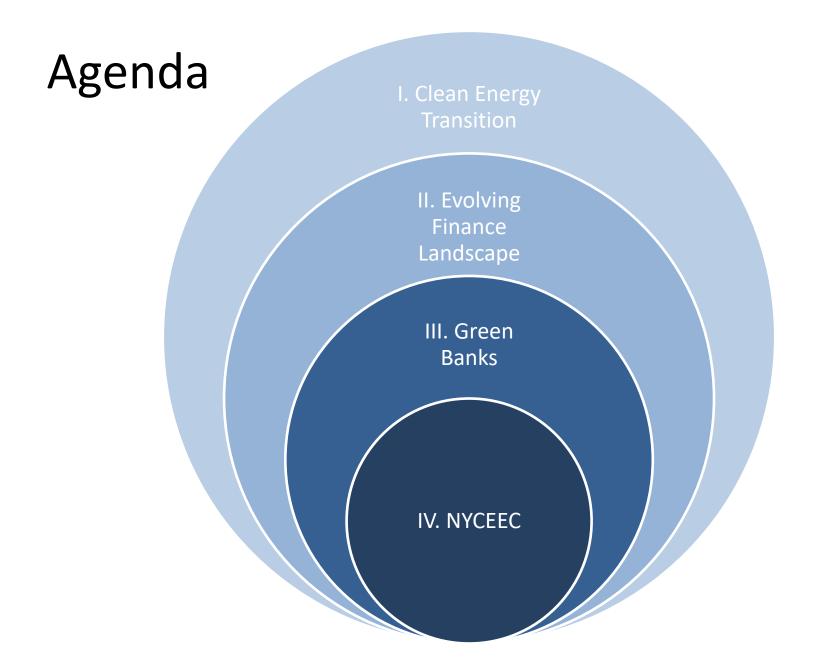
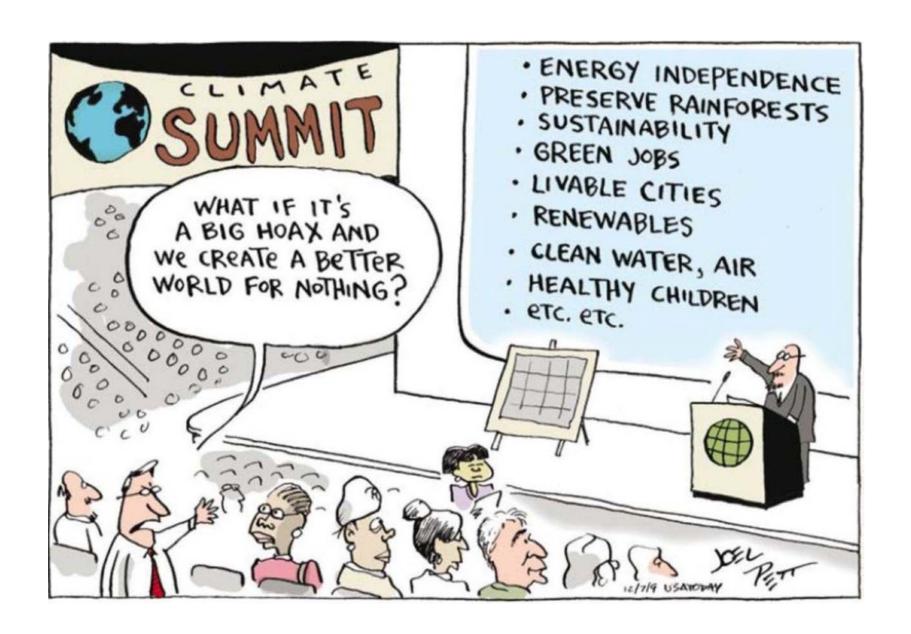
# Financing the Clean Energy Transition and the Role of State and Local Green Banks

#### Dartmouth College

Guest Speaker: Curtis Probst, CFA
Co-CEO, New York City Energy Efficiency Corporation (NYCEEC)
Adjunct Faculty, Columbia University

