



RNG 101: Leading the Way to a More Sustainable Florida

Florida Gas Utility | October 2021



About Peoples Gas



Market reach

Peoples Gas' service territory extends throughout Florida.



Local presence

600+ employees make Peoples Gas a core part of the communities we serve.



Customer base

425,000+ diversified customers – growing at a rapid pace.



Substantial assets

14,500 miles of main
5,900 miles of service lines
82 miles of transmission.




Diversified supply

Upstream transportation contracts with multiple interstate pipelines.



Corporate support

Owned by Emera, one of North America's largest energy companies.



RNG 101: Leading the Way to a More Sustainable Florida

- **Part 1: RNG Overview**
- **Part 2: Florida's RNG Potential**
- **Part 3: Our Interest in RNG**
- **Part 4: RNG Partnership Across the Value Chain**



Part 1: RNG Overview

- RNG Basics
- The Business Case
- Monetizing Environmental Attributes

What is Renewable Natural Gas (RNG)?



Renewable natural gas (RNG) is any pipeline compatible gaseous fuel derived from biogenic or other renewable sources that has lower lifecycle CO₂e emissions than geological natural gas.

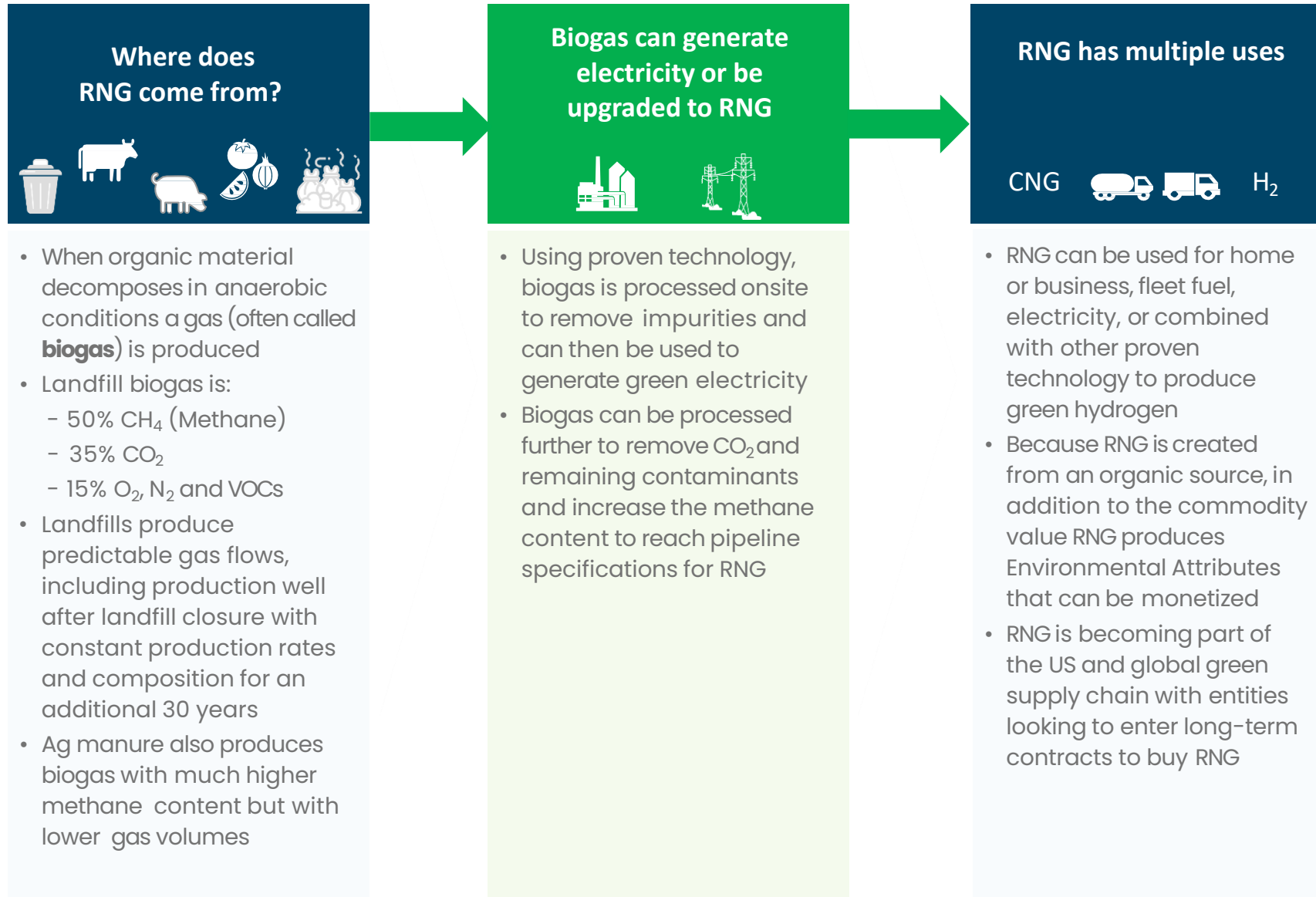


RNG is primarily made up of methane and other trace constituents.



RNG is typically produced from greenhouse gases that would otherwise be released into the atmosphere following the decomposition of organic waste. RNG requires processing to remove carbon dioxide and other contaminants.

The Basics of RNG



RNG Business Case: Sustainability Impacts

Emissions into Energy

Potential sources of organics used to produce **RNG** include:



Source: The Coalition for Renewable Natural Gas.

...While Replacing Carbon Intensive Fuels



100% RNG
in vehicles can reduce GHG emissions by more than **80%**



20% RNG-blend
provides a GHG reduction of up to **30%**



RNG
from some sources is carbon negative, meaning GHGs are sequestered during the fuel lifecycle

