



# E SOURCE Energy Smart Awareness



Rachel Reiss Buckley  
Director, Efficiency Services, E SOURCE

E SOURCE Orientation

# Today's Agenda

**Introduction from BPA**

**Research Highlights from E SOURCE**

**How to Access E SOURCE Tools and Resources**

**Q&A**



# BPA Introduction

- **Who is eligible?**
  - All staff at BPA public utility customers
  - Federal (Northwest facilities) customers
  - Pooling groups
- **How do I register?**
  - Download the welcome brochure at [www.bpa.gov/go/esource](http://www.bpa.gov/go/esource)
  - Get your log-in information in the email from your EER
  - Send the log-in information to your utility colleagues



# E SOURCE DSM Member Services Team



Lynn Stein  
Senior Advisor



Rachel Reiss-Buckley  
Director  
TAS, EDRP, BEA



Micah Allen  
Manager  
TAS



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Asst. Manager  
EDRP, TAS



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Executive VP  
Member Services



Matt Burks  
Manager  
RES, SMB, UCS



Bill LeBlanc  
Senior Advisor



Mike Hildebrand  
Director  
BMS



# E SOURCE Aims to Help NW Utilities

- Meet aggressive DSM goals
- Modify existing programs for greater impact
  - Track program savings and cost-effectiveness
- Implement programs effectively
- Validate technical information
- Benchmark program results
- Plan for EM&V
- Stay ahead of the curve
  - Keep the portfolio fresh
- Understand what other utilities are doing
  - Compare your results
  - Save time and money
- Network with your peers
- Train new staff



# You're Not Alone...

Utility	DSM Goal
Oncor	2009: 20% offset growth in demand
CSU	2009: 1% revenue; 2010: 2% revenue
NSTAR	Funding doubling to tripling
SCE	15% increase in savings over next 3 years
OPPD	1% energy reduction
Dominion	10% reduction in kWh (growth) by 2022 based on 2006 consumption
BGE	15% per capita energy reduction by 2015
NGrid	Electric: triple in 5 yrs to \$375 million Gas double in 5 yrs to \$100 million
KCPL	360% increase in 5 year budget



## What Is E SOURCE?

- Membership-based energy advisory service
- How to manage, sell, and use energy effectively
- Unbiased research and analysis
  - Fuel neutral
  - Product neutral
  - Vendor neutral
  - Program neutral
- Serving the entire energy market, including service providers and top-tier energy managers
- About 80 people on staff



