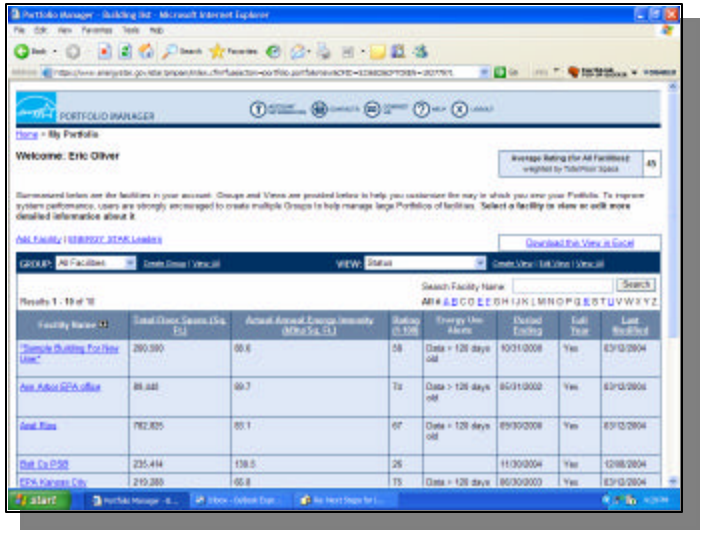
Improving your Energy Performance Rating

ENERGY STAR® Training

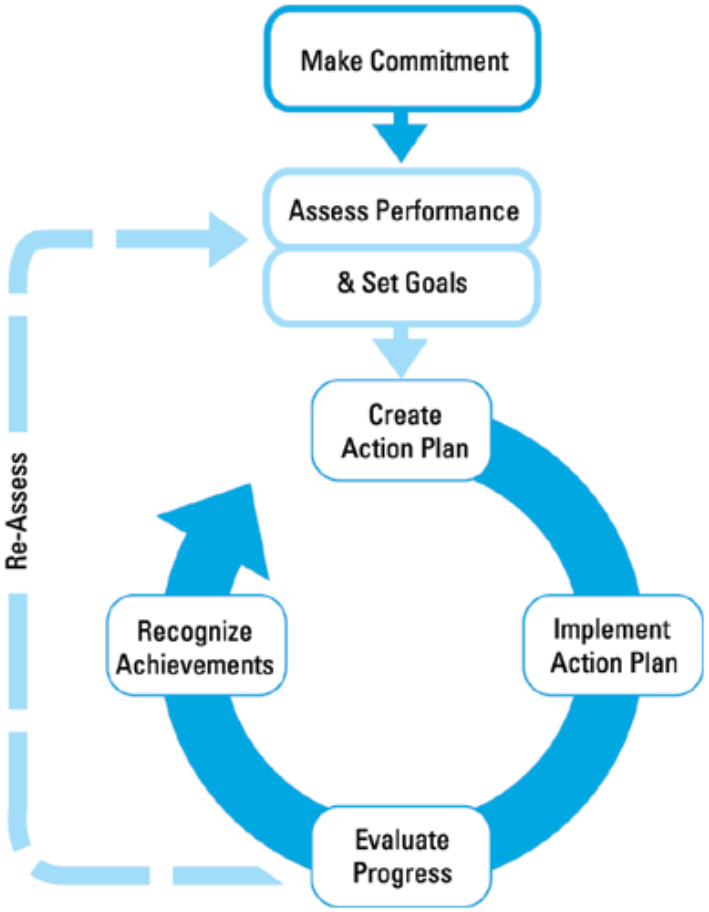
Training

- Training geared to those familiar with rating building energy performance using Portfolio Manager
- Provides framework for best next steps to improved performance



Strategic Approach

- Guidelines for Energy Management
  - steps to achieving continuous improvement
  - based upon best practices of ENERGY STAR partners
  - www.energystar.gov



So You've Rated Your Buildings—Now What?

