

Save Energy & More with Resource Conservation Managers



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WSU Energy Program

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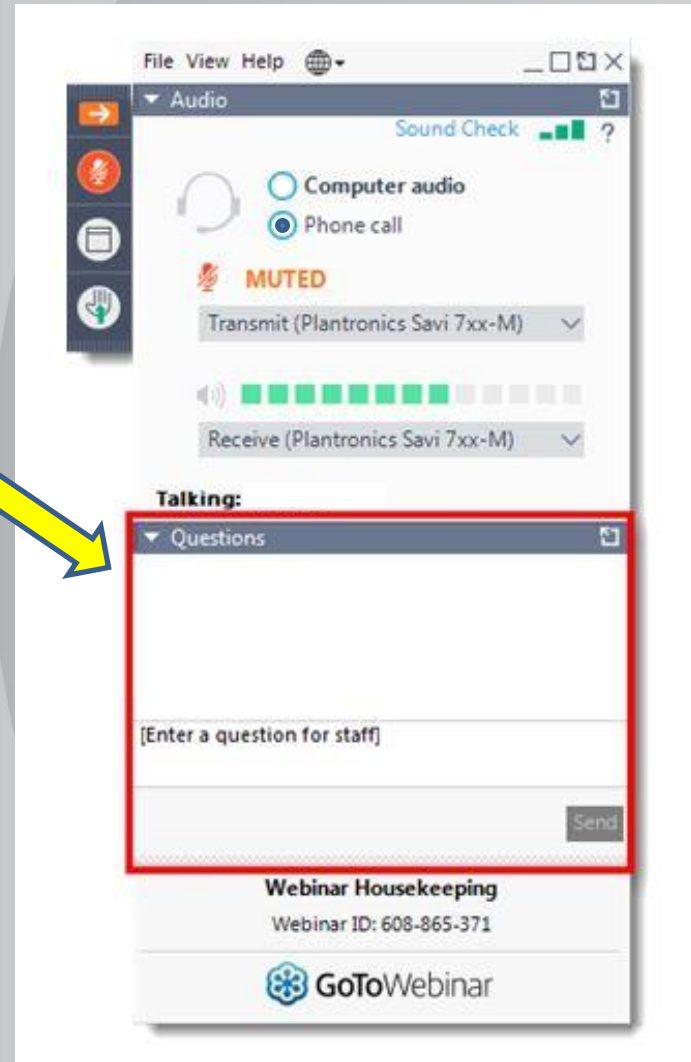
Energy Program

WASHINGTON STATE UNIVERSITY

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Today's presentation is being recorded.



Overview

- WSU Energy Program RCM
- What is Resource Conservation Management?
- What does a Resource Conservation Manager do?
- Steps to begin
- Support and resources

Goal:

More RCMs

More RCM programs

More savings

Reduced energy and resource use

WSU Energy RCM Program

The WSU Energy Program promotes and supports energy efficiency at public and government facilities in Washington State through the Resource Conservation Manager (RCM) program.

Funded by the U.S. Department of Energy State Energy Program. Funds provided through the Washington Department of Commerce Energy Division.

WSU Support for RCMs

- Monthly RCM Newsletter
- Webinars
- Technical assistance
- RCM hiring assistance
- Instrument and tool loan program
- Website resources
- Group training upon request

What is Resource Conservation Management

A **coordinated effort to** manage energy, water and other resources used, and waste generated.

Gives you **more control** over the operating costs of your facilities by conserving resources and increasing resource efficiency.

- Electricity
- Electrical Demand
- Fossil Fuels
- Water
- Sewer
- Solid Waste
- Recycling
- *and more*



Building Systems or Where an RCM Makes a Difference

- Lighting
- HVAC
- Building envelope
- Plug load
- Water use
- Irrigation
- Waste
- Recycling
- Occupant and staff behavior



Benefits of RCM Programs

- Reduces operating costs
- Increases efficiency
- Saves more than it costs
- Enhances occupant comfort
- Promote energy/environmentally friendly operations and awareness
- Reduces greenhouse gas emissions
- Produces persistent savings



What's in a Name?

- Resource Conservation Manager (RCM)
- Resource Efficiency Manager (REM)
- Energy Manager
- Resource Manager
- Sustainability Manager
- Sustainability Coordinator
- Energy Management Engineer
- Environmental Analyst
- Utility Conservation Manager
- Environmental Stewardship Coordinator
- Strategic Energy Manager (SEM)
- Resource Conservation Specialist
- Waste Reduction Specialist

The Resource Conservation Manager

Based on an individual (or team) dedicated to champion an integrated energy and resource efficiency program.

- Implements the RCM program
- Builds relationships, works across departmental lines
- Has technical knowledge and aptitude
- Collaborates with specialists
- Focuses on persistence of programs
- Problem solves