# E SOURCE Services for Utilities

## DSM



Efficiency & Demand-Response Programs

EDRP



Technology Assessment Service

TAS

Business Energy Advisor

BEA

## Marketing & Communications

Residential Market Service

RES

Business Market Service

BMS

Utility Communicators Service

UCS

Climate Advisory Service

CAS

## Customer Care

Utility Customer Care

UCC

E-Business

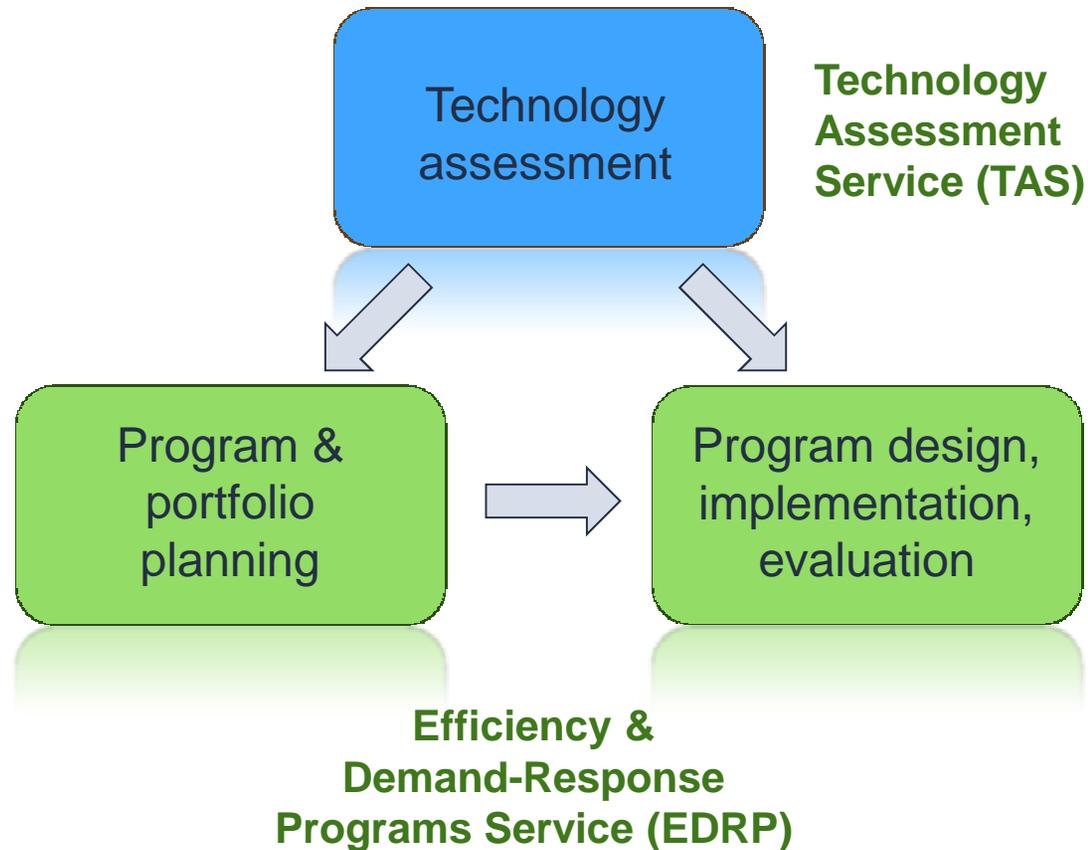
EBiz

Intelligent Grid Service

IGS



# Programs for Your Customers



# Technology Assessment Service (TAS)

Offers clear, unbiased analysis of new technologies

Explores new ways to expand your programs

Helps you be prepared when your customers call seeking advice or recommendations for improving their operations

Weeds through all the technical information on new technologies

Helps you understand the proper application of various technologies

Ensures that you won't get burned by a "black-box" offering

Determines which technologies are cost-effective

Figures out which technologies to include in your customer programs



# Efficiency & Demand-Response Programs Service (EDRP)

**EDRP helps utilities design, implement, and evaluate DSM programs and track what others are doing**

Find out what's happening and glean actionable and transferable recommendations

Identify what's coming next

Share lessons learned

Track who does what through DSMdat

Learn more about regulatory mechanisms, the size of DSM markets and spending, and DSM department organization



# Each E SOURCE Service Contains

- Library of resources
  - Research reports
  - Newsletters
  - Online content
  - Web conference archives
- Networking opportunities
- Live web conferences
- Member Inquiry Service



## Member Inquiry Service

On-demand research, with E SOURCE as your  
“consultant on retainer” or extension of your staff

Ask as often as you like!

Available to all of your colleagues

Topic areas covered by your organization’s E SOURCE  
memberships; may include technologies and utility  
programs

Time frame: Our goal is to meet your deadline

We answer more than 2,800 inquiries each year

Submit your inquiries at [www.esource.com/question](http://www.esource.com/question)



# Member Inquiry Web Form



Energy Business Intelligence
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**My Resources**

Member Inquiries

Members' Resources

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Home » Member Inquiry

## E Source Member Inquiry Service

As an E Source member, perhaps the most important benefit you'll enjoy is our Member Inquiry Service. Members have direct access to the E Source team for timely answers to their questions in our areas of expertise and for referrals to other resources. Use the form below to send us your question, or call us at 1-800-ESOURCE (1-800-376-8723) and select option 4 if you would like to discuss details of your question.

You can submit any question related to the E Source content areas to which your organization subscribes. This service answers questions that require two hours' research work or less. We also provide consulting services for larger-scale, customized projects that require a greater depth of research and analysis.

**Member Inquiry**

The (\*) asterisk indicates required information.

**Name:**  
Micah Allen

**Company:**  
E Source Companies LLC

**Email:**  
micah\_allen@esource.com

**Phone:**  
(303) 345-9113

**Subject: \***

**Your Question: \***

We always strive to provide timely, thorough responses, but when asked to respond within a very short time frame, we may not be able to make our answers as comprehensive as we'd like. This is especially true when it's necessary for us to do original research. It takes time to communicate with our sources before responding to you. Therefore, the more time you can give us, the more robust the answer to your question is likely to be.

**PLEASE NOTE: We cannot guarantee a response to inquiries in less than 2 business days.** If your deadline is urgent, please specify any date and time requirements in the question field, and we'll do our best to help you. Our business hours are 8:30 a.m. to 5:00 p.m., Mountain Time.

**Select Your Time Allowance: \***  
6 to 10 business days

**Site tools:**



# Helping Your DSM Team... By Answering Your Questions

Do you know of programs we can outsource?

How can we improve the results of our commercial energy audit program?

What should we do about our CFL program, given all the new standards?

How do we market to our low-income customers?

Who has already done this that we could learn from?

A vendor says their product saves 25%, is that accurate?

Are LED replacements for T8s ready for prime time?

How do we train staff that are new to DSM?



