RNG WORKS

THE COALITION FOR RENEWABLE NATURAL GAS

Renewable Thermal Certificates (RTC) & Renewable Thermal Markets – A Primer

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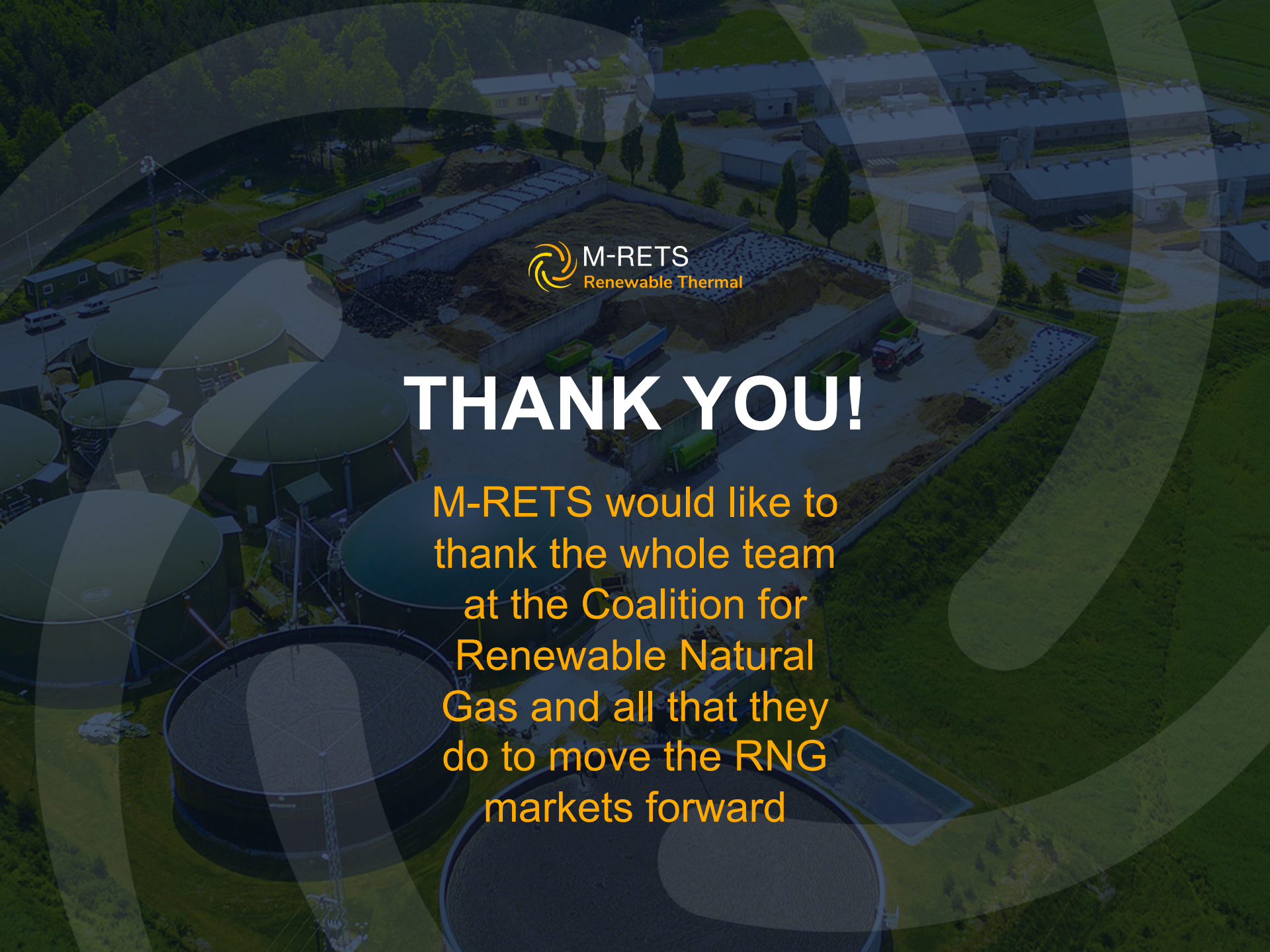
October 2020
Coalition for Renewable Natural Gas
RNG Works Online Conference
Presentation
For Public Distribution



THANK YOU!

M-RETS would like to thank the whole team at the Coalition for Renewable Natural Gas and all that they do to move the RNG markets forward

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Renewable Electricity

www.mrets.org

M-RETS creates and tracks Renewable Thermal Certificates (RTCs) and Renewable Electricity Certificates (RECs) across North America.

M-RETS RECs are able to contain hourly data information and peak/off-peak and RTC's may include verified carbon intensity data.

M-RETS supports RTC and REC compliance and voluntary markets in one easy to use platform that utilizes the latest software.

Agenda

- Background
- Definitions
- Existing Markets
- Why a thermal certificate market/tracking system?
- System screenshots/Demo
- Why M-RETS?

Background

- **Mission**: M-RETS validates the environmental attributes of energy to serve as a trusted centralized gateway to environmental markets.
- Independent 501(c)(4) nonprofit with a stakeholder board.
- M-RETS tracks across North America.
- M-RETS offers a best in class product at the lowest possible cost. Providing value today while accommodating our stakeholders' future needs.
- M-RETS offers a team of full-time dedicated development and support staff. We translate users needs into functional software.

What Does Renewable Thermal Mean?

- **Biogas -** means a mixture of CO_2 and hydrocarbons, primarily methane gas, from the biological decomposition of organics.
- **Renewable Natural Gas -** Biogas upgraded to meet pipeline quality standards so it may blend with, or substitute for, geologic natural gas.
- **Blue Hydrogen -** H produced from natural gas—usually via steam reforming with CCS.
- **Green Hydrogen -** H produced using renewable electricity—often curtailed—to produce hydrogen via electrolysis.
- **Other –** heat pumps, waste heat recovery, solar thermal, renewable liquid fuels, etc.

