

2015

U. S. A I R F O R C E

Energy Evaluations (TRIRIGA) Playbook



CE PLAYBOOKS

Contents

Overview	3
High Level	5
1.0 Prepare for Energy Evaluation.....	8
2.0 Conduct Energy Evaluation	14
3.0 Conduct Post-Evaluation Activities.....	20
Acronyms.....	23
Definitions.....	26

Energy Evaluations – Overview

[Introduction](#)

[Purpose and Goals](#)

[Scope](#)

Introduction

The Energy Evaluations Playbook standardizes information and processes to help installation Energy Managers plan, conduct, and report energy evaluations according to the Energy Independence and Security Act of 2007, Section 432 (EISA07, §432), *Management of energy and water efficiency in Federal buildings*. EISA07, §432 mandates that at least 75% of all facility energy use at each agency be covered (i.e., covered facilities) and that approximately 25% of all facilities receive a comprehensive energy and water evaluation each calendar year, such that each facility receives an evaluation at least once every four years. A Department of Defense (DoD) covered facility is an installation and includes the Air Force's Geographically Separated Units (GSU). The Air Force approach to comply with these congressional mandates and DoD definitions is to evaluate 100% of its covered facilities, eventually capturing 75% of each installation's energy and water usage.

In addition to these requirements, EISA07, §432 requires federal agencies to designate an Energy Manager to:

- Identify, measure, and verify energy conservation opportunities (ECO). This includes updating and adjusting operation and maintenance (O&M) plans, as appropriate, and measuring and verifying energy and water savings
- Certify and track compliance for energy and water evaluations through project implementation and follow-up measures, and estimate cost and savings via a web-based system (e.g., Compliance Tracking System [CTS])
- Enter energy consumption data for each metered building into a benchmarking system
- Identify re-commissioning or retro-commissioning (RCx) opportunities

EISA07, §432 defines two primary purposes of energy evaluations:

- 1) "Audit" building energy consumption and performance to develop ECMs
- 2) Determine whether RCx is required

Note: There are three levels of energy evaluations (i.e, Level 1, Level 2, and Level 3), each requiring increasing amounts of money, time, and expertise.

Purpose and Goals

Through both process maps and narratives, the Energy Evaluations Playbook documents the steps necessary for installation Energy Managers and other relevant civil engineering (CE) parties to plan and execute energy evaluations at Air Force installations. While a number of individuals and organizations are involved in the energy evaluation process, this Playbook focuses primarily on the duties of installation Energy Managers who are responsible for overall compliance with EISA07, §432. This Playbook will serve as both a useful reference for Energy Managers responsible for carrying out the required activities to conduct a successful energy evaluation and as a guide to conduct ad-hoc inspections in the years between reportable energy evaluations.

The Energy Evaluations Playbook contains three different process maps that document the major processes involved in conducting an energy evaluation that satisfy the EISA07, §432 requirements:

- Process 1.0 Prepare for Energy Evaluation describes how the Energy Manager and Air Force Civil Engineer Center (AFCEC) prepare for upcoming energy evaluations, which includes updating the covered building list, conducting an energy profile analysis and assigning an evaluation level for each covered building, and forming an evaluation team
- Process 2.0 Conduct Energy Evaluation describes the necessary tasks for the Energy Manager and Evaluation Team to complete for Level 1, Level 2, or Level 3 evaluations
- Process 3.0 Conduct Post-Evaluation Activities describes how the Energy Manager puts together a final report package and submits any necessary documentation for ECOs to go through the project approval and funding process

Scope

Limitations: This Playbook does not replace, supersede, or circumvent existing DoD or Air Force policy.

Applicability: This Playbook serves as a resource for installation-level Energy Managers in support of their duty to conduct energy evaluations in compliance with EISA07, §432. While this Playbook does not specifically address “non-covered buildings,” the installation Energy Manager (and REM, if available) should still pursue valid ECOs for inclusion in the installation’s energy opportunities portfolio. The Playbook approach covers energy evaluation activities for both inside the continental United States (CONUS) as well as outside the continental United States (OCONUS).

Note: There are two separate versions of the Energy Evaluations Playbook on the CE Portal. The ‘TRIRIGA’ version applies to installations using TRIRIGA, while the ‘Legacy Systems’ version applies to installations using legacy systems.

Energy Evaluations – High Level

[Introduction](#)

[Roles and Responsibilities](#)

[Narrative](#)

Introduction

This narrative describes the standardized and recurring process of preparing for, conducting, and reporting energy evaluations. The corresponding process map depicts a high-level, ongoing process that occurs due to the Energy Independence and Security Act of 2007, Section 432 (EISA07, §432) requirements. This process provides a framework for installations to both comply with the EISA07, §432 mandate and ensure a sustained data set in the Compliance Tracking System (CTS) as evaluations are conducted on an ongoing basis.

Roles and Responsibilities

The roles and responsibilities defined here apply to all processes in this Playbook. More detailed descriptions are provided in the respective Energy Evaluations process narratives.

ROLES	RESPONSIBILITIES
AFCEC	AFCEC initiates the energy evaluation process by requesting Energy Managers to submit an annual updated Covered Building List for approval. AFCEC validates and tracks the status of the Covered Building list throughout the process; coordinates with the Energy Manager and/or Resource Efficiency Manager (REM) to create an Evaluation Team; determines approval for Level 3 evaluations; and provides annual updates to the Compliance Tracking System (CTS) using the information gathered during energy evaluations.
Operations Flight	The Operations Flight receives and executes projects (via energy opportunities submitted as service/work requests) from the Work Request Review Board (WRRB). If requested by the Energy Manager, Operations Flight personnel may be a part of the Evaluation Team.
Engineering Flight	The Engineering Flight receives and executes projects (via energy opportunities submitted as service/work requests) from the WRRB. If requested by the Energy Manager, Engineering Flight personnel may be a part of the Evaluation Team.
Evaluation Team	<p>The Evaluation Team typically consists of the Energy Manager, the Resource Efficiency Manager (REM), the Building Manager, and representatives from both the Engineering Flight and the Operations Flight. The primary function of the Evaluation Team is to complete the required tasks and checklists for each Level 1 and Level 2 evaluation.</p> <p>Note: The composition of the Evaluation Team will vary greatly depending on available installation resources, number and complexity (i.e., Level 1 or Level 2) of evaluations to conduct, and personnel expertise. On some installations, it may be possible for the Energy Manager to conduct an energy evaluation without additional support.</p>
Energy Manager	The installation Energy Manager is the primary actor in the energy evaluation process. Once AFCEC begins the process by sending the annual request to update the installation Covered Building List, the Energy Manager proceeds to prepare for and execute energy evaluations according to EISA07, §432 requirements. Once an energy evaluation is complete, the Energy Manager completes the final report package and submits the necessary documents for energy opportunities to be approved and funded for future projects.

Narrative

Entry from Annual Update to Covered Building List.

Process 1.0 – Prepare for Energy Evaluation

This process provides guidance and instruction for installation Energy Managers to take the necessary steps to prepare for upcoming energy evaluations. The process begins when AFCEC requests Energy Managers to submit an annual updated Covered Building List for approval. The Energy Manager proceeds to extract the Covered Building List from TRIRIGA, make the necessary revisions, and submit to AFCEC for approval. Once validated by AFCEC, the Energy Manager updates the overall consumption energy profile and conducts an energy profile analysis. Based off this analysis, the Energy Manager assigns an evaluation level for each covered building. If additional support is required to conduct the required energy evaluations, the Energy Manager coordinates with AFCEC to obtain the additional resources. The Energy Manager then proceeds to prioritize the Covered Building List and forms an Evaluation Team that is capable of conducting the required energy evaluations.

Proceed to Process 2.0 Conduct Energy Evaluation.

