



Building Management Systems & Custom Controls Prescriptive & Custom Programs

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EVERSOURCE

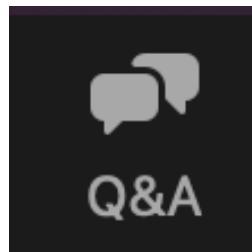


nationalgrid



We look forward to hearing from you

Please put all your questions into the questions section with this icon.



James Piermarini

Supervisor, EE Initiatives
Eversource

Whitney Brouger

Lead Analyst
National Grid



Agenda



WHY BMS & CONTROLS?



PRESCRIPTIVE BMS APPLICATION



CUSTOM CONTROLS AND OPTIMIZATION



EE PROJECT EXAMPLES



DEMAND RESPONSE AND OTHER OPPORTUNITIES

Why BMS & Controls?



Brains of
the Building

HVAC, Lighting,
Security, Fault
Detection



Cost
Effective
Solutions

**Increased
Program Funding**
Favorable
paybacks, often
low/no cost



Core to
Future EE
Programs

Optimization,
Automation,
Data-Driven
Solutions



Comp
Building
Mgmt

Essential for
optimizing use of
individual or portfolio
of buildings

Solutions for Every System



OPERATIONAL SYSTEM, 3 YEARS OLD

Retro-Commissioning - Custom

SINGLE EXISTING RTU

**Thermostat or Add-on Sequence – Rebate /
Prescriptive**

EXISTING HVAC SYSTEM WITHOUT A BMS

First Time Installation – Prescriptive

20-YR OLD PNEUMATIC SYSTEM, MANUAL LONG GONE

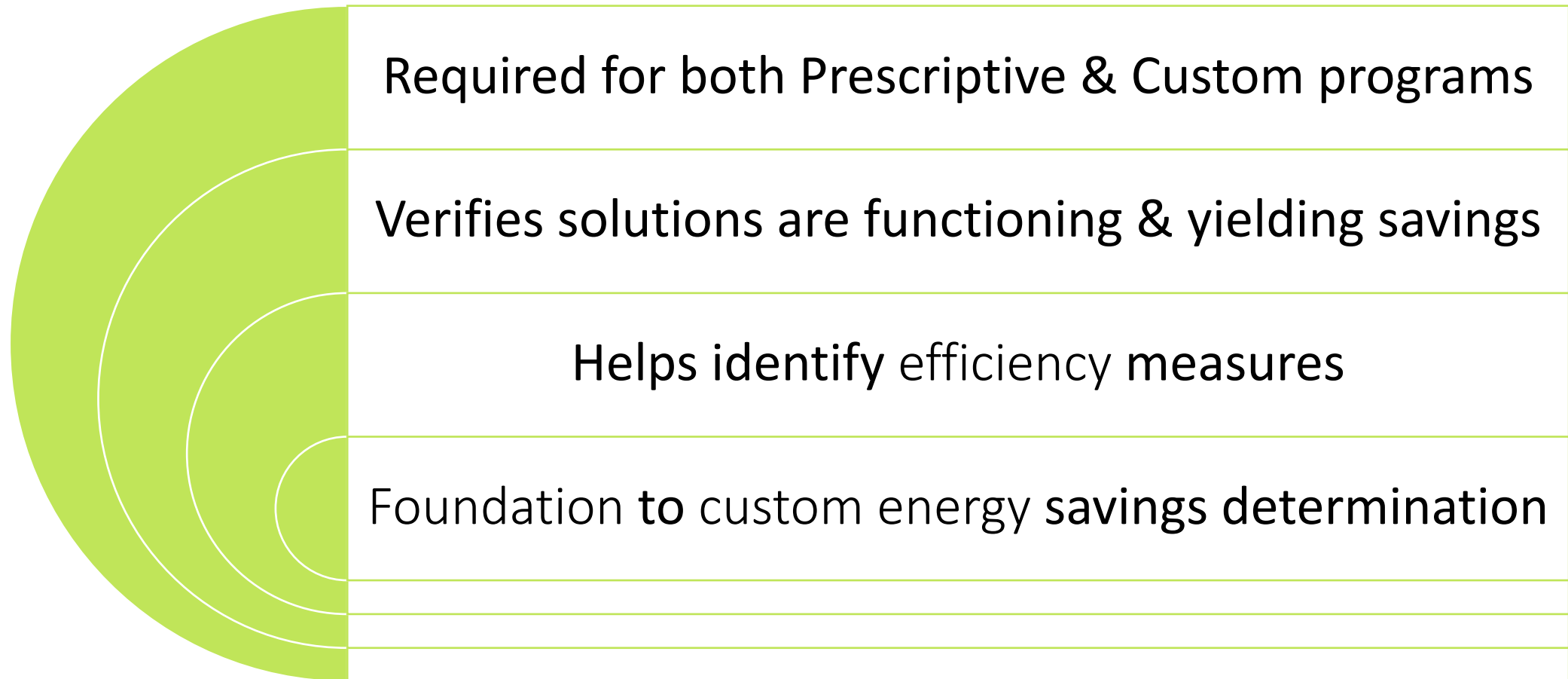
Replacement System - Prescriptive

ADVANCED PROCESS OR LAB CONTROL FOR REDUCING ENERGY

Custom Application

Importance of Trend Analysis

Trending data alone does not identify measures, but analysis of trends can.