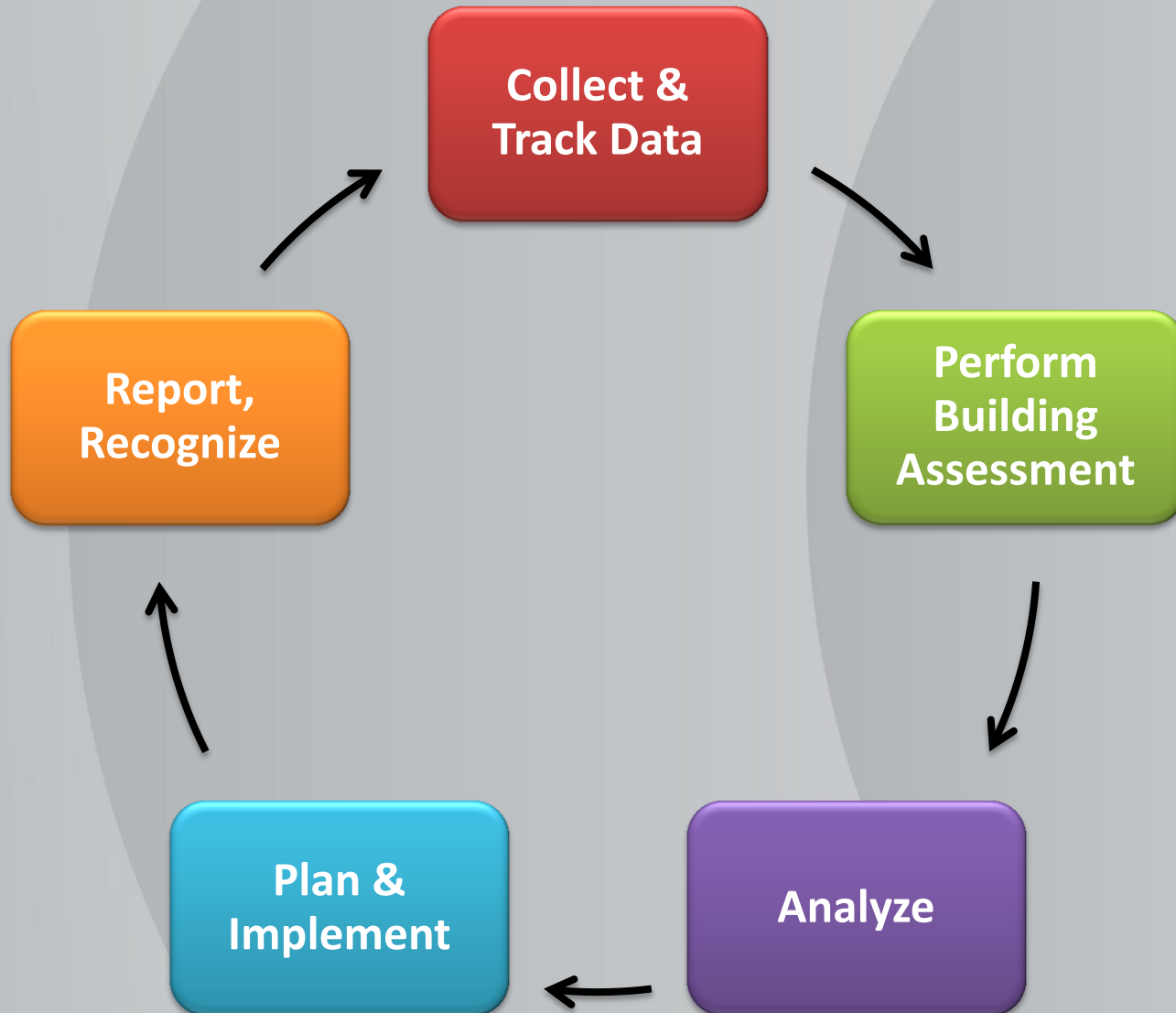




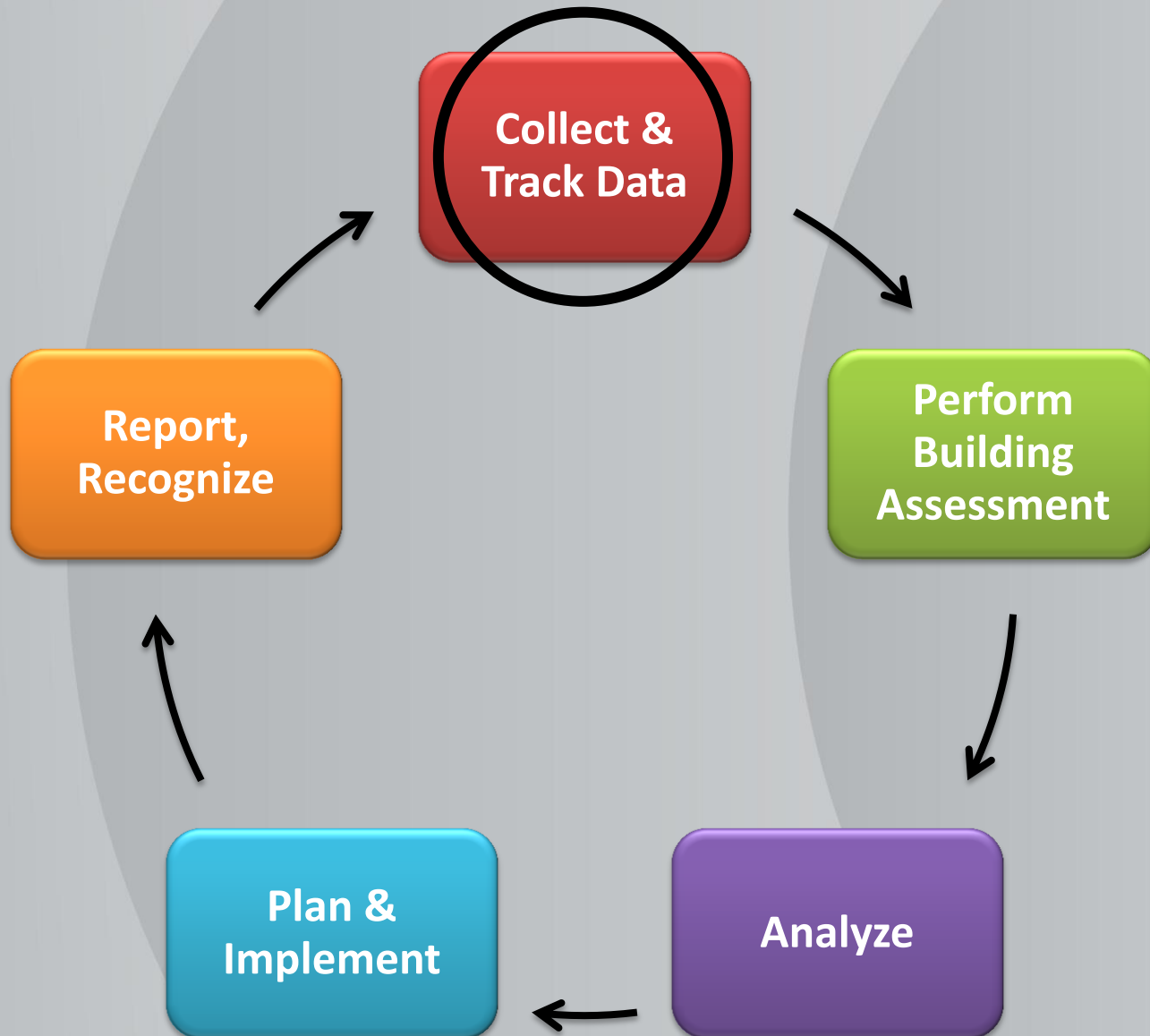
Relationships with Facilities' Staff



What Do RCMs Actually Do?



Collect, Track, & Monitor Data



Collect & Track Data

You can't manage what you don't measure

- Collect utility consumption and cost data, match meters and buildings
- Record, track, & monitor

Record, Track, & Monitor Data

- Find billing errors
- Identify inefficient facilities
- Troubleshoot abnormal consumption
- Track cost & usage fluctuations
- Identify best utility rate schedules
- Create baseline year, benchmark

Where Does the Data Get Entered

- Commercial resource accounting software
- Resource accounting service
- Energy Star Portfolio Manager
- Spreadsheet
- Abacus
- Other