Compared to Diesel
Renewable Natural Gas Provides

90% Lower NOx emissions with new "near-zero" engine

99% SOx reduction

RNG Business Case: **Growth Supported by Corporate Support + Regulatory Mandates**

Select Corporate Announcements

"Amazon is excited about introducing new sustainable solutions for freight transportation and is working on testing a number of new vehicle types including electric, CNG and others."

-Company Statement (2/5/2021)



"The use of RNG is a very important part of UPS's strategy to increase alternative fuel consumption to be 40% of total ground fuel purchases by 2025. We are using both LNG and CNG as bridging fuels to increase our use of RNG. This will have a measurable impact as RNG yields up to a 90% reduction in lifecycle greenhouse gas emissions when compared to conventional diesel. Using RNG is what will ultimately help UPS meet its 2025 sustainability goals."

**-Mike Whittlatch, Vice President of
Global Energy & Procurement (2/6/2020)**



"With more than 700 public stations across the U.S., the Hypertruck ERX leverages a robust natural gas refueling infrastructure. The truck is the only electric Class 8 vehicle that can achieve a net-negative greenhouse gas emissions footprint using RNG."

-Company Statement (6/25/2020)



"NW Natural is partnering with BioCarbN, a developer and operator of sustainable infrastructure projects, to convert methane from some of Tyson Foods facilities into RNG to heat homes and businesses."

"These first deals with Tyson are a good start. We plan to invest in more projects to meet our goals."



"Farms all over the U.S. are looking to convert manure into RNG. In the next 36 months we will have food waste co-digestion systems in each of the top 25 metro areas of the U.S."

-John Hanselman, Chairman and CEO (1/5/2021)



Corporate Support for RNG Across Industries



Source: The Coalition for Renewable Natural Gas.

