

GreenTherm™

Voluntary Renewable Natural Gas Program

Technical Conference (19-057-T04)

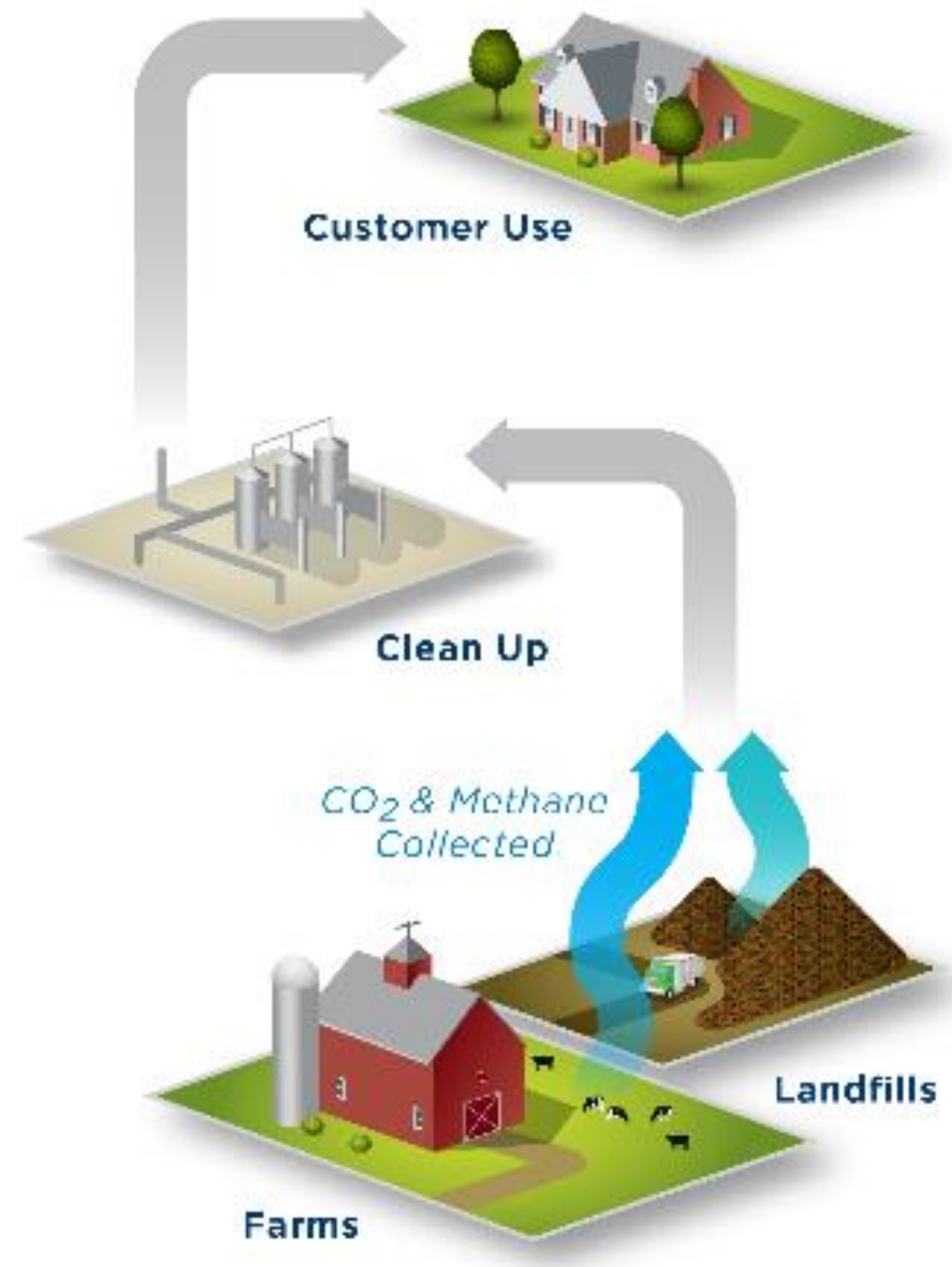
May 1, 2019



Agenda

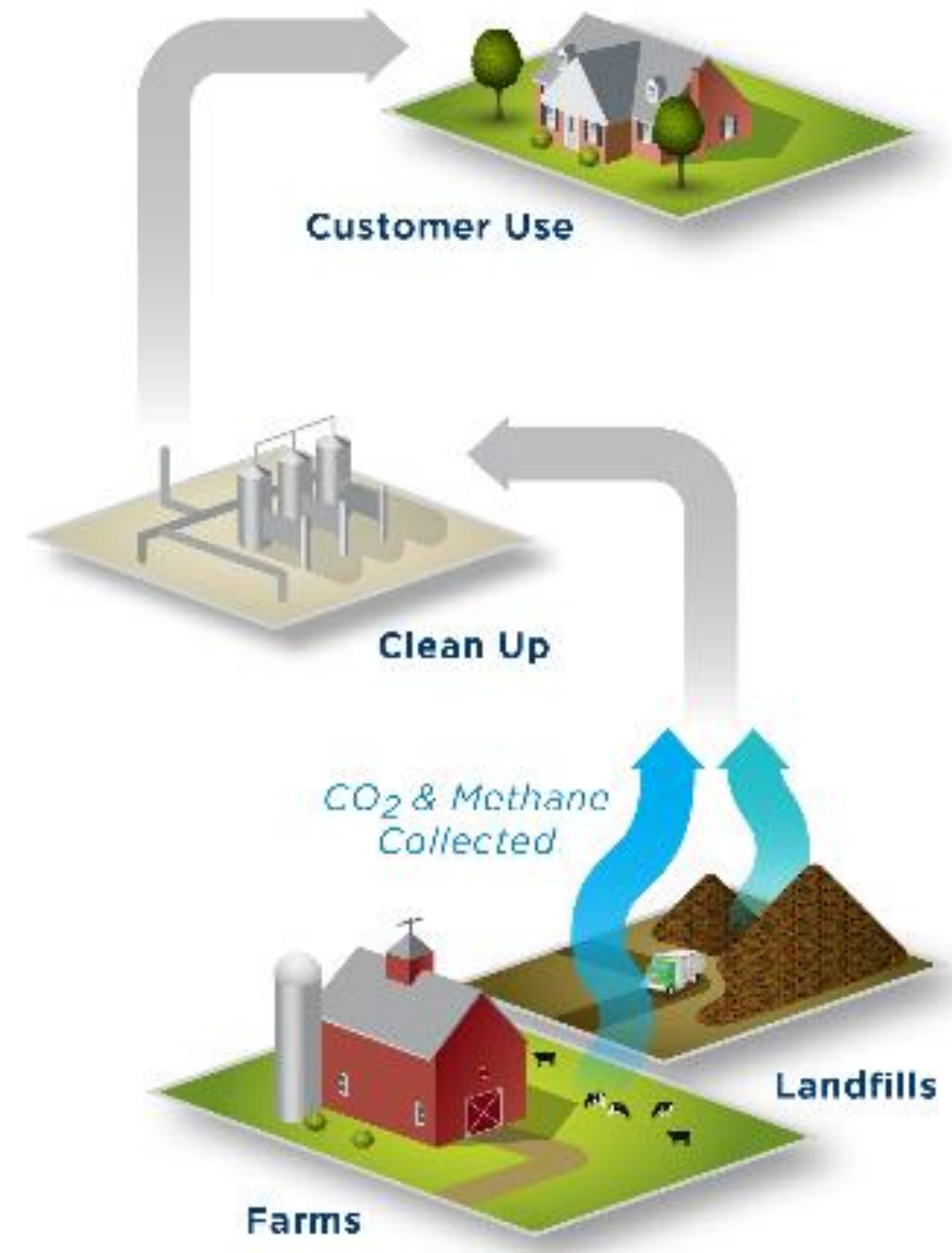
- Introductions
- Renewable Natural Gas Market
- National Voluntary Renewable Natural Gas Programs
- GreenTherm™ Program
- Renewable Natural Gas Supply