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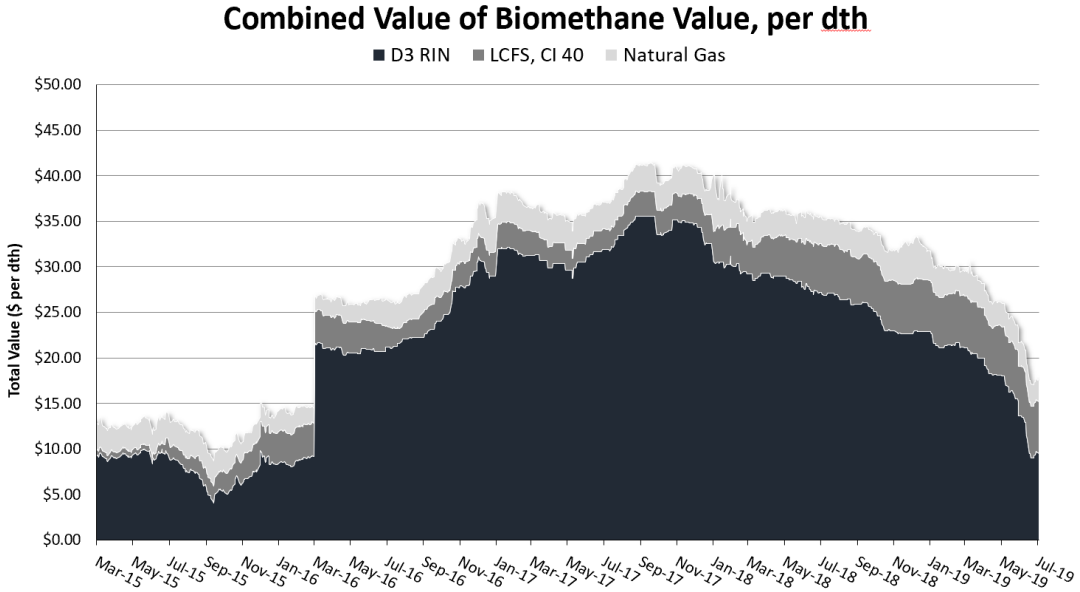
Existing Markets

Existing Markets

- European RNG certificates are sold at much lower values (mid single digit €/£) due to supply side incentives (Feed-in-Tariffs).
- Current high CA Low Carbon Fuel Standard & U.S. EPA Renewable Fuel Standard prices increase price pressure
- Thermal credits tracked in Mass Alternative Portfolio Standard and RNG used to produce RECs



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Transportation Market Value ($/MMBTU)

	Landfill (45 CI, D3)	WWTP (30 CI, D3)	Food waste (0 CI, D5)	Dairy (-250 CI, D3)
Incremental LCFS Value ($/MMBTU)	$7	$9	$15	$60
RIN Value ($/MMBTU)	$18	$18	$9	$18
Combined ($/MMBTU)	**$25**	**$27**	**$24**	**$78**
Producer 75% ($/MMBTU)	$19	$20	$18	$60
$/mtCO2e	$350	$375	$350	$1,100

Based on September 2020 pricing:

- LCFS: $200
- D3 RIN: $1.55
- D5 RIN: $0.74

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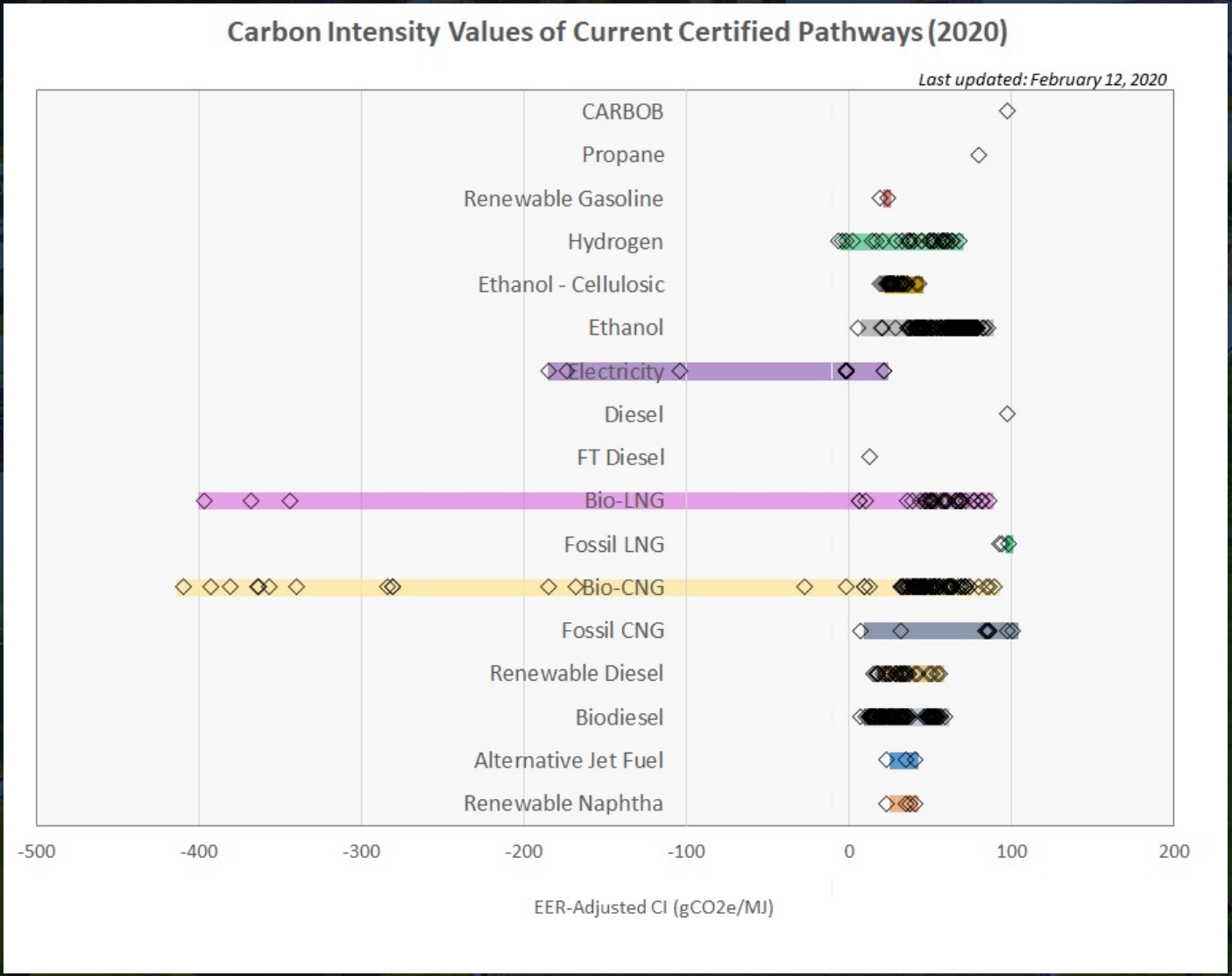
Source: 3Degrees email pweisberg@3degrees.com for more information

