RETROFITTING TO SCALE: 50,000 BUILDINGS IN 10 YEARS

June 18, 2019 © Urban Green Council
SESSION 3: SCALING IT UP

Moderator: 
**Robert Johnson**, Senior Vice President, Hannon Armstrong Sustainable Real Estate

Panelists:
- **Sabrina Kanner**, Executive Vice President & Head of Design & Construction, Brookfield Properties
- **Dan Friend**, Regional Sales Manager, NORESCO
- **Richard Benkowski**, LEED AP, Training Specialist, United Associated Department of Education
- **Kelly Dougherty**, LEED Green Associate, Director of Energy Management, FirstService Energy
Hannon Armstrong Sustainable Infrastructure Capital, Inc. is a finance company that provides debt and equity financing for sustainable infrastructure projects. Johnson is responsible for growing the federal and industrial market sectors. He leads Strategic Client Accounts, where he structures financing solutions for sustainable infrastructure projects. Johnson has been at the leading edge of the building systems and energy efficiency industries and has built businesses across a range of products and related systems, including building controls, lighting, HVAC, renewable energy, communications and life safety.
Hannon Armstrong Overview

HASI
LISTED
NYSE

First U.S. public company solely
dedicated to investments in
climate change solutions

BEHIND-THE-METER
Energy Efficiency
Distributed
Generation
Storage

GRID-CONNECTED
Wind
Solar
Storage

SUSTAINABLE INFRASTRUCTURE
Stormwater
Remediation
Environmental
Restoration
Transmission &
Communications

PRINCIPAL INVESTOR
~$1 Billion
Invested Annually
$5.5 Billion
Managed Assets
Global Temperature and Carbon Dioxide (CO₂)
Shades of Green – CO2 Reduction Impacts

Source: EIA, CME Group, Company Filings, HannieMae data, Hannon Armstrong Analysis. Cogeneration includes net fuel cost.
Market Sector Financing

**COMMERCIAL**
- Property Assessed Clean Energy (“PACE”)
- Energy Services Agreement (“ESA”)
- Power Purchase Agreement (“PPA”)

**STATE & LOCAL**
- Energy Services Agreement (“ESA”)
- Public Private Partnerships (“P3”)

**FEDERAL**
- Energy Savings Performance Contract (“ESPC”)
- Utility Energy Savings Contract (“UESC”)
- Utility Privatization (“UP”)

Hannon Armstrong Provides Debt and/or Equity Financing for High Growth Sectors
Robert Johnson
Senior Vice President
Hannon Armstrong
Brookfield Properties provides industry-leading portfolio management and development capabilities. In her 36-year tenure with the company, Kanner has played a key role in the construction, design and development or redevelopment of more than 40 million SF of signature Brookfield projects. She serves on the board of directors of Urban Green Council, the New York Building Congress, the Salvadori Center, the Opus Group, Cedar Realty Trust and the Regional Plan Association, and on the board of trustees of the National Building Museum and the Beverly Willis Architecture Foundation.
Scaling it Up: Good, Fast and Cost-Effective

Sabrina Kanner
Executive Vice President, Design & Construction
Brookfield Properties

Case Study: 5 Manhattan West
5 Manhattan West
(aka 450 W 33 St)
AFTER
5 Manhattan West (aka 450 W 33 St) AFTER
Focus on Daylight
Measured Effects on Productivity

Productivity increases 18% in working spaces with a high level of daylight.
- World Green Building Council, 2013

Students improve their results by up to 14% and learn 20-26% faster in spaces with a high level of daylight.
- World Green Building Council, 2013

Health-related costs are 41% lower, and turnover rate is 35% lower for employees who are thriving with a strong sense of well-being.
- Gallup
5 Manhattan West – Total Building Electric Cost: Pre/During/Post Recladding
5 Manhattan West – Total Building Steam Cost: Pre/During/Post Recladding
5 Manhattan West Breezeway
THANK YOU

Sabrina Kanner
Executive Vice President, Design & Construction
Brookfield Properties
Dan Friend  
Regional Sales Manager, NORESCO

NORESCO uses design-build and performance-based contracting to deliver energy and maintenance savings and infrastructure upgrades to existing facilities. For over 28 years, Friend has helped municipalities, universities, schools and hospitals lower energy and operational costs and use the savings to improve their working, learning and healing environments. In his work, Friend addresses customer-specific objectives, recognizes cost-effective opportunities, and presents strategies to ensure customers achieve their long-term goals.
SCALING IT UP: GOOD, FAST, AND COST-EFFECTIVE
HOW ENERGY SAVING PERFORMANCE CONTRACTING (ESPC) WORKS

DAN FRIEND, NORESCO
What Is ESPC?

