

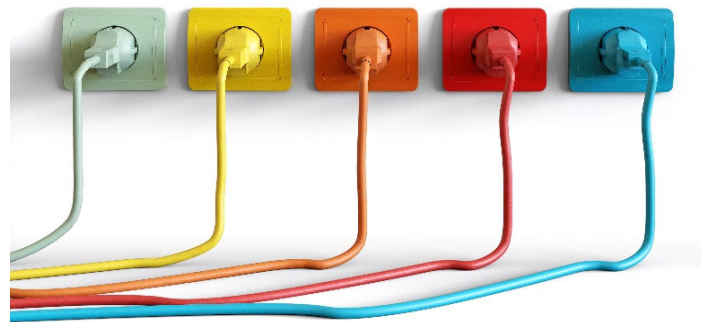
Highlighting Plug Load Devices in Energy Efficiency Programs



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ComEd®
Energy Efficiency Program




Creating Connections. Powering Innovation. Boosting Efficiency.

www.calplug.org

CalPlug
CALIFORNIA PLUG LOAD RESEARCH CENTER

Plug Load Challenges

- Plug load problem is increasing
 - Challenging to address in energy efficiency programs
 - Large number of small problems add up
 - Low energy consumption per device
 - Energy saving features only work if enabled
 - Vampire load
 - Diversity of products
 - Diversity of usage patterns
- 

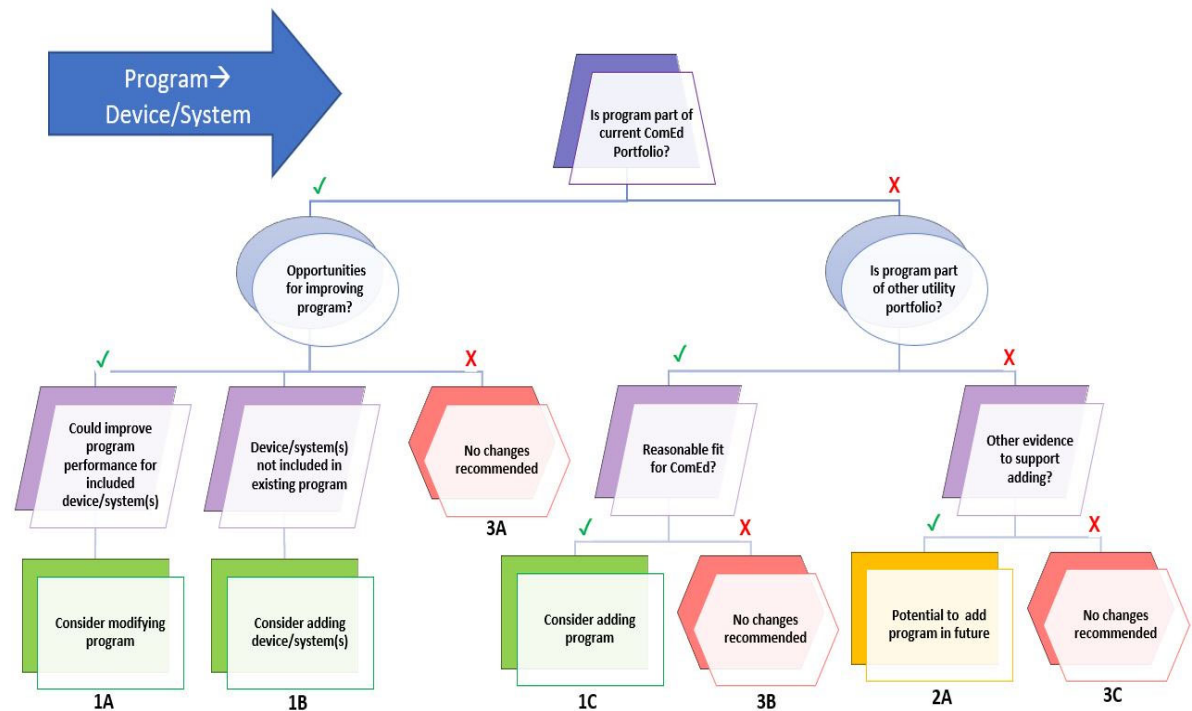


Highlighting Plug Loads in ComEd's Commercial EE Programs

- Identify list of key plug load devices
- Review and categorize ComEd's current EE programs
- Repeat for EE programs offered by 18 comparison utilities
- Systematically compare ComEd's programs to:
 - Comparison utilities
 - Best practices
 - Device list