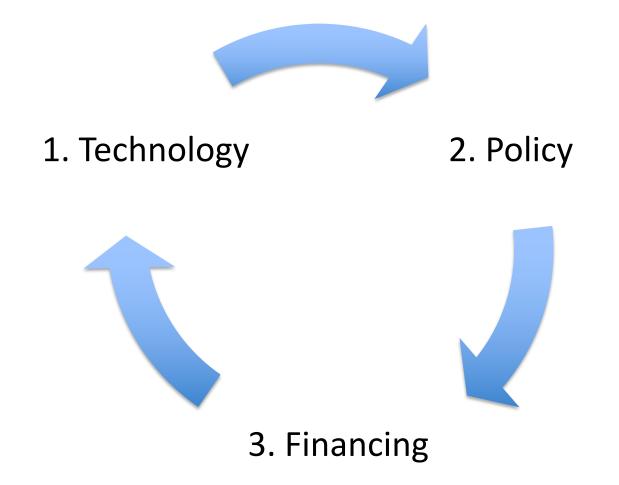


# **Clean Energy Transition**



Source: USA Today, Joel Pett

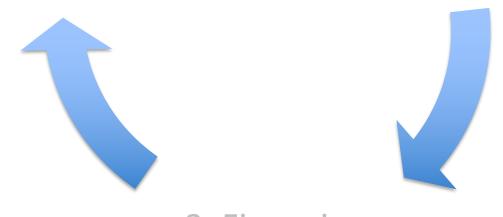
#### Transitioning to a Clean Energy Economy





#### 1. Technology





3. Financing

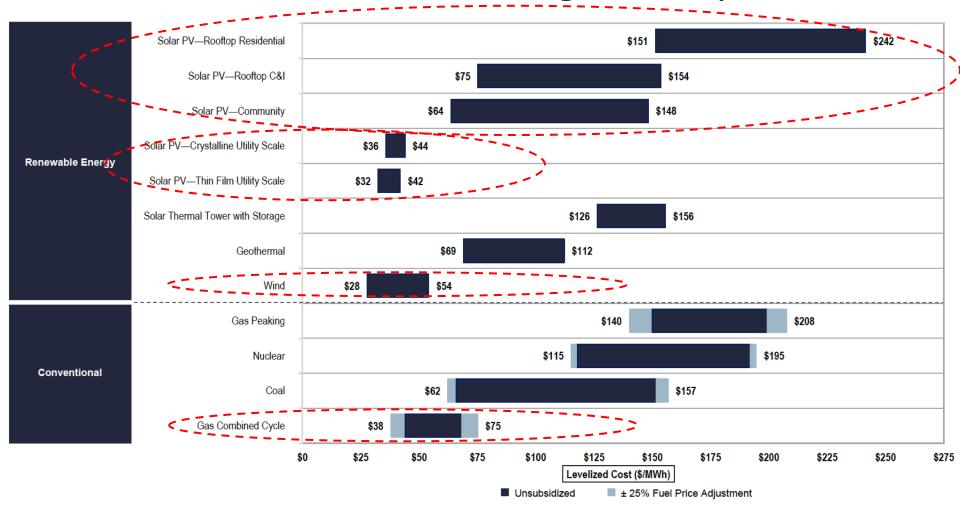
#### In short, we need to:

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Use less energy (e.g., energy efficient buildings)
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Substitute fossil fuel consumption for electricity consumption (e.g., transportation)