# Efficiency & Demand-Response Programs Service (EDRP)

**EDRP helps utilities design, implement, and evaluate DSM programs and track what others are doing**

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Identify what's coming next

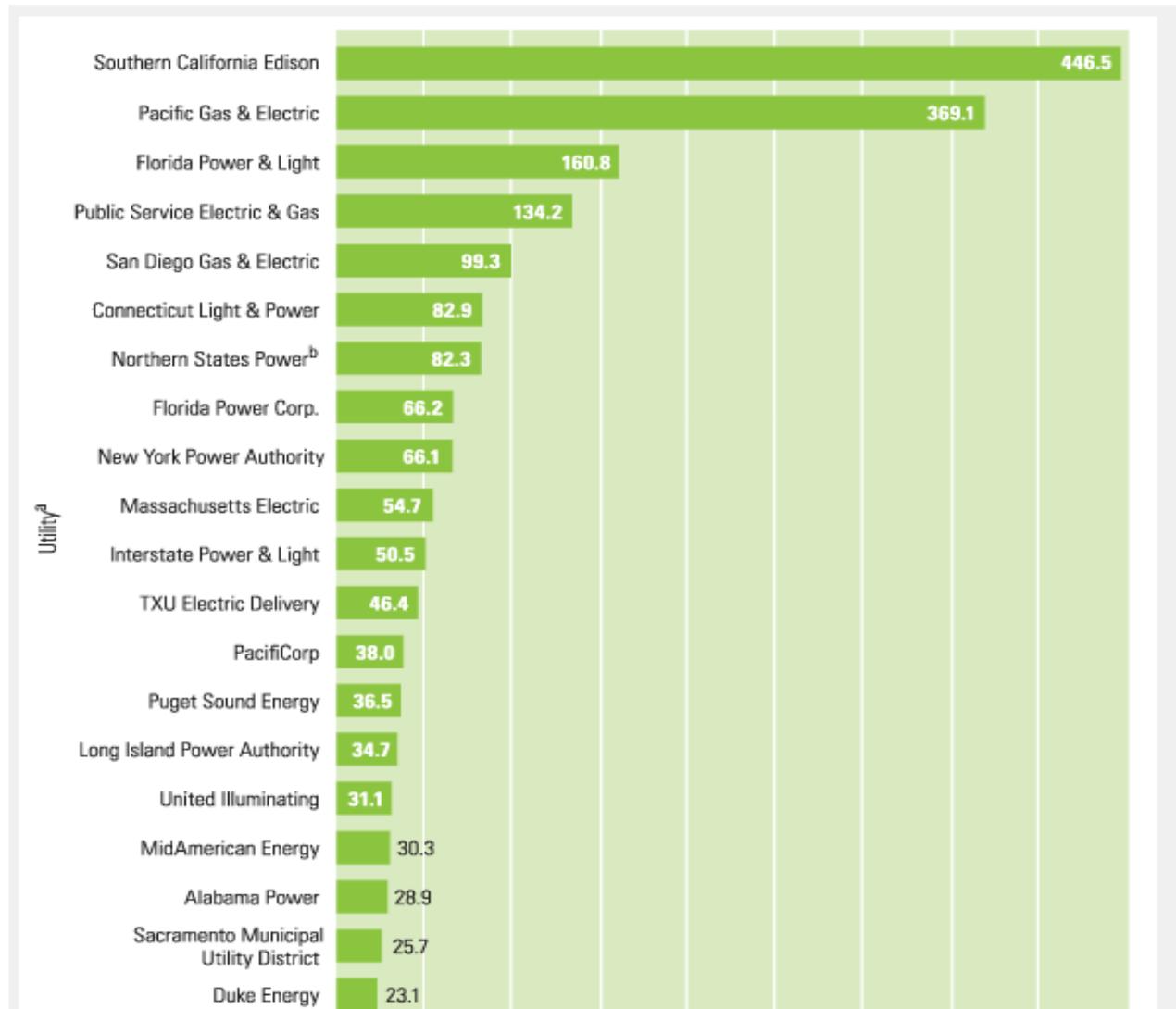
Share lessons learned

Track who does what through DSMdat

Learn more about regulatory mechanisms, the size of DSM markets and spending, and DSM department organization



# 2007 U.S. DSM Spending (millions)



# Are You Implementing Your Programs Effectively?

## Coming to Your Portfolio: New & Improved Efficiency Programs

### Previous Web Conference

Date: Wednesday April 1, 2009

Duration: 1 hour and 30 minutes

Moderator: Rachel Reiss Buckley

#### Agenda:

Many utilities have new or existing efficiency programs in place. To continue to drive participation and engagement, it's important to refresh your programs through enhancements, expansion, and new ideas.

What programs should you add to a "second round" efficiency portfolio? How can you expand upon the programs you already have?

## LEVERAGING NEW CHANNELS

*Trade allies such as contractors, retailers, products into the marketplace. Acting as a help increase customer awareness of util*

Leveraging new channels to promote existing Many utilities have found that establishing to increase participation in existing prescriptive installing new equipment and those in need efficient products into the marketplace. Actin increase customer awareness of utility-spon education about utility programs. Read more [Your Trade Allies Closer.](#)"

**Equipment dealers.** Because many consume equipment fails, a utility can benefit by provi customers to efficient options. Dealers also i selling points. Utilities can help dealers adve such as in-store displays and brochures. In i can help ensure that customers receive reb:

**Retailers.** Utilities that don't already collabo effectiveness of compact fluorescent lamp (C Utilities (GRU) and Home Depot cosponsorec months. Not only was the goal met; 2,500 C demonstration on the first Saturday of the p represented the most CFL sales on the East