Renewable Natural Gas Market



Renewable Natural Gas

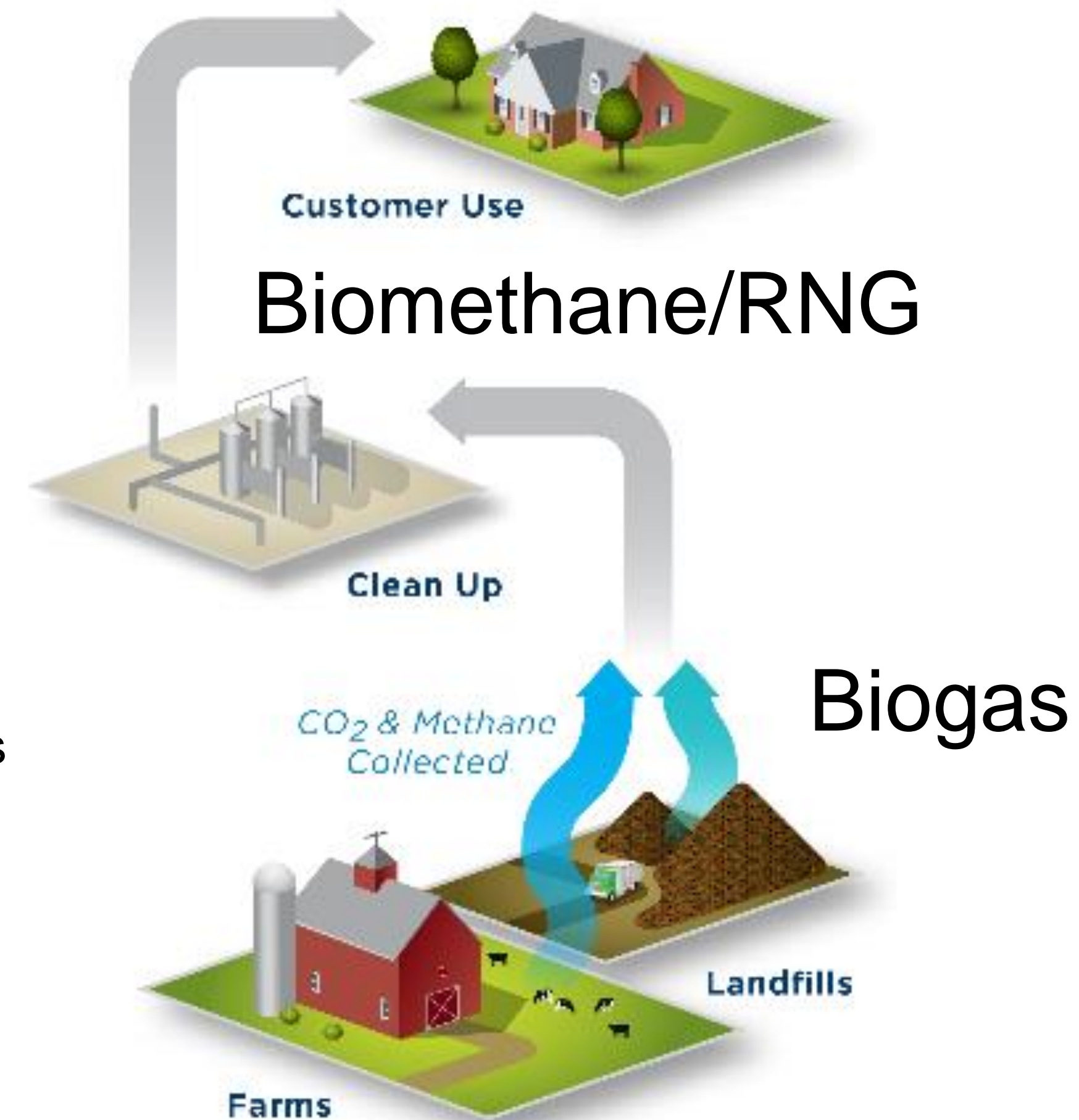
- Renewable Natural Gas (RNG) is biomethane produced from existing waste streams and variety of renewable and sustainable biomass sources. (AGA Playbook 2018)
- Sources may include:
 - Organic wastewater
 - Landfills
 - Animal waste
 - Agriculture
 - Dairy manure
 - Crop residuals
 - Food waste



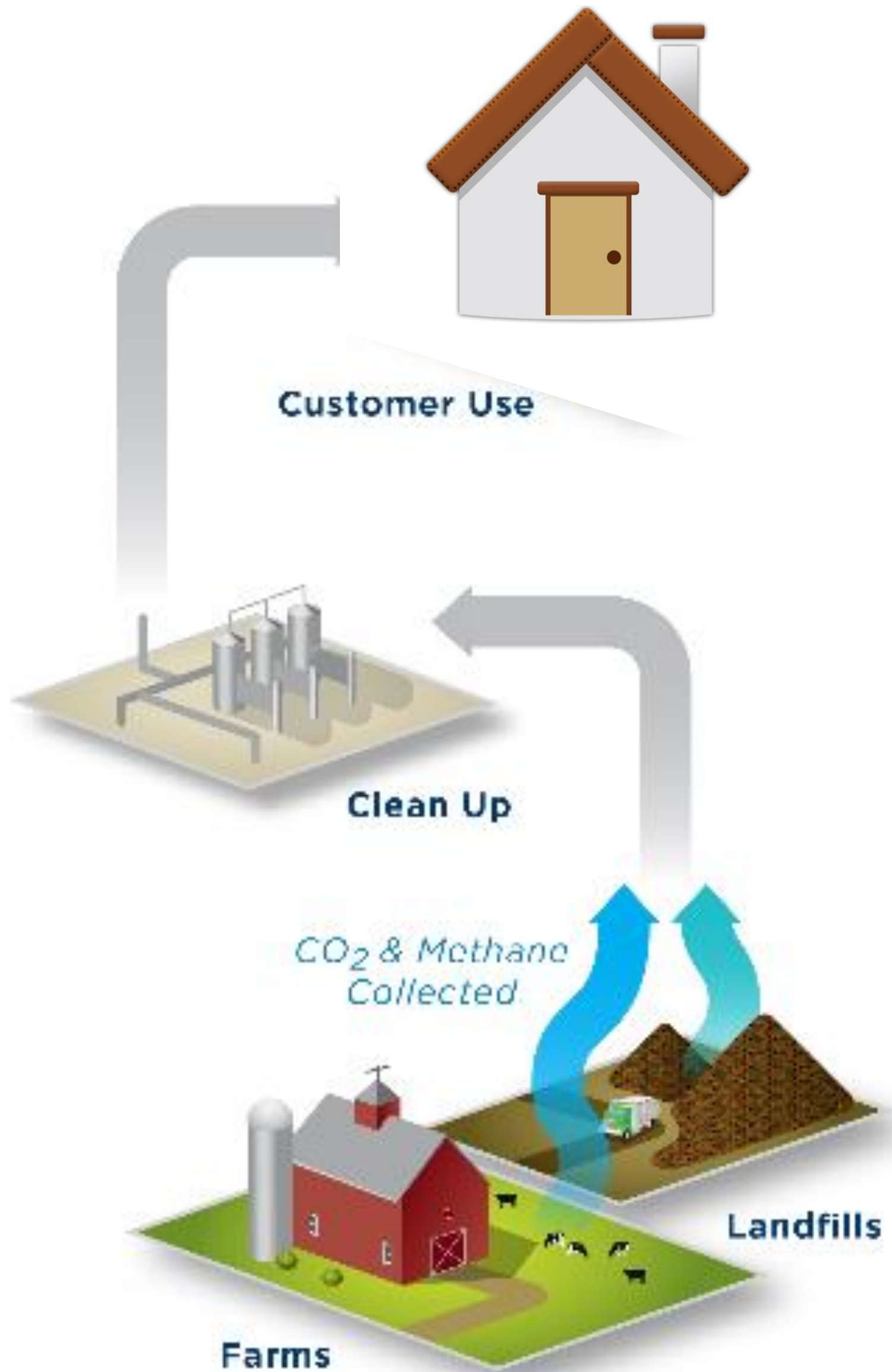
Program Definitions

- **Biogas** - refers to raw unprocessed gas, generated from the identified sources. This gas is not pipeline quality.
- **Biomethane** - refers to upgraded Biogas that is considered pipeline quality. Section 7.07 of the Company's Utah Natural Gas Tariff No. 500 (Tariff) sets specifications for the injection of pipeline quality Biomethane directly onto its system.
- **Green Attribute** – a term indicating that a volume of gas was produced at a renewable facility. The Green Attributes can be split from the Biomethane and assigned to a volume of conventional gas in another geographic region. When this is done, the conventional gas in the new region takes on the designation of Renewable Natural Gas.
- **Renewable Natural Gas or RNG** – refers to pipeline-quality gas with all of the Green Attributes associated with production from the aforementioned sources. Renewable Natural Gas is not necessarily the direct Biomethane molecule produced from a Biogas source. Any Green Attribute plus any molecule of gas is considered RNG.