Resource Accounting Software

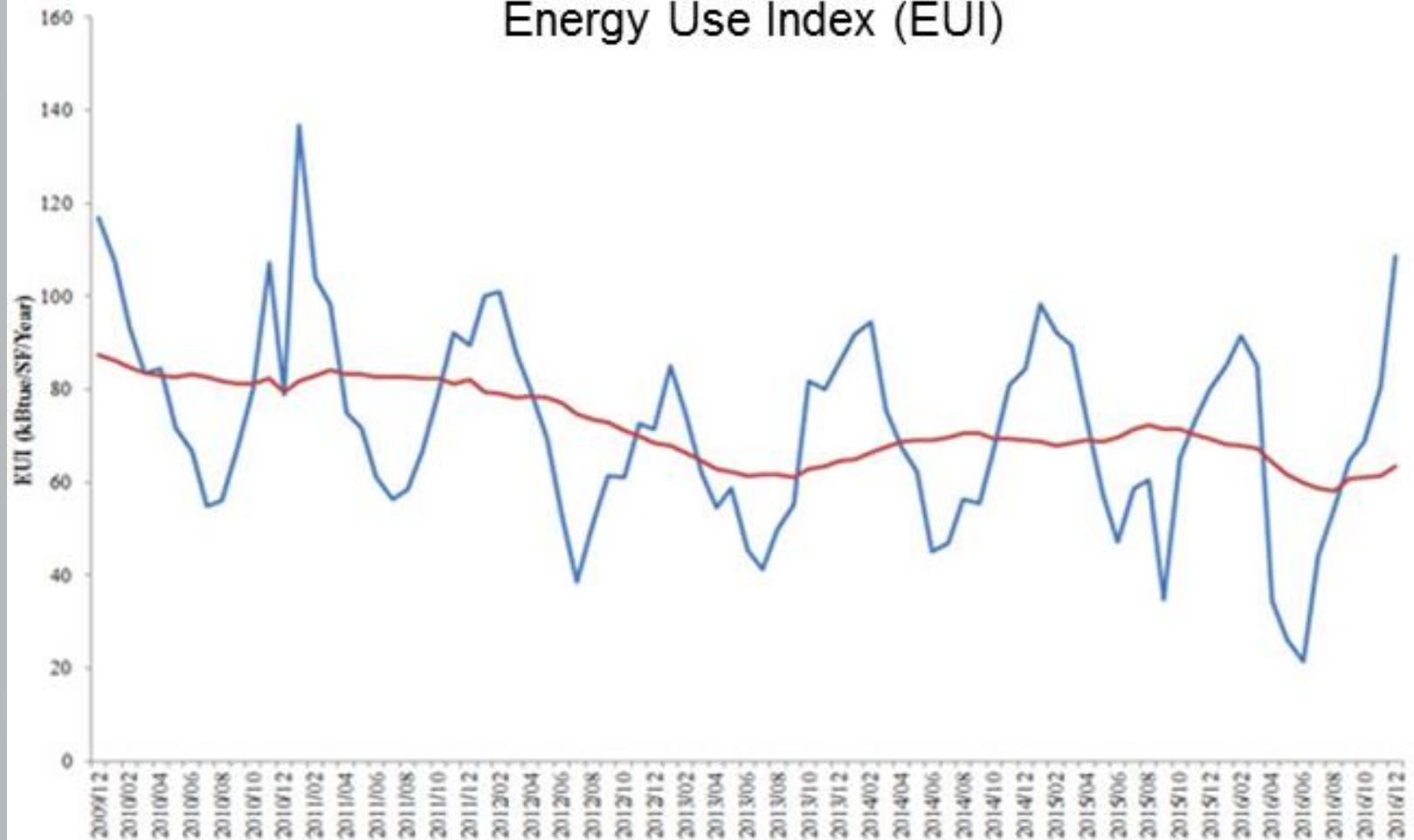
- Organizes sites, facilities, utilities
- Tracks billing
- Adjusts for weather (degree days)
- Produces reports and graphs
- Shows trends in usage
- Real time metering
- Energy interval data
- Compares different rate scenarios
- Cost avoidance module
- Feed data into EPA Portfolio Manager
- Download data directly from utility (sometimes)



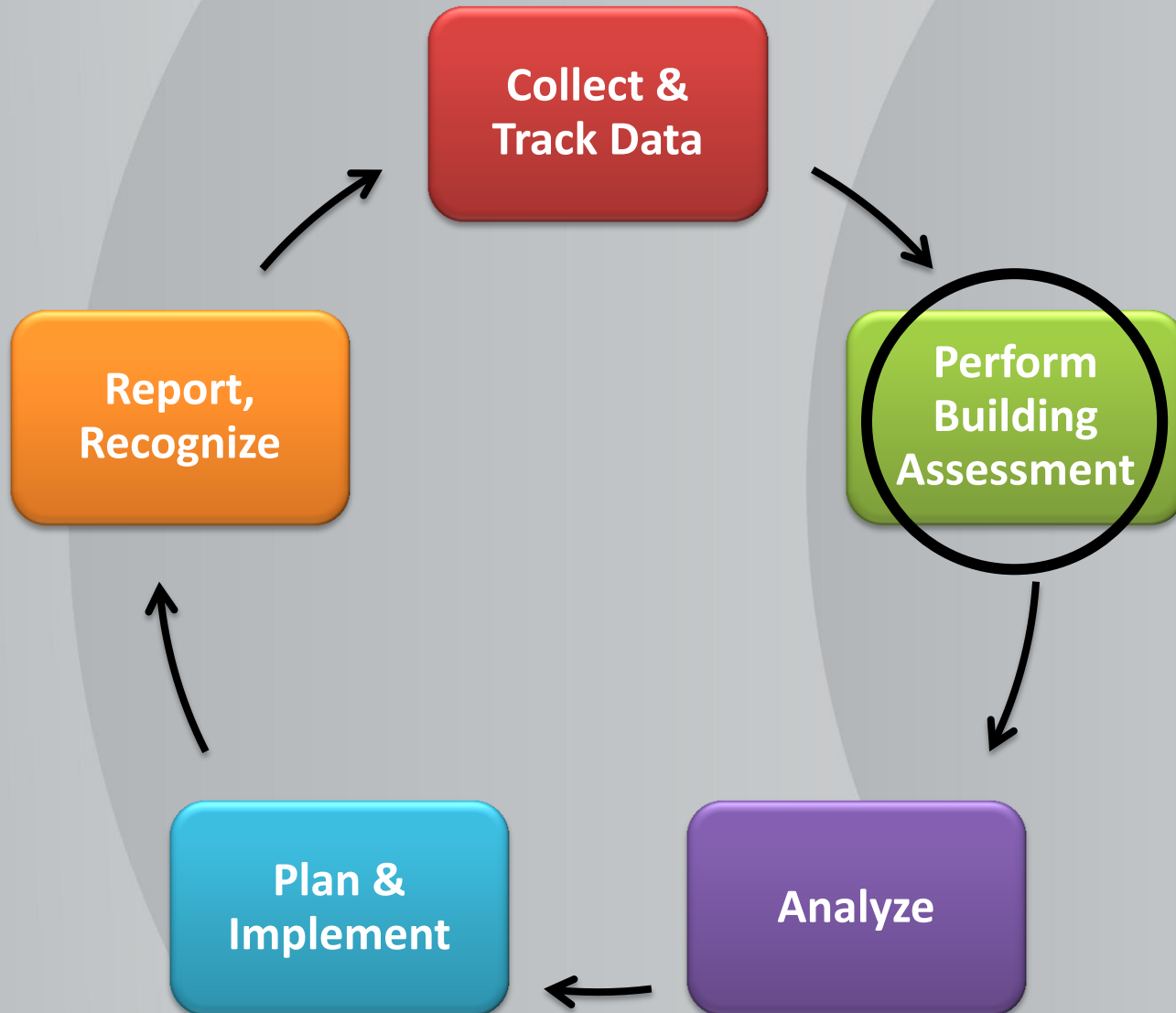
Other Data

- Interval metering from utility company
- Data loggers
- Trend logs from energy management systems
- Observations

