



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 CO₂ 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

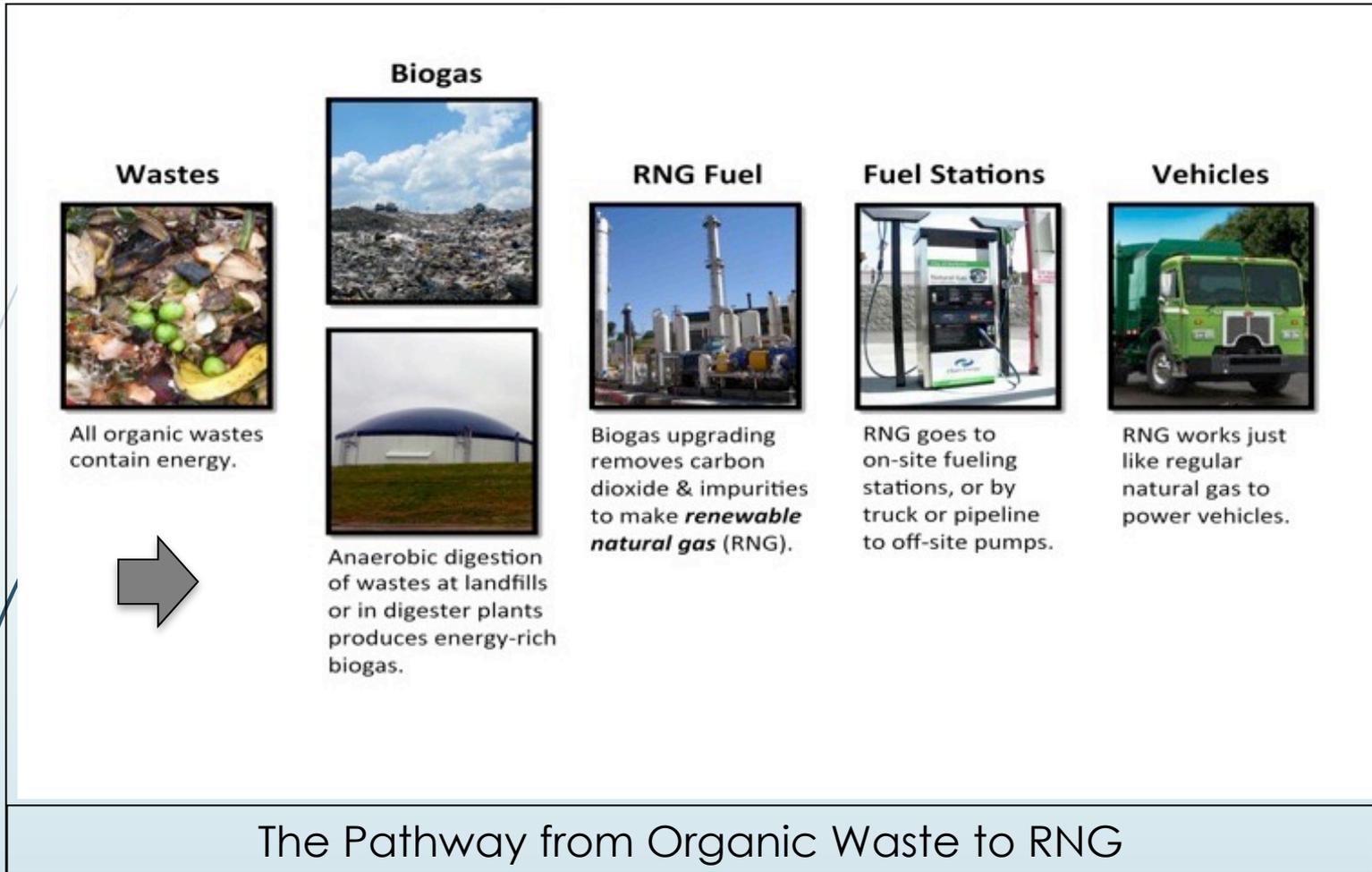


Upgrading Biogas to Renewable Natural Gas (RNG), which is interchangeable with geologic gas

