Department of Veterans Affairs
Washington, DC 20420

VA HANDBOOK 0055
Transmittal Sheet
December 31, 2025

VA ENERGY AND WATER MANAGEMENT PROGRAM

1. **REASON FOR ISSUE.** This handbook implements policies contained in VA Directive 0055, VA Energy and Water Management Program.

2. **SUMMARY OF CONTENTS/MAJOR CHANGES.** This handbook introduces procedures, standards, and guidance for implementing VA's energy and water management program found in VA's Directive 0055. In particular, this handbook provides guidance to Administrations and facilities for completing energy and water management plans necessary to ensure compliance with various Federal laws and regulations.

3. **RESPONSIBLE OFFICE.** Office of Management (004), Office of Asset Enterprise Management (044).

4. **RELATED DIRECTIVE.** VA Directive 0055, VA Energy and Water Management Program.

5. **RESCISSION(S).** Not Applicable.

BY DIRECTION OF THE SECRETARY OF VETERANS AFFAIRS:

/s/
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Assistant Secretary for Management
and Chief Financial Officer

DISTRIBUTION: Electronic only

VA ENERGY AND WATER MANAGEMENT PROGRAM

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1. **PURPOSE.** This Handbook provides specific implementation guidance for Administrations and their facilities to be compliant with requirements laid out in Directive 0055, which mandates goals, policies, roles and responsibilities, and major requirements for Administration and staff offices for energy and water program management and reporting within VA. The Directive updates VA's energy and water management and investment policies to comply with Federal mandates and laws to achieve VA's energy and water management goals.

2. **SCOPE.**

   a. This Handbook provides information and guidance on the following topics:

      (1) Energy Use Intensity (EUI) and potable Water Use Intensity (WUI)

      (2) Energy and Water Management gap data information related to the Strategic Capital Investment Planning (SCIP) process

      (3) Energy audits, Retro-Commissioning (RCx), and recommissioning

      (4) Water reduction and water alternatives

      (5) Performance contracting policies and procedures

      (6) Metering

   b. This Handbook includes actionable tools such as helpful tips for site engineers as well as guidance and tools for developing an Energy and Water Management (EWM) plan

3. **RESPONSIBILITIES.** All responsibilities are outlined in VA Directive 0055, Energy and Water Management Program.

4. **PROCEDURES.**

   a. **Energy and Water Management Plan.** As required by Directive 0055, each Administration is required to develop an EWM plan that clearly describes how it will meet the goals and requirements of the Directive, relevant laws, Executive Orders (EOs), rules, and other pertinent VA policies and guidance. Initial EWM plans must be submitted to the Office of Asset Enterprise Management (OAEM), Energy, Environment, and Fleet (EEF) Service, which will provide updates on submission dates. Updated EWM plans shall be submitted annually and shall cover a period of five years.

      (1) The EWM Plan Template is an Excel Workbook that is included in its entirety on the EEF Energy Resources SharePoint Site and clarifies data that needs to be collected, monitored, and reported to support compliance.

Each section of the EWM Plan Template provides targets, metrics, and milestones needed for VA facilities to meet Directive 0055 requirements.

(2) Step-by-step guidance to develop EWM plans that comply with Directive 0055 requirements can be found at the EEF Energy Resources SharePoint Site.

(3) Per section 2.c.(5) of Directive 0055, EWM plans submitted after the initial fiscal year (FY) 2026 must identify projects and Energy Conservation Measures (ECMs) awarded and/or implemented in the previous FY and projects and ECMs not awarded or implemented.

b. **Energy and Water Evaluations and Retro-commissioning**

(1) **General Overview.** Quadrennial Energy and Water Evaluations are required by law for VA covered facilities per EISA § 432 and Energy Act of 2020. VISNs and facilities should ensure they are aware of their next required audit date, which will be four years after the previous audit was entered into the DOE EISA 432 CTS. To be prepared for audits, ECMs should be entered into CTS upon award of the contract. Projects should be updated in CTS when ECMs are removed, added, or modified. The details of the project's measurement and verification should also be updated as "Project Follow-Up" when measurement and verification is completed.

(a) Facility engineers must upload energy project data into CTS on at least a monthly basis.

(b) Energy and Water Evaluations consist of two stages, Energy Audit and RCx, which are described in more detail below.

(2) **Energy Audit.** Facilities may contract for their energy audits or self-perform them.

(a) If they wish to contract for their audits, they can use the Indefinite Delivery/Indefinite Quantity (IDIQ) contract managed by the OAEM designated contracting office (currently Program Contracting Activity Central (PCAC)) (contact the Supervisor Contract Specialist) or develop their own contract vehicle.

(b) Local utilities often offer incentives to perform energy audits and RCx studies and have incentives to encourage their customers to use or install the most energy efficient equipment and manage that equipment in the most efficient manner. These incentives vary by state and utility and are summarized in the Database of State Incentives for Renewables & Efficiency (DSIRE®).

(c) **Third Party Performed.** To select an effective contractor, the following steps should be considered:

i **Step 1: Define Project Scope and Objective**. The VA Program and Contracting Group, facility engineers, and site personnel will collaborate to select the facility for an energy audit, confirm available funding, and outline the project scope. A sample SOW is available at the EEF Energy Resources SharePoint Site. Compliance with the four-year energy audit cycle should be ensured as mandated.

ii **Step 2: Prepare Contract Documents.** The Contracting Officer (CO) will draft the Request for Quote (RFQ), using sample documents and specific information about the facility, such as site plans and equipment lists. Providing complete information in the RFQ minimizes the need for changes after the contract is awarded.

iii **Step 3: Select Energy Audit Contractor.** A competitive bidding process will be used to choose a qualified contractor based on experience, cost, and past performance. Facility personnel should be available for pre-proposal site visits to clarify project requirements and provide further facility specific details.

iv **Step 4: Conduct Notice to Proceed (NTP) Meeting.** The CO will schedule an initial teleconference involving the facility's subject matter expert who is appointed as the Contracting Officer's Representative (COR) by the CO, Energy Managers, and the selected energy audit contractor to review project requirements, schedules, and compliance protocols. The CO will issue the official NTP to authorize project commencement and establish clear communication channels for the project.

(d) **Self-Performed.** If the VA facility wishes to self-perform an energy audit, there are key elements that must be included. Using a standardized energy audit procedure ensures VA facilities will meet previously described energy audit requirements while identifying all areas for energy efficiency improvements. Implementing the following steps as part of an energy audit can help facilities optimize energy use, reduce operational costs, and enhance system performance while meeting Federal compliance

i **Step 1: Determine Audit Level**. Choose one of the following audit levels based on facility needs. In addition to the descriptions below, VA facilities may use the FEMP Facility Evaluation (Audit) Decision Tree or FEMP Facility Evaluation (Audit) Definitions to inform the audit process.

(A) **Level 1 Audit: Walkthrough Analysis/Preliminary Audit.** A Level 1 audit is a preliminary assessment designed to identify potential energy improvements and establish a baseline for a

facility's energy performance. It includes brief interviews with facility staff, a review of utility bills and operating data, and a walkthrough of the building to gain an understanding of its energy systems and overall configuration. The audit provides a high-level analysis of energy use, highlighting visible efficiency opportunities along with preliminary cost estimates, energy savings, and simple payback periods. While recommendations are typically broad and focus on obvious improvements, this audit helps determine if further evaluation is needed and identifies areas to prioritize in subsequent audits.

(B) **Level 2 Audit: Energy Survey and Analysis.** A Level 2 audit builds on the findings of a Level 1 audit, offering a detailed evaluation of building energy systems, including the building envelope; lighting; Heating, Ventilation and Air Conditioning (HVAC); domestic hot water; plug loads; and more. It involves analyzing 24-36 months of utility data and conducting in-depth assessments of factors such as air quality, temperature, ventilation, and occupant comfort. The audit produces a comprehensive report detailing ECMs, ranging from low-cost operational changes to potential capital upgrades, along with financial analysis or an LCCA. This audit often identifies ECMs with rapid paybacks and provides recommendations for next steps, including more detailed analysis for complex projects.

(C) **Level 3 Audit: Detailed Analysis of Capital-Intensive Modifications.** A Level 3 audit, also known as an investment grade audit (IGA), is conducted for capital-intensive projects requiring substantial investments. It involves detailed data collection over weeks or months, using monitoring equipment to track system performance and validate energy modeling through historical climate and energy data. This audit provides highly accurate project costs and energy savings estimates, enabling confident decision making for significant retrofits or system upgrades. Typically initiated based on the findings of a Level 2 audit, a Level 3 audit supports major financial decisions by providing a thorough analysis of benefits, costs, and performance expectations.

ii **Step 2: Collect Data.** VA facilities should collect 12-36 months of energy usage data, review utility bills, and analyze with Operations and Maintenance (O&M) staff to determine if any unusual occurrences have taken place that might skew the data. Data should include all key energy sources, including electric, natural gas, water, and any additional utilities (e.g., fuel oil or propane).

Facilities should conduct a review of facility boiler and chiller logs, lighting, equipment loads, and sub-metered data.

iii **Step 3: Evaluate Facility Energy Profile**. Group energy data by use type (e.g., HVAC, lighting, plug loads) to profile energy consumption. Data may be analyzed in energy simulation software to determine where energy is being used within a facility. Facilities must collect the following information, which is required for the energy audit:

(A) Time schedules for occupancy and equipment usage

(B) Operational parameters

(C) Set points for HVAC systems and central plants

(D) Weather data for determining the impact of weather on heating and cooling energy consumption

iv **Step 4: Identify Energy Conservation Measures**. Identify potential ECMs across building envelope, HVAC, lighting, equipment, plug loads, domestic hot water, and process equipment. This could include identification of insulation needs, optimization of lighting, and explorations of retrofitting equipment. Use simulations for energy consumption.

v **Step 5: Prepare Audit Report**. Once all information and data are collected, prepare an energy audit report. The report should include a description of the current energy usage profile, recommendations for improvement, and an executive summary.

(A) The content of the current energy profile section should include historical energy usage, trends, comparisons to other VA facilities or national averages and energy goals and a description of energy-using systems in the facility. Outline current energy usage, recommendations, and an executive summary. Include comparisons, potential savings calculations, and detailed descriptions for each opportunity.

(B) The content of the recommendations section should include a list of potential energy and/or water conservation opportunities, including potential energy and/or water savings and cost savings associated with each opportunity. There should be enough description of each opportunity to provide a clear sense of the work to be completed and why it should be completed.

(C) There should be enough supporting data or calculations to provide assurance of accuracy listed with each opportunity or referenced in an appendix. Calculations should include and clearly identify all assumed and measured parameters within the calculation.

(D) The report should provide an executive summary to provide a concise summary of the current situation and a prioritized list of recommendations that include energy and/or water cost savings.

vi Please note that audits are likely to take at least 3-4 months to complete, so sites and VISNs should plan accordingly.

(e) Resources. The following sample templates can be used when completing an audit.

i FEMP Energy and Water Audits for Federal Buildings Resources

ii Sample Energy, Water and Renewable Energy Site Audit Template

iii Sample Energy Audits Tables

iv Sample Energy, Water and Renewable Energy Site Audit XLS File

v Sample Completed Energy Audits Table

(3) **Retrocommissioning (RCx).** Recommissioning or RCx shall be conducted in conjunction with energy and water evaluations.

(a) In addition to no/low cost ECMs identified in the RCx phase, capital project ECMs are also identified. ECMs should be implemented as early as possible and capital project ECMs will need to be entered in SCIP so they can be rolled into the capital planning process. Projects can be entered either individually, or as one project bundling several measures, if it is clearly described in SCIP.

(b) All LCC effective ECMs must be awarded (either through a standard contract or energy performance contract), or implemented in-house, within two years of evaluation completion. At the Department level, a minimum of 50% (by implementation value/cost) of identified LCC effective ECMs shall be implemented through energy performance contracts. ECMs identified during Energy Audits and Recommissioning/RCx must be reported in CTS, in particular:

i Implementation of energy and water efficiency measures, including estimated cost and savings, is required on an ongoing basis. VA

facilities may use the DOE FEMP CTS Project Upload template to aid in the uploading of project data.

ii Follow-up status on implemented measures, including measured savings and persistence of savings is also required in alignment with continuous 4-year evaluation cycles. VA facilities may use the DOE FEMP CTS Follow-Up Upload template to aid the upload of Measurement and Verification (M&V) data.

(c) ECMs, capital project ECMs, and electrification projects are developed in parallel in the energy and water evaluations. While Figure 1. Retro-Commissioning Flowchart, illustrates steps in an RCx study, capital projects and electrification potential are identified in the process as well. There are four primary processes in the evaluation: Planning, Investigation, Final Report, and Implementation and Persistence.