Low Carbon Fuel Standard CI



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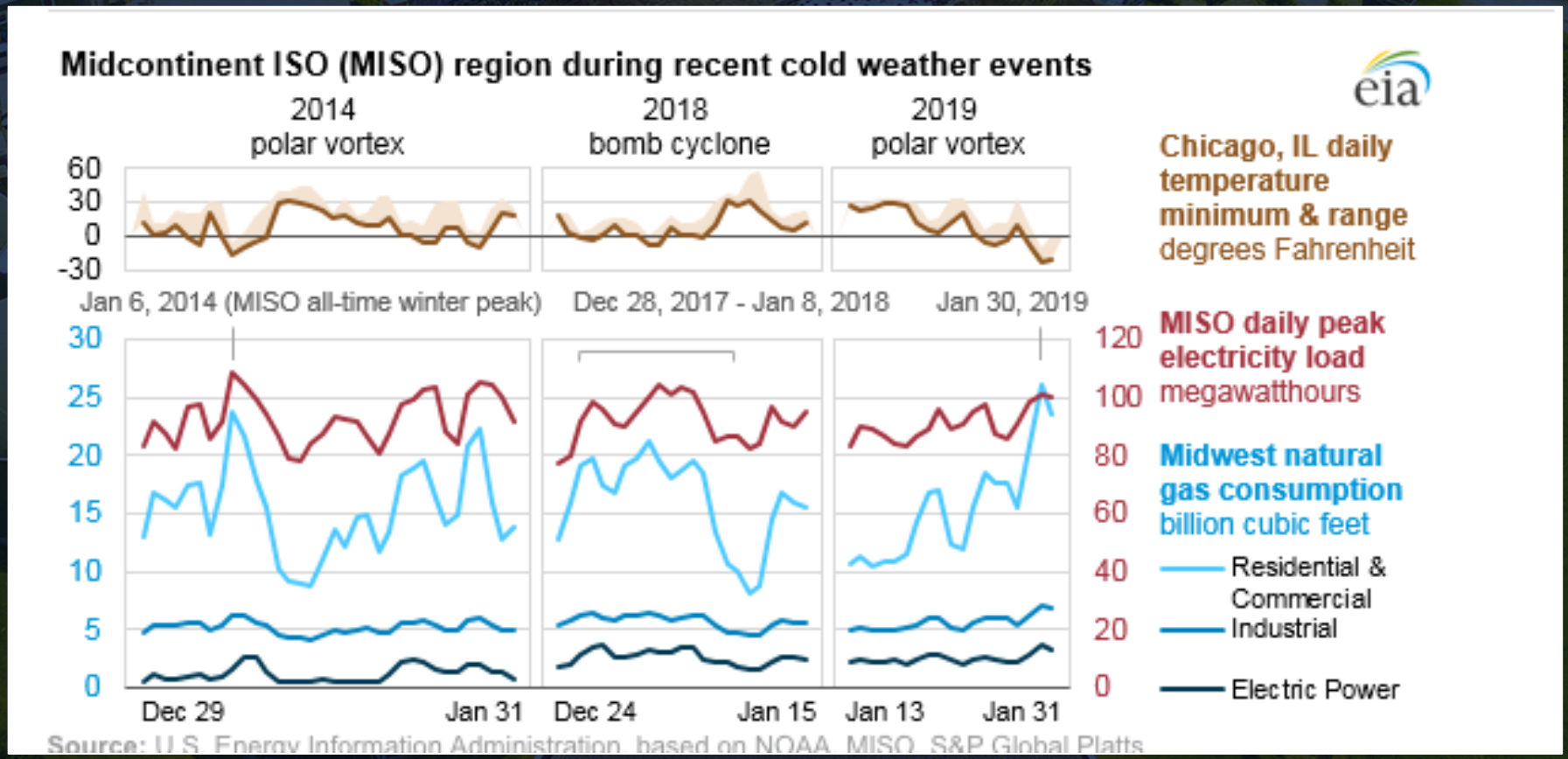
Polar Vortex & Gas Demand – Gas Plays a Critical Role in Many Parts of the United States

