

camco

BUSINESS & ECONOMIC ASPECTS OF RNG

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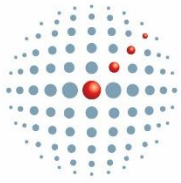
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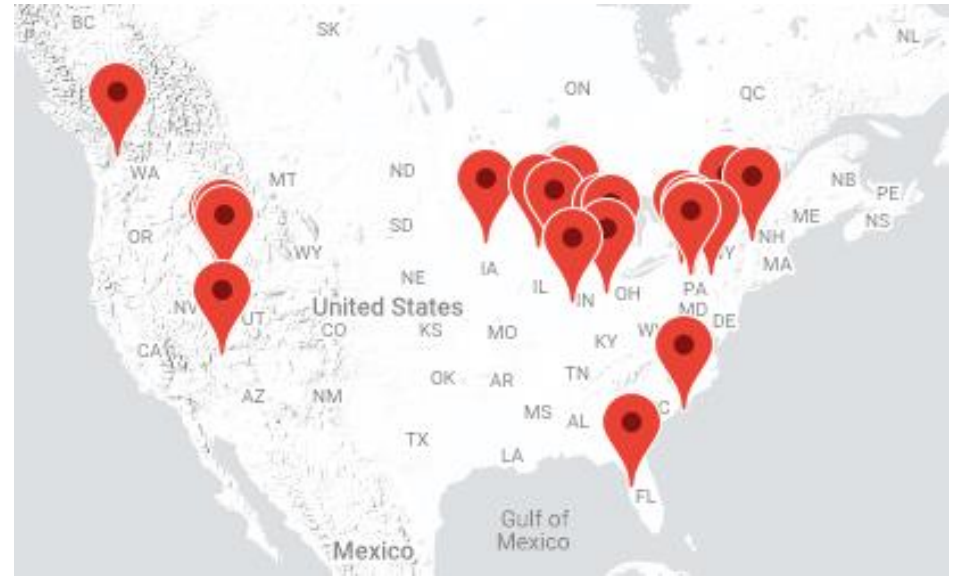
Corporate Office

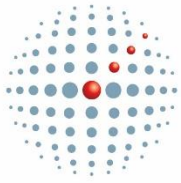
333 Perry Street, Suite 301
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Camco Overview

- Established 2007
 - 27 Managed Projects
 - 4+ Million Environmental Credits Issued
 - 1,500+ MMBTU/Day RNG Production
-
- Camco develops & operates projects producing renewable gas, electricity, and environmental credits from manure & organic wastes.
 - Our investor, Vitol supplies all the capital necessary to build the projects. Vitol is one of the world's largest crude oil and petroleum product trading firms.
 - Camco projects generate environmental credits eligible for use under State and Federal regulatory programs.

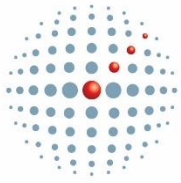




Introduction

- This information is meant to be illustrative rather than definitive.
- Project costs vary significantly depending on specifics and project boundaries.
- Relative costs shown here help explain RNG industry trends.
- Industry participants do things differently and often have different incentives that manifest in different deal structures

This presentation contains Camco International Group, Inc. ("Camco") information as well as information from third parties that has not been verified. It is being provided for informational and illustrative purposes. The figures and data in this presentation are estimates and approximations. This presentation should not be relied upon for any other purpose and Camco expressly disclaims fitness for any other purpose.



RNG Basic Information

Definitions

- **Biogas** – gas resulting from decomposition of organic matter under anaerobic conditions; principally CH₄ & CO₂
- **Biomethane** – the methane component of Biogas; produced by removing CO₂ & other fixed gases from Biogas
- **Renewable Natural Gas (RNG)** - Biogas that has been upgraded so that it is interchangeable with fossil natural gas

Sources of RNG

- **Solid Waste Landfill**
 - Large production volumes – many facilities
 - GCCS already exists – no anaerobic digester investment required
- **Manure & Food Waste**
 - Small production volumes – few facilities
 - Anaerobic digester investment is required
- **Wastewater**
 - Small production volumes – many facilities
 - Bioreactor may already exist – no anaerobic digester investment may be required

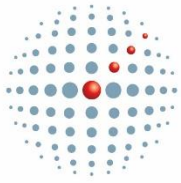
Pipeline Specifications – pipelines ensure interchangeability of RNG by requiring it meet the same specifications as natural gas. These include Wobbe #, hydrocarbon dewpoint, free from biological, dust, gum, and other contaminants; additional specifications often include limits for pesticides, siloxanes, specific hydrocarbons, and sulfur compounds.

Natural Gas

- BTU - Methane, Ethane, & trace NGL
- CH₄ content governed by Ethane/NG spread
- **Intermountain Gas Company Specification**
 - Specified in Interconnection Agreement
 - Min. HHV - 985 BTU/scf
 - Max. Inerts - 3%
- **Northwest Pipeline Tariff**
 - Min. HHV - 985 BTU/scf
 - Max. Inerts - 3%

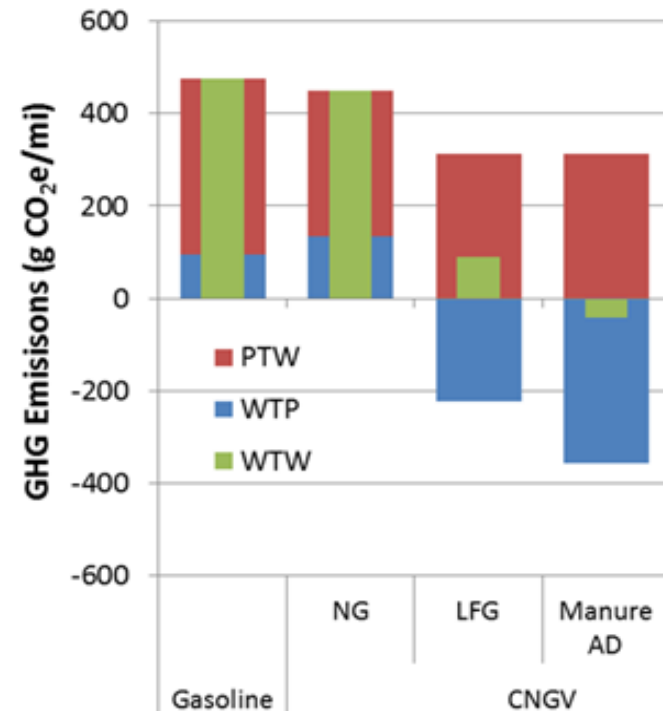
Renewable Natural Gas

- BTU - Methane
- CH₄ content governed by Min. HHV
- **Intermountain Gas Company Specification**
 - Specified in Interconnection Agreement
 - Min. HHV - 985 BTU/scf
 - Max. Inerts - 3%
- **Northwest Pipeline Tariff**
 - Min. HHV – 970 BTU/scf
 - Max. Inerts – 4%

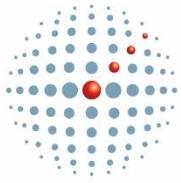


RNG Value Proposition

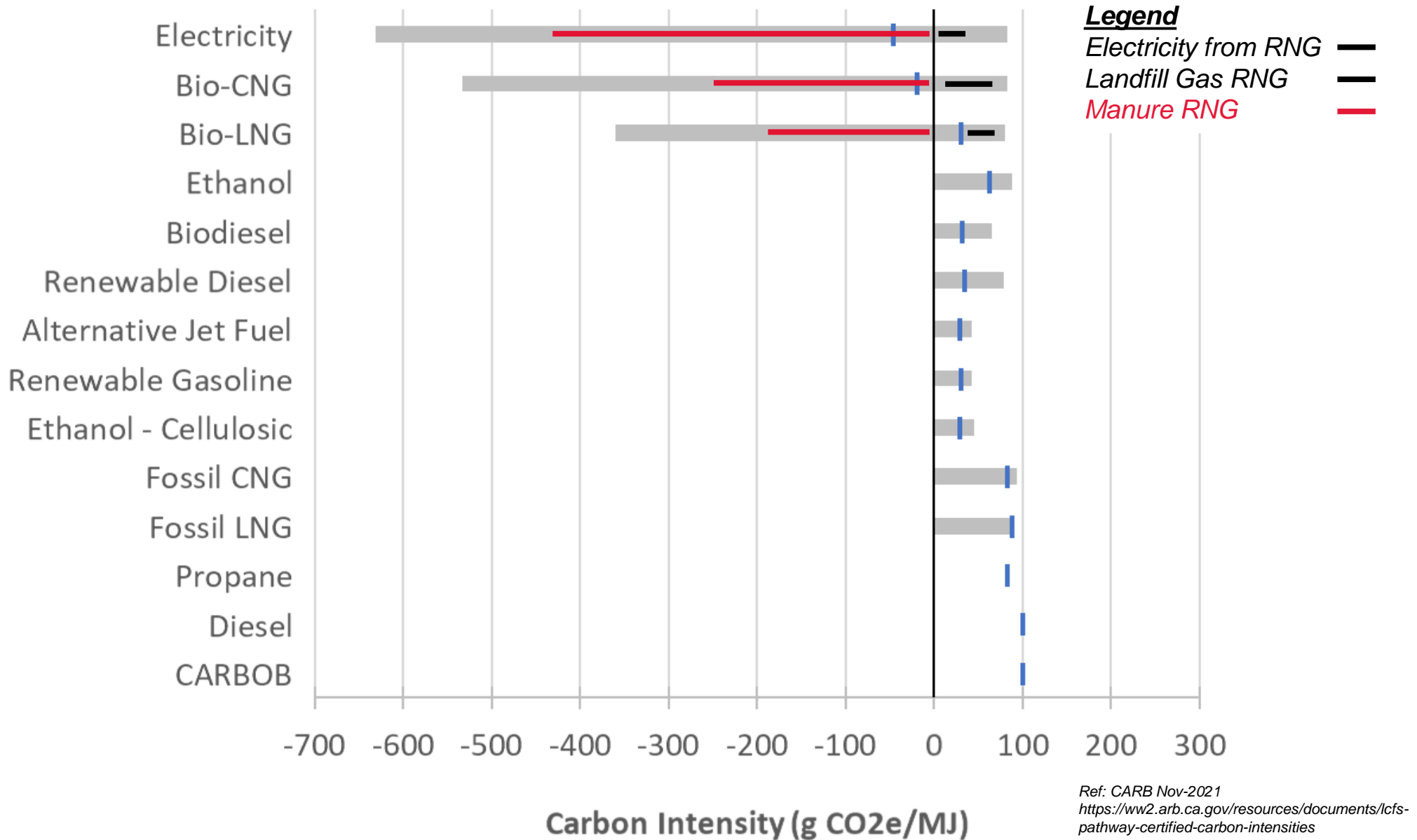
- The Federal RFS incentivizes the production and use of renewable fuels by creating annual mandates (RVOs) on fuel refiners for their use
- California, Oregon, British Columbia, & soon Washington value lower GHG emitting fuels by creating state fuel pool carbon intensity targets
- On a well-to-wheel (WTW) basis, a truck fueled with fossil natural gas (NG) produces only slightly less CO₂ equivalent (CO₂e) emissions per mile traveled than one fueled with gasoline
- If that same compressed natural gas vehicle (CNGV) were fueled with RNG produced from the anaerobic digestion of manure, there would also be a significant reduction in CO₂e emissions from currently uncaptured CH₄ emissions thereby resulting in negative CO₂e emissions.