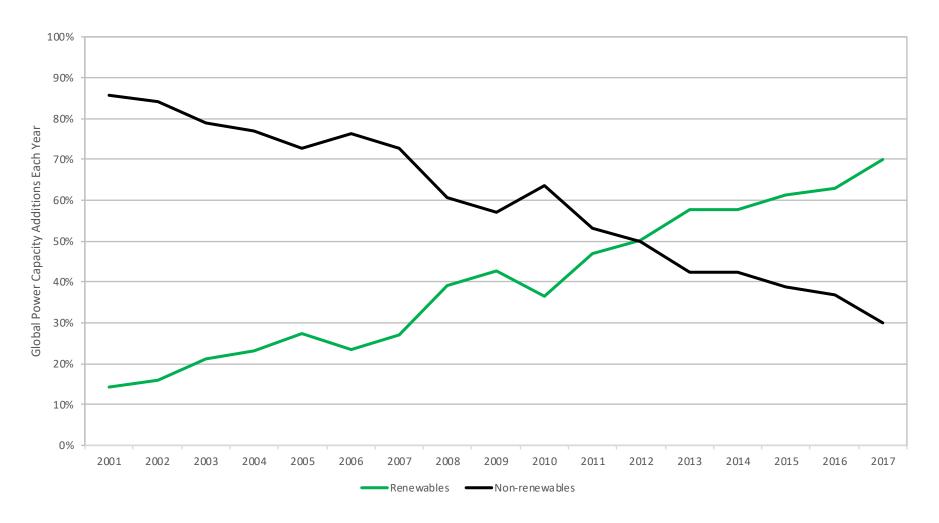
Produce energy from renewable sources (e.g., solar, wind)

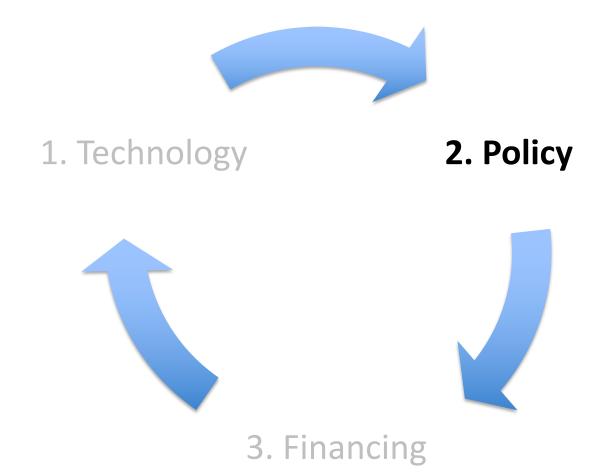
## Renewables Becoming Best Option



Source: Lazard; Lazard's Levelized Cost of Energy Analysis – Version 13.0 (November 2019)

## Global Power Capacity Net Additions = 70% Renewable





#### NYC Climate Mobilization Act (April 2019)

**Local Laws 92 and 94** requires that most buildings (new construction and substantial renovations) be covered in green roofs or solar PV systems

**Local Law 95** requires a building energy efficiency grade (A-F) to be posted on buildings larger than 25,000sf in size

Local Law 96 establishes a PACE (Property Assessed Clean Energy) loan program

- Loans are (a) made using private funds through pre-qualified capital providers, and (b) repaid as a charge on a building's property tax bill
- Debt service is (a) sized to be less than the savings from the efficiency/clean energy project, and (b) transferrable upon sale of (remains on) the property

Local Law 97 requires reductions in building greenhouse gas (GHG) emissions

- Buildings larger than 25,000 sf will have a "GHG budget" based on size and occupancy classifications
- GHG emissions that exceed the building's GHG budget subject to penalty

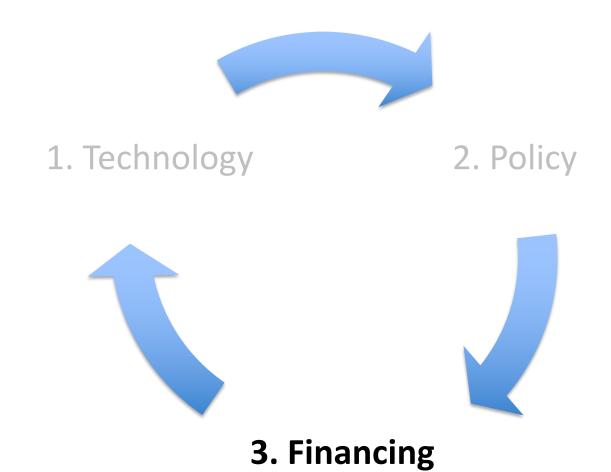
# NYS Climate Leadership and Community Protection Act (June 2019)

**Net Zero Emissions:** Commits NY to reaching net zero greenhouse gas emissions (40% emissions reductions from 1990 levels by 2030; 85% by 2050) with remaining emissions reduced, or offset through projects that remove GHGs.