Prescriptive Building Management Systems Application



Prescriptive BMS Eligibility

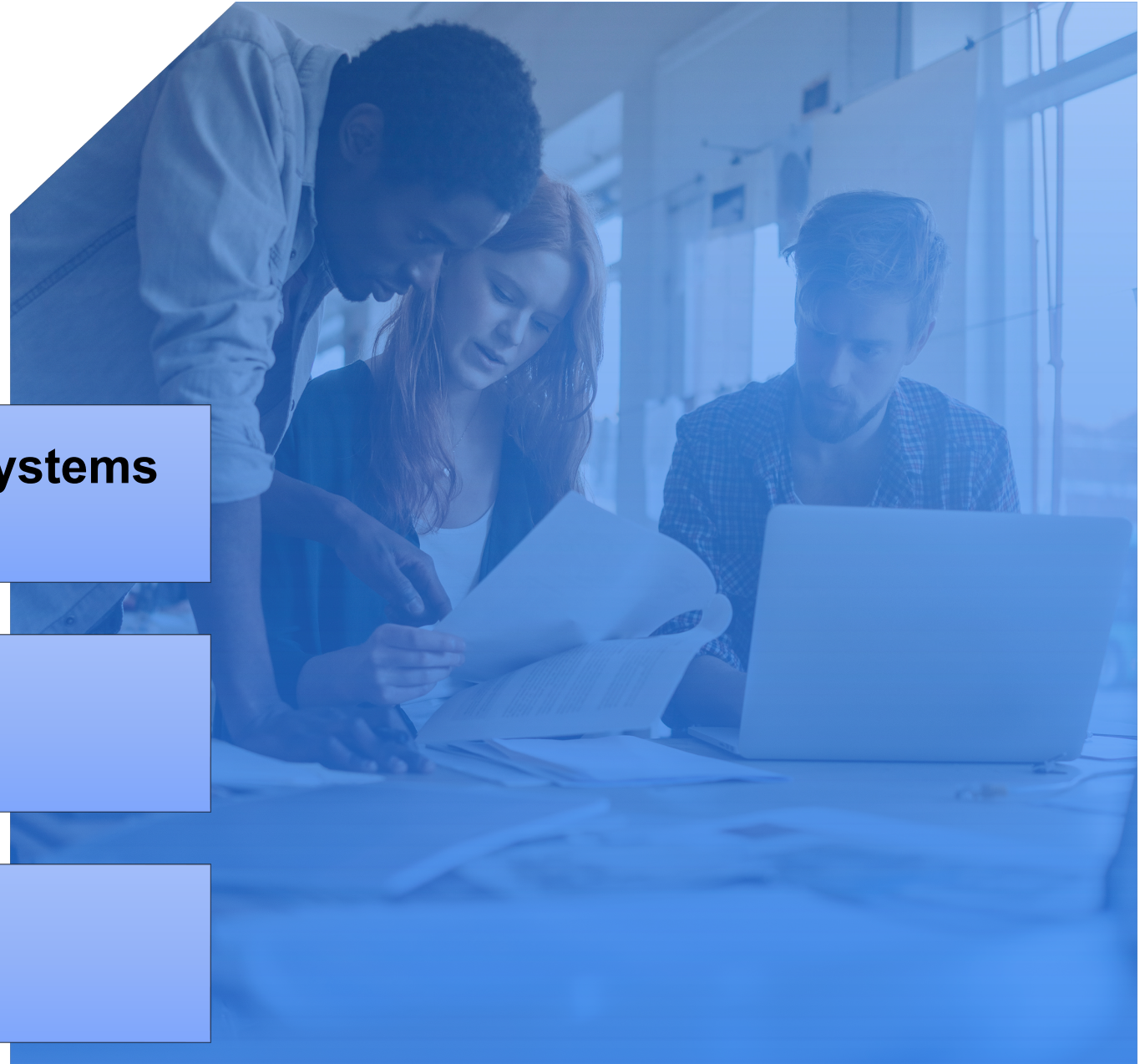
5,000 – **300,000** sq ft space

No process or lab (custom)

1. **Improvement of Existing Systems**
(add-on or optimize)

2. **System Installation**
(first time or replacement)

3. **Subscription Based**
(later 2024)



Eligible Sequences & Equipment

| Primary or Secondary HVAC Equipment | System Schedule and Unoccupied Setbacks ¹ | Optimal Start/Stop ¹ | Reset Supply Air Static Pressure | Reset Boiler Water Temperature | Demand Control Ventilation | Economizer Control (Dry Bulb or Dual Enthalpy) | Reset Supply Air Discharge Temperature | Reset Chilled Water Temperature | Reset Condenser Water Temperature |
|--------------------------------------|--|---------------------------------|----------------------------------|--------------------------------|----------------------------|--|--|---------------------------------|-----------------------------------|
| Cooling: Direct Expansion (DX) | - | - | - | - | Eligible | Eligible | Eligible | - | - |
| Cooling: Chiller | - | - | - | - | Eligible | Eligible | Eligible | Eligible | Eligible |
| Pumps and Fans: Constant Volume | Eligible | Eligible | - | - | - | - | - | - | - |