Process 2.0 – Conduct Energy Evaluation

Once the Evaluation Team is formed and ready to conduct an energy evaluation, they hold a kickoff meeting to go over contractual requirements, safety checklists, logistics, and any other items that need to be addressed before conducting a site evaluation. Once this is complete, the team proceeds to complete the required steps for the assigned evaluation level (i.e., Level 1 or Level 2) for each covered building. If the Energy Manager requests a Level 3 evaluation, AFCEC will make a determination on whether or not to approve and fund the request based on savings-to-investment ratio (SIR). Once an evaluation is complete, the process moves on to Process 3.0 Conduct Post-Evaluation Activities to perform closeout activities.

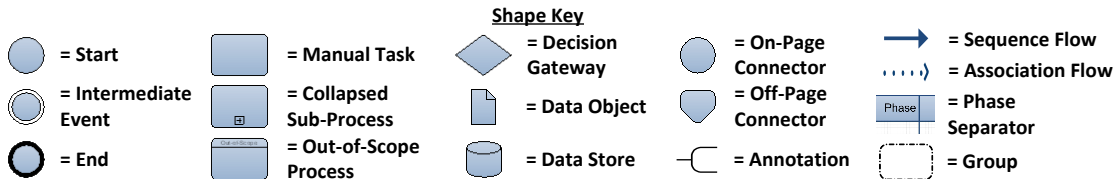
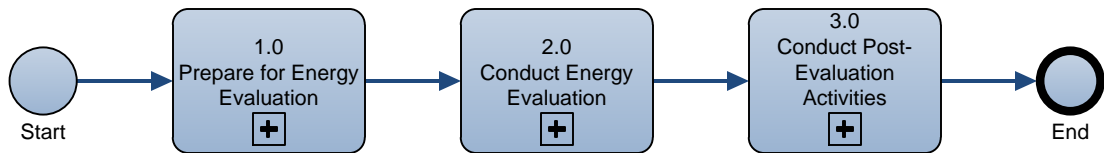
Proceed to Process 3.0 Conduct Post-Evaluation Activities.

Process 3.0 – Conduct Post-Evaluation Activities

Once an energy evaluation is complete for a covered building, the Evaluation Team holds an outbrief meeting to finalize the list of ECOs and determine any follow-on actions and due dates. The Energy Manager then coordinates with the involved stakeholders to create a report package for all viable ECOs. The Energy Manager must submit a service/work request for each viable ECO. The Work Request Review Board (WRRB) will then determine the project approval and execution method (i.e., execute in-house or send to Engineering Flight). Though outside of the scope of this Playbook, the Energy Manager should continue to follow any submitted service/work requests through the approval/funding process and be prepared to defend energy projects where needed.

End.

Energy Evaluations – High Level



Energy Evaluations – 1.0 Prepare for Energy Evaluation

[Introduction](#)

[Roles and Responsibilities](#)

[Narrative](#)

Introduction

This process details the steps necessary for the installation Energy Manager and the Air Force Civil Engineer Center (AFCEC) to prepare for required, annual energy evaluations. The Energy Independence and Security Act of 2007, Section 432 (EISA07, §432), *Management of energy and water efficiency in Federal buildings*, mandates that each Federal facility receive an energy evaluation at least once every four years (i.e., approximately 25% of all facilities each year). To ensure that this requirement is met, AFCEC begins the process by sending a request to the Energy Manager to provide an annual updated Covered Building List. From there, major activities include updating the Covered Building List and overall consumption energy profile, conducting an energy profile/benchmark analysis, assigning an evaluation level for each covered building, and coordinating resources to execute upcoming energy evaluations. After completing these steps, the process moves to Process 2.0 Conduct Energy Evaluation where the Energy Manager and Evaluation Team will proceed to conduct the required energy evaluations on the installation

Roles and Responsibilities

ROLES	RESPONSIBILITIES
AFCEC	AFCEC initiates the process by requesting Energy Managers to submit an annual updated Covered Building List for approval. AFCEC validates and tracks the status of the Covered Building list throughout the process. Should the Energy Manager request additional support from AFCEC to conduct an energy evaluation, AFCEC coordinates with the Energy Manager and/or Resource Efficiency Manager (REM) to create an Evaluation Team.
Energy Manager	The Energy Manager updates the Covered Building List and sends to AFCEC for review. Once approved, the Energy Manager updates the overall consumption energy profile and conducts an energy profile/benchmark analysis. Utilizing these outputs, the Energy Manager assigns an evaluation level for each building and coordinates resources and logistics for upcoming evaluations. Note: If available, a REM may help the Energy Manager carry out his/her duties.

Narrative

Step 1.1 – Extract and revise Covered Building List

Role: Energy Manager

The Energy Manager pulls the Covered Building List from TRIRIGA using the Covered Building List report and checks for obvious omissions or incorrectly identified buildings pertaining to the main installation as well as any associated geographically separated units (GSU) and validates the consumption criteria. The Energy Manager makes any necessary additions or deletions of buildings to the Covered Building List based off any new information pertaining to the consumption criteria (e.g. energy rate changes, mission changes, or the Energy Manager's judgment and knowledge of the building).

The Energy Manager reconciles the Covered Building List with the following:

- **SAF-MII(AR) 7115 U.S. Air Force Real Property Inventory Detail List** – The Energy Manager should sort the list by facility code, specifically Type A (single-use) and Type B (multi-use), to find additional buildings that meet the consumption criteria and are not included on the Covered Building List
- **Energy Management Control System (EMCS) and/or Automated Meter Reading System (AMRS)** – The Energy Manager confirms that the buildings are connected to an automated system that allows digital data collection and storage, or standard meters are manually read monthly and documented into the meter reading spreadsheet in TRIRIGA

The Energy Manager checks for recently completed construction projects (military construction [MILCON]), renovations, or demolitions that may affect an energy evaluation and ensures cost-effective, advanced meters are in place. The Energy Manager adds MILCON that will be completed next fiscal year (FY), notes buildings that have received renovations, and removes demolished buildings.

After making the necessary revisions to the Covered Building List, the Energy Manager sends the list to AFCEC for approval.

Proceed to Step 1.2.

Step 1.2 – Validate Covered Building List

Role: AFCEC

Upon receipt of the Covered Building List from the Energy Manager, AFCEC compares the list against strategic and programmatic criteria and either approves the list or sends it back to the Energy Manager with comments to revise. Examples of strategic and programmatic criteria include upcoming installation closures, knowledge of commander's intent, etc.

Note: Once a Covered Building List is approved, AFCEC will coordinate with the Energy Manager to obtain the information needed for the annual update to the Compliance Tracking System (CTS).

If 'Approve,' proceed to Step 1.3.

If 'Disapprove,' proceed to Step 1.2.

Step 1.3 – Update overall consumption energy profile

Role: Energy Manager

To update the overall consumption energy profile, the Energy Manager researches and compiles information from the areas detailed below.

Preliminary Assessment

If a covered building has not received an initial AFCEC-sponsored energy evaluation, the Energy Manager must conduct a preliminary energy use analysis. For more information on how to conduct this preliminary analysis, see the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Research Project (RP)-669, Special Project (SP)-56, *Procedures for Commercial Building Energy Audits* guidance located in the References section of this Playbook.

Recently Completed and Upcoming Projects

The Energy Manager works with the Engineering and Operations Flights to determine whether any recently renovated or upgraded covered buildings require an energy evaluation. An energy evaluation will not need to be completed this cycle if a recently completed project included an energy profile analysis and all previously identified energy conservation opportunities (ECO) were included in the project scope. Similarly, if a recently completed project included some level of Leadership in Energy and Environmental Design (LEED) certification, it is likely that a new energy evaluation will not be required as the LEED documentation will include a building model.

For upcoming projects, the Energy Manager works with the Engineering Flight to identify any planned, major renovations that would affect the building's energy usage. Covered buildings with upcoming major projects may be deferred for an energy evaluation in the current cycle.