Green Attribute



Renewable Natural Gas Benefits



“Net Negative” Carbon

When Burned, result is:

**H₂O,
CO₂**

Injecting into a pipeline **eliminates** this emission

1 ton of Methane =

>25X

Global Warming
Potential of CO₂

“Net Negative” NO_x

When Burned in near-zero NO_x engine, result is:

.02g
per bhp-hr

Injecting into a pipeline **eliminates** this emission

Methane flaring results in

Wide Range
NO_x Emissions

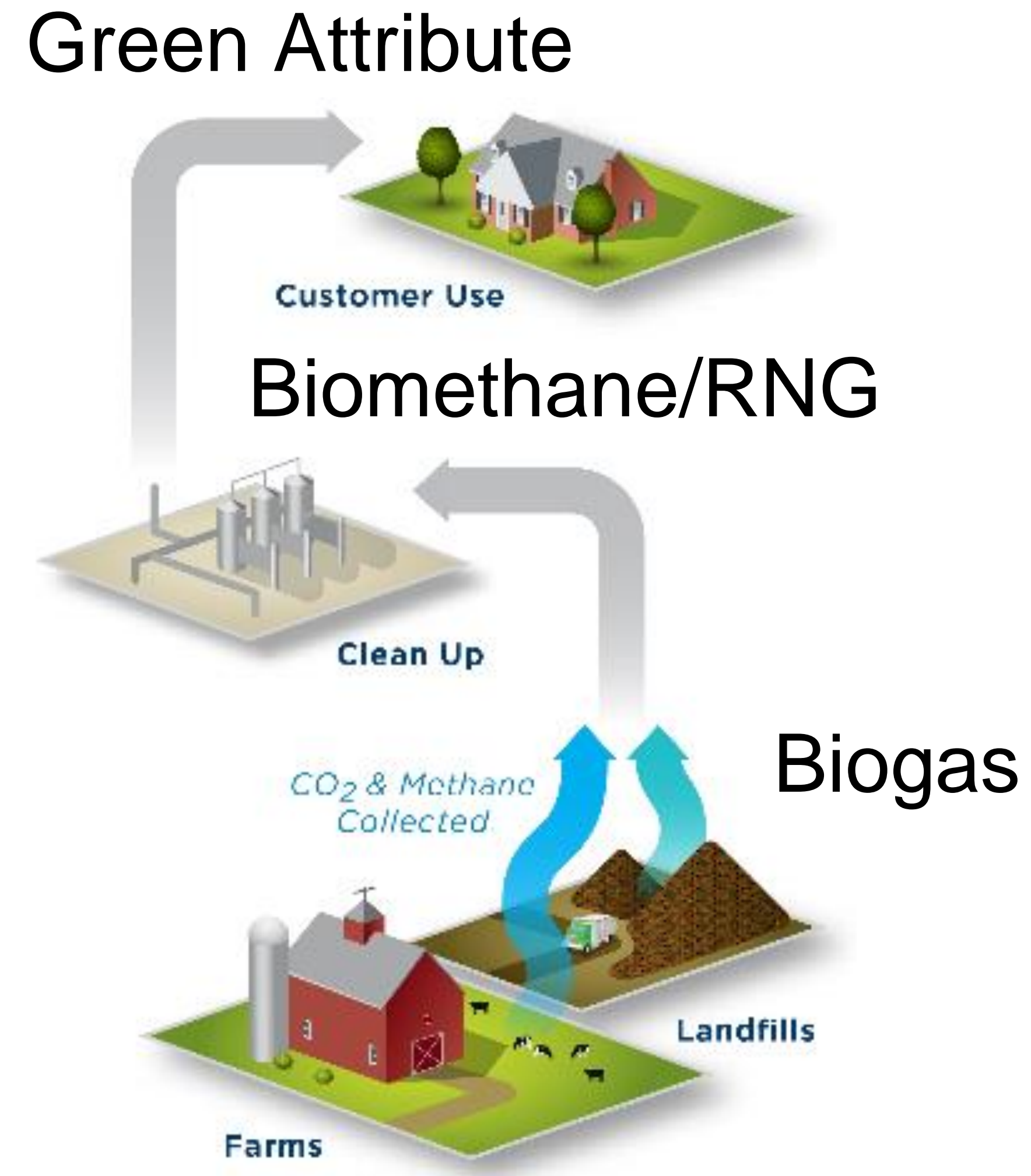
Can result in “net-negative” carbon process from source to use

Can result in “net-negative” NO_x process from source to use

RNG National Markets and Policy Questions (DPU 1,34,OCS 2c)

Two primary market price drivers:

1. Renewable Fuel Standards (RFS)
 - a. Implemented in 2005 by EPA to reduce greenhouse gas emissions
 - b. Requires a transportation fuel to contain a minimum volume of renewable fuels
 - c. Federal credit
2. Low Carbon Fuel Standards (LCFS)
 - a. California state Credit



Fueling Market: Renewable Identification Numbers

Questions (DPU 3, 43)

RINs are the “currency” of the RFS program

- Serial number attached to each gallon of renewable fuel
- Renewable fuel producers **generate** RINs
- Registered Market participants **trade** RINs
- **Obligated Parties obtain and retire** RINs for compliance (Refiners and Importers of gasoline/diesel are obligated parties)
- **EPA Moderated Transaction System (EMTS)** is the clearinghouse for RIN transactions registered with the EPA
- RINs are valued in \$/Gallon*

There are several D Code RINs:

- D6 – Conventional RIN
- D5 – Advanced Biofuel RIN
- D4 - Biodiesel RIN
- D3 – Cellulosic RIN (Biogas)

*RIN Gallon to MMBtu Conversion:

$\$/\text{Gallon} \times 11.727 = \$/\text{MMBtu}$
(1 MMBtu generates 11.727 RINs)

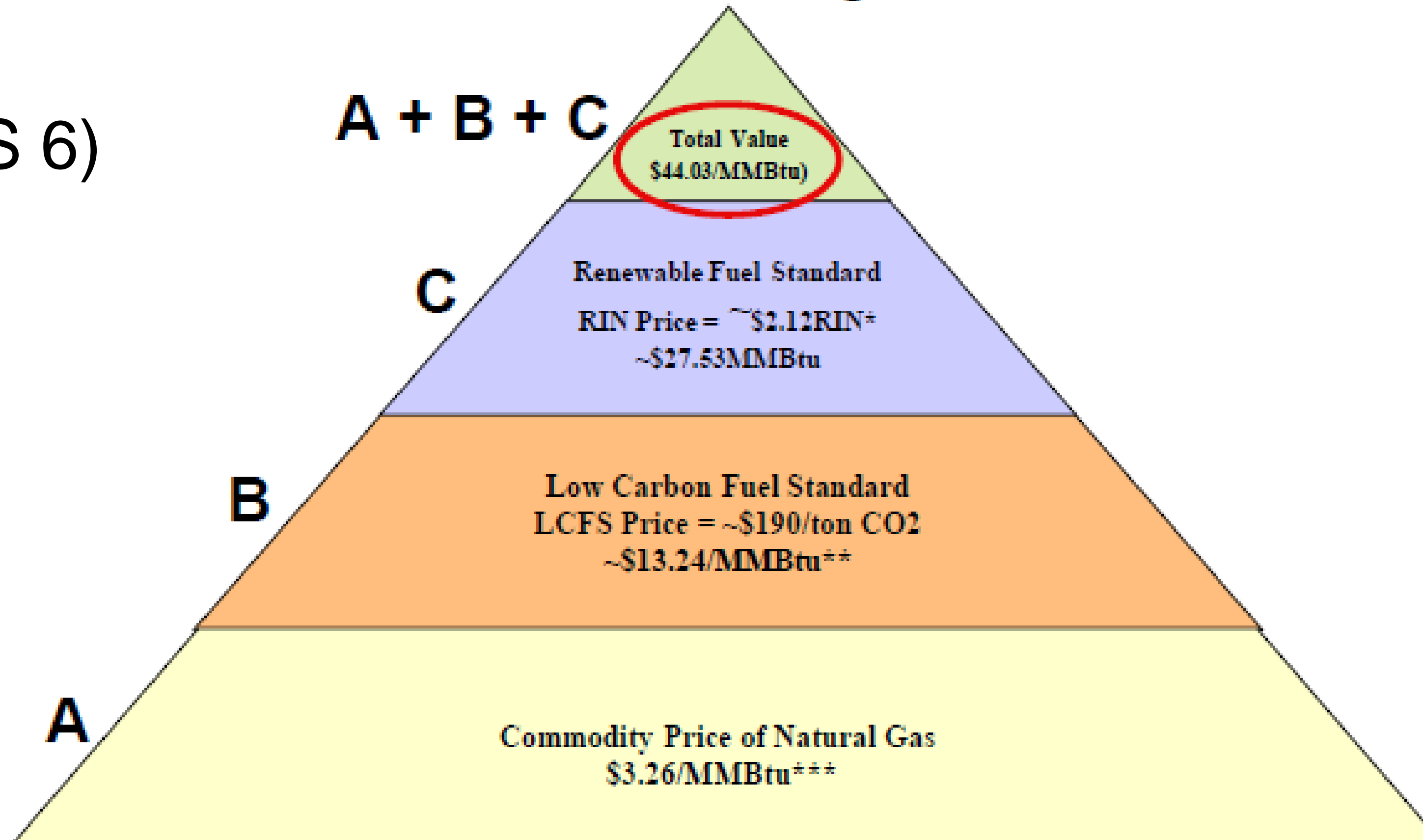
Source: EPA

	Renewable Fuel	Advanced Biofuels	Biomass-based Biodiesel	Cellulosic Biofuels
RIN Code	D6	D5	D4	D3
Reduction in GHG	20%	50%	50%	60%
Feedstock sources	Corn-based	Non-corn 8	Biomass inc. algae	Cellulose Hemicellulose

