High-Performance Measure Details

Measure Name
Building Management Systems

Use Category
Building Controls

Effective Date
January 1, 2026

Version
1

Measure Code
LM656

Measure Stage
Early Adoption & High Priority Data Collection

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Technology Summary

Building Management Systems (BMS)—also known as Building Automation Systems (BAS)—have long supported HVAC, lighting, and other building operations in large commercial facilities. Early systems, developed in the 1970s and 1980s, were proprietary, complex, and expensive, limiting adoption to buildings with significant operational demands and dedicated technical staff.

Today's BMS technologies are far more open, interoperable, and user-friendly, paving the way for modern Energy Management Systems (EMS) that not only control building systems but also optimize energy use, benchmark performance, and support grid-responsive strategies like demand management and load shifting.

Despite these advances, adoption in smaller commercial buildings remains low. Only about 13% of buildings under 50,000 square feet have any form of building automation, leaving a significant opportunity to improve efficiency, reduce energy use, and enhance occupant comfort across much of the building stock.

This high-performance measure aims to expand BMS/EMS deployment into small and medium-sized nonresidential buildings—specifically those between 5,000 and 50,000 square feet. These facilities often face cost and staffing barriers or assume their systems are too simple for automation. Yet many—such as retail, small offices, restaurants,

and community centers—have central HVAC, hot water needs, and variable occupancy patterns well suited to intelligent controls. By targeting Occupancy Groups B (business), M (mercantile), and A (assembly) per the California Building Code and offering scaled financial incentives, programs can unlock energy savings and load flexibility in this underserved sector.

In support of California's decarbonization and electrification goals, broader deployment of BMS and EMS in smaller commercial buildings can drive deeper energy efficiency, improve demand-side management, and enable low-carbon technologies. These systems enhance HVAC, water heating, and lighting operations—especially during peak grid periods—and provide a foundation for long-term operational savings, fault detection, and improved maintenance. Expanding their use beyond large facilities will accelerate progress toward the state's climate targets while building a more resilient and data-driven commercial building sector.

Alignment with CEDA Program Goals

The CEDA program supports the implementation of measures that support Code Readiness's Long Term Tactical Plan (LTTP) to drive the goals of electrification, decarbonization, and load reduction. Projects must meet one of the CEDA Inducement Requirements identified in the next section to receive an inducement and will be evaluated for level of interest in metering to support Code Readiness Objectives.

This measure meets the CEDA program goals as follows:

- **Building partnerships with market stakeholders** by consulting on innovative technologies and best practices in energy efficiency, which can lead to the development of more effective solutions and accelerate the adoption of new technologies. As teams adopt the measure, this increases the volume of engineers able to design building management systems, contractors capable of installing building management systems, and owners able to operate building management systems.
- **Increasing the supply of high-performance measures and all-electric buildings** by combining electrification with energy efficiency, which can result in projects implementing measures to achieve greater energy savings, reduced emissions, and overall improved building performance. As more buildings specify and install building management systems, this helps to increase the overall supply of building management technologies in the market for others to use, including beyond new construction.
- **Increasing the demand for high-performance measures and all-electric buildings** by pushing for electrification that drives the need for technological advancements, supporting economic growth opportunities through innovation, and raising awareness of the benefits of electrification to increase consumer adoption. As demand in the market increases for newer technologies, the long-term benefit is increased demand for manufacturers and suppliers to provide additional options available in the market.
- **Advancing new high-performance measure technology** by raising public awareness about new technologies and their benefits, helping build acceptance and demand through market support advocacy efforts that can influence stakeholder decisions that enable technological innovation.
- **Providing Codes & Standards with projects of interest** to collect metered data that will inform future California energy codes.

CEDA Inducement Requirements

The following inducement requirements are intended to accelerate the market adoption of Building Management Systems (BMS) and Energy Management Systems (EMS). Projects will be evaluated based on the total conditioned floor area served by building-level control systems. To qualify, applicants must submit all required supporting documentation and satisfy at least one of the specified system-level design criteria. In addition, each project must implement at least one other qualifying CEDA high-performance measure to be eligible for inducements. Refer to Appendix A for the complete list of qualifying CEDA high-performance measures.

