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RetrofitNY

ACEEE Finance Forum
Tarrytown, NY
May 21, 2018

NYS Energy Plan: 2030 Goals

- 40% Reduction
  - in Greenhouse Gas Emissions (from 1990 baseline)
    - on path toward 80% reduction by 2050
- 50% of Electric Generation
  - from Renewable Energy Sources
    - **Clean Energy Standard (mandate)**
- 23% Decrease
  - in Energy Consumption by Buildings (from 2012 baseline)

NYS: New Energy Efficiency Target for 2025

- 185 Trillion BTU reduction by 2025
  - Cumulative site energy savings vs. current 2025 forecast
  - ~ 40% beyond the EE target set by 2015 NYS Energy Plan
  - equivalent to powering over 1.8 million New York homes annually
  - will deliver nearly one-third of the GHG emissions reductions needed to meet NY's 40 by 30 climate goal

- New Efficiency: New York
  - Whitepaper published by NYSERDA & NYDPS
  - Proposes comprehensive EE initiative to meet new target
  - Upcoming technical conferences and comment period
    - https://www.nyserda.ny.gov/-/media/Files/Publications/New-Efficiency-New-York.pdf

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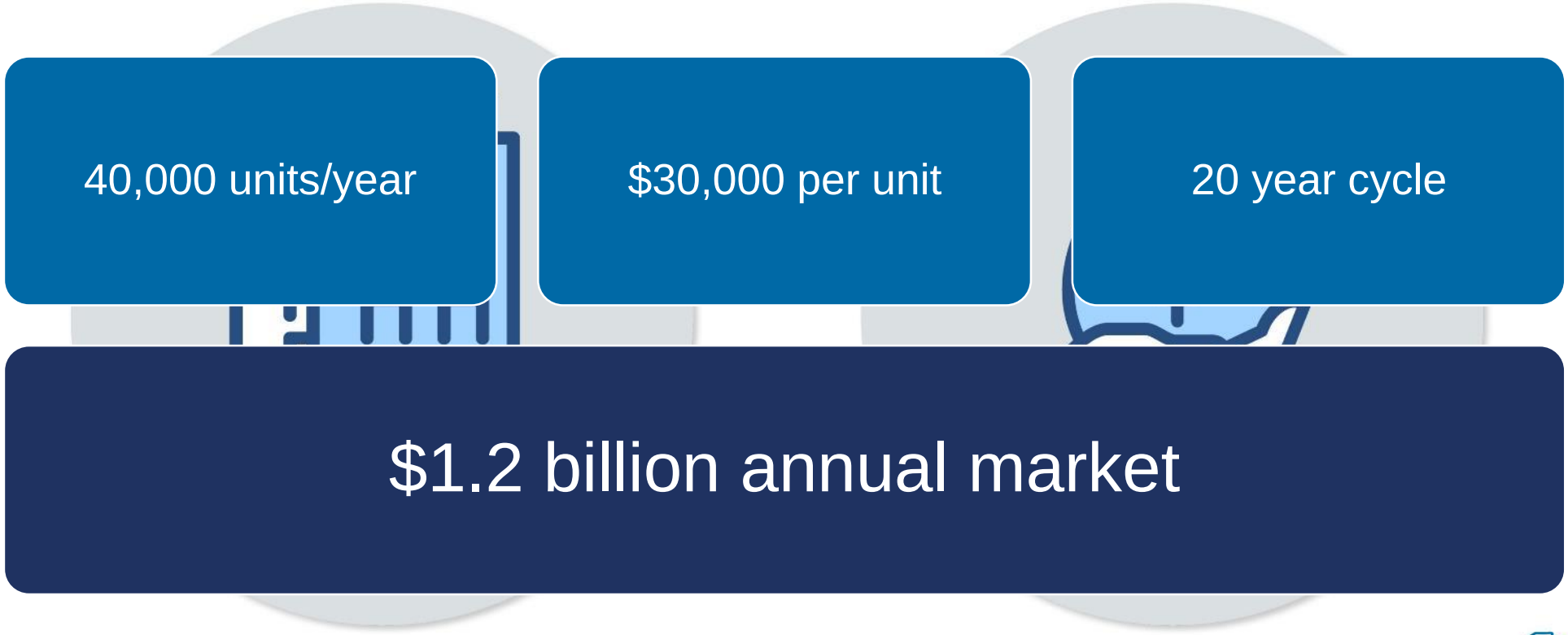
Create a large scale, self-sustaining market for high performance retrofit solutions

Industry-designed, cost-effective, long-lasting retrofit solutions for tenanted buildings reaching or approaching net zero energy.

