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Energy Management System (EMS) Pilot for Small and Medium Businesses

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EXECUTIVE SUMMARY

An Energy Management System (EMS) is a software-based solution that helps monitor, control, and optimize energy consumption in buildings. An EMS helps improve energy efficiency, reduce costs, and support sustainability goals by automating systems like HVAC, lighting, and process loads.

Deployment of EMS is typically limited to large-scale facilities due to high initial costs for equipment and installation. The goal of this pilot is to bridge the gap between Small and Medium Businesses (SMBs) and advanced control technologies and determine if cost-effective operational energy savings are achievable for this customer segment.

Below are high-level objectives of the pilot:

1. Incentivize the deployment of cloud-based EMS across a representative group of SMBs.
2. Monitor energy consumption and usage patterns to determine operational strategies for energy savings.
3. Explore EMS products that can monitor and control multiple systems (for example, HVAC, refrigeration and lighting) via a single platform to determine if there are any interactive effects between systems that affect overall realized savings.
4. Provide actionable insights into project costs and achievable savings and determine viability of EMS as a potential cost-effective way for SMBs to improve operations.

Scope of the Pilot

- **Contractor and customer recruitment**: The pilot enlisted the support of an existing network of contractors supporting the ComEd Energy Efficiency Program Small Business offering (referred to as Service Providers, or SPs). These contractors bring valuable knowledge and experience working with SMBs and were asked to use their contacts to recruit participants for the pilot. Six SPs specializing in lighting, HVAC, and other technologies, each with varying levels of experience in implementing EMS projects, were chosen to evaluate whether EMS implementation expertise is exclusive to HVAC contractors or also accessible from other specialties with some support and training.
- **Pilot incentives**: The pilot aimed to recruit up to 12 customers by offering them full product cost coverage while funds were available. Based on feedback from Service Providers, the pilot also offered labor incentives, covering up to $5,000

per project. Due to various challenges discussed below, two sites ended up installing EMS.

- **Customer eligibility**: The following criteria need to be met to qualify for the pilot:
    - Peak demand must be under 400 kW to qualify as a small or medium-sized business.
    - Project scope must include at least two of the three targeted measure categories (lighting, refrigeration, HVAC).
    - Each project must implement at least five measures from a list of 18 viable measures identified across two or more of the measure categories above.
- **Product selection**: The pilot team identified three EMS product providers (referred to below as vendors or product vendors) judged to be capable of integrating three measure categories (lighting, HVAC, and refrigeration).
- **Customer and Service Provider interviews**: The pilot included interviews with participants and non-participants to better understand their overall experience. In addition, all participating Service Providers were interviewed to gather feedback and recommendations for potential future implementation of this offering.

Key Findings

While the two projects that successfully completed installation showed improved energy performance (see Section 4) several barriers to broader product adoption were identified:

Project Costs

- The pilot team as well as the SPs had an inadequate initial understanding of labor/installation costs, which proved to be highly variable. As a result, the installation incentive allocated by the pilot proved insufficient in several cases.
- In general, the main driver for high labor costs was not system complexity, but rather the scale of work needed to integrate multiple rooftop units (RTUs) and/or lighting zones into the EMS.

Customer Awareness and Engagement

- While some customers were familiar with EMS technology and understood the general benefits, there was a frequent need for education to be provided by the SPs.

- When pilot incentives did not cover the full project cost, most customers were hesitant to invest in EMS themselves. This reluctance stemmed primarily from competing financial priorities or concerns about an insufficient potential return on investment.

Vendor Considerations

- The three products selected for this pilot (GridPoint EMS, Johnson Controls Verasys, and NexRev Freedom EMS) were initially believed to be capable of communicating with and controlling all targeted building systems (lighting, HVAC, and refrigeration).
- However, it was discovered that most EMS products targeting small facilities are primarily designed for HVAC controls. Their ability to provide advanced monitoring and control for lighting and refrigeration systems is limited, revealing a gap in functionality impacting the ability to implement improvements across all three system types.
- Poor vendor communication and support were encountered on several occasions.
- In some cases, product vendors took weeks or even months to respond with quotes, deliveries, installation help, or troubleshooting issues.

Recommendations

Consider Increasing Incentive Amounts

- While the pilot covered product costs and provided an installation incentive, Service Providers expressed that the available funding often proved insufficient for customers to move forward. They were apprehensive about the additional out-of-pocket costs needed to cover the labor, which was often at least a few thousand dollars.
- The overall lack of awareness about the full cost benefits of an EMS added to their concerns. As customers stated that they joined the pilot primarily because projects required no out-of-pocket investment, this was a significant issue. Further project cost details appear on the table below.

Carefully Screen Vendor Support, Product Capabilities, & Pricing Structures

- Throughout the pilot, communication breakdowns were encountered with vendors, including product shipment delays, declining interest in serving small businesses, and minimal troubleshooting support.

- It is essential to partner with vendors who can properly guide both customers and Service Providers through their offerings and provide appropriate solutions. This support also helps small businesses feel confident and comfortable implementing EMS.
- During the pilot, one customer refused to participate specifically because they had had bad experiences working with a specific vendor.
- Customers consistently expressed two priorities: maintaining control over their systems with quick problem resolution capabilities and avoiding recurring payment plans that prevent them from eventually owning the systems outright. All customers contacted by the pilot preferred to fully own the EMS and avoid recurring monthly or annual charges. While Monitoring-as-a-Service (MaaS) may have been successful with some national chains elsewhere, the SPs did not find much success with it during the pilot, even when approaching national restaurant chains. Most customers preferred to own the system, especially via the pilot, as the pilot would cover the full product cost upfront.

Allow Substantial Time to Accommodate Unanticipated Difficulties in Project Implementation

- With one specific product vendor, some unexpected challenges were faced, from product delivery to scheduling installation all the way to retrieving EMS data.
- One Service Provider noted that the rushed timeline sometimes forced them to hurry customers through the eligibility process for the pilot program. This pressure made customers uncomfortable, resulting in diminished customer experience.

Develop Case Studies for Customer Education and Outreach

- The pilot primarily relied on SPs to communicate effectiveness and return on investment of EMS products. While vendors supplied supplemental product flyers and literature, concrete ROI and savings statistics were lacking since this pilot represented one of the first attempts to develop EMS case studies specifically for SMBs.
- Customers resonate most with case studies and want to understand the exact payback period they can expect before investing in these systems.

Explore Potential for EMS with National Restaurant and Retail Chains

- While EMS products for small/medium businesses exist, the EMS vendors are geared towards national chains such as restaurants and retail. This is an attractive business model for the vendors due to the volume of business, while

also allowing them to provide standardized services across large numbers of locations (which frequently have similar or identical building systems).