Energy Use Index (EUI)



Perform Building Walk-throughs

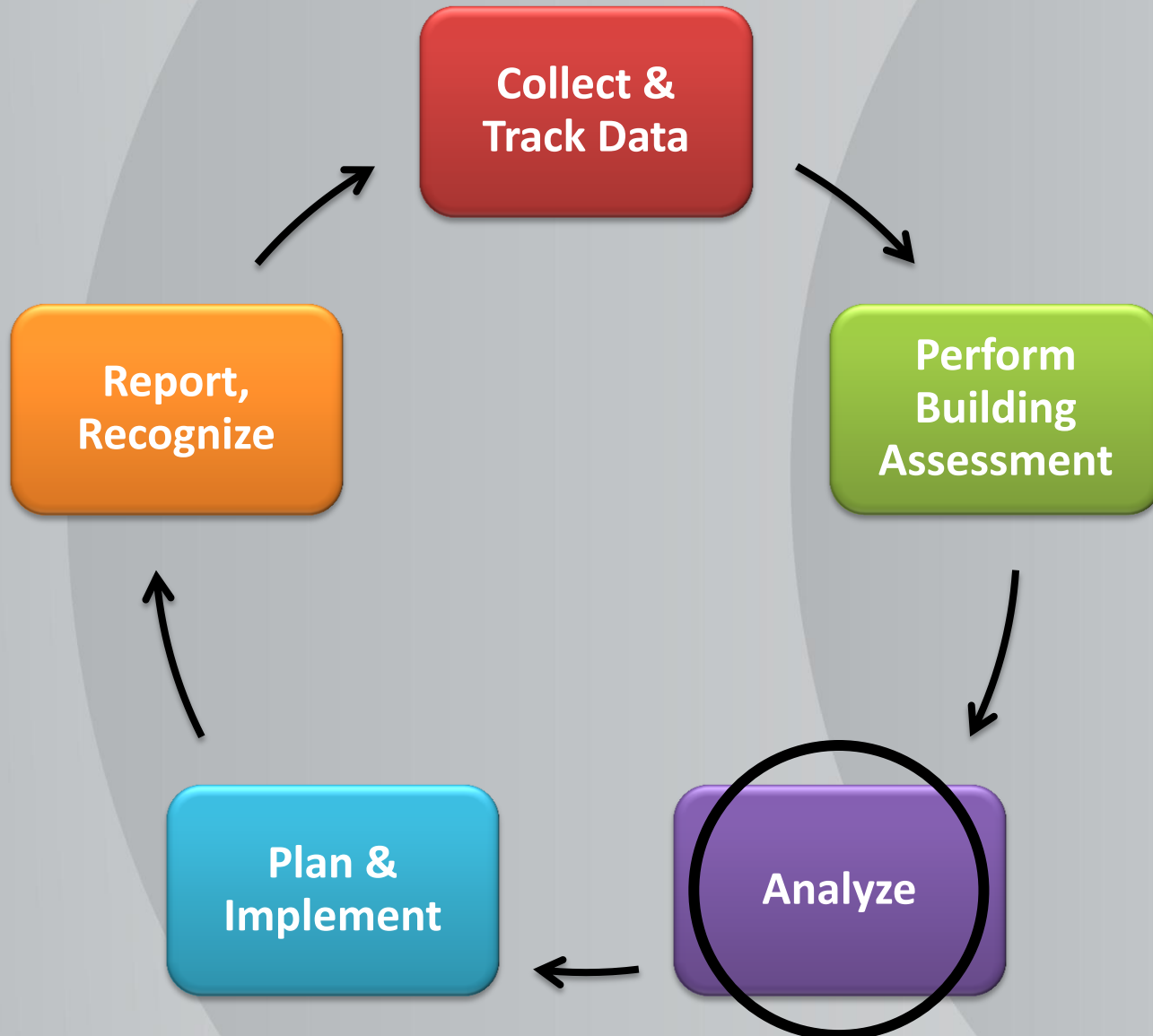


Building Assessment

- Walk through the buildings
 - Low level facility audit
 - Observe, measure
 - Do a night audit. Listen. Look for light
- Interview facility staff, building users
 - Institutional knowledge
 - How is the building used



