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# Performance Assurance for Utility Energy Service Contract (UESC)

Preparing for optimal performance for the life of the ECMs

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[https://www.energy.gov/sites/prod/files/2018/08/f54/performance%20assurance%20planning\\_0.pdf](https://www.energy.gov/sites/prod/files/2018/08/f54/performance%20assurance%20planning_0.pdf)

# Learning Outcomes for this Session

- Baseline and estimated savings
  - Both Utility Energy Service Contract (UESC) and Energy Savings Performance Contract (ESPC) require an accurate baseline and appropriately estimated savings
- Measurement and verification (M&V)
  - ESPC is addressed through an M&V plan
  - UESC is addressed through commissioning (Cx) and recommissioning (rCx) described in a performance assurance plan (Plan)
- M&V reports
  - ESPC requires post-installation M&V reports annually
  - UESC recommendations include Cx prior to acceptance and rCx post-acceptance and report templates for each protocol

# What is Performance Assurance?

A straightforward methodology for:

- Emphasizing quality and accuracy during each phase of project development and construction
- Pursuing long-term and optimal performance of installed energy conservation measures (ECM) through scheduled operations and maintenance (O&M) and rCx
- Preparing agency staff through project specific and comprehensive training

# Performance Assurance for a Utility Energy Services Contract (UESC)

Each element of the performance assurance plan is important to sustained ECM performance

1. Design – buildable ECM with substantiated performance metrics
2. Baseline – complete and accurate
3. Installation – confirmed equipment and installation quality
4. Comprehensive Training – encompasses Cx, O&M, and rCx
5. Commissioning (Cx) for acceptance – implement Cx subplan
6. Post-acceptance
  - 1) Operations and Maintenance (O&M) – implement O&M
  - 2) Recommissioning (rCx) – implement rCx subplan

# Why Include Performance Assurance?

- An implemented well-written performance assurance plan (Plan) will ensure performance is sustained and optimized
- UESC projects may include customized post-acceptance services; for example
  - Measuring and verifying performance through Cx and rCx to document, reset, and retune
  - O&M of specific or all ECMs





# What is a Performance Assurance Plan (Plan)?

A Plan is a detailed set of protocols that addresses and when implemented will confirm

- Engineering and design – quality, accuracy, meets stated metrics
- Baseline - accuracy and completeness
- Comprehensive training - developed and delivered, prepares Agency to sustain ECM performance
- Cx subplan – developed and implemented; confirms metrics meet design
- O&M subplan – integrates new requirements with existing and ensures performance is optimized
- rCx subplan – adapted from the Cx subplan; ensures sustained performance for the life of each ECM