Project goal: Identify possible improvements to ComEd's portfolio

Along the way: Ideas for utilities overall



Plug Load Devices to Consider

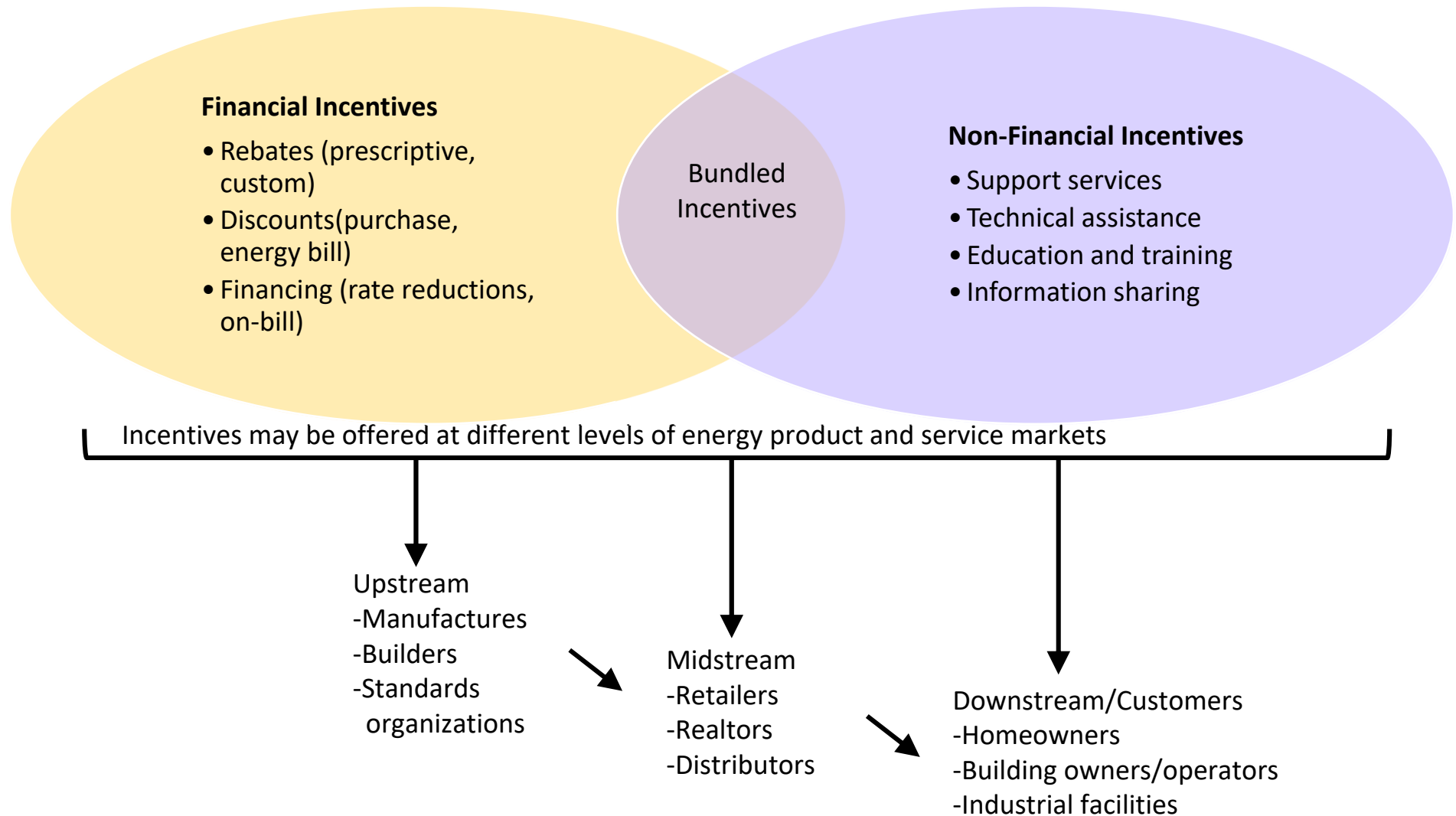
Device	1A EE Device	1B Controlled Device	2A Control System
Computer/Imaging			
Computer, Desktop	✓	✓	
Computer Monitor	✓	✓	
Computer, Laptop	✓	✓	
Printer/Copier	✓	✓	
Scanner		✓	
Multi-function device		✓	
Plotter		✓	
Networking/Servers			
Servers	✓		
UPS Units	✓		
Network Switch			
Audio/Video			
Television	✓	✓	
Projector		✓	
Audio system		✓	
Speakers		✓	
Hardware Power Management			
Advanced Power Strip, Tier 1			✓
Advanced Power Strip, Tier 2			✓
Smart Plug			✓
Plug Load Occupancy Sensor			✓
Office Miscellaneous			
Paper Shredder		✓	
Task/Desk/Floor Lamp		✓	
Room AC	✓	✓	
Dehumidifier	✓	✓	
Space Heater		✓	
Fan		✓	
Business equipment			
Cash Register	✓		