Usage Demographics

Utilizing real property (RP) records as well as EMCS or AMRS data, the Energy Manager gathers building usage demographics to include size, occupancy (permanent and visitor), use, major system age, building age, and hours of operation (building schedule).

Note: The occupancy schedule may differ from the building schedule for the Heating, Ventilation, and Air Conditioning (HVAC), lighting, or other systems.

Past Energy Consumption

The Energy Manager collects monthly utility bills and meter readings and works with the Engineering Flight, Operations Flight, and the Utilities Manager/Provider to review past energy patterns. This step helps the Energy Manager understand the building's past energy consumption to identify consumption trends, demand profiles, and abnormalities.

Note: If the Energy Manager has previously input data into TRIRIGA, the Energy Manager may run canned reports to obtain past energy consumption information.

Maintenance Logs

The Energy Manager gathers maintenance logs in TRIRIGA and works with the Operations Flight and/or Base Operations Support (BOS) contractor to determine the number of monthly direct scheduled work orders (DSW) within the past 12 months, looking for trends to determine building performance and the level of energy evaluation required.

Note: The overall consumption energy profile should not be confused with the detailed energy profile created later in a Level 2 or Level 3 evaluation.

Proceed to Step 1.4.

Step 1.4 – Conduct energy profile / benchmark analysis

Role: Energy Manager

The Energy Manager works with the REM (if available) to gather weather data from the appropriate National Oceanic and Atmospheric Administration (NOAA) weather station to compare weather trends against the overall energy consumption profile by identifying the heating degree days (HDD) and cooling degree days (CDD). This step is also used to identify any weather anomalies that could account for particularly high or low energy usage since the last evaluation.

The Energy Manager uses the weather data to benchmark the building against its own past energy usage (located in the energy profile created in Step 1.3 of this process) or against other similar buildings on installations in the same climate zone. This comparison allows the Energy Manager to normalize the overall energy consumption profile data and identify discrepancies for individual buildings over a period of time.

Note: There is currently no Air Force guidance for conducting a benchmark analysis in the energy star portfolio, but it is recommended so that the Energy Manager has a better understanding of a facility's overall consumption energy profile.

Proceed to Step 1.5.

Step 1.5 – Assign evaluation level for each covered building

Role: Energy Manager

Utilizing previous energy evaluation information and the overall consumption energy profile created in Step 1.3 of this process, the Energy Manager works with the REM (if available) to assign an evaluation level for each covered building according to the criteria (e.g., building history, age of the building, condition of the building, building mission, and building commodity consumption) used to categorize the buildings into energy evaluation levels. If the Energy Manager decides it is necessary to assign an evaluation level that differs from the set criteria to a particular building, the Energy Manager must provide specific justifications to AFCEC detailing why a different evaluation level is necessary.

Energy evaluation level descriptions can be found below:

- **Level 1:** Analyze total energy consumption and utility bills, conduct walk-through analysis of the building to identify low-cost and no-cost ECOs, develop list of potential Level 2 and Level 3 opportunities (Level 1 Evaluation Checklist can be found in the References section of this Playbook)

- **Level 2:** Level 1 requirements plus...break down energy consumption to end use, develop energy conservation measures (ECM) that meet owner's constraints and economic criteria, review O&M procedures, develop list of potential Level 3 opportunities
- **Level 3:** Level 2 requirements plus...gather field data to develop capital-intensive projects, conduct rigorous engineering analysis, and provide detailed cost estimates

Note: For covered buildings with previous Level 2 energy evaluations performed, follow-up evaluations will most likely be Level 1 plus. Level 2 evaluations will typically be conducted by the Energy Manager, REM, Evaluation Team, AVT Team, or third-party contractors (utility companies, colleges). Overall, Level 3 evaluations will be exceptionally rare and will require written justification to AFCEC (to be included in Energy Savings Performance Contracts [ESPC] or Utility Energy Service Contracts [UESC] as part of the contractual agreement). An alternative option for the Energy Manager would be to perform targeted equipment assessments on specific systems (e.g., HVAC, compressed air) rather than request a Level 2 or Level 3 evaluation on an entire building.

Proceed to Step 1.6.

Step 1.6 – Determine if additional support is required

Role: Energy Manager

The Energy Manager works with the REM (if available) to determine the in-house capacity to conduct energy evaluations; these decisions are based on the experience level of both the Energy Manager and the REM and their availability.

Local utilities may also conduct or assist in conducting energy evaluations. In this case, the Energy Manager must contact the Air Force Legal Operations Agency, Utility Litigation Team (AFLOA/ULT) at Tyndall Air Force Base before requesting energy evaluations from their local utility. The minimum CTS compliance level is a Level 1 Evaluation; the Energy Manager should also evaluate whether re-commissioning or retro-commissioning (RCx) of buildings is required.

If the volume or complexity of energy evaluations is too high for the Energy Manager to handle, the Energy Manager sends a compiled list of covered buildings to AFCEC and requests additional support.

If 'Additional support required,' proceed to Step 1.7.

If 'Additional support not required,' proceed to Step 1.8.

Step 1.7 – Coordinate support for evaluations

Role: AFCEC

AFCEC assesses available resources and determines the level of support that can be provided to the Energy Manager for upcoming energy evaluations. AFCEC coordinates with the Energy Manager and/or REM to create an Evaluation Team, which typically includes Asset Visibility Team (AVT) personnel as well as host base support personnel.

Note: If AFCEC cannot provide additional resources to the Energy Manager, the Energy Manager must still conduct the required energy evaluations as required by EISA07, §432. The Energy Manager will need to figure out an alternative audit method and proceed to conduct either a Level 1 or Level 2 evaluation based off of available in-house resources.

Proceed to Step 1.8.

Step 1.8 – Prioritize Covered Building List

Role: Energy Manager

Utilizing the energy profile analysis completed during Step 1.4 of this process, the Energy manager first prioritizes buildings based off of the previous evaluation date for each covered building. EISA07 §432 mandates that an evaluation of each facility is completed at least once every four years; the Energy Manager should ensure that this mandate is met.

After prioritizing buildings based off of the previous evaluation date, the Energy Manager may further prioritize the Covered Building List by the number of expected new opportunities to be found. This will largely depend on the Energy Manager's knowledge of the building and/or previous evaluation information.

Proceed to Step 1.9.

Step 1.9 – Form Evaluation Team

Role: Energy Manager

Organize

The Energy Manager organizes an Evaluation Team that generally consists of the REM, the Building Manager, and representatives from both the Engineering Flight and the Operations Flight. The Energy Manager can reach out to the Electrical Engineer, Mechanical Engineer, and functional shop foremen (e.g., building envelope, plumbing, electrical, EMCS/Building Automation System [BAS], and Heating, Ventilation, and Air Conditioning [HVAC]) to gain useful insight for upcoming energy evaluations.

Equip

The Energy Manager obtains checklists and guidance for completing energy evaluations. Sample checklists and guidance based upon equipment vendor operational manuals and best industrial practices are available on the Air Force Facility Energy SharePoint website. The Energy Manager should develop specific building checklists required to document and manage ECOs. For new buildings, the Energy Manager will need to customize the checklist according to the building construction and features.

The Energy Manager checks that the energy evaluation toolkit contains the appropriate tools to perform an energy evaluation in accordance with the Department of Defense (DoD) Energy Manager's Handbook. Any group that travels to the site should anticipate bringing the tools necessary to conduct the energy evaluation. Operations shops (e.g., HVAC, electrical, structures) may be able to support equipment requests if required. Shop equipment requests must be scheduled ahead of time to limit usage conflicts. Note that installations with a BOS contractor may not be able to provide contractor-owned equipment.