- Check your work
- Set realistic goals
- Review your Ratings
- Examine key facilities
- Develop action plan
- Train and educate
- Re-assess performance
- Recognize success

Rating Accuracy

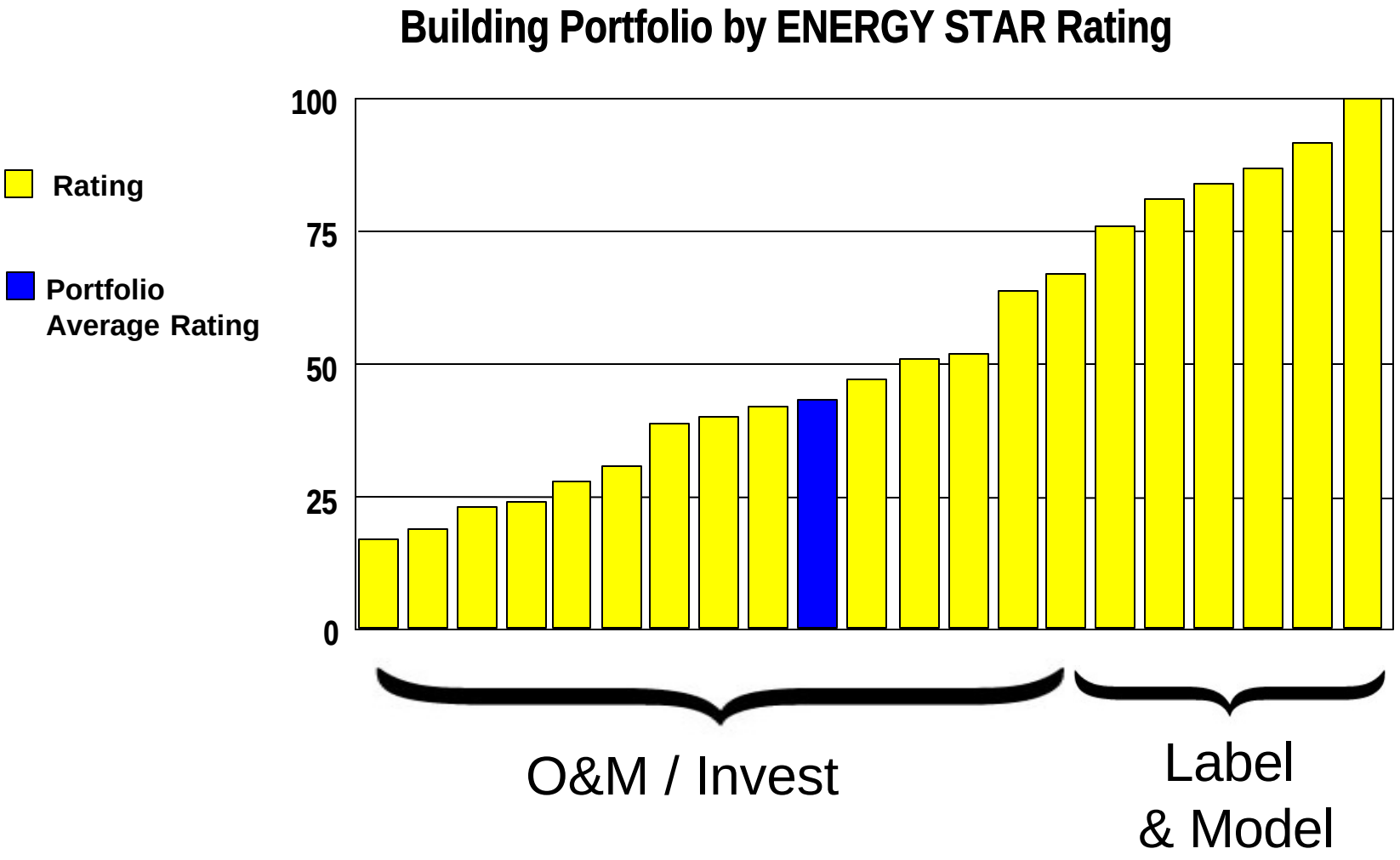
- Use actual data (not default values) for accurate rating
- Common mistakes
  - Was every meter included?
  - Have you counted all fuels/sources of energy?
    - Oil, Gas, Steam, electric, etc.
  - Are space types and building attributes accurate?
- Some ratings outside the range is normal

Set Realistic Goals

- Goals drive performance
  - goal-setting process varies by organization
- One approach
  - Use Portfolio Manager
  - Review average rating
  - How much can you improve?
  - Set a timetable
- Tie into other (e.g., financial) goals
  - Financial Value Calculator (commercial sector)
  - Cash Flow Opportunity Calculator (public sector)