# Plan Objectives

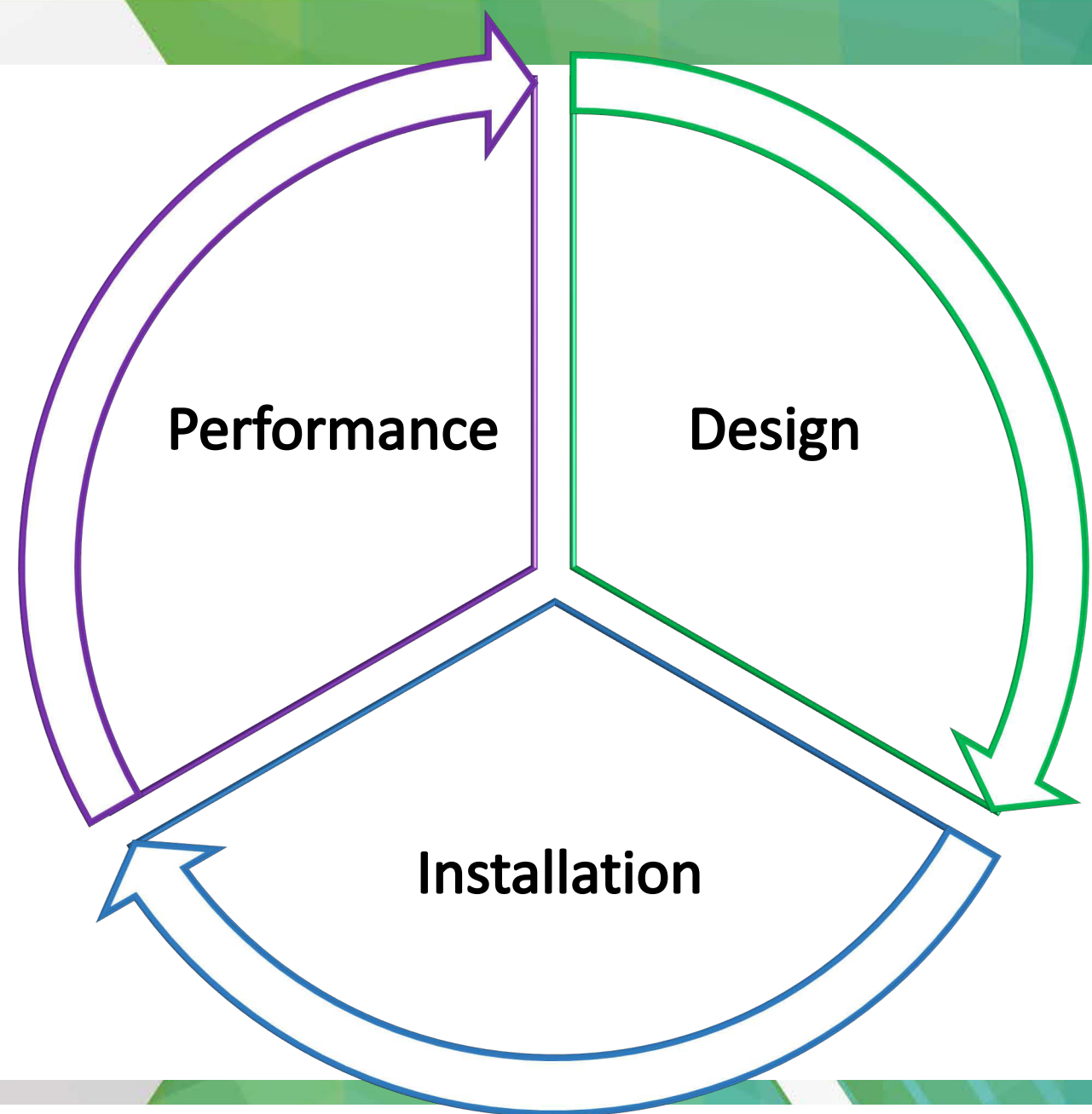
- Develop a sufficiently detailed and actionable plan that will support long-term success
- Include key performance indicators (kpi), specific Cx protocol, and performance evaluation templates for each ECM
- Develop comprehensive training to prepare agency staff to proficiently operate, maintain, evaluate, and document performance of each ECM

# Plan Strategy

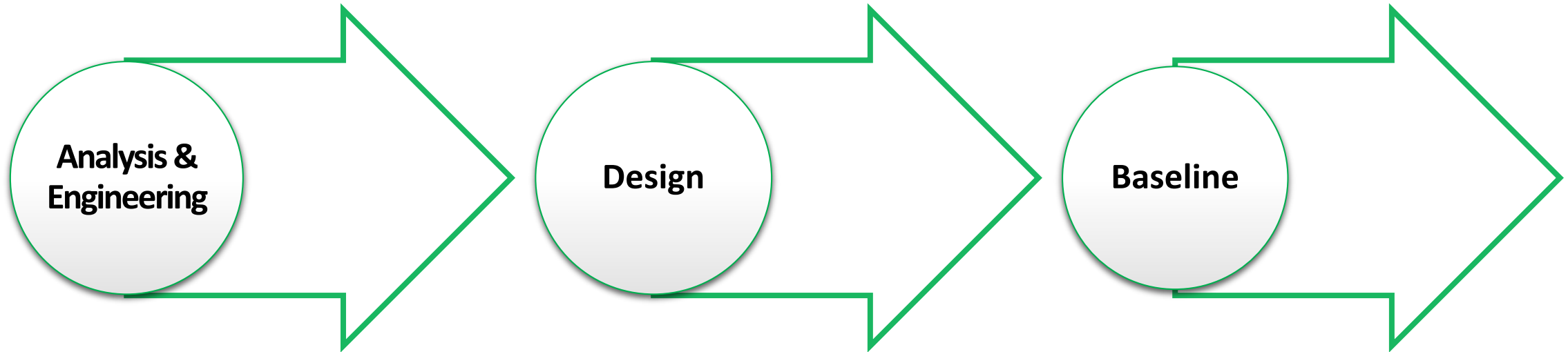
- Develop a project-specific plan
- Require Utility team to include a Plan Lead (a dedicated and experienced Cx agent)
- Require quality assurance for all project phases
- Require comprehensive training
- Use or model agency documents e.g. maintenance sheets, acceptance checklist