Device	1A EE Device	1B Controlled Device	2A Control System
Kitchen Equipment			
Residential Freezer	✓		
Residential Refrigerator	✓		
Mini-Refrigerator	✓		
Commercial Freezer	✓		
Commercial Refrigerator	✓		
Residential Dishwasher	✓		
Commercial Dishwasher	✓		
Commercial Oven	✓		
Fryer	✓		
Hot Food Holding Cabinet	✓		
Griddle	✓		
Wrap Machine	✓		
Steam Cooker	✓		
Refrigerated Vending Machine	✓		
Vending Machine Control/Miser (Refrigerated)			✓
Ice machine	✓		
Microwave		✓	
Coffee Maker		✓	
Espresso Machine		✓	
Toaster/Toaster Oven		✓	
Hot Water Dispenser		✓	
Water Cooler	✓	✓	
Laundry			
Clothes Dryer	✓		
Commercial Clothes Washer	✓		
Residential Clothes Washer	✓		
Utility and Maintenance			
Pool Pump (VSD)	✓		



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Type of EE Program Incentives



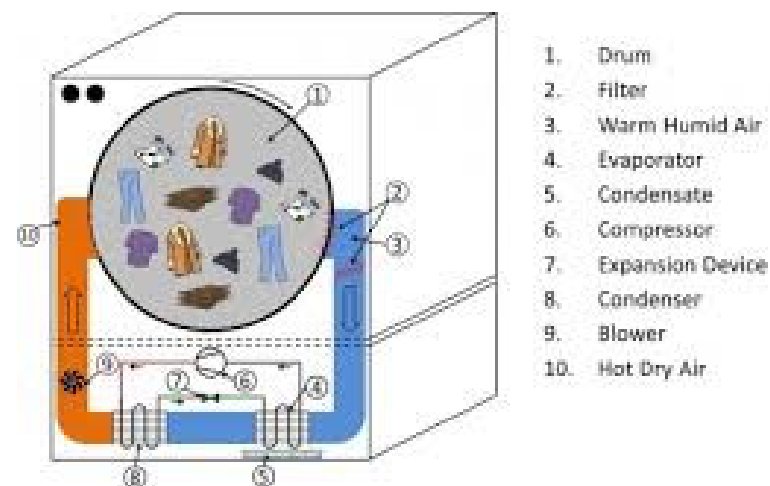
Source: National Action Plan for Energy Efficiency (2010)



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Standard Downstream Incentives

- **Rebates to encourage buying energy efficient devices**
- **Types of potential improvements:**
 - **Include device not currently in portfolio** (e.g., heat-pump and hybrid clothes dryers, room AC units)
 - **Extended standard incentives for residential customers to commercial customers** (e.g., dehumidifiers, residential-grade refrigerators for break rooms, clothes washers for multifamily buildings)
 - **Increase incentive amount and/or use a range rather than single amount can help with uptake** (e.g., larger commercial refrigerators and freezers)
- **Make standard incentives easy to find!**
(and call them rebates...)