**Ambitious Targets for Electric Sector:** Requires 70% of the state's electricity from renewable energy by 2030, and 100% emissions free by 2040 with specific goals for offshore wind, solar energy, energy efficiency and energy storage.

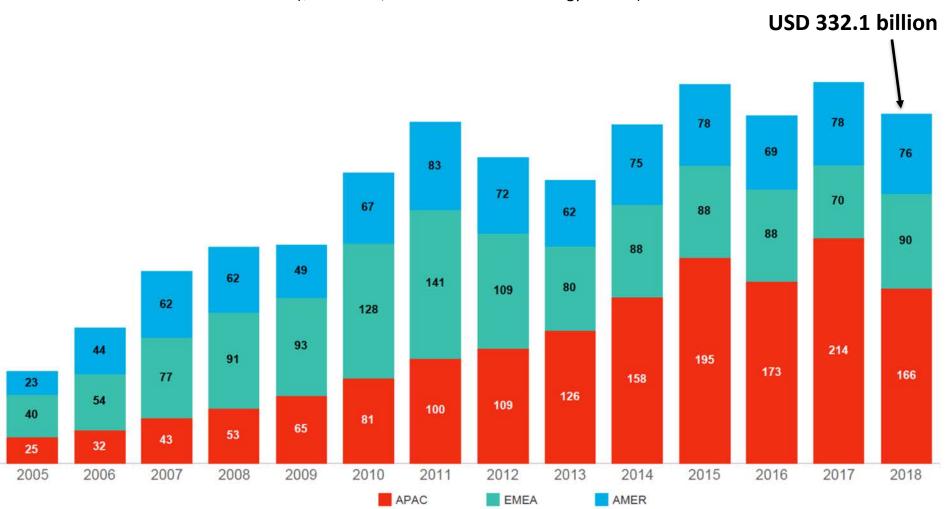
The Climate Action Council and Scoping Plan: Creates the Climate Action Council to develop a scoping plan within the next two years to produce recommendations for reducing emissions across all sectors of the economy, and then update the plan at least every five years.

**Disadvantaged Communities and Climate Justice Working Group:** Includes several environmental justice provisions, with disadvantaged communities targeted to receive 40% (35% min.) of the overall benefits from the state's climate programs.



#### Global New Investment in Renewables

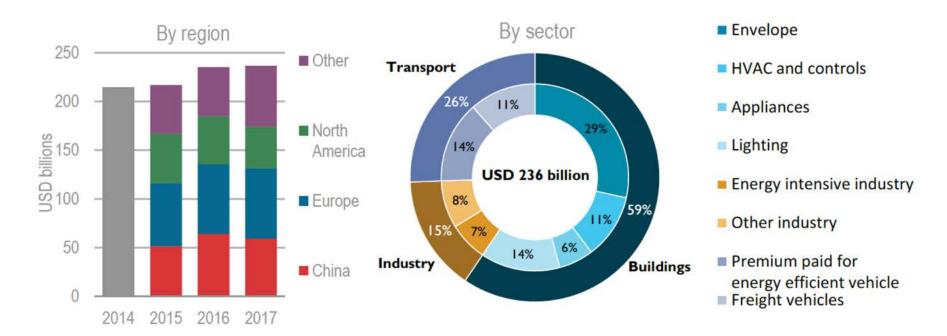
(\$ in billions; all asset classes and energy sectors)



Source: Bloomberg New Energy Finance

#### Global Investments in Energy Efficiency

- While more difficult to measure than renewable energy investment, it is estimated that global energy efficiency investment\* grew 3% in 2017 to USD 236 billion.
  - Europe represents 32% of the global total in 2017
  - Buildings sector represents 59% of the global total in 2017