- Infrastructure improvements funded by utility savings
- Opportunity to achieve multiple objectives:
  - Reduce energy and water usage and costs
  - Leverage operating budget
  - Meet sustainability goals
  - Address deferred maintenance
  - Use no capital expenditure
- Streamlined procurement
- Cash flow positive transactions
- Guaranteed results from an energy service company (ESCO)

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ESPC Project Model

ESPC Project Costs Paid from Existing Utility and Operations and Maintenance (O&M) Budgets

Before ESPC Contract

- Utility and O&M Bill

During ESPC Contract

- ESCO Payment
- Energy Cost Savings
- Customer Share

After ESPC Contract

- Utility and O&M Bill
- Customer Share
Strategies for Covering Large Portfolios of Buildings

Phased Approach: Divide a portfolio of buildings into smaller groups and develop each group as a separate project.

- **Advantage:** Provides some level of energy savings and facility infrastructure improvement more quickly.
- **Advantage:** Shows a “proof of concept” before larger investments are made.
- **Advantage:** Applies lessons learned to future phases, allowing for continuous process improvement.
- **Disadvantage:** Creates a longer timeline before all facilities are touched.

All-Inclusive Approach: Develop a single holistic project across an entire portfolio of buildings in a single phase.

- **Advantage:** Improves all buildings at the same time using the same or similar technologies.
- **Advantage:** Engages economies of scale, potentially providing the best overall return on investment.
- **Disadvantage:** Creates a large initial investment in both time and money.
Thank You

Dan Friend
Northeast Sales Manager
Cell 716-698-5738
dfriend@noresco.com
Richard Benkowski, LEED AP  
Training Specialist, United Association Department of Education

The United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States, Canada (UA) is affiliated with the national building trades and represents approximately 340,000 plumbers, pipefitters, sprinkler fitters, service technicians and welders in local unions. Benkowski develops programs for energy efficiency and water conservation initiatives to increase the awareness and skill sets of UA journey workers who construct, maintain and service high-performance buildings.
Scaling It Up:
Repeatable, Reliable, Cost Effective, Deliverable Manpower

Rich Benkowski, Training Specialist
United Association; Three Park Place, Annapolis, MD
PRODUCTIVITY AND THE WORKFORCE:
Creating a “Think & Do” Mindset
UA Apprenticeship Program

Over 40,000 Enrolled

5 Years of Training

Over 300 Locations
UA Apprenticeship Program

Over 1200 Hours in the Classroom

10,000 Hours of On-the-Job Training

45 College Credits Earned
UA Instructor Training Program

65 Years & Counting
- Washtenaw Campus
- Ann Arbor, MI

2,000 Attendees
- Professional
- Technical

“Certified Instructor”
- 200 Hours of Course Work
- 15 Credits Earned
The Variable Flow, Chiller, and CO₂ Classes are listed in the Regional Catalog & the MCAA website:

1. Mitsubishi
2. Johnson Controls
3. Daikin
4. Emerson
5. Carrier
Ferris State University Certificate

- System Design
- Equipment Selection
- Automatic Control Theory
Next.......just add ICE!
UA Service Tech Mobile Lab
NEXT STEPS:
Include the Contractors in Strategic Planning
Thank You

Rich Benkowski
Training Specialist
United Association
richb@UANET.org
FirstService Residential is the largest manager of residential communities in North America. Kelly Dougherty develops and implements long-term efficiency strategies for FirstService Residential properties to reduce energy use, emissions and costs. She works with industry leaders and government agencies to keep clients informed on the latest technologies and regulatory requirements. Dougherty also develops training seminars on efficiency best practices for property managers and building staff. Her efforts have strengthened FirstService Residential’s commitment to reducing their portfolio’s energy consumption.
The energy management and advisory subsidiary of FirstService Residential

