

# *Strategic Energy Planning*

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**State Energy Office**

**Department of Commerce**

# Agenda

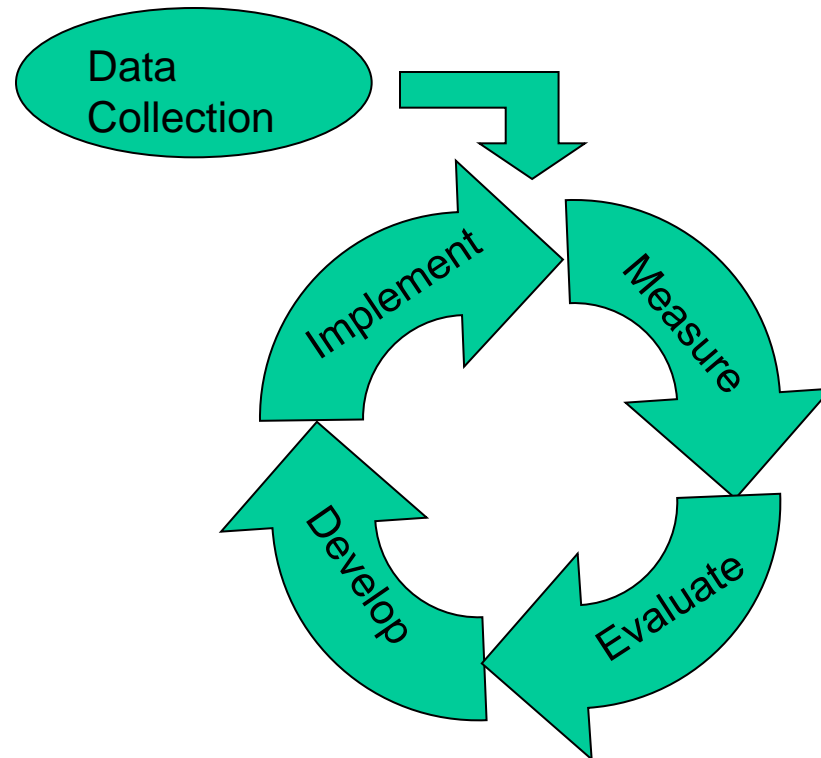
## Basic Strategic Energy Planning

This course will provide the necessary information for the participant to develop and implement an energy plan. An energy plan should provide the methodology to effectively manage utilities for your facilities.

# Agenda

## Process Steps

- Why
- How
- Data Collection
- Measure Results
- Evaluate Results
- Develop Plan
  - Strategies
  - Tactics
- Implement Plan



# Why

“Failing to Plan is  
Planning to Fail”

*Alan Lakeim*

# Why

- **Manage Utility Consumption**
  - **Control costs**
    - **Savings vs. Avoided Costs**
  - **Control GHG**
- **Improve building performance.**
- **Identify emergency conservation procedures**
- **Create equipment replacement Policy**

# How

## Assemble stakeholders

### Internal Buildings

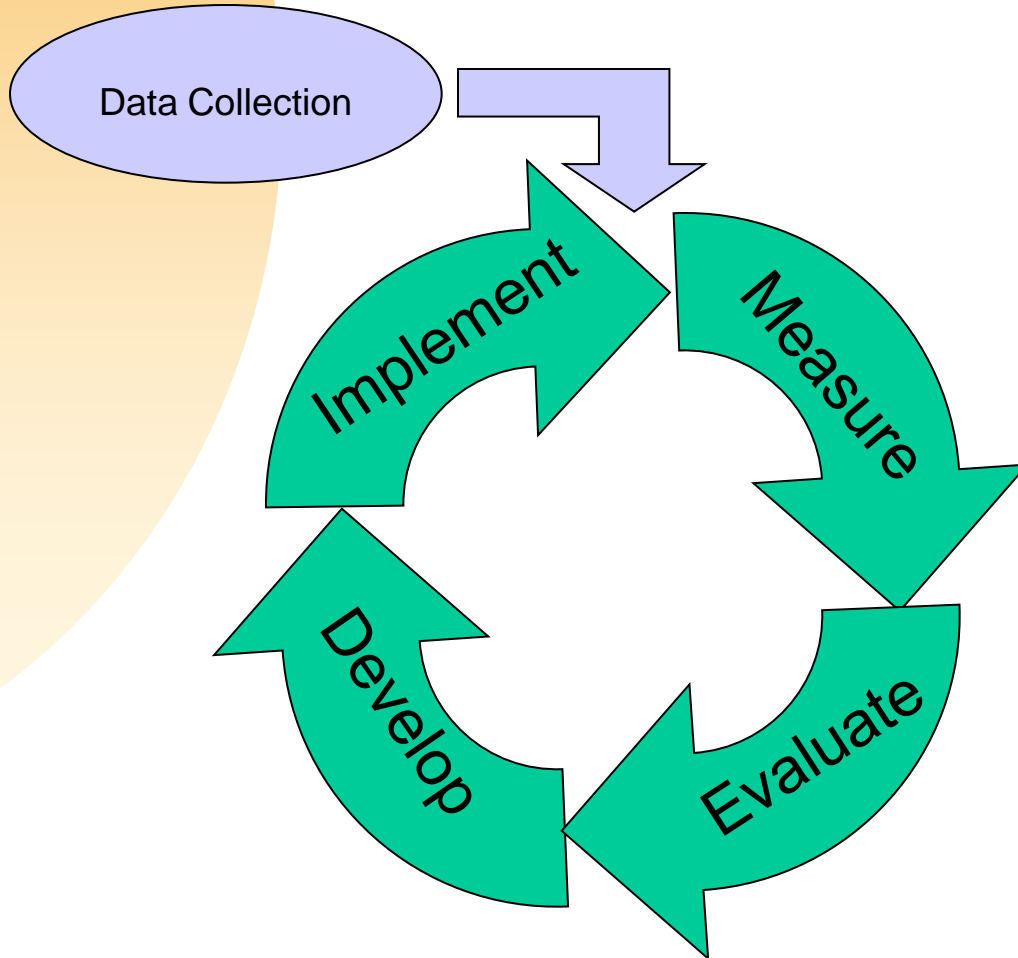
- Facilities personnel
- Building Occupants
- Utility providers
- Management
- Financial personnel
- Human Resources