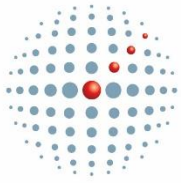


Ref: Argonne National Lab, GREET 2013, <http://GREET.es.anl.gov>



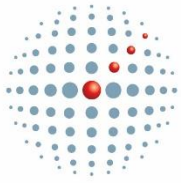
Carbon Intensity of Various Fuels





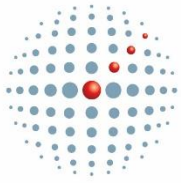
Example Idaho Dairy Anaerobic Digester



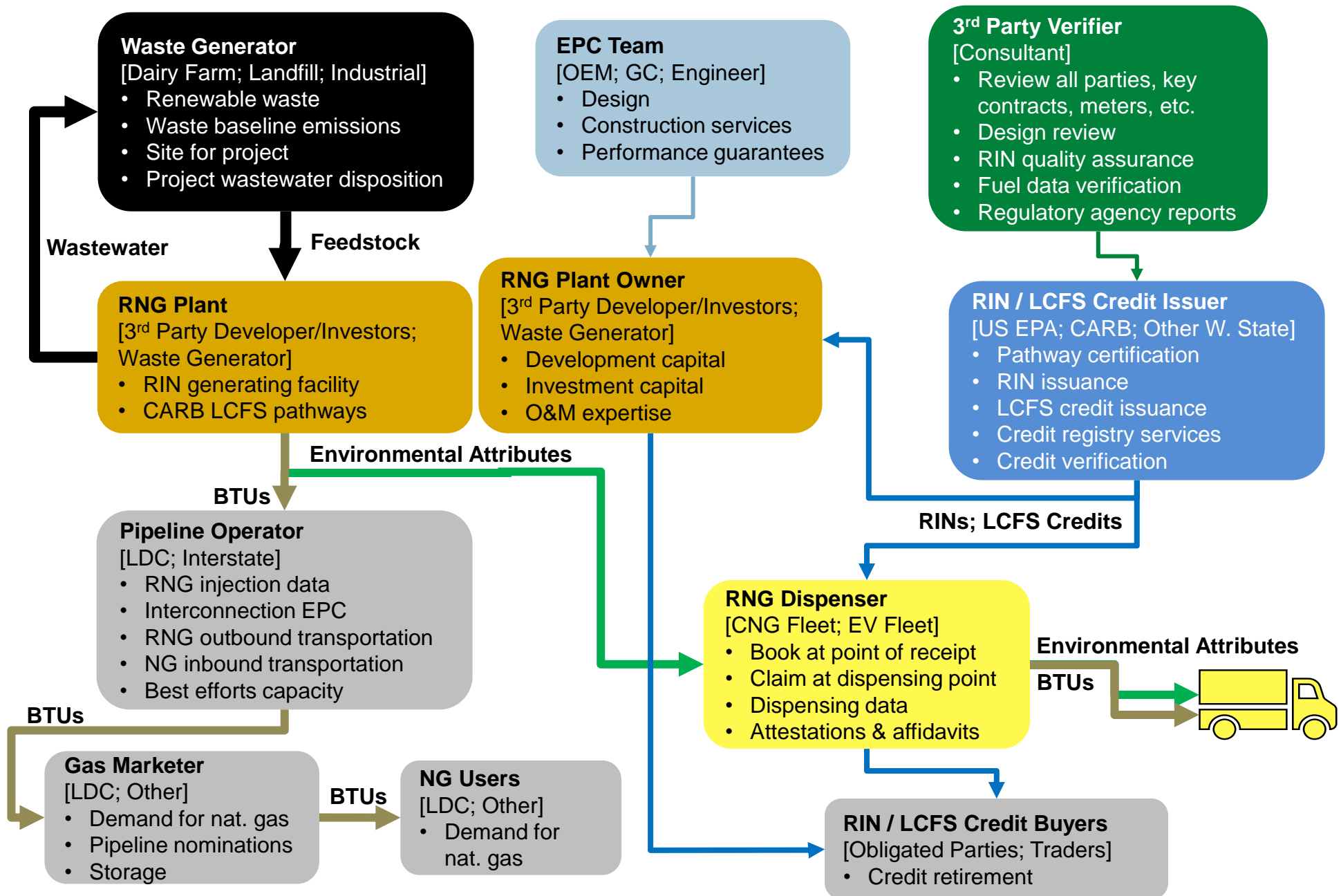


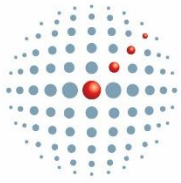
Typical Idaho Dairy RNG Plant





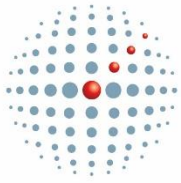
RNG Project Anatomy





Framework Agreements

1. Manure or other feedstock supply agreement
2. Site lease & mortgage holder SNDA
3. RNG sale agreement (Distributor) - NAESB Master & TC
4. Pipeline nomination/balancing agreement
5. Initial gas storage agreements
6. Pipeline interconnection agreements
7. Pipeline easement agreements
8. Gas transportation agreement
9. Pipeline access agreements
10. EPC contracts
11. RIN & LCFS Credit sale agreements – ISDA Master & TC; ICE
12. Verifier / Auditor agreements
13. Operation and maintenance agreements



Environmental Credit Legal Considerations

Credit Ownership and Visibility

- EPA and CARB will only issue credit into 1 registry account; account owner credit risk must be understood.
- Book and claim requirements dictate RNG sale and pipeline interconnection terms.
- ISDA Master Contract and Transaction Confirmation are used for OTC trades.

Regulatory Risk

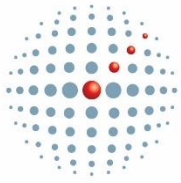
- Renewable Fuels Market subject to changing regulations. Material regulatory changes in the program may impact ability to generate and deliver credits:
 - Project owners forward contract for price certainty;
 - Buyers don't want credits if they have no value in the regulated market.

Invalidation Risk

- Significant amounts of data, some from external parties, must be collated to demonstrate provenance of environmental attributes.
- Revocation / claw-back risks are initially addressed during project development. Careful attention to operating data quality, with an eye towards annual verification is also important.

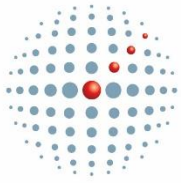
Market Risk

- Forward credit sales hedge price volatility for the RNG Producer but create delivery obligations.
- Lack of operating history scares hedge providers & they charge for taking on project delivery risk because they usually hedge a portion of the contract too.