# If You Need to Benchmark Yourself

Residential direct load control program participation levels

State	Utility	Program name	Technology used	Incentive	Number of participants	Total residential customers	Penetration rate (%)	Year*
California	Nevada Power	AC Cycling Summer Discount Plan	Corporate Systems Engineering switches	Bill credits that vary by length of cycles and cycling option.	155,000	3,944,839	4	2007
	Sacramento Municipal Utility District	Peak Corps	Switches	Monthly bill credit that varies by cycling option. Bonus credit option.	50,000	485,909	10	2006
	Pacific Gas and Electric	Smart AC	Thermostats or switches	\$25 rebate for enrolling. Free switch or programmable thermostat.	25,000	4,966,897	1	2007
Colorado	Xcel Energy	Saver Switch	Canon switches with custom algorithm	\$25 bill credit.	85,000	1,102,157	8	2009
Florida	Florida Power and Light	On Call	TWACS Power Line Carrier	Annual variable bill credit.	710,000	4,000,000	18	2007
Kansas	Kansas City Power and Light	Energy Optimizer	Honeywell programmable thermostats	Free programmable thermostat.	17,000	434,800	4	2007
Minnesota	Otter Tail Power	Residential Demand Control	Mostly water heater load control.	Reduced rates.	7,000	101,000	7	2006
	Xcel Energy	Saver Switch	NA	15% monthly bill credit AC cycling. 2% monthly bill credit for water-heater cycling.	300,000	1,162,774	26	2009
Nevada	Nevada Power	CoolShare	Various	Bill credit of \$1 per device per event.	18,000	633,166	3	2007
New York	Long Island Power Authority (LIPA)	LIPAedge	Carrier two-way thermostats	Free programmable thermostat.	23,000	967,606	3	2006
Texas	Austin Energy	Power Partners	Converge thermostats	Free programmable thermostat.	65,000	322,000	20	2006
Wisconsin	Madison Gas & Electric		Converge switches	\$2 per 15 minutes of cycling. Enrollment bonus gift.	16,500	116,000	14	2008



# Need an Evaluation Contractor?

## IMPORTANT ELEMENTS OF A GOOD RFP

*"We allow and encourage creativity. Even when our tasks are specific, we encourage bidders to propose alternative approaches." —Jeremy Newberger, National Grid*

While RFPs certainly vary across organizations, there are several key components that are found in well-written proposals. The important elements of an RFP include an introduction, scope of work, program description, evaluation criteria, and proposal requirements.

### Introduction

The introduction should provide a high-level summary of what you're trying to accomplish. It explains the broad objectives of the evaluation process and, if relevant, may include a brief history of previous evaluations. The introduction may also present background information about the reason for the evaluation.

NYSERDA clearly lays out the goals of the evaluation in its RFP for an [Impact Assessment for the New York Energy Smart Program](#) (536 KB PDF). The introduction provides a background of previous evaluation work, hyperlinks to access reports, and a description of the program portfolio.



# What Do You Do Next?

**NEW!**

**FOCUS REPORT • EDRP-F-33**

## Ten DSM and Renewable Programs Worth Knowing About

*Published: June 01, 2009*

*Kim Knox*

### Contents

**EXECUTIVE SUMMARY**

**FULL REPORT**

- Notable Outreach Programs
- Notable Demand-Response and Pricing Programs
- Notable Market Transformation Program
- Notable Renewable Programs
- Notes

## Next Steps: Ramping Up Your Efficiency Portfolio

*Published: April 03, 2009*

*Kelsie Bell*

### Contents

**EXECUTIVE SUMMARY**

**FULL REPORT**

- Enhancing Your Efficiency Portfolio
- Leveraging New Channels
- Adding New Features to an Existing Program
- Introducing New Programs to an Existing Portfolio
- Learning to Adjust
- Resources
- Notes



# If You Need to Expand Your DSM Efforts

Go wider—offer more programs



This happens to be the biggest pool in the world—20 acres!



# Wondering About Other Utilities' Incentive Levels for DSM Programs?

DSMdat will tell you

The screenshot shows a 'Query' window with the following sections:

- Program Sponsor:** AEP Texas Central Company, AEP Texas North Company, Alabama Power, Alagasco, Allegheny Power, Alliant Energy. Includes a 'Clear' button.
- Program Name:** Sensible Home Program, Smart Business Program, 101 Money Saving Tips, 2.9% Interest Conservation Loan, 20/20 Summer Savings Program, 80 PLUS Program. Includes a 'Clear' button.
- Country:** Canada, U.S. Includes a 'Clear' button.
- State/Province:** Alabama, Alaska, Alberta, Arizona, Arkansas. Includes a 'Clear' button.
- Sector:** Business, Business - agricultural, Business - commercial, Business - industrial, Business - new construction. Includes a 'Clear' button.
- Resource Impact:** Electricity, Gas, Steam, Water. Includes a 'Clear' button.
- Load Shape Purpose:** Demand response/load management, Energy efficiency, Load building, Load retention. Includes a 'Clear' button.
- Channel:** Architects/engineers/designers, Building owners/operators, Contractors/builders, Distributors, Educators/students. Includes a 'Clear' button.
- DSM Method:** Audits, Bill credits, Bill guarantees, Commissioning, Direct installation. Includes a 'Clear' button.
- DSM Measure:** Agricultural equipment, Air conditioning, Air distribution/ducts, Appliances, Boilers. Includes a 'Clear' button.
- Program Status:** Active, Inactive. Includes a 'Clear' button.

At the bottom of the window, there are three callout boxes and several buttons:

- 1. Select any program filters** (points to the filter sections)
- 2. Choose output format** (points to the 'Output' section with radio buttons for 'Format for Screen' and 'Format for Printer')
- 3. Click a report type to run** (points to 'Program List' and 'Program Details' buttons)
- Buttons for 'Program List', 'Program Details', 'Help', and 'Close'.