(Estimated Total Value of RNG When Used as a Transportation Fuel in CA)

For WWTP Biogas

Questions
(DPU 2, 10, OCS 6)



MmBtu = 1
dekatherm

Prices as of 10/05/18

* 2018 Vintage D3 RIN's

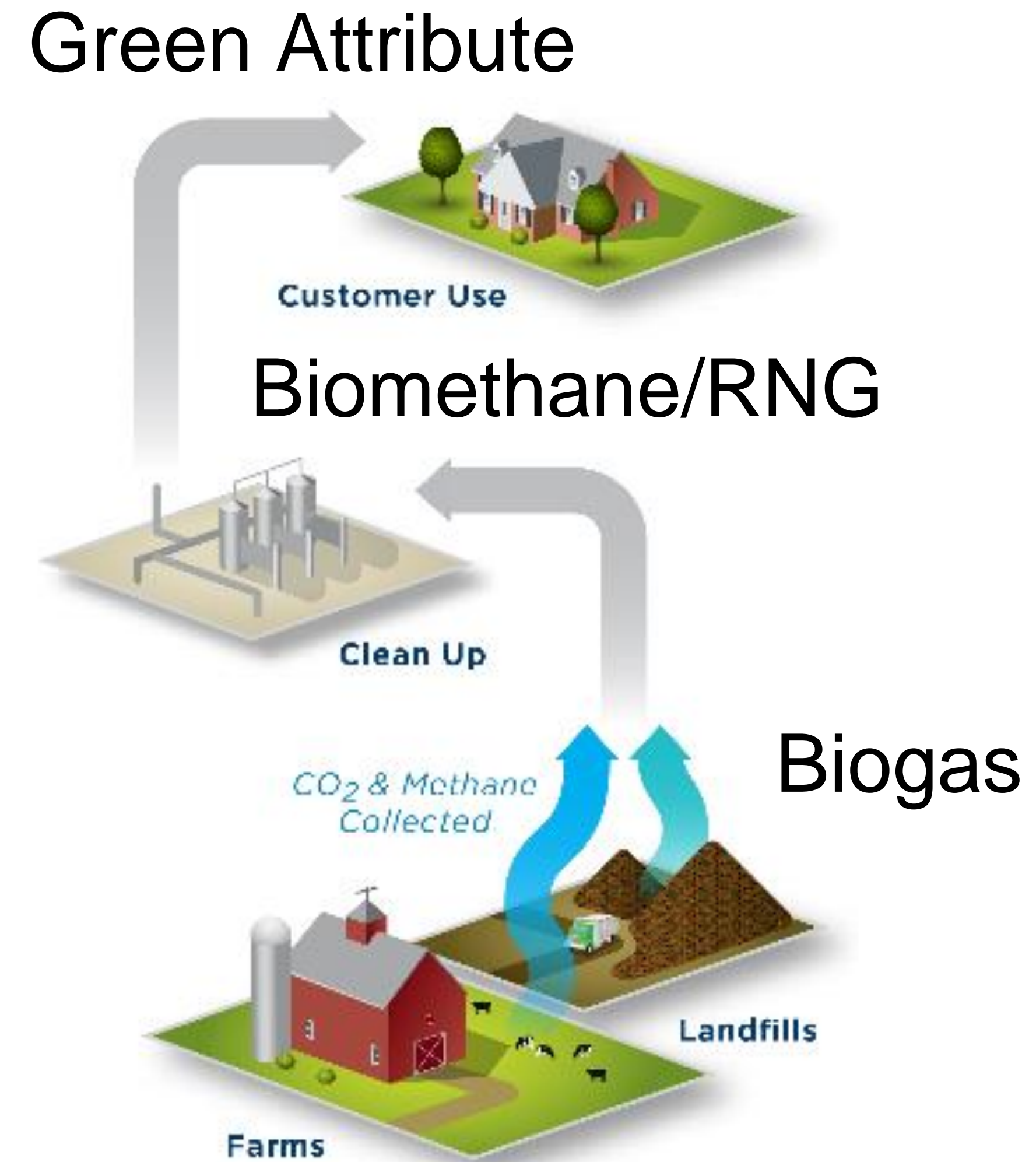
** Assumes carbon intensity for WWTP of 30 gCO₂/MJ_g

*** Approximate Henry Hub Natural Gas Future Price – Nov 2018

http://progressivefuelslimited.com/Auth_RIN/PFL_RIN_Recap.pdf

RNG National Markets and Policy Questions (DPU 1,34,OCS 2d)

- Green Attributes
 - Private party transaction
 - Price negotiated between suppliers and buyers
 - Energy units determined by contract
 - Green attributes may be assigned based on contractual obligations
 - Green attributes contribute to RNG additionality on the market
 - National RNG verification and tracking systems under development



Farm to Burner Tip Questions (DPU 6,29,34, 36,38,40, OCS 2a,b,3)

VERIFIED

RNG Supplier



- Organic wastewater
- Landfills
- Animal waste
- Agriculture
- Dairy manure
- Crop residuals
- Food waste

Pipeline quality RNG is produced

Green Attribute

CH4

VERIFIED

Pipeline quality RNG is injected

Commercial Pipeline "common carrier"

Green attribute and CH4 can be separated

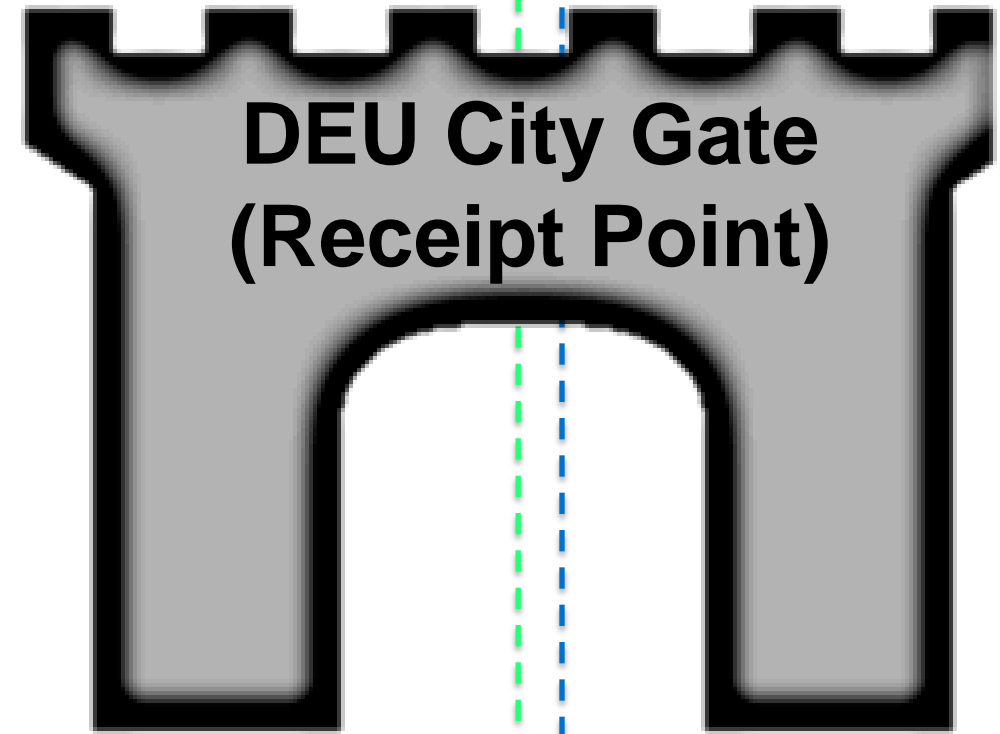
CH4 Customer

\$

Gas Supply



Green Attributes can be assigned to any CH4 supply that is physically connected



VERIFIED

GreenTherm Participant



VERIFIED

Proposed Verification System Questions (OCS 2c,d)



