

Low-Cost/No-Cost Energy-Efficiency Opportunities for Businesses

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Motivation

Commercial Buildings:

- Use ~ 1/3 of total energy
- Use 65% of nation's electricity
- Use 40% of global raw materials (3 billions tons annually)
- Generate 25% materials landfilled & 33% global greenhouse gas emissions
- Consume \$82 billion per year energy (67 billion square feet)
- 20%-30% report IAQ problems, up to 43% in schools
- Produce \$29–168 billion in national productivity losses per year
- We will erect as many buildings in next 50 years as in last 5,000.

What is Energy Management?

- Part of sound business management
- Leaders in energy management are able to achieve superior financial performance
- Who's doing it?

Operations & Maintenance

- **O&M** are the activities related to the performance of routine, preventive, predictive, scheduled, and unscheduled actions aimed at preventing equipment failure or decline with the goal of increasing:
 - Efficiency
 - Reliability
 - Safety

Operations & Maintenance Benefits

- O&M practices save an estimated 5% to 27% on energy bills without a significant capital investment*

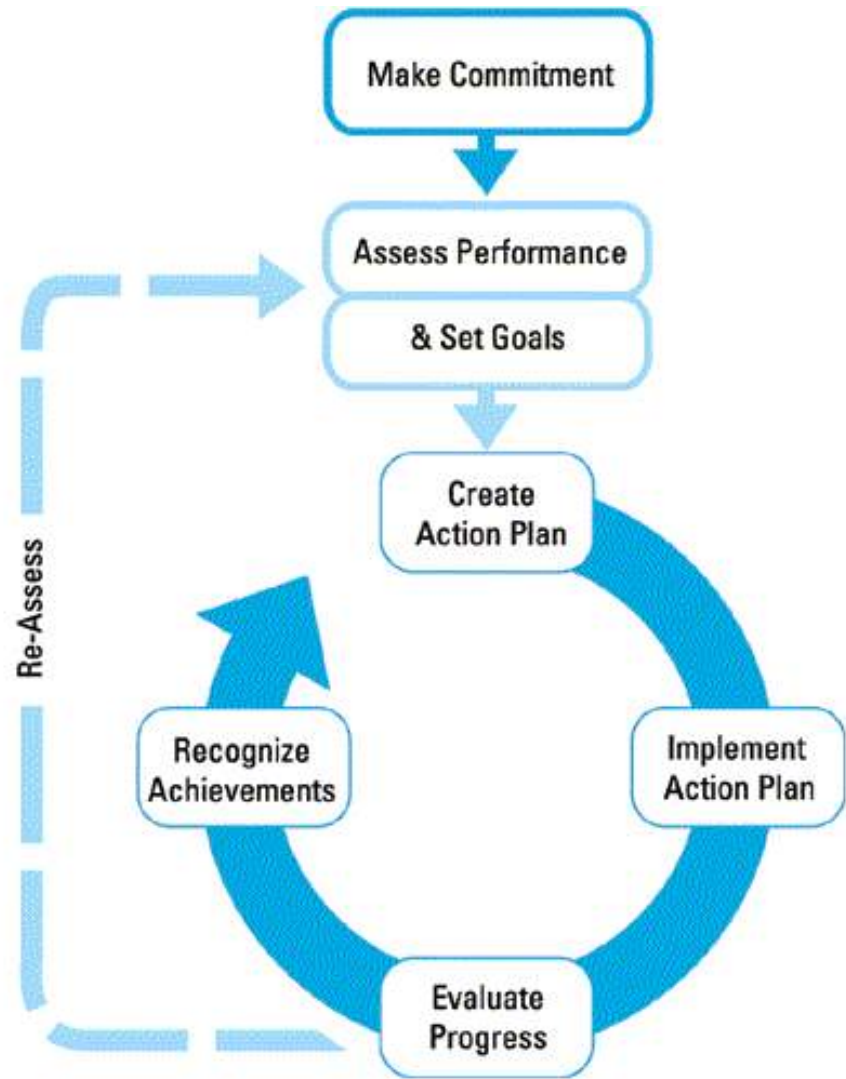
- Source: PECl. 1999. *Operations and Maintenance Assessments*. 5%-20%
- Source: Energy Forum Report, 1996 6%-27%

Operations & Maintenance Benefits

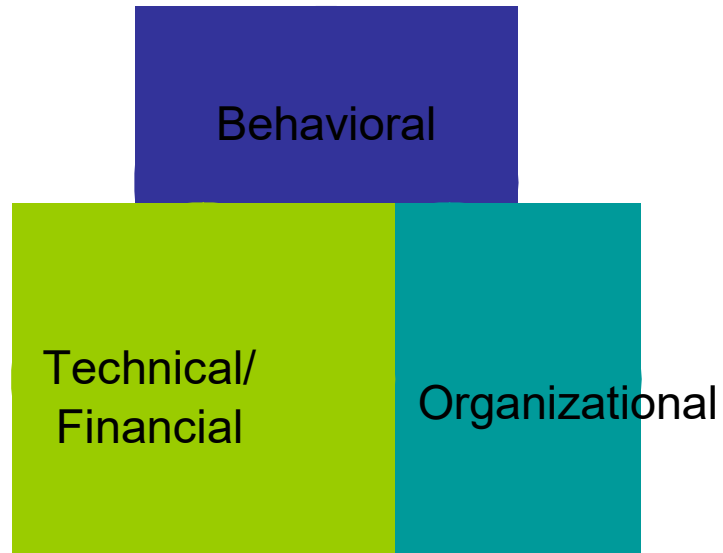
- Typically, O&M measures are low-cost or no-cost in nature.
- Many O&M measures are easily installed by in-house personnel.
- O&M measures can have immediate payback.
- These measures rarely require the design time, bid preparation, evaluation, and response, compared to capital projects that can take up to a year to implement.