System Design Requirements

1. **Essential level:** Entry-Level BMS with Central Monitoring & Control
   - 1.1. Must install an entry-level BMS with central monitoring and control capabilities.
   - 1.2. Communication Protocol: BMS must support open communication protocols such as BACnet MS/TP, Modbus, or LonWorks.
   - 1.3. Network Connectivity: The BMS must connect to a local network (LAN) and support optional internet access (via Ethernet or Wi-Fi) for remote troubleshooting and updates.
   - 1.4. Control Requirement for Small HVAC Systems: Programmable thermostats may be used instead of full Direct Digital Control (DDC) if all of the following are met:
     - 1.4.1. Thermostats use an open protocol (e.g., BACnet MS/TP or Modbus).
     - 1.4.2. Thermostats are fully integrated into the BMS and can be monitored/controlled centrally.
     - 1.4.3. Thermostats include:
       - 1.4.3.1. Time-based scheduling (at least occupied/unoccupied).
       - 1.4.3.2. Remote override and setpoint changes via the BMS.
       - 1.4.3.3. Trend logging of space temperature and setpoints for at least 7 days.
   - 1.5. System Integration:
     - 1.5.1. BMS must be integrated with centralized HVAC system control (e.g., packaged RTUs, AHUs, VAVs).
     - 1.5.2. Encouraged (but not required): Control of at least one additional load such as lighting or service water heating (SWH).
   - 1.6. User Interface: BMS must have a local display or desktop-accessible interface with zone-level monitoring.
   - 1.7. Scheduling: BMS must have time-based scheduling for HVAC (and lighting or SWH if these or other systems are integrated into the BMS).
   - 1.8. Sequence of Operations:
     - 1.8.1. Predefined sequences of operation (SOO) must be documented and implemented.
     - 1.8.2. Include a written or digital copy available to facility staff and/or owner.
   - 1.9. Trend Logging:
     - 1.9.1. Temperature and setpoint trends must be stored for at least 1 week and be accessible over an open protocol or application programming interface (API), or exportable in a computer-readable format on a regular basis.
     - 1.9.2. Optional: Alert notification for basic HVAC faults (e.g., excessively high/low temperatures).
   - 1.10. Scalability: The BMS must be expandable to include more control points, zones, or systems in the future.
   - 1.11. Energy Monitoring (Optional): Optional connection to building-level utility meters or plug-in submeters for basic energy visibility.

Essential Level Use Case Example: A cost-effective retrofit for major renovations or entry-level solution for new construction small office or retail buildings.

2. **Advanced level:** BMS with DDC, Remote Access, and Limited EMS Capabilities
   2.1. Must install a BMS that satisfies all essential-level system design requirements and includes the additional advanced-level system design requirements specified herein.
   2.2. Communication Protocol: BACnet/IP or equivalent IP-based system.
   2.3. Control Requirement:
      2.3.1. All connected systems (HVAC, lighting, etc.) must use Direct Digital Control (DDC) with programmable logic and point-level control.
      2.3.2. Pneumatic or electromechanical controls must be retrofitted or replaced.
   2.4. Interoperability: The system must use open protocols (e.g., BACnet/IP, Modbus TCP/IP) and support third-party equipment integration without requiring vendor-specific gateways or licensing fees for point access.
   2.5. Remote Access:
      2.5.1. Secure web-based access with user authentication.
      2.5.2. Use at least TLS 1.2 encryption and enforce user credentials.
   2.6. System Integration:
      2.6.1. HVAC, lighting, service hot water, and occupancy-based controls.
      2.6.2. Optional: plug loads or zone-level ventilation.
   2.7. Fault Detection: Basic fault alerts must be supported, including configurable alarms for key issues (e.g., high temperature, failed sensors, short cycling).
   2.8. Advanced Scheduling: Occupancy-based or demand schedule overrides.
   2.9. Energy Meter Integration: Integrate with available utility meters or building submeters (electric/gas).
   2.10. Data Logging & Visualization:
      2.10.1. The BMS/EMS must integrate, log, and visually display all required connected points applicable to the installed equipment, as defined in Appendix B. Compliance requires implementation of every point listed for each relevant system type (e.g., air-based, hydronic, heat recovery).
      2.10.2. Store at least 30 days of trend data.
      2.10.3. Include charts showing energy use, temperature trends, and system runtime.
      2.10.4. Allow users to export trend data (e.g., to CSV or Excel) for analysis.
   2.11. Training: Basic system training for building operators (virtual or in person), covering:
      2.11.1. Interface navigation, scheduling, alarms and faults, and troubleshooting.
   2.12. Demand Response Capability (Optional): Demand response (DR)-readiness (e.g., OpenADR signal support) is encouraged but not required at this level.