### Community Based Programs

- Home owners associations
- Chamber of Commerce
- Community Organizations

# Energy Plan Cycle

Continuous Process Improvement



# Data Collection

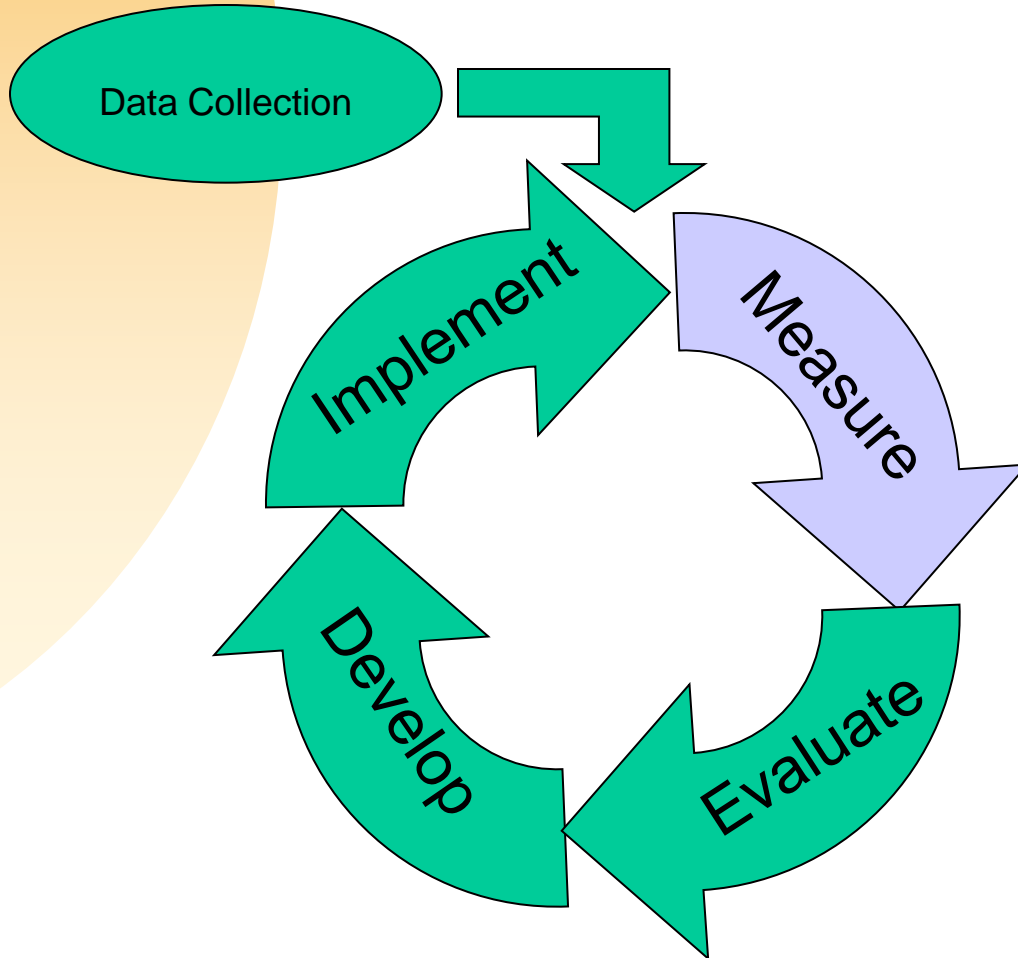
- Utility bills consumption and cost - monthly
  - Total costs including base meter charges, fees, taxes
  - 1 year history minimum
  - Provides a baseline and ability to measure progress
- Buildings, equipment inventory (CMMS), insurance lists, plug load inventory including space heaters
- Building assessments

# Data Collection

- Sub-meter Data
- Purchasing policies
  - Energy star
  - Life Cycle Cost Analysis
  - If policies do not contain an energy efficiency element they should
- Current policies, programs, projects and funding

# Energy Plan Cycle

Continuous Process Improvement



# Measure Results of Data Collection

- Identify gaps in data:
  - Supply side (utilities)
  - Demand side (owner)