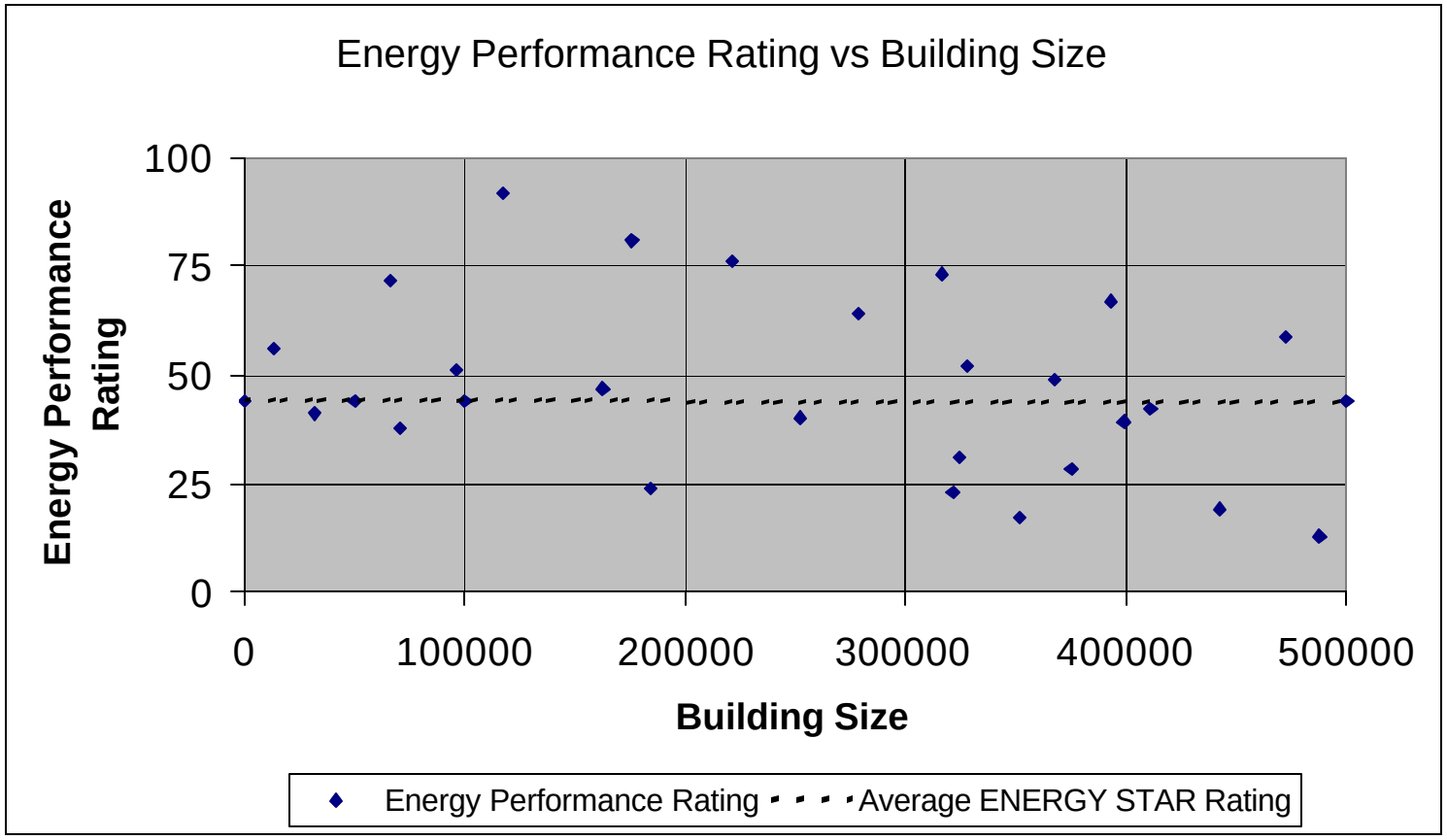
Review Ratings
&
Identify Key Facilities

How do Your Buildings Rate?