- Similar verification system as approved by Vermont Public Utility Commission for Vermont Gas Voluntary RNG Program
- Verification will include:
 1. Confirmation of renewable fuel feedstock
 2. Confirmation of renewable fuel production process
 3. Review of fuel flow measurement and quality monitoring process and equipment
 4. Review of contracts and affidavits governing the transfer of RNG from the original source to the end user
 5. Review of evidence confirming the existence of a physical path (common carrier pipeline)

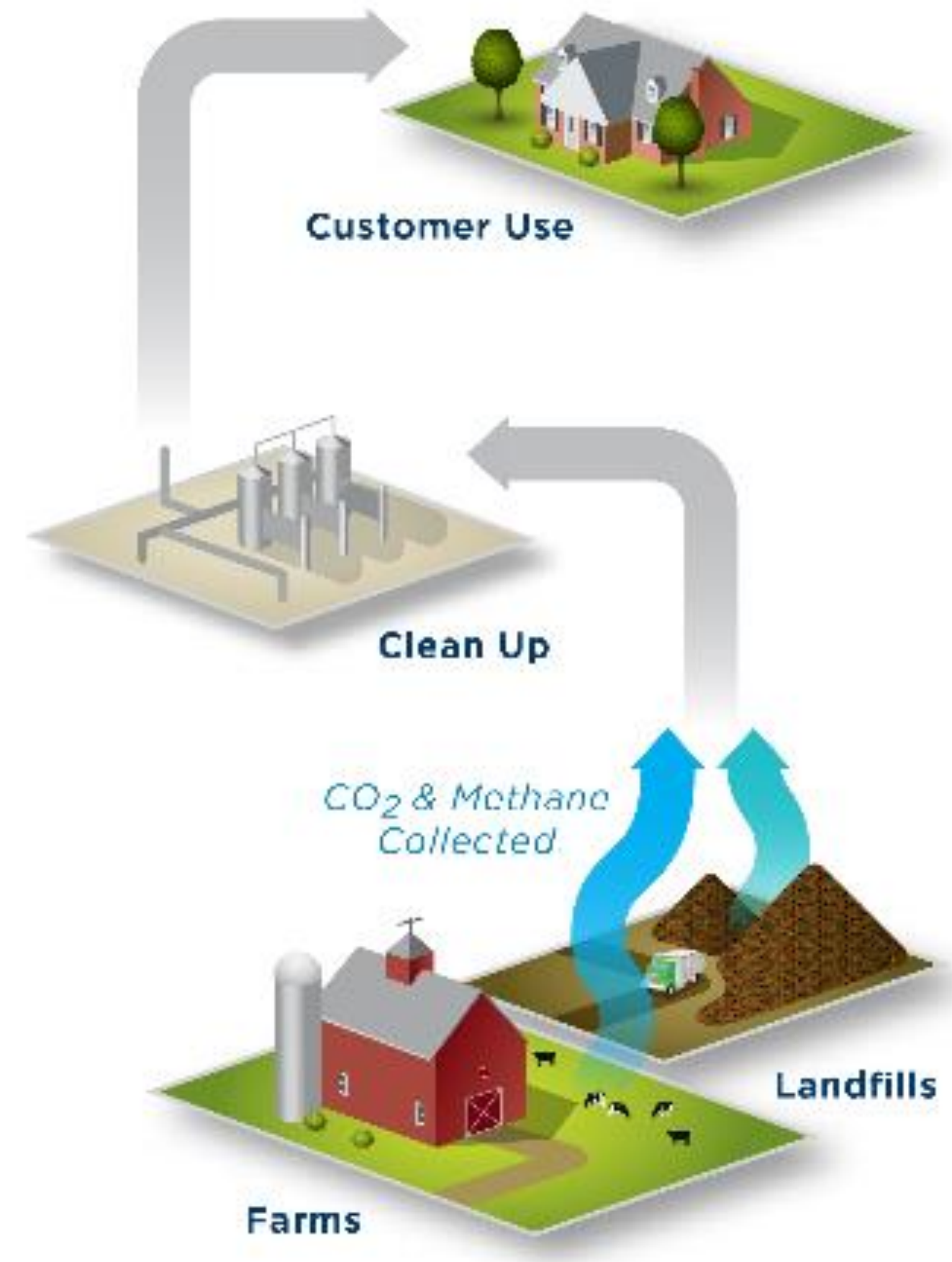
Utah Projects

Questions (DPU 7,37,39,44,45,46,48,49, OCS 7,8)

Wasatch Recovery	Bayview Landfill	Milford Pig Farm
 <p data-bbox="283 1309 1046 1365">Estimated Production 2019</p>	 <p data-bbox="1282 1309 2045 1365">Estimated Production 2020</p>	 <p data-bbox="2282 1309 3045 1365">Estimated Production 2020</p>

- Estimated annual RNG production 2 million dekatherms*

National Voluntary Renewable Natural Gas Programs



Natural Gas Utilities with Voluntary Green Tariffs Question (DPU 33)

Renewable Natural Gas



Minnesota



Michigan



Utah

Comparison of Voluntary Renewable Natural Gas Programs Questions (DPU 9,11,13,14, 15,16,32)

	Year	Participants	Unit	Cost per Unit	100% RNG	Method
Fortis BC	2013	~12,000	Gigajoule	\$10	\$630*	Usage %
DTE Energy	2013	2,000 capped	N/A	\$2.50	N/A	Flat charge
Vermont Gas	2018	~300	Ccf	\$1.2931	\$1,163	Usage %
CenterPoint	Filed 2018	~300,000 therms	Therm	\$3.89	\$3,501**	Therm
Dominion	Filed 2019	~750 (2019)	Therm	\$4	\$800 -\$3,200***	Block
SoCal/SDG&E	Filed 2019	TBD	Therm	Max \$	TBD	%/Therm