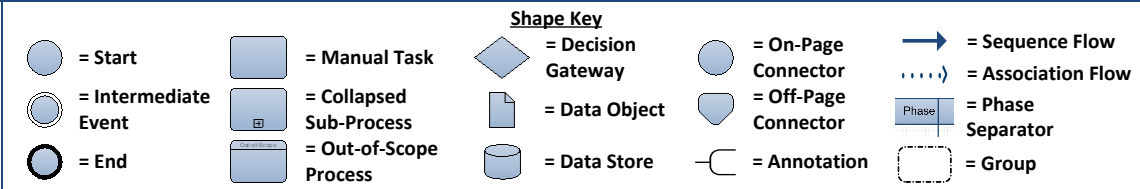
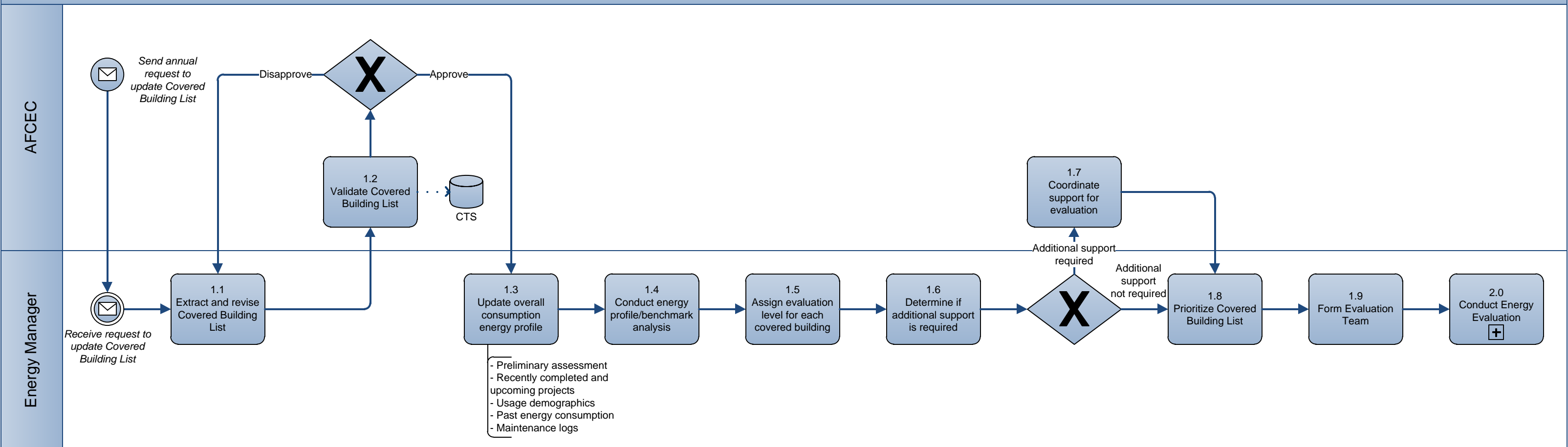
Coordinate Logistics

After the Evaluation Team is formed and ready for an evaluation, the Energy Manager finalizes the energy evaluation schedule by coordinating all participants' availability and ensuring building access will be provided by the Building Manager. The Energy Manager may have to:

- Conduct a visit authorization with security to access secure locations
- Provide cleared escorts
- Clear a facility to allow for a walk-through
- Get authorization to take pictures

Proceed to Process 2.0 Conduct Energy Evaluation.

Energy Evaluations – 1.0 Prepare for Energy Evaluation



Energy Evaluations – 2.0 Conduct Energy Evaluation

[Introduction](#)

[Roles and Responsibilities](#)

[Narrative](#)

Introduction

Process 2.0 Conduct Energy Evaluation outlines the steps necessary for the Energy Manager and/or Evaluation Team to complete Level 1 and Level 2 evaluations. If the Energy Manager requests a Level 3 Evaluation, the request gets sent to the Air Force Civil Engineer Center (AFCEC) for approval and funding. The execution of Level 3 evaluations will be done via a third party.

A Level 1 evaluation, the most basic type of evaluation, consists of a building walk-through and the identification of low- and no-cost savings opportunities as well as re-commissioning or retro-commissioning (RCx) opportunities. The Energy Manager and/or Evaluation Team looks for practical, common sense measures that can be implemented with minimal effort, time, and resources. A Level 2 evaluation includes Level 1 evaluation activities, but also incorporates the identification of the new energy conservation opportunities (ECO), conduction of an energy survey and engineering analysis, and the analysis of facility energy use and ECOs. Once a Level 1 or Level 2 evaluation is complete, the Energy Manager proceeds to update operations and maintenance (O&M) procedures and any necessary administrative items. The process then moves on to Process 3.0 Conduct Post-Evaluation Activities where the Energy Manager creates a final report package and energy opportunities are submitted to become potential projects.

Note: A person is deemed qualified to conduct an energy evaluation if that individual is in possession of a recognized degree, certificate, or professional credential, such as a Certified Energy Manger (CEM) or Professional Engineer (PE), has extensive knowledge, training, and experience in the subject matter, or a combination of both.

Roles and Responsibilities

ROLES	RESPONSIBILITIES
AFCEC	AFCEC determines approval on Level 3 energy evaluation requests received from the Evaluation Team, which is based primarily on the savings-to-investment ratio (SIR) of the project. Once a Level 3 evaluation is complete, AFCEC must validate the project baseline.
Evaluation Team	The Evaluation Team assists the Energy Manager, as necessary, in conducting Level 1 and/or Level 2 energy evaluations. Major activities include conducting the building walk-through, identifying new ECOs, conducting an energy survey and engineering analysis, and analyzing facility energy use and ECOs.
Energy Manager	The Energy Manager coordinates with the Evaluation Team to conduct Level 1 and/or Level 2 energy evaluations. The Energy Manager takes primary responsibility in completing all of the necessary actions involved. If a Level 3 evaluation is necessary, the Energy Manager sends a request to AFCEC along with written justification.

Narrative

Entry from Process 1.0 Prepare for Energy Evaluation.

Step 2.1 – Hold evaluation kickoff meeting

Role: Evaluation Team

The Evaluation Team holds a kickoff meeting to discuss the energy evaluation schedule and assign roles and responsibilities. Where needed, the Energy Manager should request specialized, additional support personnel (e.g., high voltage electrician). The Evaluation Team reviews the safety precaution checklist and contractual requirements so that all parties involved are adequately prepared before beginning the energy evaluation(s).

The Evaluation Team reviews the O&M procedures and checks for:

- Recurring problems with specific equipment (TRIRIGA)
- Planned maintenance activities (TRIRIGA)
- Meter data (AMRS, BOS contractor or Ops meter readings, energy logs, etc.)

For Level 2 evaluations, the Evaluation Team reviews the as-built drawings before conducting the facility walk-through. The Energy Manager may be able to access these in several ways:

- 1) Contact an Engineering representative
- 2) Check into the map room and make copies, or
- 3) Download the drawings from the installation intranet

The Evaluation Team should also review O&M procedures for continuous commission implementation (via an Energy Management Control System [EMCS]).

Proceed to Step 2.2.

Step 2.2 – Conduct building walk-through

Role: Evaluation Team

The Energy Manager should utilize available energy evaluation checklists to serve as a guide while conducting a building walk-through. Information gathered in Process 1.0 Prepare for Energy Evaluation and conversations with related base personnel help the Energy Manager understand potential issues with the building before performing the walk-through evaluation.

During the walk-through, the Evaluation Team inspects the building with the Building Manager and pays particular attention to the following:

- Building Envelope
 - Roof
 - Doors
 - Windows
- Mechanical Systems
 - HVAC
 - Pumps
 - Motors
 - Compressors
 - Boilers
- Electrical systems
 - Lighting
 - Distribution
- Water System
 - Domestic Plumbing
 - Reclaimed Water
 - Irrigation
 - Distribution
- Controls
- Plug Loads and Process Loads

The Energy Manager should ensure that the information captured during the walk-through is documented somewhere so that it can be retrieved for a future evaluation or whenever needed. The Energy Manager may utilize the Energy Evaluation Workbook, a paper checklist, or similar energy management tool to record this information.

