



**NY Green Bank**  
A Division of NYSERDA



# NY Green Bank

## Webinar: Financing Biogas Projects

March 27, 2020





# From Organic Waste to Renewable Natural Gas (RNG)

*National Trends and a Growing Opportunity in New York*

Matt Tomich, President, Energy Vision

NY Green Bank Webinar – March 27, 2020



# About Energy Vision

- Mission: To advance the adoption of the low-carbon renewable energy sources, transport fuels, and new technologies needed for a sustainable future.
- Program: Since 2010, primary focus on capture/utilization of methane emissions to displace fossil fuels — especially in transportation — through reports, workshops, education and outreach, advisory and media.
- Energy Vision's Impacts:
  - Core team published the first U.S. reports on natural gas for refuse trucks ("Greening Garbage Trucks") and transit buses ("Bus Futures") in the early 2000's.
  - Hosted the first national workshop on "Renewable Natural Gas" in 2010 with the U.S. Dept. of Energy (+ 16 regional workshops since)
  - Published dozens of case studies, articles and Op-Eds on the RNG opportunity, inspiring new projects and positive change
  - Performed RNG technology and market assessments for various state, regional and federal government agencies/entities

# Why Focus on Methane?

- ▶ Methane accounts for 10% of total US greenhouse gas emissions and 16% of total global GHG emissions.... assuming a “global warming potential” 25x more potent than carbon dioxide over a 100 year timeframe.
- ▶ HOWEVER, methane is 86x more powerful than CO<sub>2</sub> over the 20-year time horizon; and it is the next 10-20 years that will be most critical in combatting the global climate challenge.
- ▶ Preventing the escape of anthropogenic methane (biogas) via anaerobic digestion AND using this energy-rich resource to displace fossil fuels offers significant net-benefits.



# Biogas-to-Electricity

- Historically, biogas-to-electricity has been the norm, because of technology and policy:
  - Renewable Portfolio Standards
  - Feed-in Tariffs/Net-Metering
  - Investment/Production Tax Credits
- Access to the above programs was largely restricted to generating renewable power