	Customers
Fortis BC	~1,000,000
DTE Energy	~1,300,000

Vermont Gas	~50,000
CenterPoint	~600,000
Dominion	~1,000,000

SoCalGas	~5,800,000
SDG&E	~870,000

*FortisBC is subsidized by ratepayers

** assuming approximately 90 dths for CenterPoint customers

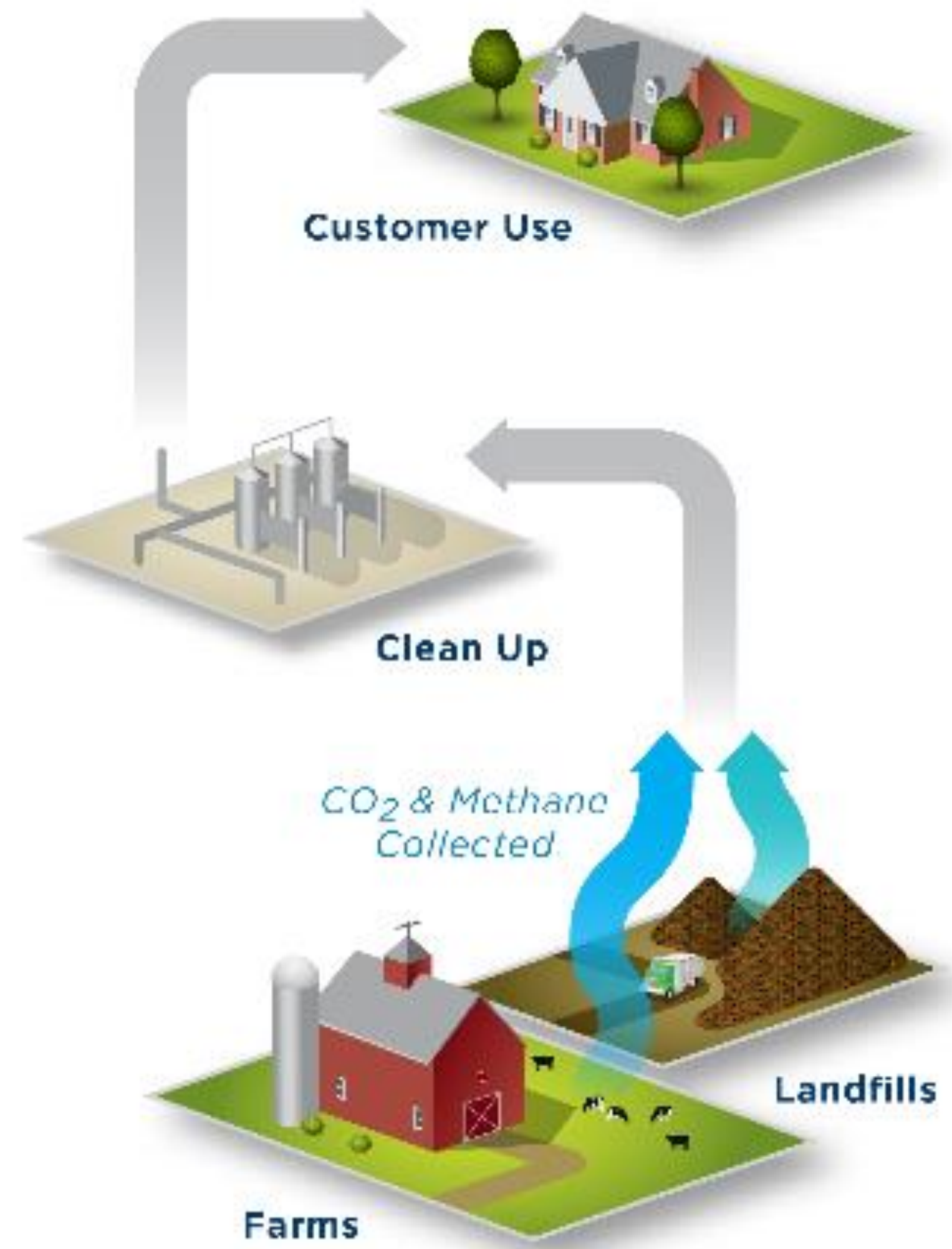
***Range dependent on block price

Renewable Energy Questions (DPU 8, 35)



- Emerging solution
- Not intermittent
- Versatile
- Efficient
- Physical commodity

GreenTherm™ Program



Program Implementation

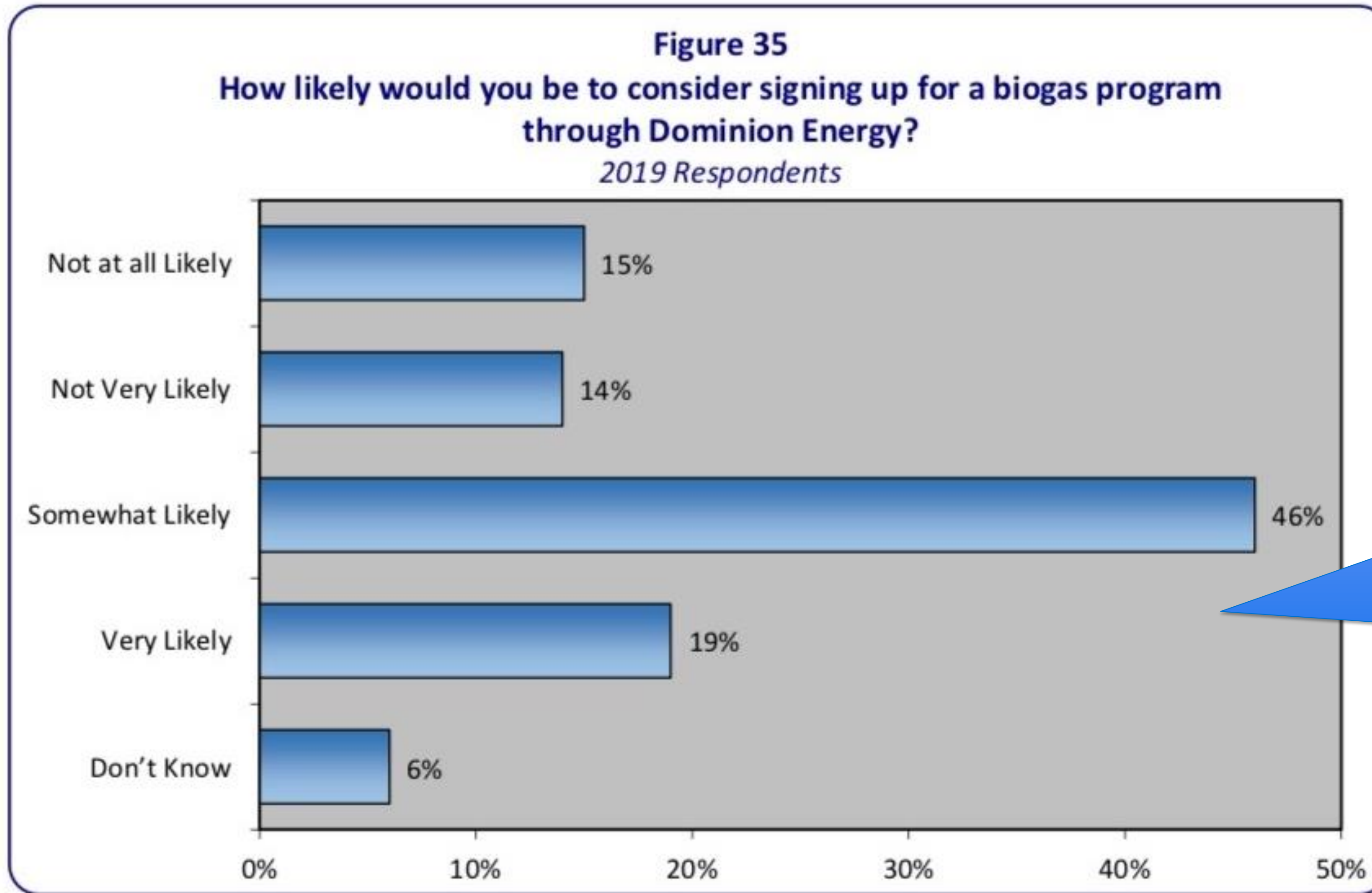
- File: March 2019
- Regulatory Approval August 2019
- Program Design (initiatives may be completed concurrently)
 - Engage in customer integrated marketing campaign
 - Enroll customers into program
 - Purchase renewable natural gas green attributes via a vendor/contractor
 - Accounting Systems Development
 - Billing / IT Systems



Questions (DPU 4, 17)

Natural Gas Usage

As Figure 35 illustrates, 46% of respondents said they would be “somewhat likely” to sign up for a biogas program through Dominion Energy.