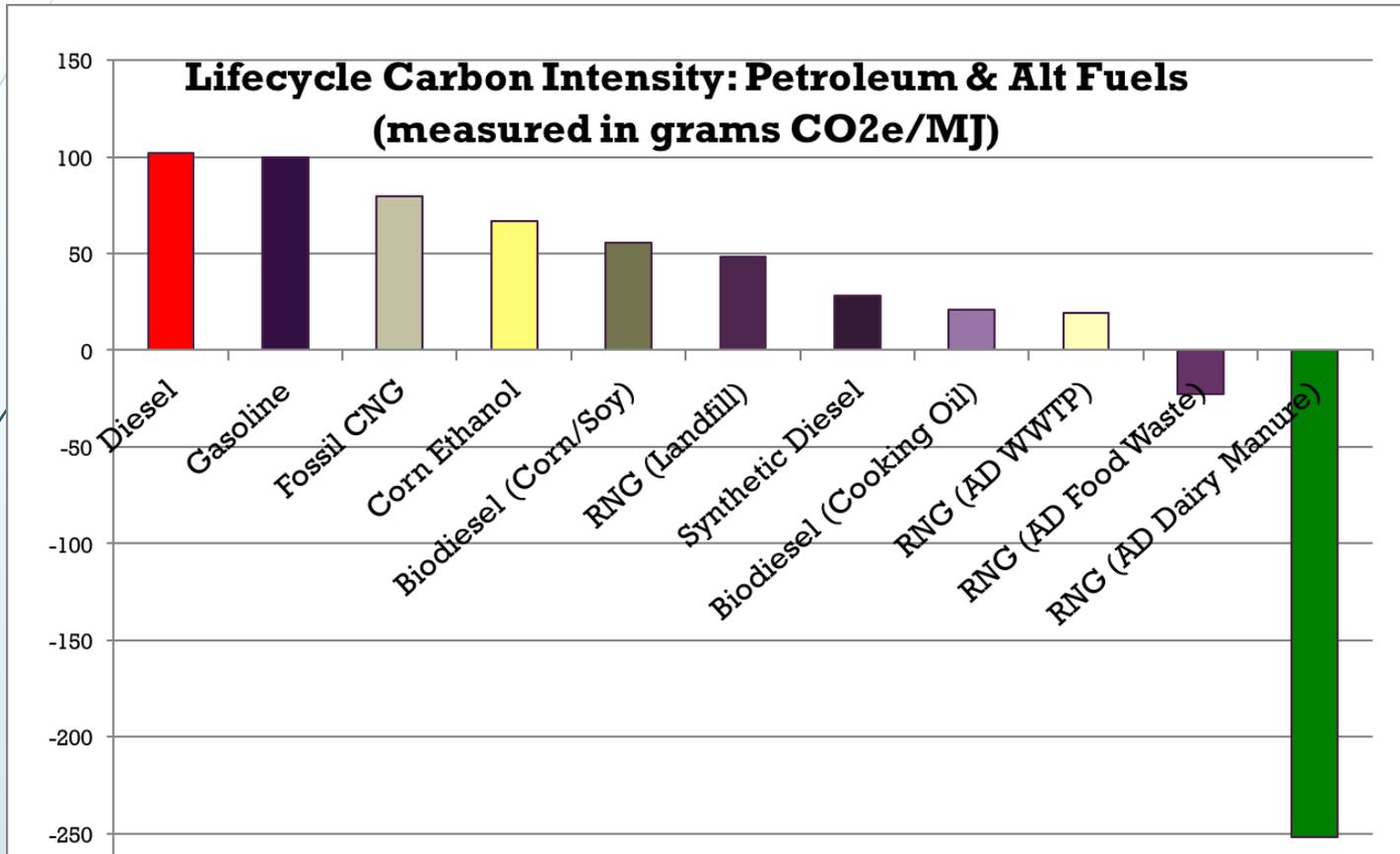
- Heating/Cooling/Cooking
- Power Generation
- Industrial Uses
- **Transportation** (use in Natural Gas Vehicles)