| Pumps and Fans: Variable Air Volume | Eligible | Eligible | Eligible | - | - | - | - | - | - |
| Heating: Boiler | Eligible | Eligible ² | - | Eligible ² | Eligible | - | Eligible | - | - |
| Heating: Furnace | Eligible | Eligible ² | - | - | - | - | - | - | - |
| Heating: Electric Resistance in AHU | Eligible | Eligible ² | - | - | Eligible | - | Eligible | - | - |
| Heating: Electric Baseboard | Eligible | Eligible ² | - | - | - | - | - | - | - |
| Heating: Heat Pump (no back up heat) | - | - | - | - | - | - | - | - | - |

¹ Not eligible for facilities occupied 24/7

² Not eligible for secondary heating equipment with heat pump as primary.

Project Verification

Trend set up for all projects

Data to be collected ~ 20% of projects
(3 weeks in 15 to 30 min intervals)

BMS Screenshots

Verification of active sequences

Reviewed to verify operation of sequences

Not for adjusting savings/incentives

Sequences requiring off-season trending

Alternative method of verification

Payment not delayed.



Project Submittal

Pre-Approval Documentation

Application, proposal, calc tool, etc.
[Engage ALL relevant PAs](#)

Prescriptive BMS Calculator

Predicts incentive and savings

Final Approval Documentation

Application, invoices, screenshots,
trends (if requested)