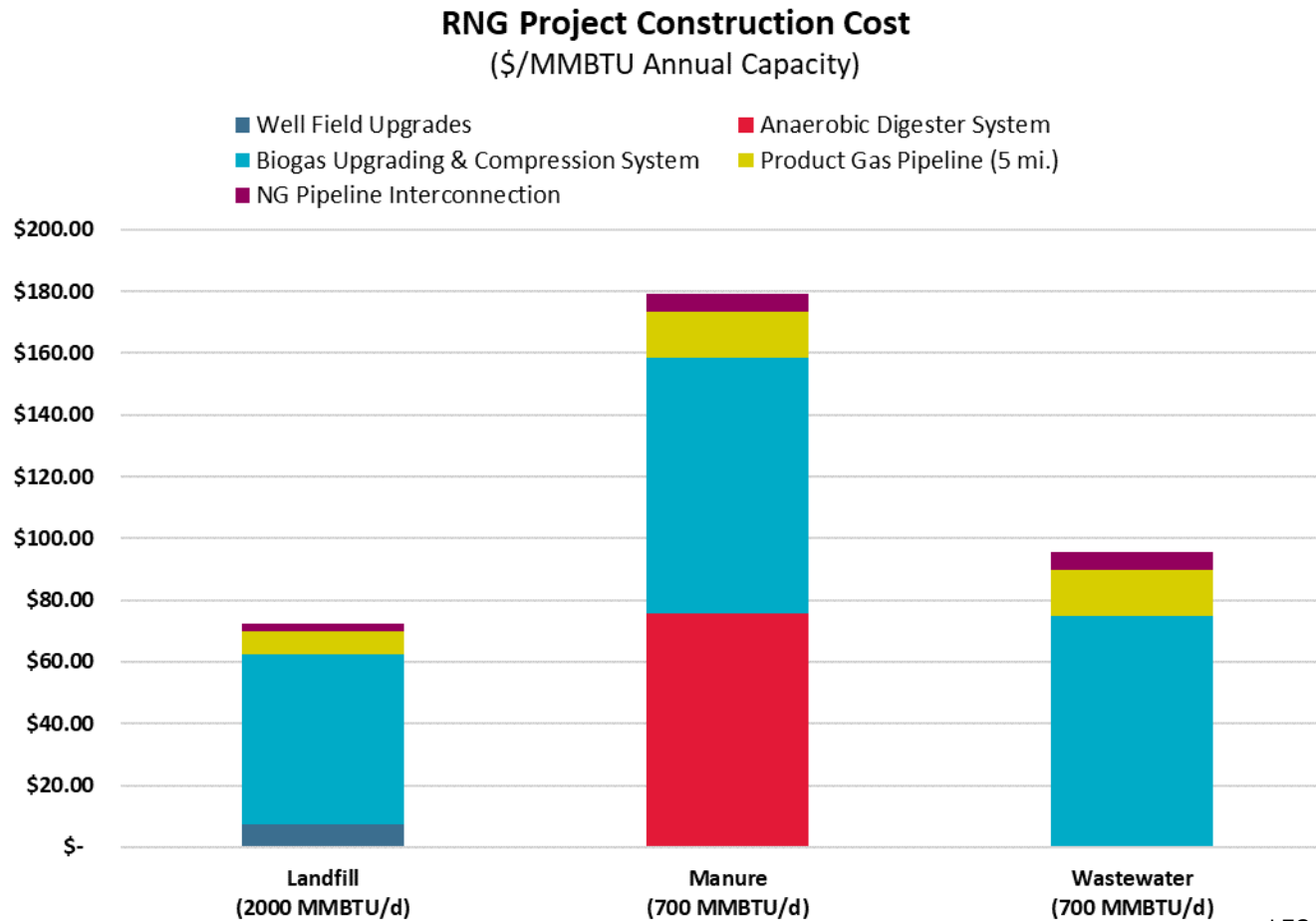


Typical Project Permits

- Air Permit – typically minor source
 - Flare for biogas and product gas
 - Boilers for heating digester
 - CO2 vent
 - Thermal oxidizer (if required)
- NPDES permit – typically unnecessary on CAFO
 - H2S scrubber effluent – sulfur wastewater disposal
 - H2S scrubber media - carbon+sulfur disposal
- Land use permit - county zoning permit usually includes sign off by local fire, weed control, canal district, highway district, & others
- Pipeline – can be unclear what agencies have jurisdiction (DOT, state, county, highway, BLM, ?)
- Building permits - county and maybe state

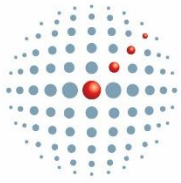


Indicative RNG Project EPC Cost



LFG Ref: USEPA LMOP Nov 2021
<https://www.epa.gov/lmop/landfill-gas-energy-project-development-handbook>

- LFG project EPC cost is lowest but CI is least favorable
- Wastewater project EPC cost is slightly better than Manure but CI is not as nearly as favorable
- Manure project EPC cost is highest but produces the lowest CI



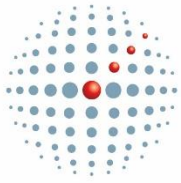
Indicative Project Economics

- LFG projects enjoy economies of scale & sunk cost for gas collection system required by regulation. However, no LCFS credits are available for LFG in California in the future; negative CI RNG has displaced most LFG.
- Manure projects low CI reduces the Distributor share and displaces LFG generating LCFS credits.
- Wastewater projects enjoy sunk cost for anaerobic digester in some cases, but only produce D5 RINs. Similar to LFG, there are no LCFS credits available due to poor CI.

Conclusions

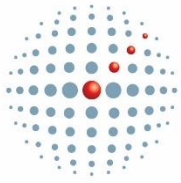
- RNG Project revenues primarily derived from environmental commodities not energy.
- Credit price volatility and regulatory risk demand short breakeven time.
- Economical credit hedges are difficult to find.

	<u>Landfill</u> <u>RNG</u>	<u>Manure</u> <u>RNG</u>	<u>Wastewater</u> <u>RNG</u>
<i>CI Score</i>	60	-150	30
Volumes (Annual)			
RNG (MM BTU/yr)	912,500	255,500	255,500
RINs (D3)	10,700,888	2,996,249	-
RINs (D5)	-	-	2,996,249
LCFS Credits	-	56,041	-
Prices			
RNG (BTU HHV)	\$ 3.00	\$ 3.00	\$ 3.00
RINs (D3)	\$ 2.00	\$ 2.00	\$ 2.00
RINs (D5)	\$ 1.00	\$ 1.00	\$ 1.00
LCFS Credits	\$ 140.00	\$ 140.00	\$ 140.00
Distributor Share			
RNG (BTU HHV)	0%	0%	0%
RINs (D3)	15%	15%	
RINs (D5)			30%
LCFS Credits		25%	
Revenue (Net of Dist)			
RNG (BTU HHV)	2,737,500	766,500	766,500
RINs (D3)	18,191,509	5,093,622	-
RINs (D5)	-	-	2,097,374
LCFS Credits	-	5,884,259	-
Total Revenue	\$ 20,929,009	\$ 11,744,381	\$ 2,863,874
Total Operating Expense	(6,843,750)	(3,832,500)	(1,916,250)
EBITDA	\$ 14,085,259	\$ 7,911,881	\$ 947,624
Project EPC Cost	\$ 59,000,000	\$ 46,000,000	\$ 24,000,000
Breakeven (Yrs)	4.2	5.8	25.3

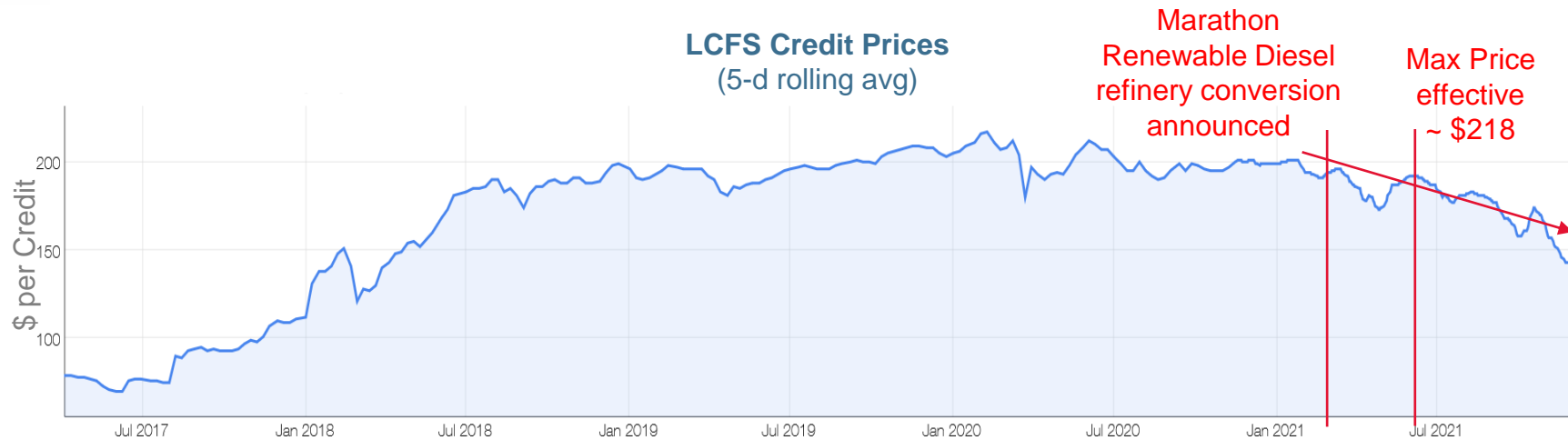


Characteristics of RNG Revenue Streams

- BTU – Index price fluctuates seasonally
 - Subject to pipeline demand & capacity restrictions
- RINs – Both D3 & D5 prices are volatile; fluctuating with US EPA's annual RVO and Federal policy changes
 - D3 for LFG but not WWT RNG
 - No EV RINs
 - No Investment Tax Credit for RNG
- LCFS – Prices are volatile
 - Supply/demand balance being affected by new RNG projects & Renewable Diesel projects coming on stream