Advanced Level Use Case Example: Mid-size buildings like grocery stores, restaurants, or medical offices that want better energy and operational visibility.

3. **Premium level:** High-performing EMS with Predictive Control and Grid Integration
   3.1. Must install an EMS that satisfies all essential and advanced-level system design requirements and includes the additional premium-level system design requirements specified herein.
   3.2. Communication Protocol: BACnet/IP and cloud- or IoT-based connectivity.
   3.3. System Integration: Full integration of:
      3.3.1. HVAC, lighting, plug loads, domestic/service hot water, and on-site renewables and storage (if present)
   3.4. Demand Response & Grid Integration:
      3.4.1. Must support OpenADR 2.0b or equivalent demand response functionality.
      3.4.2. Must be able to perform load shifting or DR actions automatically based on utility signals or preprogrammed rules.
   3.5. Advanced Control Strategies:
      3.5.1. Predictive maintenance and fault prevention.
      3.5.2. Load shifting, dynamic temperature setpoints, or pre-cooling strategies.
      3.5.3. Include automated fault detection with root cause diagnosis and alert prioritization.

3.6. Data, Analytics, & Reporting:
  3.6.1. Monthly performance dashboards and automated benchmarking reports.
  3.6.2. Provide insight into system runtime, energy consumption, and recurring faults
3.7. Commissioning & Measurement & Verification (M&V):
  3.7.1. Control logic must be verified by a commissioning agent.
  3.7.2. Must support standard evaluation methods (e.g., IPMVP Option B or C).
3.8. Cybersecurity:
  3.8.1. Must align with NIST cybersecurity best practices (e.g., NIST SP 800-53 Low/Moderate baseline) or ISO 27001 equivalent.
3.9. Enhanced Training Requirement:
  3.9.1. Advanced training and documentation must be provided for system operators.
  3.9.2. Provide training on interpreting analytics, managing faults, and optimizing energy use.
  3.9.3. A system manual must be provided and continued support or helpdesk access must be available for at least 6 months.

Premium Level Use Case Example: High-performance buildings targeting zero net energy (ZNE), decarbonization, or complex system coordination.

Supporting Documentation Requirements

1. **System Design Summary**
   1.1. System Schematic or Network Diagram:
     1.1.1. Provide a simplified diagram showing how the system components (e.g., HVAC units, thermostats, controllers) are connected. This should include communication paths (e.g., BACnet/IP) and identify major equipment or control zones.
   1.2. Sequence of Operations (SOO):
     1.2.1. Submit a concise narrative or tabular description of how the system is intended to operate. Include temperature control logic, scheduling details (e.g., occupied/unoccupied periods), and responses to overrides or alarms.
2. **Operational Evidence**
   2.1. Screenshots or Photos of Live System Interface:
     2.1.1. Provide interface captures showing the installed system in operation. This should include:
       2.1.1.1. Main dashboard or zone view
       2.1.1.2. A sample schedule or override control screen
   2.2. Point List or Live View Export:
     2.2.1. Submit a basic list or screenshot of active monitoring/control points (e.g., space temperature, fan status, setpoint). A small representative sample (5–10 points per system) is sufficient.
3. **Trend Data Sample**
   3.1. 1–2 Weeks of Logged Trend Data:
     3.1.1. Provide a sample of operational trend data showing system behavior under normal conditions. Data may include:
       3.1.1.1. Temperature or setpoint trends
       3.1.1.2. Runtime hours or energy data if available
       3.1.1.3. Acceptable formats include screenshots or exported data (e.g., CSV or Excel).
4. **Functional Verification**
   4.1. System Installation and Functional Test Confirmation:
     4.1.1. A brief statement from the installer, vendor, or building staff confirming:
       4.1.1.1. The system is installed and operational
       4.1.1.2. Control points are functioning and responsive
       4.1.1.3. Schedules and override features have been tested and verified

