RETROFITTING TO SCALE:
50,000 BUILDINGS IN 10 YEARS

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SESSION 2: Innovations and Examples of Scale

Moderator:
Clay Nesler, Vice President of Sustainability and Regulatory Affairs, Johnson Controls

Panelists:
Anne Evens, PhD, Chief Executive Officer, Elevate Energy
Tom Feeney, Vice President of Operations & Engineering, Peter Cooper Village Stuyvesant Town
Loic Chappoz, Multifamily Team Lead, NYSERDA
Clay Nesler
VP of Global Sustainability and Regulatory Affairs, Johnson Controls

Johnson Controls delivers integrated building technologies and solutions to customers in over 150 countries. Nesler is responsible for global sustainability and policy initiatives. He currently serves on the board of the American Council for an Energy-Efficient Economy, the General Services Administration Green Buildings Advisory Group, the executive group of the US DEP/EPA Senior Environmental Employment Action Network, and the International Energy Agency’s Energy Efficiency Industry Advisory Board. Nesler helped establish the UN Sustainable Energy for All Building Efficiency Accelerator with World Resources Institute, where he serves as industry co-convener and senior advisor.
Elevate Energy is a nonprofit organization in Chicago dedicated to designing and implementing clean energy and efficiency programs that lower costs, protect the environment, and ensure that the benefits of energy efficiency reach those who need them most. Evens manages a growing staff of over 100 talented professionals and provides oversight for programs related to energy efficiency retrofits in multifamily buildings, building energy performance, regional energy and climate planning, and dynamic electricity pricing initiatives. Evens has worked in energy efficiency and affordable housing for over 25 years in both the nonprofit and governmental sectors in the U.S. and in southern Africa.
Retrofitting to Scale: 50,000 Buildings in 10 Years

Anne Evens, PhD
June 18, 2019
Retrofitting 64M sq ft of conditioned space

Applications
83,394 units

Assessments
81,970 units

Retrofitted
48,415 units

Repeat
Retrofitting To Scale

Big Problem → Big Opportunity

- Understand your building stock and it’s sub-segments
- Replicable, Scaleable Strategies per sub-segment
- Long term relationships (over 50% of our pipeline is repeat customers)
Building Segmentation: 5+ Unit Building, Pre-war, Low-rise

- 15,595 (10%) buildings and 199,294 (29%) units
- Investor-owned, rental, gas-fired heat & hot water, master metered
- Masonry, flat roofs, one- and two-piped steam

Standard Assessment and Retrofit Package, Incentives and Pricing
Building Segmentation: 2-4 Unit Building, Pre-war, Masonry

- 79,903 (54%) buildings and 202,924 (30%) units
- Owner-occupied and investor-occupied depending on the neighborhood
- Individual metered forced hot air

Standard Assessment and Retrofit Package, Incentives and Pricing
Building Segmentation: 2-4 Unit Building, Pre-war, Frame

- 41,159 (28%) Buildings and 97,892 (14%) Units
- Owner-occupied and investor-occupied depending on the neighborhood
- Individual metered forced hot air

Standard Assessment and Retrofit Package, Incentives and Pricing
Why it Works!

- Building owners see an increase in NOI
- Contractors see new jobs
- Tenants see increased comfort and reduced bills
Thank You

Anne Evens, PhD
Chief Executive Officer
Elevate Energy
Tom Feeney
VP of Operations and Engineering, Peter Cooper Village Stuyvesant Town

Peter Cooper Village Stuyvesant Town is a private real estate development in Manhattan consisting of 110 residential buildings. In 2018, the development became the first-ever multifamily community in New York to be awarded LEED Platinum certification. Feeney leads operations and engineering for the development. He has over 38 years of experience in property management and building operations.
Peter Cooper Village
Stuyvesant Town

Tom Feeney
Vice President of Operations & Engineering
Peter Cooper Village Stuyvesant Town
Brief History and Property Overview

Peter Cooper Village
- 21 Structures
- 21 Addresses
- 4 Control rooms
- 4 Water Towers

