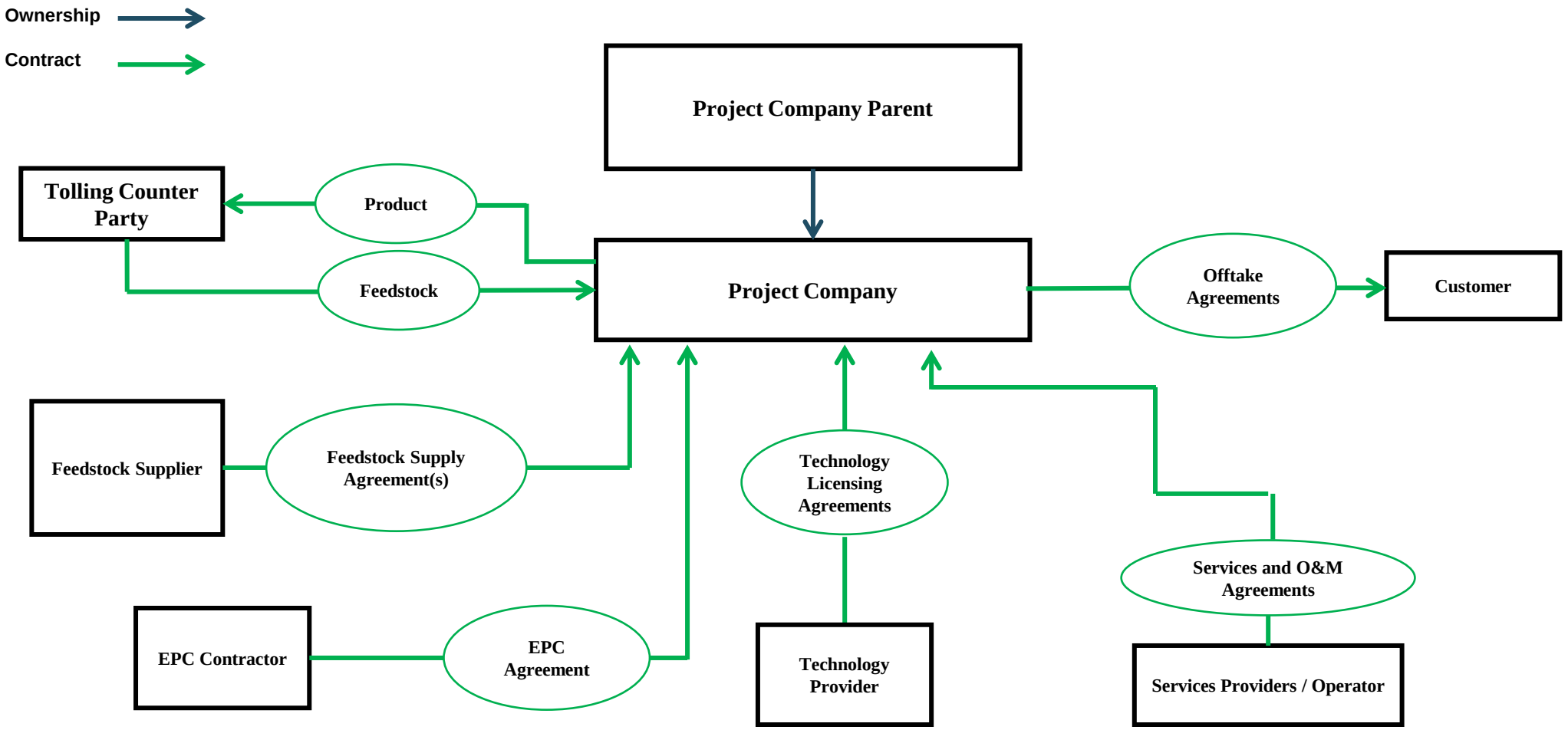
- Federal law currently provides tax incentives relating to the production and blending of renewable diesel and biodiesel within the United States.
  - A blender credit of $1.00 per gallon of biodiesel used in the production of a "qualified biodiesel mixture" (which includes renewable diesel and biodiesel) that is sold wholesale or, in certain instances, retail, or used as fuel by the producer (the "***Blender Credit***").
  - A credit of $1.00 per gallon of unblended (R100) renewable diesel or unblended (B100) biodiesel produced and either sold at retail or used as fuel by the producer (the "***Producer Credit***").
  - A small agri-biodiesel producer credit of $0.10 per gallon of qualified agri-biodiesel (biodiesel derived from virgin oils) that is produced by a qualified producer (the "***Small-Agri Credit***").
- The Blender Credit and Producer Credit are mutually exclusive.
- The Small-Agri Credit can be combined with both the Blender Credit and the Producer Credit with respect to agri-biodiesel only.
- In lieu of a credit against income taxes, a blender may claim a refundable credit against its fuel excise tax liability in the same amount as the Blender Credit.
- These tax credits currently apply to any sale or use of the applicable fuel through December 31, 2022, but have been consistently renewed in the past.
  - Presently, the House has introduced H.R. 3472 and the Senate S. 1806, which would extend the tax credits through December 31, 2025.