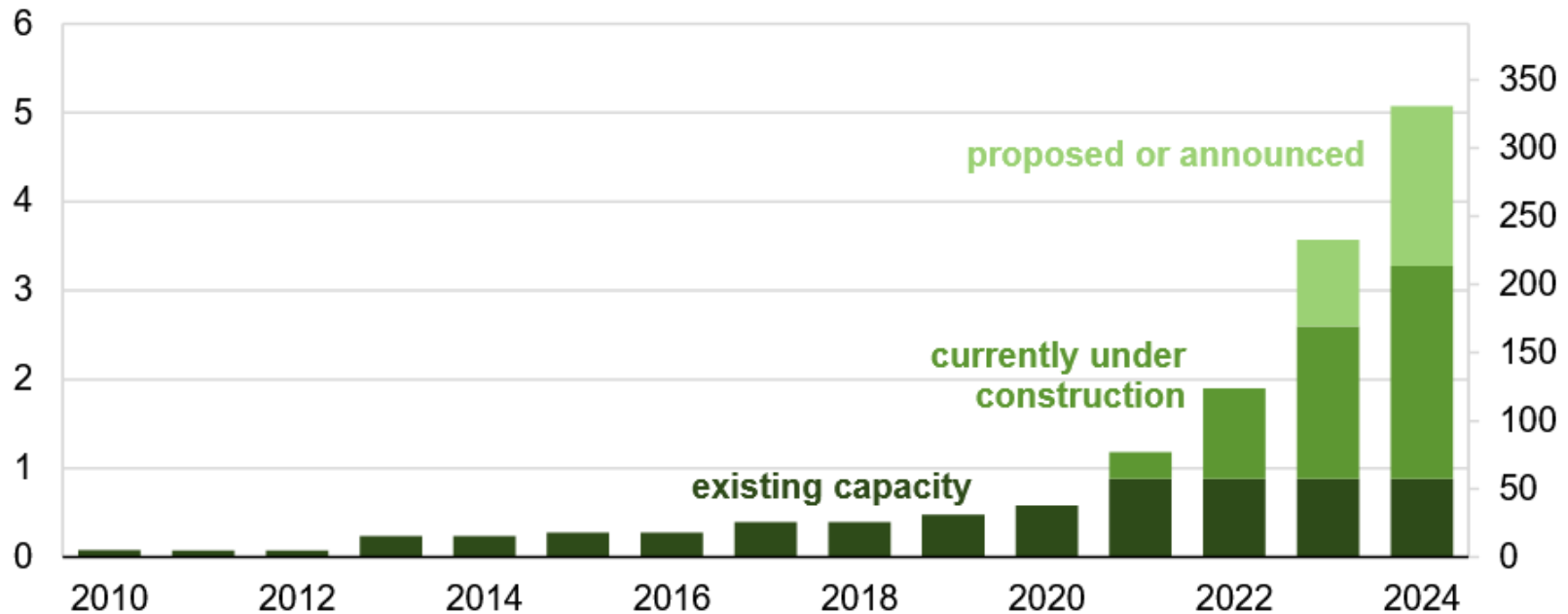
LCFS Credit Price History

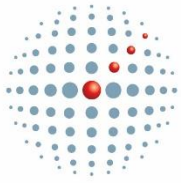


Existing and expected U.S. renewable diesel production capacity (2010–2024)

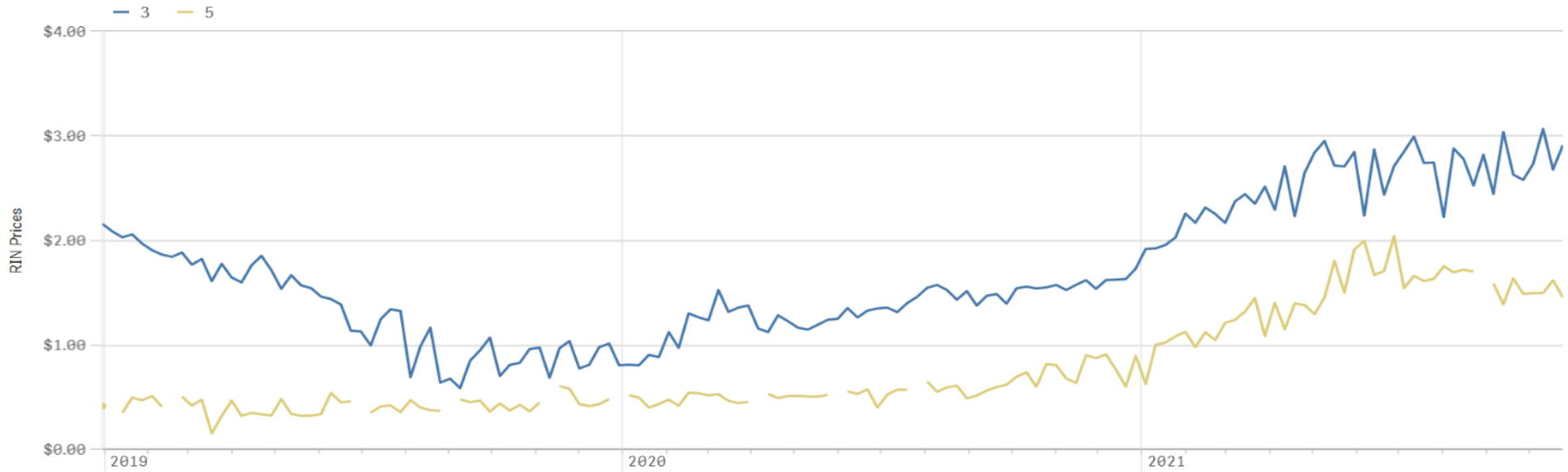
billion gallons per year

thousand barrels per day



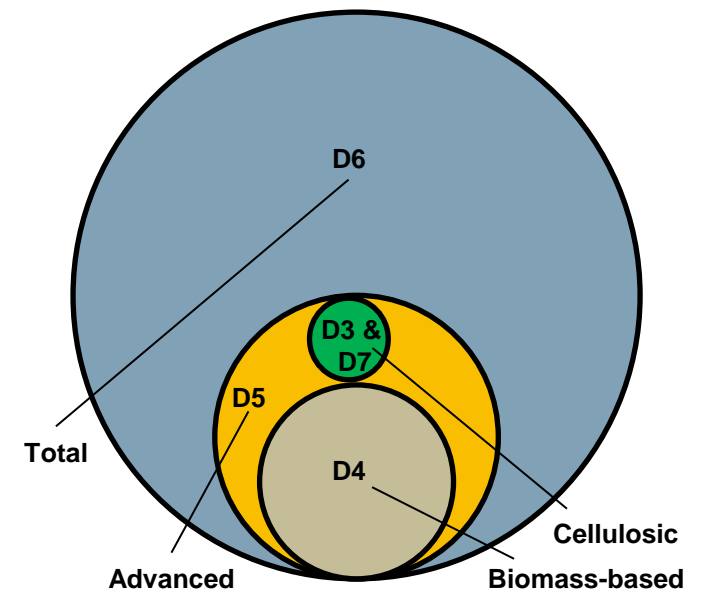


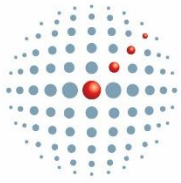
RIN Price History



RIN Nesting in RFS

- D3/D5 price differential generally reflects Cellulosic Waiver Credit established by EPA annually
- Agency delays in RVO and CWC announcement impact prices





Producing LCFS Credits

4-6 months

Accumulate 90 Days
Production Data

CI Application

6-9 months

CI Certification

First fuel sale

Reporting
Quarterly Fuel Transactions

Credit Issuance

Annual CI Data

Annual Verification of
Fuel Transactions & CI Data

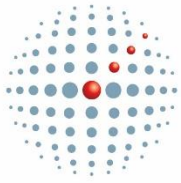
Key:

Applicant

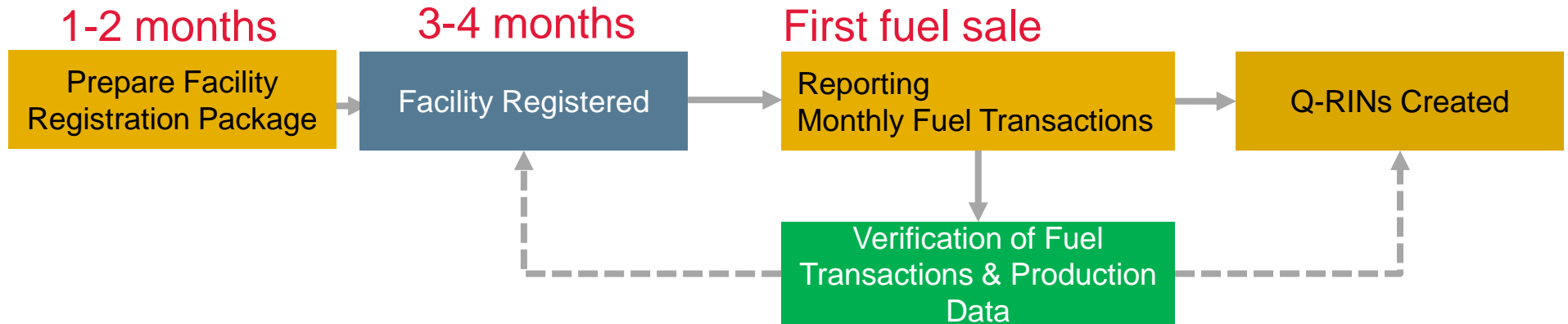
CARB Staff

CARB Staff (2019) or
Third-Party Verifier (2020)

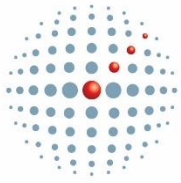
1. Carbon Intensity Pathway Application
2. CI Certified by CARB
3. Quarterly fuel sales reported to CARB
4. CARB issues LCFS credits 1st quarter after sales reported
5. Producer files attestation with CARB annually
6. CI verified annually by 3rd party for CARB review & possible CI adjustment
 - Annual verification risk is CI adjustment - Some credits issued under previous CI would become invalidated requiring producer to replace from current inventory



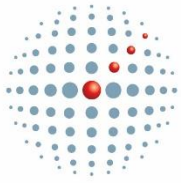
Producing RINs



1. Facility Pathway registration
2. EPA approval
3. Monthly (daily/quarterly) fuel sales reported to EPA & 3rd Party QAP provider
4. RINs issued monthly (usually)
5. End-user and producer file affidavits quarterly
6. 3rd Party files QAP reports with US EPA quarterly and annually