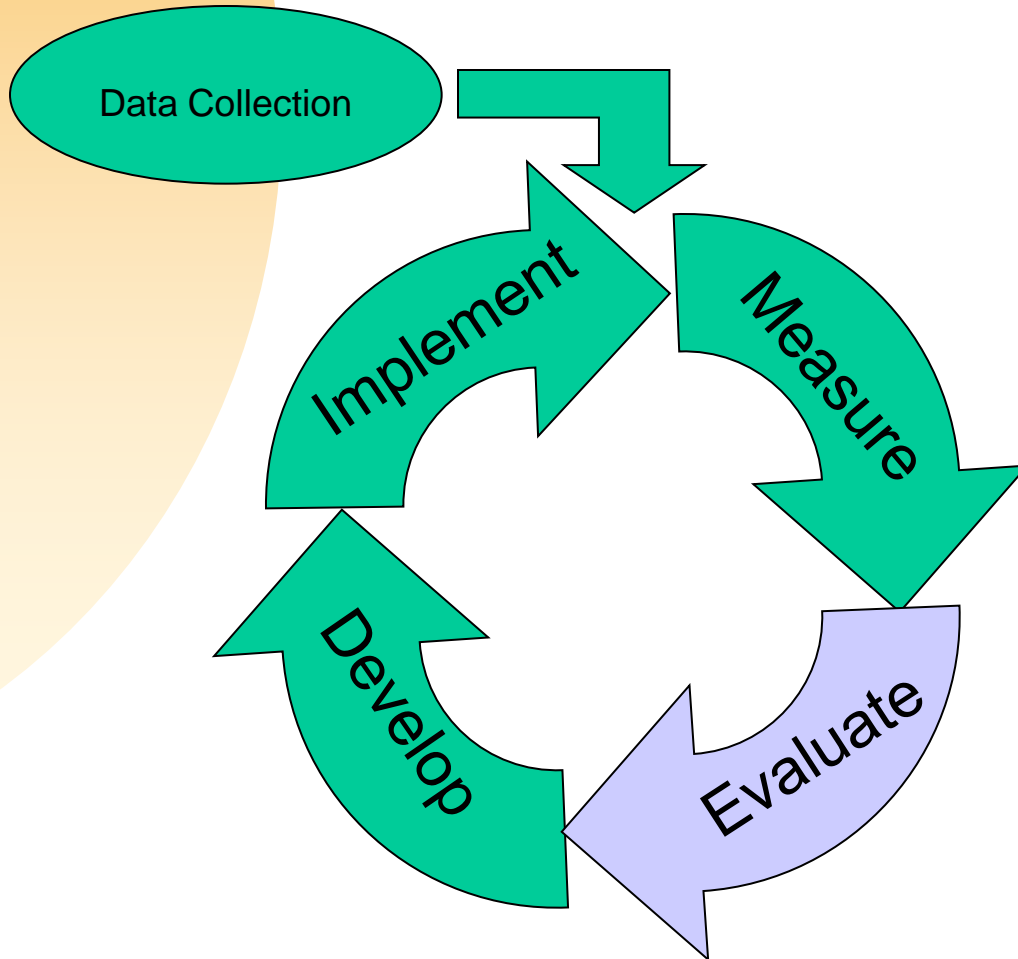
Develop methods to record consumption and cost data  
both supply and demand recommended

# Measure Results of Data Collection

- Building audit and maintenance reports
  - Hot/cold areas vs. calls
  - Plug load
- Current projects, programs and funding
- Purchasing policies

# Energy Plan Cycle

Continuous Process Improvement



# Evaluate Results of Data Collection

- Validate data accuracy
- Do gaps need to be filled before continuing
  - If yes, becomes part of plan
- Building data
- Create prioritized list of ECMs
  - Group: no-cost /low-cost/capital
- Establish key performance indicators (KPI's)