5. **Training and Turnover Confirmation**
    5.1. Training Summary or Handoff Acknowledgment:
        5.1.1. Provide evidence that building staff received basic training. This may include:
            5.1.1.1. A list of topics covered (e.g., navigating interface, scheduling, alarms)
            5.1.1.2. Contact information for support or follow-up
            5.1.1.3. Confirmation that operators can access and adjust the system
6. **Additional Documentation Requirements for Advanced or Premium-Level Tiers**
    6.1. Sample fault detection alerts or alarm configurations
    6.2. Energy dashboard or utility meter integration screenshots
    6.3. Demand response test (e.g., DR signal response)
    6.4. Performance report sample (e.g., monthly dashboard or benchmark summary)
    6.5. Commissioning agent verification (for Premium-level tier only)

Code Readiness Objectives

Historically, small- to mid-sized commercial buildings (5,000–50,000 sq. ft.) have not commonly installed Building Management Systems (BMS) or Energy Management Systems (EMS), largely due to cost, complexity, and perceived lack of value. However, advancements in scalable, cloud-based, and cost-effective BMS/EMS solutions now make it feasible to bring sophisticated controls and monitoring to these buildings. Promoting the adoption of BMS/EMS in this segment aligns with California's goals under Title 24, Part 6, to increase energy efficiency, reduce greenhouse gas emissions, and support demand flexibility and decarbonization. Future code updates that explicitly reference and support BMS/EMS functionality in smaller buildings can significantly enhance energy savings, diagnostics, and participation in demand response or grid harmonization programs.

The information would help to specifically inform energy codes to:

- Identify which building sizes and system types (HVAC, lighting, plug loads, etc.) can benefit most from scaled-down or modular BMS/EMS deployments.
- Specify minimum BMS/EMS functionalities (e.g., fault detection, data logging, remote monitoring) appropriate for smaller building types.
- Define control integration thresholds or system types (e.g., VRF systems, advanced thermostats, VAVs) where BMS integration is cost-effective.
- Inform future prescriptive or mandatory measures that require or recommend EMS capabilities for specific building sizes or system types.
- Enable performance-based compliance approaches to recognize BMS/EMS-enabled energy savings and grid-responsive operations.

To support future code cycles, Code Readiness seeks to capture the following information:

- Functional capabilities and energy impact of lightweight BMS/EMS platforms deployed in small commercial buildings.
- Cost-benefit analysis of BMS/EMS implementation, including installation and O&M savings.
- Interoperability with other code-required systems (e.g., thermostats, economizers, DCV).
- Availability of vendor-neutral solutions that support open protocols (e.g., BACnet, Modbus) and facilitate broad adoption.
- Field data from installations demonstrating operational savings, fault detection improvements, and demand flexibility.

Site Metering Prerequisites

Integrated Metering and Monitoring Requirements:

To qualify for site metering consideration under this HPM, projects must implement at least one additional qualifying high-performance measure. If selected for Code Readiness metering, system energy and performance data may be collected at the site for a period of up to 12 months.

To support system performance monitoring and data acquisition, each project must provide reasonable access for installation of metering and communication equipment under the following conditions:

Projects with a BAS/EMS:

Sites equipped with a Building Automation System (BAS), Energy Management System (EMS), or an equivalent platform shall enable integration of advanced metering devices through that system to facilitate data collection, system interoperability, and remote access.

Instrumentation Requirements:

Instrumentation and sensors will be installed or supplemented as necessary to capture key system parameters—such as fluid flow, temperature differentials, and energy transfer—sufficient to evaluate the performance of the relevant system(s) and associated equipment.

Data Benefits

- Enables more granular and time-resolved energy use analysis for benchmarking and compliance.
- Improves the accuracy and reliability of system performance through fault detection and diagnostics.
- Facilitates compliance verification and post-occupancy performance validation.
- Supports grid-interactive efficient buildings (GEBs) by enabling demand response signals, automated load shedding, or time-of-use optimization.
- Reduces long-term O&M costs through automated alerts, remote monitoring, and preventative maintenance.

Code Reference

Section 120.2(e) – Automated Demand Shed Control Requirements: EMS systems can fulfill requirements for automatic receptacle and lighting demand shed in response to signals.

Section 100.0(f) – Additions, Alterations, and Repairs: BMS systems may help document and manage compliance for alterations in existing buildings.