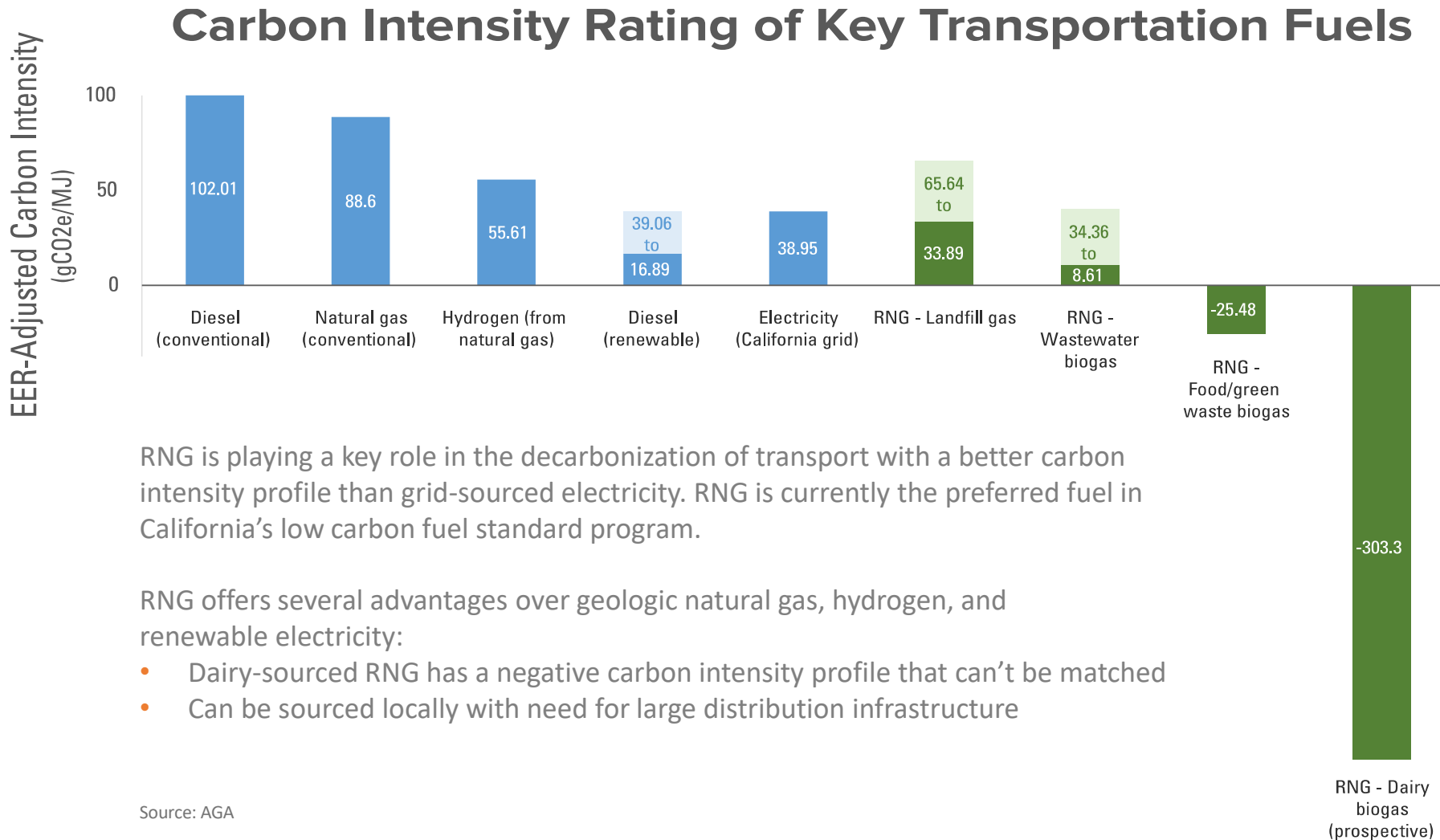
— Growth in RNG Mandates

Organization	Geography	Target/Mandate
 SoCalGas <small>A Sema Energy Ltd.</small>		20% RNG by 2030
		20% RNG by 2030
 NW Natural <small>We grow up here.</small>		15% RNG by 2030, 30% by 2050
 FORTIS BC		15% RNG by 2030
 energi		5% RNG by 2025
		€4.8bn support scheme for RNG
		10% RNG by 2030, 800mm investment
10 State-owned Enterprises		10 Bcm by 2025