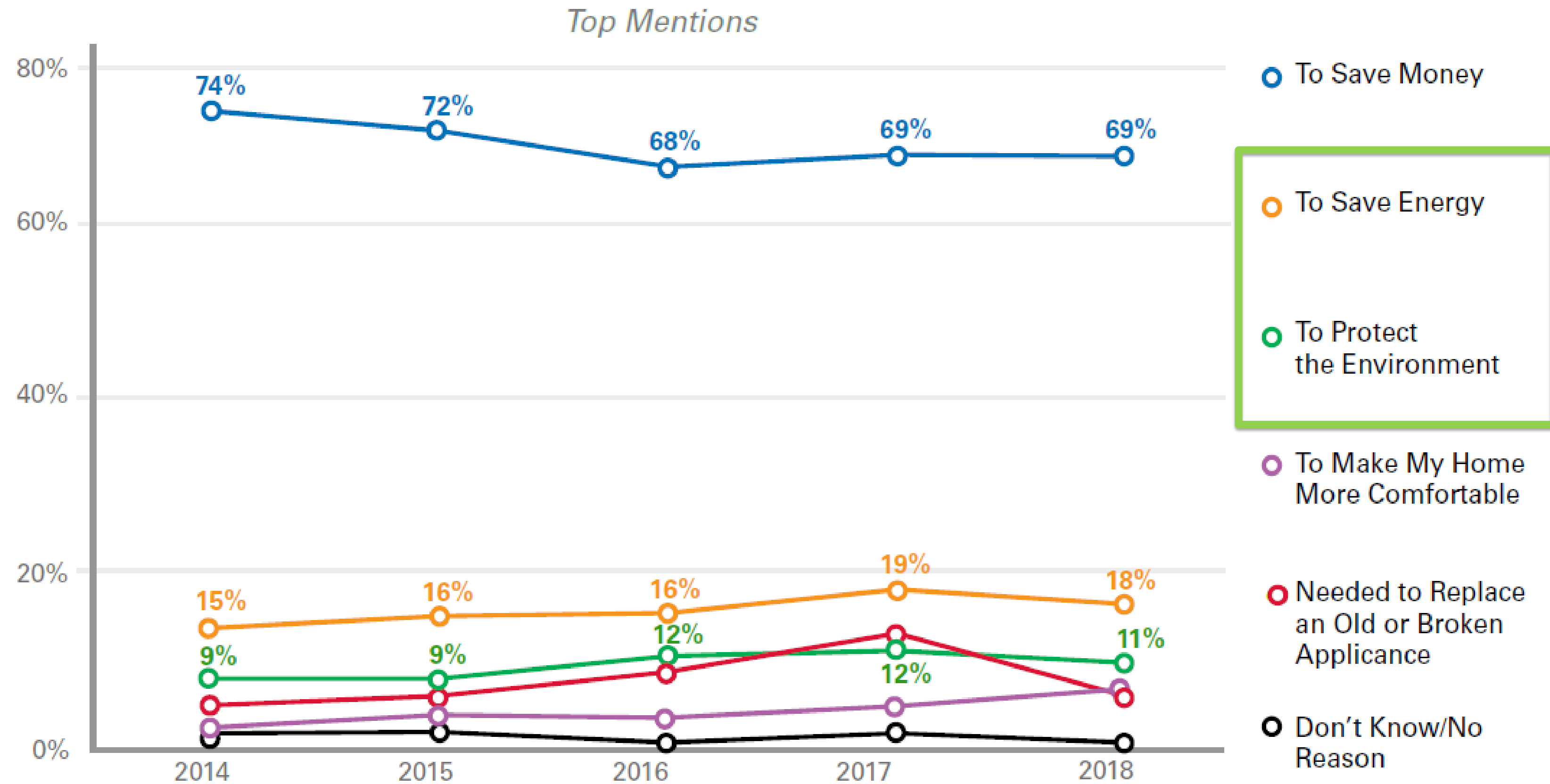


65% of customers expressed interest in the program

Energy Conservation Actions

What are the main reasons you took steps to conserve energy in your home?

- 29% of customers indicate that the main reasons include to save energy or protect the environment



Marketing Campaign

Questions (DPU 14, OCS 1)

- Integration with existing Company Outreach
 - Online
 - Educational - program description
 - Program specific materials
 - Benefits
 - Customer Care
 - Person-to-person engagement
 - Direct Mail
 - Billing Inserts
 - Separate mailers
 - Company events
 - Mass Media / Social Media
 - Video / radio content
 - Looking to issue a marketing RFP for program support



GreenTherm Marketing Benefits Questions (DPU 41,42,43, OCS 1)



- Benefits
 - Renewable energy
 - Reduction in greenhouse gas emissions
 - Interchangeable, reliable, and fully compatible
 - Improved air quality
 - Improved waste management
 - Any quantifiable benefits would be determined by the source and mix of the renewable natural gas

Balancing Account Question (DPU 22)



- The Company would create a separate regulatory asset account 191.4 Balancing Account for this program similar to purchased gas.
- Appropriate accounting codes will be created
 - Contributions
 - RNG attributes
 - Administration
 - Marketing

Enrolled Customers Billing Example

Questions (DPU 12, 31)

- The Company will add a line item highlighting the GreenTherm contribution

1 block of
GreenTherm

Account Summary as of April 30, 2019

Current Charges - Gas Service	48.47
Current Charges - GreenTherm Program	4.00
Adjustments	8.36
Total Amount Due Upon Receipt	\$60.83

Program Participation and Cost Forecast

Questions (DPU 17,18, 20, 21, 28, 30, 47)

- Participants: <500 (2019), ~3,000 (2020) , ~6,000 (2021)
- Green Attributes: ~\$10,000 (2019), ~\$60,000 (2020)
- Administrative estimates: ~\$100,000 (2019), ~ \$250,000 (2020)
 - Administrative costs are based on participant estimates. Costs will fluctuate based on program enrollment. Fewer the participants the lower the costs
- As participation grows, the percentage impact of administration/marketing costs on the program also decreases

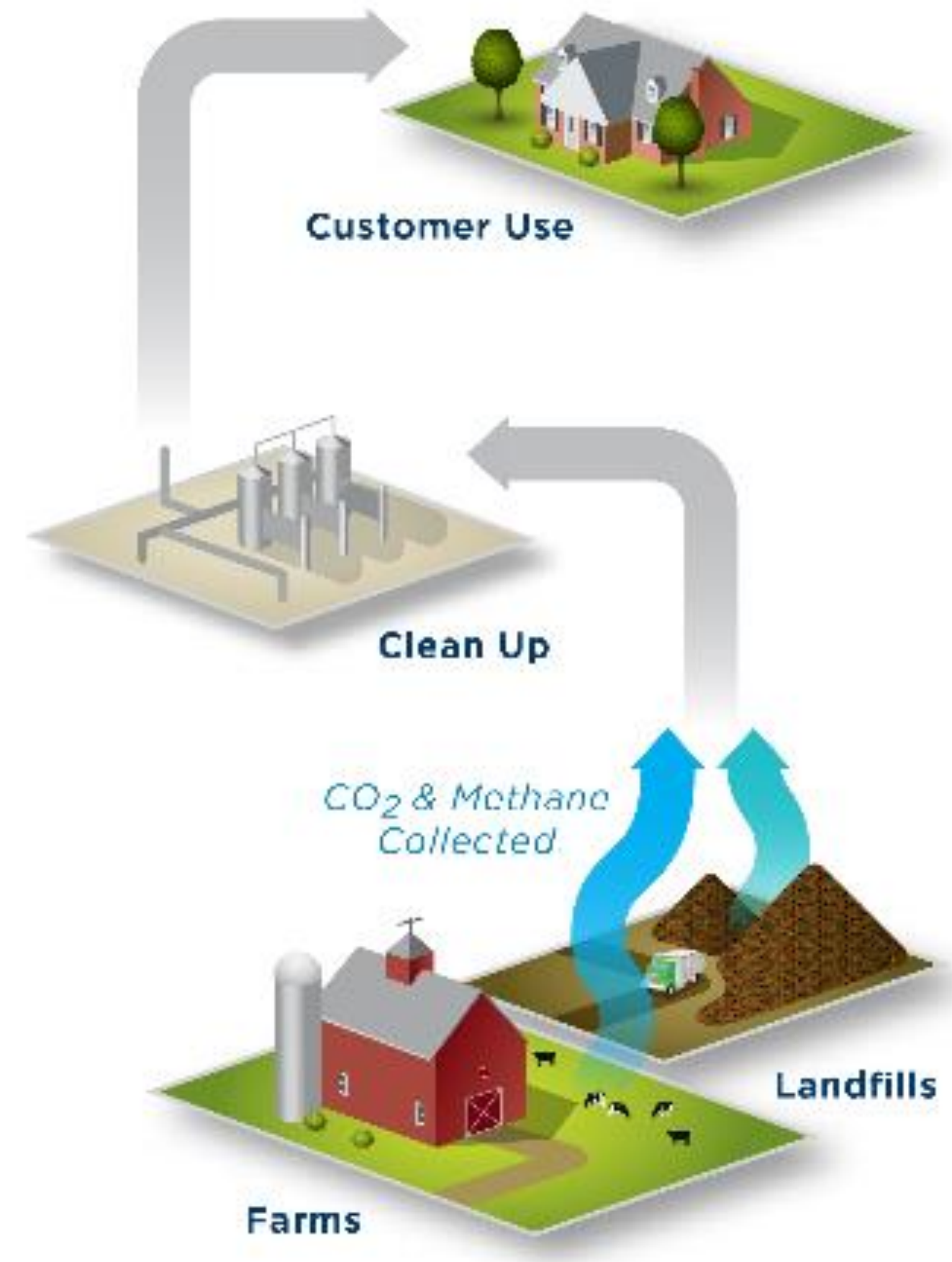
Updated Breakdown of Administrative/Marketing Costs Questions (DPU 19, 30, OCS 4)

- 2019: One-time expenses – IT development, accounting, billing modification, marketing setup (program website, billing stuffers), as well as ongoing expenses i.e. marketing materials, labor and labor overhead
- 2020: Program incentive, contract marketing, labor and labor overhead
- Costs variable based on participation
- This will not be part of other rates and program expenditures will be covered by voluntary participants

Qualifying Initiatives Questions (DPU 23, 24, 25, 26, 29)

- The Company may use Surplus Funds for qualifying initiatives. Qualifying initiatives include the following:
 1. Purchase additional RNG attributes beyond the Company's obligation as provided by customer funds
 2. Investment in infrastructure development that will support RNG.
 3. Project grants for energy efficiency projects for Utah customers that are non-profits and governmental institutions
 4. Once the Company anticipates funds will be available for qualifying projects, the Company will meet with interested parties to define a criteria for project evaluation (Anticipated 2023)