Standard Incentives Example: Efficiency Vermont

Find Your Rebates

What product or service are you looking for rebates on?

All Products & Services

For what type of building?

All Building Types

Search



To view ratings, read customer reviews, and compare the most efficient products on the market, visit our [marketplace](#).

Featured Residential Rebates



FOR RESIDENTIAL & BUSINESS
Heat Pump Water Heaters

Up to
\$800
cash back

Details



FOR RESIDENTIAL & BUSINESS
Heat Pump Heating & Cooling System

Up to
\$500
off

Details

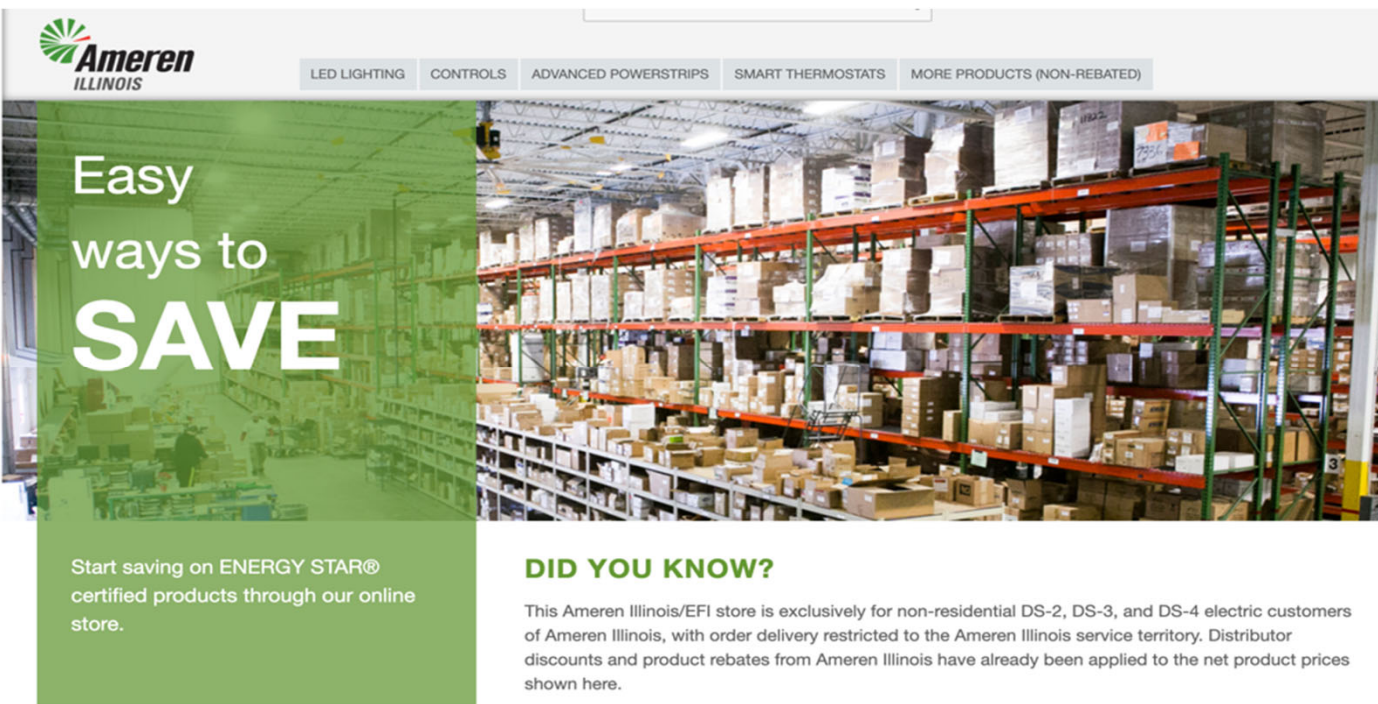


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Marketplace 1

➤ Online marketplace store

- Sell incentivized products on utility webpage
- COVID – compatible program
- Common program for residential customers, but not commercial
- Example:
 - Ameren IL offers discounted APS, desk lamps, v-notched belts, pre-rinse spray valves, LEDs, smart thermostats, and exit signs
 - 2019 NTG (net-to-gross) results: APS devices achieved 100% of targeted energy savings, smart thermostat category achieved 101%, and lighting savings realized 94%.