# Transaction Structure

# Transactional Structures: Renewable Natural Gas

- With both renewable natural gas and renewable diesel/biodiesel transactions, to generate RINs and LCFS credits, the final offtaker must use the fuel as a transportation fuel.
  - Renewable natural gas generates D3 RIN (most valuable RIN).
  - Potentially very low CI score due to displacement of traditional fossil fuels while mitigating methane emissions from agriculture.
    - RNG from livestock manure potentially offers the most valuable LCFS credits.
- Typically, will involve a feedstock supply / offtake structure given that the producer of the feedstock (e.g., dairy farm or landfill) has no use for renewable natural gas used as transportation fuel.
  - RNG and credit marketing agreements, in lieu of offtake, are also common, but can present financability issues
- Feedstock agreements for agriculture based projects can be structured structured as $/MMBTU based on the amount of renewable natural gas produced, as a royalty to the farm owner/feedstock producer off Net Income or EBITDA of the project.
- Real property agreements (leases, easements, licenses, etc.) to ensure sufficient access to the project site to construct and operate the project.
- EPCM / Construction Management models are more prevalent than wrapped LSTK EPC.
- Connection to an interstate pipeline is necessary in order to take advantage of California LCFS.

# Renewable Fuel Project Structure



# Transactional Structures: RNG Offtake Agreements

- Marketing Agreement
  - Producer transfers product to a marketer, often strategic, which takes delivery of renewable natural gas, delivers it to a vehicle fuel producer, and performs all obligations necessary to ensure that RINs and LCFS credits are generated.
  - All proceeds and credits are transferred back to the producer, less a marketing fee (typically 15% to 25% of net proceeds to producer).
  - Potentially much larger upside, but no guarantee of minimum revenue to producer.
  - RNG price + Credit Stack of RINs and LCFS (if gas can enter interstate commerce) = $80.00 - $90.00 per MMBTU.
  - Marketer's obligations are generally subject to the ability of the Marketer to place the RNG with vehicle fuel producer.
  - Seems to be prevalent agreement form in agriculture RNG projects
- Fixed Price Offtake Agreement
  - Producer is paid a fixed price in exchange for transferring all renewable natural gas and associated attributes to the offtaker.
  - Upside is capped, but revenue to producer is guaranteed.
  - Terms range from 3 up to 10 or more years.
  - Often include minimum delivery requirements and liquidated damages.
  - Have seen prices in the range of $12.00 to $18.00 per MMBTU for gas and associated credits, thus transferring credit upside to the offtaker.
- Change in law risk allocation relevant in both, inherently falls to producer in marketing agreement and has termination and price adjustment implications in fixed price agreement.

# Transaction Structures: RNG Production - Landfill vs Dairy

- Landfill
  - Landfills are generally the lowest cost RNG resource.
    - Gas collection systems are required to be in place per existing federal air quality mandates, with only nominal upgrades necessary
    - Economies of scale also result in lower relative cost of interconnection and pipeline expansion as compared to dairy
    - Individual facilities could produce in excess of 500,000 MMBtu/year of RNG, more than 10x production of large dairy farm
  - Relatively low capital cost can be recouped relatively quickly despite lower fixed price offtake and lower credit value
    - Lower credit value due to higher carbon intensity for landfill capture and lower offset (landfill already required to mitigate release of gas)
- Agriculture (dairy, swine, poultry)
  - Relatively small scale and lack of centralization near existing infrastructure make RNG dairy facilities comparatively more expensive.
    - Farms not necessarily near existing infrastructure and raw production is far lower than average landfill.
    - To the extent facility is producing RNG eligible for LCFS in addition to RINs, higher capital costs are offset by significantly lower carbon intensity and resulting higher credit value
  - Hub and spoke model
    - Production is often aggregated, either by transporting fuel to centralized processing and/or aggregating production from several farms for marketing through strategic aggregator, i.e. under a marketing agreement.