Energy Management Cycle

Gain & Maintain

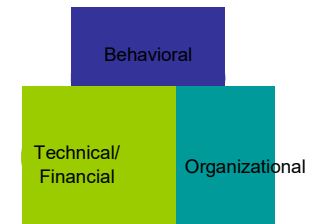


Dimensions in Energy Management



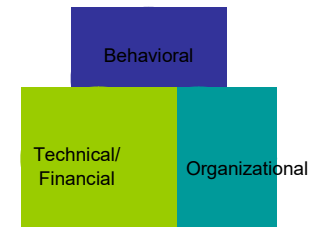
Organizational

- Become an effective energy managing organization
- Provide leadership through identifying a group of committed staff
- Develop an energy policy
- Incorporate energy management into overall management structure
- Communicate the benefits of energy management inside and outside the organization



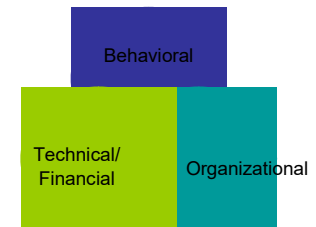
Technical / Financial

- Baseline utility consumption and cost
- Evaluate operating and maintenance budgets
- Learn how, when and where energy is used
- Learn how energy is purchased (utility rate structures)
- Report and share results



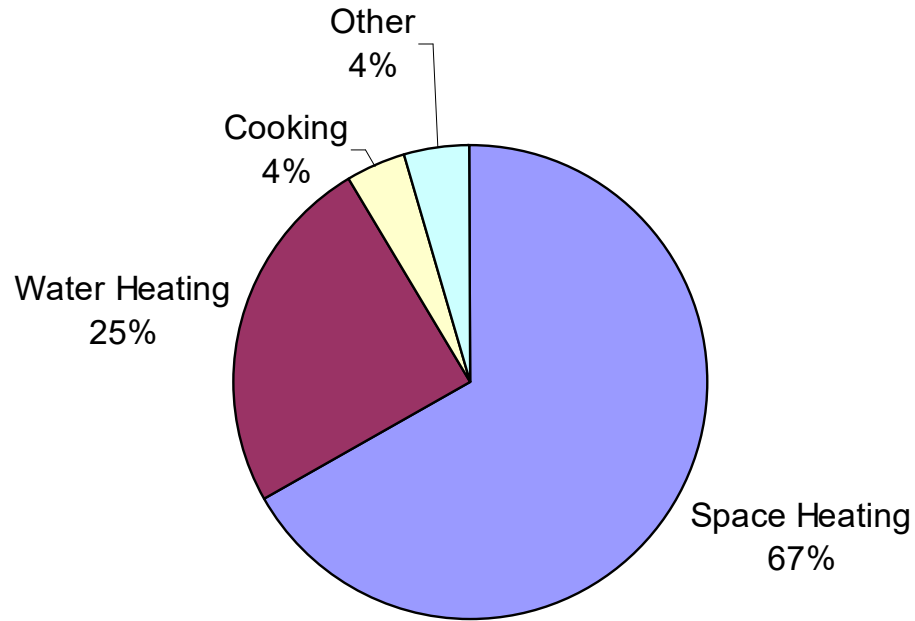
Behavioral

- Get training at all levels
- Increase awareness of resources available
- Promote the conservation ethic
- Put information into action and achieve results
- Reward participants for their efforts