The screenshot shows the Ameren Illinois online marketplace store. At the top, there is a navigation bar with the Ameren Illinois logo and several category links: LED LIGHTING, CONTROLS, ADVANCED POWERSTRIPS, SMART THERMOSTATS, and MORE PRODUCTS (NON-REBATED). Below the navigation bar, there is a large image of a warehouse filled with boxes on shelves. Overlaid on the left side of the image is a green box with the text "Easy ways to SAVE". Below this, there is a green box with the text "Start saving on ENERGY STAR® certified products through our online store." To the right of the warehouse image, there is a section titled "DID YOU KNOW?" with the following text: "This Ameren Illinois/EFI store is exclusively for non-residential DS-2, DS-3, and DS-4 electric customers of Ameren Illinois, with order delivery restricted to the Ameren Illinois service territory. Distributor discounts and product rebates from Ameren Illinois have already been applied to the net product prices shown here."

Ameren ILLINOIS

LED LIGHTING CONTROLS ADVANCED POWERSTRIPS SMART THERMOSTATS MORE PRODUCTS (NON-REBATED)

Easy ways to **SAVE**

Start saving on ENERGY STAR® certified products through our online store.

DID YOU KNOW?

This Ameren Illinois/EFI store is exclusively for non-residential DS-2, DS-3, and DS-4 electric customers of Ameren Illinois, with order delivery restricted to the Ameren Illinois service territory. Distributor discounts and product rebates from Ameren Illinois have already been applied to the net product prices shown here.

Marketplace 2

- **EE product brokering platform**
 - **Common platform site where customers can:**
 - **See Enervee scores for products**
 - **Obtain verified product reviews**
 - **Compare prices for models across retailers**
- **Common program for residential customers, but not commercial**
- **Example: PG&E Residential Marketplace**

PG&E Marketplace

Search all major retailers at once and find energy efficient products.

Search by type, brand, model...

Search



Thermostats
\$



Connected
Home
Applications



Connected
Homes



Gas Water
Heaters



Electric Water
Heaters
\$



Portable
Power Stations



Explore More
Categories

We help you find your perfect product



The Enervee Score

Our algorithms analyze and score products daily based on their energy efficiency.



All reviews in one place

One rating that combines reviews from leading retailers and trusted experts.



Get the best deals

Track price drops and get notified when it's time to buy your favorite products.

Midstream Programs

- **Plug load products sold through third-party vendors**
 - **Retailers**
 - **Distributors**
- **Advantages**
 - **Lower implementation cost per kWh**
 - **Lower measure cost per kWh**
 - **Streamlined promotion of multiple types of end-uses**
 - **Integrates with direct install measures**
 - **Market transformation**
- **COVID effects unclear**



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Midstream Programs Example: SCE

- **Example:**
 - SCE Midstream Point of Purchase (MPOP) program for Lighting and Food Service – successfully leveraged initial lighting incentives to build the CFS program
 - **Equipment:**
 - LEDs
 - Ovens
 - Freezers, refrigerators, ice machines
 - Steamers, fryers, hand wrap machines
 - Food holding cabinets
- **Possible opportunities for plug load devices**
 - Small energy savings → small per-unit incentive amounts → not sufficient to motivate consumers with downstream rebates.
 - But: volume of sales + total incentives → could motivate retailers to change their stocking and sales practices to promote more energy-efficient products



Comprehensive: Small Business Programs

- **Comprehensive programs address whole-building energy usage**
 - HVAC, lighting, and refrigeration well covered
- **Example: ComEd's small business program is recognized as a category leader by ACEEE**
 - Small business kits (Tier 1 APS, smart sockets, faucet aerators)
 - Free in-person facility assessment
 - Free direct install measures (Tier 1 APS, vending misers)
 - Detailed reports with recommended EE projects
 - Full installation services with instant incentives
 - Up to 75% of EE project costs are covered

**Most utilities have
suspended in-person
elements due to COVID**

Saving Money and Energy Starts with Small Changes

For many small businesses and public sector facilities, controlling day-to-day expenses is critical to improving their bottom-line. To help them reduce their energy use, the ComEd Energy Efficiency Program offers FREE self-install energy-saving kits to start these organizations on the right path.