Proceed to Step 2.3.

Step 2.3 – Identify low- and no-cost savings opportunities

Role: Energy Manager

After the walk-through evaluation, the Energy Manager identifies low- and no-cost energy and water savings opportunities. For example, the Energy Manager may notice that the lights are on in a building 24 hours per day and

can immediately report this to the Building Manager, who will then add this issue to the evening lock-up procedure. Though some issues may be fixed immediately after the walk-through evaluation, the Energy Manager must still record all findings in the final report. A potential result of identifying these low- and no-cost energy savings opportunities could be installation-wide policy or instructional documents.

The Energy Manager and REM (if available) then work together to develop rough estimates of cost savings from the measures identified in the walk-through of the building. They collect energy consumption data in the standard units of the commodity (e.g., kWh, therms, pounds, gallons). The Energy Manager develops four types of estimates in this step:

- Usage (consumption) savings estimates (BTUs)
- Usage (consumption) savings estimates (gallons)
- Non-energy savings estimates (e.g., labor hours)
- Cost savings estimates (\$)

The Energy Manager identifies buildings that require RCx using the RCx checklist and record those buildings in the energy audit report. The Energy Manager ensures estimated dollar savings from RCx exceed estimated cost of execution for a four-year life cycle cost analysis (LCCA).

If 'Level 2 evaluation required,' proceed to Step 2.4.

If 'Level 2 evaluation not required, ECOs identified,' proceed to Step 2.6.

If 'Level 2 evaluation not required, no ECOs identified,' proceed to Step 2.7.

Step 2.4 – Validate and identify new ECOs

Role: Evaluation Team

The Evaluation Team reviews the most recent energy evaluation on record to determine the disposition of previously identified ECOs. Past ECOs may be complete, still valid, or no longer viable. In addition to validating previous ECOs, the Energy Manager should document any new opportunities for energy and water conservation for all buildings receiving a Level 2 evaluation.

Proceed to Step 2.5.

Step 2.5 – Conduct energy survey and engineering analysis

Role: Evaluation Team

The Evaluation Team works with the Building Manager to conduct the energy survey and engineering analysis, which can occur in conjunction with Step 2.2 of this process. The following actions are accomplished during this step:

- Check mechanical rooms for sequence of operations charts
- Note condition of equipment
- Verify system design matches current building usage
- Check system key operating parameters
- Take spot readings using measuring and monitoring devices
- Use data loggers to verify system parameters, if applicable
- Take inventory and pictures of building systems, equipment nametags, and components

Proceed to Step 2.6.

Step 2.6 – Analyze energy use and ECOs

Role: Evaluation Team

Analysis and Funding

The Evaluation Team analyzes energy use by commodity and by end-use category; the term “commodity” refers to the various energy components (e.g., electricity, natural gas, steam, fuel oil, coal, water) while end-use category refers to the ultimate purpose of the energy (e.g., lighting or heating). The Evaluation Team should use engineering best practices to estimate equipment energy consumption values.

The Energy Manager and Evaluation Team conduct the LCCA of each ECO using the Building Life Cycle Cost (BLCC) software. Multiple ECOs of a similar type can be bundled into a single project to gain economies of scale where deemed advantageous. An LCCA requires a project cost estimate, estimated annual energy savings, economic life, and O&M savings. For projects to be considered energy saving projects, at least 50% of the life cycle financial savings must come from energy savings, not O&M savings. Projects with 50% or more of the savings derived from O&M will compete directly as Facility Sustainment, Restoration, and Modernization (FSRM) projects.

ECOs compete through the Air Force Integrated Priority List (IPL) process according to FSRM business rules. Most ECOs compete as “savings opportunities” in this process. Though there are no guaranteed “savings opportunities” funds, it is expected that at least \$50 million will be available each year for the projects with the best SIR. The Engineering Flight has the final decision on execution methods for ECOs. Execution is based on programming rules (Energy Conservation Investment Program [ECIP] or FSRM). The majority are FSRM, executed through the local Contracting Squadron (CONS). Other projects may be executed through AFCEC (772 Executive Steering Group [ESG]), the United States Army Corp of Engineers (USACE), Naval Facilities Engineering Command (NAVFAC), or the General Services Administration (GSA).

Viable ECOs

The Evaluation Team assesses each ECO for viability and makes a short list. Each ECO is noted viable or not viable; ECOs are not viable if they fail to meet simple payback (SPB) and SIR requirements or conflict with installation master plans. The Evaluation Team must provide written justification for why certain ECOs were not viable. For viable ECOs, the Evaluation Team begins the measurement and verification (M&V) process by initiating the M&V Workbook on the Air Force Facility Energy SharePoint website. This will serve to establish a baseline for the projects to be pursued.

Note: Any new information captured for existing or new ECOs will go into the annual update to the Compliance Tracking System (CTS).

Proceed to Step 2.7.

Step 2.7 – Update O&M procedures and administrative items

Role: Energy Manager

The Energy Manager obtains Recurring Work Programs (RWP) and Maintenance Activity Sheets (MAS) from the Operations Flight to understand the standard O&M procedures of the building and uses these references to provide recommended changes to standard policies and procedures. The Energy Manager also makes any necessary administrative changes based on the new evaluation (e.g. clock settings, lighting hours, and time changes on EMCS) and any observed changes in the space utilization report.

If ‘Level 3 evaluation requested,’ proceed to Step 2.8.

If ‘Level 3 evaluation not requested,’ proceed to Process 3.0 Conduct Post-Evaluation Activities.

Step 2.8 – Determine approval on Level 3 evaluation requests

Role: AFCEC

AFCEC reviews the materials submitted by the Evaluation Team and makes a determination on whether to approve or disapprove a Level 3 evaluation request. The primary criteria for approving a Level 3 evaluation request is the SIR of the project. AFCEC may also hold further discussions with the Energy Manager to clarify capital investment details for the proposed project.

If a Level 3 evaluation request is approved, the process moves to the Project Execution Playbook where project execution method (i.e., Design-Build or Design-Bid-Build) and funding decisions (i.e., Energy Savings Performance Contracts [ESPC] or IPL) are made. Once these decisions are finalized, all Level 3 evaluations are executed via a third party.

Note: AFCEC may also look at end-of-year funds, if available, to fund a Level 3 evaluation.

Proceed to Project Execution Playbook.

Step 2.9 – Validate project baseline

Role: AFCEC

Entry from Out-of-Scope Process Execute Level 3 Energy Evaluation.

Once a Level 3 evaluation is complete, AFCEC ensures that the project baseline in TRIRIGA is up to date and accurate.