(d) The dark blue shapes in the retrocommissioning flowchart below outline the four steps of the process.

i **Step 1: Planning.** The Planning process includes a review of documents, control reviews, and review of Federal regulations pertaining to healthcare facilities. Documents reviewed can include drawings of equipment specifications or previous reports. Control reviews can consist of gathering information on sequences of operations, point lists, graphics, and trending capabilities of control systems. There is also an initial site visit and kick-off meeting, where goals and outcomes are discussed, in addition to discussions about logistics for future site visits and communications approaches moving forward. For RCx, the output of the initial planning is the development of an issues log of known problems, a detailed equipment inventory, an RCx plan, and documents such as equipment piping diagrams and as-built drawings. Equipment inventories should include the type of device/fixture, location, number in each location, and nameplate data on a room-by-room basis. VA facilities will also begin developing ECMs for capital projects and a preliminary assessment of potential electrification projects.

ii **Step 2: Investigation.** The Investigation process involves detailed analysis of equipment and systems at a facility. ECMs identified during the Investigation process will typically involve optimization of HVAC operations and controls but can also include optimization of existing lighting control systems, electrical power distribution and grounding systems, solar photovoltaic (PV) systems, combined heat and power systems, hot water systems, and the facility building envelope. In addition to no/low cost ECMs, the RCx

team can document the Current Facility Requirements (CFRs) which aids building engineering staff in operating the building. CFRs are typically a written document that details the current functional requirements of an existing facility and expectations of how it should be used and operated. This includes goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information to meet the requirements of occupants, users, and owners of the facility. Capital projects can include heating and cooling system upgrades, lighting retrofits and controls upgrades, optimizations of data centers, and other equipment upgrades. As equipment is inspected, engineers should also be documenting the potential for electrification of space heating, water heating, clothes drying, and cooking equipment.

iii **Step 3: Final Report.** After the Investigation process is complete, the Final Report is developed and ECMs are identified with project costs and paybacks. Training recommendations for both staff and building occupants should also be outlined in the Final Report. The Final Report should include:

(A) An Executive Summary, a narrative overview of the ECMs, including energy, water, and cost savings, implementation costs, financial analysis, and any renewable energy assessments.

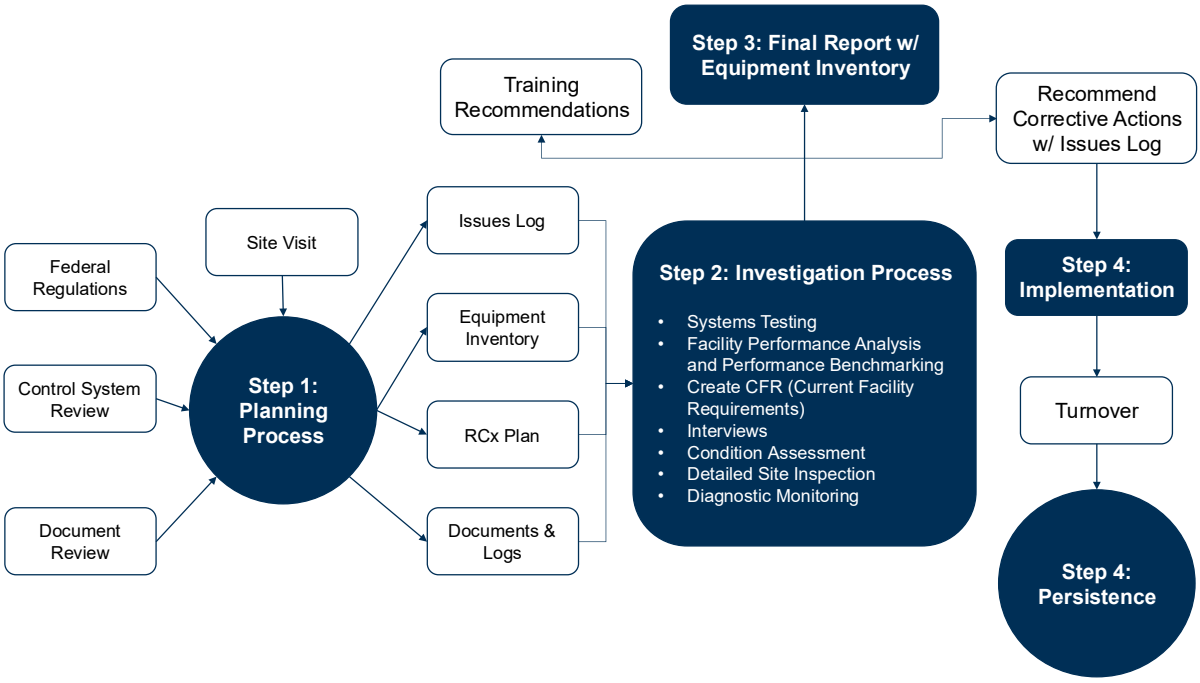
(B) A Technical Report, including detailed descriptions of each ECM, such as the affected locations, projected energy and cost savings, impacts on existing equipment, utility interruptions, required agency support, environmental impacts, and available financial incentives. This report must also contain a list of Identified Energy and Water Efficiency Measures, prioritized using Federal life cycle cost methodology. The list should provide data points, including implementation cost, annual and life cycle savings, payback period, and Savings-to-Investment Ratio (SIR).

(C) A full description of all required elements of the Final Report is included in section IV (c) of the Facility Energy Management Guidelines and Criteria for Energy and Water Evaluations in Covered Facilities.

iv **Step 4: Implementation and Persistence.** ECMs should be implemented as early as possible; capital project ECMs will be included in the capital planning process. ECMs can be awarded either through a standard contract or using the capital process or through an Energy Savings Performance Contract (ESPC) or Utility

Energy Service Contract (UESC) process. ECMs can also be completed in house. All LCC effective ECMs must be completed within two years of evaluation completion.

Figure 1. Retrocommissioning Flowchart



(e) Retro-Commissioning (RCx) Measures. All energy and water evaluations should include no/low-cost ECMs. Below is a sample list of such ECMs.

i Schedule Air Handling Units (AHUs) to Operate at a Diminished Capacity During Unoccupied Hours -- In a typical VA facility, ECMs focused on reducing equipment operation during unoccupied hours can significantly lower energy consumption. By implementing measures like scheduling Air Handling Units (AHUs) to operate only during occupied periods, facilities can minimize unnecessary energy use while maintaining occupant comfort and operational requirements. For spaces with specific schedules, such as clinics or kitchens, collaborating with staff to establish realistic occupancy schedules is essential. This ensures that equipment operates efficiently while meeting the needs of staff and patients.

ii Schedule Variable Air Volume (VAV) Boxes to Operate at a Diminished Capacity During Unoccupied Hours.

iii Reduce AHU Fan Speeds During Unoccupied or Low Occupancy Hours -- In areas that include 24/7 operations, like critical care or mechanical spaces, turning off AHUs may not be feasible.

However, ECMs such as reducing AHU fan speeds or adjusting Variable Air Volume (VAV) boxes during periods of low occupancy can still achieve energy savings without compromising functionality. These strategies, tailored to different spaces' operational requirements, can help VA facilities optimize energy use.

iv Institute a Static Pressure (SP) Reset Protocol for AHUs.

v Institute a Differential Pressure (DP) Reset Protocol for Pumps.

vi Institute a Chilled Water Temperature (CHWT) Reset Protocol.

vii Institute a Condenser Water Temperature (CWT) Reset Protocol.

viii Institute a Supply Air Temperature (SAT) Reset Protocol for AHUs.

(4) **Energy/Water Use Intensity (EUI/WUI) and Benchmarking**. VA facilities are continually attempting to increase facility energy efficiency and water efficiency to reduce associated costs and facility EUI and WUI. VA facilities may use the following formulas to calculate EUI and WUI. This process can help orient facilities to the purpose and key data needed to reach agency-wide goals.

(a) **EUI is the amount of energy used per unit of gross floor area per year.** To calculate EUI, divide the total energy consumed per year (measured in kBTU) by the building/facility (or portfolio) gross square footage (GSF). Facility gross floor area is defined as the total area in a building for all floors to the outer surface of exterior walls, including elevator shafts, vertical penetrations, equipment areas, ductwork shafts, and stairwells; and excluding areas having less than a 6'-6" clear ceiling height. GSF should not include interstitial space unless it can demonstrate that the interstitial space has more than a 6'-6" clear ceiling height. When calculating EUI, VA facilities should refer to the formula below:

$$EUI = \frac{\left(\frac{Energy\ Use\ (in\ kBTU)}{Year}\right)}{GSF}$$

(b) **WUI is the amount of water used per unit of gross floor area per year.** To calculate WUI, divide the total water consumed per year (measured in gallons) by the building/facility (or portfolio) GSF. When calculating WUI, VA facilities should refer to the formula below:

$$WUI = \frac{\left(\frac{Water\ Use\ (in\ Gallons)}{Year}\right)}{GSF}$$

(c) Understanding the EUI and WUI of an agency's facilities allow benchmarking of the facilities by building types. Benchmarking is the practice of measuring a facility EUI and comparing it to the average EUI of similar building types. A hospital or laboratory will have a higher EUI than a residence or small office building. Ranking buildings by EUI within a building category can help identify the most efficient and inefficient buildings in each building category. More information on benchmarking is available at the ENERGY STAR® Portfolio Manager. VA facilities are expected to report annual benchmarking information into CTS for metered buildings that are, or are part of, EISA covered facilities. More details are available in the Federal Building Energy Use Benchmarking Guidance.

(d) The table below provides the median EUI for health care building types at the time of publication, sourced from the previously referenced ENERGY STAR® Portfolio Manager U.S. National Median Reference Values for All Portfolio Manager Property Types reference table. The median EUI means half the buildings have higher EUIs and half have lower EUIs than listed in the table.

Table. Median EUI for Health Care Building Types

Primary Function	Median Source EUI (kBtu/sq. ft)	Median Site EUI (kBTU/sq. ft.)	Reference Data Source - Peer Group Comparison
Ambulatory Surgical Center	138.3	62.0	CBECS - Outpatient Healthcare
Hospital: General Medical & Surgical	426.9	234.3	Industry Survey
Hospital (Other/Specialty Hospital)	433.9	206.7	CBECS - Inpatient Healthcare
Residential Care Facility	213.2	99.0	Industry Survey
Senior Living Community	213.2	99.0	Industry Survey
Medical Office	232.8	97.7	Industry Survey
Urgent Care/Clinic/Other Outpatient	145.8	64.5	CBECS - Clinic/Outpatient
Outpatient Rehabilitation/Physical Therapy	138.3	62.0	CBECS - Outpatient Healthcare

Primary Function	Median Source EUI (kBtu/sq. ft)	Median Site EUI (kBTU/sq. ft.)	Reference Data Source - Peer Group Comparison
Transportation Terminal/Station	112.0	56.2	CBECS - Public Assembly
Pre-school/Daycare	131.5	64.8	CBECS - Preschool
Data Center	1.82	1.82	EPA - Data Center
Residence Hall/Dormitory*	107.5	57.9	CBECS - Dormitory
Police Station/Fire Station	124.9	63.5	CBECS - Fire Station/Police Station
Multifamily Housing	118.1	59.6	Fannie Mae Industry Survey
Mixed Use Property	89.3	40.1	CBECS - Other
Laboratories	318.2	115.3	CBECS - Laboratory
Museum	112.0	56.2	CBECS - Public Assembly
Office	116.4	52.9	CBECS - Office & Bank/Financial
Social/Meeting Hall	109.6	56.1	CBECS - Social/Meeting
Mailing Center/Post Office	96.9	47.9	CBECS - Service
Other - Public Services	89.3	40.1	CBECS - Other
Vocational School/Other – Education	110.4	52.4	CBECS - Education
Food Service	527.7	270.3	CBECS - Food Service
Self-Storage Facility	47.8	20.2	CBECS – Non-refrigerated Warehouse
Non-Refrigerated Warehouse* & Distribution Center	52.9	22.7	CBECS – Non-refrigerated Warehouse
Refrigerated Warehouse*	235.6	84.1	CBECS – Refrigerated Warehouses

(5) An energy and water evaluation for any building type should begin with a comparison of the facility EUI to the median EUI of the same building type.

If the EUI of a building is significantly higher than the median, this may represent large savings opportunities. It is also useful to compare the EUI with the EUI of other buildings of the same type.