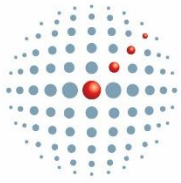


ADDITIONAL INFORMATION



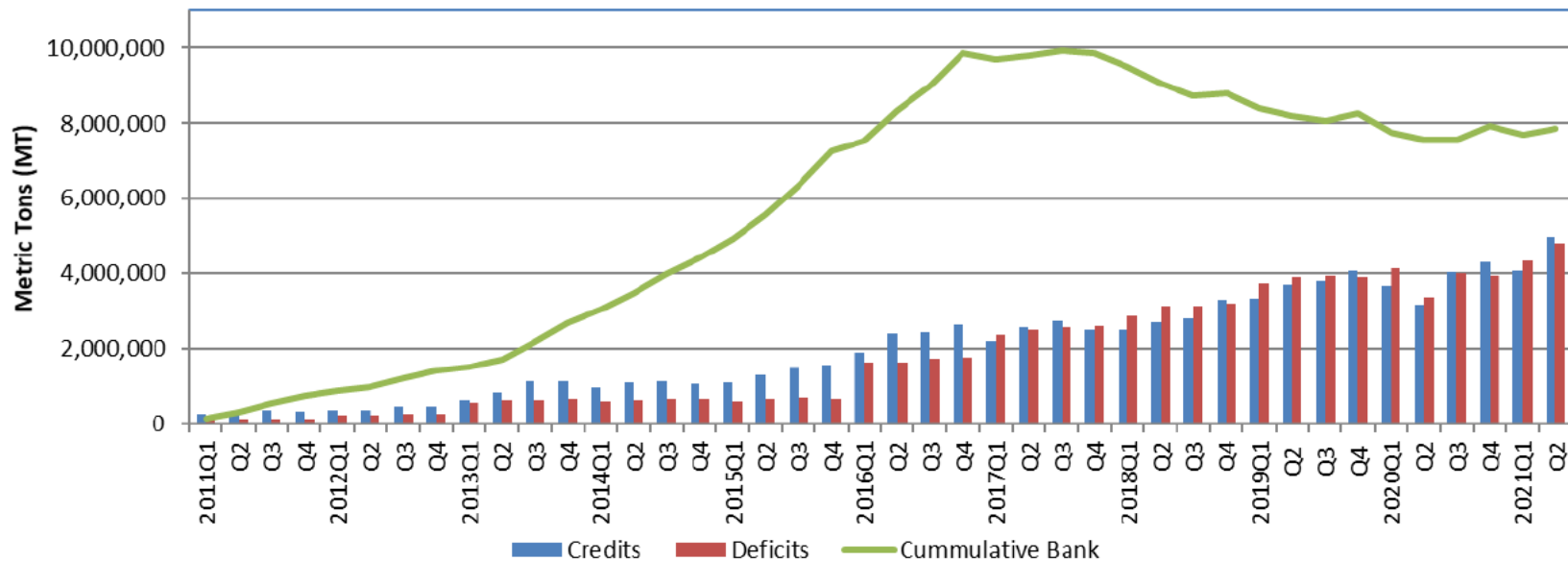
RINs

- Lifespan - 2 years; year of generation + next year
- Yield varies
 - Ethanol – 1.0 RINs per gallon
 - Biodiesel – 1.5 RINs per gallon
 - Renewable Diesel – 1.6 to 1.7 RINs per gallon
 - RNG – 11.727 RINs / MMBtu (HHV)
 - Electricity – 1 RIN / 22.6 kWh
- Q-RINs - Renewable fuel producers can participate in the Quality Assurance Plan program – independent, on-going audit of fuel, RINs
- Obligated Parties
 - Companies who produce or import petroleum gasoline or diesel fuel in a given calendar year
 - Do not have to blend physical renewable fuel
 - Must satisfy their renewable volume obligations (RVO) using RINs and/or cellulosic waiver credits
 - Can use prior-year RINs for up to 20% of the applicable RVO
 - Acquire RINs through the purchase of physical fuel with RINs or through RIN-only transactions

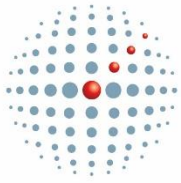


LCFS Credit Market

Fig 1. Total Credits and Deficits (MT)
for All Fuels Reported Q1 2011 - Q2 2021



- Average quarterly credit demand 4-5 MM credits
- Credit Bank ~ 2 quarters of demand 8 MM credits



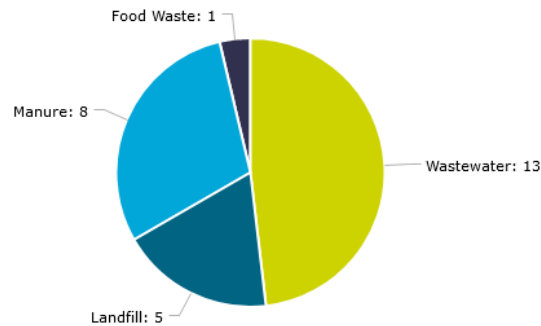
Northwest Biogas Production

IDAHO

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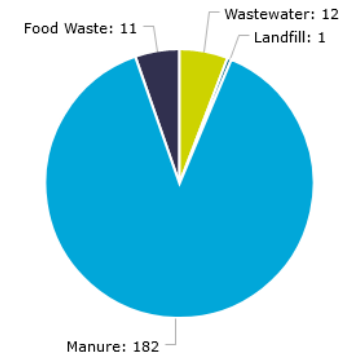
Idaho ranks **20th** out of 50 states for its biogas production potential. We estimate up to 23.4 billion cubic feet of renewable methane from biogas could be produced each year for energy, fuel, heat, and more!

Current Systems



Total Number: 27

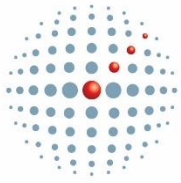
Potential Systems



Total Number: 206

THE POWER OF 36.56 BILLION CUFT OF BIOGAS:

Ref: NREL Dec-2021
<https://www.nrel.gov/gis/biomass.html>



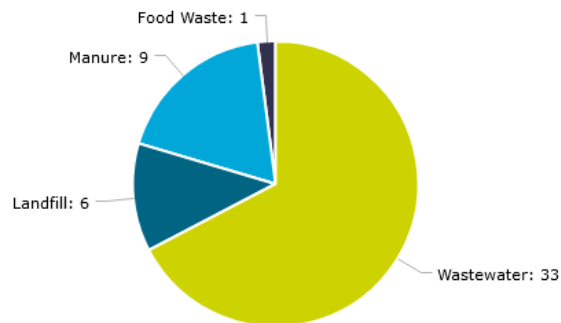
Northwest Biogas Production

WASHINGTON

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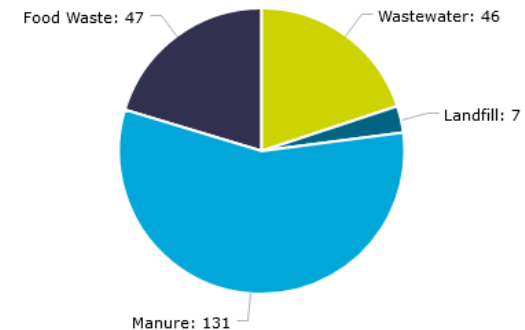
Washington ranks **22nd** out of 50 states for its biogas production potential. We estimate up to 18.54 billion cubic feet of renewable methane from biogas could be produced each year for energy, fuel, heat, and more!

Current Systems



Total Number: 49

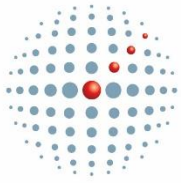
Potential Systems



Total Number: 231

THE POWER OF 28.96 BILLION CUFT OF BIOGAS:

Ref: NREL Dec-2021
<https://www.nrel.gov/gis/biomass.html>



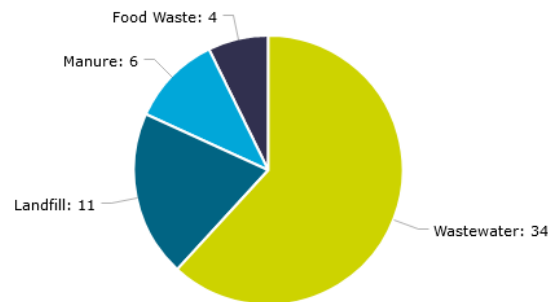
Northwest Biogas Production

OREGON

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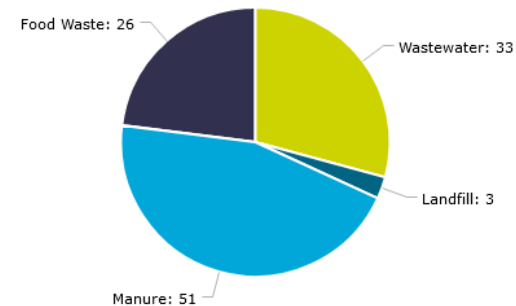
Oregon ranks **33rd** out of 50 states for its biogas production potential. We estimate up to 10.23 billion cubic feet of renewable methane from biogas could be produced each year for energy, fuel, heat, and more!

Current Systems



Total Number: 55

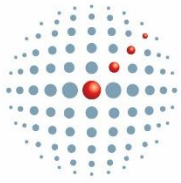
Potential Systems



Total Number: 113

THE POWER OF 15.99 BILLION CUFT OF BIOGAS:

Ref: NREL Dec-2021
<https://www.nrel.gov/gis/biomass.html>



Camco – What We Do

Operations Management & Credit Monetization

- Camco manages facility operations & monetizes the RNG, renewable electricity, & environmental credits
 - California Low Carbon Fuel Standard Credits (LCFS)
 - D3 & D5 RINs under the Federal RFS Program
 - Renewable Energy Certificates (RECs)
 - California Carbon Offsets (CCOs)
- Our broad experience mitigates development risks and ensures projects come to fruition. We understand the regulatory frameworks and technologies.
- We've spent years developing the cornerstone commercial agreements, building facilities, managing operations, registering projects, and selling environmental commodities.

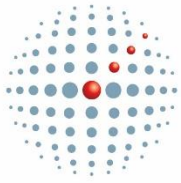
Renewable Fuel Credits

- Camco understands the renewable fuel programs & has the project experience to register & comply with both the Federal RFS & CARB LCFS rules.
- We manage the initial pathway approval, facility registration, annual verification, the credit generation process, & reporting once facilities are operational.
- Camco has commercial relationships with fuel end-users & credits buyers looking to comply with state or federal requirements.