Section 110.12 – Mandatory Requirements for Demand Management: BMS platforms with Virtual End Node (VEN) capability can automate demand response actions across HVAC, lighting, and plug load systems to meet mandatory OpenADR signal requirements.

Section 120.1(c), (d) – Ventilation and DCV Control Requirements: BMS integration allows for centralized control of ventilation rates, supporting IAQ and energy goals through coordinated airflow logic and occupancy feedback.

Section 120.2(b) – Zonal Thermostat Controls: BMS may satisfy mandatory requirements for space-by-space temperature control if it meets all individual code criteria, reducing the need for separate thermostats in each zone.

Section 120.2(c) – Hotel/Motel Thermostat Controls: BMS systems may centrally manage guest room HVAC control across multiple zones, enabling automated setpoint resets and occupancy-based adjustments.

Section 120.2(e) – Shut-off and Reset Controls: BMS platforms can automate HVAC system shutdown and reset during unoccupied hours and implement temperature reset sequences to reduce energy consumption.

Section 120.2(g) – Isolation Area Controls: BMS can enable zonal control logic that shuts off or reduces HVAC in inactive areas of large buildings.

Section 120.2(h) – HVAC Demand-Shed Logic: BMS systems can fulfill HVAC-specific demand response requirements by reducing heating or cooling loads during DR events in compliance with §110.12. This typically includes strategies like setpoint adjustment, compressor staging, or fan speed control executed via OpenADR signals.

Section 120.2(i) – Fault Detection and Diagnostics (FDD): BMS integration can support compliance with mandatory FDD for air handlers and economizers by monitoring fault signals and generating diagnostic alerts.

Section 120.2(j), Table 120.2-A – DDC to the Zone Level: BMS systems built on DDC architecture meet zone-level control requirements for new or altered systems ≥300 kBtu/h, enabling advanced supervisory logic and data integration.

Section 120.5 – Mechanical System Acceptance: BMS interfaces can provide trend logs and live dashboards that assist with NA7 acceptance test verification for DDC, FDD, and DR functionality.

Section 130.1(a), (b), (d) – Lighting Controls: BMS systems can satisfy multi-level lighting , shutoff, and demand-response lighting requirements using programmable logic tied to occupancy sensors and time schedules.

Section 130.5(d) – Electrical Power Distribution Monitoring: BMS platforms can log and display data from required power monitoring systems.

Section 140.4(b), (e), (f), (r) – Prescriptive HVAC Sequences: BMS systems using Programming Library logic based on ASHRAE Guideline 36 can meet prescriptive reset and economizer control requirements while improving system efficiency and diagnostics.

Section 140.4(s) – Mechanical Heat Recovery Integration: BMS logic can coordinate simultaneous heating and cooling loads across HVAC and water heating systems to meet prescriptive waste heat recovery requirements.

Section 140.9(b)2 – Kitchen Hood Demand Ventilation: BMS systems can modulate exhaust airflow based on appliance operation and automate the transition between full-flow and reduced modes.

Section 160.3(a)2G and 2H – Multifamily HVAC Controls: BMS systems can automate DR load shed and FDD reporting for centralized HVAC systems serving multifamily common or dwelling areas.

Section 160.5(b)4B – Multifamily Lighting Controls: BMS integration supports demand-responsive lighting reduction in multifamily common areas ≥4,000 W, providing compliant dimming during DR events.

Section 160.6(d) – Controlled Receptacles (Multifamily): BMS may coordinate automatic shutoff of controlled receptacles during DR events using programmable relay panels or plug load controllers.

Section 160.7(a) – Elevator Cab Controls: BMS logic may support elevator cab lighting and fan shutoff when idle, satisfying mandatory control requirements through occupancy or runtime detection.

Section 160.7(b) – Pool and Spa Energy Controls: BMS systems may manage timer schedules or heater interlock functions for pool & spa systems in multi-tenant buildings.

Joint Appendix 5 (JA5) – Acceptance Testing Procedures for Controls: BMS can simplify and automate some acceptance testing procedures for lighting and HVAC controls.

NA7 Acceptance Tests – Field Verification and Diagnostic Testing: BMS platforms can support documentation and execution of NA7 tests for HVAC and lighting controls by providing control sequences, data logging, and trend visualizations.

