Program Summary
Nimble Brains for Complex Systems

Program Brief

On November 30, 2022, NYSERDA and BE-Ex hosted the sixth event of their High Rise / Low Carbon Series, focusing on recent advancements in building control systems and their impact on system integration and optimization between legacy HVAC systems, heat pumps, thermal storage, and thermal distribution systems in large buildings.

The Empire Building Challenge (EBC) is a $50 million NYSERDA program that accelerates the decarbonization of tall buildings through public-private partnerships to bring scalable carbon-neutral retrofit approaches to the New York market.

The High Rise / Low Carbon Series highlights NYSERDA's EBC and the commitments of the Challenge Partners. The series is designed to inspire action among New York's building industry stakeholders and invite the world's top solution providers to join New York on its journey towards a low-carbon future.

Program Takeaways

Decarbonized buildings require data and analytics designed for optimization. Building controls are of equal importance to mechanical systems, ensuring that the building runs at peak performance. Advanced building controls and analytics go beyond traditional Building Management Systems (BMS), identifying heat recovery opportunities and enabling grid interactivity to improve energy performance and reduce emissions.

Systems that are normally siloed (i.e. HVAC and shading systems or occupancy sensors) become integrated by using advanced building controls, combining data from a wide variety of sources into a consistent model that enables better decision-making and energy optimization.

Real Time Energy Management (RTEM) systems, which pull in metering and submetering datapoints onto one major control platform, enable load shifting, peak shaving, and grid interactivity, encouraging participation in demand-response programs, and even the downsizing of mechanical system equipment, as peak loads are reduced.

Advanced building controls enable waste heat recovery and thermal dispatch systems, predicting a building's thermodynamic behavior, identifying opportunities to capture and dispatch excess thermal energy within and between buildings, and reducing overall energy consumption.

be
ex

building
energy
exchange

Program Takeaways

==A fully electrified building stock necessitates advanced control systems designed for grid load management.== Smart control systems can predict peak events by incorporating weather forecasts, occupancy trends, and other data points, providing operators with significant time to prepare (e.g., charge thermal batteries in advance).

==Stakeholder buy-in, supported by high-level goal setting around energy and carbon reduction, is key to implementing advanced control systems.== Educate building operators, assign responsibilities, and provide well-defined performance objectives to ensure that new control systems are being put to use.

==Advanced controls can reduce tenant energy consumption in commercial buildings.== Control systems provide a clear understanding of tenant occupancy rates and energy use across time, informing smart policies that limit low-occupancy, high-energy use scenarios (e.g., one employee triggers floor-wide heating on a Saturday). Control systems can also establish rules around asset relationships to reduce energy consumption and save tenants money— like reducing set-points based on occupancy sensors.

Additional Topics for Future Consideration:
- Building operator training
- Digital Twins
- Advanced building controls and tenant engagement
- Implementing advanced controls in existing buildings
- district thermal networks

Presenters

Matthew Sheridan
Energy Manager, Rockefeller Center
Tishman Speyer

Thomas Walsh
General Manager, Manhattan West
Brookfield Properties

Panel

Neil Breen
Vice President, Energy Services
Ramboll

Javier Aleman
Principal
AXC Automation

Moderator

Nyla Mabro
Head of Strategy & Marketing
The Clean Fight

Opening Remarks

Thomas Yeh
RTEM Advisor
NYSERDA

NEW YORK STATE OF OPPORTUNITY. | Empire Building Challenge