Analyze Utility Data & Building Info



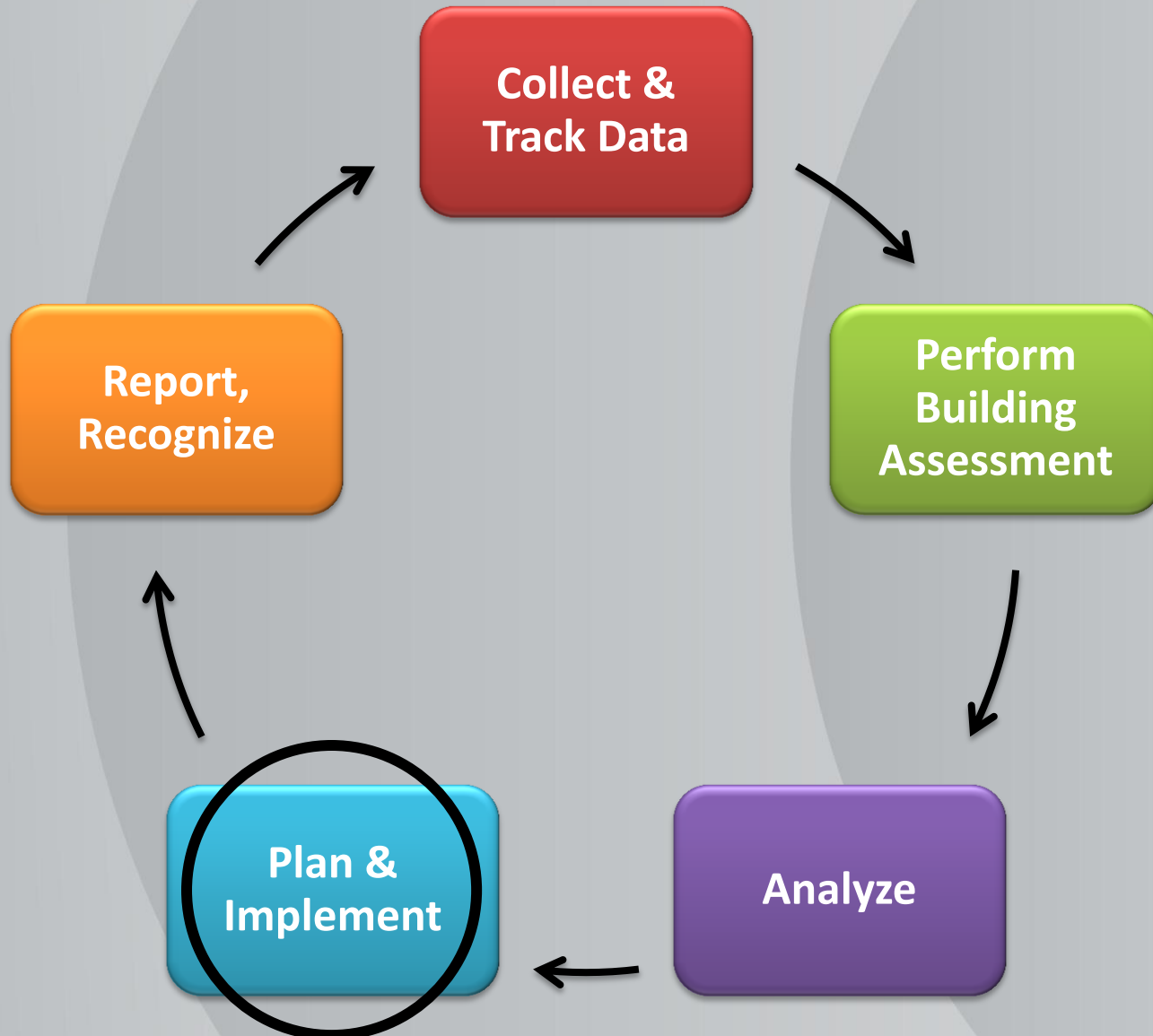
Analyze

- Benchmark and compare
 - Benchmark facilities & prioritize measures
 - Historical and facility comparisons
 - Guide & justify recommendations and capital improvements
 - Energy Use Index (EUI) – kBtu per square foot per year
- What does utility data indicate
- What improvements were found during the walk through

Analyze

- Identify opportunities
 - Does the schedule match when the building is occupied
 - Can the set points be adjusted?
 - Is the building pressure too high or low?
 - Are the outside air dampers open during morning warm-up or cool down?

Create Plans and Implement

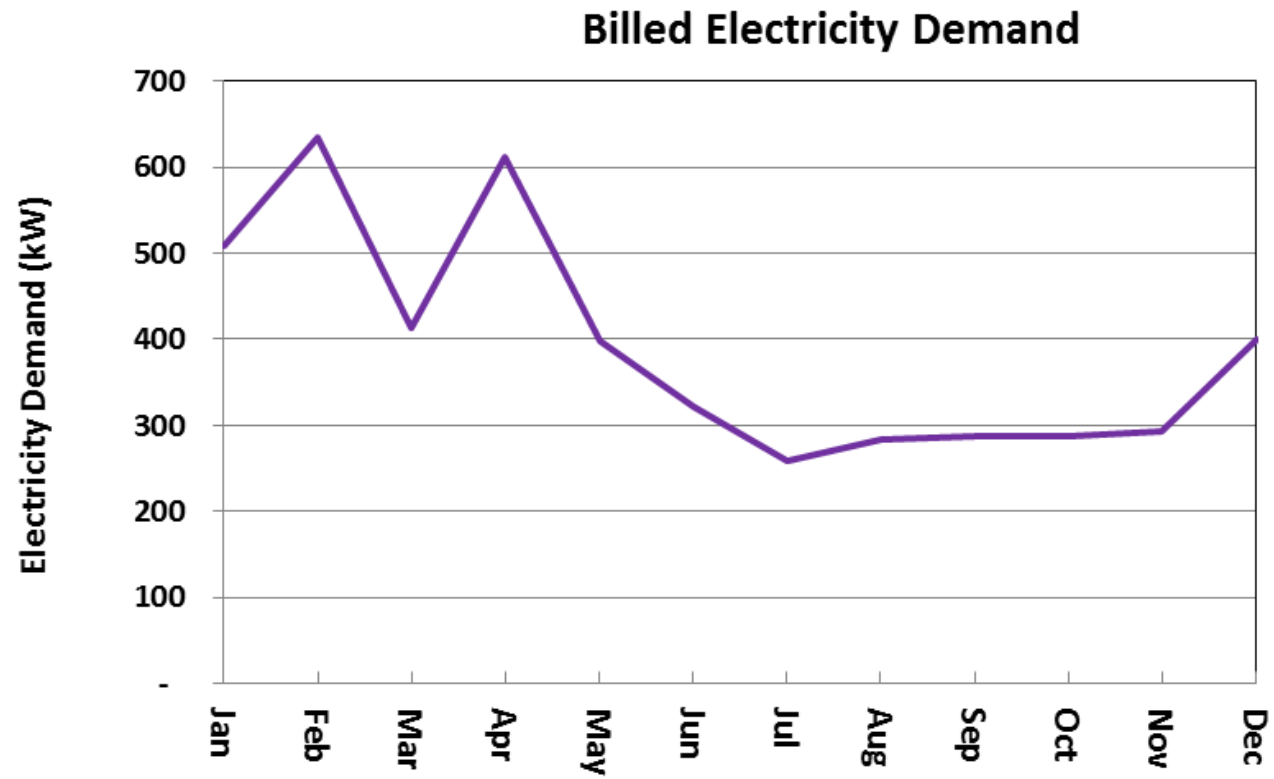


Plan & Implement

- Create facility action plan
 - No-cost/low-cost
 - Operational and maintenance changes
 - Behavior change, education
 - Medium cost
 - Work with commissioning professionals to make the building work as intended
 - High cost, long-term fix
 - Capital projects
 - Energy Savings Performance Contracting (ESPC)
- Find incentives and grants
- Work with building managers, building staff, occupants to implement changes