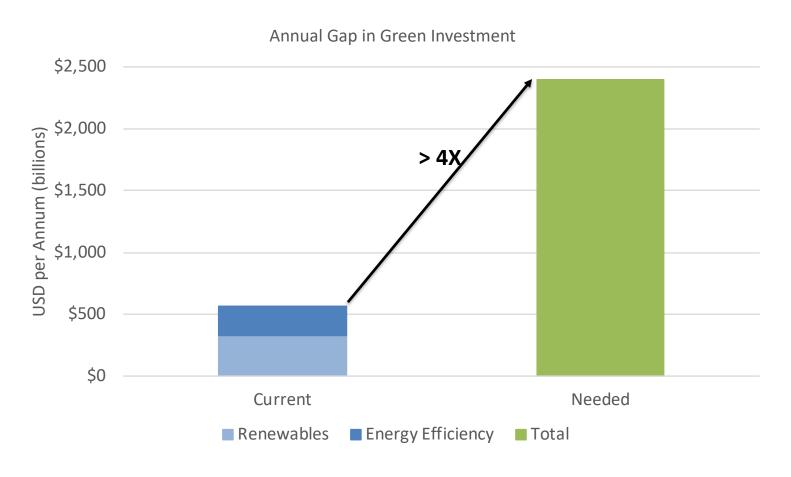


Source: International Energy Agency, Energy Efficiency 2018: Analysis and outlooks to 2040.

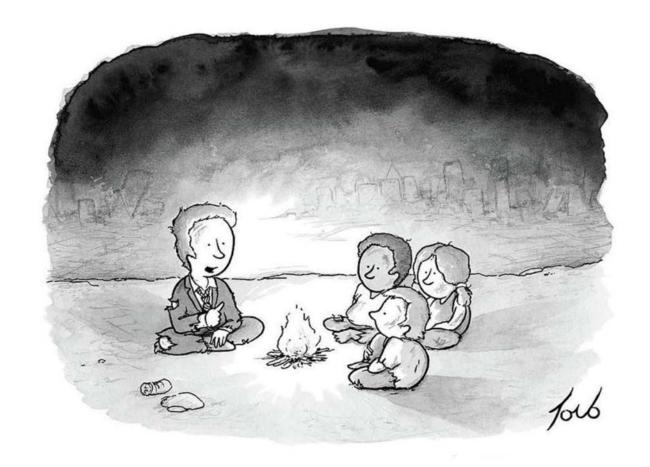
<sup>\*</sup> Incremental spending on new energy efficient equipment or the full cost of refurbishments that reduce energy use.

#### Capital Needed

...The world must invest \$2.4 trillion every year through 2035 and cut the use of coal-fired power to almost nothing by 2050 to avoid catastrophic damage from climate change (UN Intergovernmental Panel on Climate Change 2018)...



## **Evolving Finance Landscape**



"Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders."

#### Shareholders to Stakeholders

## **Shareholder Theory Milton Friedman, 1970**

...there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game...

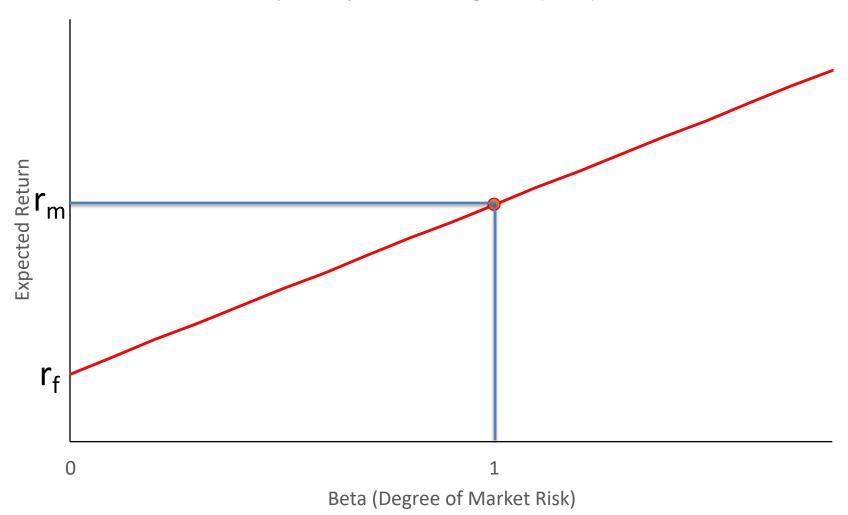
### Statement on the Purpose of a Corporation Business Roundtable (181 CEOs), 2019