Qualifying customers such as small businesses, fire stations, libraries, park district buildings and public works offices will receive a FREE energy-saving kit which is shipped directly to their facility for self-installation. Customers will receive one of the three different types of kits based on type of facility. The kits include simple energy-efficient products like LED light bulbs, water-saving faucet aerators or advanced power strips.

Find Out if You Qualify

Small business and public sector customers who generate less than 100kW peak demand and who have not previously participated in the ComEd Energy Efficiency Program Small Business offering are eligible.

To verify your eligibility, email us at SmallBizKitsEE@ComEd.com or call 855-433-2700 during normal business hours to speak with a ComEd Energy Efficiency Program representative.

[Contact Us](#)



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Custom and Hybrid: Data Center

- **Utility Best Practices**
 - Custom incentives for overall savings
 - Also offer standard incentives
 - Endorse:
 - EE Servers (*Georgia Power*)
 - EE UPS devices (*Wisconsin Energy*)
 - EE Hard Disk Drives (*endorsed by SCE*)
 - Unplugging comatose servers (*ConEd, SCE, FL&P*)
 - Replacing HDDs with SSDs and MAID (*FL&P*)
 - Educate and encourage IT staff on technical EE strategies (*SCE, FL&P*)



Advance Plug Load EE through Education

- Empower customers to identify problems and tailor their own solutions
- Target information by customer segment
- Include information on plug loads
 - Enhance visibility of plug load issues
 - Products/technology
 - Plug load control devices
 - Incentives offered by the utility
 - Tips page on no cost/low-cost strategies

Reasons to Choose ENERGY STAR

In order to earn the ENERGY STAR, a computer must have power management features built into its operating system. Power management allows you to set your computer and display to go into sleep mode after a set amount of time. In sleep mode, these models use about 70% less electricity than those without power management features. In addition, monitors labeled with the ENERGY STAR are on average 25% more efficient than standard models. This results in less energy used, and lower bills for you.

- ENERGY STAR monitors are 25% more energy efficient
- Our Smart Choice label helps you find the most efficient models
- Set power management to put your computer to sleep after 5 to 20 minutes of inactivity



Home > [Ways to Save](#) > [For Your Business](#) > [Business Types](#) > Hotel

Get the Most out of Your Hotel

The competitive nature of the hotel and hospitality industry places guest experience and comfort as top priorities for hotel managers like you. In a typical hotel, lighting and HVAC account for almost 70% of total electricity consumed, creating good opportunities for energy efficiency upgrades.

By improving operations and maintenance procedures and upgrading lighting and HVAC systems, you can lower your hotel's energy use by 45%. You'll also improve guest comfort, reduce the number of service calls and save money!



Whatever strategy you choose to reduce energy use in your hotel, motel or other hospitality business, the ComEd Energy Efficiency Program offers incentives and free technical assistance to help you get started.

Savings in action: The Chicago Marriott saved over \$100,000 a year in electric costs, all while improving guest comfort. [View this case study](#) to learn more.

Not Sure Where to Start?

1. Schedule an Assessment

Call 1-855-433-2700 and request a Facility Assessment. A ComEd energy engineer will assess your facility and equipment for potential electrical savings during a two-hour site walkthrough.

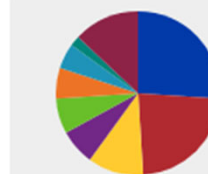
2. Receive Recommendations

Within a month, you will receive a high-level summary recommending energy-saving changes and upgrades that can improve the energy efficiency of your business.

3. Make Improvements & Apply for Incentives

After you have decided which energy-saving improvements you want to make, consult the ComEd Energy Efficiency Service Provider [Directory](#) to find a contractor who can provide the products and services you need and help you apply for ComEd Energy Efficiency Program incentives.

