

EMIS Operation



Figure 1. Energy improvements require planning on how an Energy Management System team will use EMIS to identify, prioritize, implement, and verify opportunities. The EMIS itself also requires regular maintenance and improvements to ensure updated integrations of equipment and accurate data flow. *Illustration by Fred Zietz, NREL*

Best Practices to Support EMIS Operation at Federal Facilities

The Federal Energy Management Program (FEMP) promotes best practices for impactful utilization of Energy Management Information Systems (EMIS) at federal facilities, as detailed in the EMIS Technical Resources Report. This best practices document is one in a series of best practices documents created by FEMP to help accelerate the market adoption and use of EMIS in the federal sector.

EMIS Are Human-in-the-Loop Tools

EMIS are extremely powerful software tools, but they should not be considered stand-alone energy efficiency systems capable of producing results. Generally, apart from automated supervisory controls, EMIS are human-in-the-loop tools—they will not generate results unless energy conservation measures (ECMs) are identified, acted upon, and implemented. The most common EMIS operational issues are:

1. Facility staff not utilizing the EMIS to fully identify and prioritize ECMs at each facility
2. Lack of action on issues identified in the EMIS
3. Lack of verification once issues found in the EMIS have been corrected in the building automation system or in the field

4. Lack of system maintenance, such as fixing data connection problems and integration of new equipment
5. A need for ongoing support to ensure that existing interval meter analytics and fault detection and diagnostics rules remain tuned and working correctly (both for existing systems and new equipment)
6. Lack of culture shift emphasizing a proactive—rather than reactive—maintenance workflow.

The operational process outlined in this best practices document addresses these EMIS operational issues. EMIS require regular use by a well-resourced team to fully convert data to information, insights to action, and action to verified results.

Effective EMIS use requires integration of ongoing EMIS activities into the organization's standard operating procedures, and preferably a companion energy management system (EnMS)—the codification of strategic energy management processes as defined in International Organization for Standardization (ISO) 50001. An EnMS represents a process for establishing and managing energy performance improvements when using an EMIS. A prime role of an EnMS is for management to create and empower an energy team and to prioritize energy improvements as a part of site operations.

Planning Effective EMIS Operations

Energy improvements require planning as to how an EnMS will use an EMIS to synergize its data flows with the human aspect to optimize building performance. Additionally, EMIS also typically require a funding source—a savings reinvestment program can be a great starting point. The following steps, highlighted in Figure 1, outline an effective process for continually optimized EMIS operation.

Step 1: Identify and Prioritize.

The EnMS team can utilize the EMIS to identify improvement opportunities, which are prioritized based on qualitative or quantitative metrics such as calculated energy savings and criticality. The team can then use the EMIS to track issue history and frequency. It is most efficient for the EnMS team to use automated rather than manual prioritization tools for initial prioritization of the opportunities that the EMIS uncovers.

Step 2: Validate, Diagnose, and Triage.

The EnMS team then uses the EMIS and underlying systems to confirm the validity of improvement opportunities, determine root causes, and triage into implementation categories. The data analysis and visualization tools within the EMIS can help validate issues and determine root causes. A survey of the underlying systems may be required as a second step. Once the root cause is diagnosed, the complexity and effort involved in implementation will vary