(a) Helpful Tip: Consider two VA hospitals. VA1 has an EUI of 350 kBTU/GSF and VA2 has an EUI of 230 kBTU/GSF. Both hospitals have similar square footage floor spaces allocated to surgery, emergency rooms, patient rooms, clinic space, and common areas. When starting an energy audit of VA1, it is useful to look at the latest audit of VA2 to get some insight into the best practices implemented at that facility. For example, in VA1, equipment serving clinic spaces might run 24/7, while in VA2, schedules were implemented to correspond to the hours the clinic is open. In VA1, surgical space might operate at 40 Air Changes per Hour (ACH) and at VA2 controls were upgraded and now control to 24 ACH.

(b) How Energy Is Used in a Building.

i Reducing energy usage requires understanding how energy is used in a building – both by end use such as heating, cooling, and ventilation, and by space type such as surgery, patient rooms, and clinic areas. Energy audits collect information such as the size of the building (in GSF) and efficiency to determine electrification potential. As such, energy engineers should think of loads/ equipment that will be included in the energy audit by its fuel source. Lighting and plug loads are clearly only electric loads. However, many loads can be both electric and natural gas loads. Cooling systems are primarily electric, but large chillers can be powered by natural gas. Heating, Ventilation, Cooling, Process Loads, and Domestic Hot Water can be both electric and natural gas loads, while lighting and plug loads are electrical only.

ii It is also important to understand the gross floor area in a facility by space type, as well as other relevant information. Knowing the gross floor area helps normalize energy consumption data, allowing VA facilities to benchmark performance against similar buildings and identify inefficiencies in energy use per square foot. For spaces served by an AHU this could include information such as the AHU serving the space, which helps track HVAC zoning and identify equipment-specific energy demands and operating hours. Tracking HVAC zoning is critical for understanding when energy consumption is occurring and whether there are opportunities for operational adjustments, such as the required ratio and actual ratio of outside air. Understanding this information can help identify potential issues such as excessive energy use due to over-conditioning of outside air and ensure compliance with ventilation standards. Collecting this information helps VA facilities

understand how energy is used at their site and supports targeted energy efficiency improvements, HVAC optimization, and compliance with operational standards.

(a) Engineers should review previous audits to see what information has already been collected and update as required. AHUs may already be documented with the spaces they serve, hours of operation, and size. Different space types will have different requirements based on codes and healthcare regulations. Ventilation rates, pressurization requirements, and air exchange rates (in ACH) must all be maintained at required levels when spaces are occupied. They should also be compared to actual levels during occupied and unoccupied hours.

(b) **Static Pressure and Differential Pressure Setpoint Resets.** HVAC equipment is sized for peak loads and yet peak loads only occur for very few hours per year. Typically, HVAC equipment runs at partial loads. Therefore, most fans and pumps are equipped with Variable Frequency Drives (VFDs) that allow the equipment to slow down at lower loads and speed up at higher loads. The power (kW) required to run a fan or pump motor is decreased by the cube of the change in motor speed. (e.g., If a motor speed decreases by 10%, the motor speed will be 90% of the original speed. The power required to run the motor will be $(90\%)^3$ = 72.9% of the original required power, a decrease of 27.1%.)

i Note: Engineering calculations typically use 2.5 for the exponent when calculating motor power to account for system losses. (e.g., If a motor speed decreases by 10%, the motor speed will be 90% of the original speed. The power required to run the motor will be $(90\%)^{2.5}$ = ~76.8% of the original required power, a decrease of ~23.2%.)

ii The SP setpoint controls AHU fan speed and the DP setpoint controls the pump speed. If trend data of the fan and pump speed indicate that fan or pump speed runs at constant speed and do not vary, then SP or DP setpoints are set for peak loads. Implementing setpoint resets would allow fans and pump speed to decrease and result in reduced power consumption for fan and pump motors as described above by power reduction equations for motors.

iii SP and DP setpoints are often implemented by sampling VAV box damper positions or coil valve positions and resetting the setpoints based on these inputs. For new systems with robust BASs, this is a good way to implement this measure. However, with an older BAS there may not be enough capacity for this traffic on the

network. A simpler approach can be to implement a linear reset based on Outside Air Temperature (OAT).

(c) **Chilled Water, Condenser Water, and AHU Supply Air Temperature Resets.**

i HVAC equipment is sized for peak loads, with determined operating parameters. For example, a water chiller may be designed to supply 1000 Gallons per Minute (GPM) of chilled water at 42 °F during a peak OAT of 95 °F. An HVAC cooling tower may be designed to cool condenser water to 85 °F when the OAT is 95 °F. However, a chiller will run more efficiently (consuming less power per HVAC cooling load, expressed in kW/ton of cooling (12,000 BTU/hr.)) if it supplies higher temperature water and if the condenser is cooled with lower temperature water. During peak summer loads this will not be possible, but in non-peak periods CHWT and CWT should be reset.

ii AHUs typically supply air to VAV boxes at 55 °F. This temperature allows dehumidification of the air at the AHU. However, the air can require reheating at the space so that temperature setpoints can be maintained. This is especially true for patient and clinic spaces. Therefore, SAT can be reset to increase when OAT is lower. Typically, a linear reset based on OAT can be used. Since warmer air requires more fan power to move the air than cooler air, there is a small fan penalty for this measure that should be calculated. However, it is offset by the reheat savings.

(6) **FEMP RCx Resources.** To support VA facilities in reducing energy use, the FEMP Re-Tuning in Federal Buildings page for Federal Buildings offers valuable resources to optimize building operations. These resources guide facilities in identifying and correcting operational inefficiencies in building systems, particularly HVAC, lighting, and controls, through low- or no-cost measures. FEMP also offers an Existing Building Commissioning Decision Tool, which guides energy management teams and operations and maintenance staff through the process of identifying RCx requirements and the approaches to consider for their buildings. Additionally, FEMP Energy Management Training Courses provide comprehensive learning opportunities, including workshops on energy audits, advanced metering, and building commissioning. Leveraging these tools can help VA facilities reduce operational costs while improving occupant comfort. For customized support, VA facilities can also explore FEMP Technical Assistance programs.

(7) **Capital Projects.**

(a) Major systems that can be evaluated for capital projects or be used as a checklist for energy audits include:

i Building envelope (roof, windows, etc.).

ii HVAC equipment.

iii Building Automation Systems.

iv Building envelope (roof, windows, etc.).

v Metering (including identification of buildings and systems with submetering).

vi Lighting systems and controls.

vii Facility-specific equipment.

viii Water conservation and efficiency measures

(b) Facilities should consider the Guiding Principles for Sustainable Federal Buildings and Monitoring Based Commissioning (MBCx – ongoing commissioning), where possible.

(c) Deficiencies identified in the RCx portion of an energy and water evaluation should inform the identification of capital project ECMs. For example, ECMs that cannot be implemented because of end-of-life equipment and inadequate controls systems are potential capital projects. Another example is if small spaces that require 24/7 operation are requiring large AHUs for larger spaces to run 24/7, a dedicated AHU for the smaller space is a potential ECM. In the same way, spaces that require very low chilled water temperatures, such as surgical suites, might be driving a chilled water system to operate for longer hours and at lower temperatures than other areas need on the system. A dedicated chiller for these surgical spaces is therefore another potential ECM.

(d) ECM Requirements for Energy and Water Evaluations including Capital ECMs.

i ECM description which should contain enough information to develop a Statement of Work (SOW).

ii ECM implementation cost estimate

iii Estimated annual electricity, gas, steam, or water/sewer consumption savings.

iv Estimated associated annual utilities and O&M cost savings

v An LCCA that includes all estimated costs

vi Bundling of long payback period measures with short payback period measures to incorporate more upgrades as part of a comprehensive, LCC effective project.

(e) Audits should include water conservation measures as well, using the following steps.

i Appliances: Verify water using appliances are ENERGY STAR® certified. This includes dishwashers, ice machines, and washing machines. If they are not, this is a potential ECM.

ii Plumbing fixtures: Verify the toilets, urinals, faucets, and plumbing fixtures have been upgraded to WaterSense products to the maximum extent practicable, as defined in the Federal Acquisition Regulation (FAR) 23.103 and 23.104(a). If they are not, this is a potential ECM.

iii Water metering: Verify water meters are reporting correctly. Verify there is a utility grade meter for cooling towers make-up water and overflow drains and any irrigation so that sewer charges are not accrued unnecessarily. If meters are not installed or working properly, this is a potential ECM.

iv Steam systems: Verify that at least 90% of potential condensate is being returned to the boilers. If it is not, this is a potential ECM.

v Water cooled condensers: Verify there are no one-pass systems. If there are, this is a potential ECM.

vi Landscape irrigation: Ensure that irrigation systems are controlled automatically based on weather and soil condition to provide water based on the actual needs of the plants.

vii Steam Powered Potable Water Hot Water Heat exchangers: Verify there is no cross leakage between the potable water supply and the heating medium, (e.g., steam condensate). Cross flow results in wasted potable water and contamination of the heating medium, which will negatively impact water chemistry.

viii Boiler Blowdown Tempering Water: Potable water is used to temper down the temperature of boiler blowdown water. Verify that the amount of tempering water is proportional to the amount of blowdown flow sufficient to achieve maximum discharge temperatures to avoid wasting water.

ix Legionella Prevention Flushing: Verify that any programmed flushing of distal points (e.g., faucets, showers) durations are at the minimum necessary amount to effectively elevate water disinfection levels to target levels, without excessively flushing. Use measured disinfection level data against time to achieve disinfection, over multiple locations, to establish minimum effective flushing durations. VA facilities must also comply with all Legionella-prevention guidelines under VHA Directive 1061(4), Prevention of Health Care-Associated Legionella Disease and Scald Injury from Water System including:

(A) Establishing a Health Care-Associated Legionella Disease (HCA LD) Prevention Plan specifically for Legionella prevention in potable water systems and process water systems.

(B) Maintaining hot water temperatures at a minimum of 124 °F and cold-water temperatures at or below 67 °F.

(C) Monitoring residual disinfectant levels in water systems according to directive specifications.

(D) Conducting regular Legionella testing, with a focus on high-risk areas such as patient care rooms and aerosol-generating devices.

(E) Taking corrective actions (e.g., system flushing, temperature adjustments, and increased disinfection) if Legionella levels exceed directive action thresholds.

(8) **Reporting.**

(a) Each covered VA-owned facility shall conduct an energy and water evaluation at least once every four years. EISA 2007 § 432 requires RCx as needed based on the results of the energy audit. RCx must be completed in conjunction with the energy audit every four years – either just prior, concurrent with, or just following the energy audit. Energy audit and RCx reports must meet the following key reporting requirements to qualify under EISA § 432 and EA 2020:

(b) EEF will notify Administrations when facilities require an energy and water evaluation.

(c) Completed evaluations and audit reports shall be submitted electronically to the EEF Energy Resources SharePoint.

i Medical Center Facility Energy Engineers shall submit their audit and retro-commissioning reports to the VA Office of Healthcare

Engineering (OHE) at least two months before the due date for reports within CTS while providing a copy to the VISN Energy Manager. Sites may use the FEMP CTS Evaluation Upload template to aid the upload of evaluation data

ii No later than 30 days prior to the due date, OHE shall forward audit and RCx reports to the EEF Program Service for their review and possible comments. Once any comments are cleared EEF will upload the Energy Audit into CTS on or before the required due date. OHE and the VISN Energy Manager may provide comments or feedback that may result in corrections to the Energy Audit reports.

iii To be prepared to submit audit and RCx reports at least two months before the due date, sites should leave one to three months for contracting. An IDIQ may only need one month; all other contracting options will likely take at least three months. Sites should also anticipate taking three to four months to complete the audit and RCx process.

(d) All Administration approved LCC effective ECMs proposed from an energy and water evaluation shall be awarded, or implemented in house, within two years of evaluation completion.

(e) At the Administration level, a minimum of 50% (by implementation value/cost) of identified LCC effective ECMs proposed from energy and water evaluations shall be implemented through energy savings performance contracts.

(f) All projects to be executed from proposals from energy and water evaluations (including within energy performance contracts) shall be entered into the SCIP Automation Tool and be given a SCIP project number and facility project number

(g) Exceptions to EISA 432 Requirements. Facilities may be excluded from the 4-year evaluation, re-commissioning, and retrocommissioning requirements if the facility meets the criteria of 42 U.S.C. 8253(f)(3)(B). Energy engineers who believe a covered facility may be excluded from this requirement must contact EEF to ensure compliance.

c. **Achieving High Performing Buildings**

(1) **New Construction and Major Renovations.**VA must design and construct new buildings and modernization projects greater than 25,000 GSF to fully comply with the most current version of the Guiding Principles for Sustainable Federal Buildings. New construction and major renovation projects must be certified using the Leadership in Energy and

Environmental Design (LEED) green building rating system, achieving a minimum of LEED Silver. During every design phase, the designer must provide a copy of the current LEED scorecard showing the project is on track for LEED Silver certification. For all other projects, complete a 2016 Guiding Principles Checklist for New Construction and Modernization. The checklist and required supporting documentation need to be included during every design submission. Upon project completion, the final checklist and supporting documentation must be uploaded to the Capital Asset Inventory (CAI) record for that building. If a CAI record does not exist for the asset, the documentation must be maintained by the Capital Asset Manager responsible for that asset.