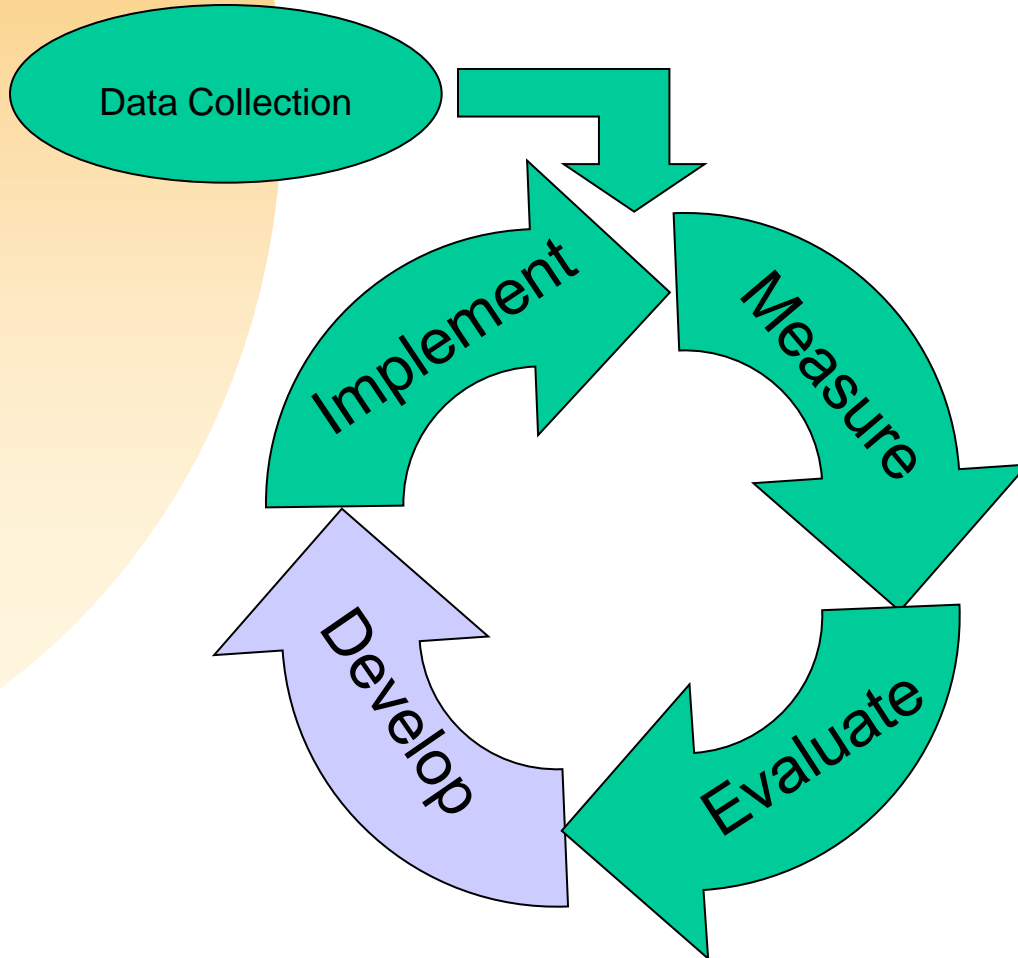
# Evaluate Results of Data Collection

## Key Performance Indicators

- The Energy Office has to standardize on Btu/gsf/yr and gal/gsf/yr as an overall state level KPI
- Should this metric not accurately reflect your performance you may create **additional** KPIs and report this in your Plan

# Energy Plan Cycle

Continuous Process Improvement



# Develop the Plan

- S.M.A.R.T Goals in a S.M.A.R.T Plan
  - **S**pecific
  - **M**easureable
  - **A**ction-Oriented
  - **R**ealistic
  - **T**ime-Dependent

# Develop the Plan

- Keep it focused and simple
- Less may be more
- Sustainable

# Develop the Plan

## Strategies

- The philosophies, plans and policies supporting long term energy management goals
- Example: “We will implement conservation measures that have a simple payback of two years or less.”

# Develop the Plan

## Tactics

- Short term actions that support strategic energy management goals
- Example: We will replace all incandescent EXIT signs in buildings ABC and XYZ this year with more efficient technologies

# Develop the Plan

## Primary USI Focus Areas

- Executive summary
- Supply side (supplier side of meter)
- Demand side (owner side of meter)
- Communication and Training
- Water

# Develop the Plan

## Optional Focus Areas

- Transportation
- Community Based
  - Residential programs
  - Non-profit programs
  - Commercial, industrial, retail programs

# Develop the Plan

## Executive summary elements

- Multi year look ahead (5 years)
  - Summarize where you are and where you want to go
- Brief description of facility/campus
- Top Executive statement of commitment

# Develop the Plan

## Executive summary elements

- Mission and goals of plan
  - 20% reduction by 2010
  - 30% reduction by 2015
- Assign overall responsibility and accountability
- List KPI

# Develop the Plan

## KPI Example:

energy evaluation						water/sewer evaluation			
year	energy \$/gsf	\$/mmbtu	%change	btu/sf	btu/sf %change	\$/mgal	%change	gal/sf	gal/sf %change
2002-03	\$1.14	\$6.356		178,764		\$3.27		51.82	
2003-04	\$1.26	\$9.189	45%	136,616	-24%	\$2.97	-9%	49.13	-5%
2004-05	\$1.25	\$9.590	51%	129,989	-27%	\$2.98	-9%	47.90	-8%
2005-06	\$1.45	\$12.775	101%	113,548	-36%	\$2.69	-18%	43.78	-16%
2006-07	\$1.43	\$11.661	83%	123,042	-31%	\$2.80	-14%	40.71	-21%

# Develop the Plan

## Supply Side Strategies

Focus A: Supply Side	
Strategy 1.	Purchase utilities at most economical rates .
Strategy 2.	Risk minimization through multiple fuel sources
Strategy 3.	Maximize utilization of incentive programs

# Develop the Plan

## Supply Side Tactics

Next 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Check for billing errors	360 bills		\$600.00		2 hrs/mo	1	Accounts payable	salary
Fuel rate negotiations	1 per year		\$25,000.00		8 hrs	1	Utility manager	salary
Meter verification	1 per year		\$0.00		16 hrs	1	Meter reader	salary

# Develop the Plan

## Other Supply Side Tactics

- Data collection, management and analysis
  - Identify appropriate software
  - Assign responsibility
- Rate reviews
- Review contracts with providers
- Leverage utility company incentives

# Develop the Plan

## Demand Side Strategies

Focus B: Demand Side	
Strategy 1.	Conducting energy audits to identify opportunities for conservation.
Strategy 2.	Complete Cost Benefit Analysis for opportunities and appropriately prioritize projects based on probable benefit and available resources
Strategy 3.	Benchmarking and developing Key Performance Indicators (KPIs) that clearly measure real energy and water conservation progress, factored for facility growth.
Strategy 4.	Accurate measurement and analysis of electricity, fossil based fuels, and water usage, including a quarterly review of trends and costs. In addition to primary utility meters for each building this will include where appropriate and feasible sub-metering of energy utilization for HVAC and lighting on larger buildings, and for water used for cooling towers.