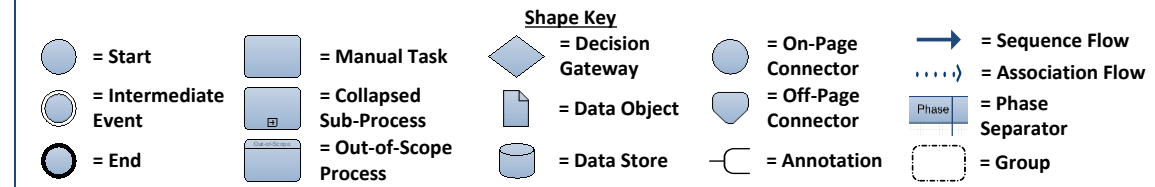
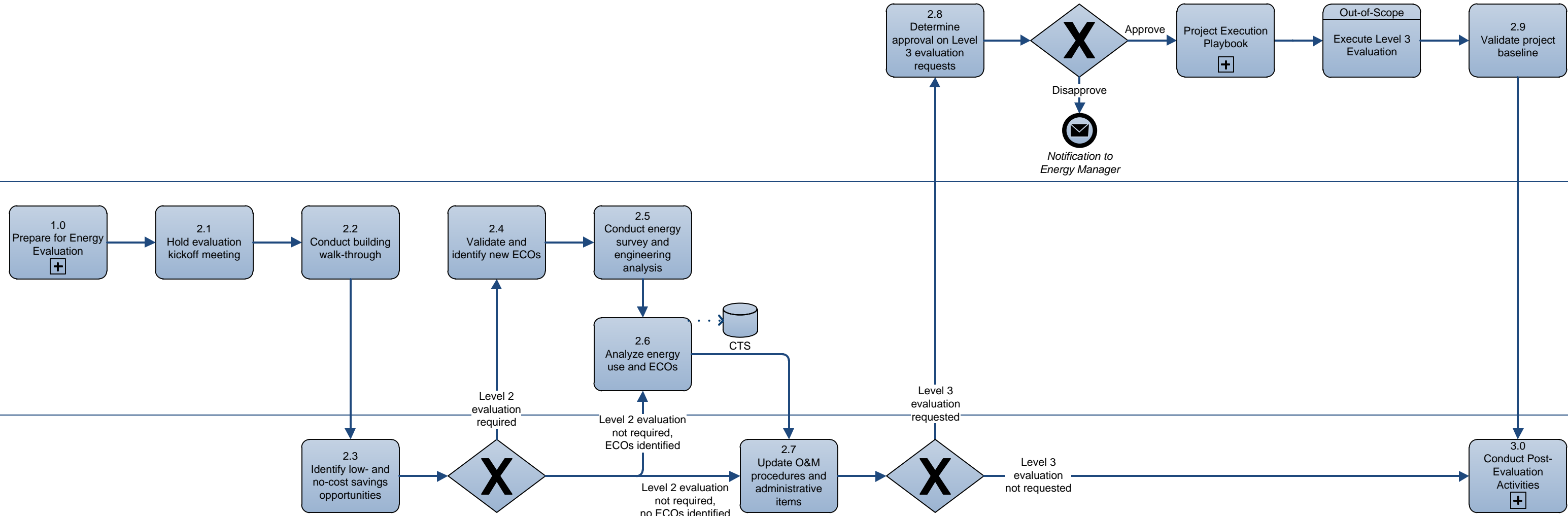
Proceed to Process 3.0 Conduct Post-Evaluation Activities.

Energy Evaluations – 2.0 Conduct Energy Evaluation

AFCEC

Evaluation Team

Energy Manager



Energy Evaluations – 3.0 Conduct Post-Evaluation Activities

[Introduction](#)

[Roles and Responsibilities](#)

[Narrative](#)

Introduction

The purpose of the Conduct Post-Evaluation Activities process is to develop a report package that accurately captures and reports energy evaluation data to the Air Force Civil Engineer Center (AFCEC) to meet the Energy Independence and Security Act of 2007, Section 432 (EISA07, §432) energy evaluation requirement. Under this requirement, agencies must identify all “covered facilities” that constitute at least 75 percent of the agency’s facility energy use, and designate an energy manager at each of these covered facilities. Additionally, the report prepares installations to propose sound energy conservation opportunities (ECO) for programming and funding. Once the report package is complete, the Energy Manager also submits service/work requests for viable energy conservation opportunities (ECO) to become potential Air Force projects.

Roles and Responsibilities

ROLES	RESPONSIBILITIES
Engineering Flight	The Engineering Flight executes approved projects sent from the Work Requirements Review Board (WRRB).
Operations Flight	The Operations Flight executes approved projects sent from the WRRB.
Energy Manager	The Energy Manager is ultimately responsible for ensuring the energy evaluation is thorough and complete. The Energy Manager may work with the Evaluation Team to develop, review, and finalize the report package. The Energy Manager also submits service/work requests for viable ECOs to the WRRB for programming and funding.

Narrative

Entry from Process 2.0 Conduct Energy Evaluation.

Step 3.1 – Hold evaluation outbrief meeting

Role: Energy Manager

The Energy Manager facilitates the outbrief meeting with the Resource Efficiency Manager (REM) (if available) and involved stakeholders to ensure all parties understand which data and forms are needed to proceed successfully through the process. This meeting serves as the technical outbrief to determine the follow-on actions and respective due dates. The Energy Manager finalizes the list of ECOs and ensures all parties proceed with the correct data and required documents. At the discretion of the Energy Manager, this meeting can include stakeholders such as Base Civil Engineers (BCE), Division Chiefs, and Flight Chiefs.

Proceed to Step 3.2.

Step 3.2 – Create report package

Role: Energy Manager

The Energy Manager works with all involved stakeholders to compile the ECOs and validation documents (building life cycle costs [BLCC], detailed cost estimates, etc.) to create the report package. Viable ECOs may be bundled together to create larger investment grade projects.

Common bundling best practices:

- Combining multiple projects to reach monetary thresholds for various programs
- Combining a single technology across multiple buildings
- Combining multiple technologies in a single building
- Combining tabled ECOs with new ECOs to create larger scale projects
- Integrating whole systems for improved performance (e.g., combining lighting fixture upgrades with controls equipment)

Note: The Energy Manager may send the report package to other parties at the installation to build awareness of the report results.

Proceed to Step 3.3.

Step 3.3 – Submit service/work requests for viable ECOs

Role: Energy Manager

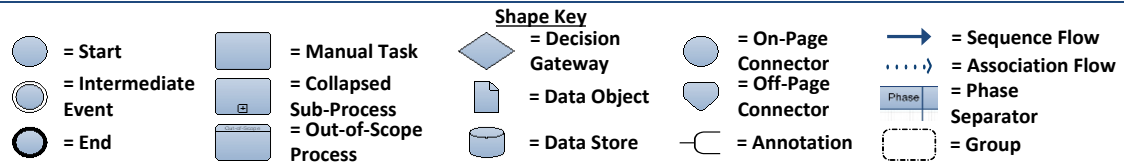
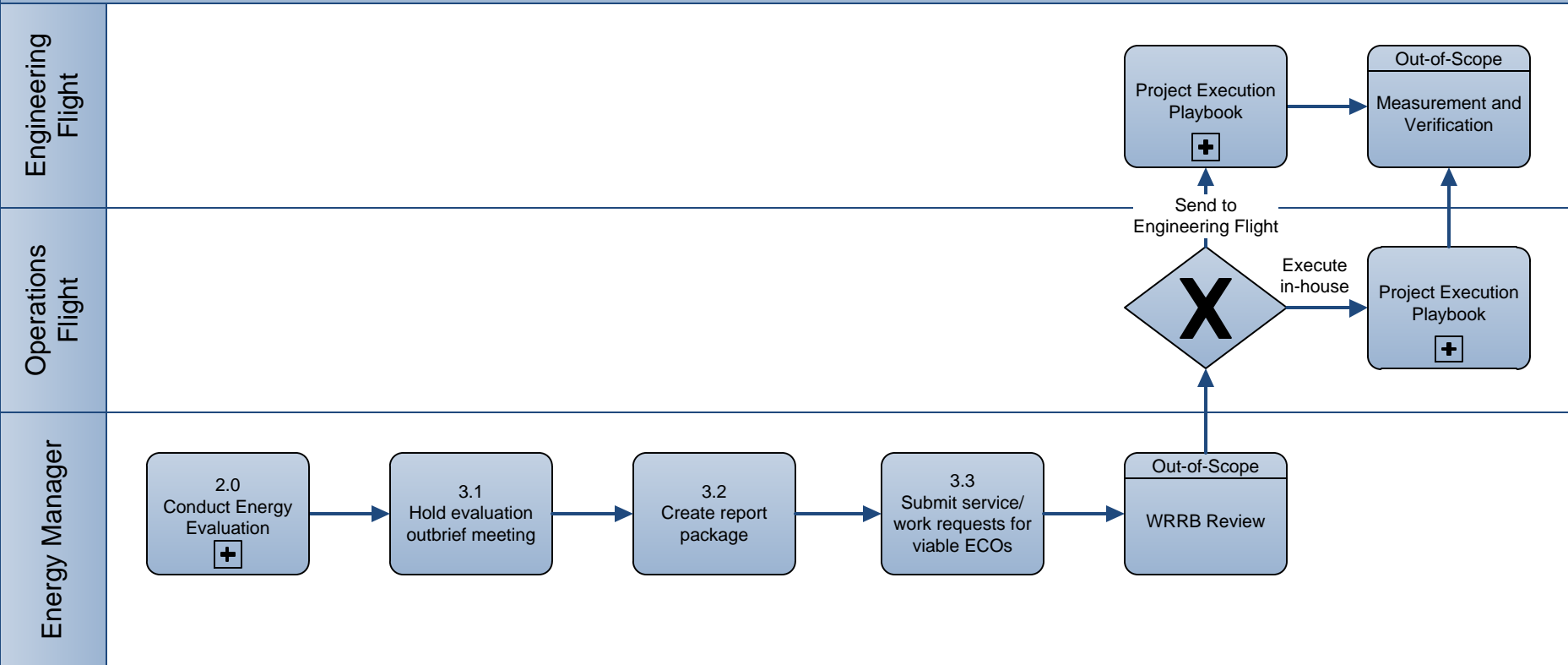
For all viable ECOs, the Energy Manager submits service/work requests by filling out Air Force (AF) Form 332s and, if necessary, Department of Defense (DD) Form 1391s (depends on the scope or business rules of the particular execution method). If a DD Form 1391 is required, the Energy Manager and involved stakeholders must ensure the “Justification” section of DD Form 1391 fiscal year (FY) Military Construction (MILCON) Project Data is properly completed to approve projects. DD Form 1391 should demonstrate one or more of the following: energy/utility savings, energy security (quality of the utility), cost savings, and Air Force mission support.