CenterPoint Energy estimated that their natural gas demand for MN customers was more than 20 GW during the polar vortex. MN has less than 5 GW installed renewable electricity capacity with a net summer electricity capacity of 16.9 GW.



https://www.eia.gov/electricity/state/Minnesota/

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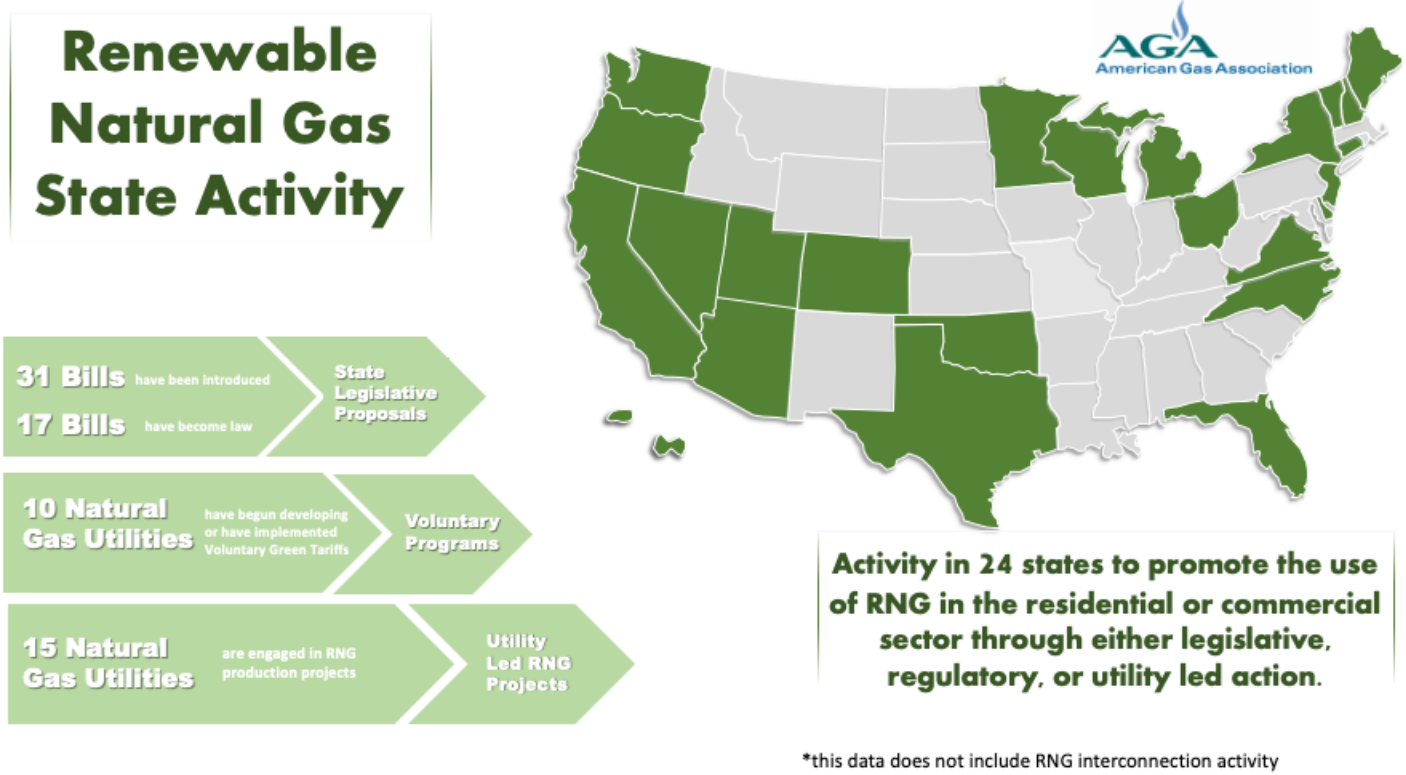
State/Utility/Voluntary Work



- Oregon - SB 98
- Nevada – SB 154
- Minnesota – Regulatory
- Colorado – VW Settlement Funds
- Northeast – Summit, Vermont
- Hawaii — Hawaii Gas
- Canada – Enbridge, Fortis, Canada Federal Carbon Plan, Clean BC 15% target
- Green-e Renewable Thermal Certification
- Renewable Thermal Collaborative – Buyers Statement