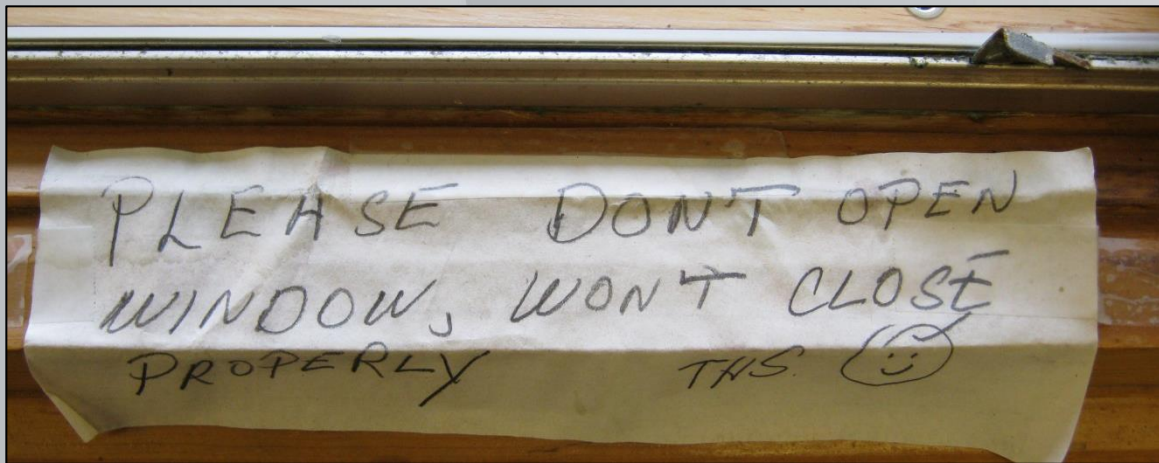
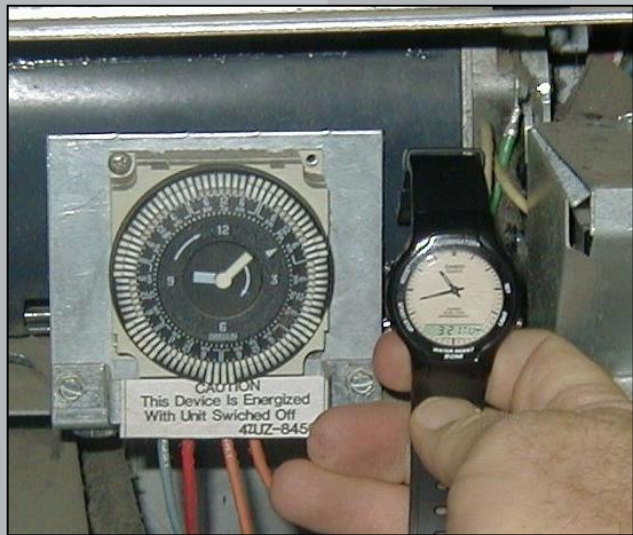
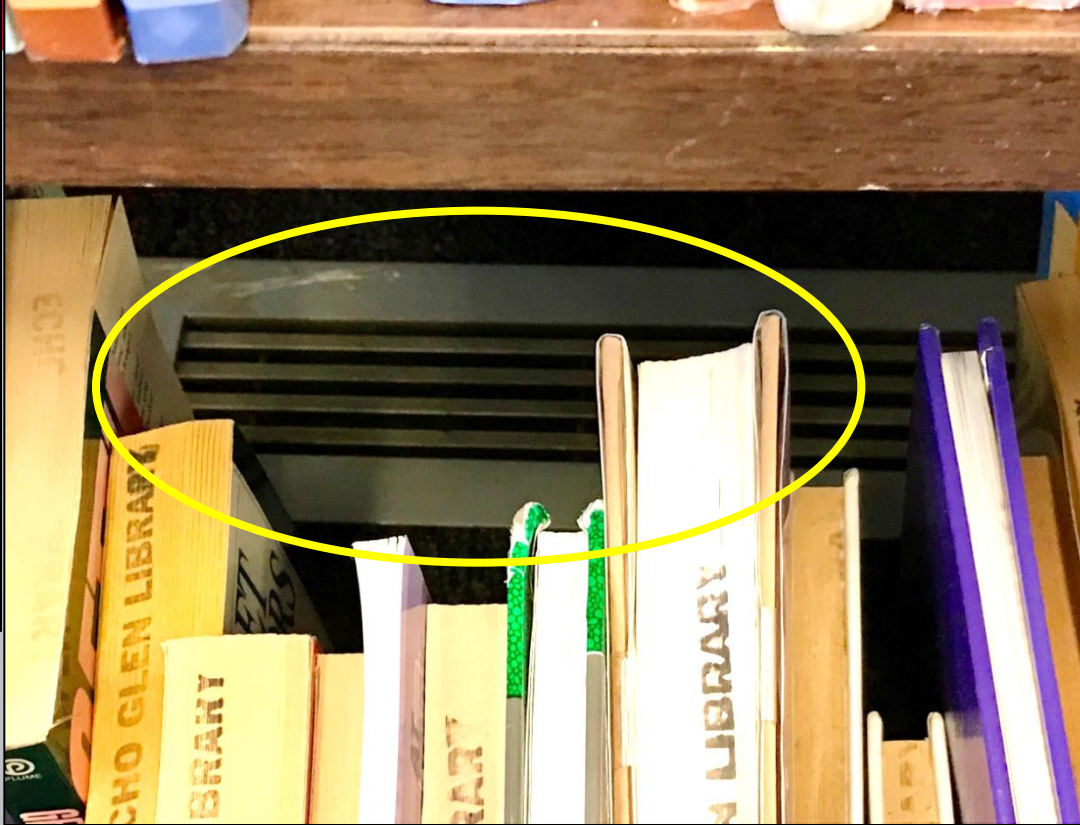
No-cost, Low-cost Example Measures

- Set point adjustment
- Scheduling changes
- Uncover blocked vents
- Close (or open) outside damper vent
- Train facility staff or occupants
- Reduce water temperature
- Change custodial routine to use fewer lights
- Recycle, look at waste stream
- Engage staff – behavior change
 - competitions, recognition



Sample Measures

Measure Area	Energy Efficiency Measure Name	Energy Savings Magnitude	Measure Cost	Ease of Implementation	Notes/Details
EM	Program and Training on Thermostats	Med	No Cost	Training, education and cultural shift.	
General Equipment	Consolidate Server Equipment	Low	Low/No Cost	This might be able to be performed by employees or DSHS IT support staff.	
Lighting	Repair the exterior dusk-to-dawn photo lighting sensors	Low	Low/No Cost	Can be performed by maintenance staff or electricians.	
Envelope	Repair and Seal Gaps in the Building Envelope	Low to Med	Low/No Cost	Can be performed by maintenance staff	
Envelope	Repair Door and Window Seals	Low to Med	Low/No Cost	Can be performed by maintenance staff	
Envelope	Incorporate Seasonal Weatherization Practices	Low to Med	Low/No Cost	Can be performed by maintenance staff	
HVAC	Deactivate Ductless Heat Pump Equipment	Low to Med	Low/No Cost	Can be performed by maintenance staff	
HVAC	Deactivate and Remove Cadet Wall Heater	Low	Low/No Cost	Can be performed by maintenance staff	
Appliances	Consolidate Refrigerators and Freezers to Eliminate Unnecessary Equipment	Low	Low/No Cost	Can be performed by kitchen staff	
Water	Reduce Water Heater Temperature Settings by 5-10F	Low to Med	Low/No Cost	Can be performed by maintenance staff	
Water	Lockout the temperature control setting on laundry to cold/cold setting	Low to Med	Low/No Cost	Can be performed by maintenance staff	
Water	Standardize and enforce laundry load sizes	Low to Med	Low/No Cost	Can be performed by administrator and/or staff team	
HVAC	Install Timer Control on Bathroom Ventilation Fans or Replace Fan with a Variable Speed Bathroom Fan	Low to Med	Low to Med	Can be performed by maintenance staff	