# Transactional Structure: Renewable Diesel

- Renewable diesel generates D4/D5 RINS.
- Transaction / project structure is more complicated than renewable natural gas:
  - more robust utility arrangements (i.e., renewable diesel facilities are small refineries that require greater utility loads and more exact specifications)
  - technology licensing arrangements (renewable diesel production technology is proprietary)
  - catalyst supply
  - hydrogen supply
  - more complicated permitting considerations.
- Can be structured as a tolling arrangement.
  - some suppliers of feedstock have a use for the renewable diesel that is produced or the ability to distribute it as a vehicle fuel
- Renewable Diesel transactions can also be structured:
  - Under a feedstock / offtake model; and
  - Under a supply / marketer model with the offtaker retaining a marketing fee.
- Biodiesel is not generally shipped via pipeline due to operational and technical difficulties, but renewable diesel is better suited to transportation via pipeline and several renewable diesel pipelines are currently in development in addition to the possibility of using existing pipelines.

# Financing Considerations

# Financing Considerations: Challenges and Players

- Certain features of RNG transactions may limit traditional project finance (e.g., predictable cash flow in exchange for lower return targets on large capital investment)
  - Uncertainty of long-term value of LCFS and RIN, somewhat mitigated by shorter term return of capital
  - Small size ($25 - $50mil) of landfill transactions, notwithstanding relatively rich return profile based on fixed price offtake.
  - Variable cash stream from marketing agreement offtake contracts vs higher upfront capital costs per MMBtu/year production (particularly for dairy RNG), yet relatively small transaction size (single digit seven figure per digester)
- However, participation has never been deeper nor industry, governmental and local support more available
  - In 2021 alone the recently rebranded Clean Energy has announced deals with Amazon, BP, Total, as well as expansion of Chevron participation in Adopt a Port, which Chevron also supplies, and several transit authority and fuel transactions
  - Recently, Chevron committed to investing $10 billion into renewable natural gas, renewable fuels, hydrogen, carbon capture, and carbon offsets by 2028, with an expected $1 billion of annual cash flow coming in from the businesses, noting the strategy is driven by significant potential to create shareholder value (which was contrasted with “mature” wind and solar markets).
  - BP is the largest supplier of RNG domestically and has well publicized JV with Aria Energy for dairy RNG, including RNG Moovers project with Certarus
  - NextEra and OPAL converting existing Republic Services landfill power generation facility to RNG production
  - Sources of finance capital are diversified, and investor interest is growing
    - Strategic equity and commercial bank lenders are active | Federal grants and loan guaranties available | Green bond and conduit municipal bond issuances

# Financing Considerations: Challenges and Players Continued

- Federal, state and local mandates, incentives and credits are plentiful
  - RFS targets only set through 2022, but are generally not expected to decline any time soon, notwithstanding calls to overhaul RVO system
  - Biden administration continues to support
    - Blender/Producer/Small Agri potentially being extended through 2025
    - Will we see an ITC for RNG?
  - USDA grants and loan guaranties now administered through One RD program
- States active as well
  - LCFS and SB-1383 (compliance standards) in CA
  - Clean Fuels Program and SB-98 (voluntary 30% state RNG target) in Oregon
  - Natural Gas Innovation Act (cost recovery) in Minnesota
- Local hand - Tax exempt municipal bond finance

# Considerations for Transactions

# Considerations for Transactions: Feedstock Supply Considerations

- Securing feedstock supply
  - A key focus in any transaction is knowing and contracting for supply priority
    - Understanding sources of supply to ensure viable long-term
    - Designing agreements to contractually lock up supply where possible
  - Livestock RNG
    - Supply is less of an issue provided the farm is in normal operations
      - Sometimes a requirement on the farm to maintain a minimum herd size
  - Landfill RNG
    - Generally, the parties know the expected production from the landfill and design the contract terms accordingly
  - Renewable Diesel / Biodiesel
    - Supply constraints can develop
      - For example, reports that UCO availability was reduced during COVID
      - Absent new sources / land for biomass supply, also limited by availability of crop/biomass production
        - Expansion of production raises land use / allocation policy issues (i.e., shifting from agricultural/food production to biomass production for energy)
      - Feedstock supply is a key part of the transaction
        - Tolling agreements with feedstock producer (most common) or feedstock supply agreements with supplier
    - RFS/LCFS pathway approvals and/or CI score may depend on supply characteristics and analysis of these types of effects