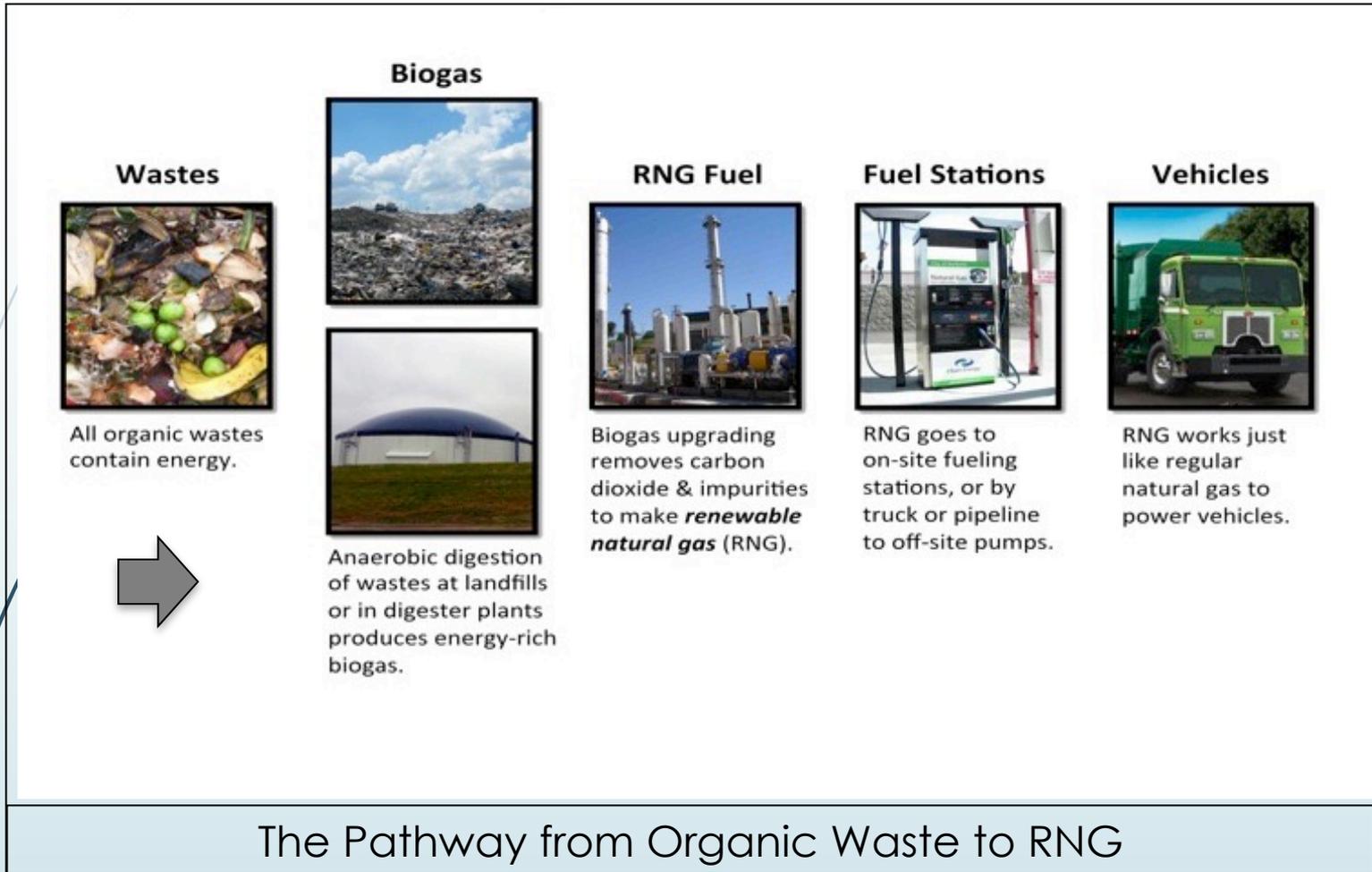


# Upgrading Biogas to Renewable Natural Gas (RNG), which is interchangeable with geologic gas

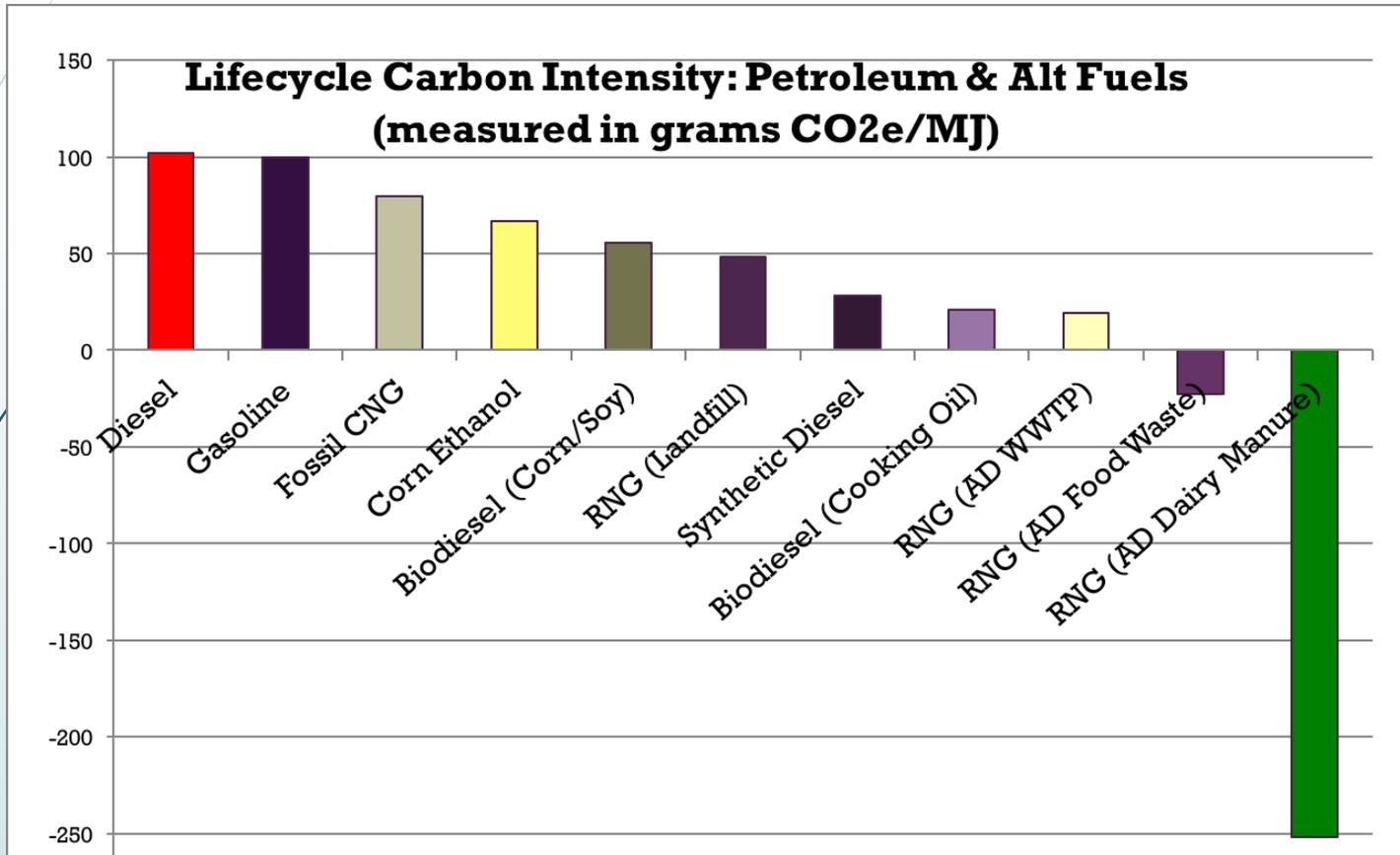
- Heating/Cooling/Cooking
- Power Generation
- Industrial Uses
- **Transportation** (use in Natural Gas Vehicles)