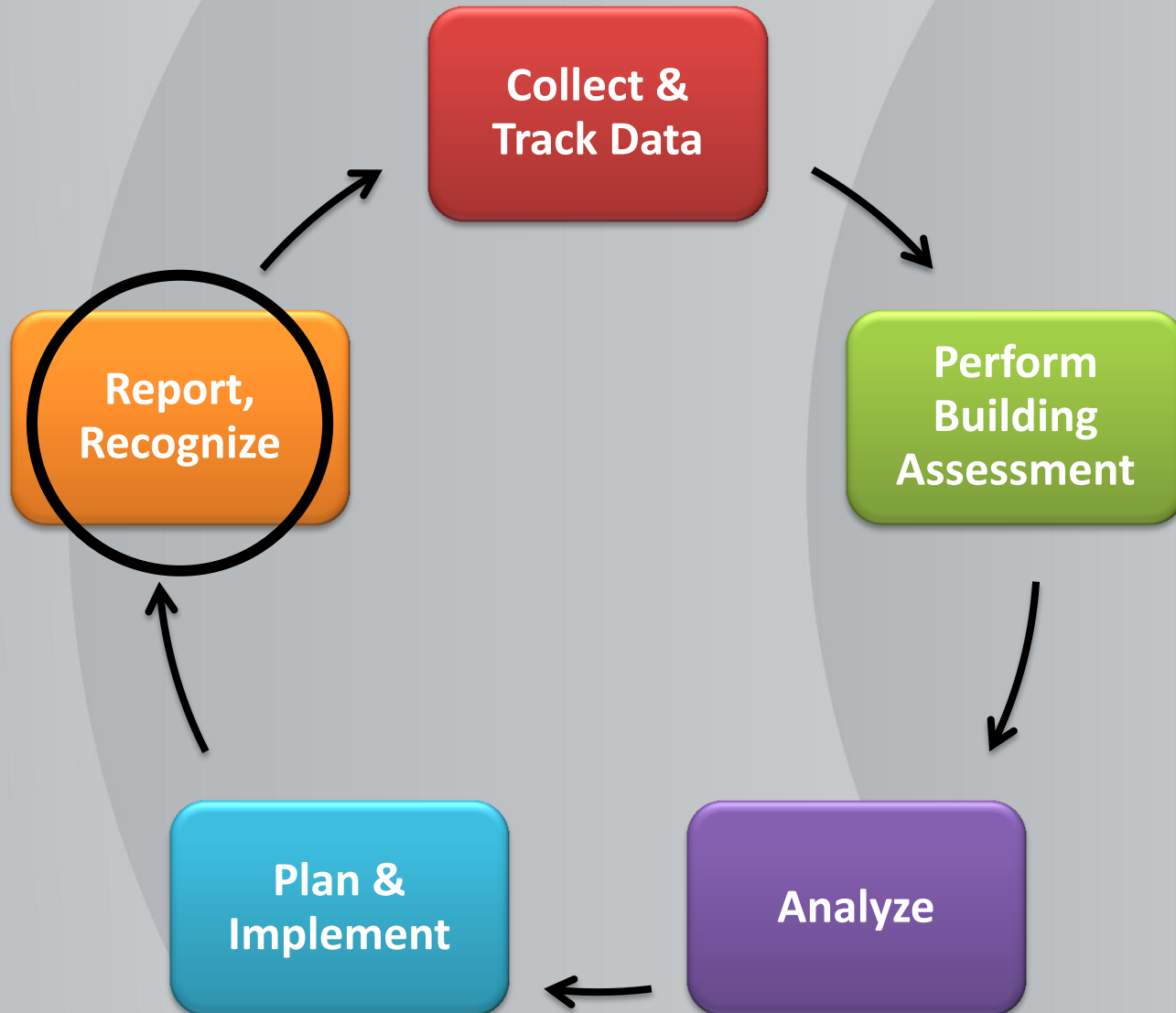
WSU RCM Tools for Loan

- Light meter
- Temperature
- Relative humidity
- On/Off logger
- Current Logger
- Carbon Dioxide
- Ballast Discriminator
- Tracer Smoke
- Camera

and more....