...We believe the free-market system is the best means of generating good jobs, a strong and sustainable economy, innovation, a healthy environment and economic opportunity for all... we share a fundamental commitment to all of our stakeholders. We commit to:

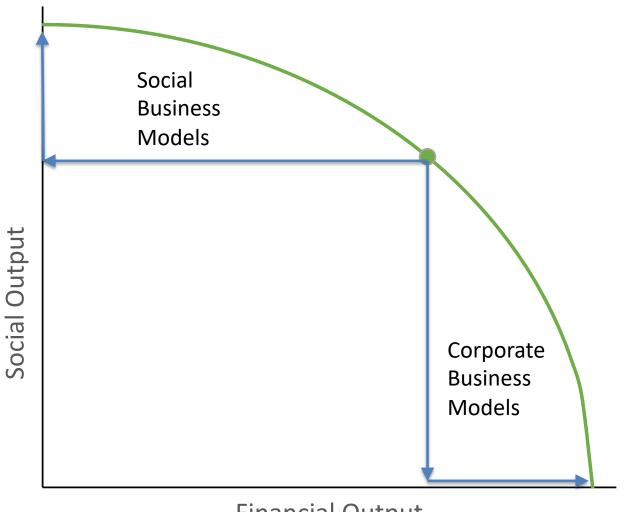
- Delivering value to our customers
- Investing in our employees
- Dealing fairly and ethically with our suppliers
- Supporting the communities in which we work
- Generating long-term value for shareholders, who provide the capital that allows companies to invest, grow and innovate

#### Efficient Frontier (mid-late 1900s)

Simplified Capital Asset Pricing Model (CAPM)



#### Efficient Frontier (2010s)

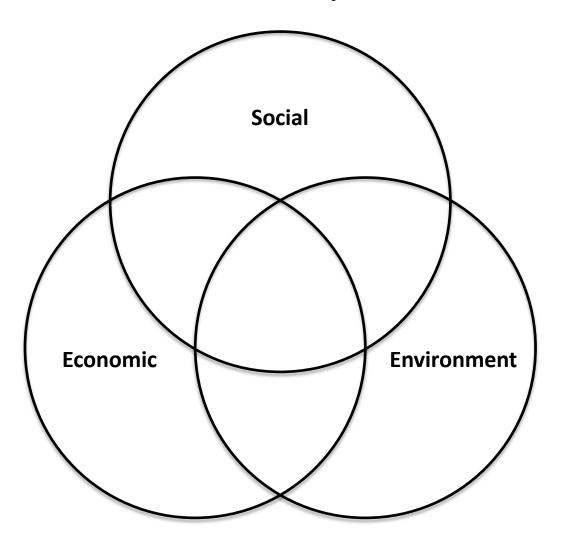


Financial Output

#### Investment Spectrum

Social value "Blended" social and financial value Financial value **Impact Only Impact First Finance First** Not-For-Profit Charities Social Enterprise For-Profit Business Profit-with-CSR Market Some trading Breakeven: all Profitable surplus Grants and PRI/MRI purpose company/cor company income from reinvested revenue investments company porate trading philanthropy/ SE JVs **Social Finance** Venture Philanthropy Impact Investment

## Where are the priorities?



### Where are the priorities?



#### Sustainability Reporting Frameworks

A company's impact on economic, Impact on financial environmental or social issues performance CDP TCFD FSB Task Force on Climate-related How a company impacts a range of A company's exposure Financial Disclosures environmental issues and is positioning itself to climate-related to address future climate-change scenarios How material climate-related issues could issues impact a company's financial performance GRI SASB Global Reporting Initiative Sustainability Accounting A company's Standards Board How a company impacts a range of exposure to a range economic, environmental and social issues How material sustainability issues impact of sustainability issues a company's financial performance