– CleanCity RNG Initiatives



RNG Business Case: **Decarb a Strategic Rationale**



RNG Business Case: **Cost Estimates by Source**

	Feedstock	Cost Range (\$/MMBtu)
Anaerobic Digestion	Landfill Gas	\$7.10 – \$19.00
	Animal Manure	\$18.40 – \$32.60
	Water Resource Recovery Facilities	\$7.40 – \$26.10
	Food Waste	\$19.40 – \$28.30

Cost Parameter	ICF Cost Assumptions
Delivery	Cost of delivering the biogas at a price of \$1.20/MMBtu. This cost is in line with financing, constructing, and maintaining a pipeline of about 1 mile in length. The cost of delivering the same volumes of biogas that require pipeline construction greater than 1 mile will increase, depending on feedstock/technology type, with a typical range of \$1–\$5/MMBtu.
Project Lifetimes	The levelized cost of gas was calculated based on the initial capital costs in Year 1, annual operational costs discounted at an annual rate of 5% over 20 years, and biogas production discounted at an annual rate of 5% for 20 years.

Source: ICF Study on the Use of Renewable Natural Gas

RNG Business Case: **Environmental Attributes**

Renewable Fuel Standard (RIN Market)

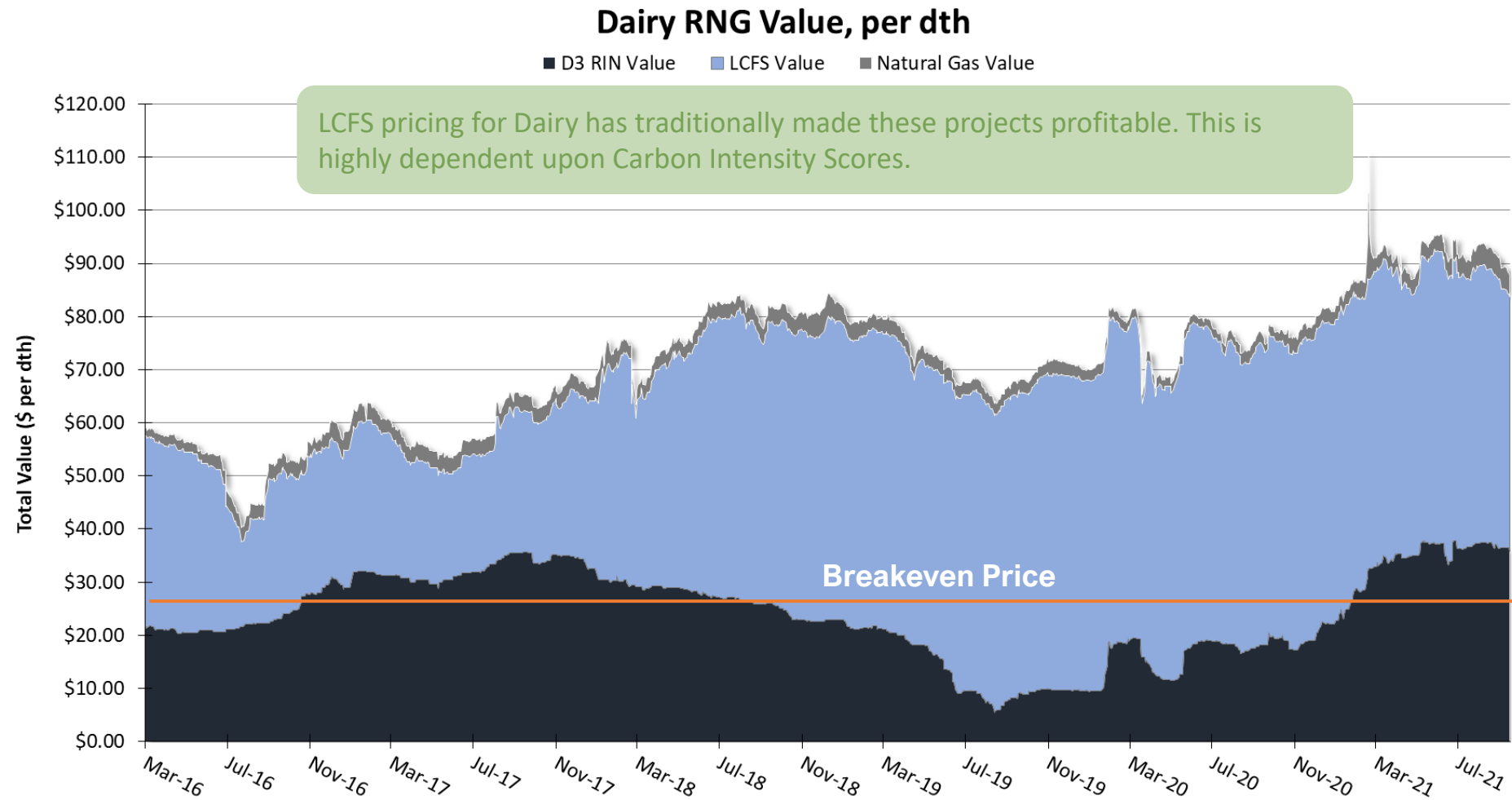
- **Purpose:** Renewable Fuel Standard (RFS) requires obligated parties (refiners and importers) to procure certain amount of renewable fuel each year
- **Objective of RFS:** Replace 36 billion gallons of petroleum-based fuel consumed by the transportation sector in the U.S. with renewable fuel by 2022 and thereafter
- **Origin:** Established in 2005 under Energy Policy Act and required refiners and importers of gasoline and diesel (defined as Obligated Parties) to procure a certain amount of their fuel that is defined as renewable fuel under RFS
- Each renewable fuel is defined a “D code” based on feedstock and fuel production process
- Biogas produced by dairy farm is considered a “D3 RIN”
- To be eligible for RINs:
 - Renewable gas must be used as transportation fuel (either as CNG and/or LNG)
 - Registration, compliance and verification of RINs

