Implementing Your 2010 Energy Plan:
Boost Profitability with Energy-Efficient Equipment

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Meet your moderators

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Agenda

• When is the right time to replace your equipment?

• How to select which equipment to upgrade
  – Prioritization
  – Getting started

• Energy-efficient equipment explained – Kohl’s Department Success Story
  – Lighting
  – Refrigeration
  – Heating, Ventilation, Air Conditioning (HVAC)
  – Demand Control Ventilation (DCV)
  – Demand Control Ventilation – Exhaust Hoods
  – Energy Recovery Ventilation (ERV)
  – Office Equipment

• Next steps
  – Selecting a contractor
  – Financing options

• Summary
Upgrading your equipment is an important step in a company’s overall energy management plan

Energy-efficient Equipment Upgrades

• Writing and implementing an energy plan provides a strategy
  – Follow the eight-step process
  – A proven strategy for energy management developed by the EPA
  – Assists your organization in improving its energy and financial performance
  – Distinguishes your organization as an environmental leader

• Equipment upgrades are often required to maximize savings opportunities
  – Cost
  – Energy

Businesses are reducing their energy use by 30 percent or more through effective energy management practices*

* Source: EPA
Because financial investment is typically required, purchase and installment of equipment upgrades must be strategically planned

**When is the Right Time to Upgrade?**

- **Low-cost, no-cost enhancements are typically made first**
- **Ideal times to upgrade to energy-efficient models and systems**
  - As equipment fails
  - With a new facility or major remodel
  - As part of your energy plan

*Source: EPA*
Knowing the estimated life span of your equipment helps determine when to upgrade

**When Should Your Equipment Be Replaced?**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Estimated Service Life</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motors</td>
<td>Not rated in terms of operation</td>
<td>• Deterioration of insulation performance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wear of sliding parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Deterioration of bearings</td>
</tr>
<tr>
<td>Lighting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fluorescents</td>
<td>• 2 years for Fluorescent and HID lamps</td>
<td>• Turning lights off more frequently than the standard test time will diminish the life</td>
</tr>
<tr>
<td>• High Intensity Discharge (HID)</td>
<td>• Ballast operating life varies from 1 to 5.5 years based on manufacturer and type</td>
<td>• Heat and voltage transients negatively affect ballasts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Heaters</td>
<td>6, 9, or 12 years</td>
<td>Water properties (i.e., water softeners)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chillers</td>
<td>15 – 25 years</td>
<td>Good maintenance practice required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rooftop A/C</td>
<td>10 – 20 years</td>
<td>Good maintenance practice required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boilers</td>
<td>19 – 29 years</td>
<td>• Boiler type (cast-iron and steel last longer than copper-tube)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cycle times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Water type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformers</td>
<td>25 years</td>
<td>• Fluid maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Winding resistance testing</td>
</tr>
</tbody>
</table>
Determining which initiatives to start with can be difficult, especially if a significant investment is required

**Ways to Prioritize Opportunities**

- Conduct a performance assessment to determine which items account for the highest consumption
- Determine the value of your proposed investment
- Consider a staged approach
  - Accounts for the interactions among all the energy flows in your building
  - A systematic method for planning upgrades that increases energy savings
  - Each stage includes changes that affect the upgrades performed in subsequent stages, producing the greatest possible energy and cost savings
Developing estimated savings of equipment upgrades can help prioritize initiatives

### How Much Could Your Company Save?

<table>
<thead>
<tr>
<th>Upgrade to…</th>
<th>Realize Estimated Annual Savings of…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motors</td>
<td>Varies from 85 percent (1 HP) to 95 percent (&gt;75 HP) NEMA Premium Efficiency motors are 1 – 3 percent basis points more efficient than baseline motors</td>
</tr>
</tbody>
</table>
| Lighting    | • T8 fluorescent lamps from T12  
• Compact fluorescent lighting (from incandescent lighting)  
• High output fluorescent lighting (from probe start metal halide highbay lighting)  
• Up to 30 percent  
• Up to 75 percent  
• Over six times the rated life  
• Up to 30 percent |
| .5 kW/ton water cooled chiller (from .8 kW/ton) | 37 percent |
| High performance windows | Six to eight percent  
Three year payback |
| 10 EER rooftop A/C unit (from 8 EER) | 20 percent |
| Daylighting (skylights/lightpipes, clerestory windows, roof monitors) | Range from $.25/ft² to $.50/ft²  
(Depends on building type, location, office area plan and local energy cost) |
| Occupancy sensors | Classroom: 40 – 46 percent  
Private offices: 13 – 50 percent  
Restrooms: 30 – 90 percent  
Conference rooms: 22 – 65 percent  
Corridors: 30 – 80 percent  
Storage areas: 45 – 80 percent |

• National data from independent studies
Getting Started

Where To Begin

- Before deciding what investments to make, take an inventory of what equipment you have and determine what energy-saving opportunities exist.
- Companies typically focus first on equipment and systems responsible for consuming the most energy.