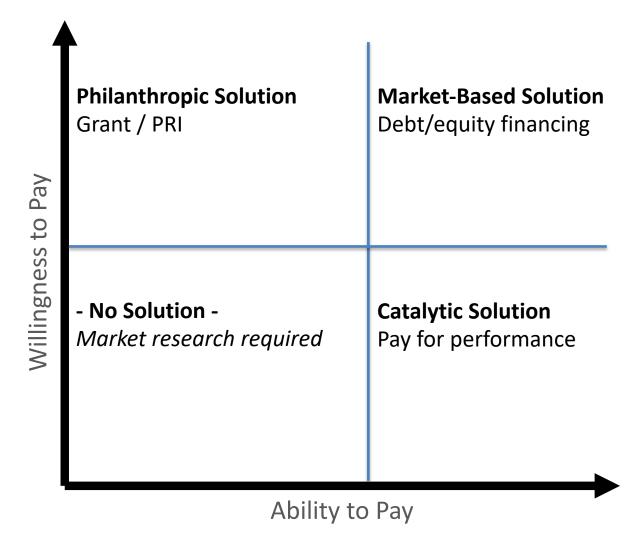
Financial market participants

Source: Bloomberg, Materiality Assessment

Cities, government, investors & companies

Primary audiences:

#### Financial Products to Meet the Need

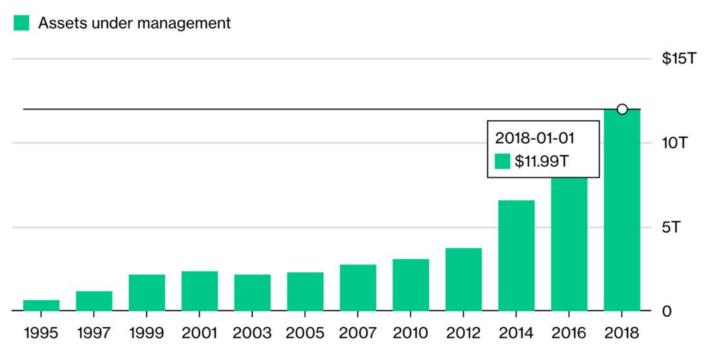


### Growth in "Sustainable Investing"

More than a quarter of U.S. assets under professional management used sustainable-investing strategies (with environmental, social and governance analysis) in 2018, with investor focus on issues such as handguns and tobacco (Forum for Sustainable and Responsible Investment (US SIF))

#### **Sustainable Growth**

Investors using socially responsible criteria hit \$12 trillion in U.S. assets



Source: US SIF

Source: Bloomberg News, "Climate Changed: U.S. Sustainable-Investing Holdings Advance 38% to \$12 Trillion", October 31, 2018

## **Green Banks**

#### **Green Banks**

A Green Bank is a dedicated public or non-profit finance entity designed to drive private capital into market gaps.

- A financial institution dedicated to increasing and accelerating investment in environmentally sustainable goods and services (e.g., clean energy)
- Its mission is to use finance tools to mitigate climate change
- Unlike typical "banks" it does not take deposits, and its operations can be supported by governments or charitable contributions or both
- It may deploy capital from public or private sources, invest on its own or in conjunction with private sector investors

#### **Green Banks**

#### **Current Barriers to Financing**

- Capital is expensive
- Financing gaps
- Small, disaggregated projects

#### **Green Bank Solutions**

- Lower the cost of capital
- Facilitate increased financing
- Animate private capital markets

# Green Banks can provide an alternative to traditional government-funded grant programs

- \$1 grant covers \$1 of project costs
- \$1 used to capitalize a green bank can attract private sector capital providers, typically financing \$3 to \$10 of project costs
- Additionally, that \$1 when loaned to a qualifying project is likely to be repaid with interest, and those monies can finance additional projects

#### Green Banks – Global Presence

These dedicated green investment entities have been established at the national level:

- Australia
- Japan
- Malaysia
- Switzerland
- United Kingdom

#### Green Banks – Growing US Presence

Green banks also exist at the state level in CO, CT, FL, HI, MD, MI, NV, NY, RI and at the local level in DC, Montgomery County (MD) and New York City (NY)





























