Building Digital Transformation and Integrated Distributive Energy Resources
Energy Technology Savings ("ETS")

- Utilizing data to reduce energy and maintenance costs while increasing resiliency and sustainability for buildings in the most capital efficient manner

- COD Jan 2014

- Servicing Over 60 Million SF / ~200 commercial and multifamily properties in Northeast

- Equipped with multidisciplinary licenses and certifications to deliver full stack value of energy efficiency and Distributed Energy Resources (DERs)

- Continuous optimization of >2MW of DER assets
Building Digital Transformation and Grid Decentralization Trends

**Generation**

**Transmission**

**Distribution**

**Load**

In Front of the Meter

Behind the Meter

New York Independent System Operator ("NYISO")

Con Edison

Load

PROPRIETARY & CONFIDENTIAL
Building Digital Transformation and Integrated Distributed Energy Resources

Building Digital Transformation

Building Denominator

Building Numerators

Staff Engagement

Integrated Distributed Energy Resources

Energy Efficiency Capital Projects: LED Lighting, VFDs, Cogen, Backup Generator, Solar, Battery Storage etc.
NYC: 15,000 properties over 50,000 square feet, which account for as much as 48 percent of New York City's total energy use (1)

- ~50% of electricity consumption in a multifamily building is borne by the owner (3)
- ETS is unlocking energy management value in the largest electricity consuming segment

NYC LL84 Benchmarking (2)

- Pre-war: 64%
- Post-war: 22%
- Modern: 14%

(1) NYC Mayor's Office of Sustainability - Green Buildings & Energy Efficiency
(2) URBAN GREEN COUNCIL - A MILEMARKER ON THE WAY TO 80X50
(3) ETS - Energy Technology Savings
Smart Building Desired Outcomes

- Energy Expenditures Savings
- Operating/Capital Expenditures Savings
- Improved Tenant Comfort and Health
- Increased Sustainability
- Increased Resiliency
Building Denominator: Smart Building Full Stack Value Opportunities

Fault Detection

Continuous Demand Management
Building Numerators: New Era of Big Data Insights
Property Operations Data Digitization

- Shut lobby fan
- Run secondary pumps at 45 hertz
- Raise set points on all cooling towers
- Raise set points on all chillers
- Shut all elevators in each bank
- Shut lobby and arcade lights
- Raise set point on secondary water temperature
- Lower hertz on all cooling towers
- Raise set points on all chillers
- Lower set points on all fans
- Raise set point on secondary water temperature
Case Studies
SmartKit in a High Rise Multifamily Property – New York, NY Case Study

~10% Electricity Expenditures Reduction through Data Transparency and Behavior Modification

- **2017 Energy Savings:** $18,363
- ~10% Reduction in Electricity Expenditures
- ~$550,000 increase in NAV

**Energy Savings**

- SmartKit data is providing the roadmap and capability for all future energy related capital projects at the Building such as Combined Heat and Power, Battery Storage and Solar
- The Building’s participation in Demand Response proved out a critical resource to Con Edison in the case of an actual emergency to avoid blackouts in the Con Edison Service territory
- The Building reduced 100kW (40%) of electricity consumption during Demand Response Events

**Resiliency & Sustainability**

**Continuous Energy and Operations Management:**
SmartKit monitors:
- **Energy:** Real-time building electrical usage
- **Temperature:** Ambient (e.g. lobby) and material (e.g. hot water pipes)
- **Operations:** Water leaks, door movement, audio/visual data

Smart Kit enables building staff to reduce energy and operating expenditures through intelligent guidance of energy usage reduction and building system fault-detection diagnostics

**Data Transparency:** Building benefits immediately from energy use transparency

**Behavior Modification:** Guided by ETS Energy Concierge and software application, building managers reduce energy usage during key high-value time periods

**SmartKit IoT Sensor Platform:**
smart meter, camera, sensors, connected to ETS mobile and web software tools

**1**

**2**

**3**

**Demand Response Events**

**Potential ICAP Events**
Mini Storage
HVAC Control and Monitoring System

Sustainability:
10% of Energy Consumption Reduced Through Intelligent Temperature Control

75 kW Automated Demand Response:
Providing a Critical Resource to the NY State Electric Grid

Financial Returns:
~$40k Net Savings
~$35k Net Capex
<1 year payback
~$740k NAV Increase

“The Mini Storage HVAC Control Project was the fastest, most effective and cost efficient Demand Management Project we have seen.” - Con Edison

The Problem:
- The facility had 36 manual thermostats that hang 15 feet in the air from the ceiling. The temperature setpoints were only changed twice per year (summer / winter) due to the difficulty of physically reaching each manual thermostat.

Project Scope:
- ETS designed and installed a control system on a 420 ton electric chiller and 40 fan coil units distributed throughout the facility. The system enables remote temperature monitoring and control of each zone.
- System can be easily accessed, monitored and controlled from mobile app and desktop devices
- NYSERDA (Real Time Energy Management) and Con Edison (Demand Response Program) rebates combined to >50% of the total project costs

System Design and Configuration

Real Time Power Meter
Real-time utility revenue grade power meter integrated into HVAC Control and Monitoring System

Controller x 1
Chiller

Controller
Chiller Bank 1
Chiller Bank 2

Thermostat x 16
Air Handling Unit x16

Controller

Questions

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