RNG for Transportation



The Climate Case for RNG use as a Vehicle Fuel



Source: CARB LCFS Pathway Data, 2019

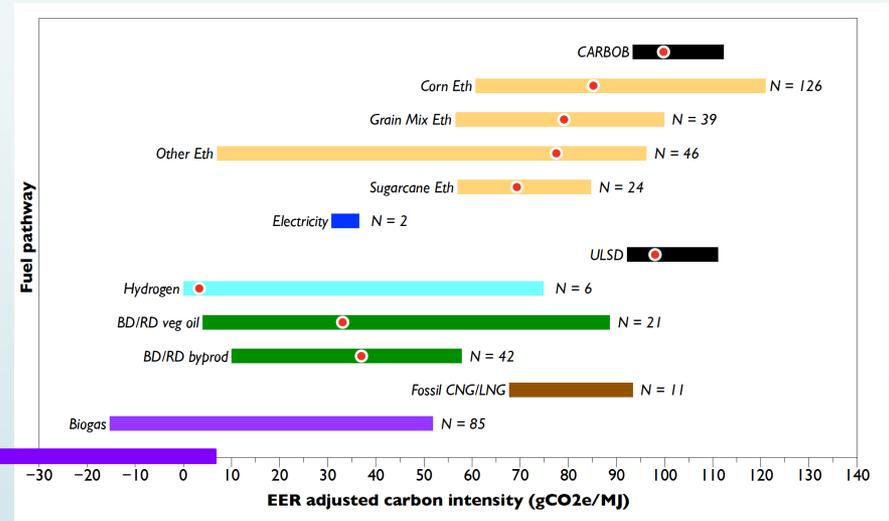
The Need to go Negative



Dairy AD RNG

RNG

-276 gCO₂e/MJ



“Getting to Neutral,” Jan 2020 Lawrence Livermore report:

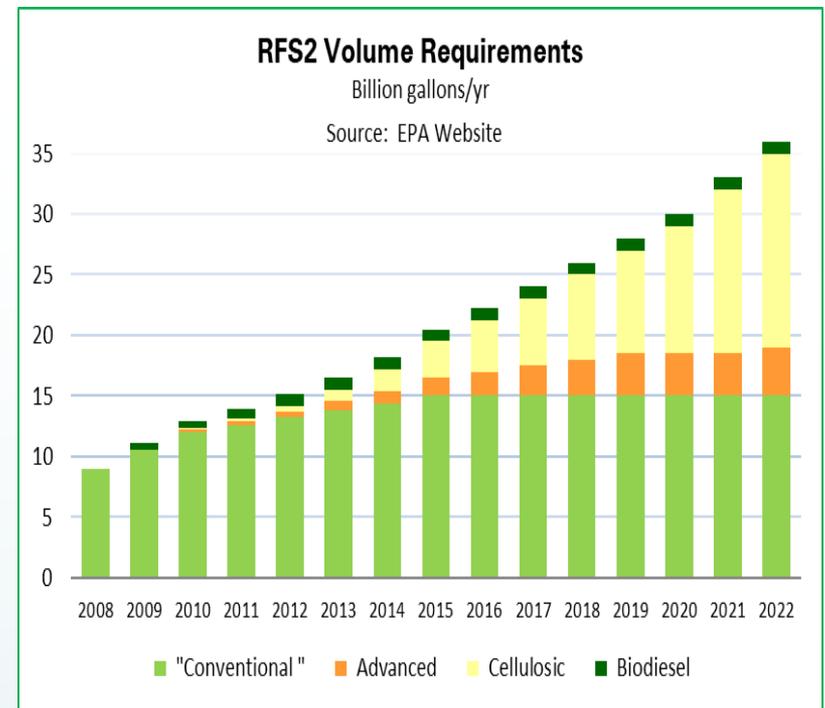
<https://livermorelabfoundation.org/2019/12/19/getting-to-neutral/>