# Project Phases

- Design – assure performance in design
- Installation – assure performance in installation
- Performance Period – assure performance post-acceptance

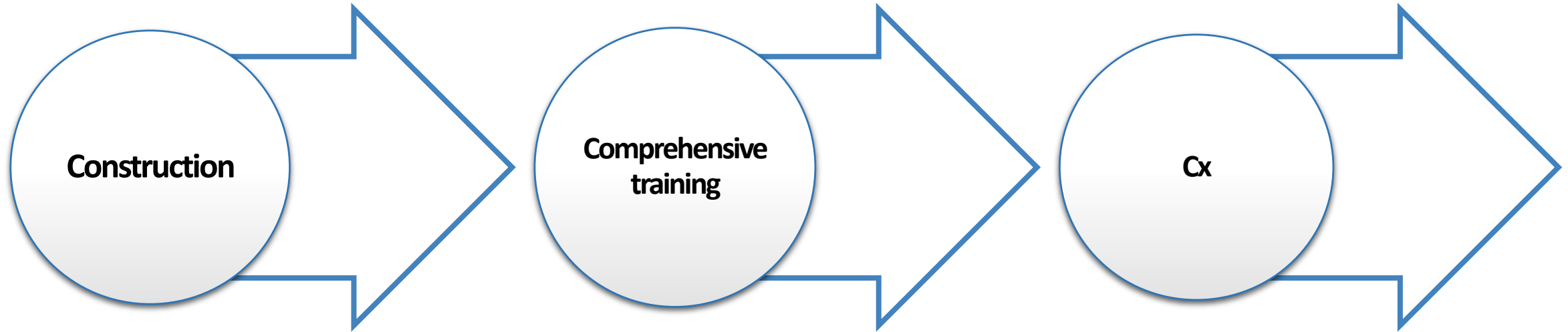


# Assuring Performance in Design



- Analysis & engineering: accurate assumptions and calculations
- Design: performance-based design with clearly defined operational instructions, kpi, and include controls and metering when able
- Baseline: accurately measure and document performance of existing equipment and systems