FPL’s Business Energy Evaluation

- As your energy partner, FPL will:
  - Evaluate your energy usage
  - Provide recommendations
  - Offer rebates
- You will receive:
  - Recommendations for installing energy improvements
  - Information about FPL’s incentive programs
  - A list of low-cost measures that will help you save energy
- Call 1-800-FPL-5566, or
- Talk to your FPL account manager, if you have one

Many tools are available to help you develop your equipment checklist.
Depending on your business type, lighting can account for 20 to 50 percent of electricity consumption

**Lighting**

**Upgrade Strategy**

1. **Evaluate lighting system for upgrade opportunities**
   - If selecting a consultant look for certifications (LC, CLS)
   - Computer models help ensure that the lighting design meets criteria for your facility

2. **Consider enhancements based on your facility type and business requirements**
   - Bulbs / lamps
   - Ballasts
   - Fixtures

3. **Evaluate control systems**
   - Bi-level switching
   - Dimmers
   - Occupancy sensors
   - Daylight sensors
New, more efficient fluorescent lighting systems offer improved light quality and practically eliminate flicker

### Fluorescent Lighting

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Watts</th>
<th>Lumens</th>
<th>CRI</th>
<th>Life (hrs, 000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T12</td>
<td>Magnetic</td>
<td>40</td>
<td>1,750</td>
<td>75-78</td>
<td>15-20</td>
</tr>
<tr>
<td>1G, T8</td>
<td>700 Series, Basic</td>
<td>32 W</td>
<td>2,800</td>
<td>75-78</td>
<td>20</td>
</tr>
<tr>
<td>2G, T8</td>
<td>800 Series</td>
<td>32 W</td>
<td>2,850 -3,000</td>
<td>82-86</td>
<td>24-30</td>
</tr>
<tr>
<td>3G, T8</td>
<td>Super, HO</td>
<td>32 W</td>
<td>2,950 - 3,200</td>
<td>82-86</td>
<td>24-30</td>
</tr>
<tr>
<td>4G, T8</td>
<td>Reduced Wattage, Energy Savers</td>
<td>23 W 25 W 28 W 30 W</td>
<td>2,000 2,400 2,750 2,850</td>
<td>82-86</td>
<td></td>
</tr>
<tr>
<td>T5</td>
<td>Suspended</td>
<td>28 W</td>
<td>2,850-3,000</td>
<td>82-86</td>
<td>24-30</td>
</tr>
<tr>
<td>T5HO</td>
<td>Highbay</td>
<td>54 W</td>
<td>5,000</td>
<td>82-86</td>
<td>24-30</td>
</tr>
</tbody>
</table>

Standard fluorescent lamps can be hidden in your facility. Be sure to check:
Suspended and recessed “troffer” fixtures, recessed “can” fixtures, wall sconces, suspended fixtures, lamps and task lighting, illuminated exit signs and exterior and facade
LEDs last much longer, but check lumens per watt output.

**Lighting**

- **Light Emitting Diodes (LEDs)**
  - Comparison with traditional lighting

<table>
<thead>
<tr>
<th>Type</th>
<th>Rated Life, hours</th>
<th>Lumens per Watt</th>
<th>CRI</th>
<th>Lumen Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED</td>
<td>50,000</td>
<td>25-80</td>
<td>70-90</td>
<td>95-98%*</td>
</tr>
<tr>
<td>Incandescent</td>
<td>750-1,500</td>
<td>10-17</td>
<td>100</td>
<td>95%</td>
</tr>
<tr>
<td>Fluorescent</td>
<td>10,000-20,000</td>
<td>60-100</td>
<td>80-86</td>
<td>90-95%</td>
</tr>
</tbody>
</table>

*At 40% fluorescent rated life; 70% to 90% at 50,000 hours

- Frequent switching does not affect rated life for LEDs as it does for fluorescents
- Directional nature of LED results in very high luminaire efficacy
- Very compact and low-profile
- Instant on (no warm-up time required)
Simple, inexpensive lamp and ballast upgrades can generate significant savings immediately and over time.

### Lighting Savings Opportunities

<table>
<thead>
<tr>
<th>Replace...</th>
<th>With...</th>
<th>Realize Estimated Annual Savings of...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent</td>
<td>New halogen</td>
<td>30 percent</td>
</tr>
<tr>
<td>Incandescent</td>
<td>CFL, R-CFL, LED</td>
<td>50-75 percent</td>
</tr>
<tr>
<td>Incandescent Spot PAR bulbs</td>
<td>Ceramic Metal Halide PAR lamps</td>
<td>30-50 percent</td>
</tr>
<tr>
<td>T12</td>
<td>T8</td>
<td>30 percent</td>
</tr>
<tr>
<td>Full-wattage F32T8 lamps</td>
<td>Reduced wattage 23W T8 lamps</td>
<td>28 percent</td>
</tr>
<tr>
<td>Standard 54W T5HO bulbs</td>
<td>Reduced wattage T5HO lamps 49W lamps; 51W lamps</td>
<td></td>
</tr>
<tr>
<td>Std. Electronic Ballasts</td>
<td>NEMA Premium Ballasts</td>
<td>Five to seven percent</td>
</tr>
</tbody>
</table>
Many control technologies are available to save money and add convenience to your lighting system.