Low Carbon Fuel Standard (LCFS Market)

- **Purpose:** Low Carbon Fuel Standard (LCFS) is a California mandate to reduce statewide greenhouse gas emissions from the California transportation sector
- **Objective of LCFS:** Reduce carbon intensity of fuels in the transportation sector by 20% by 2030
- **Enforcement:** California Air Resources Board (CARB)
- 1 LCFS represents 1 metric ton of CO₂ emissions reduction
- Carbon intensity often determines whether the fuel is eligible for LCFS, with the lowest carbon intensity (negative carbon intensity) required to secure LCFS
- Agriculture has much lower carbon intensity than landfills and wastewater treatment plants
- To be eligible for LCFS:
 - Renewable gas must be used as transportation fuel (either as CNG and/or LNG)
 - Registration, compliance and verification of LCFS
 - CI score must be competitive against alternatives (e.g. dairies more competitive than landfills)

Renewable transportation fuels may generate both RINS and LCFS if fuel is consumed in California.

RNG Value Stack - Dairy

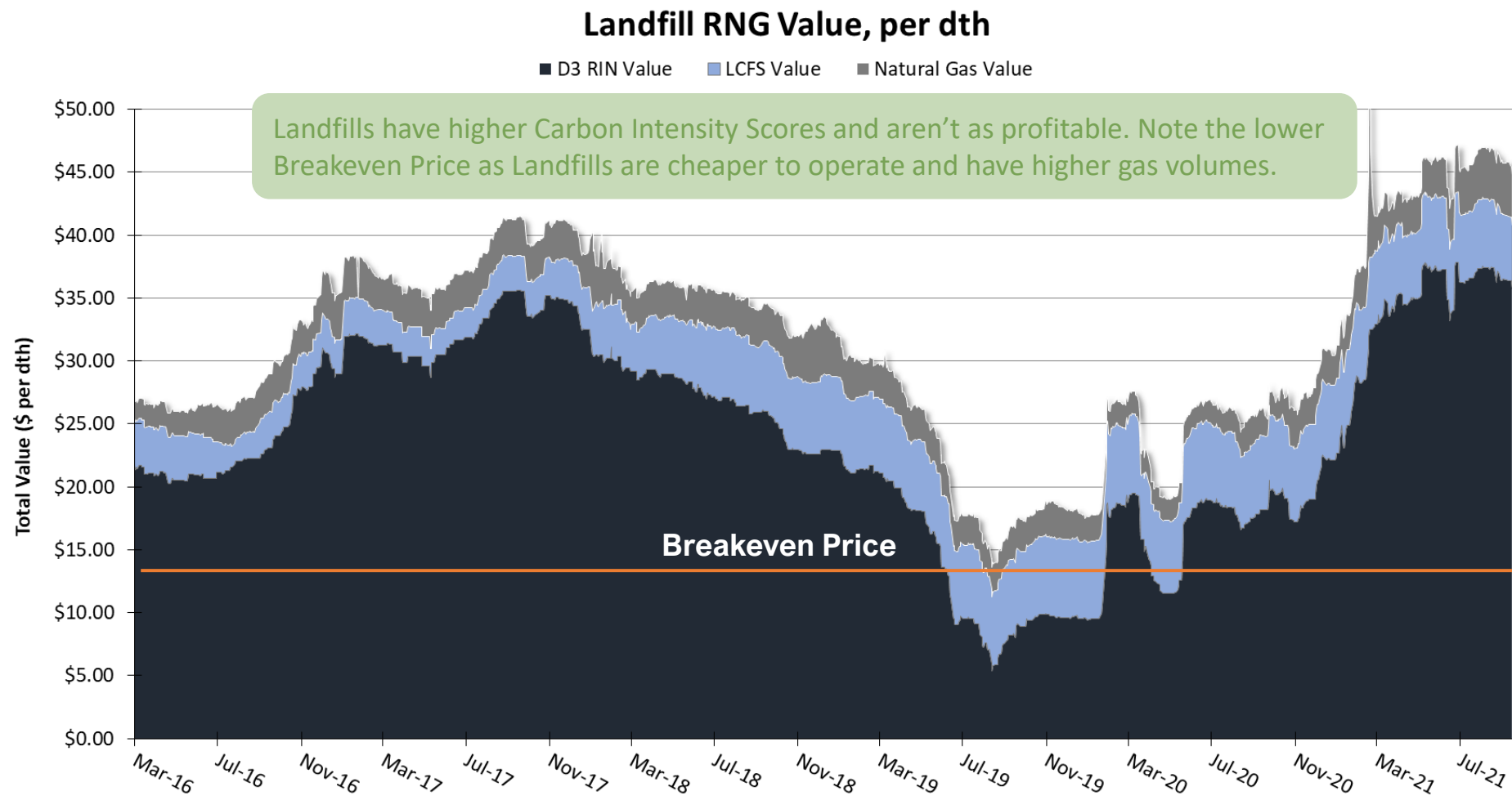


Source- Element Markets

*Natural Gas Value is the Henry Hub natural gas spot market price as reported by US Energy Information Administration

**LCFS Value was calculated based on an assumed carbon intensity value of -250 gCO₂/MJ (ex. dairy manure management)

RNG Value Stack - Landfill



Source- Element Markets

*Natural Gas Value is the Henry Hub natural gas spot market price as reported by US Energy Information Administration

**LCFS Value was calculated based on an assumed carbon intensity value of 50 gCO₂/MJ (ex. landfill gas)

Monetizing Environmental Attributes of RNG

Landfill



Municipal Wastewater



Ag Digester



RNG Delivered



**RNG
Marketers**

(bridge
regulatory,
compliance and
buyers with
sellers)

RNG Revenue



Transportation Markets (e.g. LCFS)



Compliance Buyers (e.g. RINs)



Voluntary Buyers (e.g. carbon offsets)