Once submitted, these service/work requests are reviewed by the Work Requirements Review Board (WRRB) and, if approved, executed as projects either in-house or via the Engineering Flight to be programmed and inserted into the integrated priority list (IPL).

Note: After submitting the necessary service/work requests, the Energy Manager should stay engaged throughout the project approval/funding process and, where needed, prepare to defend Energy projects.

Proceed to Out-of-Scope Process WRRB Review.

Energy Evaluations – 3.0 Conduct Post-Evaluation Activities



Energy Evaluations – Acronyms

A

AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFIT	Air Force Institute of Technology
AFLOA/UTL	Air Force Legal Operations Agency, Utility Litigation Team
AMRS	Advanced Meter Reading System
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
AVT	Asset Visibility Team

B

BAS	Building Automation System
BCE	Base Civil Engineer
BLCC	Building Life-Cycle Cost
BOS	Base Operations Support
BTU	British Thermal Unit

C

CDD	Cooling Degree Day
CEM	Certified Energy Manager
CONS	Contracting Squadron
CONUS	Continental United States
CoP	Community of Practice
CTS	Compliance Tracking System

D

DoD	Department of Defense
DoE	Department of Energy
DSW	Direct Scheduled Work Order

E

ECIP	Energy Conservation Investment Program
ECO	Energy Conservation Opportunity
EISA07, §432	Energy Independence and Security Act of 2007, Section 432
EM	Energy Manager
EMCS	Energy Management Control System
ESG	Executive Steering Group
ESPC	Energy Savings Performance Contract
ETL	Engineering Technical Letter

F

FM	Financial Management
FSRM	Facility Sustainment, Restoration, and Modernization

FY	Fiscal Year
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G

GSA	General Services Administration
GSU	Geographically Separated Unit

H

HDD	Heating Degree Day
HPSB	High Performance Sustainable Building
HVAC	Heating, Ventilation, and Air Conditioning

I

IWIMS	Interim Work Information Management System
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J

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K

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L

LCCA	Life Cycle-Cost Analysis
LEED	Leadership in Energy and Environmental Design

M

MAJCOM	Major Command
MAS	Maintenance Activity Sheet
MILCON	Military Construction
M&V	Measurement and Verification

N

NAVFAC	Naval Facilities Engineering Command
NOAA	National Oceanic and Atmospheric Administration

O

O&M	Operations and Maintenance
OCONUS	Outside the Continental United States
OCR	Office of Collateral Responsibility
OPR	Office of Primary Responsibility

P

PE	Professional Engineer
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Q

R

RCx	Re-commissioning or Retro-commissioning
REM	Resource Efficiency Manager
RPIE	Real Property Installed Equipment
RPO	Real Property Office
RWP	Recurring Work Program

S

SIA	Sustainable Infrastructure Assessment
SIR	Savings-to-Investment Ratio
SPB	Simple Payback Method

T

U

UESC	Utility Energy Service Contract
USACE	United States Army Corps of Engineers

V

W

WRRB	Work Request Review Board
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X

Y

Z

Energy Evaluations – Definitions

Term	Definition
Advanced Meter Reading System	Technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (gas, electric) and transferring that data to a central database for billing, troubleshooting, and analyzing
AF Form 332	Form used to request modification, alterations, new work, reimbursable work, and self-help work to facilities and infrastructure
Air Force Institute of Technology	Graduate school and provider of professional and continuing education located at Wright-Patterson Air Force Base.
Air Force Instruction	Documented instruction for members of the United States Air Force intended for use by active duty, guard, and reserve members and associated civilians
American Society of Heating, Refrigerating, and Air Conditioning Engineers	Building technology society that focuses on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry
Asset Visibility Team	Assist with Level 2 Energy Evaluations at covered facilities and can be comprised of a combination of Air Force Civil Engineer Center and base-level personnel
Base Civil Engineer	The base real property custodian responsible for providing a service-oriented organization to support the base mission by providing utilities, fire protection, facility maintenance, repair, alterations, and new construction
British Thermal Unit	Unit of energy needed to heat 1 pound (0.454 kg) of water, which is approximately 0.1198 US gallons, from 39 °F to 40 °F (3.8 °C to 4.4 °C)
Building Automation System	Computerized, intelligent network of electronic devices designed to monitor and control the mechanical electronics and lighting systems in a building
Building Energy Profile	A summary of the energy usage in a building segmented by commodity
Building Life-Cycle Cost	The Building Life-Cycle Cost program analyzes capital investments in buildings. It also computes an average annual escalation rate based on Energy Information Administration energy price forecasts and on Energy Information Administration projections adjusted by the National Institute of Standards and Technology to calculate energy savings projects
Building Walk-Through	An energy assessment of an existing facility that includes, but is not limited to, the mechanical room, building space, roof area, heating, ventilation, and air conditioning equipment, grounds outside of the building, garages, computer equipment rooms or closets, and the basement
Capital Investment	Investment that includes, but is not limited to, constructing new, energy-efficient facilities, replacing inefficient facilities, and retrofitting existing facilities
Commissioning	A systematic process of ensuring that all building systems perform interactively according to the design intent and the Owner's operational needs. The process evaluates building equipment, subsystems, operation and maintenance procedures, and performance of all building components to ensure that they function efficiently, and as designed, as a system
Compliance Tracking System	Web-based system developed and maintained by the Department of Energy that tracks agency performance towards compliance with EISA, §432, specifically covering energy and water evaluations, project implementation and follow-up measures, and annual building benchmarking requirements
Contracting Squadron	Primary point-of-contact for commercial business interests at an Air Force installation
Cooling Degree Day	Measurement designed to reflect the demand for energy needed to cool a building against a base temperature of 65 degrees
Covered Building List	List of buildings for each Air Force covered facility that is covered by EISA, §432, including the requirement to have energy evaluations accomplished every 4 years and is the top 75% of energy and water consumption
DD Form 1391	Military Construction Project Data Sheet. Form used to state requirements and justifications in support of funding requests for military construction projects. It is submitted for all projects requiring Office of the Secretary of Defense approval, including major and minor new construction and certain projects involving operations and maintenance, restoration of damaged facilities, and non-appropriated fund construction
Design-Bid-Build	Project delivery method in which the agency or owner contracts with separate entities for both the design and construction of a project