# RNG for Transportation



# The Climate Case for RNG use as a Vehicle Fuel



Source: CARB LCFS Pathway Data, 2019

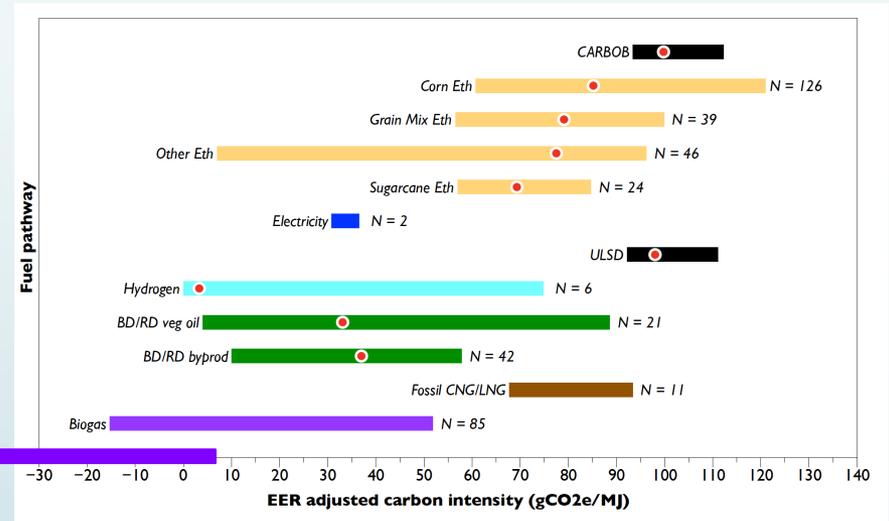
# The Need to go Negative



Dairy AD RNG

RNG

-276 gCO<sub>2</sub>e/MJ

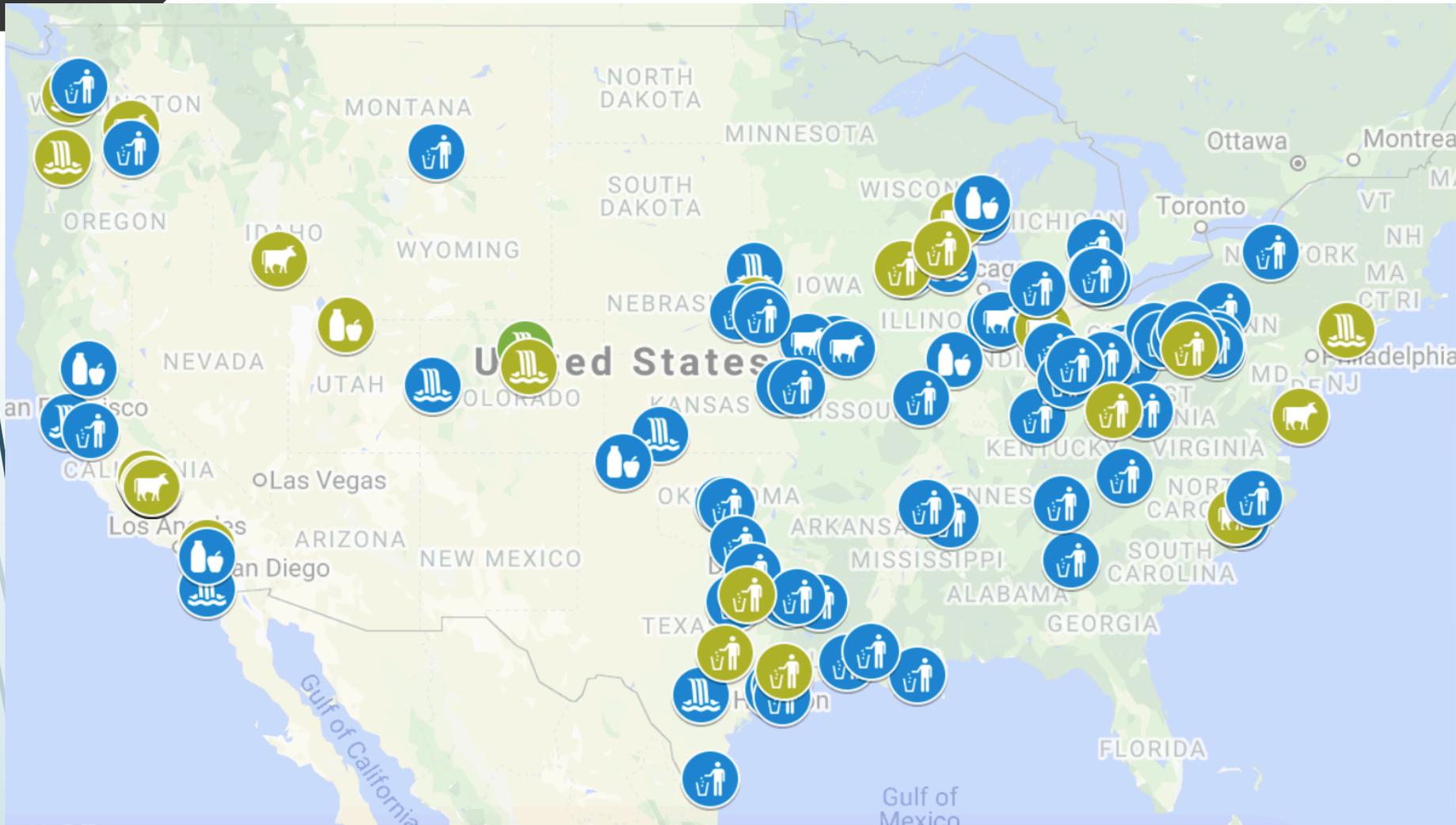


"Getting to Neutral," Jan 2020 Lawrence Livermore report:

<https://livermorelabfoundation.org/2019/12/19/getting-to-neutral/>



# ~105 Operational US RNG Projects



WWTP



Manure



Landfill

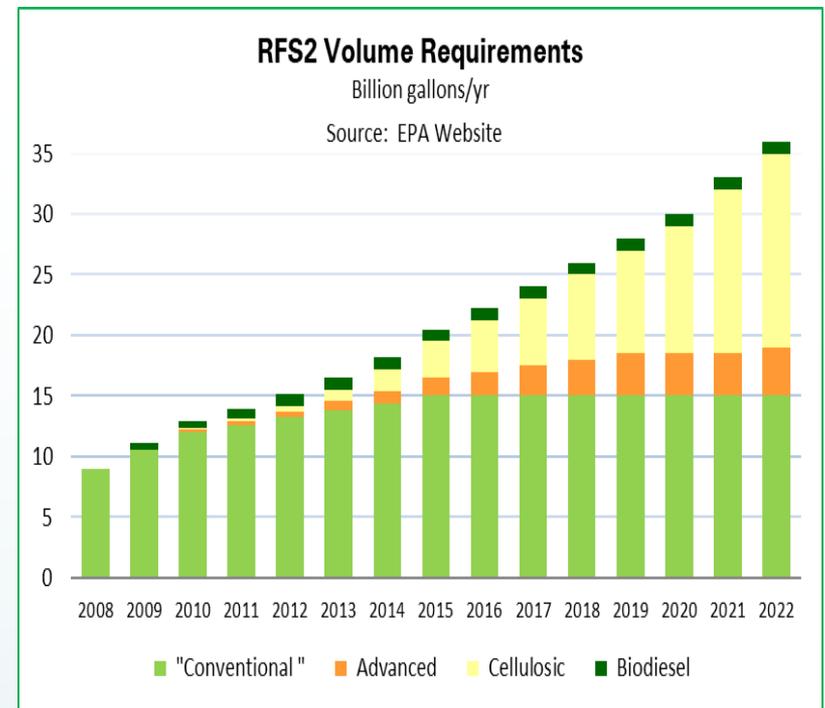


Food Waste

# Federal Policy Driver

## The Renewable Fuel Standard

- **Enacted in 2005 and Amended in 2007**  
- "The Ethanol Mandate" but also a push to develop waste-derived fuels
- **Designed to Incent Biofuel Production**  
Requires "Obligated Parties" (e.g. oil producers and refiners) to produce/blend biofuels OR purchase credits (RINs) to meet yearly Obligations



### Weekly D3, D4, D5 and D6 RINs Prices



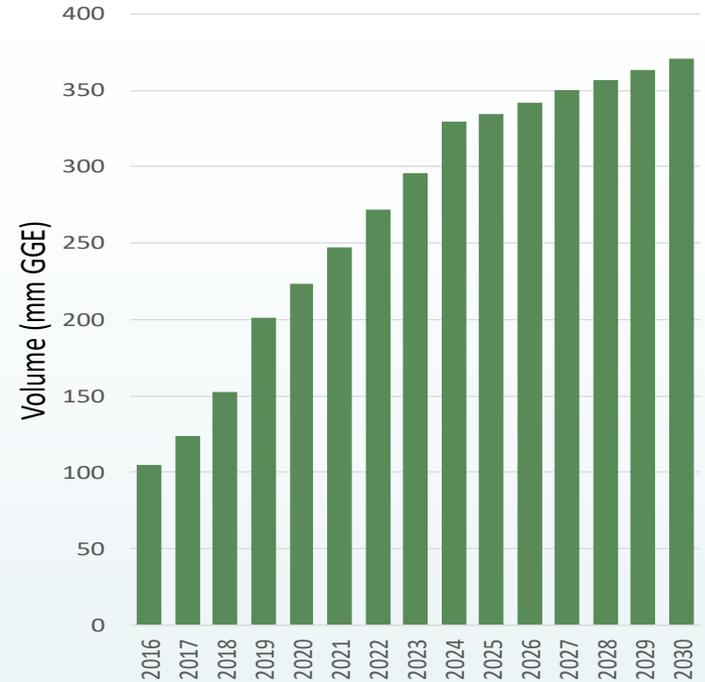
Transfer Date by Week, FUEL (D Code)