# NYCEEC (New York City Energy Efficiency Corporation)

#### NYCEEC

- NYCEEC (New York City Energy Efficiency Corporation) is the oldest local green bank in the US (established 2010)
- NYCEEC is a not-for-profit organization launched by the City of New York to advance the City's climate and economic goals by developing energy efficiency programs, products and services
- Now, NYCEEC operates throughout the region (NYC plus, CT, DC, DE, MA, MD, NJ, NY, PA, RI) and funds a wide variety of building-related technologies that reduce greenhouse gases, e.g.:
  - energy efficiency
  - combined heat and power
  - fuel conversion
  - demand response
  - building-scale renewable energy and storage

#### NYCEEC

#### Mission

Deliver financing solutions and advance markets for energy efficiency and clean energy in buildings

#### Vision

Energy efficiency and clean energy financing for buildings to achieve scale and be accessible to all

#### NYCEEC

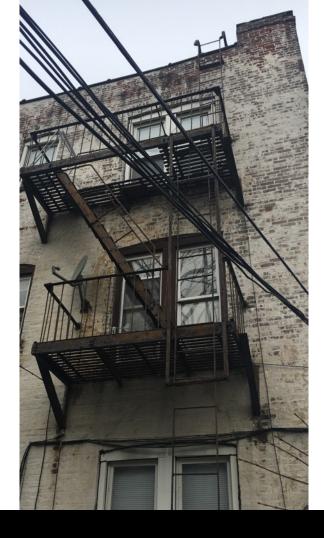
#### Why Do We Exist?

- We do not provide lower rates of interest, but will do smaller deals than other lenders
- We share our lessons with other lenders
- We provide feedback to policymakers about their rules and regulations
- We focus on underserved communities (e.g., low- and moderate- income)
- We support newer contractors and the financing of their projects
- We provide referrals to other agencies
- We will try to make sure good projects get done

#### **NYCEEC Impact**









**AFFORDABLE MULTIFAMILY** 

**ENERGY EFFICIENCY** 

\$477,611 \$30,249

**TOTAL PROJECT COST** 

**NYCEEC** PREDEV. LOAN 27%

**PROJECTED ENERGY COST SAVINGS** 





# AFFORDABLE MULTIFAMILY

ENERGY STORAGE (100 BUILDINGS)

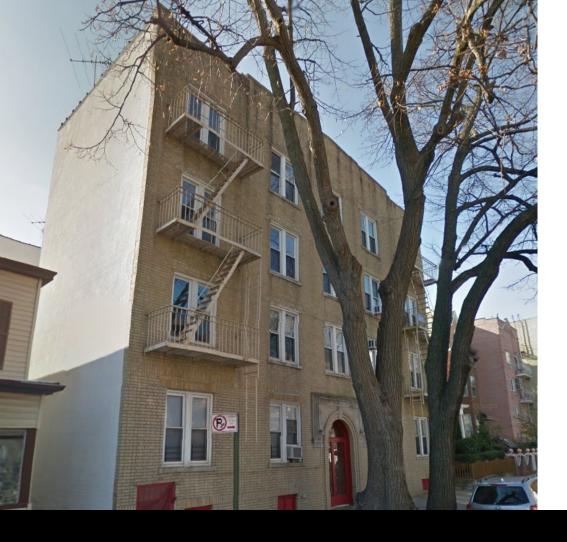
\$1.2M

TOTAL PROJECT COST

\$1.2M

NYCEEC ESA LOAN **15%** 

REDUCTION IN PEAK DEMAND





MULTIFAMILY CO-OP

SOLAR PV (24 UNITS)

\$200,000

TOTAL PROJECT COST

\$186,000

NYCEEC EQUIPMENT LOAN

94%

**GHG SAVINGS** 





SUPPORTIVE HOUSING FACILITY

**COGENERATION** 

\$749,000

TOTAL PROJECT COST

\$530,000

NYCEEC EQUIPMENT LOAN

326

AFFORDABLE UNITS GREENED