Design-Build	Project delivery method in which the design and construction services are contracted by a single entity known as the design–builder or design–build contractor
Direct Insert Model	High-priority projects to be conducted out-of-cycle from the regularly scheduled project data calls
Direct Scheduled Work	Also called a job order or service call, the fastest way to authorize and accomplish work that does not require detailed planning.
Energy Conservation Investment Plan	A subset of the Military Construction program specifically designed for energy saving projects for facilities
Energy Conservation Opportunity	A project identified to reduce the energy and/or water consumption in a building or facility infrastructure. (Note: Synonymous with Energy Conservation Measures, Water Conservation Opportunities, and Water Conservation Measures)
Energy Consumption Profile	Assessment tool developed to measure and compare energy input versus energy output of an installation or building
Energy Evaluation	Inspection, survey, and analysis of facility energy usage to identify energy conservation measures in a building, process, or system to reduce the amount of energy input into the system without negatively affecting the output(s)
Energy Evaluation Workbook	A Microsoft Excel-based workbook that covers all covered buildings in which the Energy Manger completes the overall consumption energy profile and forwards to the Major Command and Air Force Civil Engineer Center for review
Energy Independence and Security Act of 2007, Section 432	Law that requires federal agencies to identify all "covered facilities" that constitute at least 75% of the agency's facility energy use, among other mandates
Energy Intensity	The total amount of energy used per square foot in a building or facility
Energy Management and Control Systems	An energy conservation feature that uses computers, instrumentation, control equipment, and software to manage a building's use of energy for heating, ventilation, and air conditioning, lighting, and/or business-related processes; it may also manage fire control, safety, and security
Energy Manager	Primary individual responsible for monitoring the organization's energy usage. Develops and implements practices and procedures designed to reduce energy consumption and/or improve efficiency of usage. Researches alternative/renewable energy technologies and determines their feasibility and cost-effectiveness
Evaluation Team	Group composed of combination of Asset Visibility Team, Resource Efficiency Manager Team, contractors, and/or local utilities who assist the Energy Manager in carrying out Level 2 Energy Evaluations
Facility	Any building, installation, structure, or other property (including any applicable fixtures). (Note: not to be confused with "covered facilities" in the context of energy management)
Fiscal Year	The period of time from 1 October of the previous calendar year until 30 September of the year with which it is numbered
Geographically Separated Units	Installation that is physically separated from its "parent" base and is "owned" and reported by their parent organization/installation (e.g., Patrick Air Force Base includes Cape Canaveral Air Force Station)
Heating Degree Day	Measurement designed to reflect the demand for energy needed to heat a building against a base temperature of 65 degrees
High Performance Sustainable Building	Building that integrates and optimizes all major high-performance building attributes, including energy efficiency, durability, life-cycle performance, and occupant productivity
Leadership in Energy and Environmental Design	A suite of rating systems developed by the Green Building Council for the design, construction and operation of high performance green buildings, homes and neighborhoods
Level 1 Energy Evaluation	Energy evaluation that is comprised of analysis of total energy consumption and utility bills, walkthrough and analysis of the building to identify low- and no-cost energy conservation opportunities, and developing a list of potential Level 2 and Level 3 Energy Evaluation opportunities
Level 2 Energy Evaluation	In addition to a Level 1 Energy Evaluation, this includes a breakdown of energy consumption to end use, developing energy conservation opportunities that meet the owner's constraints and economic criteria, reviewing operations and maintenance procedures, and developing a list of potential Level 3 opportunities
Level 3 Energy Evaluation	In addition to Level 1 and Level 2 Energy Evaluation, Level 3 requires building modeling due to project complexity

Life Cycle-Cost Analysis	Method for assessing the total cost of ownership that takes into account all costs of acquiring, owning, and disposing of an asset or system
Maintenance Activity Sheets	Sheet used to document maintenance procedures for a particular piece of equipment or system
Major Command	A major Air Force subdivision located directly below Headquarters Air Force in the chain of command
Major Renovation	A renovation that costs in excess of \$2.5 million and over 50% of plant replacement value
Measurement and Verification	The process of using measurement to reliably determine actual savings created within an individual facility by an energy management program. Savings cannot be directly measured since they represent the absence of energy use. Instead, savings are determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions
Office of Collateral Responsibility	The office, agency, or flight that is given partial responsibility for the direction or execution of a task
Office of Primary Responsibility	The office, agency, or flight that holds ultimate responsibility for the execution of a task
Operations and Maintenance	The broad spectrum of services required to assure the built environment will perform the functions for which a facility was designed and constructed. Operations and maintenance typically includes the day-to-day activities necessary for the building and its systems and equipment to perform their intended function
Preliminary Assessment	Data collection effort used to develop building energy and cost indices, which can be used to compare with other similar buildings and make rough determination of the benefit of further analysis
Re-commissioning	Refers to commissioning of an existing building that has already gone through the commissioning process, provides additional opportunities to improve facility efficiency, and addresses issues that may have arisen since the original commissioning
Recurring Work Program	Work that consists of operations, recurring maintenance, service work, and other recurring work for which the scope and level of effort are known without an earlier visit to the job site each time the work is scheduled
Resource Efficiency Manager Team	Team of Resource Efficiency Managers, organized and commissioned by the Air Force Civil Engineer Center for Level 2 and/or Level 3 Energy Evaluations that require greater complexity and resources
Resource Efficiency Manager	Contracted staff hired by the Air Force Civil Engineer Center and deployed to installations and Major Commands to support the Air Force's energy and resource efficiency program. The Resource Efficiency Manager's primary focus is to bring about reductions in the cost of energy, water, natural gas, fuel oil, refuse disposal, and any other utilities and energy/water-related operations, through the construct of EISA, §432.
Retro-Commissioning	A systematic process for improving and optimizing building performance. Retro-commissioning applies to existing buildings that have never gone through any type of commissioning or quality assurance process. Its focus is usually on energy-using equipment such as mechanical equipment, lighting, and related controls
SAF-MII(AR) 7115 U.S. Air Force Real Property Inventory Detail List	Report generated from the Air Force Real Property records listing all facilities on an installation
Savings-to-Investment Ratio	Ratio of the present value of total saving stream with respect to the present value of the total cost. In the energy industry, total savings is generated from energy, water, operations and maintenance, and salvage factors. Total cost includes design and construction fees along with sustainment cost factors
Simple Payback Method	A value equal to the quotient obtained by dividing -- (I) the estimated initial implementation cost of the measure (other than financing costs); by (II) the annual cost savings resulting from the measure, including -- (aa) net savings in estimated energy and water costs; and (bb) operations, maintenance, repair, replacement, and other direct costs
Sustainable Infrastructure Assessment	Combined facility assessment for energy, operations, and assets management, which can include: Energy Evaluation, Equipment Condition Assessment, Space Optimization, High Performance Sustainable Building, Real Property Inventory, and Facility Condition

Utilities	Source of energy or water to an installation and/or building. Energy sources may include electricity, natural gas, and steam. Water sources may include potable, well, and reclaimed
Work Request Review Board	Board established by the Base Civil Engineer to review and make final determination on the method of work accomplishment