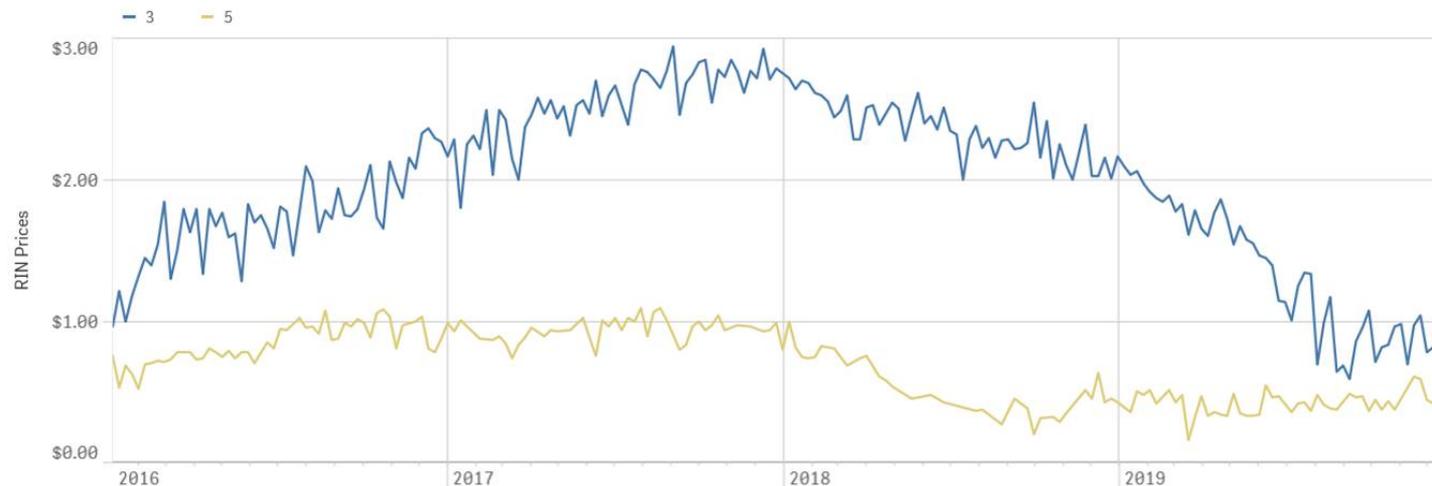
Federal Policy Driver

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



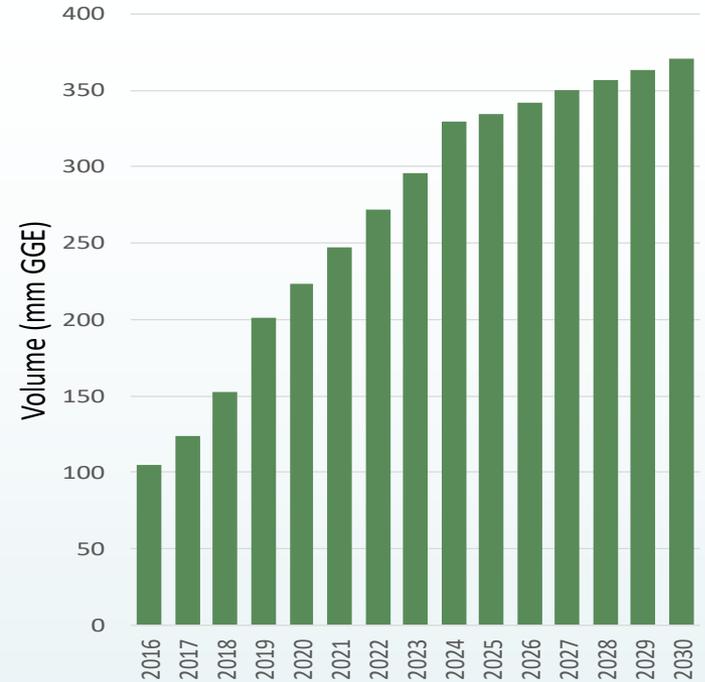
Transfer Date by Week, FUEL (D Code)