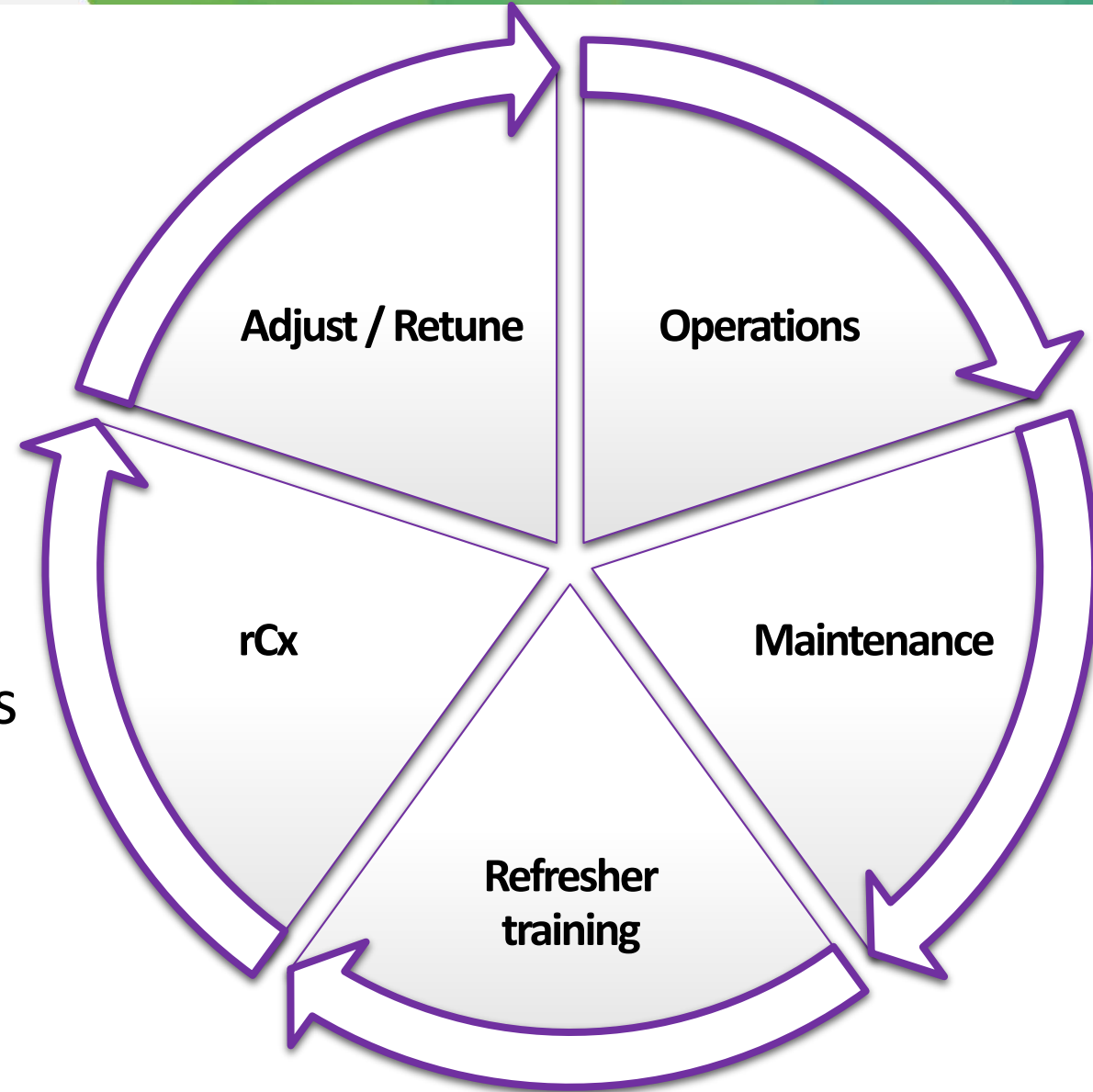
# Assuring Performance in Installation



- Construction: ensure equipment and systems meet design specifications e.g. count and efficiency ratings; and installed per manufacturers' requirements
- Comprehensive training: prepare agency for long-term success
- Cx: ensure performance meets or exceeds stated performance

# Assuring Performance Beyond Acceptance

- Implement ECM-specific protocol to optimize and sustain performance
  - Provide consistent maintenance, recommissioning, and adjustments as needed
- More to come in Sessions 4 & 5



# Best Practice: Performance Assurance Planning

Federal agency technical teams,

- Engage your most knowledgeable staff e.g. O&M, engineering, and planning with Utility's Plan Lead
- Write contract language to describe project-specific requirements
- Acquire services for Agency/Site needs e.g. rCx consultation and refresher training annually or at intervals throughout the term of the contract



# Comprehensive Training

Introduce the big picture, examine the activities and schedules, provide hands on practice, and training materials, maintenance manuals, and templates

- 1) Project objectives and priorities
- 2) ECM-set review: ECM design and kpi, roles of Cx, O&M, and rCx in project success, and sustained performance
- 3) Cx and rCx plans: Overview, protocol, hands-on exercises, report content, and reviewing results
- 4) O&M training: Manufacturers' recommended maintenance and variances from current maintenance, if applicable
- 5) Templates, checklists, maintenance manuals, Cx report template, and rCx report template

# Best Practice: Plan Lead

- Require a Plan Lead (a dedicated and experienced Cx agent)
  - Assure measures (systems, equipment, and interfaces with other building systems) meet or exceed design specifications for installation and performance
  - Assure training materials and classes prepare agency team for successful operations, maintenance, and rCx of measures
  - Provide fully developed and accurate Plan with subplans and templates for each e.g. training, Cx, O&M, and rCx
- The Plan Lead will draft the content in concert with the project

# Best Practice: Retrocommissioning

- Include retrocommissioning as part of the preliminary assessment
  - Identify measures that support optimization of equipment, system, and operational schedules
  - Identify important issues e.g. simultaneous heating and cooling
  - Build a case for a deep energy retrofit