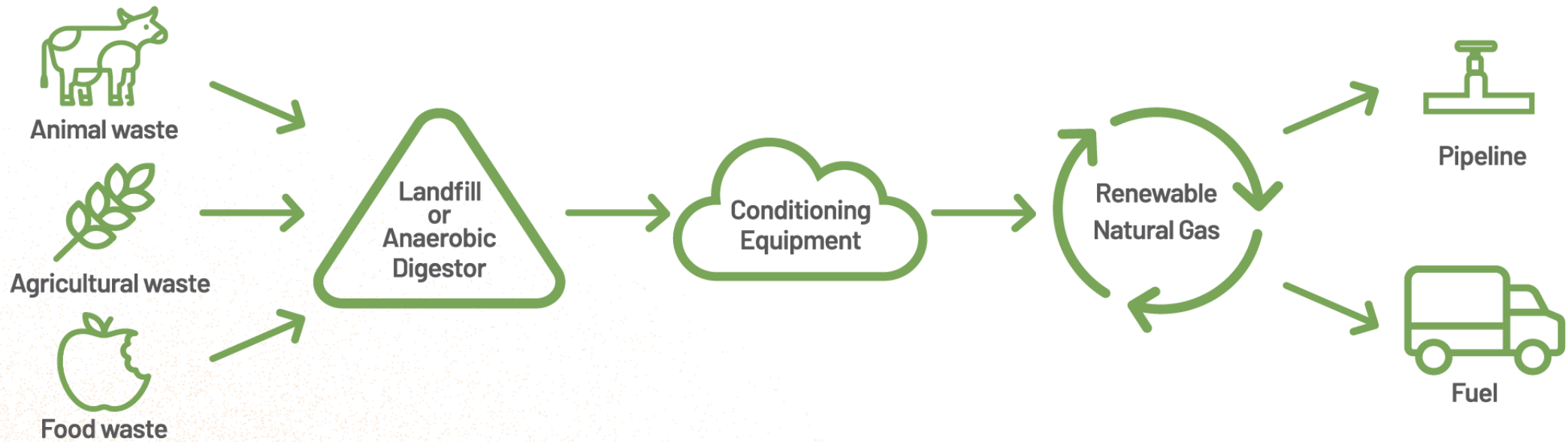




Part 2: Florida's RNG Potential

- **#13 in the U.S.** for methane production potential from biogas sources.
- **70 operational biogas projects** with potential for **375 new projects** to be developed based on the estimated amount of available organic material.
- **Generate \$1.13 billion** in capital investment and create 9,383 short-term jobs and 623 long-term jobs.
- Produce **52 BCF/yr of biogas** or **33 BCF/yr of renewable methane**.
- Reduce greenhouse gases by the **equivalent of removing 3.29 million cars** from the road.

RNG Value Chain



Sources of waste gas include landfills, wastewater treatment plants, animals and food.

The background of the slide is a photograph of a field of dandelions in bloom, with a warm, golden light filtering through the scene. A large, solid green leaf graphic is positioned in the upper right quadrant, partially overlapping the dandelion field and the white background of the right side of the slide.

Part 3: Our Interest in RNG

- **Renewable** source of energy.
- Delivers **clean air gains** with major reductions in greenhouse gas emissions.
- Provides ability to achieve zero, and often **carbon negative** emissions.
- An energy option that is **resilient, consistent and low cost**.
- **Local gas source** that contributes to sustainability goals while also **enhancing system reliability, infrastructure and economic development**.

Peoples Gas RNG Timeline

2017

Peoples Gas RNG Tariff
approved by Florida
Public Service
Commission
(1st in Florida)