# Considerations for Transactions: Acquisitions and Projects

- Acquisitions of Operational Assets
  - Valuation / Timing of Credits
    - We expect transactions will need to factor in timing and periods of RIN / LCFS credits and provide for a review period. Possibly similar to effective time economic concepts in upstream oil and gas transactions.
    - Earnouts may be appealing where there is uncertainty around value or pathway generating the credits over a compliance period
- Refinery Conversions / Brownfield Projects
  - Responsibility for Pre-Existing Environmental Conditions
    - Environmental review and early negotiation of responsibility for pre-closing environmental liabilities between buyer and seller
      - Seller may seek to shift environmental responsibility, even in an asset transaction designed to minimize buyer responsibility for prior operations
      - May inject uncertainty into costs and liability profile
- Acquisitions of Development Projects / Construction
  - Ensuring Completion
    - Seller / Developer may have the relationship with the EPC contractor necessary to complete the project
    - Consider arranging for seller's completion of the project through a transition services agreement
    - Consider holdbacks to fund construction cost overruns and/or performance issues if doesn't meet performance guarantees
      - May not be sufficiently protected by liquidated damages clauses and holdbacks may be hard to negotiate

# Considerations for Transactions: Compliance

- Solvency Bankruptcy Risk
  - Particularly for Livestock RNG, producers are often small businesses (as opposed to municipal landfills)
  - May need to consider how to continue the existing feedstock/supply agreements with creditors/new owners out of any bankruptcy
- RIN / LCFS Compliance Issues
  - CARB investigations into Dairyland Farm LLC (4/21/2021) livestock methane compliance offset credits
    - Transfer of credits is blocked pending investigation
    - If purchased credits are invalidated, they must be replaced by any purchaser that retired the credits with a valid credit within 6 months
      - Purchaser is harmed and would need to pursue available remedies against the seller of the invalidated credit
  - Due diligence of renewable fuel pathway approvals to minimize risk of RINs and LCFS credits being investigated or invalidated
  - Due diligence risk of not getting applicable permits for projects in development
    - Involve state law permitting experts
    - Ensure ability to audit the producers in order to minimize risk for CARB determining an invalid CI score

# Considerations for Transactions: Livestock RNG Financing / Marketing

- Livestock RNG Financing / Marketing Agreements
  - In many Livestock RNG transactions to date, a marketer does not have a firm obligation to take and market the gas and credits
    - A marketer seeks to sell the RNG to a vehicle fuel producer in CA and obtain RINS and LCFS credits for the seller (usually taking a netback payment), but generally will not take risk that there is not a buyer (it is essentially a merchant contract, with no guarantee as to quantity or term)
  - In contrast
    - Landfill RNG generally has a long-term fixed price agreement with an offtaker (who takes the RINS/LCFS credits, and any upside on those credits)
    - Renewable Diesel and Biodiesel are most commonly done as tolling agreements with the feedstock supplier, which reduces issues
  - *Takeaway*: Depending on financing needs, Livestock RNG may need to plan more for possible difficulty in financing due to uncertainty around the revenue streams

# Questions?

# THANK YOU

This content is intended for educational and informational purposes only and does not constitute legal advice or services. It does not constitute the provision of legal advice or services by any of the speakers or by Vinson & Elkins LLP.


**Austin**
T +1.512.542.8400

**Dallas**
T +1.214.220.7700

**Dubai**
T +971.4.330.1800

**Houston**
T +1.713.758.2222

**London**
T +44.20.7065.6000

**Los Angeles**
T +1.213.527.6400

**New York**
T +1.212.237.0000

**Richmond**
T +1.804.327.6300

**Riyadh**
T +966.11.250.0800

**San Francisco**
T +1.415.979.6900

**Tokyo**
T +81.3.3282.0450

**Washington**
T +1.202.639.6500