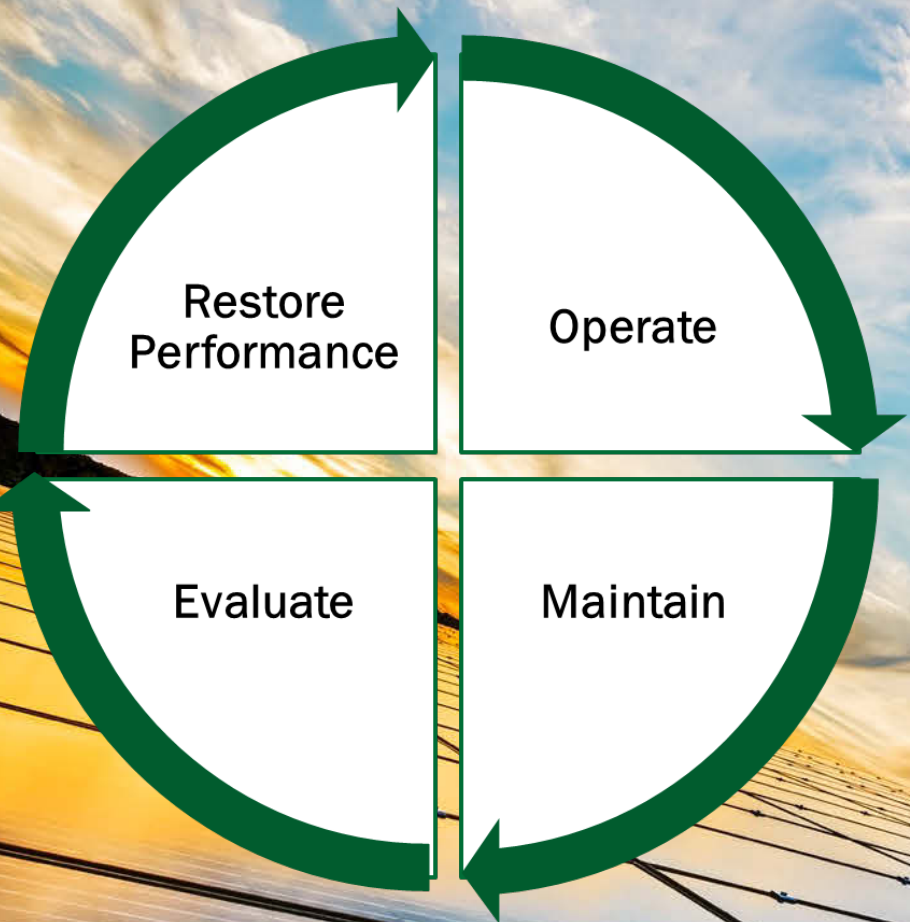
# FEMP Resources

- **Performance assurance planning for UESC projects**
  - [https://www.energy.gov/sites/prod/files/2018/08/f54/performance%20assurance%20planning\\_0.pdf](https://www.energy.gov/sites/prod/files/2018/08/f54/performance%20assurance%20planning_0.pdf)
- **O&M guidance and training**
  - <https://www.energy.gov/eere/femp/operations-and-maintenance-federal-facilities-0>
  - <https://www.energy.gov/eere/femp/downloads/operations-and-maintenance-best-practices-guide>
- **Cx guidance and training**
  - <https://www.energy.gov/eere/femp/commissioning-federal-buildings>
- **FEMP Training**
  - [energy.gov/eere/femp/federal-energy-management-program-training](https://www.energy.gov/eere/femp/federal-energy-management-program-training)

# Components of a Performance Assurance Plan

1. Design – with specific performance metrics
2. Baseline – complete and accurate
3. Installation – equipment and installation meet or exceed design specifications
4. Agency training – address design strategy, Cx, O&M, and rCx
5. Commissioning
  - 1) Commission each measure including the interactions between measures and existing equipment and systems
  - 2) Commissioning report
6. Post-acceptance
  - 1) Warranties and extended warranties
  - 2) Post-acceptance services – refresher training, rCx, and O&M as negotiated and stated in the task order





Optimal performance for the life of each ECM and throughout the performance period is fundamental to achieving projected savings

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# Notice

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