Eligible Climate Zones, Building Types, & Project Scopes

Eligible Climate Zones

This high-performance measure applies statewide in California Climate Zones 1-16 (Title 24). Applicants must identify the project's climate zone in the submittal.

Eligible Building Types

This measure is applicable to the following building types:

- Building Size: Small to medium-sized buildings that are between 5,000 and 50,000 square feet.
- Building Type: Buildings that are classified under the California Building Code (CBC) as:
    - Group A – Assembly (e.g., restaurants, small theaters)
    - Group B – Business (e.g., small offices)
    - Group M – Mercantile (e.g., retail stores)

Mixed-Use Buildings: If a building has multiple CBC classifications, the primary classification must account for at least 50% of the building's total floor area and must be one of the eligible types listed above.

Eligible Project Scopes

This high-performance measure applies to new construction, additions, and major alterations or retrofits that include systems affected by or integrated into the BMS/EMS installation. Eligible scopes include improvements to:

- HVAC systems
- Lighting and plug load controls
- Domestic/service hot water systems
- On-site renewable energy and energy storage systems (where applicable)

Projects are eligible when these systems are monitored, controlled, or otherwise served by the BMS/EMS installed under this measure.

Measure Exclusions

This high-performance measure excludes the following:

- Buildings with existing, fully functional BMS/BAS/EMS platforms that already provide comparable control, scheduling, monitoring, and data-access capabilities.
- Facilities classified under Group I (Institutional), Group F (Factory/Industrial), or Group H (High-Hazard) per the California Building Code, as these occupancies typically include complex systems for which BMS deployment is already standard or governed by specialized requirements.
- Buildings larger than 50,000 square feet, since the intent of this HPM is to expand adoption within small to medium commercial buildings rather than large facilities that commonly have established control systems.
- Buildings smaller than 5,000 square feet, where system complexity is generally insufficient to justify or benefit from BMS/EMS deployment.
- Temporary buildings, relocatable structures, or facilities undergoing major renovation where long-term system operation or monitoring cannot be reasonably ensured.
- Sites where the owner declines to allow installation of required sensors, metering equipment, or communication devices, which would prevent compliance with monitoring and data-collection requirements.

Appendix A: CEDA High-Performance Measures

To qualify for the BMS measure, projects must implement at least one of the following CEDA-approved High-Performance Measures. These measures are considered highly complementary to building management system adoption and are prioritized for their potential to enhance energy efficiency, operational performance, and grid flexibility.

Qualifying CEDA High-Performance Measure List

- Heat Recovery Chillers for Space Heating
- Space Heating with Air-to-Water or Water-to-Water Heat Pumps (Hydronic Heat Systems)
- Cold Climate Air-to-Air Heat Pump
- Very High Efficiency DOAS Units
- HP RTU Units with High-Frequency Power Metering
- Heat Pumps with Thermal Energy Storage for Space Heating Load Shifting
- VAV Hydronic Reheat System with Hydronic Heat Pumps for Medium and Large Office Buildings
- VRF with Thermostat Setback based on Occupancy Signals.
- DOAS with Ventilation Airflow Controls and Occupancy Controls at Each Thermal Zone
- DOAS Ventilation with Space Conditioning Water Source Heat Pumps (WSHP) with Extended Range/Geothermal Operations (25F to 110F)
- Heat Pump Crankcase Heater Controls
- Ground-Coupled (Ground Source) Heat Pumps
- Cold Climate VRF Systems
- Heat Pump Defrost Controls
- Central Heat Pump Hot Water (HPWH) Systems
- Semi-Central HPWH Systems
- Heat Pump Water Heater System with Adequate Storage for Restaurants
- HPWH Thermal Storage Optimization and Load Flexibility Controls
- AWHP for Pool and Spa Heating
- Alternate Heating Process Designs for Industrial Applications
- High Efficiency Elevators
- Drain & Wastewater Heat Recovery
- Refrigeration Heat Reclamation
- Commercial Clothes Dryer Exhaust Heat Recovery

Note: This list highlights priority high-performance measures that are most synergistic with the BMS measure. It is not all-inclusive; additional qualifying measures may be considered at the discretion of the CEDA program.