Kelly Dougherty
Director, Energy Management
FS Energy
FirstService Residential

- 7,600 Residential Properties
- 24 States & 3 Provinces
- 5 Million Residents
- 1.6 Billion Sq. ft Residential Real Estate

- 15,000 FirstService Residential Associates
- 1.6 Million Residential Units
- 530 Managed Properties in NY
- 360,000 Metric Tons GHG Emissions - NYC
To enhance our property management business by leading our clients to reduce energy consumption, costs, and emissions.
Energy Assessment Report
Cast Iron

67 East 11th Street
New York, NY

Erie Delwitt is providing our clients this value-added service through its subsidiary EC Energy.

With the goal to maximize efficiency across our portfolio.

A full-lifecycle energy audit could cost a substantial sum.

On April 19, 2019, the New York City Council voted to move legislation to replace once-through gas

energizers with two new, known as the Centralization Function (CF)—specifically the largest energy savings per kilowatt hour among gas systems.

In addition, the council also passed a measure that would require all new buildings over 10,000 square feet to go into effect starting in 2020 through 2050. The legislation limits emissions on the city’s existing energy systems significantly.

The actual energy of each building is calculated using a greenhouse gas coefficient for each type of occupy building type: District Steam, Natural Gas, Fuel Oil, and Electricity.

Although the city still has some debate to iron out, EC Energy has gone ahead and calculated your actual emissions based on 2018 aggregate energy use for each building, as well as the possible fines for noncompliance.

Please note: If you have at least 1 year regulated system in your building, you may choose to opt into an alternative compliance pathway, by completing a mandatory list of prospective energy conservation measures. Further details will need to be defined in the coming years to determine eligibility.

Our goal is to help our buildings avoid fines by helping them comply with the law. If you don’t want to comply and avoid a financial penalty, you will also see an operating expense as a result of your building running more efficiently.

<table>
<thead>
<tr>
<th>Energy Report Card for</th>
<th>Cast Iron Corp</th>
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</thead>
<tbody>
<tr>
<td>BERG Score</td>
<td>7.1</td>
</tr>
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NYC Energy Building Energy Grade

C1203 – Cast Iron Corp

NYC Carbon Intensity by Type 2019

- Natural Gas
  - Medium-Burn 1.88
  - Medium-Burn 1.5
  - Medium-Burn 1.2
- Fuel Oil
  - Medium-Burn 1.88
  - Medium-Burn 1.5
  - Medium-Burn 1.2
- District Steam
  - Medium-Burn 1.88
  - Medium-Burn 1.5
  - Medium-Burn 1.2
- Electric
  - Medium-Burn 1.88
  - Medium-Burn 1.5
  - Medium-Burn 1.2

- Total potential fine paid by 2050: $476,227

Report Prepared For:
Cast Iron Corp.
6/08/19
Climate Mobilization Act Impact

Total Actual Building GHG
- Total Actual Building GHG

2024 % of Buildings With Fines
- 20% Fines (%)
- 80% No Fines (%)

2030 % of Buildings With Fines
- 23% Fines (%)
- 77% No Fines (%)

Fines (%) No Fines (%)
Stakeholder Engagement and Planning

Owners

Capital Planning & Energy Reduction Planning

Subject Matter Experts

Building Operators

Property Managers
Kelly Dougherty
Director, Energy Management
FS Energy
Kelly.Dougherty@fsenergyservices.com
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June 18, 2019 © Urban Green Council
ALL ABOUT NYC’S HISTORIC BUILDING EMISSIONS LAW

On May 18, the City of New York enacted Local Law 97 of 2019—the most ambitious climate legislation for buildings enacted by any city in the world. The new law places buildings on path to meet the city’s goal to reduce overall carbon emissions 80 percent by 2050. Buildings represent nearly 70 percent of those emissions.

When Urban Green convened the 80x50 Buildings Partnership in 2017 to draft the Blueprint for Efficiency, we knew we needed an ambitious yet actionable plan. We’re pleased that many Blueprint elements are reflected in the new law, including more feasible timelines, a green power purchase option, a provision for carbon trading between buildings, and future refinement through an advisory board process.