# Recent Research

E SOURCE Customer Direct information regarding ARRA funds

- [Information on Energy-Efficiency and Renewable-Energy Tax Incentives for Mass-Market Customers](#)
- [Information on Energy-Efficiency and Renewable-Energy Tax Incentives for Commercial & Industrial Customers](#)
- [Information on the American Recovery and Reinvestment Act of 2009 for Federal Accounts](#)

[Next Steps: Ramping Up Your Efficiency Portfolio](#)

(report and web conference)

[Ten DSM and Renewable Programs Worth Knowing About](#)

(report)

[2007 U.S. Electric DSM Spending](#) (report)



## Upcoming Topics

- Attribution Issues
- Solar Thermal Programs
- Residential On-Bill Financing
- Energy-Efficiency Microsites
- Renters/Multifamily Report and Web Conference
- Leveraging Local Climate Policies

**What would you like us to delve into?  
Let us know more topics that interest you!**



# EDRP Resource Center

## Efficiency & Demand-Response Programs || Resource Center

HOME ▾
RESOURCE CENTER ▾

**Filters**

You can narrow these results using the filter options in the right-hand column of this page.

**Results**

1 2 3 4 5 6 7 8 next > last »

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**NEW!**  
**50 Homes in One: Multifamily Efficiency Programs**  
 Web Conference  
 July 8, 2009  
 How do you engage multifamily properties in your energy-efficiency programs? There are significant savings to be had, but when landlords aren't responsible for tenants' energy bills and tenants don't own the property, who do you convince to make the investment?  
**Content type:** Web Conference Roundtable | **Document ID:** EDRP-WC-7-09-MFProg | **Author:** Rachel Reiss Buckley

PREVIEW
VIEW

---

**NEW!**  
**Rounding Up New Technologies and Innovative Programs**  
 June 16, 2009  
 June 2009 issue of the Efficiency Services newsletter  
**Content type:** Service E-mail | **Document ID:** Efficiency-EDRP-TAS\_SE\_06-16-09

PREVIEW
VIEW

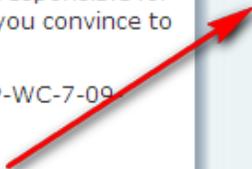
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**NEW!**

Search within results

**- FILTER BY TOPIC**

- + Customer Service (5)**
- + Energy, Resource & Environmental Management (4)**
- + Marketing & Communications (20)**
- Programs, Products & Services (159)**
- Demand-side management (119)**
- DSM department & portfolio management (11)
- Efficiency & conservation (53)
- Evaluation (4)
- Load management (19)
- Education & information (13)
- Environment (15)
- Financing (4)
- Generation & delivery (6)
- Rates & billing (1)



# Technology Assessment Service (TAS)

Offers clear, unbiased analysis of new technologies

Explores new ways to expand your programs

Helps you be prepared when your customers call seeking advice or recommendations for improving their operations

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Figures out which technologies to include in your customer programs



# Black Box “Energy Saving” Devices

A great topic for a Member Inquiry

How do you verify, or disprove, vendor claims?

Call Today 978.568.8810

**EZ Energy Savings**  
TM

Save up to 25% on your Monthly Electric Bills!

- Home
- About Us
- Products
- Product Demo
- Testimonials
- Department of Energy**
- Employment
- Electricians
- Order Today!
- Contact Us

MAKING RENEWABLE ENERGY AFFORDABLE.

EZ Energy Savings is the premier direct manufacturer and distributor for other manufacturers of renewable energy and energy savings products. We provide quality tested and certified products direct to the consumer, at a price affordable to everyone.



### NEWS FLASH!

Investigative Report Videos from Fox News and CBS 46 News Proving that Power Factor Technology Works!

Click Here to see the Fox News Investigative Report video.



Click Here to see the CBS 46 News Investigative Report video.



Click Here to see a demonstration of the 1200™ Unit



Source: [www.ezenergysavings.com/](http://www.ezenergysavings.com/)

- This example is a power factor optimizer, essentially a capacitor intended for homeowners
- It will **not** save a significant amount of energy, but they cite endorsements
  - Two news shows reported positively on it.
  - It links to a [DOE report](#) that describes power factor
  - Does not link to [DOE report](#) that says little savings possible



# “Ask E SOURCE” Reports Are Quick Answers to Common Member Inquiries

E SOURCE inquiry responses

Posted online if we get a lot of similar questions

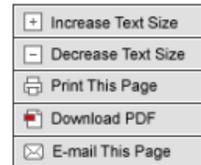
Questions are “scrubbed” of identifying information

## Energy Savings via Power-Factor Correction

Tech News, June 2006 — Ask E Source

Published: June 28, 2006

Peter Criscione



### Q: Can residential, commercial, or industrial customers save energy and money by improving their power factor?

**A:** Many vendors of power-factor (PF) correction equipment (usually simple capacitors or banks of switched capacitors) claim that they can achieve energy savings exceeding 10 percent of consumption simply by improving a facility's PF. Capacitors have long been used to improve PF, and they can in fact reduce energy consumption to a degree, but we would be skeptical of a claim of anything greater than 2 to 3 percent of energy consumption. It would be a rare facility indeed that had the potential for more than a couple percent in savings from PF correction.

In general, customers can save money by improving PF at their facilities by:

- Avoiding penalties in areas where utilities charge for low PF.
- Freeing up capacity in supply transformers, if that capacity is needed. The savings come from avoiding the cost of adding new transformer capacity.
- Reducing heat-related energy losses due to low PF. Whenever the PF of an electrical circuit is below 1.0, more current is flowing through that circuit than is necessary to power the load. This means that the transformers, conductors, and other components supplying that circuit are incurring greater energy losses than necessary. (Losses in these components are proportional to the square of the current flowing through them.) Correcting PF will reduce those losses, provided the capacitors are located close to the inductive loads that cause low PF (usually motors).