# State Policy Driver(s)

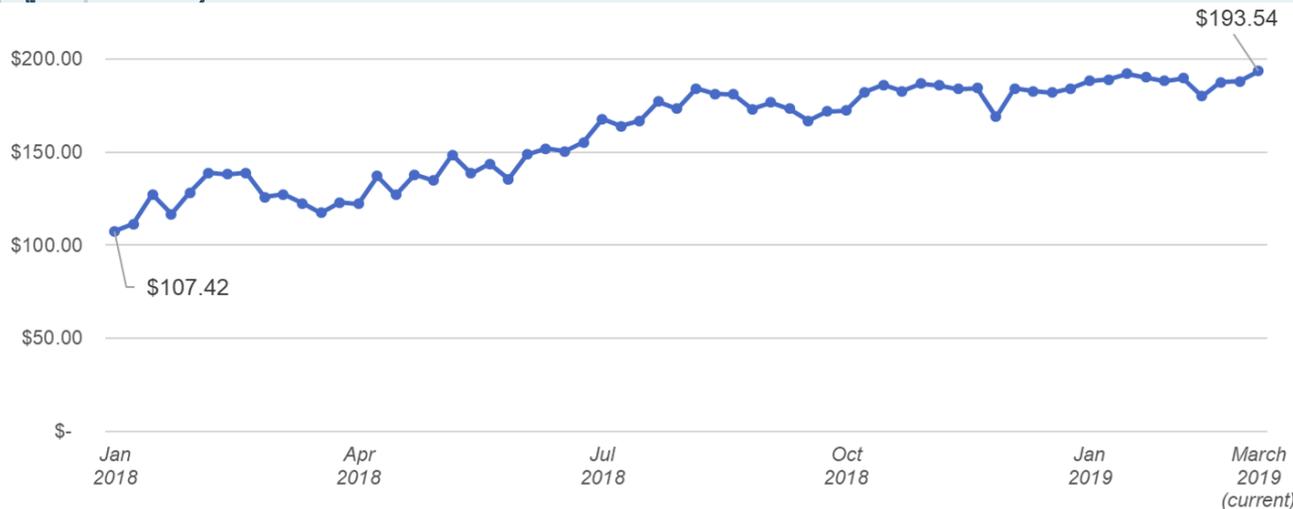
## Low Carbon Fuel Standards

- California**  
 First state to implement an LCFS in 2009;  
 Achieved 10% reduction in transport fuels  
 “carbon intensity” in 10 years; Mandated  
 20% target by 2030
- Oregon**  
 “Clean Fuels Program” passed in 2016;  
 Mirrored after CA program and ramping up

## California RNG Demand Growth



## Historical California LCFS Credit Value



### Sample LCFS Credit Prices (\$/gal gasoline-equivalent for fuels used as gasoline)

CI Score (gCO <sub>2</sub> e/MJ)	Credit Price
-273	\$8.27
10	\$1.88
20	\$1.65
30	\$1.43
40	\$1.20
50	\$0.98
60	\$0.75

# RNG End Users

- **Transportation Market Driving Investments**

*CNG/LNG fleets expanding RNG use nationally; driven by RFS and LCFS credit value well above commodity gas pricing*

- **Gas Utility Procurement Heating Up**

*A growing list of natural gas utilities across the country are developing RNG programs for residential and commercial customers*

- **Voluntary CSR Commitments Emerging**

*Corporations, colleges and universities are recognizing the role RNG can play*



Middlebury



# The Biogas-to-RNG Opportunity in NY

## Dairy Farms

- ▶ 28 Existing on-farm digesters out of 300+ large “candidate” farms
- ▶ Historically, state and federal incentives limited to producing electricity
- ▶ Several dairy RNG projects underway with plans to sell gas to California

## Wastewater Facilities

- ▶ 586 operational WWTPs; ¼ have operating digesters
- ▶ NYC DEP's 14 WWTPs alone currently produce close to 2 million mmtbu of biogas
- ▶ Significant untapped opportunities

## Landfill/Food Waste

- ▶ 25 large landfills already collect and use biogas, including 2 RNG projects (Fresh Kills/Seneca Meadows)
- ▶ 3.9 million tons of commercial and residential food scraps are available for future digestion

# Current & Potential Future RNG Project Drivers

## Current

- ▶ City and state level landfill diversion mandates that will require anaerobic digestion or composting
- ▶ NYSERDA funding for conversion from biogas-to-electricity to RNG (PON 3739)
- ▶ Federal RFS + California LCFS
- ▶ Growing natural gas utility + CSR demand to decarbonize

## Future

- ▶ New York's Climate Leadership & Community Protection Act sets the most ambitious state-level carbon reduction goals in the US
  - ▶ Ongoing uncertainty around the status of anaerobic digestion under this policy
- ▶ Introduction of a Low Carbon Fuel Standard in NY



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# NY Green Bank

## Webinar: Financing Biogas Projects

March 27, 2020 | Andrew Kessler, NY Green Bank

New York, NY

# NY Green Bank Accelerates Clean Energy Deployment in NYS

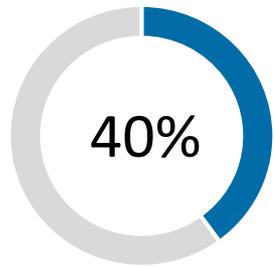
## Mission:

To accelerate clean energy deployment in New York by working in collaboration with the private sector to transform financing markets