**Lighting Controls**

- **Bi-level switching**
  - Good for offices, conference rooms and classrooms
  - Allows you to turn off half of the lights in a room when full illumination is not required
  - T8 bi-level switching ballasts

- **Dimmers**
  - T8 dimming ballasts

- **Occupancy sensors**

- **Daylight sensors (Photocells)**
  - Turn exterior lights on and off based on daylight
More Lighting Tips

- Replace lamps before they lose effectiveness
- Label electrical switches
  - Left on at all times
  - Left on during business hours only
  - Left on during occupancy hours only
- Switch to LEDs (light emitting diodes) for exit signs and holiday lights
- Use task lighting when appropriate
- Allow for natural daylight
  - Blinds to control window light
  - Sky lights and "sun tubes" to transfer solar light from the sun to a building without heat gain
  - Light shelves
  - Daylight dimming systems use small photo sensors to control each electronic ballast
- Clean and inspect your lighting systems regularly

Following these tips helps conserve energy and maximize the life of your lighting equipment
Upgrading to a more efficient system will lower operating costs and result in better quality lighting.

**FPL Lighting Incentive**

<table>
<thead>
<tr>
<th>Qualification Requirements</th>
<th>FPL Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• New system must be approved by FPL prior to installation</td>
<td>• Rebates of up to $4 per lamp on technologies such as T8, T5 or pulse-start lamps</td>
</tr>
<tr>
<td>• FPL Participating Independent Contractor must be used</td>
<td>• Incentive will be an up-front discount on the cost of the job</td>
</tr>
<tr>
<td>• Use interior lighting (includes covered parking garages) on a regular basis April 1 through October 31, any day(s) during the work week from 3 to 6 p.m.</td>
<td></td>
</tr>
<tr>
<td>• Use a hard-wired system to make permanent energy-saving lighting modifications</td>
<td></td>
</tr>
</tbody>
</table>
The Kohl’s corporation, a large national retailer, has made a commitment to energy conservation.

Kohl’s Background

- Operate 1088 stores in 49 states by year end
- Headquarters in Menomonee Falls, Wisconsin
- $17.5 billion in sales
- 130,000 + associates
Energy-efficiency initiatives support Kohl’s promise to offer value to its customers

Kohl’s Department Stores Business Focus

- Customer-focused approach
- Offering value-oriented national and private brands
- Convenient, fun shopping experience
At Kohl’s, energy-efficiency starts with control, measurement and data

**Energy-efficiency Initiatives**

- **All Kohl’s stores are controlled with a building automation system**
  - Temperatures and lighting schedules are universal and set and controlled at the corporate office
  - Occupied, maintenance and unoccupied modes
  - Measure and monitor store temperatures and energy use

- **Third party billing program**
  - Data base with usage and rates
  - Review of usage patterns
  - Data transfers to Energy Star Portfolio Manager
Energy Star’s Portfolio Manager helps you benchmark your energy usage

**Energy Star Portfolio Manager**

- Benchmarks your buildings against other similar sites
- Score 0 to 100 based on your efficiency
- Score 75 or better to earn Energy Star label for your building
- Use the data to determine your focus
Kohl’s uses Energy Star’s portfolio manager to rate its stores.

**Energy Star Scores for Kohl’s Department Stores**

The bar chart shows the frequency of Energy Star ratings for Kohl’s Department Stores. The ratings are grouped into bins, and the number of stores within each bin is indicated. For example, there are 209 stores in the bin with a rating of 80, and 206 stores in the bin with a rating of 85.
Kohl’s recommends taking advantage of technological improvements to save

**Upgrades**

- **Ceramic metal halide spot light replacement program**
  - Ceramic Metal Halide PAR 38 Relamp
  - Burn cooler which releases less heat into the stores
  - Reduces energy consumption from 75W to 24W per spotlight

- **Variable Speed Drives**
  - Motor speed is controlled by actual demand which eliminates waste caused by fixed-speed operation
  - Reduced our fan motor power consumption by 47%

- **3 to 2 lamp kit conversions for ambient lights**
  - Reduces energy consumption per fixture from 88W to 48W

- **Use utility rebate programs to help improve your ROI**
Kohl’s has realized a 5 percent improvement every year since implementing energy-efficiency improvements.
Kohl’s has reached many targeted sustainability milestones

Milestones

- 480 ENERGY STAR labeled stores
- 88 activated photo voltaic solar arrays
- 64 LEED certified buildings
- 100 percent green power in 2010
- Goal to be net zero carbon emissions in 2010, 2011, 2012
Kohl’s has benefited from positive press on its energy conservation measures and associated cultural shift.