# Develop the Plan

## Other Demand Side Strategies

- Adopt LEED or other building standard
  - Statutory new building requirements
- Project criteria
  - Simple payback
  - LCCA
  - ROI
- Equipment replacement strategy
- Sub-metering objectives

# Develop the Plan

## Demand Side Tactics

Next 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Facility audits	10 /year		TBD		80 hrs	1	Energy manager	salary
Performance contracting	3 bldgs		TBD		TBD	1	Planning and design	PC
Re-lamping	1,500 fixtures		450,000 kwh \$27,000		\$150,000	2	Facilities maintenance	ARRA utility incentive
Replace incandescent exit signs Reid Hall	100 signs		38 watts ea		\$3,500	2	Facilities Maintenance	ARRA utility incentive

# Develop the Plan

## Other Demand Side Tactics

- Take projects from prioritized list
- Specific targeted activities
- Short implementation times
- Measureable results

# Develop the Plan

## Communication & Training Strategies

Focus C: Communication and Training	
Strategy 1.	Work with Town management and the Board of Alderman to develop and publicize an Energy Management Policy
Strategy 2.	Training and effective use of Maintenance and Facilities employees to perform planned service and upgrades to maintain and improve the performance of the facility equipment and vehicles to reduce energy waste.
Strategy 3.	Organize Support for Energy Culture Change
Strategy 4.	Revise purchasing policy to include procurement of green transportation systems and energy star appliances.
Strategy 5.	Educate employees via, email, intranet and handouts on the benefits of energy management and conservation so that they can implement measures at work and home.

# Develop the Plan

## Communication & Training Tactics

Next 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Energy Manager assigned					salary		HR	salary
Action team in place	6 mtngs						Energy manager	salaries
Newsletter	4 issues				\$80		HR	O&M
Training	6 classes				free		Facilities staff	SEO

# Develop the Plan

## Other Communication & Training Tactics

- Conservation Action Team
  - Occupants, facilities, admin. security, housekeeping, etc..
- Turn off/Turn down
- Training
  - EMD classes
  - Building Operators Certification
  - Technical workshops and classes

# Develop the Plan

## Water Strategies

Focus D: Water	
Strategy 1.	Develop water conservation measures for drought conditions
Strategy 2.	Implement an effective leak reporting and repair program
Strategy 3.	Minimize need for and use of irrigation systems

# Develop the Plan

## Water Tactics

Next 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Leak repair program	75 work orders		\$2,500		75 man hours	2	Facilities staff	O&M
0.5 gpm sink aerators	250 installed		\$500 /year		\$212.50	2	Facilities staff	O&M
Irrigation sub-metered	2 systems		\$750 /yr no sewer chg		\$3,000	2	Plumbing company	O&M

# Develop the Plan

## Appendix A – Emergency Energy Procedures

- Tactics
  - Short term
  - Identify non-critical loads

# Develop the Plan

## Appendix B – Emergency Water Procedures

- Tactics
  - Short term
  - Determine consequences of actions

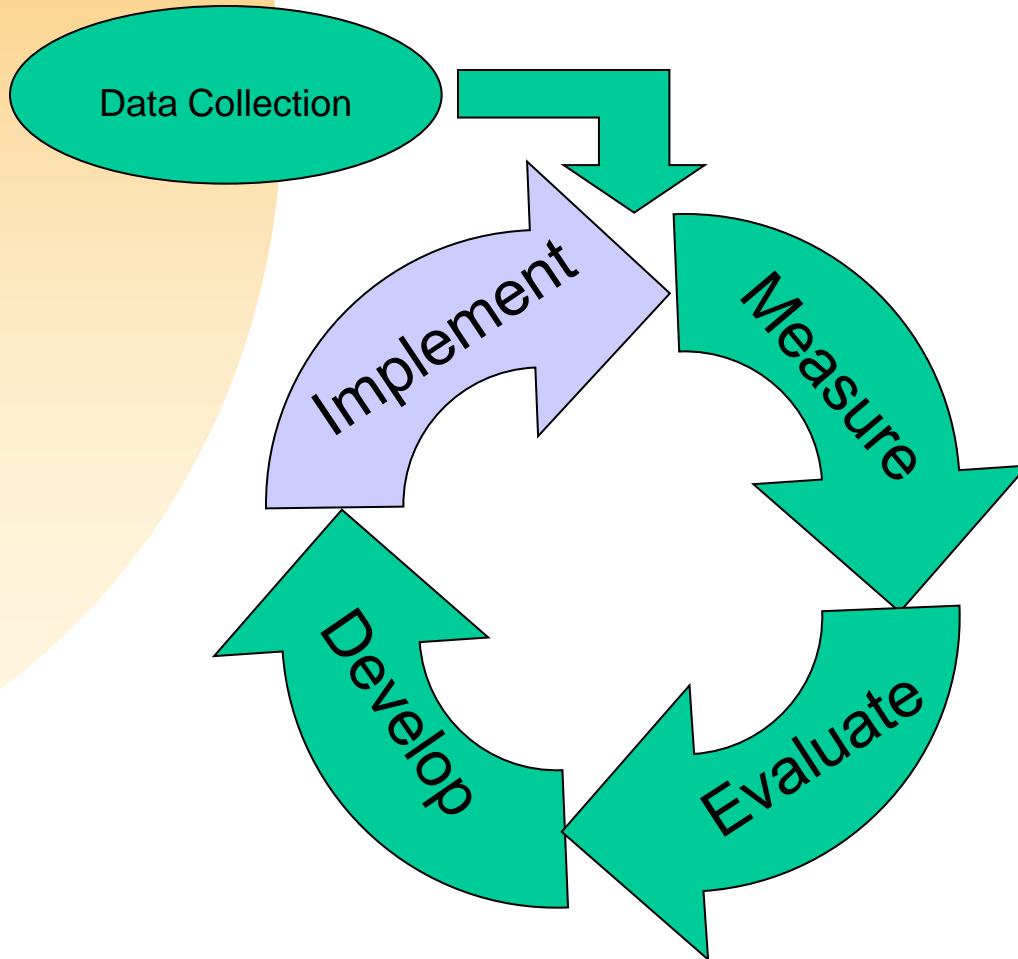
# Develop the Plan

## Appendix C – Equipment Replacement

- Tactics
  - Identify critical equipment
  - Locate potential loaner/rental replacement
  - Determine if equipment is still the correct size, capacity and type for current conditions
  - Specify correct replacement including source