Energy savings of 1 to 2 percent are the highest we would expect for typical systems. In rare cases savings might exceed 3 percent, but we're unaware of any circumstances where savings would approach the claims of 8 to 20 percent energy savings some manufacturers make.

Because the potential for energy savings is limited, it's usually difficult to justify the cost of PF correction capacitors on the basis of energy savings alone. In general, there need to be avoided PF penalties to justify the expense of PF correction.

For more information on power factor, see Section 13.1 of the *E Source Drivepower Atlas*.

**Got a Question? Ask Us!**



If you can't find an answer quickly, submit a Member Inquiry!



# Quick! What Do I Need to Know About Building Automation Systems?!?!?

Maybe you:

- Are designing a new program.
- Have a customer calling with questions.
- Are trying to find a good solution for a project.
- Are “geeking out” on a cool new technology.



Courtesy: [www.systelpower.com](http://www.systelpower.com), [www.mivune.ch](http://www.mivune.ch), [www.advantech.gr](http://www.advantech.gr)



# Building Automation Systems

## Resource

A Resource

- Independent
- Clear technical
- Focus on know
- “Key” information listed early

### Building Automation Systems

Published: January 21, 2009

John Sustar

- Contents
- Fast Facts
- Overview
- Applications and Limitations
- Economics
- Efficiency
- Making the Right Choice
- Retrofit Options
- Maintaining Performance
- Technical Details
- Market Outlook
- Manufacturers and Products
- Success Story
- Utility Program Example
- Got a Question About This Technology?
- Notes

**RESOURCE CARD - TAB#0-13**

**Building Automation Systems**

Published: January 21, 2009

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**FAST FACTS**

- Building automation systems (BAS) are used to control HVAC, lighting, security, and fire safety systems in commercial and institutional buildings.
- BAS tend to cover less than half of all buildings in the U.S. larger than 500,000 square feet.
- The physical components of a BAS generally represent 10 to 20 percent of the total cost of a system (the remaining costs represent installation, software programming, and maintenance).
- Owners typically quote the cost of a BAS in the range of \$4.50 to \$7 per square foot, depending on building type.
- Studies have shown that BAS typically save 5 to 15 percent of total building energy consumption. In retrofit situations, savings depend heavily on how thoroughly the building was operating before installation (energy use greater in poorly performing buildings) and can be as high as 30 percent.
- BAS can also reduce demand of buildings. It's not possible to generalize about demand savings because few data studies are available, but one study found summer peak load reduction of 5 to 9 percent.
- Direct digital control (DDC) systems have replaced pneumatic as the standard for BAS. DDC systems use substitute devices and respond to real-time signals, via computers or process data for direct system control.
- In the mid-2000s, proprietary communications protocols for BAS components began to give way to open standards such as BACnet and LonWorks; most BAS manufacturers have migrated to one of these protocols.
- The key to getting BAS to live up to their potential are controlling good design with commissioning and training building occupants; too few see the systems.

**OVERVIEW**

Including a BAS—also known as an energy management system—or upgrading an existing BAS can reduce overall building operating costs by controlling energy-consuming building equipment so that it operates more efficiently and safely. With recent advancements in information technologies and the Internet, BAS are becoming more effective at reducing facility energy costs while maintaining occupant comfort.

A BAS typically schedules the operation of HVAC equipment and controls operating parameters, such as fan speeds and supply air temperatures. In addition, BAS often have the means to control lighting, security, and fire control systems (Figure 1). A BAS has four primary components:

- Sensors are devices that sense environmental conditions, or equipment status, and convert that information to controllers. Sensors measure temperature, pressure, weight, volume, electrical current, and other variables.
- Controllers process sensor inputs and generate outputs that are delivered to actuators or other controllers. Unlike a controller, sensor inputs are compared with other sensor inputs, outputs from controller calculations, or setpoints (such as the desired indoor air temperature). The outputs often modify required operations. For example, cooling fans in a system will respond to a drop in required setpoint or setpoint to turn on or off.
- Actuators are mechanical devices consisting of assemblies of metal parts or shafts, attached to valves or dampers. Other electric controls or pneumatic air pressure power the actuators to turn, rotate, or push dampers or valves open and closed.
- Software performs monitoring and supervisory functions from the operator's workstation, such as changing setpoints and tracking operations data. Control logic software is distributed to the individual controllers via that, in the event of a BAS hardware computer failure or violation, the system still operates.

**FIGURE 1: Linking building automation systems to building systems**

With a building automation system (BAS), building systems can be connected through sensors, controllers, actuators, and software. An operator interfaces with the system via a central BAS workstation, which can be connected to other BAS workstations via the Internet or through remote access.