Custom Controls & Optimization

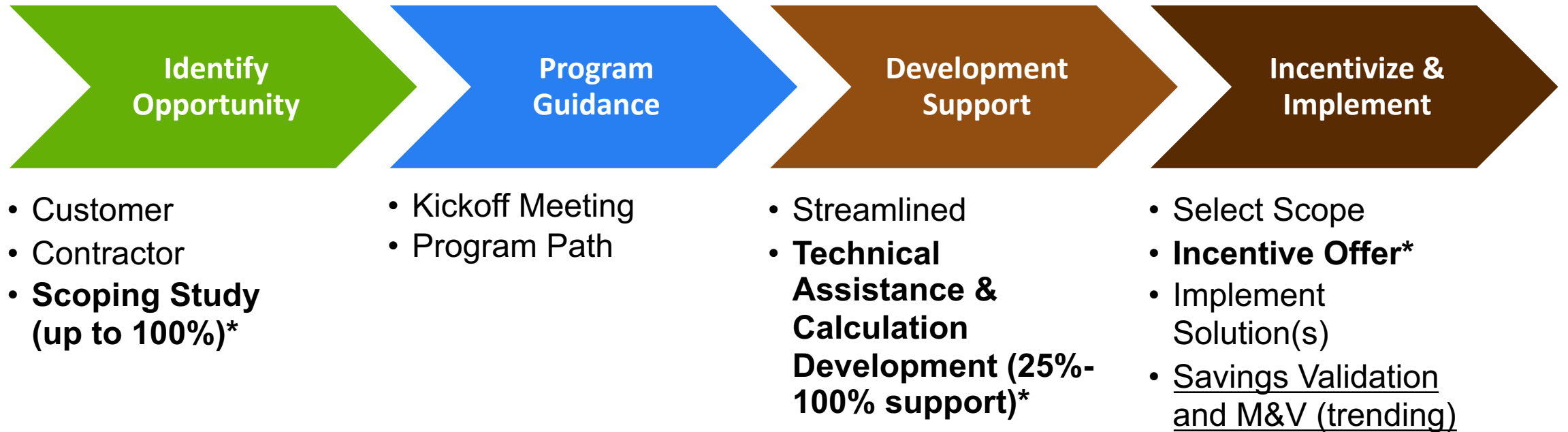


Custom Criteria & Measure Examples

- Over 300,000 sq. ft.
- Process, lab, complex load
- Custom sequences
- Energy Recovery
- Pumping Schemes
- Airflow Reduction
- Chiller Optimization



Project Development



* Mass Save Funding Available

TA Study Process & Importance of Savings Calculations

ENGAGE CUSTOMER AND TA VENDOR

Kickoff meeting | Discuss expectations

DETERMINE SCOPE OF WORK

Review proposal with customer and discuss funding

SITE VISIT

Data collection and documenting baseline

TA STUDY REPORT AND FINDINGS TA

Detailed list of ECMs with cost and savings/incentives

POST INSPECTION AND COMMISSIONING

Confirm installation and review additional data

EE Project Examples



Prescriptive – Confirm Implemented Sequences

| Prescriptive Project | Measures | Implement Measures | Rebate | ~ Savings kWh/yr | ~ Savings Therms |
|-----------------------|--|--|----------|------------------|------------------|
| 3-Story Building RTUs | Tool outlines savings and rebate based on prescribed sequence outcomes | System Schedules and Unoccupied Setbacks, Optimal Start/Stop, Demand Control Ventilation, Economizer | \$29,485 | 102,767 | N/A |
| Middle School BMS | | | \$72,000 | 83,623 | 4,092 |
| Hotel (Comp, NG Gas) | | | \$85,279 | 77,360 | 2,193 |

Custom – Confirm Implemented Savings

| Custom Project | Identify Measures and Savings | Measures | Implement Measures | Rebate | Savings kWh/Yr | Savings Therms |
|------------------|-------------------------------|---|--|-----------|----------------|----------------|
| Medical Facility | \$3,350 (Scoping) | Detailed data points, system information and documentation; Rebate tied to post-installation verified savings | airflow set-backs for unoccupied and weekend; air flow reduction for selected zones | \$43,552 | 1,047,329 | N/A |
| University | \$6,000 (TA) | | airflow reduction, repair actuators, optimize DAT; static pressure reset; economizer RCx | \$176,000 | 480,000 | 40,000 |

Other Existing Building EE & Optimization Opportunities

- Active Demand Response
- Lighting Controls
- Comprehensiveness
- Don't Forget the Building Envelope!