# Energy Plan Cycle

Continuous Process Improvement



# Implement the Plan

- Identify financial resources
  - Utility Providers
  - O&M
  - R&R
  - COPS/Bonds
  - Performance Contracts
  - SEO
  - ARRA funds

# Implement the Plan

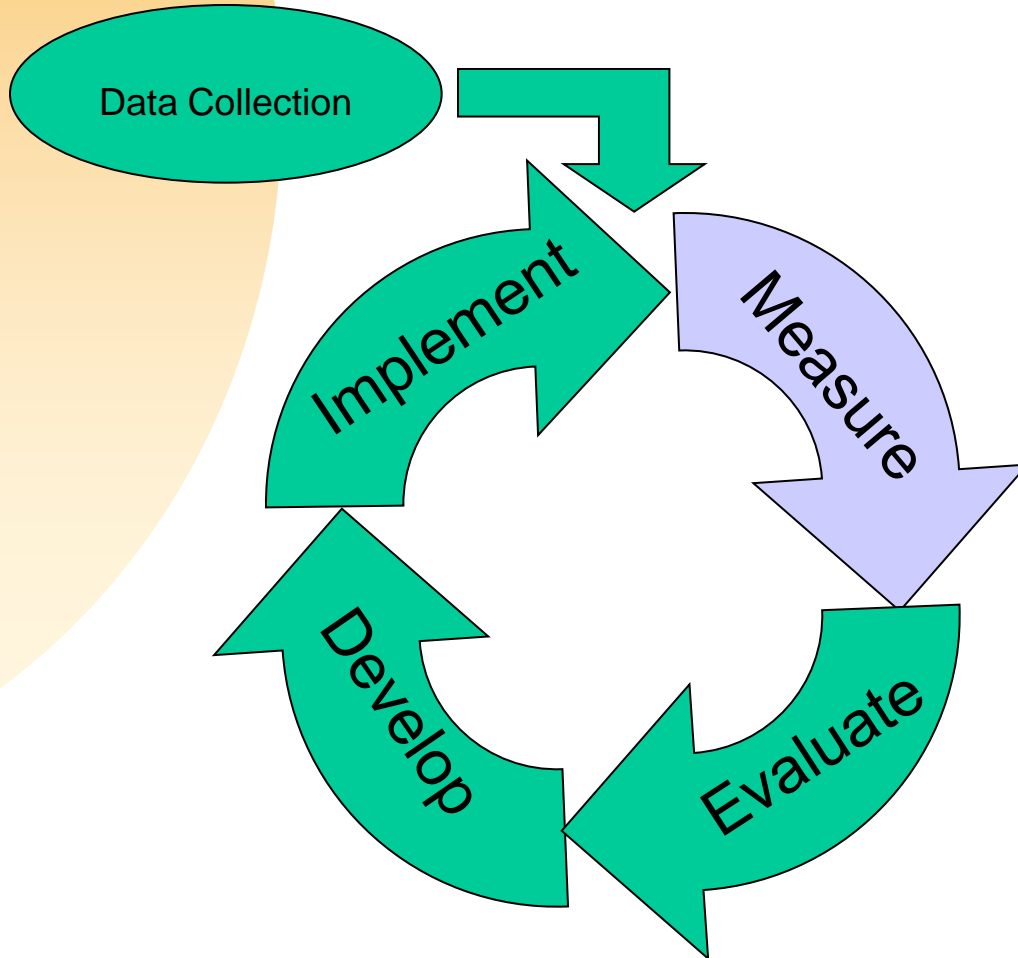
- Identify partner resources
  - Community Colleges
  - Universities
  - County or municipal partners
  - SEO
  - Workforce development boards
  - COGS

# Implement the Plan

- Perform no cost behavioral activities first
- Align resources with projects
- Assign accountability and responsibility
- Then Do It

# Energy Plan Cycle

Continuous Process Improvement



# Measure Results of Implementation

Results should be measured based upon the method indicated in the tactic tables.