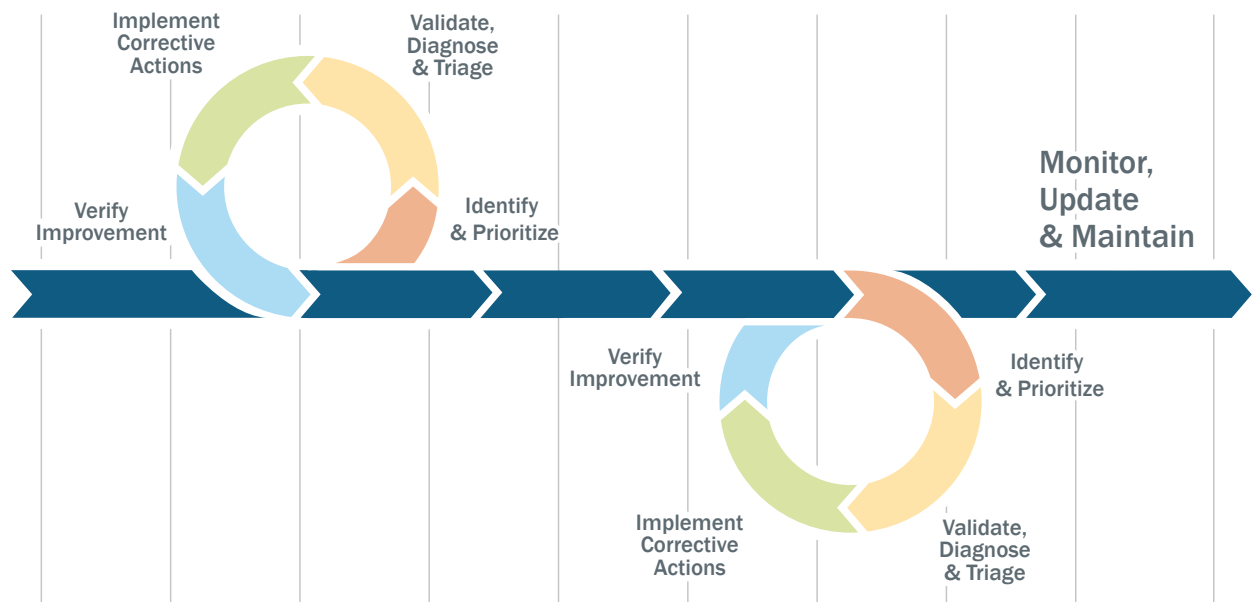


Figure 2. Recommended steps in the EMIS operational process. Illustration by James Dice and Fred Zietz, NREL

for different opportunities. Triaging the opportunities into predefined categories helps to streamline the implementation process. When creating implementation categories, key considerations should include the level of criticality, who will implement improvements, cost and payback, work order system tracking, and implementation of like improvements across multiple properties. Finally, the EnMS team will likely uncover opportunities to improve the EMIS itself. These types of improvements should be included in the implementation process.

Step 3: Implement Corrective Actions.

The EnMS team then implements the prioritized improvement opportunities in each implementation category. If the improvement can be made from the EMIS or underlying control system workstation (e.g., changing a schedule), the EMIS operator can implement it right away without involving the rest of the team. For other measures, the team should develop clear recommendations for the steps to complete implementation. Successful EnMS teams establish a regular EnMS meeting cadence to track the energy management system implementation, the site's performance, and the findings related to the EMIS functionality.

Step 4: Verify Improvement.

The EnMS team can use the EMIS to ensure proper implementation. Ideally, the root cause of each issue is reported back to the EMIS operator to improve EMIS analytics, prioritization, and diagnostics. After the opportunity is verified, measurement and verification capabilities can be used to automatically or manually quantify energy and cost savings and create savings reports.

Step 5: Monitor, Update, and Maintain.

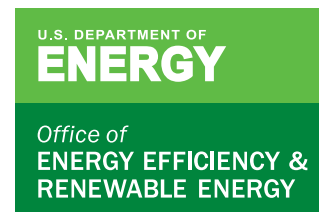
The EMIS itself requires regular maintenance and improvements to ensure updated integrations of equipment and accurate data flow. While the process steps above are typically executed in weekly, monthly, or quarterly intervals, these are ongoing tasks required to support the overall process. The organization should also keep team members trained on the EMIS itself. As improvements are made to building systems, building operators should be notified and trained on all changes or modifications. As the building itself changes, the building documentation (e.g., sequences of operations), standard operating procedures, cybersecurity protocols, and the EMIS should be updated to reflect changes.

Learn More

Download the Energy Management Information Systems Technical Resources Report at energy.gov/eere/femp/articles/energy-management-information-systems-technical-resources-report.

More information about operations and maintenance in federal facilities is available at energy.gov/eere/femp/operations-and-maintenance-federal-facilities.

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