Average Energy Use



Cooling	26%
Lighting	23%
Space Heating	11%
Office Equipment	7%
Ventilation	7%
Refrigeration	6%
Water Heating	5%
Cooking	2%
Other	13%

Available Programs & Incentives

- [Commercial Kitchen Equipment](#)
- [Custom](#)
- [Lighting](#)
- [New Construction Services](#)
- [Refrigeration](#)
- [Retro-Commissioning](#)
- [Roofing Units](#)
- [Variable Speed Drives](#)

Additional Project Incentives

[Made in Illinois Fact Sheet \(pdf\)](#)
[Standard and Custom Additional Project Incentives \(pdf\)](#)

Case Studies

[Chicago Marriott Hotel Case Study](#)

Questions About Energy Efficiency?

[Contact our team](#) and one of our representatives will reach out to you.

Hotel & Hospitality On-Demand Webinar



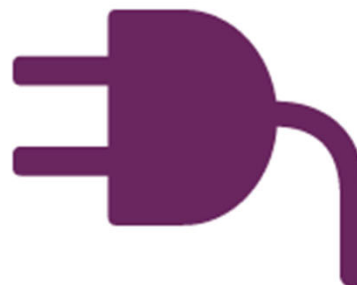
[Register today](#) to learn about energy-saving ideas that can help you save money!

Example: We Energies

Equipment

No cost

- Turn off equipment during nonbusiness hours.
- Enable power management settings on computers, printers and copiers and unplug electronic devices that aren't being used.
- Set water heaters at 120 degrees F unless 140 degrees F is needed for specific equipment or sanitation requirements.



Low cost

- Many electronic products use power when not in use. Instead of manually unplugging equipment, use a smart power strip to eliminate phantom power drain. Combined with power management features, almost any device can be turned on and off automatically.
- De-lamp the lighted display on your refrigerated vending machine and reduce its energy use by 35 percent.

Invest to save more

- Buy Energy Star equipment when it's time for replacement.
- Replace electric water heaters with natural gas water heaters, which save up to 75 percent of the cost of electric water heating.
- Replace desktop computers with laptop computers to save 80 to 90 percent in electrical cost.
- In Wisconsin, check with [Focus on Energy](#) for equipment incentives.



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Example: SCE Plug Load White Paper



SCE Energy Conservation Series

Plug In To Greater Energy Savings: With Smart Plug Load Management



Simple low- or no-cost steps could reduce your plug load energy use by up to 40%¹.

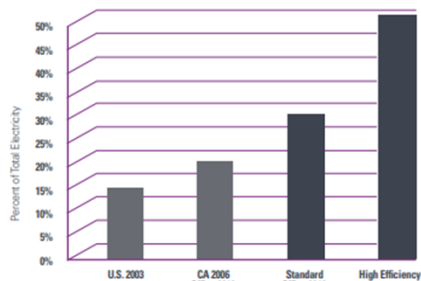
A typical business these days uses an ever-increasing array of electronic devices that plug into a wall outlet, and which have multiple power modes. The resulting "plug loads" are now one of the fastest growing uses of energy.

Once you've determined your energy goals, understanding and managing plug loads can help you reach them and may substantially lower your energy usage.

We offer this handy guide to assist you in that effort.

Office Equipment Plug Loads as a Percent of Total Office Electricity²

Plug load energy use for computers and office equipment is increasing. In office buildings that have improved the efficiency of lights, heating and cooling it can represent as much as 50% of the total electricity use.



How and When Plug Loads Use Energy

Today's electronic equipment operates in a variety of power levels or modes. Switching from a higher to lower power mode is an easy way to save energy. Yet, the very best way to save energy is to always ensure devices are turned off or unplugged when not in use for long periods, or at the end of the work day.

Know Your Power Modes

Understanding and adjusting machine settings to take advantage of different power modes can help your business save a significant amount of energy every year.