Report Results, Recognize Contributors

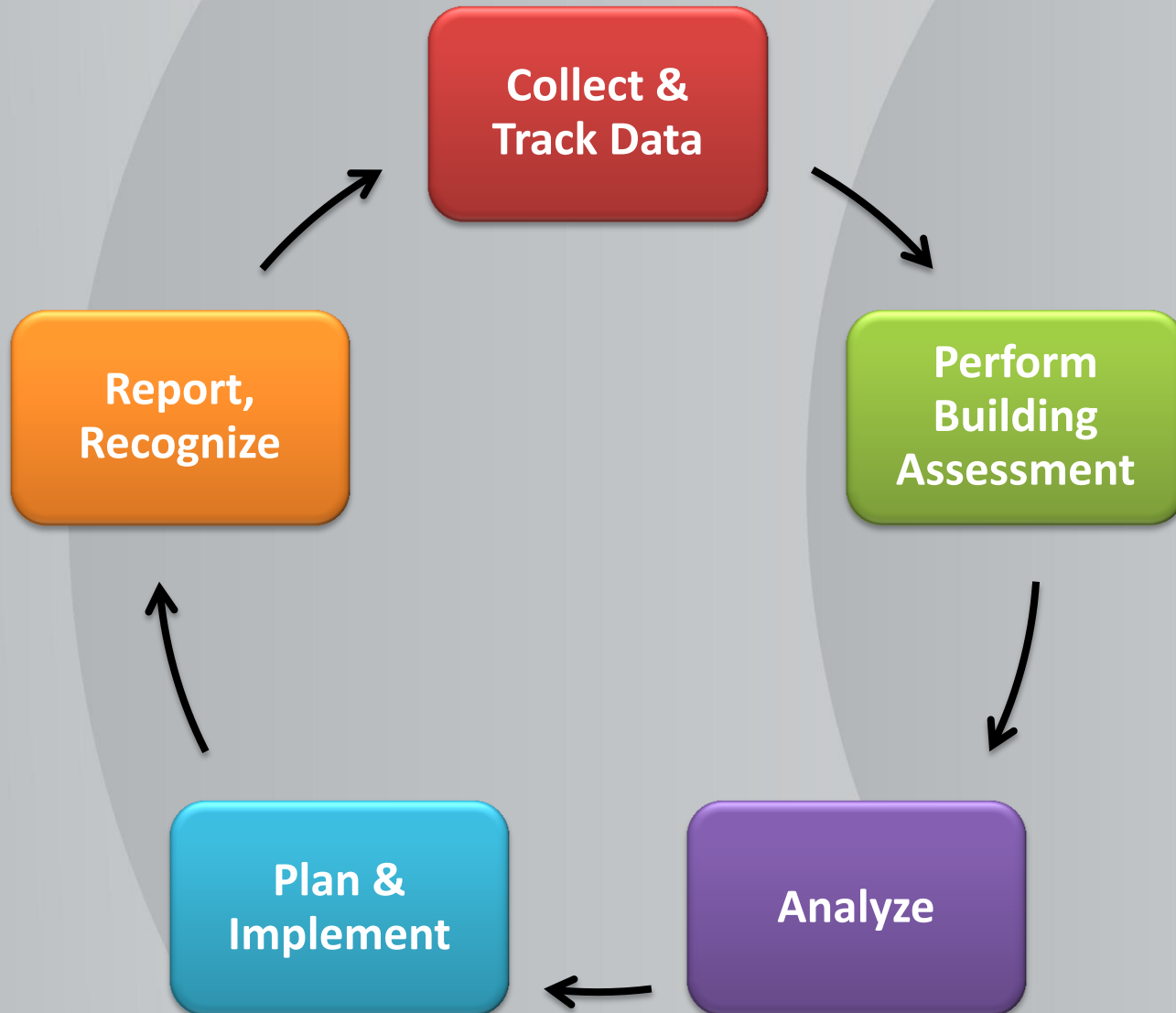


Report & Recognize

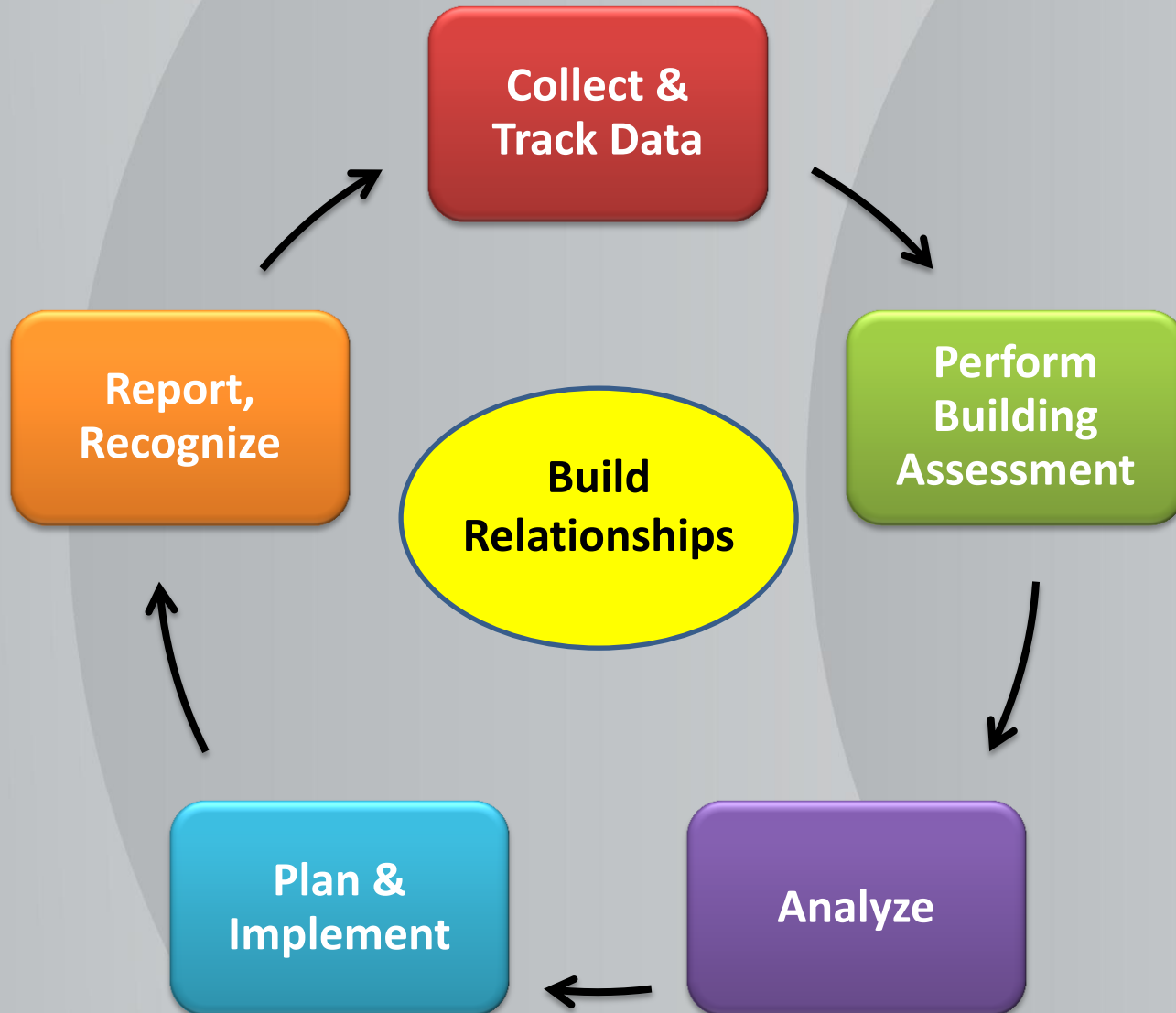
- Summarize and communicate results
- Evaluate success – what worked, what didn't
- Educate
- Recognize - Promote staff awareness & involvement



Repeat



Repeat



What is the First Step?

- Do you:
 - Hire an RCM
 - Collect and record utility use and cost

It Depends ...

- Collect data first
 - Need someone to do this
- Hire first
 - Need funds to hire someone

First Step – Collect the data

- Collect two years previous consumption use and cost
 - Billing office, individual buildings, utilities
- Collect all the bills, match meter numbers and addresses

First Step (part two) – Who Collects the Data

- Hire an RCM – full time? Part time?
- Use in-house staff
- Find an intern

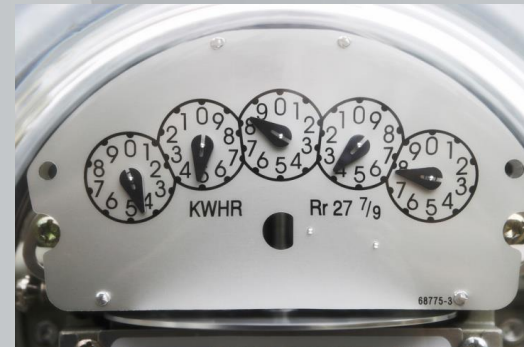


First Step (part three) – Enter the Data

- RCM
- In-house staff
- Intern
- Consultant/contractor
- Utilities
- WSU Plant Operations Support Consortium about membership and Portfolio Manager services
- Washington State Department of Enterprise Services

Other Thoughts

- Give time to data entry
- Take time to set up database
(will save time in the long run)
- Varying practices for billing and rates
- A person must still understand utilities and rate schedules



Second Step – Continue to Get & Enter the Data

- Plan for continued receipt of data
 - Larger gas and electric utilities are required to send uploads of energy consumption data
 - Utilities that serve more than 25,000 in Washington State (RCW 19.27A.170)
 - Smaller energy utilities and other resources
 - Talk with them to get regular data
- Talk to our WSU Plant Operations Support Consortium about membership and possible Portfolio Manager services
- Washington State Department of Enterprise Services

Training and Resources

- WSU Energy Program
<http://www.energy.wsu.edu/PublicFacilitiesSupport/ResourceConservation>
- WA State Dept of Enterprise Services (DES)
<https://des.wa.gov/services/facilities-leasing/energy-program>
- Better Bricks
<https://betterbricks.com/>
- Building Operator Certification
<http://www.theboc.info/>

Training and Resources

- NEEC
<http://www.neec.net/>
- Smart Buildings Center
<http://www.smartbuildingscenter.org/>
- ENERGY STAR and Portfolio Manager
<https://www.energystar.gov/buildings?s=mega>
- Your Utility
- Office of Superintendent of Public Instruction (OSPI)
<http://www.k12.wa.us/SchFacilities/default.aspx>

Energy Facilities Connections Conference

May 8-10, 2018

Leavenworth, WA

browns@energy.wsu.edu

14th annual conference

<https://www.eiseverywhere.com/ehome/efcc/639070/>

Questions?

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Go Cougs!