Opportunity

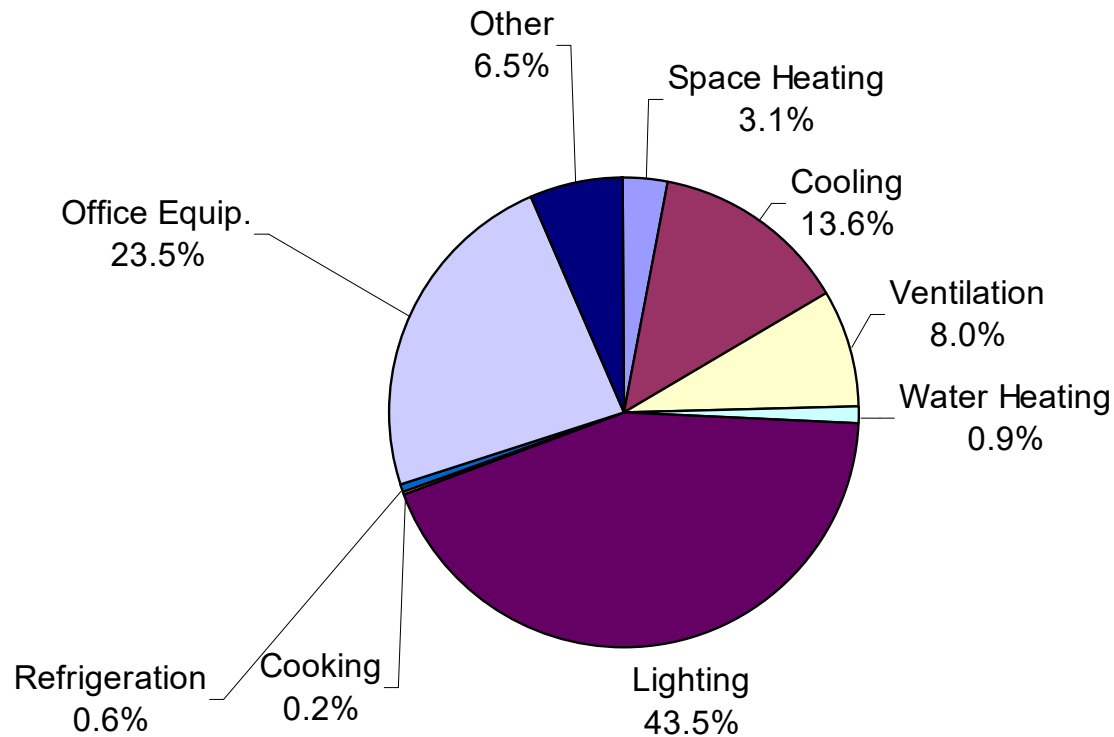
**Typical Energy End-Use for Gas
Office Facility**



•Source: Energy Information Administration's 1995 Commercial Building Energy Consumption Survey

Opportunity

**Typical Energy End-Use for Electricity
Office Facilities**

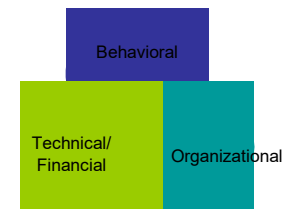


•Source: Energy Information Administration's 1995 Commercial Building Energy Consumption Survey

Energy Management for Businesses

Top 10

1. Get everyone involved
2. Set goals
3. Track utility bills monthly
4. Make low-cost and no-cost improvements immediately
5. Do preventative maintenance (tune-ups)
6. Make long-term plans for equipment maintenance and replacement
7. Upgrade to efficient equipment (office, HVAC)
8. Adjust time clock schedules
9. Set back thermostats
10. Turn off lights and computers when not needed

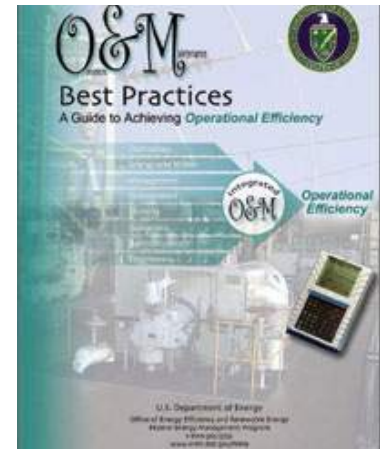
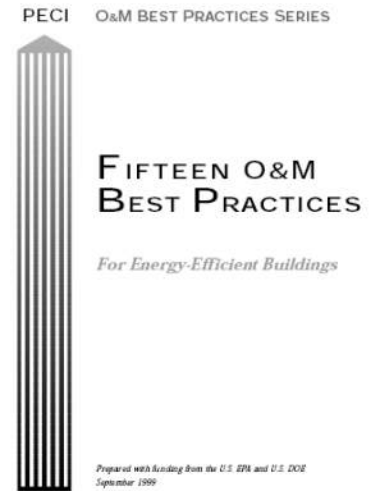


Energy Management for Businesses

Resources

- <http://www.state.co.us/oemc/>
- <http://www.eere.energy.gov/femp/>
- <http://www.energystar.gov/>

Additional Opportunity: Waste & Water!



Cost & Benefits

- EPA - every **\$1 invested** in energy efficient upgrade **yields \$2-\$3** in increased asset value. (EPA website)
- USGBC - each **\$1 invested** in upgrade **yields \$4** in market value (LEED-EB pilot)
- **50% energy savings** using thoughtful, integrated design (new construction)
 - More cost effective to make building energy-efficient at time of construction

New Construction / Retrofits

- Incorporate efficient technologies into the project;
- Evaluate the life-cycle costs of investments;
- Select an energy-wise design firm; and,
- Draft appropriate specifications

Energy Star & LEED

- Energy Management & Optimizing O&M are integral part
- Helping to change the way we design, build, and operate better buildings.
- LEED helps define what constitutes a green building
- Energy Star primarily is concerned with energy performance

Benefits (Energy Star & LEED)

- A valuable business document for leasing, appraising, selling, insuring and securing investment in your facility
- National recognition for your commitment to energy and environmental efficiency
- Economic, Health & Safety, Productivity benefits