- **What:** A \$1 Billion State-sponsored investment fund that is a division of NYSERDA
- **Why:** To alleviate financing gaps in New York's clean energy markets and create a cleaner, more resilient and affordable energy system
- **How:** By mobilizing greater private sector activity to increase the availability of capital for clean energy projects

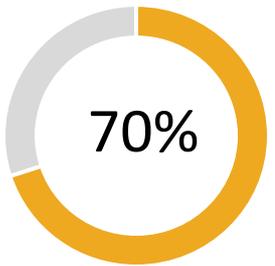
# Advancing NYS Climate Goals

**Climate Leadership & Community Protection Act:** Governor Andrew M. Cuomo's new framework for decreasing GHG emissions, increasing renewable electricity, and improving energy efficiency



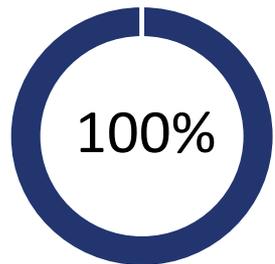
40%

Reduction in emissions by 2030



70%

Renewable electricity by 2030



100%

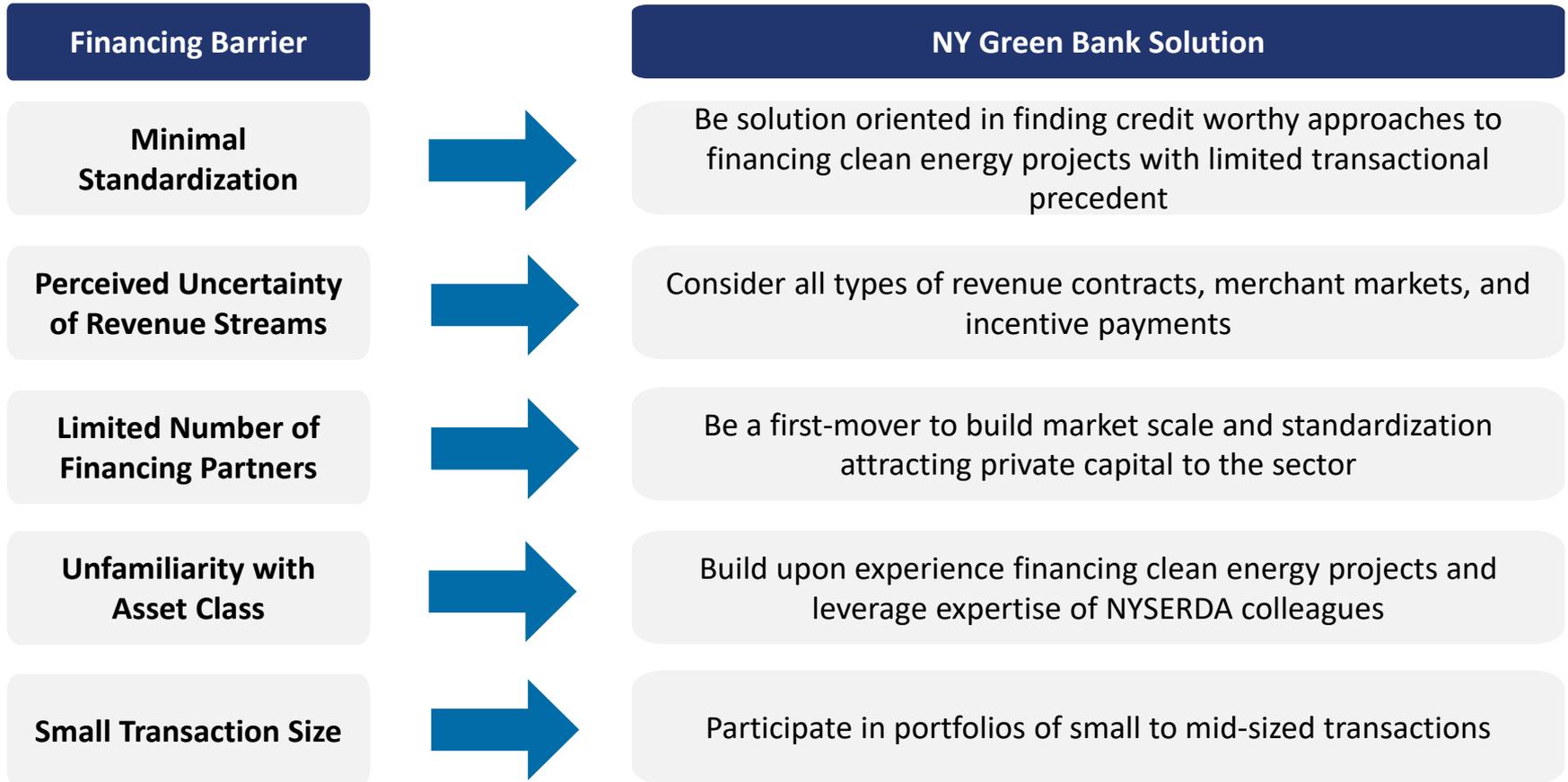
Zero-carbon electricity by 2040

**+ 9,000 MW** of offshore wind by 2035

**+ 6,000 MW** of distributed solar by 2025

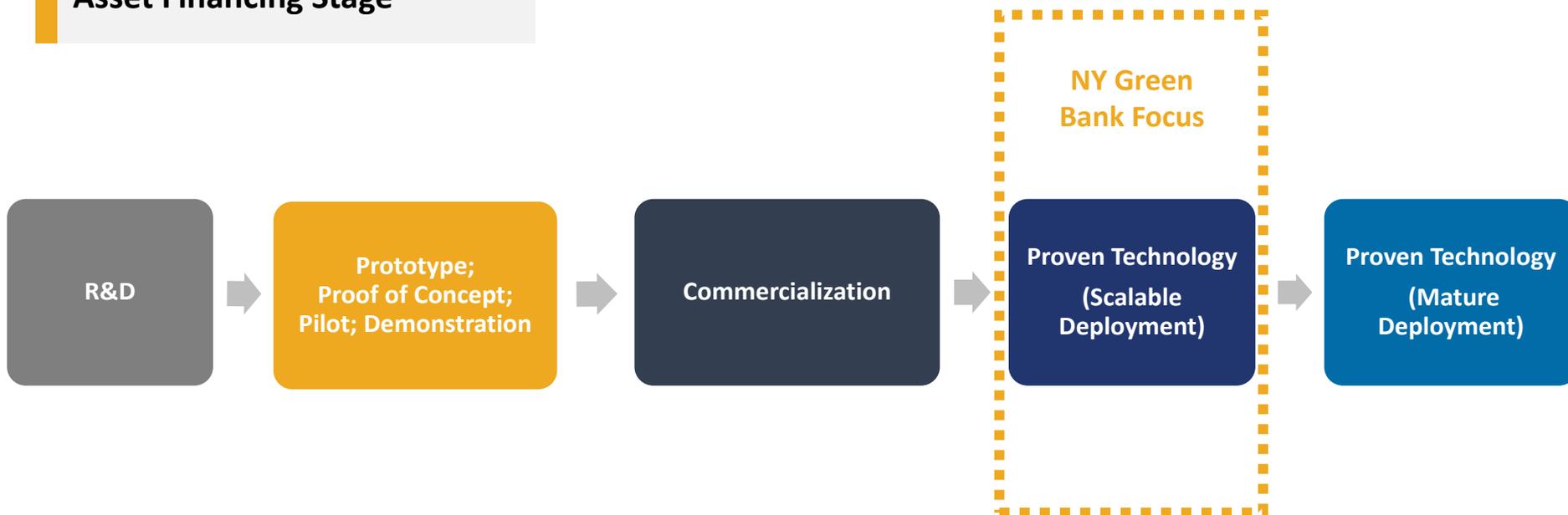
**+ 3,000 MW** of energy storage by 2030

# Role in Overcoming Financing Barriers



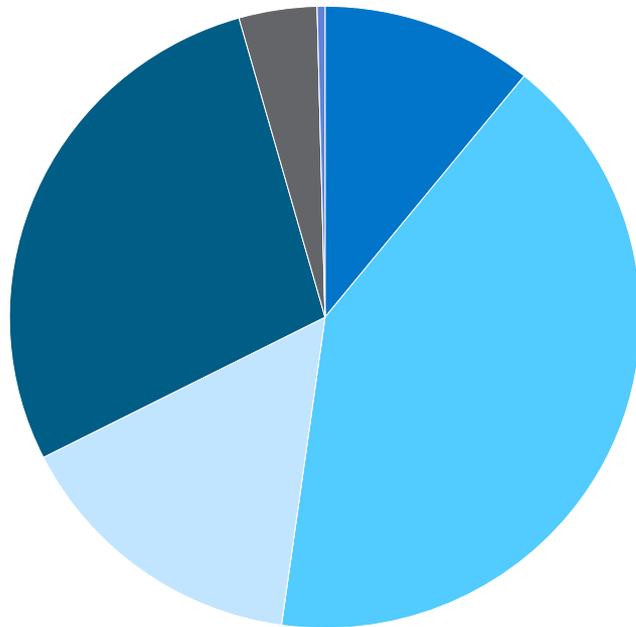
# Investment Focus

## Asset Financing Stage



# Pipeline & Portfolio Highlights (as of December 31, 2019)

## Technology Distribution of Active Pipeline



## Portfolio Highlights

- **\$909.2 million** in overall investments to date
- Investments support clean energy projects with total project costs between **\$2.0 and \$2.4 billion**
- **\$79.4 million** in cumulative revenues generated since inception