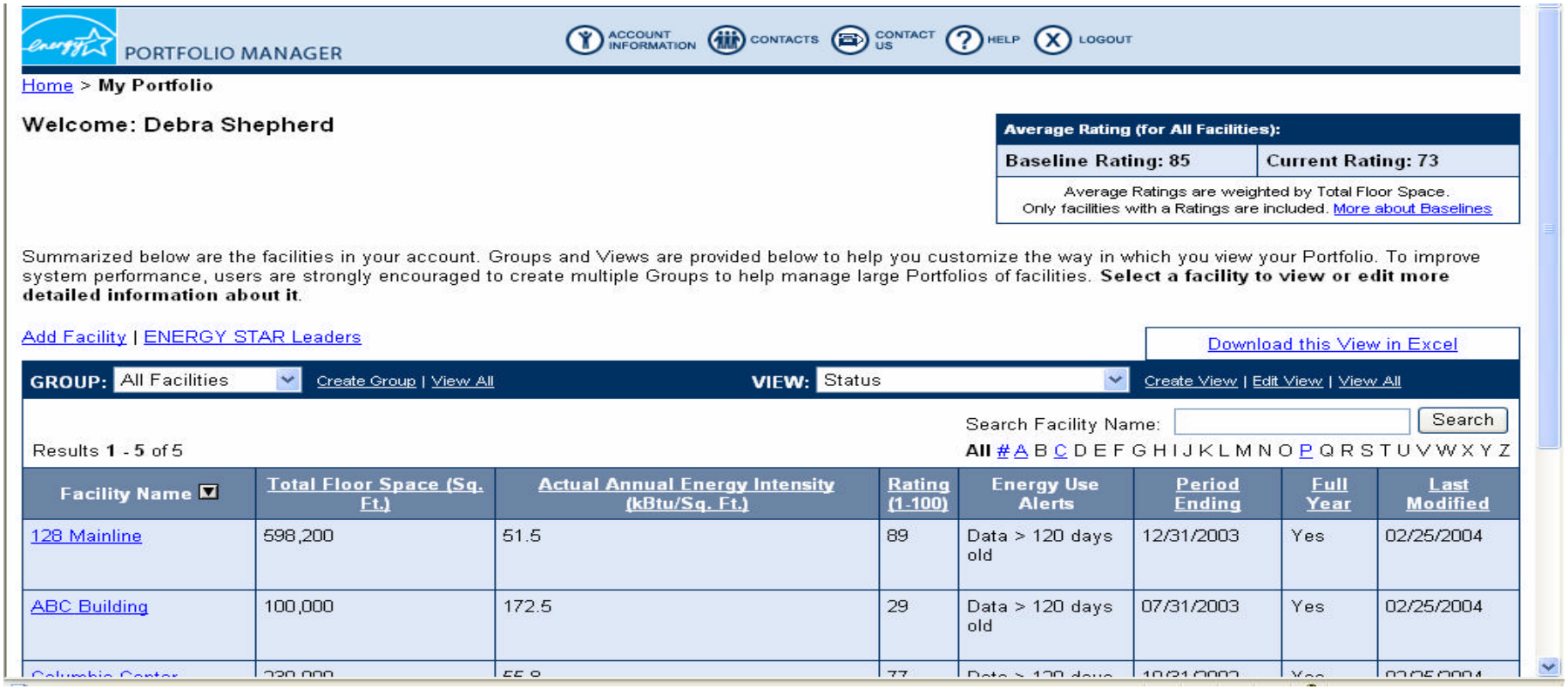
Identify Key Facilities

Plot Building Performance



Prioritize facilities

- Create matrix to compare building energy performance across multiple factors
  - Create view in PM



PORTFOLIO MANAGER

ACCOUNT INFORMATION | CONTACTS | CONTACT US | HELP | LOGOUT

Home > My Portfolio

Welcome: Debra Shepherd

Average Rating (for All Facilities):	
Baseline Rating: 85	Current Rating: 73

Average Ratings are weighted by Total Floor Space.
Only facilities with a Ratings are included. More about Baselines

Summarized below are the facilities in your account. Groups and Views are provided below to help you customize the way in which you view your Portfolio. To improve system performance, users are strongly encouraged to create multiple Groups to help manage large Portfolios of facilities. **Select a facility to view or edit more detailed information about it.**

Add Facility | ENERGY STAR Leaders

Download this View in Excel

GROUP: All Facilities | Create Group | View All

VIEW: Status | Create View | Edit View | View All

Search Facility Name: Search

Results 1 - 5 of 5

All # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Facility Name	Total Floor Space (Sq. Ft.)	Actual Annual Energy Intensity (kBtu/Sq. Ft.)	Rating (1-100)	Energy Use Alerts	Period Ending	Full Year	Last Modified
128 Mainline	598,200	51.5	89	Data > 120 days old	12/31/2003	Yes	02/25/2004
ABC Building	100,000	172.5	29	Data > 120 days old	07/31/2003	Yes	02/25/2004
Columbia Center	220,000	55.8	77	Data > 120 days	10/31/2003	Yes	02/25/2004