(2) **Energy Efficient Design Requirements.** All major renovations and new construction in VA-owned buildings must adhere to the design requirements of the VA Sustainable Design Manual (SDM), where such requirements are not less stringent than the other requirements of VA Directive 0055 or Subparts B of 10 C.F.R. § 433 and 10 C.F.R. § 435, collectively known as the Clean Energy Rule. Major renovation, in this context, is defined through the Clean Energy Rule as all Scope 1 fossil fuel-using systems in a Federal building that are less than whole building renovations and provide significant opportunities for substantial improvements in energy efficiency and reduce on-site fossil fuel usage. Directive 0056 provides more detail on these requirements.

(3) **Water Efficient Buildings.**

(a) As required by 42 U.S.C § 8253, VA should implement life-cycle cost effective water conservation measures identified in quadrennial audits within two years, as well as installing water meters where such metering is expected to result in increases potential for savings or other improvements. Improving water use efficiency also saves money and increases resiliency. Facilities should:

i Identify water intensive uses and opportunities to reduce water use through following and executing construction and renovation projects to VA design and specification standards, developing and implementing ECMs, instituting operational and behavioral changes, and carrying out regular maintenance tasks. Some common fresh water uses in buildings include:

(A) Irrigation: This is often the largest water use in older buildings. Xeriscaping and use of recycled water, where available, can reduce it significantly.

(B) Plumbing: This includes restrooms, break areas, and kitchens. These are good targets for high efficiency plumbing fixtures.

(C) Cooling water and steam: These are used for either HVAC or process purposes and can often be reduced through operational adjustments or with selection of high efficiency equipment.

(D) Laboratory/medical equipment: Specialized equipment can have specific water requirements that can be difficult to reduce, but when purchasing equipment, attention should be paid to water consumption requirements.

(E) Commercial kitchen equipment: Water efficient equipment purchases can reduce kitchen water use.

(F) Vehicle wash: Some buildings may have significant vehicle wash water use.

(G) Leaks: Leaks in plumbing are an excellent target for reductions and metering can assist in locating them.

ii Integrate xeriscaping into facility management wherever practicable.

iii Ensure that all major water uses are metered in accordance with the VA Metering Implementation Plan, which is specifically required for any building with irrigable land greater than ten acres and that the water meters can report water use to the building management system.

iv Identify opportunities for alternative water, including water treatment to improve discharge water quality for reuse. The DOE defines alternative water as the following: harvested rainwater, stormwater, sump-pump (foundation) water, graywater, air-cooling condensate, rejected water from water purification systems, reclaimed wastewater, and water derived from other water reuse strategies.

(b) Facilities in areas of greater water vulnerability as defined by the DOE FEMP Water Vulnerability Tool should be prioritized for freshwater use reduction. Areas of greater water vulnerability have historically been in the southwestern United States, but recently southeastern portions of the country have seen increasing water vulnerability.

(c) FEMP also provides a building-level Water Project Screening Tool in the form of an Excel spreadsheet. The tool provides a step-by-step method to assess a building's water use and cost effectiveness associated with water reductions. It includes specifying water uses and sources, as well as costs.

(d) VA facilities should measure their total water use using facility metering systems and should monitor both alternative water use and water returned. Water returned is the water collected from the building systems and returned to the original water source. For the uses of fresh water in VA buildings listed above, VA facilities should collect annual water use data for potable water use, non-potable water use (from freshwater sources), alternative water use, wastewater treated on-site and returned to original water source, and stormwater infiltrated to the original water source through infrastructure.

i If VA facilities do not monitor stormwater infiltration, rough estimates are allowed. To calculate those estimates, the amount of precipitation received within the boundaries of the building over the course of a year is multiplied by the capture capacity (area) of infrastructure features and any potential losses of captured water considering the infrastructure design are deducted from the total.

ii VA facilities can reduce water consumption significantly by implementing targeted strategies in high water use areas. For irrigation, facilities may choose to adopt water-efficient landscaping techniques, such as xeriscaping or the usage of native plants, and the installation of smart irrigation systems that adjust water use based on weather conditions. In plumbing systems, facilities may replace outdated fixtures with low-flow faucets, toilets, and showerheads. VA facilities can also optimize cooling systems by upgrading to closed loop or hybrid cooling towers and by ensuring proper maintenance to prevent excessive water use. Finally, sites may implement regular inspection and repair for leaks in plumbing, equipment, and irrigation systems. To identify additional opportunities, facilities can leverage tools like the FEMP Water Efficiency Resources, which provide guidelines, calculators, and case studies for reducing water use in Federal buildings.

d. **Utility Programs, Agreements, and Purchasing**

(1) **Review Process for Utility Contracts and Agreements.** To comply with FAR 41 and to ensure lowest costs for VA, all utility contracts and agreements must be reviewed, at minimum, in the following intervals:

(a) For utility supply contracts with a term of one year or more, facilities shall initiate review by the facility at least six months before contract expiration.

(b) Agreements and contracts of less than one year, including month-to-month utility agreements, shall be reviewed annually if the facility's annual utility expenses exceed $250,000.

(c) Facilities with utility expenses less than $250,000 shall review agreements, at minimum, every three years.

(d) Best practices for the review process are provided on the EEF Energy Resources SharePoint site. Documentation showing facility's review process and its findings should be preserved to demonstrate compliance with this requirement.

(e) Any new contract method must be coordinated with EEF and the OAEM designated contracting office (currently PCAC)

(2) **Commodities Purchases.** Through use of authorities held by the U.S. General Services Administration (GSA) and the Defense Logistics Agency (DLA), or through other advantageous contracting mechanisms such as open market procurement, administrations shall strive to procure commodities at overall reduced cost to VA. Before initiating a bulk commodities purchase contract for electricity or natural gas, facilities shall first contact the OAEM designated contracting office (currently PCAC) to determine the best contracting authority and procedure.

(3) **Utility Incentive Programs**. 42 U.S.C. § 8256 authorizes and encourages agencies to participate in utility incentive programs for efficiency and electricity demand. VA facilities shall take advantage of these incentive programs to the maximum extent practicable and allowable.

(4) **Renewable Energy Requirements.** 42 U.S.C. § 15852 requires that electric consumption by Federal agencies be at least 7.5% renewable, where economically feasible and technically practicable. Facilities should consider current levels of electricity consumption that are renewable and should provide planned contracts or investments that will impact that percentage, where applicable, to EEF for awareness. Renewable energy not part of standard delivered power, or produced on Federal land, must be validated through the use of Renewable Energy Certificates (RECs).

e. **Performance Contracting**

(1) **Overview of Performance Contracting.** Energy performance contracts are contracting vehicles that allow Federal agencies to procure energy savings and facility improvements with minimal required upfront capital costs. To comply with EA 2020, VA must implement a minimum of 50% (by implementation value/cost) of identified LCC effective ECMs through energy performance contracts at the Administration level. VA will track progress annually.

(2) **Background.**

(a) A significant part of the annual budget of a VA facility is associated with operating expenses, which include utilities bills. Since many VA

facilities are hospitals, costs associated with energy and water consumption can be significant, and these costs must be annually budgeted and paid to utilities providers. Unless measures are taken to change facility energy or water consumption, utility costs will generally increase year after year as equipment degrades with age, facility utilities usage increases, or utilities rates increase. Even when energy and water savings can be identified, a facility operating budget may not be sufficient to implement large-scale energy and water savings measures, or those resources may be needed for other priorities, leaving the facility to continue paying elevated utilities costs. To maintain ECM gains, VHA should develop guidance around the need for a facility Computerized Maintenance Monitoring System (CMMS). CMMS software centralizes maintenance information and would allow facilities to better track their ECMs. These systems can be used by facilities to assist with scheduling and tracking inspections, testing equipment, identifying preventative and predictive maintenance, and performing correct repairs.

(b) Generally, an energy performance contract 1) identifies available ECMs, 2) quantifies the expected utility and O&M cost reductions that would result from those measures over a set performance period, 3) leverages those future annual savings to obtain up-front financing to fund ECM implementation costs, 4) measures and verifies actual utilities consumption and cost savings, resolving any discrepancies to ensure the overall project remains budget-neutral throughout the performance period, and 5) repays financing through future utilities cost savings throughout the performance period, which by VA policy can require up to a 23-year contract term. By law, that contract term can increase to 25 years although facilities should aim to stay closely aligned with VA policy to allow for any unforeseen delays.

(3) **Benefits.** Performance contracting offers several benefits to VA facilities. In a performance contract, facility personnel work with an Energy Services Company (ESCO) and/or utility and can improve energy and water efficiency and reduce operating costs while making payments based on realized savings.

(a) Improves facilities and associated infrastructure (including Facility Condition Assessment (FCA) deficiencies) with minimal required upfront project monetary appropriation.

(b) Enhances facility resiliency and reliability.

(c) Measures that are necessary or valuable, but which have long paybacks (e.g. chillers), can be bundled with short payback measures to assist with cash flow projections. Capital contributions can also

help longer payback ECMs. Condition deficiencies and modernization can be addressed holistically rather than on a piecemeal basis.

(d) Reduces facility energy and water costs.

(e) Reduces vulnerability to budget impacts from utility rate hikes; energy and water economic savings are magnified when rates increase.

(f) VA has full discretion over energy performance contract project scope.

(g) Risk of implementation cost overruns is on the contractor, not on the VA.

(h) Contractor is motivated to complete construction on schedule to receive payment.

(i) Allows facility and contracting staff to maximize impact by managing multiple needed capital improvements within one contract.

(j) ESCO/utility is responsible for equipment performance for the life of the contract, which provides an incentive to select high-quality equipment rather than lowest upfront cost.

(k) Guaranteed cost savings and equipment performance through Performance Guarantee (under an Energy Savings Performance Contract (ESPC)) or Performance Assurance (under a Utility Energy Service Contract (UESC)).

(l) Actual savings are likely to exceed the guarantee because the ESCO is generally conservative with guaranteed savings, and the savings are likely to continue accruing for VA beyond contract term.

(4) **Contract Vehicles.** The two major types of energy performance contracts used by VA are Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESCs). In an ESPC, VA selects a third-party ESCO directly to design the project, install identified ECMs, and obtain financing through a selected lender. In a UESC, VA contracts with the serving utility provider to act as a general contractor and obtain the necessary financing for project(s) that will be implemented. The following table summarizes differences between ESPCs and UESCs.

Table. Summary of Differences Between Energy Savings Performance Contracts (ESPCs) and Utility Energy Service Contracts (UESCs)

Groups	Energy Savings Performance Contracts (ESPCs)	Utility Energy Service Contracts (UESCs)
Partner	Energy Services Company (ESCO).	Serving distribution utility (electricity, natural gas, or water).
Contract Type	Awarded through the VA Service- Disabled Veteran Owned Small Business (SDVOSB) ESPC IDIQ contract.	Awarded through serving utility's GSA areawide contract.
Savings Guarantee	Annual savings guarantee required.	Performance assurance plan required to verify performance and savings (may include measurement and verification); savings guarantee not required, negotiable.
Equipment Guarantee	Performance guarantee of equipment (In the case of any breakages with equipment, ESCOs are responsible).	Performance assurance of equipment (In the case of any breakages with equipment, UESC utilities companies need to support VA in finding solutions).
Measurement and Verification (M&V)	M&V required annually, typically rigorous for complex ECMs.	M&V required, may not be annually, typically less rigorous.
Investment Grade Audit (IGA)	IGA is conducted at risk of ESCO; VA does not owe fees unless award is made.	VA may need to pay for an IGA regardless of award; VA does request utilities to undertake an IGA at risk.
Multiple Facilities	Multiple utility providers allowed.	All sites must have the same utility provider.

(5) **Training on Performance Contracting.** The facility subject matter expert who is appointed as the Contracting Officer's Representative (COR) by the CO, and others considering or supporting an energy performance contract must review FEMP ESPC and UESC best practices and resource documents and incorporate them into practice, as well as take appropriate FEMP training. In addition to required training courses listed in VA's Site Data Package (SDP), FEMP has a crosswalk of available training that may provide a helpful place to start in identifying helpful training courses to complete. The training material on performance contracting developed by VA is located on the EEF Energy Resources SharePoint. This site includes

the VA SDP Checklist, Customer Service Agreement (CSA) template, VA Project Checklist for IGA review, and other resources.