# Investment Strategy & Criteria

## Strategy:

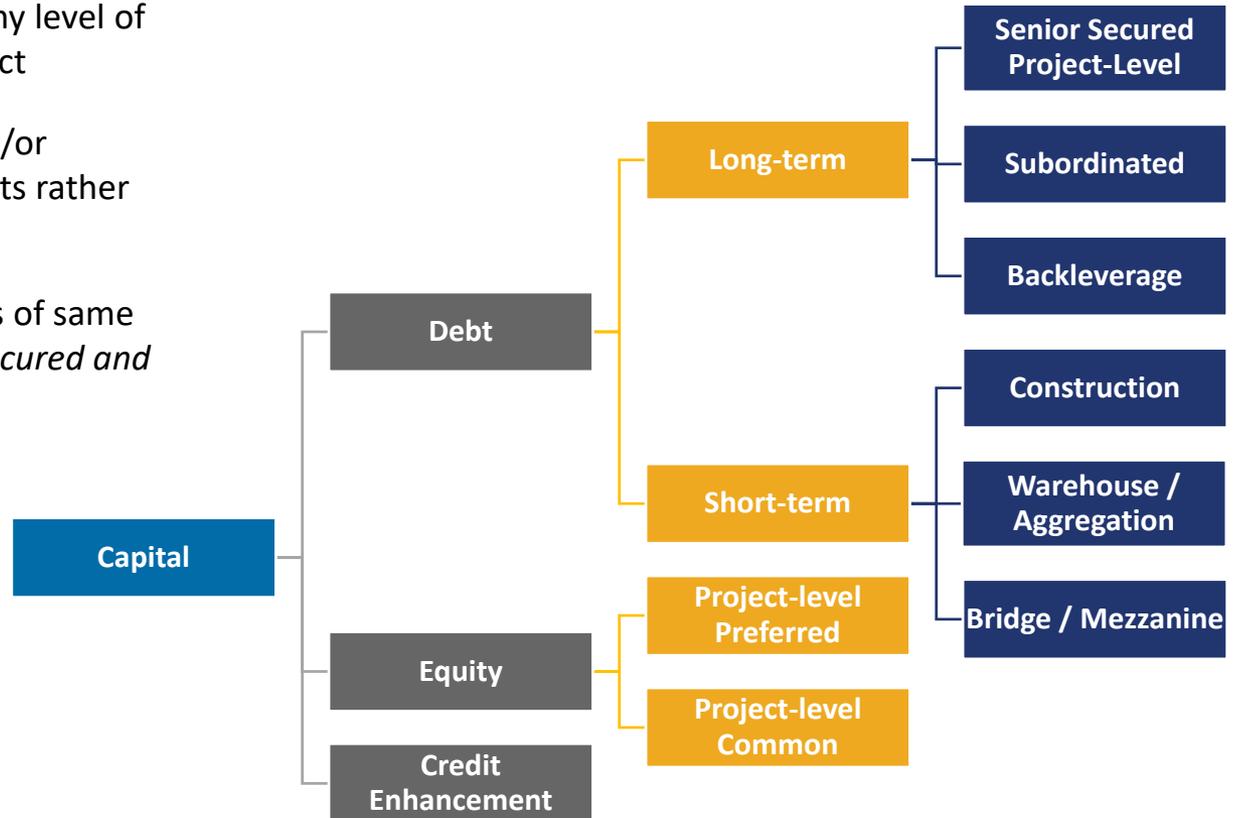
- ✓ Executing structured, project finance transactions
- ✓ Due diligence process similar to a commercial bank
- ✓ Structuring transactions on market terms to attract private capital investment

## Primary Investment Criteria:

- ✓ Demonstrate GHG reductions
- ✓ Demonstrate how the transaction contributes to market transformation
  - ✓ Mobilization of private capital
  - ✓ Additionality in proposed investments
- ✓ Be economically and technically feasible, and provide financial returns to NY Green Bank

# Potential Roles in Project Finance Transactions

- NY Green Bank can invest at any level of the capital structure of a project
- Directly invests in projects and/or portfolios of clean energy assets rather than companies
- Can invest in multiple tranches of same project (*For example, senior secured and term loan B in the same deal*)



# Select Counterparties to Date

BLACKROCK

THE CARLYLE GROUP



GUGGENHEIM



# NY Green Bank's Approach to Biogas Projects

- Developing biogas infrastructure is strategic priority for NY Green Bank
  - ✓ Currently working on 3 biogas and 2 LFG projects totaling \$134MM in NYGB commitments
  - ✓ Two of the biogas projects are manure only; one project is entirely food waste, some yard waste
  - ✓ Sole lender in two of the biogas project and both LFG projects; Senior lender in one of the biogas project
- Feedstock agnostic
- Technology must be proven with a positive track record
- Project finance orientation
- Capital stack flexibility (Senior, Subordinated, Back levered / mez, preferred)
- Bilateral or as part of a lender group

# Key Diligence Items

- Company (Sponsor) & Management team (experience, track record, financial wherewithal)
- Site control
- Feedstock contracts (counterparty risk, length of contracts)
- Permitting
- Technology (verified by Independent Engineer)
- Projections (certain items verified by Independent Engineer)
- Revenue visibility / contractual nature of cash flows (energy monetization, attributes, other)
  - ✓ For CHP: PPA, RECs
  - ✓ For RNG: RINs, LCFS. Verify attributes, attestation, gas clean up technology & O&M, pipeline injection strategy, duration of contract, counterparty risk, committed vs. best efforts, contracted, merchant or quasi
- Digestate disposal (cost) or monetization (revenue) strategy
- Third party O&M provider (experience, track record, terms of O&M contract)
- EPC (experience, track record, balance sheet, terms of EPC contract)
- Servicer replacement options & risk



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