Compare Building Energy Performance Across Multiple Factors

- Download into Excel
  - add additional factors not available in PM

My Portfolio: Debra Shepherd								
February 8, 2005 - 12:29:59 PM								
Total Buildings: 5								
Facility Name	**Total Floor Space (Sq. Ft.)**	**Actual Annual Energy Intensity (kBtu/Sq. Ft.)**	**Rating (1-100)**	**Period Ending**	**Full Year**	**Last Modified**	**Energy Manager**	**Date Last Audit**
128 Mainline	598,200	51.5	89	12/31/2003	Yes	2/25/2004		
ABC Building	100,000	172.5	29	7/31/2003	Yes	2/25/2004		
Columbia Center Township	230,000	55.8	77	10/31/2002	Yes	2/25/2004		
Craig Towers	123,000	69.6	67	2/29/2004	Yes	3/2/2004		
Plaza Building	900,000	68.4	68	7/31/2004	Yes	9/14/2004		
Group Total	1,951,200							

Examine Key Facilities

Examine Key Facilities

- Walk-through versus full-scale audit
- Simple walk-through
  - Identify obvious energy drains
    - Open windows
    - Space heaters
    - Lights/appliances left on at night
    - Running motors
  - Collect data from major equipment/controls
  - Develop ideas, assess costs and savings

Examine Key Facilities

- Comprehensive energy assessment
  - Performed by a qualified energy professional
  - Monitor and measure
    - Air temperatures
    - Water flow rates and temperatures
    - Electric demand of mechanical equipment
    - Run times of lighting
  - Assess O&M strategies, interview maintenance staff
  - Develop detailed energy conservation measures
  - Onsite renewable energy opportunities
  - Detailed cost/savings estimates for improvements

Common Findings

- Oversized or outdated equipment
- Unnecessary/inefficient lighting
- Excess loads
  - Ventilation in areas that aren't occupied
  - Kitchen/office equipment on when not needed
  - Heat loss/solar gain through windows/envelope
- Insufficient monitoring and/or controls
- Miscalibrated energy management system
- Poorly maintained HVAC

Key Components
Staging Improvements

Key Components

- Technical steps and targets
- Roles and resources
  - Identify internal managers/champions
  - Set performance goals for managers, contractors, and individual buildings
  - Estimate cost/paybacks to secure resources
- Monitor/track progress
  - Benchmark regularly
  - Ratings can change

Eastman Kodak's largest U.S. facility held brainstorming events with a mix of employees that helped uncover $2.5 million in energy savings.

Staging Improvements

- Existing building commissioning
- Lighting
- Supplementary load reduction
- Fan/motor system upgrades
- Heating/cooling system upgrades

Details about the staged approach to energy management can be found in the ENERGY STAR Building Manual, available online at www.energystar.gov

Existing Building Commissioning

- Does building perform as intended?
  - Especially new, well-designed underperformers
- Revisit temperature setpoints
- Boiler combustion efficiency and waste heat
- Building envelope
  - Insulation/infiltration
  - Roofing material
- Light sources and quality
- **This step alone can significantly impact the rating**

Lighting

- Take space use into account
  - Use natural light where possible
  - Position task lighting only where needed
  - Check light levels against industry standards
- Automatic controls
  - Occupancy sensors
  - Timers
  - Dimmers
- Retrofit
  - ENERGY STAR-labeled products
  - Lights use two-thirds less energy, 10X longer

High efficiency 4-lamp T8 fixture:
–40% fewer Watts than T12
–40% less heat output
–10% greater light output
–2-4 year simple payback

Reducing Loads

- Ventilation systems
  - Economizer cycle, occupancy sensors cut loads
  - New ASHRAE 62 standard for auditoriums, etc.
- Equipment
  - ENERGY STAR-labeled products power down
  - Vending machine lights on timers/dimmers
  - Domestic hot water tanks' heat loss
- Building envelope
  - Window films/shading to reduce solar gain
  - Insulation, weathersealing to reduce infiltration

System Upgrades

- Variable air volume/speed fans/motors
  - Motors operate 98% of the time at part-load
  - VAV air systems: 30% less energy than constant
- Heating/cooling systems
  - New chillers 15% to 50% more efficient
  - Replacement cost-effective if chiller 10+ years old
- Ongoing maintenance
  - Clean coils, ducts, fan blades
  - Calibrate sensors, adjust boilers
  - Replace filters
  - Treat scale buildup on towers

St. Francis Hospital in Minneapolis:

–Improved rating from 51 to 91

–Used $ saved from right-sizing water pump to buy new boilers

–Used $ saved from new boilers to fund new DDC controls

Reduce Consumption—Increase Rating

Every one percent reduction in energy consumption increases the energy performance rating by approximately one point.