# TAS Resource Guides

## Recent:

- Air Side Economizers
- Sector-Specific Demand Response
- Demand-Response Thermostats
- Water-Cooled Electric Chillers
- Lighting Controls
- Building Automation Systems
- Small Gas Condensing Boilers

- Hotel Room Automation
- Lighting Maintenance
- Energy Use Displays

## Upcoming:

- Cooling Thermal Storage
- Ground Source Heat Pumps
- VRV/VRF HVAC systems
- Vehicle Electrification
- Optimizing Compressed Air



# A Technology to Promote?

1999  
E SOURCE writes a report on underperforming economizers

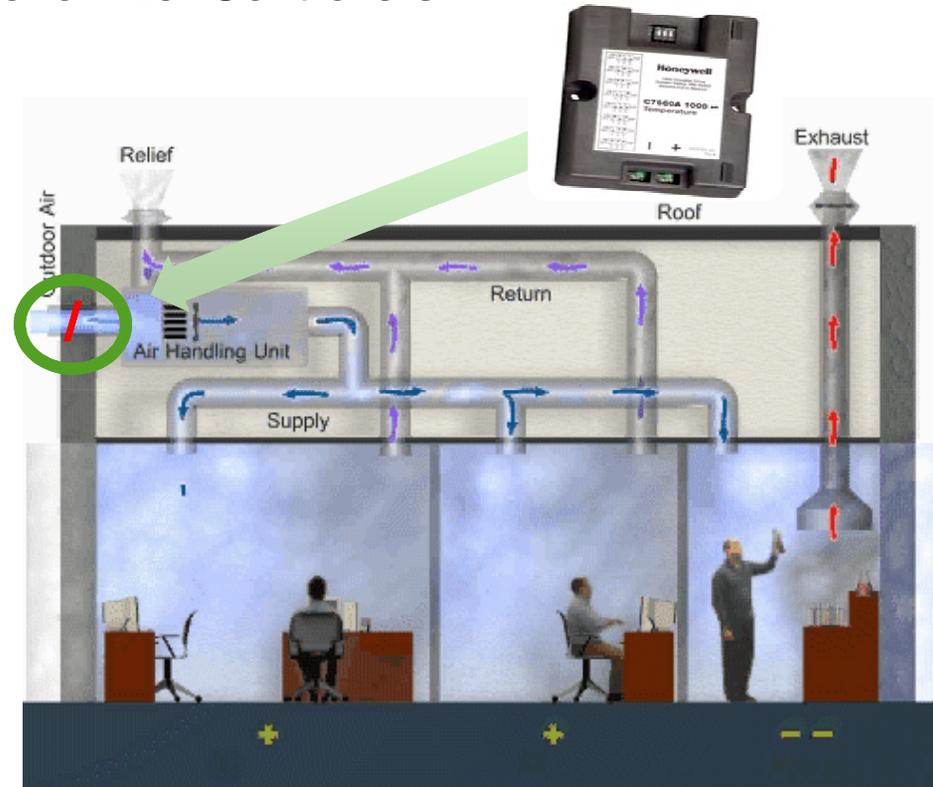


2001-2008  
New Building Institute conducts lab tests, compiles results, finds workarounds



Fall 2008  
Honeywell releases updated controller

## Economizer Controllers



Courtesy: EPA



# Tech News: New Economizer Sensor



Original Honeywell drybulb (C7650) temperature sensor/controller

- Deadband of ~10°

New economizer sensor (C7660) for controllers

- Deadband of ~10°

Potential Energy Saving

- A \$70 retrofit can save ~8% of cooling energy

December 2008 E SOURCE

Tech News: [A Simple Fix for a Common Economizer Problem](#)



**E SOURCE Energy Business Intelligence**

**A Simple Fix for a Common Economizer Problem**  
 Published: December 01, 2008  
 John Sustar

In response to laboratory tests that suggested its products were contributing to widespread air-side economizer underperformance, Honeywell, the world's largest air conditioning controls manufacturers, recently released a new and improved air temperature sensor. For years we've been writing about how most economizers either underperform or don't function at all. Recently, researchers at the New Buildings Institute (NBI), a nonprofit that promotes improved energy performance in commercial buildings, obtained several older-generation Honeywell economizer controllers and sensors and subjected them to laboratory tests. They found that the sensor and controller combinations tested activated economizer operation at lower outdoor temperatures than they expected. This problem has likely been reducing economizer performance in dry climates with limited nighttime temperature swings. Honeywell, to its credit, redesigned its economizer air temperature sensor to mitigate this problem.

Although economizers are based on a relatively simple operating concept, evidence suggests that most economizers don't work properly and that many are energy wasters, not energy savers. Between 2001 and 2004, NBI compiled the results of several field studies conducted in the western U.S. and found that out of a total of 503 rooftop HVAC units, 64 percent had failed or required adjustment.

To get to the bottom of at least one problem plaguing economizers, NBI researchers ran bench tests on the Honeywell C7650 drybulb sensor, which is primarily used in low-humidity climates. The percentage of economizers that use this particular sensor is unknown, however researchers estimate that Honeywell occupies about 70 percent of the economizer controller market. The tests were conducted in controlled chambers to determine how the sensors and controllers responded to a range of temperatures. Other manufacturers' economizer controllers and sensors were not investigated in this study due to budget constraints.