# Measure Results of Implementation

- Continue to identify gaps in data
- Measured energy reductions from meter data
- Measured cost reductions from billing data
- KPI Trend
- Number of measures implemented from plan

# Measure Results of Implementation

- Number of newsletters issued
- Number of team meetings conducted
- Building performance data
  - Hot/cold calls
  - Plug load inventory
- Purchasing policies including rate changes
- Occupant participation

# Measure Results of Implementation

## Supply Side Tactics

Past 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Check for billing errors	360 bills	340	\$600.00	\$1,200	2 hrs/mo	1	Accounts payable	salary
Fuel rate negotiations	1 per year	1	\$25,000.00	\$22,500	8 hrs	1	Utility manager	salary
Meter verification	1 per year	1	\$0.00		16 hrs	1	Meter reader	salary

# Measure Results of Implementation

## Demand Side Tactics

Past 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Facility audits	10 /year	5	TBD	\$10,000	80 hrs	1	Energy manager	salary
Performance contracting	3 bldgs		TBD		TBD	1	Planning and design	PC
Re-lamping	1,500 fixtures	1,750	450,000 kwh \$27,000	525,000 kwh \$31,500	\$150,000	2	Facilities maintenance	R&R utility incentive

# Measure Results of Implementation

## Communication & Training Tactics

Past 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Energy Manager assigned					salary	1	HR	salary
Action team in place	6 mtngs	7					Energy manager	salaries
Newsletter	4 issues	6			\$80		HR	O&M
Training	6 classes	5			free		Facilities staff	SEO

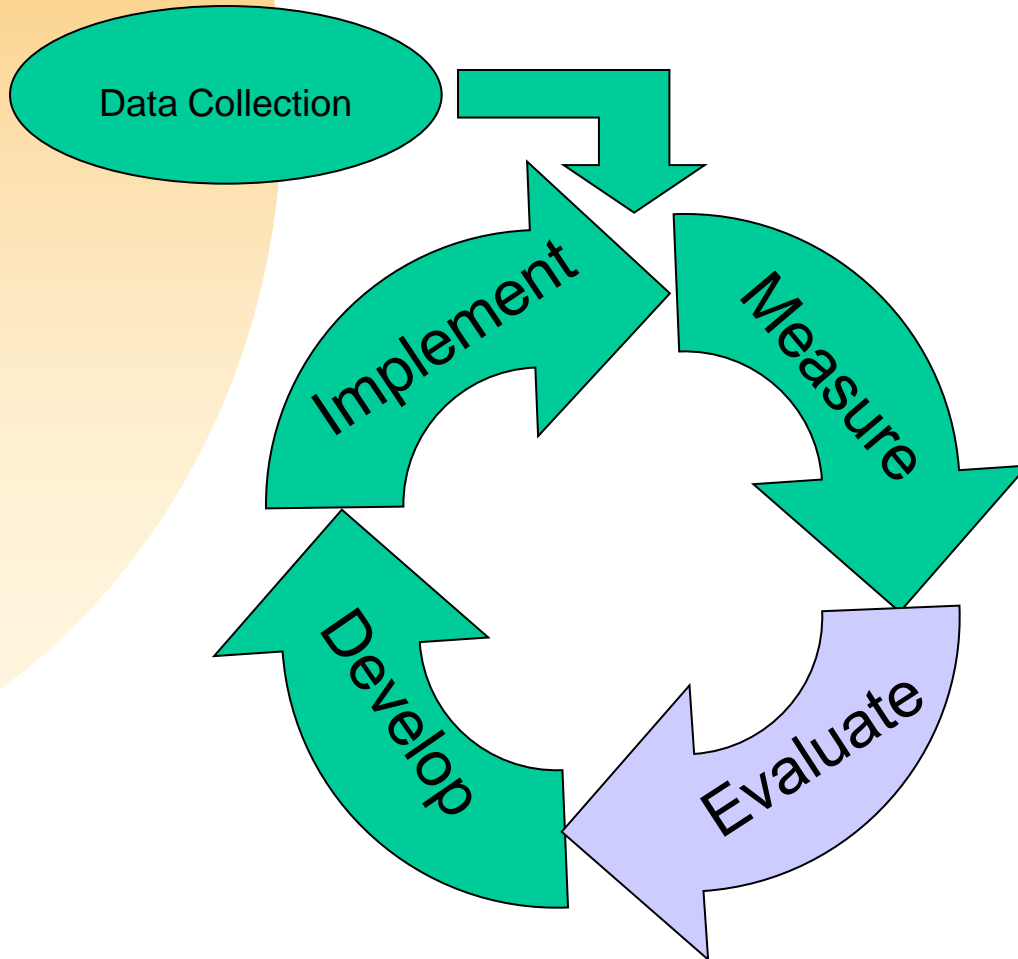
# Measure Results of Implementation

## Water

Past 12 Months Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Leak repair program	75 work orders	82	\$2,500	\$2,725	75 man hours	2	Facilities staff	O&M
0.5 gpm sink aerators	250 installed	195	\$500 /year	\$475	\$212.50	2	Facilities staff	O&M
Irrigation sub-metered	2 systems	3	\$750 /yr no sewer chg	\$895	\$3,000	2	Plumbing company	O&M

# Energy Plan Cycle

Continuous Process Improvement



# Evaluate Results of Implementation

- Validate data accuracy
- Were measurements relevant for what you wanted to achieve with the activities?

# Evaluate Results of Implementation

- Did you achieve or surpass goals as indicated in measurements column of tables?
  - If not, why?
  - abandon project?
- Is the project complete?
  - Continue or expand

# Evaluate Results of Implementation

- Determine next steps to achieve strategic goals
- Create new prioritized list
  - Group: no-cost /low-cost/capital
  - Set realistic goals

# How the Plan Can Look

Review Handout

# Sample Mandate

## Commitment

- We recognize that energy and water consumption can be managed to our benefit. Energy and water management is a responsibility of the occupants at each facility, guided and supported by the Energy Manager,.
- The attached plan outlines the activities and expenditures required to reduce energy and water consumption to achieve the goals of the program.
- The Department Heads will review progress and results quarterly, and will support staff attendance at training in energy and water management at least quarterly.