State Policy Driver(s)

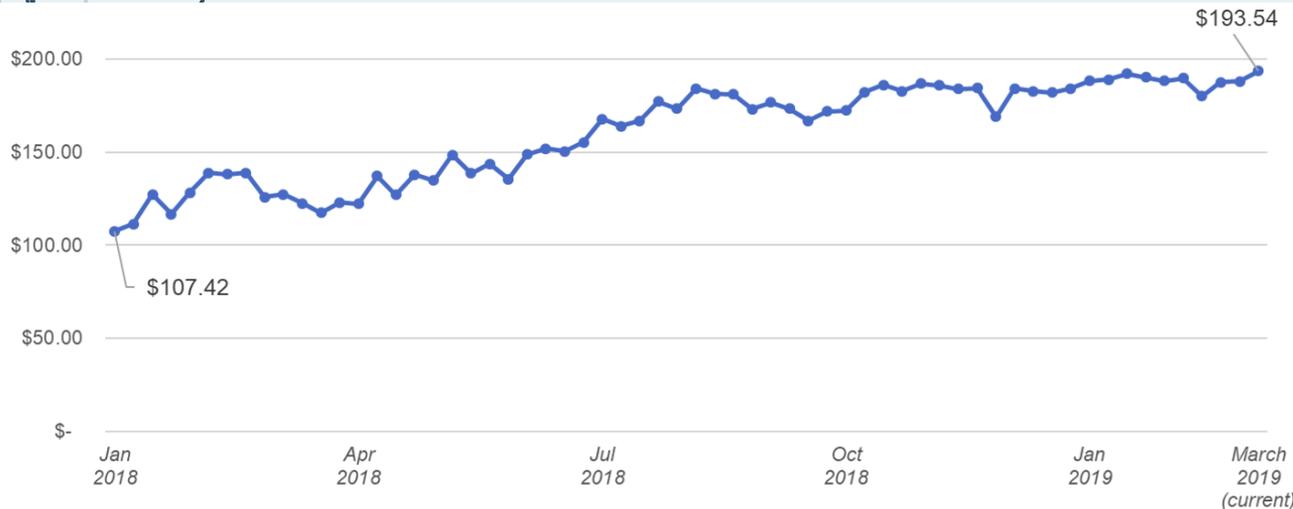
Low Carbon Fuel Standards

- 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 ₂ 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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March 27, 2020 | Andrew Kessler, NY Green Bank

New York, NY

NY Green Bank Accelerates Clean Energy Deployment in NYS

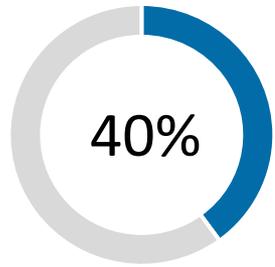
Mission:

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

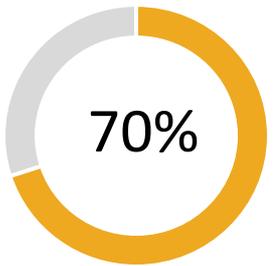
- **What:** A \$1 Billion State-sponsored investment fund that is a division of NYSERDA
- **Why:** To alleviate financing gaps in New York's clean energy markets and create a cleaner, more resilient and affordable energy system
- **How:** By mobilizing greater private sector activity to increase the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

Advancing NYS Climate Goals

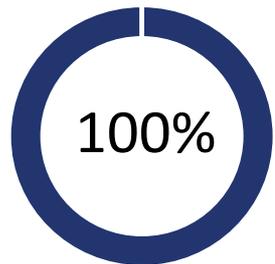
Climate Leadership & Community Protection Act: Governor Andrew M. Cuomo's new framework for decreasing GHG emissions, increasing renewable electricity, and improving energy efficiency