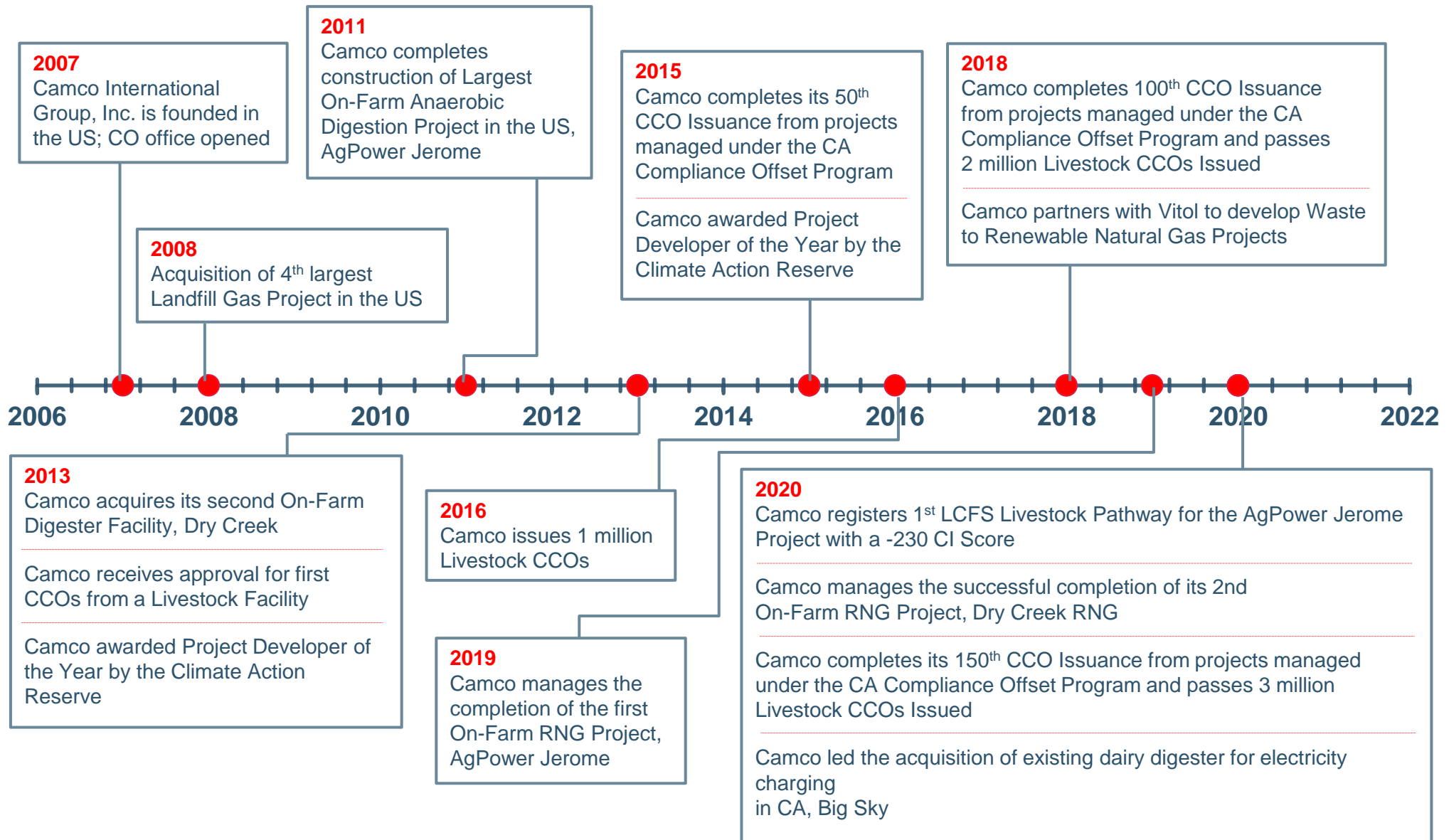
Carbon Offsets

- Camco's environmental commodities team manages project registration, annual verification, carbon offset credit issuance, & sale of the credits.





Camco - Timeline



STATE REGULATORY ASPECTS OF RENEWABLE NATURAL GAS

Peter Richardson

Richardson Adams, PLLC

Presentation for the Environmental and Natural Resources Section of the Idaho State
Bar

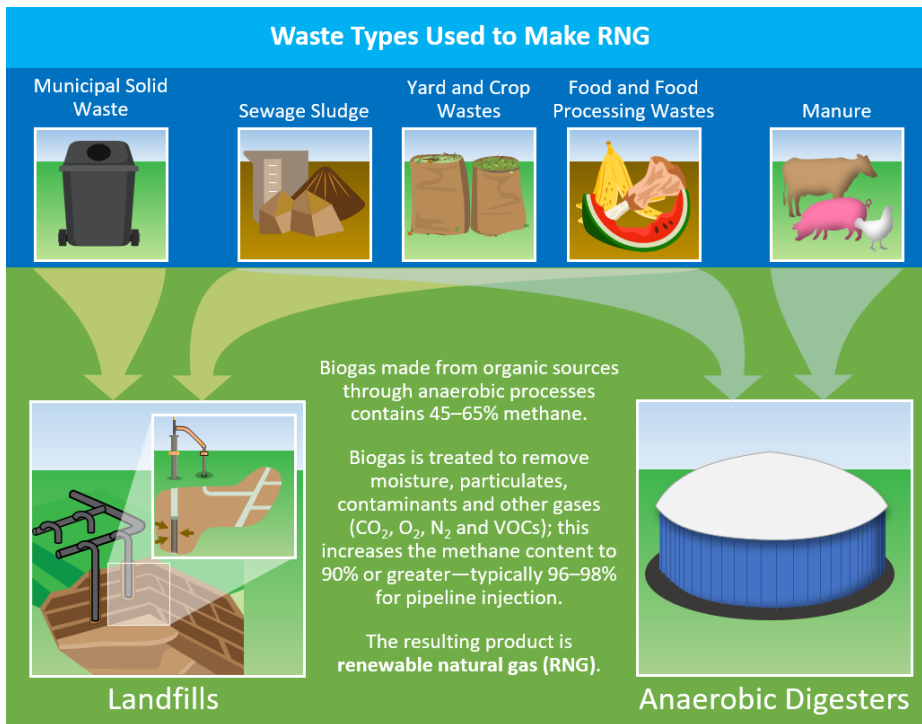
December 8, 2021 (via Zoom)

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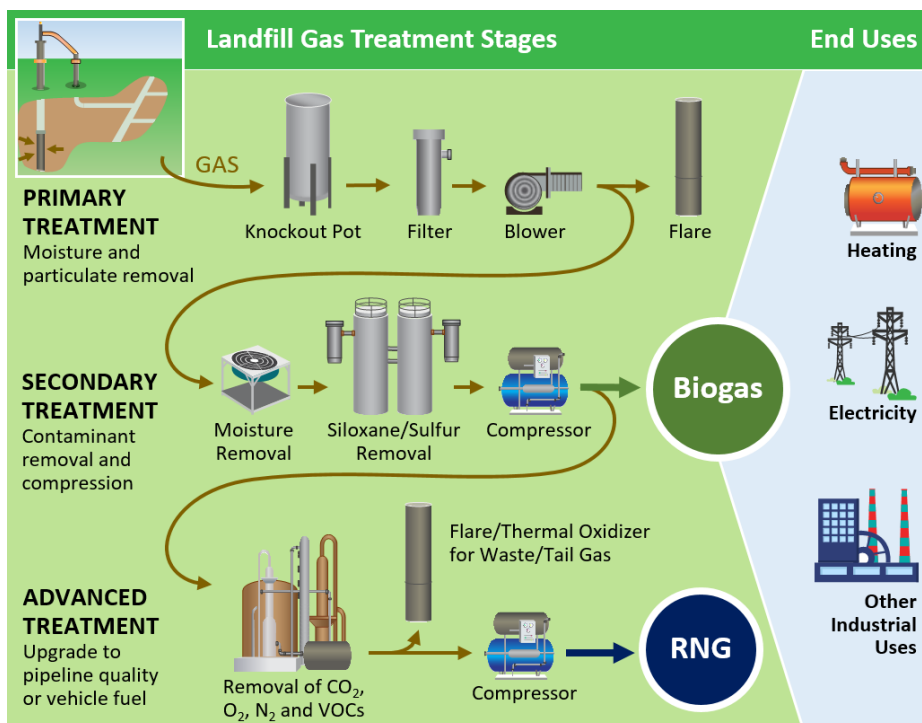
What is Renewable Natural Gas (RNG)?

- For a resource that has been historically fossil fuel based and extracted through invasive processes, the concept of “renewable” natural gas may appear oxymoronic on its face. However, natural gas is already emitted through various industrial/agricultural processes such as wastewater treatment, dairy processing, landfills, etc. The methane produced from sources like these has traditionally been released into the atmosphere or flared. However, methane, as a by-product can be harnessed, added into the existing natural gas system to replace fossil gas.