(6) **Energy Performance Contracting Development Process**. Performance contracting is an important vehicle to achieve many energy and water system related goals for a site including reducing energy and water usage and costs. Sites interested in pursuing a performance contract should contact EEF staff (EMPEnergyPOC@va.gov) to learn more about the ESPC and UESC contract vehicles.

(a) In order for sites to begin an energy performance contract. they will need to consider project goals, review FEMP and EEF training on energy performance contracting; complete a Site Data Package (SDP), enter proposed energy performance contract project into SCIP and/or ensure ECMs are included in VISN and facility operating plans per HEFP requirements, consider if there is a preference for a UESC or ESPC contract structure; and decide if an energy performance contract would be focused on a single facility or expanded to encompass multiple facilities or an entire VISN.

i **Site Data Package (SDP).** A complete and accurate SDP is critical to the timely generation of solicitation documents for the launch of an ESPC or UESC. VA developed an SDP Checklist to assist engineers who are assigned by the contracting officer to act as the COR in the solicitation of an ESPC or UESC. The SDP includes:

(A) Appendix A: ESPC and UESC Training

(B) Appendix B: Project Goals

(C) Appendix C or Energy Audit Report

(D) Appendix D: Other Identified Facility Activities

(E) Appendix E: COR Nomination Memo

(F) MS Excel Spreadsheet: ECM Wish List – Initial Project Scope

(G) MS Excel Spreadsheet: Independent Government Cost Estimate (IGCE) (a subset of the previous item)

(H) Secure funding for Project Facilitator (PF) contract

(I) Signed Customer Service Agreement (CSA)

ii **Project Facilitator (PF).** A PF is a DOE certified industry expert for the UESC and ESPC contracting vehicles. PFs provide support to VA project teams throughout the development and

implementation process, including the annual review of M&V data, by providing technical and financial advice. VA strongly encourages PFs for all VA performance contracts as a best management practice, funded by VISN or site funds. A PF should be in place prior to the issuance of the Notice of Intent to Award (NOITA). VISNs or sites will need to provide PWS, IGCE, and funding for the initial PF contract, to the OAEM designated contracting office (currently PCAC) as part of initiating a project (Please reference the EEF SharePoint for PWS/IGCE templates). The procurement office will then solicit and select a PF near the beginning of the development process and VISNs or facilities will be responsible for providing funding to retain them throughout the performance period. Because service contracts last only five years, there will likely need to be at least one re-solicitation during the performance period.

iii **Customer Service Agreement (CSA).** A fully executed CSA is required prior to the issuance of a NOITA to ensure all key VA stakeholders are aware of the roles and responsibilities for the energy performance contract project. The CSA is an agreement between EEF, the OAEM designated contracting office (currently PCAC), HEFP, and VISN and facility officials relevant to a new energy performance contract and is intended to document awareness and approval by key stakeholders to proceed with development. The CSA defines the services and support to be provided to and received from each party, establishes roles and responsibilities of the core project team, and explains procedures for effective communication, decision making, and reporting among all parties. In addition to program office, contracting leadership, and HEFP, required signatories include the VISN Director, VISN Chief Financial Officer (CFO), VISN Capital Asset Manager (CAM), Director of the relevant Network Contracting Office (NCO), VISN energy manager, facility Director, facility CFO, facility Chief Engineer, and facility energy engineer. Execution of a CSA often involves providing multiple briefings for signatories and includes documenting stakeholder buy-in to proceed with development of an energy performance contract. A signed CSA is required to proceed with project development of an energy performance contract but does not constitute approval to award, which occurs many months later, following multiple rounds of technical, contracting, and legal reviews.

(b) **Investment Grade Audit (IGA) Process.**

i **Overview.** An IGA is a detailed study involving substantial amounts of data collection, site observations and surveys, field measurements, interviews with VA O&M staff and subject matter

experts, workshops, preliminary design work, and bid walkthroughs with subcontractors. Once an SDP is finished, the following steps must be completed before an IGA can begin:

(A) SDP Review by the site engineering staff, including Chief Engineer; the VISN (usually VISN energy manager and/or CAM); VHA Office of Healthcare Engineering (OHE); and EEF.

(B) EEF initiates the project with the OAEM designated contracting office (currently PCAC)

(C) Notice of Opportunity is issues to ESPC IDIQ holders or serving utilities

(D) Utility/ESCO partner selected.

(E) Utility/ESCO partner performs preliminary assessment.

(F) VA reviews preliminary assessment and decides to proceed or not proceed with the project.

(G) If VA elects not to proceed, the preliminary assessment must be treated as proprietary information, and the agency may not use it to develop future projects.

(H) If VA elects to proceed, CO will issue a NOITA (for an ESPC) or an NTP (for a UESC).

(I) After VA issues a NOITA or NTP, the ESCO or utility will conduct an IGA of facilities and energy systems at the project site(s). The IGA is then used to substantiate the contractor's proposed ECMs and savings from the preliminary assessment. VA requests that ESCOs or utilities perform feasibility studies/IGAs at risk, meaning VA is only responsible for the cost of a feasibility study/IGA if a contract is awarded. The IGA is developed in phases and each phase is submitted for review to VA. Each phase builds on the preceding phase and provides more complexity and detail.

ii **Phases of the IGA.** The VA Project Checklist provides detailed checklists for each IGA phase. Instructions for the checklist can be found in Appendix A.

(A) As the IGA progresses, requirements are added to the phase: the 30-35% phase has 11 requirements, the 60-65% phase has 17 requirements, and the 90-95% phase has 25 requirements in addition to 12 pricing proposal requirements

that are also required at the 90-95% phase. Each requirement becomes more detailed and complete as the IGA progresses through the phases. For example, the Commissioning Plan will not have been started in the 30-35% IGA submission phase, is in development in the 60-65% IGA submission phase, and is complete in the 90-95% IGA submission phase. Once comments are incorporated, the 90-95% IGA submission phase becomes finalized, hence the lack of a 100% IGA Submission column.

1. 30-35% - Provides a high-level look at proposed ECMs (more defined than a preliminary assessment) and helps VA make decisions about which ECMs are worthwhile to further investigate.

2. 60-65% - Provides a more detailed understanding of site operations and what is required to implement ECMs.

3. 90-95% - IGA is almost complete and includes firm-fixed price bids from subcontractors. The 90% IGA generally corresponds with a 30% design for construction for more complex ECMs but may have close to final designs for simple ECMs like lighting.

4. Final - IGA and all requirements are complete.

(B) VA requires that all IGA submissions meet the minimum content requirements as detailed in these checklists. Failure to meet these requirements will result in the return of the IGA submission.

(C) VA facility staff review is critical to ensure Utility or ESCO baseline, assumptions, and methods of verification are correct and accurate. Facility subject matter expert who is appointed as the Contracting Officer's Representative (COR) by the CO and other site and VISN staff, along with the PF, must use the VA Project Checklist, saved at the EEF SharePoint site, at each submission to ensure all critical elements are reviewed and discussed.

iii **IGA Process Steps**

(A) **Step 1: Data Collection.** One of the first steps in developing an IGA is collecting data that will aid a contractor in developing a baseline profile for a facility's energy use, utility costs, and O&M expenses affected by an energy performance contract project. Typical data required for an IGA includes:

1. Utility bills – at least 12 and preferably 24+ months of actual bills for each utility serving the affected facilities. Actual bills (not just a consumption summary) are needed to allow the ESCO/utility to analyze rate tiers, ratchets, customer costs, and other considerations.

2. Engineering service contracts (24+ months history).

3. Purchase order history for repair materials and expendables such as lighting and plumbing equipment (24+ months history).

4. Rental contracts for temporary services related to equipment failures associated with equipment on VA's ECM list.

5. Advanced metering system utility data. Perform spot measurements for constant loads and continuous logging for variable loads. If meters need calibration, this can generally be completed by the ESCO as part of the IGA if VA is willing to pay for it.

6. Historical trend data from the building automation system reflecting setpoints, schedules, runtimes, and other information. If historical trend data is not available, then data should be collected as early as possible to capture required information through the widest period of ambient conditions and seasonal changes. Where trend data cannot be captured, data loggers can be used to support baseline assumptions. This is especially important for large motors and to establish load factors.

7. Utility drawings, building floorplans, and system design drawings.

8. Other energy and O&M-related documents as requested by the ESCO.

9. Facility planning documents and records, for example asbestos surveys, facility master plan, facility condition assessment (FCA), and Physical Security and Resilience Design Manual (PSRDM) risk assessment.

10. Consider granting the ESCO direct access to online data sources where possible. Examples of online data sources include utilities and building automation systems. Providing accurate baseline data is critical to quantifying savings. Assumptions about and/or missing data typically

increases risk to VA and should be evaluated carefully and validated where possible. It is important to consider the following early in the study:

11. Plan for several walkthroughs and the associated time commitment from escorting staff during each one. Some of these surveys (e.g., lighting fixture survey in every room) may be intrusive to Medical Center operations and may need to be conducted after hours and/or when activity volume is low. Access to roofs and sensitive areas will need to be coordinated. Consider issuing badges and keys to relevant ESCO or utility staff once they become familiar with the facility and its policies; they can then serve as escorts for their own team members and subcontractors. Greater access reduces overall project risk: the more access granted to contractors, the greater the ability to identify issues and account for them during the IGA.

(B) **Step 2: Scoping.** The detailed IGA study will expand VA's ECM concepts into preliminary designs and work scopes that will support savings calculations and subcontractor pricing efforts. VA's O&M staff and subject matter experts should be included in preliminary design conversations and reviews throughout this phase. Questions to explore include:

1. Have all known deficiencies of a system been identified? Examples include equipment that does not function properly, has been abandoned, or has perpetual overrides on controls.

2. Is the appropriate related equipment included in the scope wherever possible?

3. Do ECMs make sense operationally?

4. Are there areas designated for an upcoming renovation or change in use?

5. Can the building automation system (BAS) accommodate additional data points available with new equipment, or is BAS upgrades also required to achieve savings?

6. Are RCx and Monitoring Based Commissioning (MBCx) being considered in the scope? Bundling no/low cost ECMs with high capital cost energy projects or electrification projects can improve payback and reduce

the contract length. MBCx software can be a valuable tool in M&V and maintaining energy savings over time.

7. Are VA product preferences or standardizations being identified for inclusion in the ECM scope?

    a. VA shall specify and purchase ENERGY STAR® certified or DOE FEMP-designated energy efficient products for all applicable contracts for products or services involving energy-consuming products.

    b. VA shall specify and purchase WaterSense labeled water efficient products and services and water-efficient products that are ENERGY STAR® certified or FEMP-designated products for all applicable contracts for products or services involving water-consuming products.

8. Where known equipment deficiencies are being included and addressed by the ECMs, are O&M savings or capital contributions being considered to help capture the total savings benefit and offset the increased cost? Energy engineers should include all O&M savings and capital contributions. Including full cost across the ECM scope can assist with providing full consideration towards any potential savings and offsets on cost.

9. Does the project include an owner-controlled reserve account of funds set aside to cover additional, unplanned, and/or undefined costs that abound during construction?

    a. For example, scheduling or repairing controls on an AHU might later uncover a failed VFD which was not part of the repair scope. Having reserve funds available will allow repairs to be made immediately while contractors are already on-site so that testing and commissioning of the entire system can be completed.

    b. Other items that are difficult to define or quantify during this phase, such as asbestos abatement and physical security items, may be considered for inclusion in the reserve account.

10. What is the capacity of O&M staff to operate and maintain the new systems and equipment? Where equipment is new (e.g., microgrid) or requires significant repairs that are challenging for VA to keep up with (e.g., steam traps),

consider assigning operations, maintenance, or repair and replacement responsibilities to the ESCO/utility. Doing this can protect against unmet savings due to missed maintenance.

(C) Step 3: Measurement and Verification Approach. The IGA will include the development of the M&V plan for the project. In each progressive phase of the IGA, the M&V plan will likely become more detailed. As previously mentioned, once comments are incorporated, the 90-95% IGA submission phase becomes finalized.