Renewable Natural Gas Supply



GreenTherm Program Supply Questions (DPU 5, 6, 27, OCS 3)

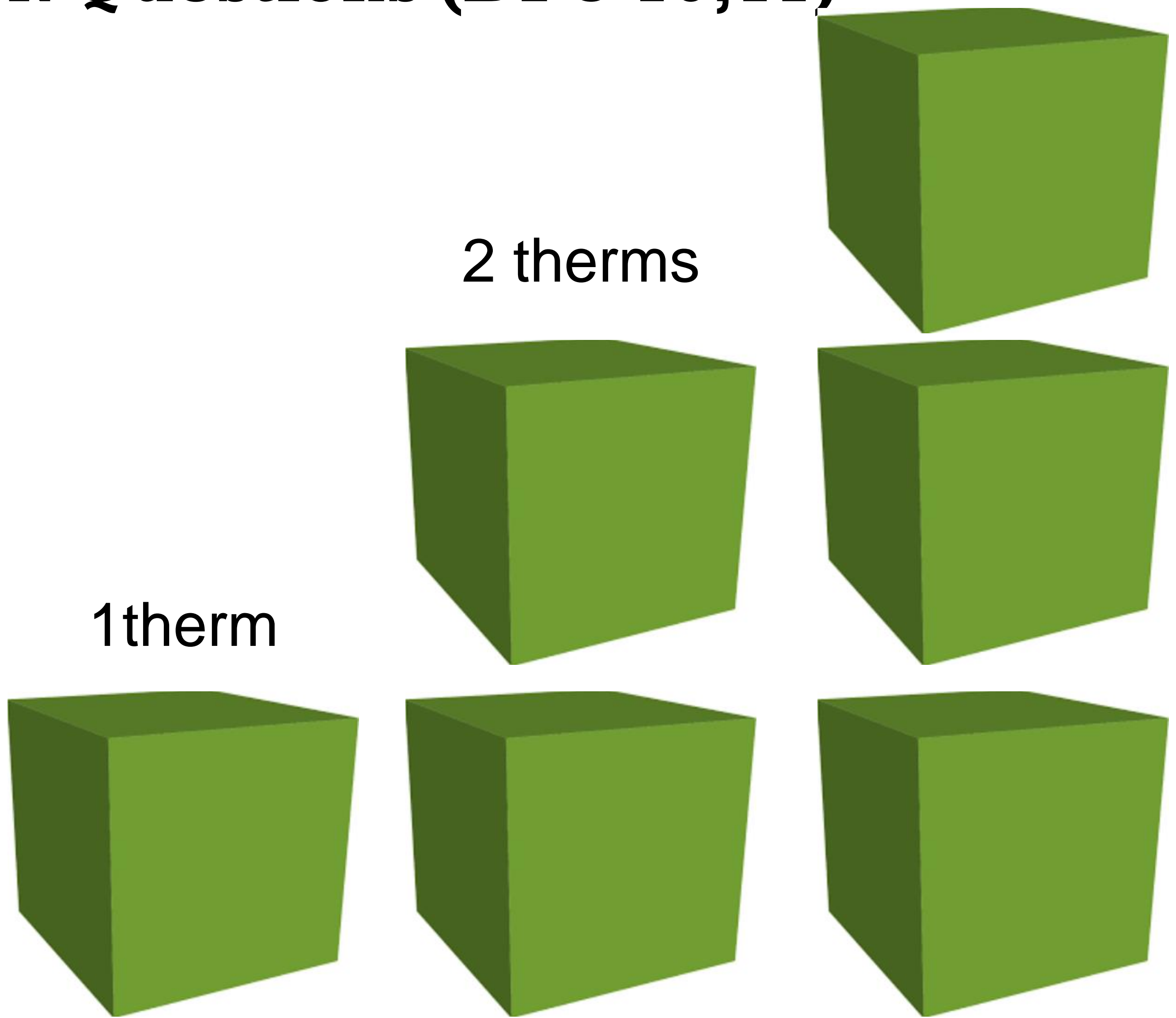
- Company issued RFP in March 2019
 - Distributed to seven suppliers
 - Request to purchase only green attributes
 - Evaluation criteria included price, location of supply, and flexibility of volumes
 - Still evaluating responses

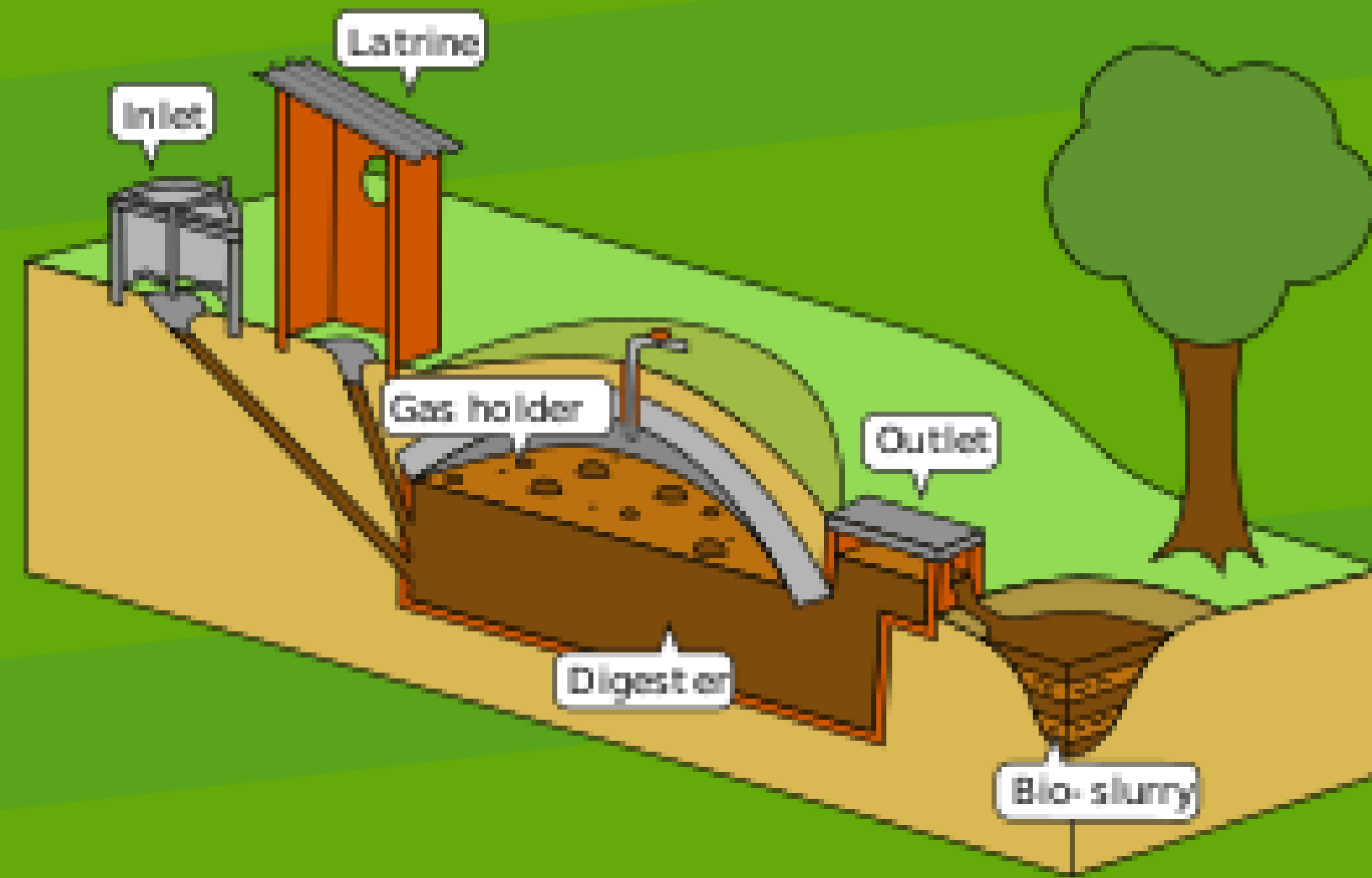


Program Objectives: \$4 block Questions (DPU 10,11) 3 therms

The Company anticipates increasing the value for each block as renewable natural gas attribute prices decline.

- Goal: 1. Purchase renewable natural gas attributes on behalf of customers (RNG +Admin)
- Goal 2: Transform the market. Support the development of renewable natural gas with local priority. (RNG Development)





Questions?