Training and Motivating Staff
Encouraging Occupants

Training Staff

- Training
  - Provide training for:
    - appropriate use of technologies
    - approaches to energy management
    - concept of continuous improvement
  - Ensure staff has required knowledge of building performance
    - Actual energy use, rating, costs
    - Equally important as technical knowledge

Hines Energy Manager Skill-Sets

--Understand energy management

--Understand building operating dynamics

--Aware of new technologies

--Think outside the box

--Calculate payback

--Incorporate change

Motivating Staff

- Education and Outreach
  - Use posters, tip sheets, newsletters, etc.
- Awards, recognition, friendly competition
- Financial rewards
  - Hilton Hotels & Food Lion offer a bonus
- Employee responsibility
  - GM saved $57 million

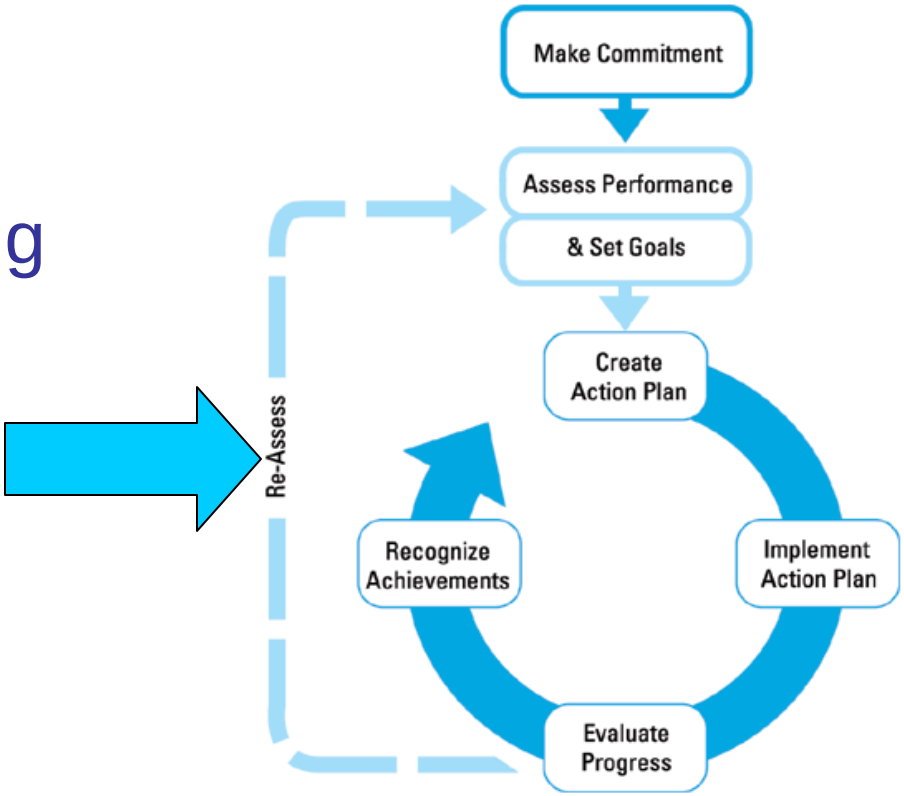
Involving Occupants

- Identify energy champions
- Educate tenants
  - Email newsletters
  - Lobby posters
- Every Watt counts
  - Put computers in “sleep” mode
  - Turn machines off when not in use
  - Shut off lights when you leave
  - Request janitorial contractors minimize lights

Each year, Americans use 4 billion kWh to brew 30 billion pots of coffee.

Ongoing Assessment

- Continuous improvement requires ongoing assessment



Ongoing Assessment

- Re-assess building performance
  - Update utility data monthly
    - Continuous if possible
    - Spot trends and address issues
  - Conduct an annual review of goals and achievements (including financial)
    - Calculate portfolio-wide improvements vs. goal
    - Set new goals

Achieving Success

- Financial benefits
- Environmental benefits
- Demonstrate stewardship

Earn recognition from EPA

- Building level
  - ENERGY STAR Label
    - Existing buildings rating 75 or higher
  - Designed to earn ENERGY STAR
    - Buildings in design phase
- Organization-wide
  - ENERGY STAR Leaders
    - 10, 20, or 30 point increase portfolio-wide
  - ENERGY STAR Partner of the Year awards

For More Information

www.energystar.gov

ENERGY STAR Hotline

1 (888) STAR YES

1 (888) 782-7937