***Underlined text are links, graphic from American Gas Association**

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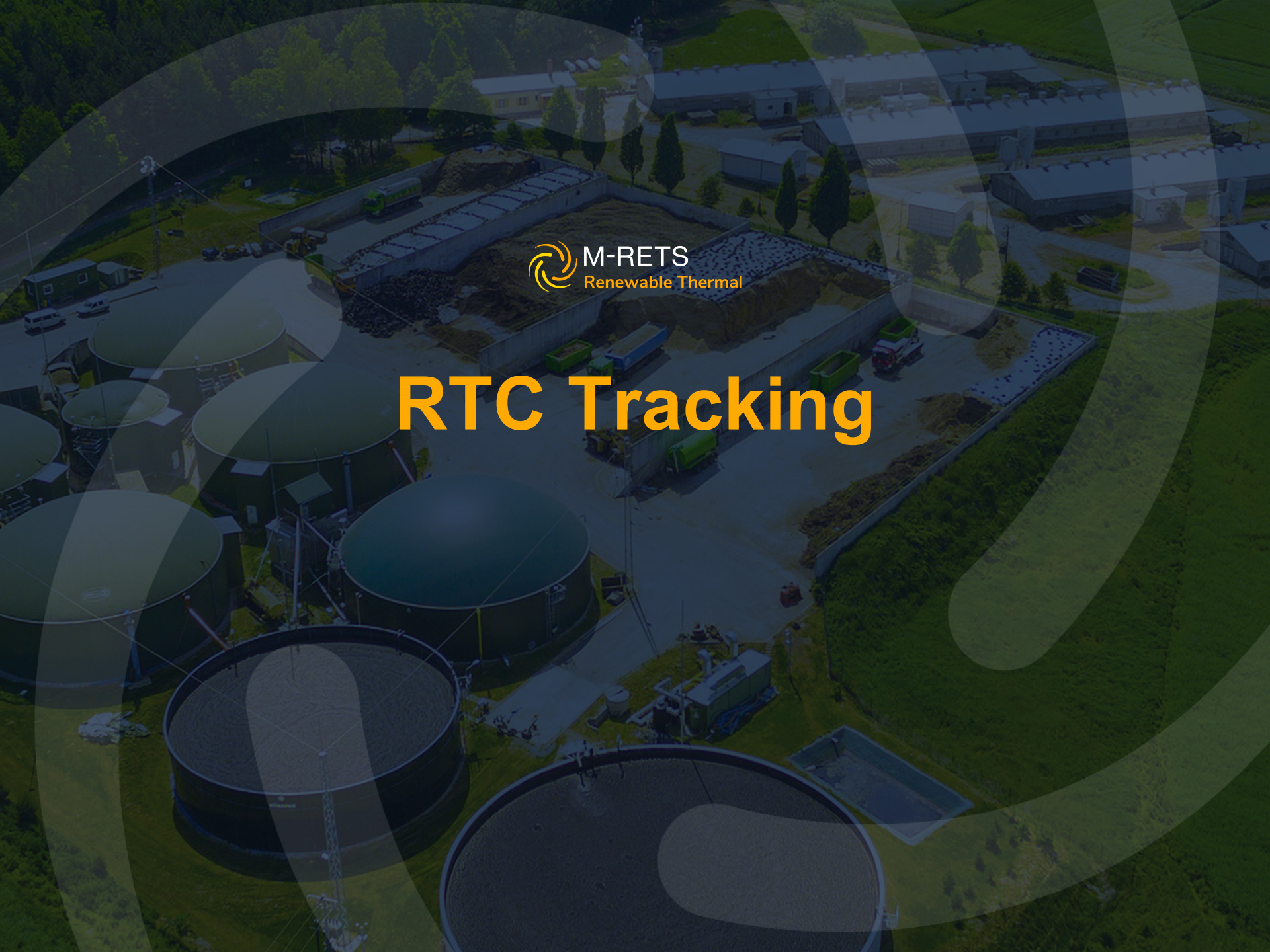

RTC Tracking

Why use a certificate tracking system?

The goal is **simplicity & efficiency** for all parties

Generate.
Streamline credit management and prevent double counting

Compliance.
Provide regulators with an independent, easy to use, and reliable source to verify compliance

Liquidity.
Provide a mechanism to manage holdings, effectuate transactions, and maintain claims

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RNG Tracking System Goal

A web-based tracking system that both supports existing markets and establishes robust new markets through:

- **Increased market transparency**
- Higher level of integrity and assurance
- Increase liquidity (both exchange-based and over-the-counter bilateral transactions)
- **Scientifically validated carbon values to facilitate GHG reduction claims**

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Supported Thermal Resources

Thermal Resources

- Air Source
- Biogas
- Compost Heat Exchange System
- Ground And Water Source Heat Pump
- Hydrogen
- Non-Renewable Additives
- Renewable Natural Gas
- Solar Thermal
- Woody Biomass System

- M-RETS **is not** a policy decision-making body and will support relevant regulators in determining what qualifies as renewable thermal for their specific programs. M-RETS can easily add new supported thermal resources or feedstocks.
- M-RETS can insert software code to prevent improper claims occurring within certain programs
- Regulators utilize reporting functionality to verify compliance.

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What does an RTC look like?

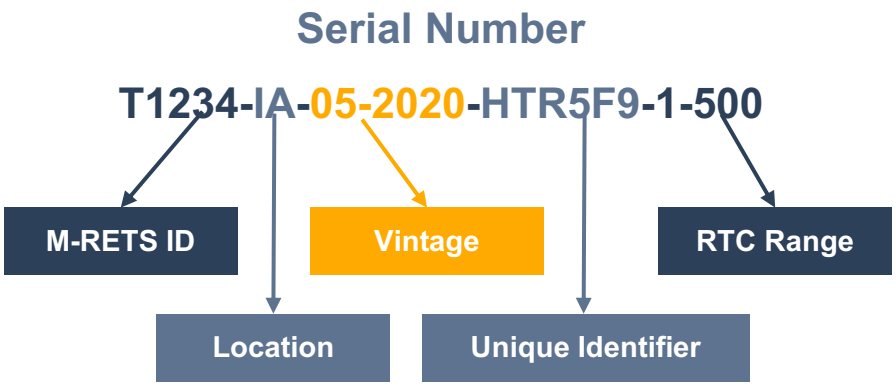
RTC Information

Dekatherm (Dth) Renewable Thermal = 1 Renewable Thermal Certificate

Certificate Details include:

- Serial Number (See Example)
- Account
- Project
- Thermal Resource
- Feedstock
- Vintage
- Location
- Quantity

Carbon Pathways (If Applicable)
IRE Verification (If Applicable)



***IRE stands for Independent Reporting Entity which is a third party that reports data On behalf of a generator M-RETS.**