1. The M&V approach must be based on FEMP's most recent M&V guidelines. For each ECM, the M&V plan selects one of the four FEMP M&V options (A, B, C or D) along with the key parameters measured or agreed on in the calculations. The four options are described in detail in the required FEMP training for VA facility subject matter expert who is appointed as the Contracting Officer's Representative (COR) by the CO on the FEMP Training site.

    a. Option A: Retrofit Isolation, Key Parameters Measured - Baseline and post-installation energy use are estimated using an engineering analysis of measurements of the most critical parameter.

    b. Option B: Retrofit Isolation, All Parameters Measured - Baseline and post-installation energy uses are estimated by measuring all relevant parameters.

    c. Option C: Whole Facility, Utility Metering - When several systems have been retrofitted, verification methods determine savings by studying overall energy use in a facility.

    d. Option D: Calibrated Simulation - Calibrated computer simulation models of component or whole-building energy consumption determine energy savings. Performance contracts typically use options A, B, and D. Each of these options involves performing calculations to estimate the baseline energy usage and then modifying those calculations with updated parameters based upon the ECMs implemented during the performance contract. The updated parameters typically include operating hours, setpoints, efficiency

ratings, power (kW), water flow, and insulation factors, depending on the ECMs.

2. Regardless of the M&V option, all M&V plans should include certain general information. For example, in addition to documenting the baseline conditions, it is important to understand which parameters will be measured, and which will be estimated, assumed, or agreed on. Calculation and data analysis methodology should be agreed on; in addition, decisions need to be made about procedures for handling lost or poor-quality data. Generally, M&V plans should include:

    a. A description of the ECM and the project boundaries.

    b. Identification of the measurement and verification option to be used.

    c. Documentation to support calculations and baselines.

    d. Facility baseline energy consumption profile via electric/gas data or equipment/facility metering.

    e. Facility type, occupancy, number of shifts.

    f. Space conditions such as schedules and relevant setpoints, equipment inventories, equipment operating practices, photographs of equipment operating parameters and equipment nameplates.

    g. Existing issues or problems with equipment.

    h. Description of any planned changes to conditions of the baseline.

    i. Specifications of exact data analysis procedures, algorithms, and assumptions.

    j. Specifications of metering points, periods, meter characteristics, metering periods, calibration processes, and procedures for handling lost or poor-quality data.

3. Risk. In an energy performance contract, there is an energy savings risk for both the ESCO or Utility and VA.

    a. ESCO or Utility risk is centered around the performance of the new equipment, such as the

measured efficiency or energy consumption of a new light fixture or motor vs. the manufacturer's published ratings. If the new equipment does not meet or exceed the advertised performance, then the ESCO/utility will be at risk to correct the discrepancy or remediate the lost savings.

b. VA risk is centered around usage of the new equipment, such as loading and run hours, time-of-use savings or demand ratchets, schedules or setpoint assumptions, or equipment which tests satisfactorily but does not run at its most efficient point much of the time. If savings are affected by new equipment running more than expected, or at different times, the ESCO/utility will likely point to changes in use or other VA operational actions beyond the contractor's control. Because VA's savings risk centers around operations and use of the ECMs, it is important to validate any baseline assumptions made during the IGA and identify any anticipated changes in use that could affect the baseline. When reviewing the M&V approach, ensure the parameters to be measured are clearly delineated and appropriately represent the equipment's performance and the system's operation as constructed by the ESCO/utility. To minimize risk to VA, it is important to consider the following when developing baseline operations:

    i. Compare baseline hours, setpoints, and loading against trends or data loggers used during the detailed study.

    ii. Ensure the ESCO/Utility takes field measurements to confirm important parameters. A 25 kW nameplate motor does not consume 25 kW while running; ensure the calculations are based on actual system loading rather than nameplate ratings.

    iii. Compare baseline usage with advanced utility monitoring system data. If the calculated baseline consumption of the modeled systems is removed from the meter data, how much is left for the rest of the building?

    iv. Ensure usage is reasonable as these assumptions will be "agreed on" at contract award, meaning both

parties accept them as a factual basis for the agreement.

(c) **Leveraging Appropriated Funding (Capital Contributions).** Leveraging energy performance contracting in combination with direct appropriations is a best practice encouraged by the DOE. The practice allows VA facilities to maximize resources to perform more work with the same level of funding and fewer constraints on facility staff and contracting resources.

i Any items dealing with NRM and Minor funding need Capital Review and Concurrence. These items are reviewed by the Office of Capital Asset Management and Engineering Service (OCAMES). OCAMES is responsible for coordinating all VHA's ESPC and UESC efforts with OAEM.

ii For all types of construction, including NRM and Minor funding, facilities should align with ASHRAE 90.1-2019 where possible. Aligning with ASHRAE 90.1-2019 would ensure cost effective measures are identified and noted during project buildout.

iii For facilities with energy performance contracts initiated in FY 2024 and thereafter, Administrations shall incorporate into the energy performance contract all direct-funded NRM projects and associated funding planned for award prior to the expected performance contract award date. All exceptions must be approved by the Administration and OAEM.

iv Exceptions to this requirement include projects that will expire prior to the expected performance contract award date and projects that cannot be performed as part of a performance contract or where there is a compelling reason why a particular project is not suitable for implementation through a performance contract.

v ECMs shall be identified in the SDP or no later than the 30-35% IGA Submission for inclusion in the initial energy performance contract award. Additional ECMs may be considered as a modification, as allowed by the CO. Any modifications that add additional work must include energy or water savings. Additional appropriated funding may be applied to energy performance contracts where available.

vi Capital contributions may use medical facilities funds, NRM funds, or funds from rebates, incentives, or grant programs such as those run by local utilities or open to Federal agencies, like the DOE Assisting Federal Facilities with Energy Conservation Technologies (AFFECT) grant program.

vii Capital contributions shall be applied at award of the task order or modification to supplement financing of ECM(s) that would not otherwise affect cashflow or to further reduce a contract term below the allowable maximum of 23 years to maximize savings and minimize financing needs.

viii While 42 USC 8257 allows for a term of up to 25 years, this term must include all construction activities. VA policy is that energy performance contracts shall fit within a 23-year maximum term to allow for construction period activities and unforeseen circumstances. Where capital contributions are being considered for a project, the Administration/Administrative Region/facility shall notify the Contracting Officer of the amount available to contribute as early as possible during project development, but no later than 60 days before award.

ix Capital contributions may also be applied after award to support up to four years' worth of upcoming payments at Administrative Region/facility discretion with the approval of the CO. This is not a buy-down or buy-out of financing.

x Administration/Administrative Region/facility shall notify the Contracting Officer no later than 30 days prior to the end of a fiscal year of its request to apply funds toward an early payment.

(d) **Energy Act of 2020 (EA 2020) Compliance.** At the Administration level, a minimum of 50% (by implementation value/cost) of identified LCC effective ECMs shall be implemented through energy performance contracts.

i At the facility level, VA requires that all LCC effective ECMs must be awarded (by performance contract), or implemented in house, within two years of evaluation completion. When determining when an ECM is LCC effective within an energy performance contract, facilities are encouraged to consider documentable O&M savings (e.g., through the elimination of a maintenance contract). Note: Savings from avoided VA employee labor costs are not allowed in LCCAs. ECMs may be LCC effective as standalone ECMs, or when bundled with other ECMs.

ii VA shall also consider how environmental benefits of ECMs can be monetized to help fund an underlying ECM, or other ECMs in a bundled project. Examples of environmental benefits include credits for reductions in GHGs or the sale of environmental attributes associated with a project. Within an energy performance contract, the utility ESCO partner should assist with identification of

these opportunities for review and approval by VA. (See Section 7, Life Cycle Cost Analysis (LCCA) Requirements.)

iii Determining whether an ECM is LCC effective or not is done through the energy manager of each facility/VISN. The VISN/facilities should direct their request to EEF with justification and an updated ECM list showing the revised cost and savings information.

(e) **Modifications.** During the implementation period of an energy performance contract, circumstances might require a scope change. These could include unforeseen site conditions, changes in mission needs or VA operations, or equipment failures. If VA facilities have funding to support additional in-scope work (as defined by the CO), they might execute a modification to include that work. As with traditional contracts, only the CO can authorize changes. Generally, the CO will request that the ESCO or utility track minor scope changes and cost and savings impacts in a log that can be attached to a biweekly meeting agenda and discussed. Larger changes likely require a modification. For any potential modifications, impacts to cost, savings, and schedule should be considered. For energy performance contracts, VA should request that any savings from modifications, especially those that entail additional work added at the request of VA, be guaranteed the same way as the base scope.

(f) **Central Office Review.** EEF, as the energy performance contracting program office of VA, will approve SDPs prior to submission to Contracting. EEF, as well as the CO, specialists, and the PF shall review PAs, IGAs, scope changes, and other key submittals, including proposed modifications. Other VA offices shall also review energy performance contracting submissions or other related materials, as needed. Reviews must be completed, and comments submitted for consideration, within 30 calendar days of receipt.

(g) **Buy-down and Buy-out Policy**

i **General Policy**.

(A) A buy-down is a capital payment made to a utility or ESCO after award of an energy performance contract or modification that buys down some, or all, of the loan and modifies the financial schedule. A buy-down is intended to reduce the annual payment or outstanding contract term for VA while retaining other contract services. A buy-down would require amending task order schedules of an energy performance contract.

(B) A buy-out is a capital payment made to a utility or ESCO after award of an energy performance contract or modification that buys out the remaining loan on one or more ECMs, or the entire project. A buy-out is intended to eliminate the annual payment or outstanding contract term for VA and terminates contractual responsibilities (including M&V) towards ECMs or the overall project.

(C) The key difference between a buy-down and a buy-out policy is a buy-down is intended to ensure contracting services are retained, whereas a buy-out terminates the contractual responsibilities.

(D) A one-time ESPC or UESC payment may be made (where appropriate funds are available) without tying such payments to other/separate energy or energy related cost savings because the interest savings themselves may be considered energy-related cost savings for the purposes of 42 U.S.C. § 8287. A Federal agency may use any combination of appropriated funds and private financing under an ESPC.

(E) Buy-downs and buy-outs may be appropriate in certain cases but should be used sparingly because they present VA with several short- and long-term disadvantages, including limiting or removing the ability of VA to withhold payment if ECMs are not performing as expected. An OAEM Buy-downs Supplemental information file is available on the EEF Service Energy Resources SharePoint.

ii **Policy by project phase**

(A) **Projects in Development.** For energy performance contracts in the development phase (prior to contract award), appropriations can only be applied as a capital contribution.

(B) **Projects in Construction.** Buy-downs and buy-outs are only allowed during the construction phase if a significant change in facility use, including changes that will impact, alter, or dismantle ESPC/UESC material or equipment, or a facility closure eliminates or greatly reduces the benefit of an awarded ECM. In those instances, an ECM buy-out is the preferred path. Buying out a project may be permitted with a written explanation of the facility change and its impact on the project for the review and approval of the VISN, CO, OAEM program office, and HEFP.

(C) **Projects in Measurement and Verification.** Buy-outs or buy-downs are permitted after the first five years of the performance period, once a solid record of acceptable performance has been established in which there are no outstanding and unmitigated savings shortfalls. Where M&V has shown a record of shortfalls (i.e., where an ECM or project is not meeting the guaranteed or proposed savings goals) and those shortfalls are noted to be the contractor's responsibility, a buy-down or buy-out may only be considered once the ESCO or utility has corrected the issue(s) that created the shortfall. Buying out or buying down a project prior to correction would remove VA's leverage to address the problem. After five years of M&V, and in the absence of issues with savings shortfalls, buy-outs or buy-downs can be considered with a written justification and approval from the VISN, CO, OAEM program office, and HEFP.

iii **Process.** VISNs and facilities with projects in construction or M&V that meet the above criteria and want to consider a buy-down or buy-out must:

(A) Request an estimate of interest savings from the ESCO or utility as part of the written justification to pursue a buy-down or buy-out. Interest savings must exceed total early payment, termination, and other fees and costs incurred by the VA.

(B) Retain performance period services such as M&V and O&M for the contractually agreed term unless written justification is provided and approved, even in circumstances when financing payments have been reduced or eliminated. A cost to retain these services shall be requested from the ESCO or utility.

(C) Seek all required VA approvals. Where an evaluated buy-down or buy-out aligns within the criteria listed above, the facility must obtain written approval from the VISN, CO, HEFP, and OAEM program office prior to notification, using the template in the OAEM Buy-downs Supplemental information saved at the EEF Service Energy Resources SharePoint.

(D) Notify the CO of the intent to pursue a buy-down or buy-out no later than 90 days prior to the end of the FY. Notification must include a specific dollar amount available to allow contracting time to negotiate with the utility, ESCO, and/or financier. Provide a VA Form 2237 (Request, Turn-In and

Receipt for Property or Services) with the funds when notifying contracting.

(h) **Reporting Requirements.** VISNs and facilities are responsible for reporting all awarded energy performance contracts and modifications in the DOE CTS and coordinating with the contractor to report in the FEMP eProject Builder (ePB). Reporting in both CTS and ePB shall include follow-up reporting of M&V information throughout the performance period. VISNs and facilities must be responsive to requests for additional energy performance contracting reporting requirements at the discretion of the EEF Service.