Stuyvesant Town
- 35 Structures
- 89 Addresses
- 14 Control rooms
- 4 Water Towers

Property Overview
- Constructed between 1942 – 1947 post WWII
- 80 Acres
- 11,246 apartments
  - Range from Studios – 5 Bedroom apartments
- Property Staffing
  - Trades
Project Overview

- Building Management System
- LED Lighting – Common Area & Stairwells
- Primary Heat Exchangers
- Ventilation Louver Install – Stairwells & Lobby
- Garage VFD Installation
- Interval Meter Installation
Solar Photovoltaic system

JUNE, 2018 PHOTO
STUYTOWN HAS 22 ACRES OF ROOFTOPS

View video at: https://vimeo.com/241191513
Scope of Work

- 61 Individual Solar Photovoltaic Systems
- Cool Roof Coating Installation
- ~ 9,671 Solar Panels
- ConEd Electric Interconnection
- Coordination with CHP Accounts
Combined Heat and Power
Scope of Work

- Two 1,150 kW CHP Units
- Three 500 hp Boilers
- Disconnect Four ConEd Steam Hubs
- ConEd Electric Interconnection
- New Mechanical Building
Steam Hub Modifications
- Increasing CHP efficiency from 62% to 80+%
Buildings Benefiting From the CHP Project
CO #2 Update

- NEW PLAN STEAM HEATING AND HOT WATER SUPPLY
- NEW PLANT ELECTRIC ACCOUNTS OFFSET
- ELECTRICITY OFFSET AND HEATING
LEED for Communities Platinum

- Certification demonstrates commitment to sustainable growth and progress, and provides a platform to communicate overall sustainability goals and performance to our key stakeholder and broad community
- Energy Star Scores: ST: 85, PCV: 84
Thank You

Tom Feeney
Vice President of Operations & Engineering
Peter Cooper Village Stuyvesant Town
Loic Chappoz, LEED GA  
Multifamily Team Lead, NYSERDA

NYSERDA promotes energy efficiency and the use of renewable energy sources. Chappoz leads NYSERDA's multifamily team, focusing on improving the efficiency of existing residential buildings across the state. Prior to his work with NYSERDA, Chappoz worked as an independent consultant on energy efficiency policies in Europe, as a fuel efficiency specialist in the airline industry and as a commercial pilot.
Retrofitting to Scale: 50,000 Buildings in 10 Years

Loic Chappoz, Multifamily Team Lead, NYSERDA
June 18, 2019
Productivity evolution, 1995–2015

Gross value added\(^1\) per hour worked

Index: 100 = 1995

<table>
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<th>Year</th>
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<td>2015</td>
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Compound annual growth rate:
- Total: 1.76%
- Construction: -1.04%

Source: McKinsey Global Institute, Reinventing Construction: a Route to Higher Productivity, 2017
50-70% energy use reduction
Improve onsite execution

Adapt the supply chain

Technology and innovation
Photo courtesy of Energiesprong
Photo: courtesy of Energiesprong
Solution Provider

Owner / Developer

Component Suppliers
- Mechanical pod
- Integrated envelope solution
- Integrated roof system

Suppliers
- Heating and cooling
- Hot water
- Ventilation
- Air barrier
- Windows
- Insulation
- Controls
- Etc.
A New Model That Enables Scale

All electric, net zero energy buildings at <50% of the cost of initial pilots

The market is scaling up
• 4,500 retrofits completed
• 5,000 new construction projects completed
RetrofitNY: Supporting the Creation of Scalable Retrofit Solutions in NY

Industry-designed, cost-effective, standardized solutions

Drive industrialization and reduce costs
Key Learnings from the First Phase

**Successes**
- 6 viable solutions
- Several projects anticipated to be built
- Very engaged owners
- Supply chain starting to innovate

**Challenges**
- Cost
- Electrification of hot water in larger buildings
- Supply chain
Loic Chappoz
Multifamily Team Lead
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