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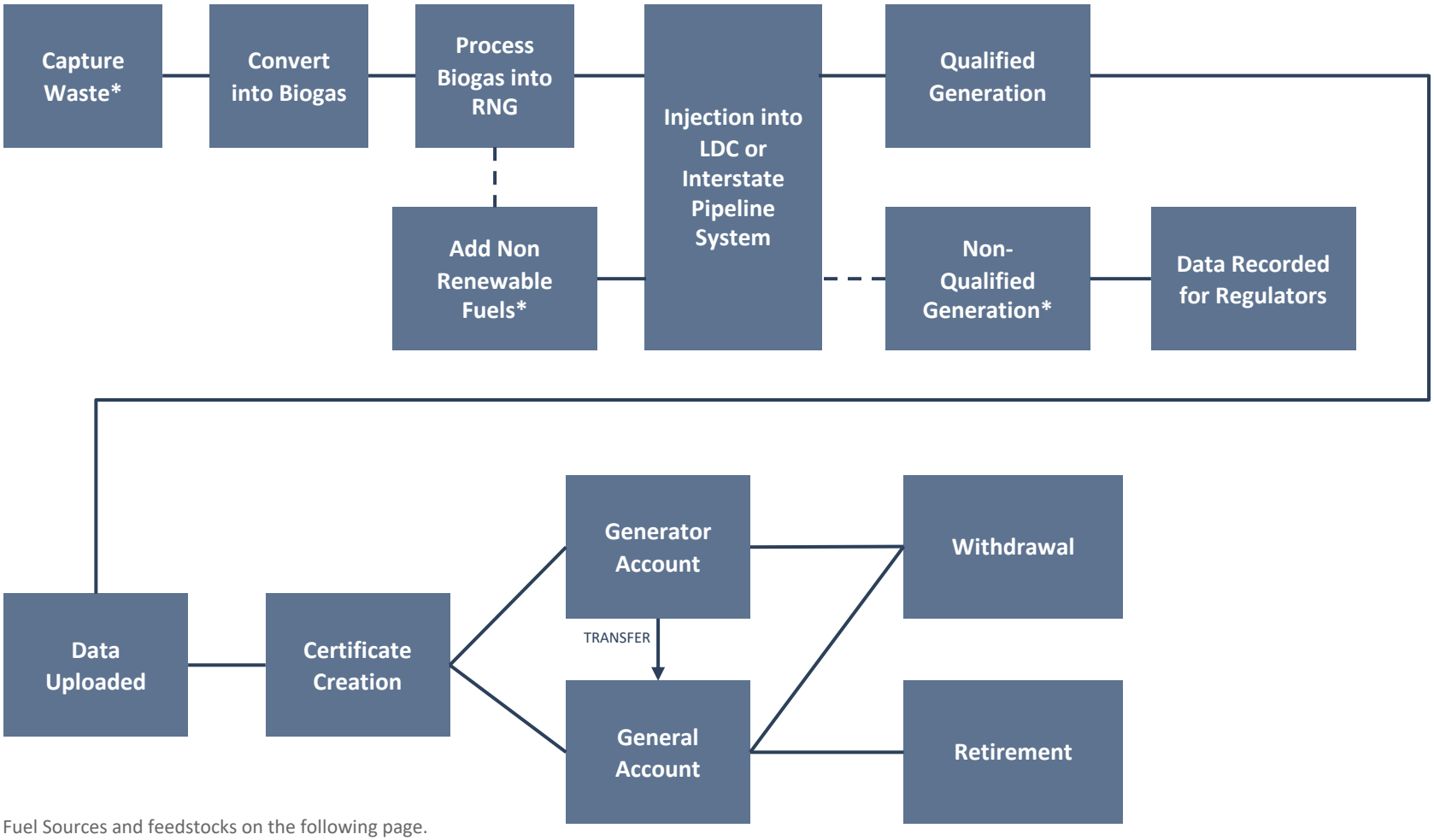
RTC Process



* List of Fuel Sources and feedstocks on the following page.

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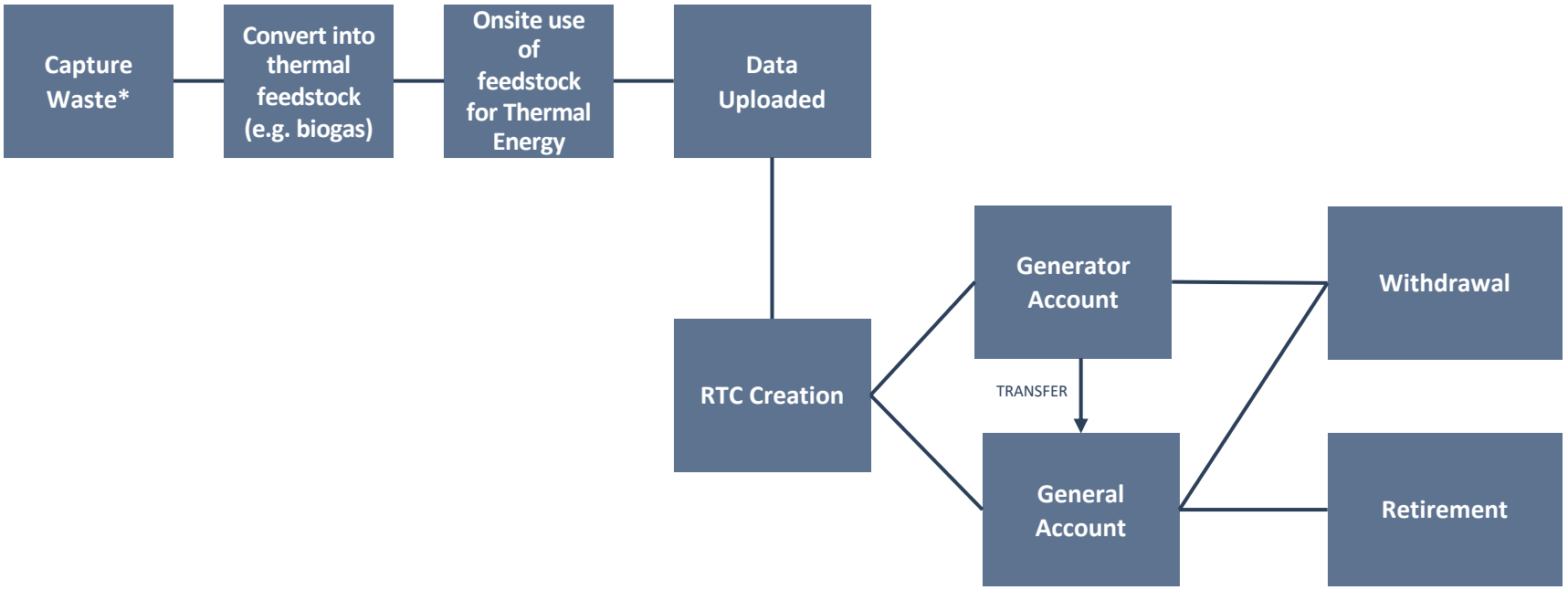
Onsite Thermal Process