(i) **Energy** Savings **Performance Contract Energy Sales Agreements.** An ESPC Energy Sales Agreement (ESA) is a project structure like a Power Purchase Agreement (PPA) that uses the multiyear ESPC authority to implement distributed energy projects – referred to as ESA ECMs – on Federal buildings or land. The ESA ECM is initially privately owned for tax incentive purposes, and the Federal agency purchases the electricity it produces with guaranteed cost savings. To facilitate additional on-site distributed generation, Administrations shall consider the use of ESPC ESAs either as part of a larger ESPC, or as a standalone project. FEMP has developed a number of resources to help sites structure effective ESPC ESAs, including an ESPC ESA Toolkit, Process Diagram, and Checklist. Sites may follow the following ESA development Phases, which are described in more detail in the FEMP Toolkit: For additional information, please reach out to EMPEnergyPOC@va.gov.

i **Phase 1: Form a Strong Project Team.** VA facilities should begin by assembling a dedicated team that includes an energy champion, CO, legal advisors, and technical experts. This team will be responsible for project planning, obtaining necessary approvals, and ensuring compliance with all VA and Federal guidelines. Regular meetings should be scheduled to keep all team members aligned with project goals and timelines.

ii **Phase 2: Validate Project.** The VA facility team should validate the project by confirming compliance with VA and Federal requirements, ensuring that third-party power sales are permitted, and reviewing relevant agency and regulatory policies. This phase involves conducting feasibility and cost-effectiveness analyses to determine optimal project sizes and utilities consumption and cost savings potentials. Additionally, the team should ensure that an ESA ECM fits within facility site plans and addresses any environmental or interconnection requirements.

iii **Phase 3: Acquisition Planning.** VA facilities should develop an acquisition plan that outlines procurement needs, small business involvement requirements, and project specifications. The team should coordinate with necessary departments to obtain all required approvals and finalize acquisition strategies that comply with VA policies. Preliminary market research and initial drafting of contract terms should also take place during this Phase to ensure the project meets VA standards.

iv **Phase 4: Request for Proposal (RFP) Development.** VA facilities should prepare an RFP by including all technical, environmental, and legal requirements necessary for an ESA ECM. This step involves gathering site access agreements, completing National Environmental Policy Act (NEPA) assessments, and setting clear project performance specifications. Collaboration with stakeholders is essential to finalizing an RFP, by ensuring it meets VA and Federal requirements and addresses specific project needs of a facility. The FEMP RFP Template can be utilized when developing an RFP for an ESA ECM.

v **Phase 5: Procurement.** The VA facility team should issue the RFP and manage the procurement process, which includes organizing site visits and preproposal conferences. Amendments to the RFP and responses to inquiries from potential offerors should be managed in a timely manner. This Phase ensures that all questions and requirements are addressed and that the bid process proceeds smoothly.

vi **Phase 6: Proposal Evaluation and Contract Award.** VA facilities should evaluate proposals based on criteria such as technical qualifications, experience, and projected cost savings. The team may need to conduct negotiations and obtain all necessary agency approvals before awarding a contract. Both successful and unsuccessful bidders should be notified and finalized contract terms should clearly reflect energy generation and cost-saving goals of the ESA ECM.

vii **Phase 7: Construction and Performance Period**. During this final Phase, VA facilities should oversee construction to ensure compliance with all project specifications and conduct commissioning and inspections as required. The team should establish protocols for ongoing M&V to confirm that energy savings (or generations) targets are being met. Regular performance evaluations and adjustments may be necessary for the ESA ECM to maintain alignment with facility energy and financial objectives.

f. **Life Cycle Cost Analysis (LCCA) Requirements.** VA Directive 0055 contains specific mandates regarding LCCA requirements and related concepts. This Section contains a set of definitions, references to standards and best practices, and a consolidated list of LCCA policy guidance contained within Directive 0055.

(1) VA Directive 0055 mandates that LCCAs shall comply with the principles and procedures outlined in 10 C.F.R. § 436 Subpart A, and the most recently published version of the National Institute of Standards and Technology (NIST) *Handbook 135, Life Cycle Costing Manual for the Federal Energy Management Program*. Definitions and references in this section have been developed in accordance with these standards as well as VA Directive 0055 and other relevant VA requirements. VA personnel should incorporate guidance around LCCA into existing practices and tools for conducting LCCA, including through use of the Building Life Cycle Cost (BLCC) tool.

(2) LCCA is a methodology used to assess the total LCC of a project, asset, or facility over a defined study period. The study period is a time range used for assessing future project, asset, or facility costs and is usually related to the expected life of the project and/or alternative projects considered. LCCA can be used to understand and assess the expected, full life cycle cost of a project, asset, or facility. It can enable informed decision making when VA chooses whether to authorize a project or consider a project alternative with a lower LCC. LCC includes all expected costs from owning, operating, maintaining, and ultimately disposing of an asset or a project. These costs may include upfront costs, O&M costs, replacement costs (minus salvage value), and energy and water costs.

(3) Because LCCA considers multiple cost types over many years of a study period, LCCA often converts costs into a Net-Present Value (NPV). NPV combines all projected costs in all years to a single dollar value that captures the full project cost over the study period in a single year's currency. NPV is calculated by discounting all project costs into present-value dollars to account for the time value of money and combining these costs together into a single metric. Translating costs for a project alternative into a single NPV makes it easy to compare LCCs between alternatives.

(4) Directive 0055 also uses the term "life cycle cost effective" (LCC effective). As defined in 42 U.S.C. § 8253, for a project to be LCC effective, "the estimated savings of [the project must] exceed the estimated costs over the lifespan of the measure." Note that LCCA is distinct from Life-Cycle Assessment (LCA). LCA is a methodology to evaluate the environmental impacts of a project or asset across its life and is not a focus of Directive 0055. LCCA is a methodology used to assess the total LCC of a project, asset, or facility over a defined study period. The distinction between the

two must be acknowledged to ensure VA facilities are identifying the two methodologies as separate when completing their calculations.

g. **Metering.** To reduce energy use and increase efficiency, as well as to enable effective verification of savings, it is necessary to quantify energy and water use. By confirming that metering continues to operate properly, VA will be better positioned to implement all goals of Directive 0055. Metering is critical to monitoring and improving energy and water use at connected buildings.

(1) For new construction and major renovation projects, facilities must follow metering requirements listed in the VA Sustainable Design Manual. In the VA Sustainable Design Manual, all buildings greater than 5,000 square feet shall install advanced utility meters for electricity, natural gas, and/or steam, if the building uses it. That also includes steam condensate, chilled water, hot water, domestic water, and/or non-potable water. VA facilities should ensure all advanced meters or metering devices provide data at least once every 15 minutes. Advanced metering requires automatic communication of consumption data and storage for at least three years.

(2) For existing VA-owned Federal Buildings, VA has created a guidance document called *VA 2023-2028 Metering Implementation Plan*. This document delineates requirements that existing buildings greater than 50,000 sq. ft. shall install advanced energy metering, and that existing buildings greater than 600,000 sq. ft. shall install advanced water metering.

(3) Facilities should collect the following data points for each meter type:

(a) Potable Water Meters: VA facilities should track flow rate (GPM), totalized flow volume (gal), and temperature (°F). Pressure can be monitored in pounds per square inch (psi) if applicable. Water meters are required for any facility with more than ten acres of irrigable land.

(b) Steam Meters: Facilities should measure temperature (°F), pressure (psi), mass flow (lb/h), mass total (lb), energy flow (BTU/h), energy total (MMBTU), volume flow rate (CFM), and volume total (ft^3).

(c) Chilled Water Meters: Facilities should track supply and return temperature (°F), supply and return pressure (psi), flow rate (GPM), energy flow rate (BTU/h), and totalized energy (MMBTU).

(d) Natural Gas Meters: Facilities should monitor volume flow rate (CFM), totalized volume (MCF), energy flow rate (BTU/h), totalized energy (MMBTU), and pressure (psi).

(e) Electric Meters: VA facilities should record voltage (V), current (A), power factor (%), reactive power (kVAR), real power (kW), and apparent power (kVA) on each phase (line to line and line to neutral). Facilities should also monitor total reactive/real/apparent power, total

current, total power factor, totalized energy (kWh), and frequency (Hz.).

(4) **Maintenance**. A challenge with previous metering programs has been lack of maintenance. Without an adequate maintenance plan, meters fall out of calibration and issues can arise with meter data capture and storage. Meters shall be calibrated and maintained as per the manufacturer's operation and maintenance manual or as needed to maintain optimal performance. Without accurate metering data for large and high-energy use buildings, it is difficult to determine where energy improvements are appropriate and if implemented energy measures are operating correctly and achieving savings. To address the maintenance issues, each campus or installation (i.e., multiple buildings) must designate a Facility Metering Program Manager (FMPM) to take responsibility for metering on the campus-level. The metering record will be maintained by VHA and provided annually to EEF. Having a specific FMPM in charge of metering should help ensure proper implementation and maintenance. New construction metering implementation will be handled by a CFM Metering Program Manager (MPM). The *VA 2023-2028 Metering Implementation Plan* also requires an Agency Level VA Metering Program Manager (VAMPM) and Administration Metering Program Managers (AMPMs).

(5) **Campus Metering Plan.** The *VA 2023-2028 Metering Implementation Plan* provides campus metering requirements. The FMPM should use these requirements to develop a campus metering plan. Steps to implement such a plan include.

(a) Designate an FMPM for the campus.

(b) Identify buildings requiring metering (all existing VA-owned buildings over 600,000 GSF require advanced water metering and buildings over 50,000 GSF).

(c) Identify all available funding streams, which could include internal VA funding as well as ESPCs, potentially through FEMP.

(d) Create a tracking list or spreadsheet of buildings requiring metering. This should include a place for meter numbers and last date of calibration or maintenance.

(e) Assess the current utility meters on each campus, including all submeters and record in the tracking spreadsheet. Assess the cost of repair and calibration of existing meters or installation of new meters. Record projected cost of repairs in the spreadsheet.

(f) Select one or multiple previously identified funding streams to finance meter repair and installation.

(g) Calibrate, repair, and reconnect or replace existing advance meters. Record date and actual cost of repair in the spreadsheet.

(h) Install, calibrate, and connect new meters to the central monitoring system managed by HEFP. Record date and actual cost of initial calibration and operation.

(i) Confirm data is being properly transmitted and stored by the company contracted by VA to collect and store the data and confirm that the FMPM has access to the data.

(j) Designate an annual date to confirm correct operation of each meter and storage of data and track it in the spreadsheet.

(6) Submetering would allow for VA facilities to obtain more detailed insights into energy consumption, which would allow site level engineers greater access into cost savings. By identifying high-use locations across VA facilities, submetering is a useful practice to reduce overall energy consumption and focus on implementing energy-saving measures.

(7) VA facilities with building-level meters should provide meter data to the existing data aggregation devices that are in use. If there is no data aggregation device in use, VA facilities should install one as part of future projects.

h. **Data, Reporting, and Tracking.**

(1) **Prepare for Data Reporting.** VA facilities must confirm that all main POCs are prepared and have access to the VHA Support Service Center (VSSC) database. They should also have access to the DOE CTS. These two databases are where VA facilities will input data either on a monthly or quarterly basis.

(2) **Record Consumption Data.** VA facilities must collect, verify, and certify monthly data on water and energy consumption, on-site generation, and other metrics following utility bill reviews. Each quarter, facilities should enter this monthly data into the VHA VSSC database. This should be accomplished by the energy engineer of the facility, or another facility designated POC. Prior to submission, facilities should carefully review all entries to ensure accuracy and adherence to verification standards outlined in the directive.

(3) **Quarterly Report of Energy, Water, and Sewer Costs.** VA facilities are required to collect quarterly data on energy, water, and sewer costs to support VA’s financial reporting requirements. This data must be entered quarterly into the VA Financial Management System as well as VSSC. It may be necessary for facility energy, accounting, and finance departments to collaborate to collect and disclose this information. Facilities should

maintain comprehensive records of all entries to facilitate audits and ensure transparency.

(4) **Complete Energy Audits and Report Data.** The final step is for energy engineers to report energy project data into CTS every month, and for VISN energy managers to input a quarterly review of project data in CTS. Energy engineers must also enter energy audit information into CTS every four years or as audits are completed. Users may create an account in EISA § 432 CTS by filling the Request User Account form. An energy project is one that has been awarded and meets one or more of the following criteria:

(a) The majority of the project funding and/or the primary intent of the project is to reduce energy or water consumption

(b) The project will produce renewable fuel; for example, installation of a solar PV array

(c) The project will result in significant energy and/or water savings

(d) To be counted as Energy Act of 2020 compliant, projects must be reported within CTS.