<table>
<thead>
<tr>
<th>RANK</th>
<th>COMPANY</th>
<th>INDUSTRY SECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Kohl’s</td>
<td>Retail</td>
</tr>
<tr>
<td></td>
<td>&quot;Has the largest solar power program...&quot;</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Staples</td>
<td>Retail</td>
</tr>
<tr>
<td></td>
<td>&quot;Along with other office supply companies,...&quot;</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Gap</td>
<td>Retail</td>
</tr>
<tr>
<td></td>
<td>&quot;Its program to address concerns about...&quot;</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>J.C. Penney</td>
<td>Retail</td>
</tr>
<tr>
<td></td>
<td>&quot;Shows environmental leadership in an industry...&quot;</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Macy’s</td>
<td>Retail</td>
</tr>
<tr>
<td></td>
<td>&quot;Has installed solar panels on more...&quot;</td>
<td></td>
</tr>
</tbody>
</table>
Kohl’s has been rewarded and recognized for its energy conservation efforts

Awards and Recognition

• Energy Star *Partner of the Year*
• Energy Star *Design to Earn*
• Newsweek *#1 Green Retailer*
• Green Power *Partner of the Year*

Learn more about Kohl’s environmental progress at: [www.kohlsgreenscene.com](http://www.kohlsgreenscene.com)
Grocery stores, convenience stores and restaurants can attribute 25 to 60 percent of their energy use to refrigeration.

**Refrigeration**

**Upgrade Strategy**

1. **Use savings calculators to evaluate potential payback**

2. **Identify key product requirements based on your business needs**

3. **Source qualified products**

4. **Determine where to buy**

5. **Understand installation requirements**

6. **Develop and implement a maintenance plan**
Your facility’s size and type combined with your business needs determine the type of refrigeration system used

**Refrigeration**

- Many advances have been made in commercial refrigeration technology
  - Cost effective
  - Improve product quality
- Types of refrigeration systems
  - Central refrigeration system
    -- Refrigerated spaces connected to a remote condenser
    -- Emit waste heat outside of the conditioned space through the condenser
  - Stand-alone refrigeration system (Merchandiser)
    -- The case, evaporator and condenser are packaged in a single unit

Technology options can save considerably on electricity used for refrigeration.

Save:
- 10 percent with energy-efficient case lighting
- 3 to 10 percent with floating head pressure controls
- 5 to 13 percent with energy-efficient fan motors
- 1 to 6 percent with defrost controls
- 3 to 9 percent with evaporative condensers
Today, many features are available in refrigeration that can maximize energy efficiency

**Refrigeration Efficiency Opportunities**

- **When purchasing commercial refrigerators and freezers, consider the following energy-saving features:**
  - Premium insulation packages where available for walk-in coolers
  - National Electrical Manufacturers Association (NEMA) premium motors and/or variable speed drives on evaporator and condenser fans
  - Oversized condensers to supercool refrigerant
  - Humidistat controlled anti-sweat heaters, instead of timers, for large display systems
  - Evaporative condensers
  - Defrost controls, instead of timers, that measure frost accumulation and humidity
  - Floating head pressure systems and/or liquid pressure amplifier pumps
  - Glass door cases (instead of open door cases)
  - Heat recovery from compressors and condensers to provide hot water
  - Automatic door closers (with appropriate interior safety releases)

Compared to standard models, ENERGY STAR labeled commercial refrigerators and freezers can lead to as much as 35 percent energy savings with a 1.3 year payback
Regularly scheduled maintenance ensures that your refrigeration systems are working effectively and efficiently

**Refrigeration Maintenance Tips**

- **Engage a qualified refrigeration contractor in a maintenance contract with seasonal tune-ups**
  - During these tune-ups, a technician should check combustion efficiency, refrigerant level, and belt tension as applicable.

- **Properly load the unit**
  - Overloaded refrigeration units result in disrupted airflow while under loaded units are using more energy than needed.

- **Clean cooling coils regularly to ensure proper airflow and heat transfer**

- **Consult your refrigeration professional when considering any modification to an existing refrigeration system that involves changing refrigerants**
With anti-sweat heater controls and equipment, building owners save energy and money

**FPL Refrigeration Incentive**

<table>
<thead>
<tr>
<th>Qualification Requirements</th>
<th>FPL Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install one or more of these technologies:</td>
<td>• Up to $75 per kilowatt (kW) reduction for the installation of qualifying controls and equipment that reduce electric strip heater usage in refrigeration equipment</td>
</tr>
<tr>
<td>• Electric strip heaters around display case doors using automatic controls with humidistats to turn off heaters when not needed, or controls that stagger defrost cycles</td>
<td>• The incentive amount is based on the manufacturer documentation indicating potential kW reduction</td>
</tr>
<tr>
<td>• Special glass doors for reach-in display cases that require minimum or no anti-sweat heat</td>
<td></td>
</tr>
<tr>
<td>• Freezer doors that incorporate hot gas reclaim, reducing or eliminating the need for electric strip heaters normally used for defrost control</td>
<td></td>
</tr>
<tr>
<td>• Documentation must be provided by the manufacturer indicating the potential kW reduction of equipment installed</td>
<td></td>
</tr>
</tbody>
</table>
High-efficiency A/C units reduce cooling costs, which can account for up to half of a Florida business’s energy costs