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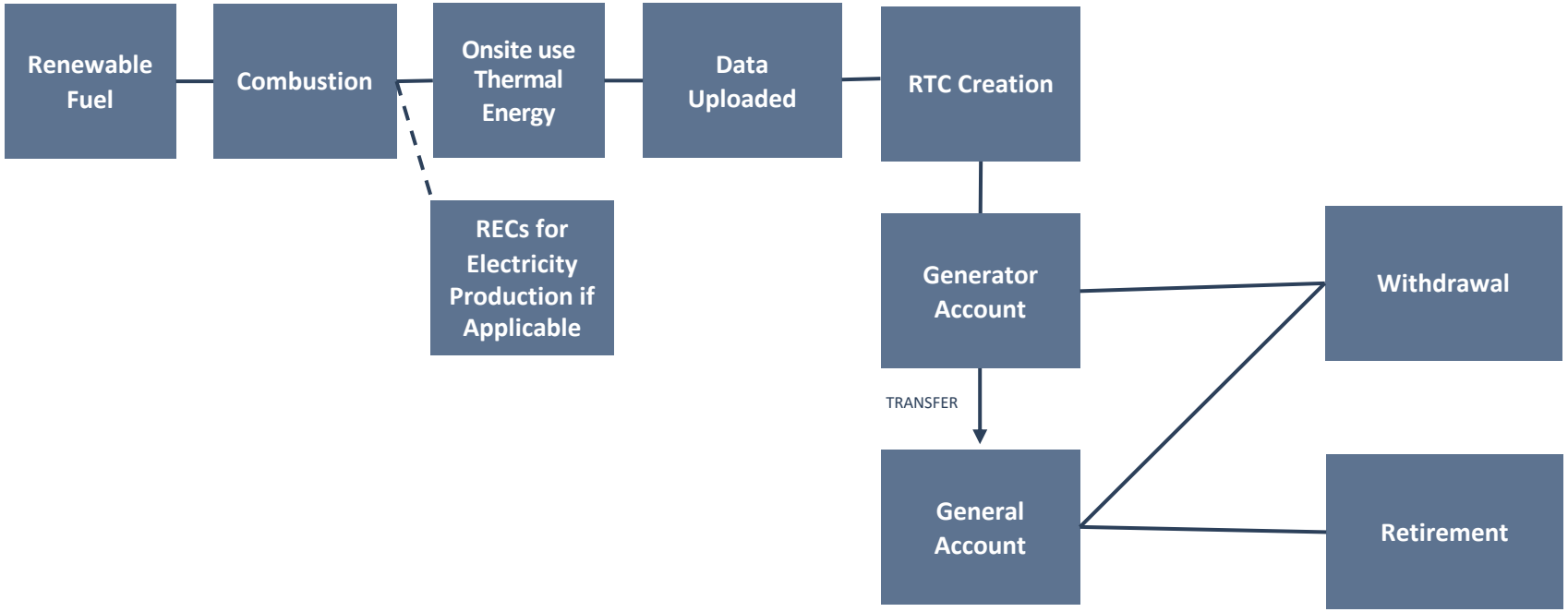
Combined Heat and Power Thermal Process