Implement solutions on a large scale to drive industrialization, reduce cost, and standardize and guarantee long-term performance.

A Large Potential Market

1.7 million units of Affordable Housing in NY



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ENERGIESPRONG

Netherlands

United Kingdom

Germany

France

New York

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Revolutionizing the way multifamily buildings are renovated, keeping residents in their homes.

Nyserda.ny.gov/RetrofitNY

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We are looking for solutions that

Are designed to

- **Be cost-effective:** planned rehab budget + savings
- **Improve the appearance of the building**
- **Improve health, comfort, quality of life for tenants**
- **Achieve or approach net-zero energy**
- **Eliminate fossil fuel use onsite**

Are delivered with

- **Residents in place with limited disruption**
- **A long term energy performance guarantee**

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Woodrow Wilson Apartments
Amsterdam, NY
Circa 2014

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Woodrow Wilson Apartments
Amsterdam, NY
Circa 2016

Courtesy: Beacon Communities, LLC

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Key Components of the Energiesprong Solution

Elements

- Highly insulated building envelope
- New mechanical works
- On-site generation

RetrofitNY's Role: Market Transformation & Aligning the Market

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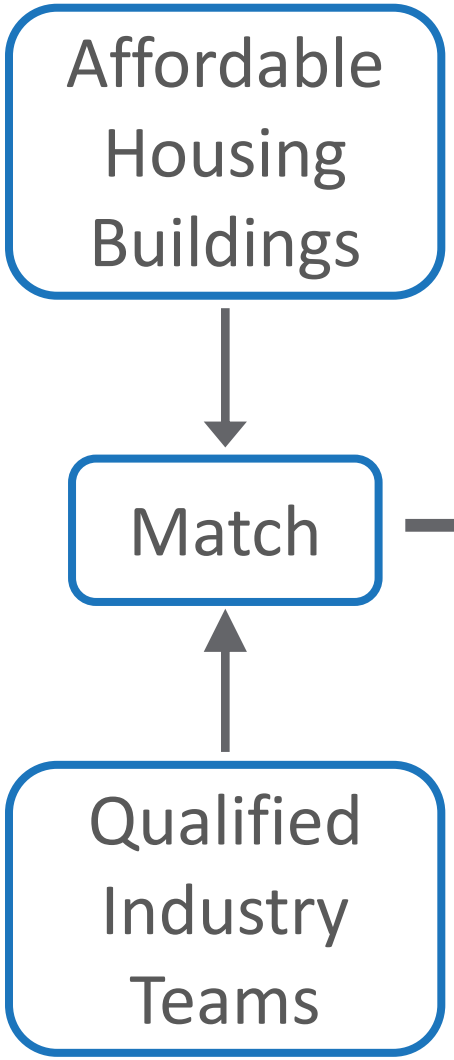
We Are Starting the Pilot Phase

Design RFP: First projects start June 2018
First of a series

Unlocking Additional Markets
NYC Housing Authority (178,000 apartments)
State University of New York (400 buildings, 70,000 beds)



- 1-2 story garden style
- 3-7 story building
- Simple architecture

6 month design period

- Designs that can be approved and executed
- **Trust and understanding of the financial models**
- Clarity on what regulations may need adjustment
- Solutions adaptable to other buildings

- Can design, engineer and install the solution
- Open source design

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6 month design period

Deal Closing
+
Construction

Gap Funding Available

Supporting the Teams

- Transfer of knowledge from Energiesprong
- Coaches
- $75,000 stipend
- IPNA for Buildings

Making the Deal

- Regular touch base
- HPD, HCR and HUD
- Financing partners
- Permitting agencies

Encourage collaboration among teams and open communication with owners and agencies

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A successful model to show market potential

Cost per Unit & Performance of Retrofits

By reaching scale, this solution will become the standard.

This is where the market is headed, and you can be ahead of the curve.