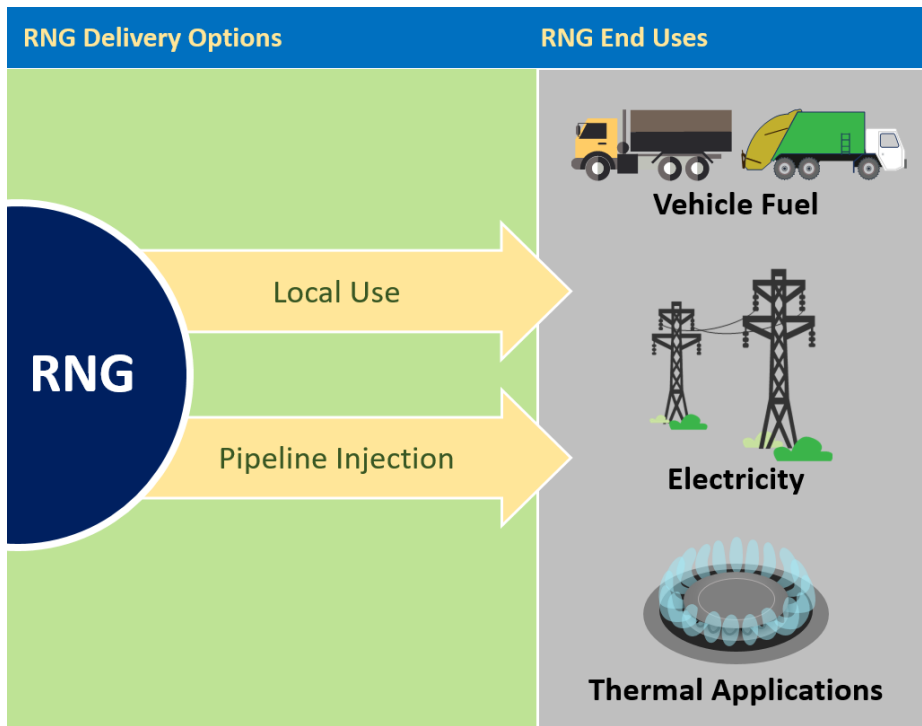
2



3



4



5

EPA List of Idaho Dairy to Methane Projects

AgPower Jerome LLC - Double A Dairy Digester	Jerome	ID	Mixed Plug Flow	Pipeline Gas	2011	Dairy	No	Animals: 15,000 dairy; Yes
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EPA List of Idaho Landfill to Gas Projects

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7

RNG Applications

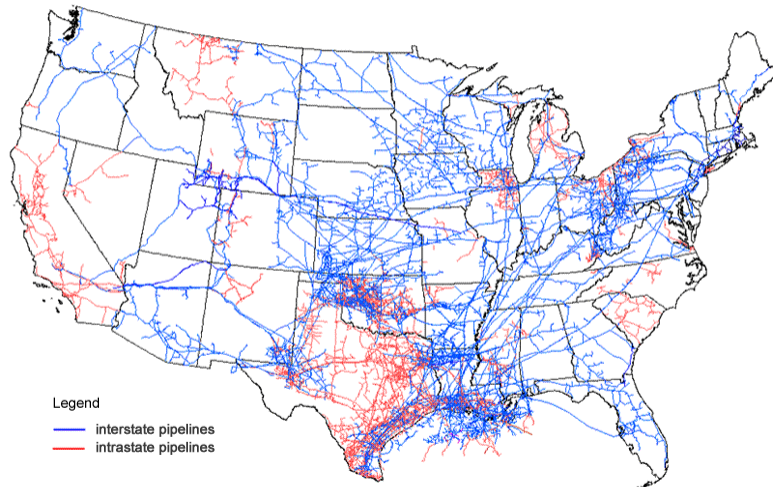
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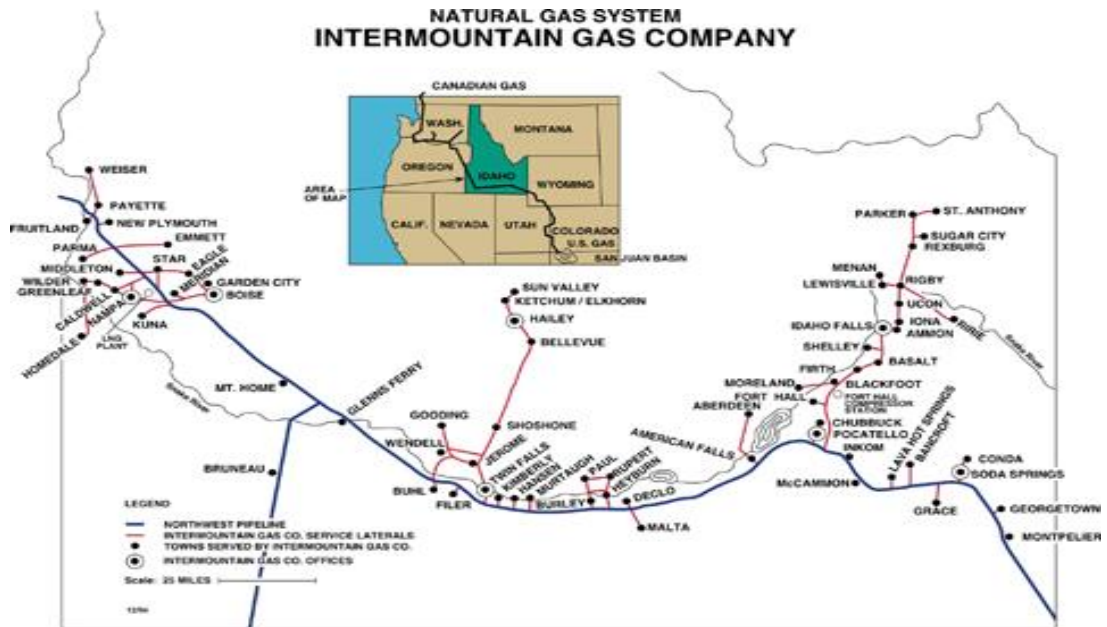
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8

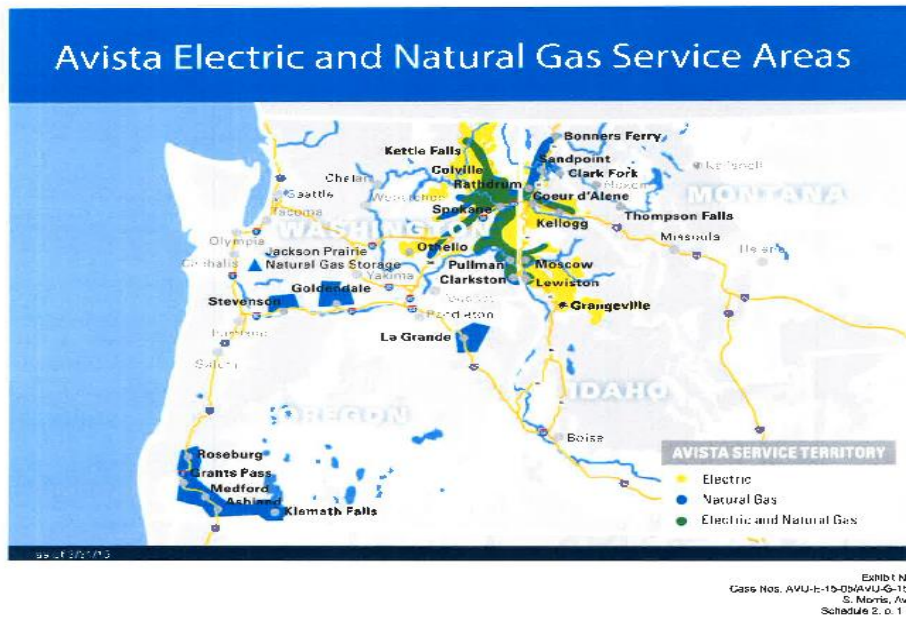
Map of U.S. interstate and intrastate natural gas pipelines

Source: U.S. Energy Information Administration, *About U.S. Natural Gas Pipelines*

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Renewable Fuel Standard

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STATE REGULATORY ASPECTS OF RENEWABLE NATURAL GAS

Peter Richardson

Richardson Adams, PLLC

Presentation for the Environmental and Natural Resources Section of the Idaho State
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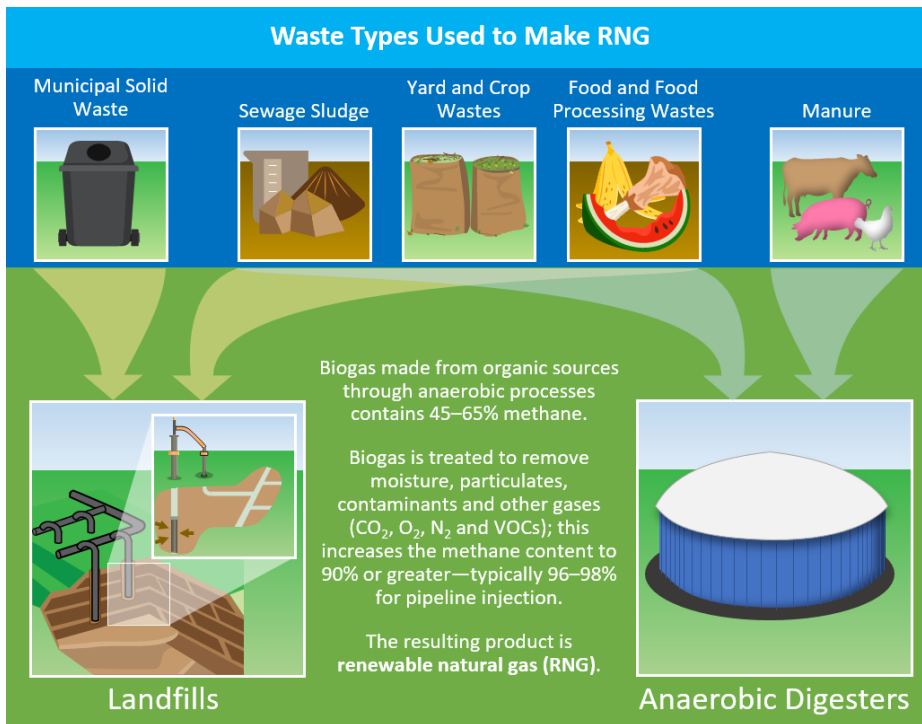
December 8, 2021 (via Zoom)