2019

40+ RNG
development
opportunities
identified

2018

Dedicated RNG
development
team staffed

2021

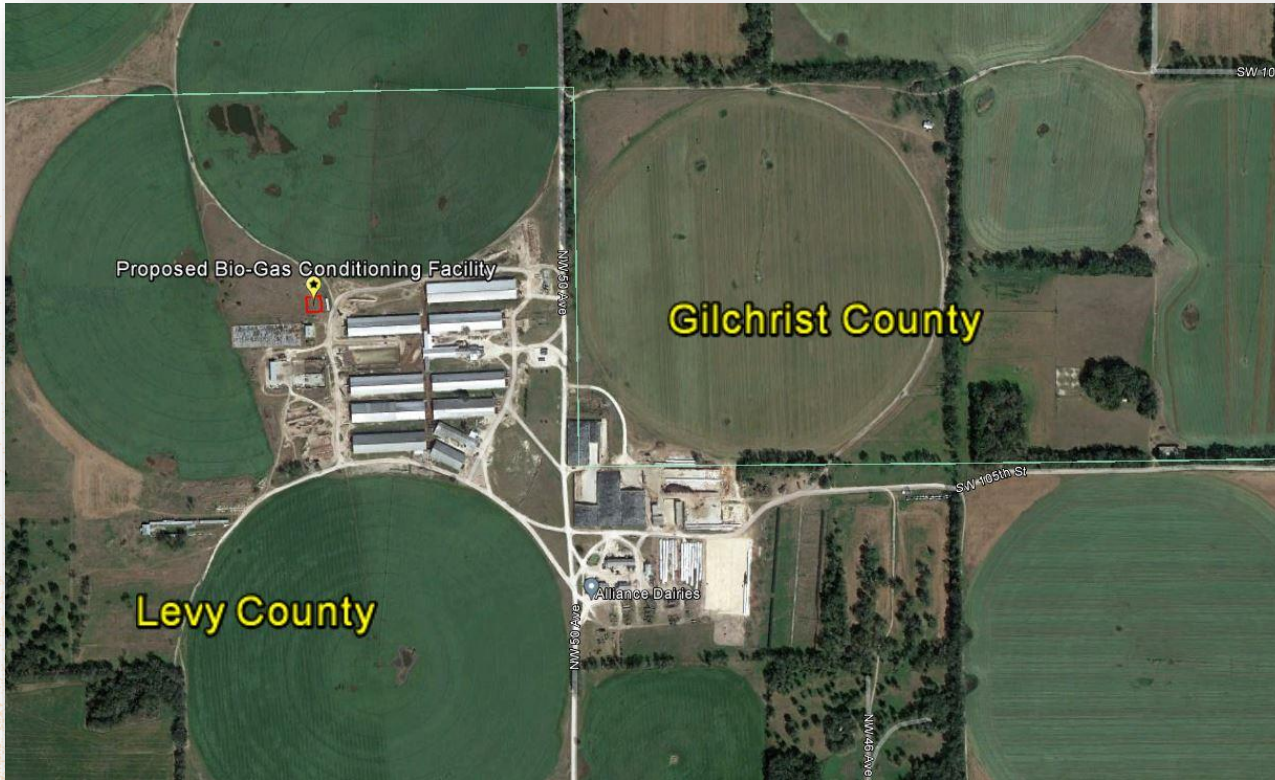
Executed development agreement
with Alliance Dairies, a first for Florida
natural gas LDC
Advancing multiple RNG projects



Peoples Gas + Alliance Dairies

- Alliance Dairies in Trenton near Gainesville
- Peoples Gas will develop, own and operate a facility that will generate **105,000 MMBtu of RNG**, enough to fuel **4,400 homes** a year
- Capture waste from approximately **6,500 cows** and clean it to pipeline-quality natural gas

Peoples Gas + Alliance Dairies



Peoples Gas is constructing a biogas conditioning facility at Alliance Dairies to produce RNG.

The project also includes construction of a pipeline to deliver the RNG to the Florida pipeline system at industry gas quality specifications.

Alliance Dairies will use its existing digester currently part of the farm operations.

Completion is expected Summer 2022.



Part 4: RNG Partnership Across the Value Chain

- Develop workable strategies to interconnect RNG supply to the natural gas supply system in Florida.
- Invest in raw biogas generation and cleanup technology to produce pipeline quality RNG.
- Create opportunities for purchase of biogas with additional assistance to secure environmental incentives.
- Reduce the carbon footprint of natural gas, in some cases above and beyond displacing fossil fuel usage.



RNG Partnership

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