Reduction in emissions by 2030



Renewable electricity by 2030



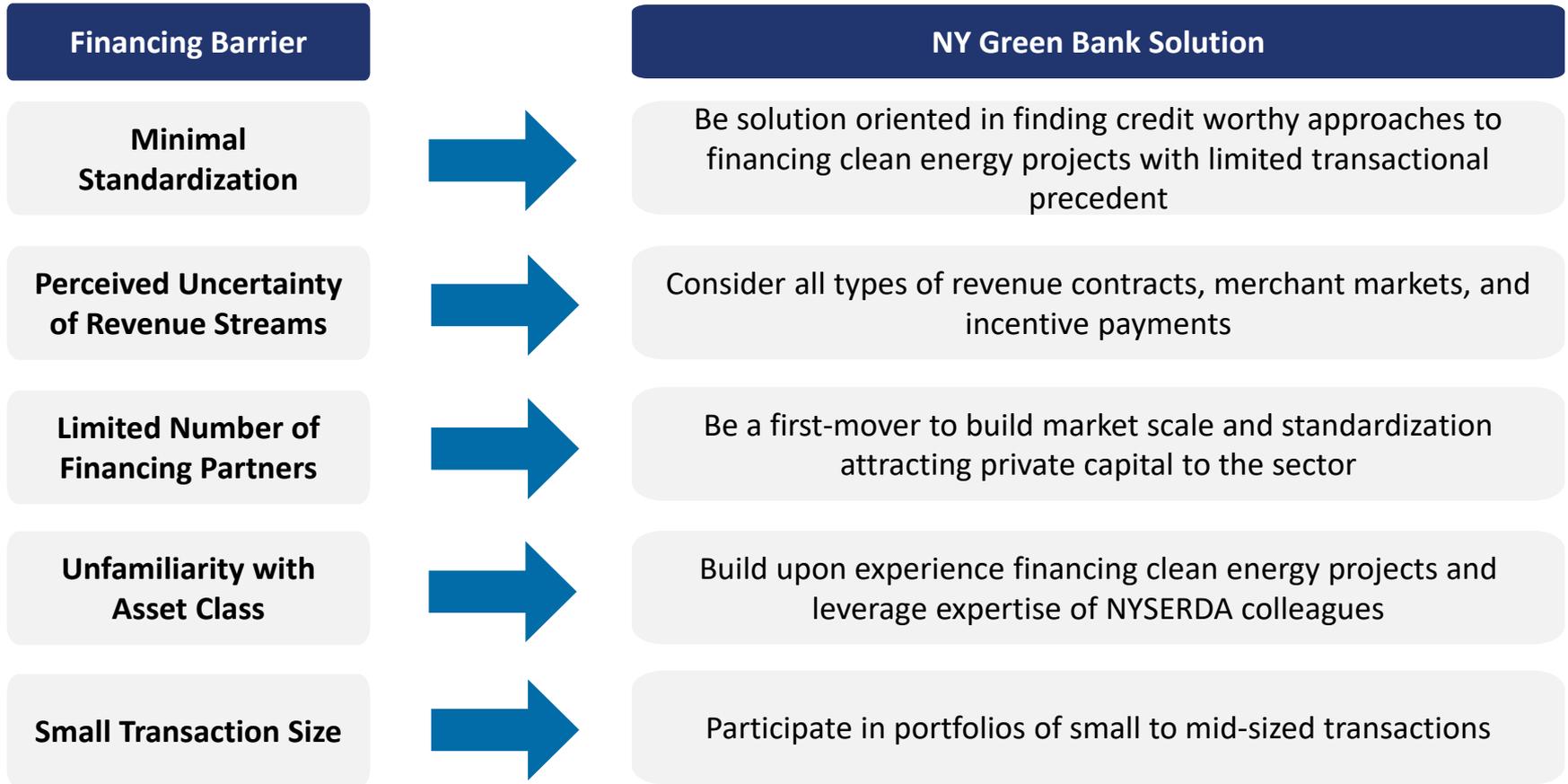
Zero-carbon electricity by 2040

+ 9,000 MW of offshore wind by 2035

+ 6,000 MW of distributed solar by 2025

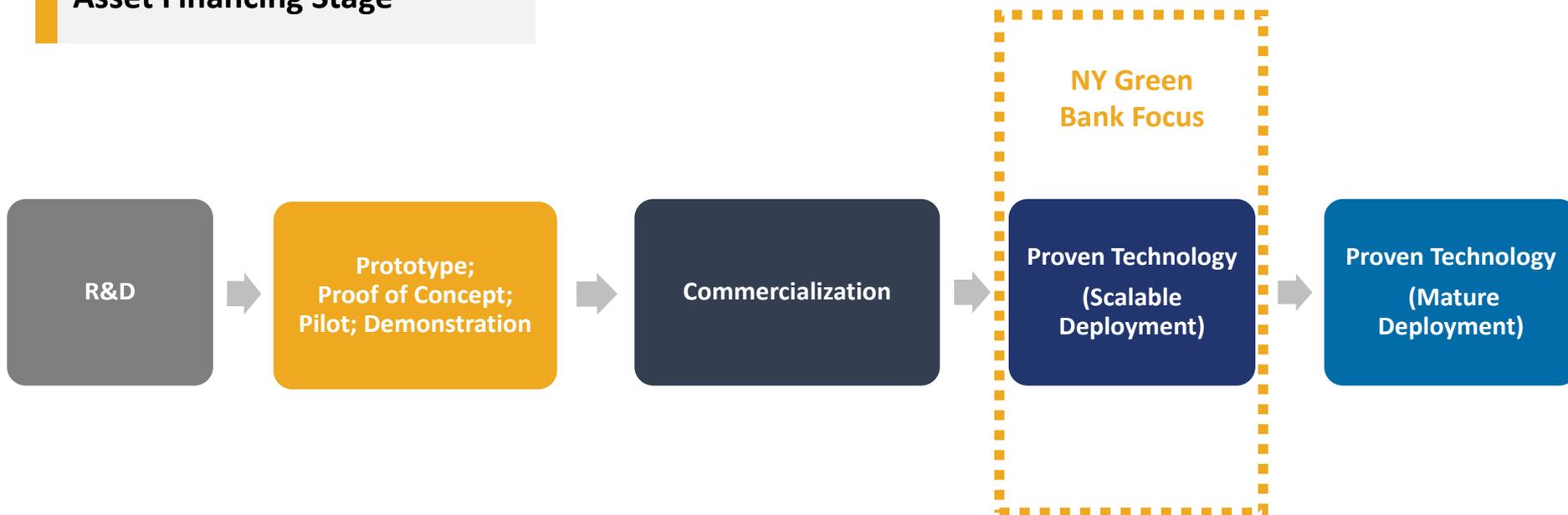
+ 3,000 MW of energy storage by 2030