Statewide Contacts

Berkshire Gas

Gary Lane
glane@uinet.com

Liberty Utility

Matthew Caffrey
Matthew.Caffrey@LibertyUtilities.com

Cape Light Compact

Briana Kane
BKane@capelightcompact.org

National Grid

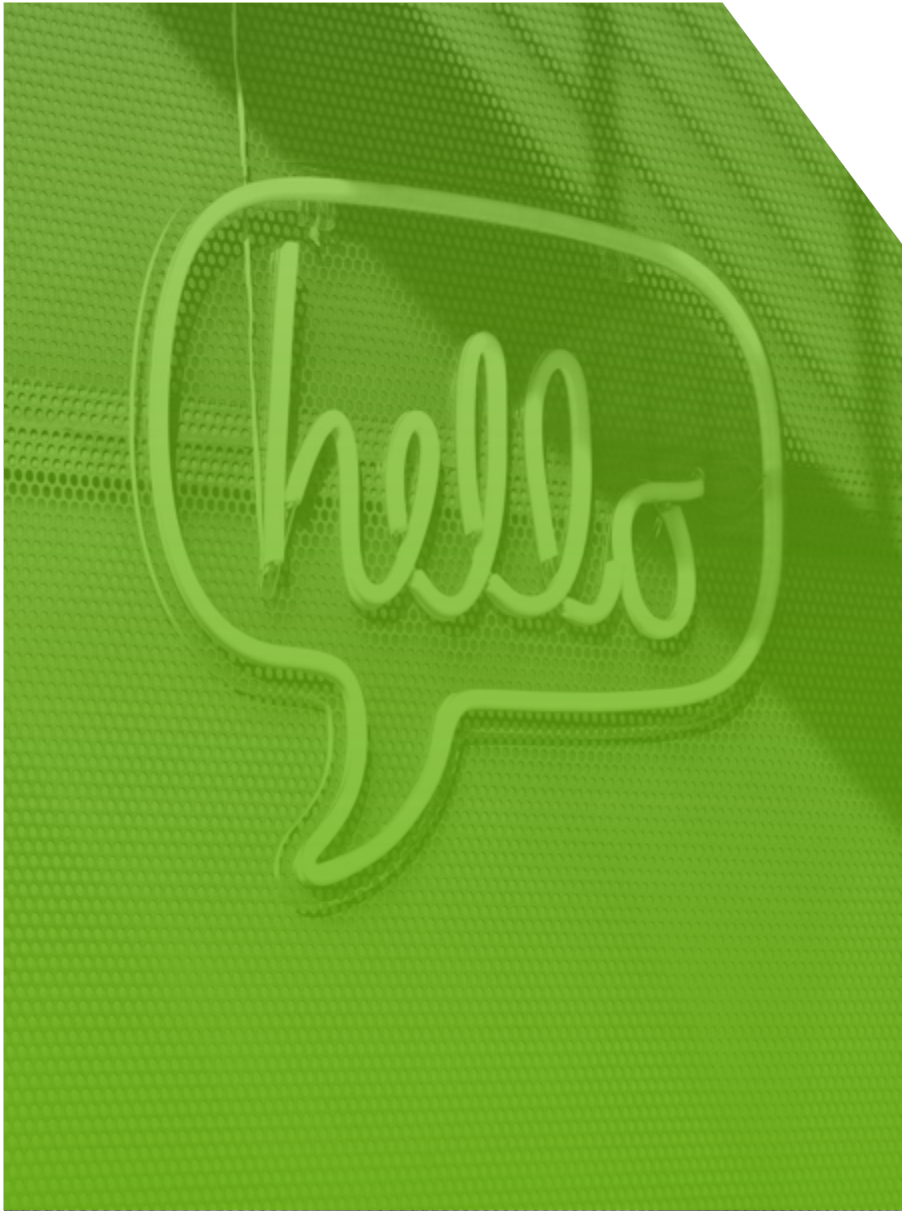
Zachary Lippert
Zachary.Lippert@nationalgrid.com

Eversource

Jim Piermarini
BMS@eversource.com

Unitil

Matt OKeefe
okeefe@unitil.com



Questions?

[Building HVAC & Controls Website Link](#)



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