Heating Ventilation and Air-Conditioning (HVAC) Upgrade Strategy

1. Reduce load on existing system(s)
2. Get quotes
   - Compare cost of standard unit to high efficiency unit, including lifecycle costs
   - Request that your HVAC professional conduct an Air Conditioning Contractors of America’s (ACCA) Manual N Commercial Load Calculation to ensure proper sizing
3. Consider system enhancements based on your facility type and business requirements
   - Heating / Cooling unit upgrade
   - Energy Recovery Ventilation (ERV) system
   - Chiller
   - Thermal Energy Storage
4. Evaluate control systems to manage your new system’s load
   - Demand Control Ventilation (DCV)
   - Programmable thermostat
   - Multiple zones
Upgrading a 10-ton unit from a 10.3 to a 13 EER system would produce an annual savings of $770

Sample Annual Savings: Direct Expansion Air Conditioner and Heat Pumps

<table>
<thead>
<tr>
<th>Annual Hours of Operation</th>
<th>10.5 EER</th>
<th>11 EER</th>
<th>11.5 EER</th>
<th>12 EER</th>
<th>12.5 EER</th>
<th>13 EER</th>
<th>13.5 EER</th>
<th>14 EER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>$29</td>
<td>$96</td>
<td>$157</td>
<td>$213</td>
<td>$265</td>
<td>$312</td>
<td>$356</td>
<td>$397</td>
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<tr>
<td>1500</td>
<td>$35</td>
<td>$116</td>
<td>$190</td>
<td>$258</td>
<td>$320</td>
<td>$378</td>
<td>$431</td>
<td>$481</td>
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<td>2500</td>
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<td>$156</td>
<td>$255</td>
<td>$347</td>
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<td>3500</td>
<td>$59</td>
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<td>$321</td>
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<td>4500</td>
<td>$71</td>
<td>$236</td>
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<td>$453</td>
<td>$614</td>
<td>$763</td>
<td>$901</td>
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<td>$1,146</td>
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<tr>
<td>6500</td>
<td>$95</td>
<td>$316</td>
<td>$518</td>
<td>$704</td>
<td>$874</td>
<td>$1,032</td>
<td>$1,177</td>
<td>$1,313</td>
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<td>$107</td>
<td>$356</td>
<td>$584</td>
<td>$793</td>
<td>$985</td>
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<td>$1,327</td>
<td>$1,479</td>
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<tr>
<td>8500</td>
<td>$119</td>
<td>$396</td>
<td>$650</td>
<td>$882</td>
<td>$1,096</td>
<td>$1,293</td>
<td>$1,476</td>
<td>$1,646</td>
</tr>
</tbody>
</table>

Based on an existing 10-ton unit with an EER of 10.3, operating 10 months a year at $.082/kwh and $9.10/kwd rate plus 10 percent tax.

Even if your air conditioner is only 10 years old, you may save 20 percent on your cooling energy costs by replacing it with a newer, more efficient model.
Approximately half of all U.S. commercial floor space is cooled by self-contained packaged air-conditioning units that have recently-improved energy-efficiency standards

Packaged Rooftop Air Conditioners

- **Self-contained units that sit on rooftops**
- **Mass-produced machines include:**
  - Cooling equipment
  - Air-handling fans
  - Gas or electric heating equipment (sometimes)
- **Available in sizes ranging from one to more than 100 tons of air-conditioning capacity**
- **Energy-efficiency considerations**
  - Select the right size
  - Consider high-efficiency levels recommended by the Consortium for Energy Efficiency
  - Evaluate high-efficiency models by performing a cost-effectiveness calculation
  - Pay attention to design, commissioning and maintenance

| Unitary Air Conditioner Minimum Efficiency Requirements ASHRAE 90.1-2004 |
|-----------------------------|-------------------|-------------------|
| **Size Range**              | **Pre-2010**      | **As of 2010**    |
| 65-135 kBtu/hr (5-11 ton)   | 10.3              | 11.2              |
| 135-240 kBtu/hr (11-20 ton) | 9.7               | 11.0              |
| 240-760 kBtu/hr (20-63 ton) | 9.5               | 10.0              |
| >760 kBtu/hr (>63 ton)      | 9.2               | 9.7               |
Even if your air conditioner is only 10 years old, you may save 20 percent on your cooling costs by replacing it with a newer, more efficient model.