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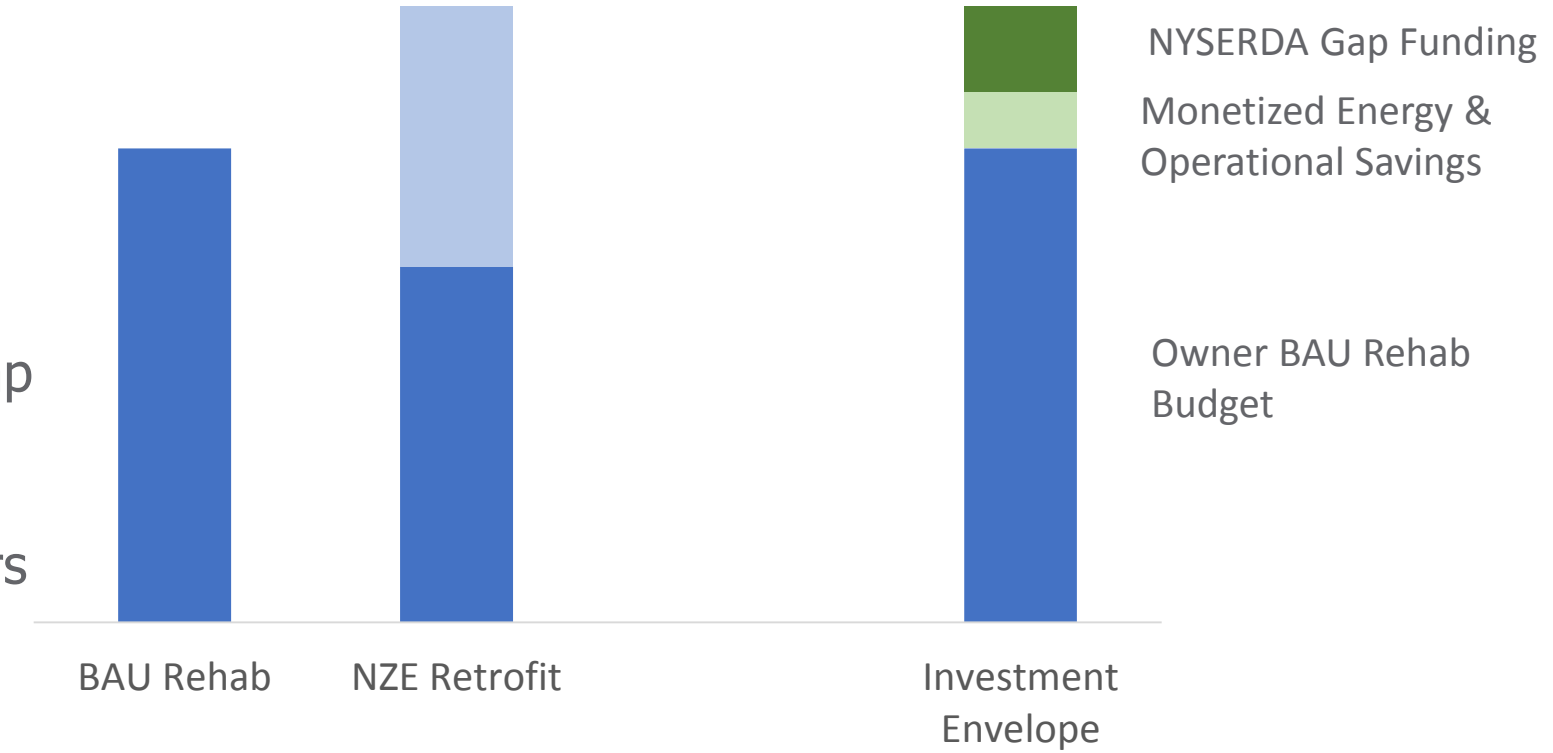
The Investment Envelope

- Marginal cost of NZE retrofit vs. BAU Rehab =$25-30k/unit
- Monetized operational savings + NYSERDA funding to bridge the gap
- NZE Retrofits can quickly become more cost-effective in coming years via cost compression, innovation, standardization, and scale



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10
1,000

Report

McKinsey Global Institute

February 2017

Reinventing construction through a productivity revolution

Action in seven areas can boost sector productivity by 50–60%

- Reshape regulation
- Rewire contracts
- Rethink design
- Improve procurement and supply chain
- Improve onsite execution
- Infuse technology and innovation
- Reskill workers

5–10x productivity boost

possible for some parts of the industry by moving to a manufacturing-style production system

Project and craftmanship oriented

Industrial production, IT systems, marketing and sales channels


BOSCH


10


DD Productie
DD Productie
ROBI-ONE
a H&M innovation
UNIVERSAL ROBOTS
UNIVERSAL ROBOTS


20th century solutions
scale essential to transform

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High Performance Buildings

To reach scale, we must capture all available economics:

- Operational Savings – energy, water, maintenance (e.g., LL 11)
- Grid Benefits
  - Permanent – long term load reduction through ultra low load profiles
  - Temporary – Demand Response
- Rate Design – Behavior
- Carbon Benefits – social cost of carbon
  - Heat pumps absorbing excess capacity
- Health Benefits – Medicaid Redesign
- Net Zero Buildings ➡ Net Zero Communities ➡ Net Zero

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Thank you
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