(5) Annual guidance on due dates for quarterly data entry will be provided at the beginning of each calendar year. Step by step instruction for VSSC access and data entry is available in the VSSC Guidebook located on the VSSC home page. Entry of data into the VSSC database should follow utility bill verification and certification of payment.

i. **Energy and Water Management Program Gap Strategic Capital Investment Planning (SCIP) Guidance.**

(1) The SCIP process is a competitive decision-making exercise that determines which projects receive funding. ECMs must be input in SCIP, either within a larger project, as a standalone project, or as part of a performance contract. The EWM Plan Template requests that users input SCIP numbers when available to track progress and funding of ECMs.

(2) In the SCIP process, gaps are weighed as a factor in prioritizing and allocating funding for projects. Energy and Water Management Program gaps are based on compliance with Federal mandates and Departmental goals that require Federal agencies to meet the following criteria:

(a) Reduce energy and water consumption

(b) Ensure facilities are on track to meet the 42 U.S.C. § 15852 requirement that electric consumption be at least 7.5% renewable

(c) Increase the proportion of applicable buildings that meet the Guiding Principles for Sustainable Federal Buildings or achieve Green Globes Two Green Globes or Leadership in Energy and Environmental Design (LEED) Silver Certification, as described in the VA SDM

(3) Data for these criteria in the SCIP process are populated from the VSSC Utility Data Collection System. Facility managers develop SCIP business cases by leveraging data input by energy engineers. It is crucial that data input by engineers in VSSC is accurate and up to date as that will enable facility managers to communicate sustainability gaps using reliable information.

(4) Engineers are encouraged to support their facility's SCIP application early in the development process so that the facility manager can most effectively develop and communicate the need for funding to reduce energy and water gaps. Similarly, given the competitive nature of the funding application, engineers are encouraged to find opportunities for projects that close multiple gaps to increase the likelihood of project funding. SCIP is further detailed in Directive 0011.

5. REFERENCES. References are outlined in VA Directive 0055, Energy and Water Management Program in addition to the below. Additional energy and water-related information and resources can be found at the EEF Energy Resources SharePoint Site (https://dvagov.sharepoint.com/sites/VACOOAEMEnergyResources/SitePages/Energy Resources - Reference.aspx).

a. 10 C.F.R.

(1) § 433 https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-433

(2) § 435 https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-435

(3) § 436 https://www.ecfr.gov/current/title-10/chapter-II/subchapter-D/part-436

b. 2016 Guiding Principles Checklist for New Construction and Modernization. https://www.cfm.va.gov/til/sustain/GPChecklist02-VA2016.xlsx

c. 42 U.S.C. § 8253. https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title42-section8253&num=0&edition=prelim

d. 42 U.S.C § 8256. https://www.govinfo.gov/content/pkg/USCODE-2023-title42/pdf/USCODE-2023-title42-chap91-subchapIII-partB-sec8256.pdf

e. 42 U.S.C. § 8287. https://uscode.house.gov/view.xhtml?path=/prelim@title42/chapter91/subchapter7&edition=prelim

f. 42 U.S.C. § 15852. https://uscode.house.gov/view.xhtml?req=(title:42%20section:15852%20edition:prelim)

g. Database of State Incentives for Renewables & Efficiency. https://www.dsireusa.org/

h. Determining Price Reasonableness in Federal ESPCs. https://www.energy.gov/femp/articles/determining-price-reasonableness-federal-espcs

i. Directive 0011. https://www.va.gov/vapubs/viewPublication.asp?Pub_ID=1548&FType=2

j. DOE EISA 432 compliance tracking system. https://www.eisa-432-cts.eere.energy.gov/EISACTS/Login.aspx.

k. DOE FEMP CTS Project Upload template. https://www.energy.gov/sites/default/files/2024-04/CTS_project_template.xlsx

l. DOE FEMP CTS Follow-Up Upload template. https://www.energy.gov/sites/default/files/2024-04/CTS_UploadTemplate_FollowUp.xlsx

m. DOE FEMP CTS Evaluation Upload Template. https://www.energy.gov/sites/default/files/2024-04/CTS_UploadTemplate_Evaluation.xlsx

n. DOE Energy Audit template samples:

(1) https://www.energy.gov/femp/energy-and-water-audits-federal-buildings

(2) http://vaww.hefp.va.gov/resources/7-1-sample-energy-water-and-renewable-energy-site-audit-template

(3) http://vaww.hefp.va.gov/resources/7-1-attachment-sample-energy-audits-tables

(4) http://vaww.hefp.va.gov/resources/7-2-sample-completed-energy-water-and-renewable-energy-site-audit

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6. DEFINITIONS. Definitions are outlined in VA Directive 0055, Energy and Water Management Program.

APPENDIX A - VA PROJECT CHECKLIST INSTRUCTIONS FOR USE

1. **What is it**. A checklist to assist with VA review of the IGA submissions for an ESPC or UESC, and to ensure such reviews are properly documented. Checklist is available to download on EEF's SharePoint site

2. **Why is it important:** VA review is critical to ensure information, assumptions, calculations, and measurements in the IGA, which includes the contractor's energy baseline and cost savings estimates, are witnessed and validated per FEMP guidelines. VA reviewers must use the VA Project Checklist, along with the VA contracted project facilitator (PF), at each submission to ensure all critical elements of the contractor baseline, assumptions, and methods of verification are reviewed and discussed to ensure accuracy. The checklist can also be used to document critical agreed upon terms and is included as an attachment to the TO documentation.

3. **Who should use this checklist.**

    a. VA facility subject matter expert who is appointed as the Contracting Officer's Representative (COR) by the CO, with assistance from other site and VISN staff.

    b. VA's PF.

    c. VA Contracting will ensure this checklist is part of the project file once complete.

4. **When**: There are tabs for reviewers to use at each IGA project submission (30%, 60%, 90%). At each stage, reviewers should complete the checklist and comments with their initial review, then discuss with the project team (including the contractor) and update accordingly. After all comments/issues are resolved in the final proposal prior to award, the facility subject matter expert who is appointed as the Contracting Officer's Representative (COR) by the CO, should sign the *Summary* tab to signify for the contracting officer that all elements have been properly reviewed and validated. The Contracting Officer (CO) will countersign and save to the project file for record.

5. **How to use**: The VA Project Checklist includes the following elements:

    a. *Instructions* tab with explanations of the primary checklist options and general guidance for use.

    b. *Summary* tab with an overall tracking page for the project, to include the name and contract number, most recent update, project development timeline and checklist overview, as well as a signature block for CO and COR when the checklist is completed (just prior to award).

    c. *30% Checklist* tab with content requirements for the initial IGA submission (usually referred to as the 30% IGA). The reviewer should ensure all required elements listed are included and sufficient, including ECM calculations. The

reviewer should then answer each of the questions, which prompt attention to specific areas that must be considered and validated to ensure the information provided is reasonable and accurate. The resources listed below can assist the reviewer with determining reasonableness. Comments on this checklist should be general and/or refer to more detailed comments on the *30% Comments* tab.

d. *30% Comments* tab will track comments from all reviewers, including contractor responses and final disposition of comments. These comments should address any areas of concern or confusion, as well as missing or inaccurate data.

e. *60% Checklist* tab with content requirements for the intermediate IGA submission (usually referred to as the 60% IGA). The reviewer should ensure all required elements listed are included and sufficient, including ECM calculations. The reviewer should then answer each of the questions, which prompt attention to specific areas that must be considered and validated to ensure the information provided is reasonable and accurate. The resources listed below can assist the reviewer with determining reasonableness. Comments on this checklist should be general and/or refer to more detailed comments on the 60% *Comments* tab.

f. *60% Comments* tab will track comments from all reviewers, including contractor responses and final disposition of comments. These comments should address any areas of concern or confusion, as well as missing or inaccurate data.

g. *90% Checklist* tab with content requirements for the draft final IGA submission (usually referred to as the 90% IGA). The reviewer should ensure all required elements listed are included and sufficient, including ECM calculations. The reviewer should then answer each of the questions, which prompt attention to specific areas that must be considered and validated to ensure the information provided is reasonable and accurate. The resources listed below can assist the reviewer with determining reasonableness. Comments on this checklist should be general and/or refer to more detailed comments on the 90% *Comments* tab.

h. *90% Comments* tab will track comments from all reviewers, including contractor responses and final disposition of comments. These comments should address any areas of concern or confusion, as well as missing or inaccurate data.

i. *90% Tech Checklist* tab is an additional review checklist for the draft final review. Because the 90% IGA submission should include the contractor’s final pricing, assumptions, calculations, and measurements prior to award, this submission requires additional scrutiny. This tab includes detailed questions and prompts to ensure that for each ECM proposed savings are reasonable relative to baseline, assumptions and measurements have been appropriately documented, calculations have been double-checked for accuracy, models have been calibrated, etc.

j. *BDP* tab – this is the Baseline Development Plan. The BDP is usually introduced at IGA Kick Off and a workshop is typically done prior to the ESCO taking any on-site measurements. This is to ensure both the ESCO and Agency agree to baseline measurements to be taken before being deployed by the contractor. The BDP is referenced at each IGA submission to ensure it is reviewed and validated as it continues to evolve during development. The BDP should be developed with the contractor and then fully vetted to ensure VA is comfortable with the baseline parameter(s), type of measurement, meter data being used where applicable, amount and type of sampling to ensure accurate representation of the whole (e.g., lighting), frequency of measurements being taken, and documentation of witnessing.

6. Resources to assist with reviews:

a. NIST Building Life Cycle Cost Program.

b. NIST Handbook 135.

c. NIST publishes an annual supplement that provides Energy Price Indices and Discount Factors for Life Cycle Cost Analysis which can be found at their website. For example, 2024 Annual Supplement to NIST Handbook 135.

d. FEMP ESPC Resources (Contains essentially everything you need for each project stage).

e. FEMP's ESPC Project Development Resource Guide may be a particularly helpful general resource.

f. Utility rate estimation.

g. Fair and reasonable pricing: Determining Price Reasonableness in Federal ESPCs.

h. Guide to Government Witnessing and Review of Measurement and Verification Activities: Process and guidance.

i. FEMP UESC Resources.

j. FEMP ESPC and UESC Training can also help prepare reviewers.

k. Market research – consult with your CO and other VA project staff to identify relevant market research that was recently conducted or conduct your own survey of costs and savings in your local area and/or similar areas and building types.

l. Additional resources can be found on EEF's SharePoint Site.

APPENDIX B - ABBREVIATIONS

ACH – Air changes per hour

AFFECT –Assisting Federal Facilities with Energy Conservation Technologies (Grant program managed by the DOE)

AHUs – Air handling units

AMPM – Administration Metering Program Manager

BAS – Building Automation System

BTU/kBTU – British Thermal Unit/Thousand British Thermal Unit

CEQ – Council on Environmental Quality

CFR – Current Facility Requirements

CHWT – Chilled Water Temperature

COR – Contracting Officer's Representative

CSA – Customer Service Agreement

CWT – Condenser Water Temperature

DOE – Department of Energy

DP – Differential Pressure

EO – Executive Order

ECM – Energy Conservation Measure

EEF – Energy, Environment, and Fleet Program (within VA OAEM)

ESA – Energy Sales Agreement

ESCO – Energy Services Company

ESPC – Energy Savings Performance Contract

EUI – Energy Use Intensity

EWM – Energy and Water Management

FCA – Facility Condition Assessment

FEMP – Federal Energy Management Program

FID – Final Investment Decision

FMPM – Facility Metering Program Manager

FY – Fiscal year

GPM – Gallons per Minute

GSF – Gross Square Footage

IGA – Investment Grade Audit

IGCE – Independent Government Cost Estimate

LCCA – Life Cycle Cost Analysis

M&V – Measurement and Verification

NOITA – Notice of Intent to Award

NRM – Non-Recurring maintenance

O&M – Operations and Maintenance

OAEM – Office of Asset Enterprise Management

OAT – Outside Air Temperature

OMB – Office of Management and Budget

PCAC – Program Contracting Activity Central

PF – Project Facilitator

PSRDM – Physical Security and Resilience Design Manual

PWS – Performance Work Statement

RCx – Retro-Commissioning

SAT – Supply Air Temperature

SCIP – Strategic Capital Investment Planning

SDP – Site Data Package

SP – Static Pressure

UESC – Utility Energy Service Contract

VA – Department of Veterans Affairs

VAMPM – VA Metering Program Manager

VAV – Variable Air Volume

VFD – Variable Frequency Drive

VHA – Veterans Health Administration

VISN – Veterans Integrated Services Network

VSSC – VHA Support Service Center

WUI – Water Use Intensity