**FPL Incentive on A/C Equipment**

<table>
<thead>
<tr>
<th>Qualification Requirements</th>
<th>FPL Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduced cooling costs</td>
<td>Rebate on qualifying high efficiency split/packaged DX unit</td>
</tr>
<tr>
<td>• Lower maintenance costs</td>
<td>• Replacements</td>
</tr>
<tr>
<td>• Comfortable environment for employees and customers</td>
<td>• Units installed during new construction</td>
</tr>
<tr>
<td></td>
<td>• Rebates vary by size, type and efficiency of the new unit</td>
</tr>
<tr>
<td></td>
<td>• Air-, water- or evaporative-cooled A/C or heat pump</td>
</tr>
<tr>
<td></td>
<td>• Room units, including package terminal A/C or heat pump</td>
</tr>
</tbody>
</table>
Demand Control Ventilation (DCV)

What is DCV?

- A system that controls a building’s ventilation based on carbon dioxide (CO2) concentration
  - Sensors monitor the CO2 levels and send a signal to the HVAC system
  - Brings in only the air necessary for the actual occupancy
- Best for businesses with long operating hours, where occupancy varies greatly and is unpredictable
  - Stores, supermarkets, theaters and places of worship

Benefits to DCV

- Easily added to existing HVAC systems
- Reduces A/C costs by up to 10 percent or more annually
- Helps HVAC equipment operate more efficiently and last longer
- Maintains indoor air quality and comfort more efficiently

Demand Control Ventilation adjusts ventilation rates based on actual occupancy at any given time
Demand control ventilation is a more efficient and affordable way to meet fresh air requirements and lower energy costs

**FPL’s Demand Control Ventilation Incentive**

<table>
<thead>
<tr>
<th>Qualification Requirements</th>
<th>FPL Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Your system must be designed to reduce outside air flow at low occupancy</td>
<td>Rebate on DCV systems based on:</td>
</tr>
<tr>
<td>• Your system must modulate outside air flow based on real-time sensor readings</td>
<td>• Building type</td>
</tr>
<tr>
<td>• Documentation is required and must include design documents and sequence of operation</td>
<td>• Number of sensors required</td>
</tr>
<tr>
<td></td>
<td>• Square footage of air conditioned space</td>
</tr>
</tbody>
</table>

**Example of CO2 Sensors:**
A 20,000 square foot retail store would earn an $1,080 incentive, based on installing at least 4 or more CO2 sensors.
Kitchen Demand Control Ventilation (DCV)

What is Kitchen DCV?

- A system that uses variable speed fan control to reduce exhaust and airflow when appliances are not being used to capacity or are turned off

Benefits to Kitchen DCV

- Cost savings
  - Businesses can save up to 50 percent a year in ventilation energy costs
  - Saves on cooling cost
    -- Hood operation is reduced and therefore less conditioned air is exhausted
  - Incremental cost for a kitchen DCV system is around $0.4 per cfm

- Eliminates Kitchen Hood Overuse
  - Increases Hood Efficiency
  - Hoods last longer

- Ensures proper IAQ
New and existing facilities can qualify for incentives on FPL’s Kitchen DCV or CO2 sensors

### FPL’s Kitchen DCV Incentive

<table>
<thead>
<tr>
<th>Qualification Requirements</th>
<th>FPL Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• For CO2 sensors the customer must submit:</td>
<td></td>
</tr>
<tr>
<td>‒ Preliminary design drawings, final as-built drawings, equipment schedules, and operating sequences</td>
<td></td>
</tr>
<tr>
<td>‒ Limited to 5,000 square feet per occupancy sensor installed</td>
<td></td>
</tr>
<tr>
<td>• For kitchen DCV:</td>
<td></td>
</tr>
<tr>
<td>‒ A copy of the hood manufacturer specifications listing airflows of the exhaust and make-up air fans must be submitted</td>
<td></td>
</tr>
<tr>
<td>‒ Test and Balance Report showing both exhaust and make-up airflows for the fans can be substituted for the hood manufacturer specifications</td>
<td></td>
</tr>
<tr>
<td>‒ FPL pre-approval required</td>
<td></td>
</tr>
<tr>
<td>• Rebate on CO2 sensors based on:</td>
<td></td>
</tr>
<tr>
<td>‒ Square footage of air conditioned space</td>
<td></td>
</tr>
<tr>
<td>‒ Type of facility</td>
<td></td>
</tr>
<tr>
<td>• Incentive is determined by cubic feet per minute (CFM) of exhaust flow of existing hood(s)</td>
<td></td>
</tr>
</tbody>
</table>

**Example of Kitchen Hood Controls:**

A 5,000 CFM exhaust hood with VFD speed drives controlled by usage sensors could earn an $1,663 incentive.
Energy Recovery Ventilation (ERV)

What is ERV?

- Commercial buildings are required to bring in fresh air – typically 15-20 cubic feet per minute (cfm) for every occupant.
- The unconditioned fresh air greatly increases a building’s air conditioning load.
- Since an equal amount of air must be vented outdoors, air you’ve paid to cool is basically being thrown away.
- ERV systems help reduce waste and lower energy costs.

