OPPORTUNITY

How much energy can be saved with smart building control?

TECHNOLOGY

How does an energy management information system (EMIS) with automated system optimization (ASO) work?

AGGREGATES HISTORICAL AND REAL-TIME DATA WITH MACHINE LEARNING AND THERMAL MODELING TO OPTIMIZE BUILDING PERFORMANCE

ENERGY MANAGEMENT INFORMATION SYSTEM (EMIS)

- **EIS** (Energy Information System) 
- **FDD** (Fault Detection & Diagnosis) 
- **ASO** (Automated System Optimization)

WHERE DID MEASUREMENT AND VERIFICATION OCCUR?

NATIONAL RENEWABLE ENERGY LABORATORY assessed the impact of an EMIS with ASO provided by Prescriptive Data at four testbeds representative of a range of GSA facility types and operating conditions.

RESULTS

**5-11% WHOLE-BUILDING ENERGY SAVINGS**: From controlling AHU fan speeds based on weather and occupancy

**95% ACCURATE PREDICTED DEMAND WAS WITHIN 5% OF MEASURED DEMAND**: From controlling AHU fan speeds based on weather and occupancy

**VISIBILITY INCREASED WITH MULTIPLE DATA STREAMS**: From controlling AHU fan speeds based on weather and occupancy

**POSITIVE USER ACCEPTANCE**: From controlling AHU fan speeds based on weather and occupancy

GSA Market Analysis for Automated System Optimization

Portfolio potential for cash-flow positive facilities based on % savings*

<table>
<thead>
<tr>
<th>Cash-flow positive facilities (total out of 504)</th>
<th>5% Annual Cost Savings</th>
<th>7.5% Annual Cost Savings</th>
<th>10% Annual Cost Savings</th>
<th>12.5% Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Building Area (sf)</td>
<td>30,488,470</td>
<td>77,028,119</td>
<td>106,211,953</td>
<td>139,233,885</td>
</tr>
<tr>
<td>Gross Annual Cost Savings ($/yr)</td>
<td>$4,538,021</td>
<td>$12,467,287</td>
<td>$19,949,064</td>
<td>$28,689,424</td>
</tr>
<tr>
<td>Annual Subscription Cost ($0.10/sf/yr)</td>
<td>$3,048,847</td>
<td>$7,702,812</td>
<td>$10,621,195</td>
<td>$14,766,035</td>
</tr>
<tr>
<td>Net Annual Cost Savings after SaaS ($/yr)</td>
<td>$1,489,174</td>
<td>$4,764,475</td>
<td>$9,327,869</td>
<td>$14,766,035</td>
</tr>
</tbody>
</table>

*Break-even point depends on utility costs, annual savings, and geographic region. Does not include installation cost due to varying expense of integration.

DEPLOYMENT

Where does M&V recommend deploying an EMIS with ASO?

BUILDINGS WITH HIGH ENERGY COSTS

An EMIS with ASO can simplify building management and should be considered for deployment across the portfolio. Prioritize buildings with high energy costs.