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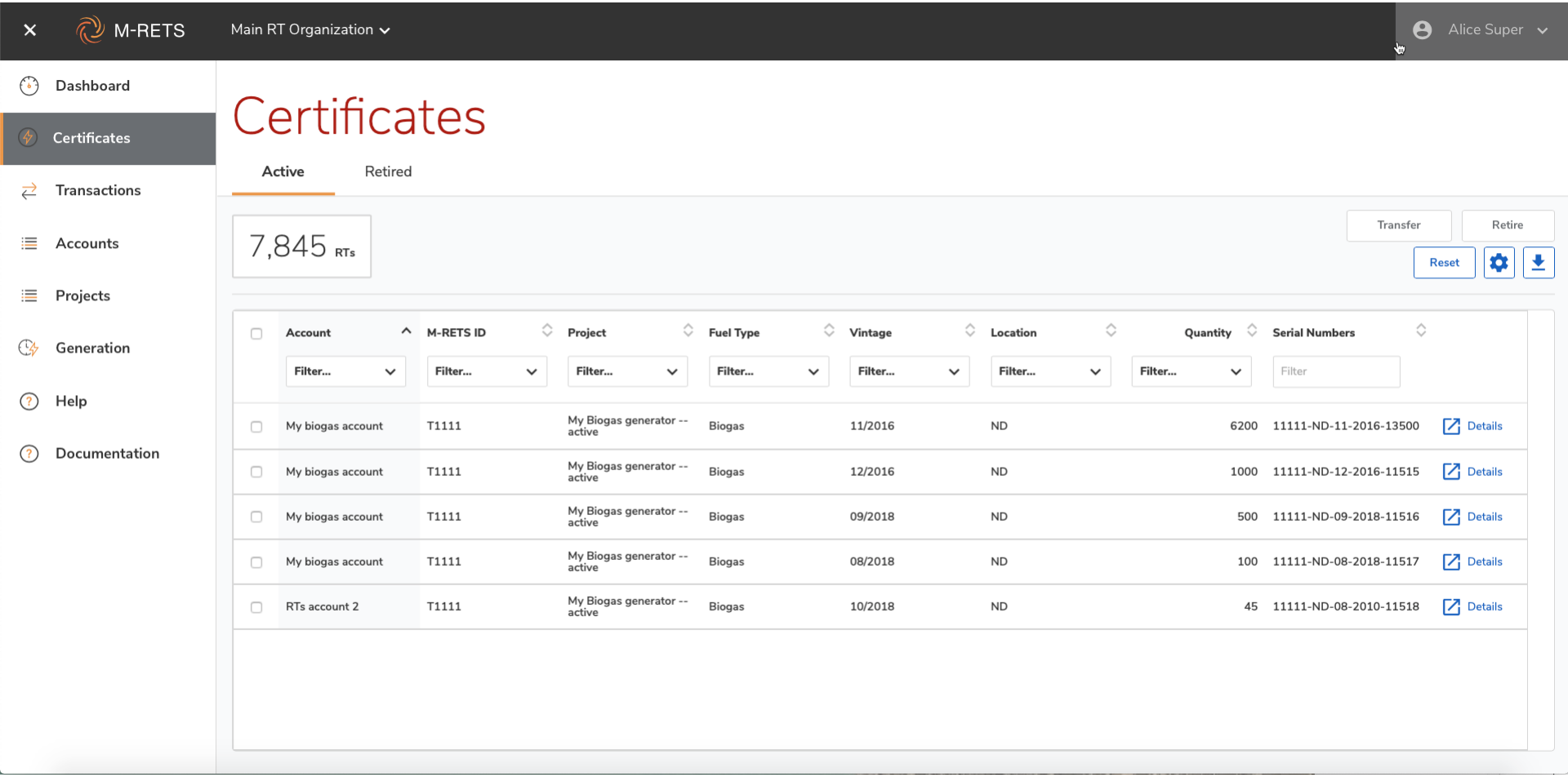
Demo/System Screen Shots

Renewable Thermal System



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RTC Batch Details

Serial Numbers T1112-ND-09-2018-F115DD-9001 to 9977

Project	Account	Thermal Resource	Feedstock	Vintage	Quantity
Springfield Landfill	My biogas account	Renewable Natural Gas	Anaerobic Digestion of 100% Green Waste	09/2018	977

Injection Receipt:

Carbon Pathways

Name	Tool Name	Carbon Intensity	grams CO2 / Dth	Date Range	CP Endpoint	CP Endpoint Description	Injection Point	Document
RNG LCA #1	GHGenius 5.0f	0.25	263.750	2018-01-01 - 2020-01-01	Injection Point	N/A	46.1764445, -123.9092231	t2n-1248_report.pdf

Eligibilities

No eligibilities available

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RTC Batch Details

Serial Numbers T1112-ND-09-2018-F115DD-9968 to 9977

Project	Account	Thermal Resource	Feedstock	Vintage	Quantity
Springfield Landfill	Retirement account 1	Renewable Natural Gas	Anaerobic Digestion of 100% Green Waste	09/2018	10

Carbon Pathway

Name	Tool Name	Carbon Intensity	grams CO2 / Dth	Date Range	Document
RNG LCA #1	GHGenius 5.0f	0.25	263.750	2018-01-01 - 2020-01-01	t2n-1248_report.pdf

Retirement Reason: Corporate Renewable Claim

Eligibility

Notes: Acme Corp. Retirement 2020 RNG Claim

Period: 2020

Retired For: NY

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Important Market Dynamics

A modern registry platform works to support goals of regulators and those seeking to verify, certify, and/or market claims and builds trust between all parties.

It should be flexible enough to accommodate:

- One system nationally or at least system compatibility
- Calculated carbon reductions instead of just pass/fail project metrics
- **Compliance and voluntary markets**

Unknowns/Market Holdups

Claims:

- Reduction of carbon vs. traditional thermal resource or gross volume?
  - Scope Emissions Issue – How companies can count RNG use in scope emissions is currently holding up the industry!
- How will states and/or the FTC regulate?
- Will regulators allow voluntary claims stacking like RFS/LCFS
- Will voluntary markets work off CI or volumes? RFS/LCFS pricing will dictate how important/how much corporates are willing to pay to reduce emissions
- Carbon Offset Natural Gas (CONG) & RNG

Data:

- As these markets grow there will be a greater need for data standardization. M-RETS is working on this for both REC & RTC markets.

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Why M-RETS?

Well-Established Relationships.
M-RETS maintains strong relationships with many North American regulators

Industry Credibility.
A long track record in commodity tracking among clean energy stakeholders

Proven Platform.
Using the M-RETS platform saves high initial startup costs and ensures a stable rollout

Responsiveness.
In-house development staff

Business Model.
501(C)(4) status allows M-RETS to focus resources on maintenance and improvements

Accepted Practice.
Similar market structures and complimentary processes between RECs and RNG justify using a system already trusted by regulators and market participants

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THANK YOU
Contact: ben@mrets.org