Benefits to ERV

- Reduces peak A/C load by as much as 20 percent.
- Can cut total energy costs by as much as 10 percent per year.
- Reduces energy waste and increases heating and cooling efficiency levels by up to 40 percent.
- Controls indoor humidity, which prevents mold and mildew.

An energy recovery ventilation system reclaims waste energy from the exhaust air stream and uses it to condition incoming fresh air.
A redesigned air conditioning system with ERV helped the Museum of Art/Fort Lauderdale yield success

**Case Study**

**Customer:**
- Museum of Art / Fort Lauderdale (MoA/FL)

**Problem:**
- 20-year-old chillers were ineffective at maintaining humidity and temperature levels needed in a museum environment.
- The MoA/FL also wanted to become one of four U.S. locations to attract the King Tut exhibit. Stringent requirements exist for protecting the 3,500 year old artifacts.

**Solution:**
- A redesigned air conditioning system with Energy Recovery Ventilation

**Results:**
- Won the exhibit and over 700,000 visitors
- 31,000 kWh/yr savings
- Cooling reduction of 48 tons
- Total energy cost savings of $5,966/yr
- FPL incentive of $16,482

“We welcomed 700,000 people to the King Tut exhibit. Our new cooling system did its job to keep indoor temperatures cool and humidity under control – which is an essential part of our existence.”

– Anthony Lauro, Museum of Art/Fort Lauderdale
FPL offers incentives for installing a qualifying ERV unit

FPL Incentive on ERV Systems

<table>
<thead>
<tr>
<th>Qualification Requirements</th>
<th>FPL Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td>To qualify for FPL’s ERV incentive, your system must:</td>
<td>Rebate on qualifying ERV units:</td>
</tr>
<tr>
<td>• Be an enthalpy wheel or plate type ERV system.</td>
<td>• Replacements</td>
</tr>
<tr>
<td>• Control humidity using either desiccant or moisture transfer membranes</td>
<td>• Units installed during new construction</td>
</tr>
<tr>
<td>• Be listed on the ARI Web site (<a href="http://www.ari.org">www.ari.org</a>) with at least a 50% total cooling effectiveness rating</td>
<td>• Based on size and efficiency of the ERV unit as well as the heating type for the HVAC system</td>
</tr>
<tr>
<td>• Be installed by an FPL Participating Independent Contractor (for HVAC systems smaller than 65,000 BTU/hour)</td>
<td></td>
</tr>
</tbody>
</table>
Selecting experienced, competent contractors and energy professionals is critical to the success of your project

**Selecting a Contractor**

- Ask for multiple references and be sure to check them
- Get written cost estimates
- Only hire contractors who are licensed and insured
- Ask your contractor to certify that the work conforms to state and local regulations and codes
- Verify that the contractor carries workers compensation insurance
- Make sure that the contractor is experienced and is using energy-efficient equipment
Using energy-efficient office equipment and control systems can save money and electricity while enhancing workers’ comfort

Office Equipment

Why Focus on Office Equipment

• Building operators and owners are wasting money on office equipment that is not shut off
  – In many offices and businesses, computers, printers, copiers, task lights, fans and other devices are left on, in some cases, for 24 hours a day, 365 days a year
  – An estimated 80 percent of printers, 70 percent of copiers, and 20 to 30 percent of computer monitors and task lights are left on overnight

Upgrade Strategy

1. Evaluate current equipment and usage habits
2. Identify opportunities to add control mechanisms to power off unused equipment
   – Computer power-management software
   – Smart power strips
3. When equipment requires replacement, consider more energy-efficient models
   – LCD monitors
Offices can save approximately $70/year per computer just by using Sleep Mode

**Potential Savings on Computer Equipment**

<table>
<thead>
<tr>
<th>Device</th>
<th>Typical Operating Power (Watts)</th>
<th>Typical Idle Power (Watts)</th>
<th>Typical Sleep Power (Watts)</th>
<th>Annual Energy Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8 Hours/Day, 5 Days/Week, Sleep Mode*</td>
</tr>
<tr>
<td>Desktop Computer</td>
<td>100</td>
<td>60</td>
<td>6</td>
<td>$12</td>
</tr>
<tr>
<td>CRT Monitor (15&quot;)</td>
<td>60</td>
<td>40</td>
<td>4</td>
<td>$7.70</td>
</tr>
<tr>
<td>LCD Monitor (17&quot;)</td>
<td>35</td>
<td>8</td>
<td>2</td>
<td>$2.50</td>
</tr>
<tr>
<td>Laptop</td>
<td>65</td>
<td>15</td>
<td>1</td>
<td>$4.60</td>
</tr>
<tr>
<td>Laser Printer</td>
<td>350</td>
<td>85</td>
<td>20</td>
<td>$26</td>
</tr>
<tr>
<td>Fax Machine</td>
<td>300</td>
<td>75</td>
<td>10</td>
<td>$12</td>
</tr>
<tr>
<td>Copier (small)</td>
<td>300</td>
<td>75</td>
<td>20</td>
<td>$13</td>
</tr>
<tr>
<td>Copier (large)</td>
<td>1,400</td>
<td>350</td>
<td>40</td>
<td>$55</td>
</tr>
</tbody>
</table>

*Assumes $0.10/kWh, 2085 operating hours per year, 20% full power, 60% overall idle mode, 20% sleep mode for computers and monitors, 50% idle mode and 45% sleep mode for printers, faxes, and copiers. Equipment is turned off for 6675 hours.