Role in Overcoming Financing Barriers



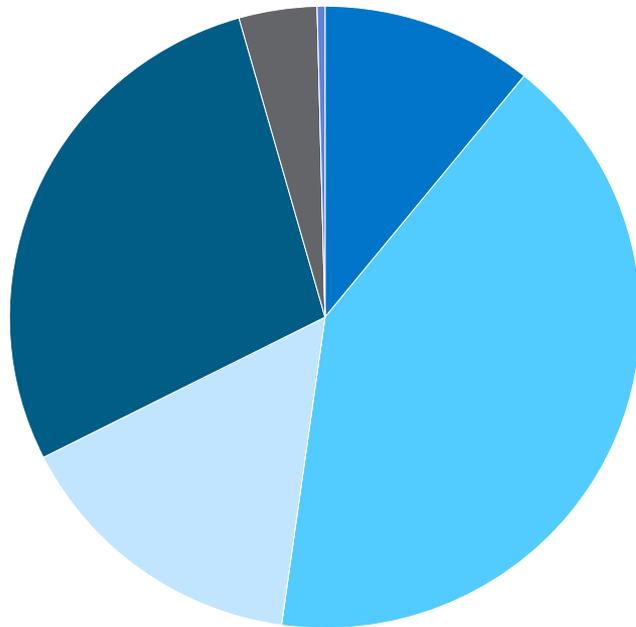
Investment Focus

Asset Financing Stage



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

Technology Distribution of Active Pipeline



- Energy Efficiency
- Bioenergy
- Multiple Technologies
- Solar
- Other
- Sustainable Transportation