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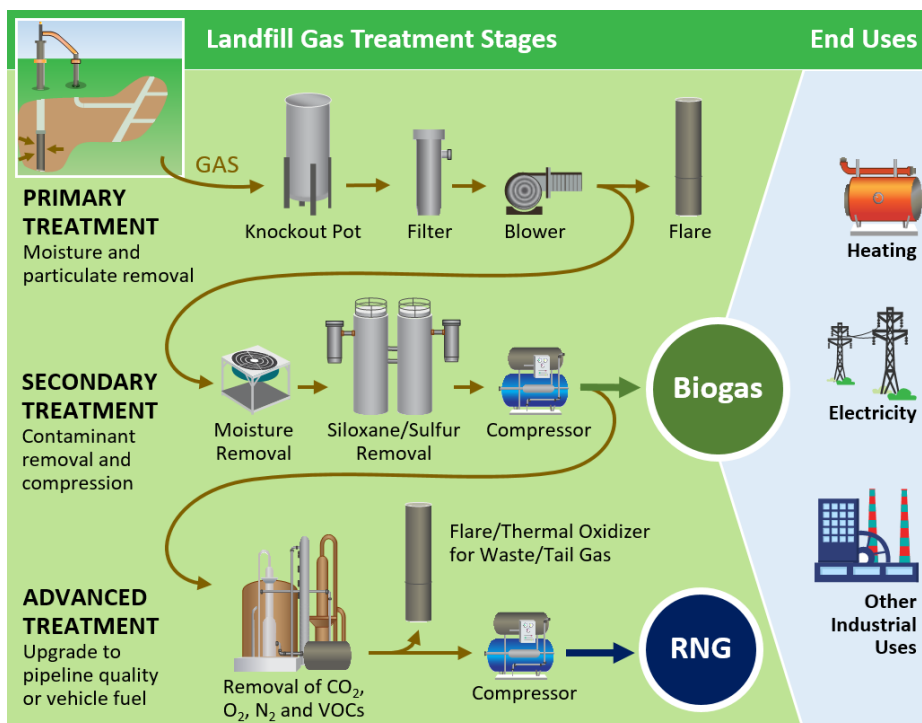
What is Renewable Natural Gas (RNG)?

- For a resource that has been historically fossil fuel based and extracted through invasive processes, the concept of “renewable” natural gas may appear oxymoronic on its face. However, natural gas is already emitted through various industrial/agricultural processes such as wastewater treatment, dairy processing, landfills, etc. The methane produced from sources like these has traditionally been released into the atmosphere or flared. However, methane, as a by-product can be harnessed, added into the existing natural gas system to replace fossil gas.

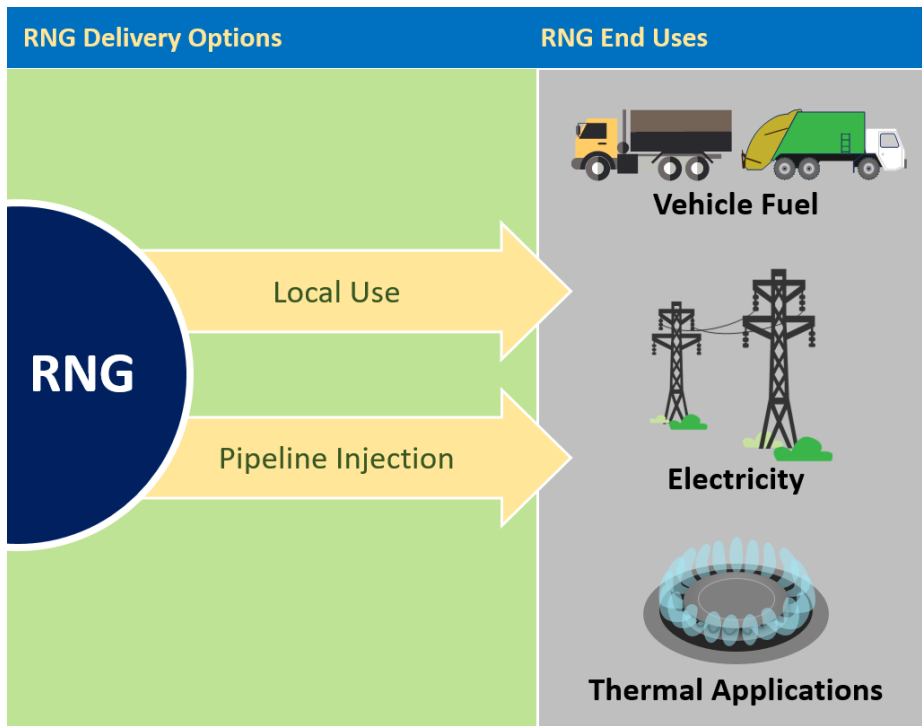
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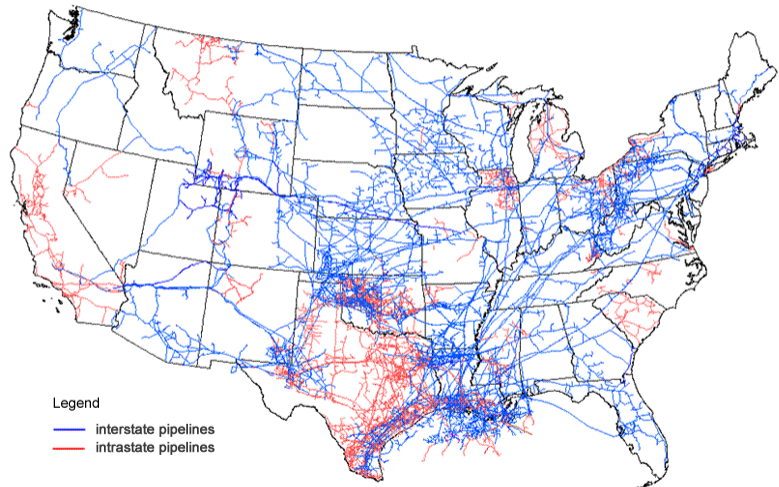
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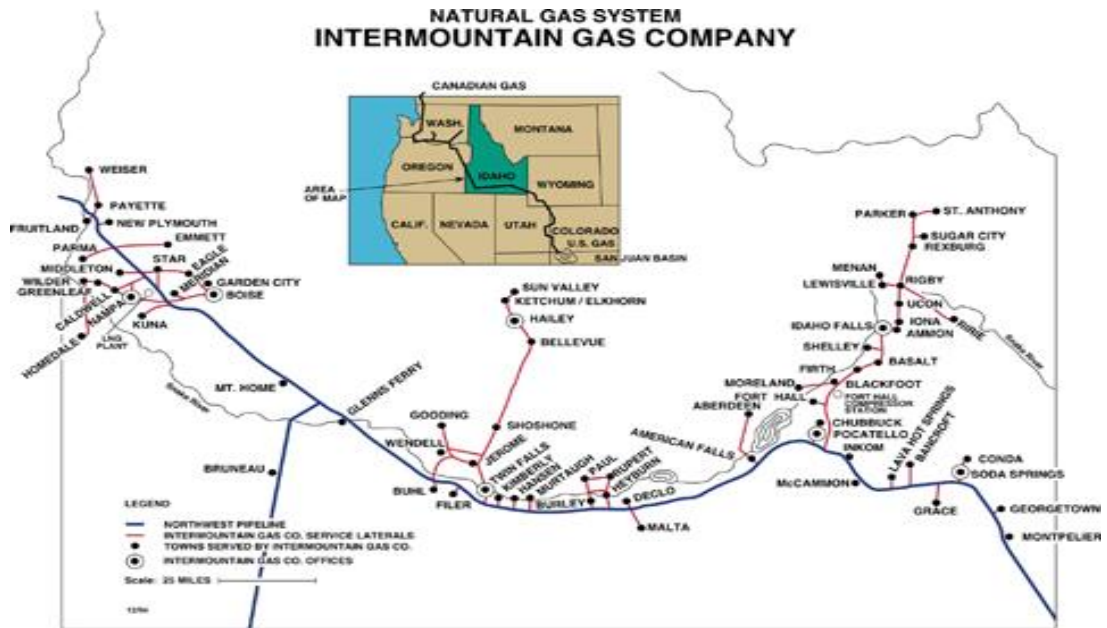
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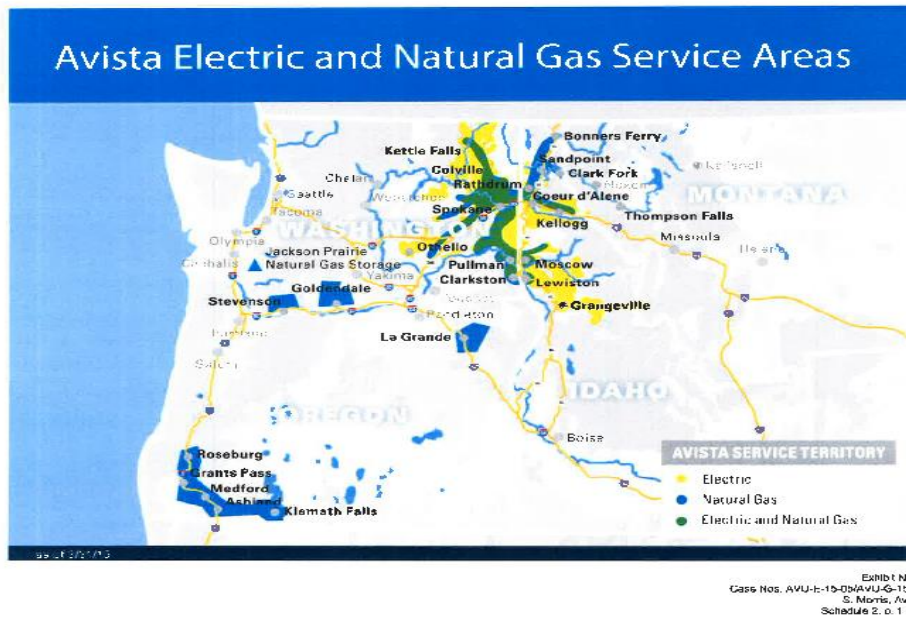


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