**Assumes $0.10/kWh, 8760 operating hours per year, same 8-hour/5-day mode, and either sleep or idle for non-work hours (work day nights and weekends). Equipment is never turned off.

Sources: Manufacturers’ specifications, Energy Star (DOE), and Office Equipment Energy Savings Calculator (LBL)
Offices with many computers can benefit from switching to LCD panel monitors and using computer-power management software

**Computer Savings Opportunities**

**Computer monitors**

- **Select LCD over CRT**
  - Over the course of its lifetime, the LCD monitor will save more than $100 in energy costs compared to a similar CRT monitor and will last nearly three times as long

- **Look for the Energy Star label**
  - Long-term energy savings will typically outweigh any initial price difference

- **Choose the smallest monitor that meets your needs**

**Power-management settings**

- **Encourage employees to enable and use the existing power-management capabilities of their PCs**

- **Have your IT expert develop and deploy logon scripts that control power-management settings**

- **Use third-party software to establish and implement a computer power-management policy across the company LAN or WAN**

Office computer monitor energy costs exceed $250 million and account for roughly 4 billion pounds of carbon dioxide emissions
Smart power strips add up to significant savings by powering off office equipment that is not in use

**Smart Power Strips**

- **Use monitors, timers and sensors to turn off unused equipment**
- **Control a variety of devices that can be turned off when not in use**
  - Calculators
  - Coffee warmers
  - Space heaters
  - Computer monitors
- **Plug devices that must stay on into outlets that are not controlled by smart power strips**
  - Fax machines
  - Modems
  - Computer processing units
  - Certain printers

In most cases, smart power strips can save enough electricity to enable payback periods of less than two years!

Employee personal appliances circumvent energy-efficiency efforts and can cost up to $135 annually per office

<table>
<thead>
<tr>
<th>Appliance</th>
<th>Average Power (watts)</th>
<th>Annual Operating Hours</th>
<th>Annual Energy (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Heater</td>
<td>1,500</td>
<td>500</td>
<td>750</td>
</tr>
<tr>
<td>Mini-fridge, 3ft³</td>
<td>150</td>
<td>Year-round</td>
<td>320</td>
</tr>
<tr>
<td>Microwave</td>
<td>1,000</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>Portable Fan</td>
<td>180</td>
<td>500</td>
<td>90</td>
</tr>
<tr>
<td>Coffee Pot/Warmer</td>
<td>300</td>
<td>250</td>
<td>75</td>
</tr>
</tbody>
</table>

Sample Appliance Costs
Whether your company is large or small, many financing options exist to help fund energy efficiency improvements.

**Financing Options for Small and Large Companies**

- The options that are right for your company depend upon factors such as:
  - Company size
  - Risk tolerance
  - Credit rating
  - Enhancement type
  - Savings impact

<table>
<thead>
<tr>
<th></th>
<th>SMALL / MEDIUM</th>
<th>LARGE / CI</th>
<th>MUNICIPAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebates &amp; Incentives</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Utility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal, State &amp; Local</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Foundations &amp; Non-Profits</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Performance Contracting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guaranteed Savings</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Shared Savings</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Paid-from Savings</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Purchasing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Loans</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td></td>
<td></td>
<td>x*</td>
</tr>
<tr>
<td>Leasing</td>
<td></td>
<td></td>
<td>x*</td>
</tr>
<tr>
<td>Operating Lease</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Municipal Lease</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Capital Lease</td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>
FPL will provide you with the tools needed to identify and implement your equipment upgrade program. Start the process with a Business Energy Evaluation

**Summary Slide**

- Get started with a Business Energy Evaluation
  - Call 1-800-FPL-5566, or
  - Talk to your FPL account manager, if you have one
- Identify upgrade requirements
- Determine timing
- Use resources available to make smart purchase decisions

- To access previous webinars
  - Developing Your 2010 Energy Plan: Eight Essential Steps You Need to Know
    -- [Eight steps to building your energy plan](http://www.fpl.com/business/savings/energyadvisor.shtml)
  - Funding Your 2010 Energy Plan: Valuable Financial Tips and Resources
    -- [Resources available to finance your energy plan](http://www.fpl.com/business/savings/energyadvisor.shtml)