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:

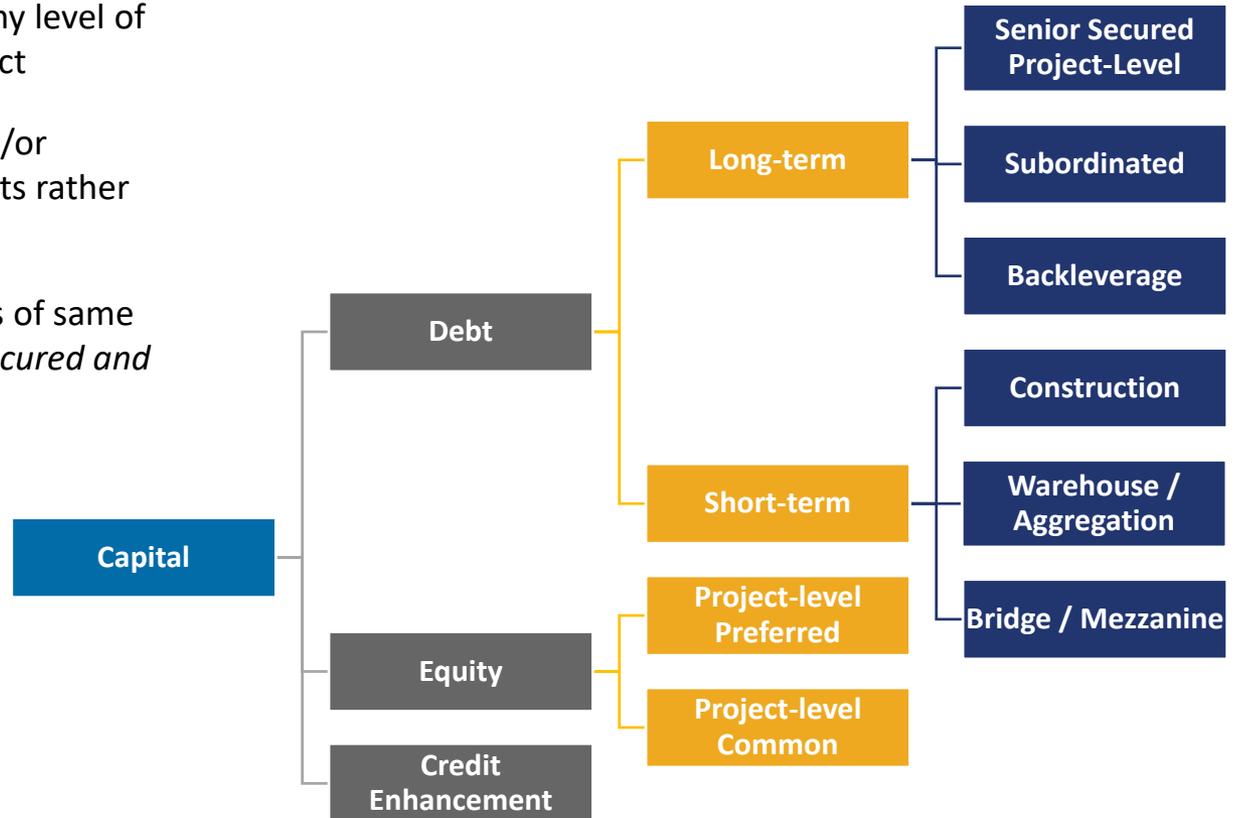
- ✓ Executing structured, project finance transactions
- ✓ Due diligence process similar to a commercial bank
- ✓ Structuring transactions on market terms to attract private capital investment

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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