Appendix B: Required Connected Points List

System	Data Point	Unit of Measurement
All Systems	Total Unit Power Consumption	Kilowatts [kW]
Air-Based Systems	Air Return Flow Rate	Cubic Feet per Minute [CFM]
	Air Return Temperature	Fahrenheit [F]
	Air Supply Flow Rate	Cubic Feet per Minute [CFM]
	Air Supply Temperature	Fahrenheit [F]
Hydronic Systems	Water Return Flow Rate	Gallons per Minute [GPM]
	Water Return Temperature	Fahrenheit [F]
	Water Supply Flow Rate	Gallons per Minute [GPM]
	Water Supply Temperature	Fahrenheit [F]
Heat Recovery Systems	Heat Recovery Water Return Temperature	Fahrenheit [F]
	Heat Recovery Water Supply Temperature	Fahrenheit [F]

Reviewer Checklist

HPM Review Checklist: LM656 – Building Management Systems – V1

Checklist Description: This checklist captures the elements that must be present in the project design to be eligible for the high-performance measure inducement or consideration for additional site metering.

Project Name: _____ **Review Date:** _____

Assessment:

- ☐ Approved
- ☐ Not approved

Notes:

Reviewer: _____ **Signature:** _____

Essential Level Inducement Requirements	Comments
☐ Project demonstrates implementation of ≥1 qualifying CEDA high-performance measure (*per Appendix A*).	
☐ **§ 1.1** Entry-level BMS with central monitoring & control is installed.	
☐ **§ 1.2** Supports open protocol (BACnet MS/TP, Modbus, or LonWorks).	
☐ **§ 1.3** Connected to LAN; optional internet access (Ethernet/Wi-Fi) available.	
☐ **§ 1.4.1** Thermostats use open protocol (BACnet MS/TP or Modbus).	
☐ **§ 1.4.2** Thermostats are fully integrated with BMS for central monitoring/control.	
☐ **§ 1.4.3.1** Provides time-based scheduling (min. occupied /unoccupied).	
☐ **§ 1.4.3.2** Supports remote override and setpoint adjustment via BMS.	
☐ **§ 1.4.3.3** Stores ≥7 days of trend data for temperature & setpoints.	
☐ **§ 1.5.1** Central HVAC equipment (RTUs, AHUs, VAVs, etc.) integrated into BMS.	
☐ **§ 1.5.2** *Optional*: Additional load integrated (lighting, SWH, etc.).	
☐ **§ 1.6** Local display or desktop-accessible interface with zone-level monitoring.	
☐ **§ 1.7** Time-based scheduling implemented for HVAC (and integrated systems).	
☐ **§ 1.8.1** Documented sequences of operation implemented.	
☐ **§ 1.8.2** SOO provided to owner/facility staff (digital or written).	
☐ **§ 1.9.1** Stores ≥1 week of temperature & setpoint trend data; data accessible/exportable.	
☐ **§ 1.9.2** *Optional*: Basic fault alerts enabled (e.g., high/low temperature).	
☐ **§ 1.10** BMS can expand to additional points, zones, or systems in future.	
☐ **§ 1.11** *Optional*: Integration with utility meters or plug-in submeters.	

Advanced Level Inducement Requirements	Comments
☐ **§ 2.1** BMS satisfies all Essential-level requirements and all Advanced-level requirements.	
☐ **§ 2.2** System uses BACnet/IP or equivalent IP-based protocol.	
☐ **§ 2.3.1** All connected systems operate with full DDC (programmable logic + point-level control).	
☐ **§ 2.3.2** Pneumatic or electromechanical controls replaced or retrofitted with DDC.	

HPM Review Checklist: LM656 – Building Management Systems – V1

- ☐ **§ 2.4** System uses open protocols (BACnet/IP, Modbus TCP/IP, etc.).
- ☐ **§ 2.4** Supports third-party integration without vendor-specific gateways or licensing fees for point access.
- ☐ **§ 2.5.1** Secure web-based remote access provided (user authentication).
- ☐ **§ 2.5.2** TLS 1.2+ encryption used; credentials enforced.
- ☐ **§ 2.6.1** HVAC, lighting, SWH, and occupancy-based controls integrated.
- ☐ **§ 2.6.2** *Optional*: plug loads or zone-level ventilation included.
- ☐ **§ 2.7** Basic HVAC/system fault alerts enabled (sensor failures, high temp, short cycling, etc.).
- ☐ **§ 2.8** Occupancy-based or demand-based scheduling overrides implemented.
- ☐ **§ 2.9** Utility meters or submeters (electric/gas) integrated where available.
- ☐ **§ 2.10.1** Required connected points (Appendix B) integrated, logged, and visualized.
- ☐ **§ 2.10.2** At least 30 days of trend data stored.
- ☐ **§ 2.10.3** Provides charts for energy use, temperature trends, and equipment runtime.
- ☐ **§ 2.10.4** Trend data exportable (CSV, Excel, etc.).
- ☐ **§ 2.11** Basic operator training provided (interface, scheduling, alarms, troubleshooting).
- ☐ **§ 2.12** *Optional:* DR-readiness provided (OpenADR, equivalent signal support).