### Strategic Energy & Water Plan Mandate- Goals

Reduce annual Total Energy Consumption by a minimum of \_\_\_\_% by fiscal year \_\_\_\_\_ - \_\_\_\_\_ from a baseline fiscal year \_\_\_\_\_ - \_\_\_\_\_.

### Strategic Energy & Water Plan Mandate- Measures

Our tracking measures will be the following Key Performance Indicators (KPI):

*Total Energy Use Btu per Square Foot per year*

### Strategic Energy & Water Plan Mandate- Commitment

*I have read and support the Strategic Energy & Water Plan for my Organization Implemented this \_\_\_\_ day of \_\_\_\_\_*

\_\_\_\_\_  
Utility Manager

\_\_\_\_\_  
Director of Facilities

\_\_\_\_\_  
Chief Financial/Budget Officer

\_\_\_\_\_  
Chief Operating Officer

# Possibilities

“Don’t make excuses.  
Find solutions.”

*Unknown*

# USI Contacts...

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# Thank You for Attending



North Carolina Energy Office [energync.net](http://energync.net)

**ENERGY**

# Self Assessment



# Self Assessment



# Self Assessment



# Plug Load Awareness

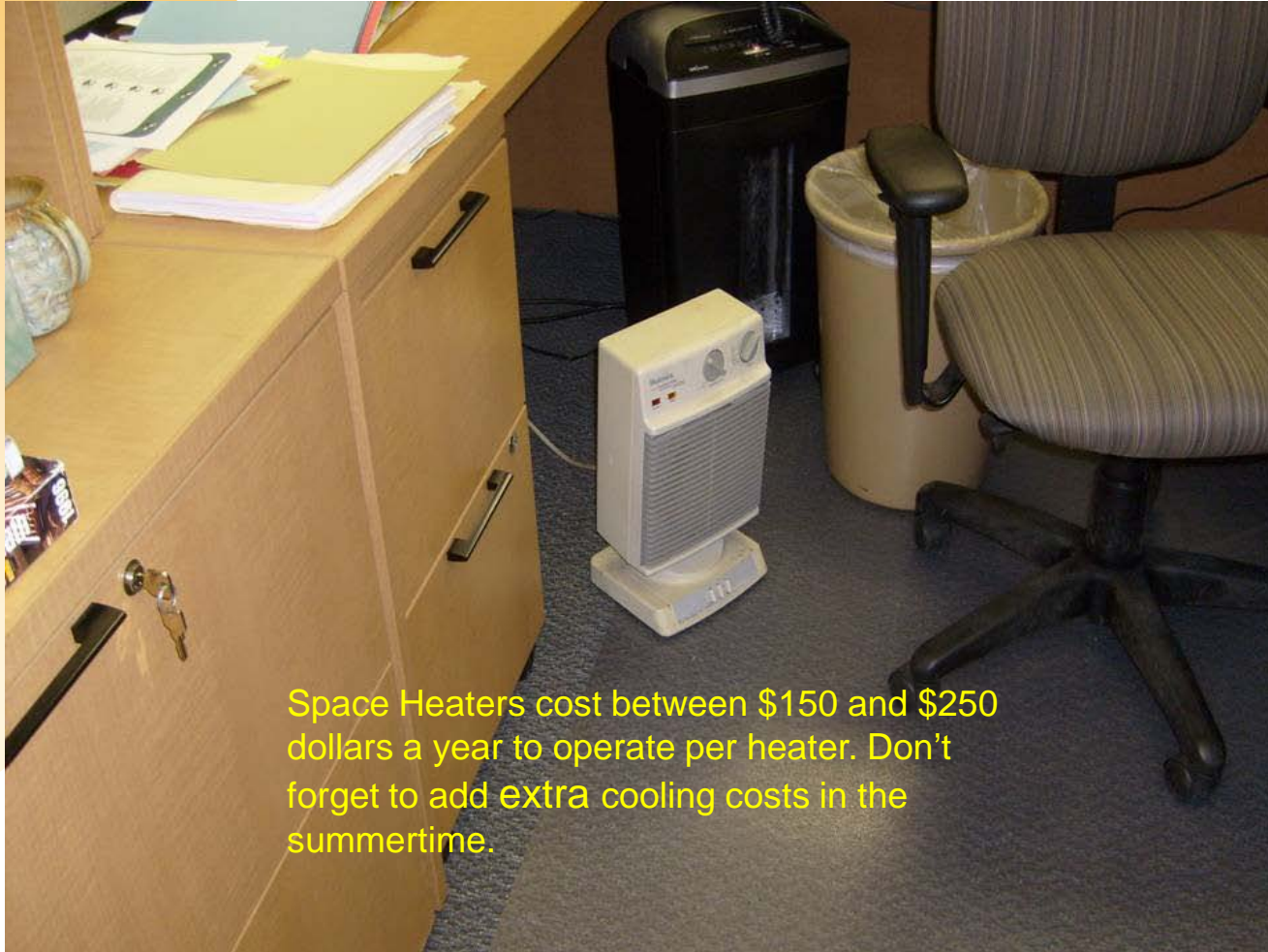


Mini Refrigerators  
cost between \$80  
and \$150 dollars a  
year to operate

# Plug Load Awareness



# Plug Load Awareness



Space Heaters cost between \$150 and \$250 dollars a year to operate per heater. Don't forget to add extra cooling costs in the summertime.