- ✓ **Active Mode** – Equipment is on and performing its intended function
- ✓ **Idle Mode** – Equipment is on, ready to perform work, but not active. Surprising amounts of energy can be used in this mode.
- ✓ **Sleep or Standby Mode** – Equipment has been powered down, but is not fully off, drawing reduced power. Equipment is also ready to wake up and return to active mode in response to demand.
- ✓ **Off Mode** – Equipment draws no power. This is the ideal mode for maximizing energy savings.

Knowledge Is Power!

The "vampire" or "phantom" load is the energy a device consumes while in the Sleep or Standby mode. It can be substantial.

Advanced Power Strips Can Help

Advanced power strips (APSSs) can be an effective means for managing plug loads. They're a lot like regular power strips, but with built-in "intelligence" that shuts off the supply power to unused or idle devices based on various situations.

Along with reducing plug loads, APSSs can also save you time by eliminating the need to retrain staff or keep adjusting power modes on office equipment.

Manage Your Server Loads

For many office-based organizations, 30 to 70% of electricity use stems from powering and cooling servers than run 24/7.³ Start saving energy by measuring or estimating the energy consumption of your server room.

Switch off unused servers or set them to go into a low power mode when inactive. Also consider optimizing server use through consolidation and virtualization.

Consider Your Computers

Computers are becoming more and more energy-efficient every year. So, it's very possible that replacing old equipment with new models could reduce energy demand in your business. Something else to think about: laptops with dockings station use less energy than most desktops, and enable a more mobile workforce as well.

Energy Star® recommends setting computers and laptops to sleep after 15 to 60 minutes of inactivity. By doing so, savings up to \$50/computer/year are possible.

Talk To SCE

Contact your Account Manager about our energy incentive programs for your industry. Or check with your local contractor who may also have access to incentive programs.

Help Us Help You—and Our Community

Managing plug loads is not only good for your business and bottom line; it's also good for our community as a whole.

The information we've provided in this guide can aid you in achieving your energy goals and assist SCE in better managing the electric grid—which benefits everyone.

Just What Is a Plug Load?

A plug load is the energy consumed by any electronic device plugged into a wall outlet, i.e., computers and peripherals, printers, television monitors, break room equipment (coffee makers, microwave ovens) or any other equipment you may use for your specific industry.



Additional Resources

Sheppy, Michael, et al. *Assessing and Reducing Plug and Process Loads in Office Buildings*. National Renewable Energy Laboratory (NREL), November 2014. apps1.eere.energy.gov/buildings/publications/pdfs/alliances/20111121_webinar_assessing_ppls.pdf

Plug Load Best Practices Guide. New Buildings Institute (NBI). 2014. advancedbuildings.net/index.php?q=plug-loads

Interested In Learning More?

Choose from the many topics in our Energy Conservation Series:

- LED Lights: A Bright New Way to Conserve Energy
- Switch To a More Energy-Efficient Business—With Smart Lighting Controls
- Manufacturing Motors & Compressors: Start Your Energy-Efficient Engines
- On The Menu: Major Energy Savings With Restaurant Refrigeration
- Cold Hard Facts About Refrigeration and Energy Conservation for Grocery and Convenience Stores
- Energy Efficiency Is In the Air: Optimizing Your HVAC
- Agricultural Pumping: Pumped and Primed to Save Energy

¹ Plug Load Best Practices Guide. New Buildings Institute (NBI), 2014.
² US-Energy Information Agency; CA-CEUS; 2012 offices-NBI Measured Data



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Advance Plug Load EE through Training

- **Train EE Service Providers to recognize and solve plug load-related problems (especially control strategies)**
 - Facility assessment training
 - Webinars, guidelines, checklists
- **Training EE Service Providers to include demonstrations and education to end-users**
 - Within direct install programs
 - More user feedback and training within prolonged programs like retro-commissioning and SEM
- **Get everyone involved**
 - Building operators/facility managers
 - Individual office workstation users (educational materials)
 - Maintenance personnel
 - Purchasing agents
 - IT managers



EX: Facility Assessment with Plug Load Focus (NREL)

[illegible]

Final Thoughts

The first step
is awareness
that you have a plug load problem.
The solutions
are waiting
to be discovered.

Thank you!
Any questions?