Premium Level Inducement Requirements	Comments

- ☐ **§ 3.1** EMS satisfies all Essential + Advanced level requirements and all Premium requirements.
- ☐ **§ 3.2** BACnet/IP and cloud/IoT connectivity provided.
- ☐ **§ 3.3.1** Full integration of HVAC, lighting, plug loads, SWH, and renewables/storage (*if present*).
- ☐ **§ 3.4.1** Supports OpenADR 2.0b or equivalent.
- ☐ **§ 3.4.2** Can perform automated load shifting or DR actions.
- ☐ **§ 3.5.1** Predictive maintenance/fault prevention included.
- ☐ **§ 3.5.2** Supports load shifting, dynamic setpoints, or pre-cooling.
- ☐ **§ 3.5.3** Automated FDD w/ root-cause analysis + alert prioritization.
- ☐ **§ 3.6.1** Monthly dashboards + automated benchmarking reports provided.
- ☐ **§ 3.6.2** Insights on runtime, energy use, and recurring faults provided.
- ☐ **§ 3.7.1** Control logic verified by commissioning agent.
- ☐ **§ 3.7.2** Supports M&V methods (IPMVP Option B or C).
- ☐ **§ 3.8.1** Aligns with NIST cybersecurity best practices or ISO 27001 equivalent.
- ☐ **§ 3.9.1** Advanced operator training provided.
- ☐ **§ 3.9.2** Training covers analytics, faults, optimization strategies.
- ☐ **§ 3.9.3** System manual + 6 months of continued support/helpdesk access provided.

Supporting Documentation Requirements	Comments

- ☐ **§ 1.1.1** Diagram provided showing system components and communication paths (e.g., BACnet/IP).

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- ☐ **§ 1.2.1** Narrative or tabular Sequence of Operations (SOO) submitted which includes temperature logic, scheduling, overrides/alarms.
- ☐ **§ 2.1.1.1** Main dashboard or zone view provided.
- ☐ **§ 2.1.1.2** Sample schedule or override screen provided.
- ☐ **§ 2.2.1** Point list or representative sample (5–10 points per system) provided.
- ☐ **§ 3.1.1** Trend data sample provided (screenshots or export).
- ☐ **§ 3.1.1.1** Includes temperature or setpoint trends.
- ☐ **§ 3.1.1.2** Includes runtime or energy data (if available).
- ☐ **§ 4.1.1** Statement provided confirming system is installed and operational.
- ☐ **§ 4.1.1.2** Confirms control points are functioning and responsive.
- ☐ **§ 4.1.1.3** Confirms schedules and overrides tested/verified.
- ☐ **§ 5.1.1** Summary or acknowledgment of training provided.
- ☐ **§ 5.1.1.1** Topics covered listed (interface, scheduling, alarms).
- ☐ **§ 5.1.1.2** Support contact information provided.
- ☐ **§ 5.1.1.3** Operators can access and adjust system.
- ☐ **§ 6.1** Sample fault detection alerts or alarm configuration provided.
- ☐ **§ 6.2** Energy dashboard or meter-integration screenshots provided.
- ☐ **§ 6.3** Demand response test or DR signal response provided.
- ☐ **§ 6.4** Sample performance report (monthly dashboard, benchmark summary).
- ☐ **§ 6.5** Commissioning agent verification (Premium level only).

Version History Log

Version	Effective Date	End Date	Change Description
1	January 1, 2026	Active	N/A

The version identified as 'Active' is the current published version and remains in effect until superseded by a subsequent published version. CEDA may update, replace, or retire High-Performance Measures without prior notice. End dates are assigned to prior versions once superseded.