Results from the NBI study show that the older-generation Honeywell controller and sensor combinations exhibit an excessive deadband—the difference between the temperatures at which a controller activates and deactivates the economizer—that inhibits the operation of the economizer. Although deadbands are useful in that they minimize the



# Demand Response: Sector DR Series

## DR Tech Briefs Currently

- Office Buildings
- Manufacturing Facilities
- Warehouses
- Schools
- Grocery
- Hospitals
- Hospitality
- Retail



# How Does This Widget Compare to Standards?

## Equipment Efficiency Standards Directory

- Consolidates multiple standards resources
  - U.S. Federal & State
  - Canada
  - Energy Star
  - Consortium for Energy Efficiency
  - States
- Current
- Pending



EQUIPMENT EFFICIENCY STANDARDS DIRECTORY •

### Packaged Air Conditioners and Heat Pumps (Commercial)

Equipment Efficiency Standards Directory

By Equipment Type | Planned Updates | Pending Updates | By State | Additional Resources

Appliances & Office Equipment  
 Drivepower  
 Distribution  
 HVAC & Refrigeration  
 Lighting  
 Water Heating

Boilers (Res)  
 Central air conditioners and heat pumps (Res)  
 Direct heating equipment  
 Furnaces (Res)  
 Furnaces, warm air (Com)  
 Ice makers (Com)  
**Packaged air conditioners and heat pumps (Com)**  
 Packaged terminal air conditioners and heat pumps (Com)  
 Refrigerators and freezers (Res)  
 Refrigerators and freezers (Com)  
 Room air conditioners  
 Single-package vertical air conditioners and heat pumps  
 Unit heaters  
 Walk-in coolers and walk-in freezers (Com)

Effective Date

For small commercial air-cooled equipment with a capacity less than 135,000 Btu/h, the current standard took effect on January 1, 1994. For large commercial air-cooled equipment with a capacity of 135,000 Btu/h or greater, the current standard took effect on January 1, 2004. For three-phase air-cooled equipment with a capacity of 135,000 Btu/h or greater, the current standard took effect on January 1, 1994. For water-cooled equipment with a capacity of 135,000 Btu/h or greater, the current standard took effect on October 29, 2003. For water-cooled equipment between 135,000 Btu/h and 240,000 Btu/h, the current standard took effect on October 29, 2004.

Standards

Water-Cooled Air Conditioning and Heating Modes

Capacity (Btu/h)	U.S. federal standard		CEE	
	EER	COP	EER	COP
<17,000	12.1	4.2	14	4.6



# Technology Assessment Service

Reports



Tech News



Equipment Efficiency Standards



Webinars



Meetings



Questions, Comments?



**Energy Business Intelligence**

My E SOURCE | Events | Products & Services | About E SOURCE

**My Resources**

- Member Inquiries
- Members' Resources
- My Services
  - Business Energy Advisor
  - Business Market Service
  - Climate Advisory
  - Corporate Energy Managers' Consortium
  - Distributed Energy
  - E-Business
  - Efficiency & Demand-Response Programs
  - Energy Information & Communication
  - Energy Market Advisory
  - Green Energy
  - Intelligent Grid
  - Managed Accounts Service
  - Micro-CHP
  - Power Quality
  - Renewable Power Service
  - Residential Market
  - Small & Midsize Business
  - Strategic Distribution Management
  - Technology Assessment
    - Home
    - Resource Center
    - Utility Communicators
    - Utility Customer Care

**Technology Assessment || Home**

HOME | RESOURCE CENTER

**Latest Research**

Browse our library of research and analysis. Here you'll find detailed reports and reference materials focusing on specific technologies, policies, programs, trends, industry practices, and market sectors.

- Demand-Response Thermostats
- Plug-In Hybrid and Electric Vehicles' Effects on the Power Grid
- Meter Data Analysis Services Evolve
- Water-Cooled Electric Chillers
- PTAC Efficiency Specifications

**Latest News**

Review our archive of timely, concise news and analysis that we provide through our service newsletters.

- New Software Uncovers Best VSD Investments
- The EVs Are Coming! (Are You Ready?)
- Plug-In Hybrid and Electric Vehicles' Effects on the Power Grid
- Meter Data Analysis Services Evolve
- News from the E Source Efficiency Services

**Tools & Other Resources**

Here you'll find helpful tools and information resources.

- Equipment Efficiency Standards Directory
- Operations and Maintenance (O&M) Checklists
- PIER Tech Briefs
- U.S. Federal Energy Policy
- E Source PDF Toolkit

**Member Inquiry**

As an E Source member, you have direct access to our experts. If you can't find the answer you're looking for in our library of Research, News, and Tools, you can submit any

**Events**

Web Conferences

Upcoming | Past

Tuesday April 28, 2009  
Selecting an Appropriate Demand-Response Thermostat

Meetings

Upcoming | Past

September 21-25, 2009  
22nd Annual E Source Forum

**About This Service**

- Service Directors
- Service Overview (PDF)
- Research agenda/upcoming
- Sign up for the service e-newsletter
- Inquiry & Consulting Contact
- Membership License Agreement



# E-Mails from E SOURCE

## Events Newsletter (Mondays)

- See what web conferences and meetings E SOURCE has planned for the next few weeks and click to register.

## Efficiency Newsletter (Monthly)

- Discusses current events and trends from the perspective of both the *E SOURCE Technology Assessment* and the *Efficiency & Demand-Response Programs Services*.

## Tech News (Monthly)

- Each month we highlight and analyze the latest news in the energy technology industry. Skim the e-mail to see if the topics are of interest, then click to get a quick E SOURCE analysis of the technology and its implications.

## DSM News (Quarterly)

- Once a quarter, we bring you “must-know” news about energy efficiency, load management, and customer-sited renewable generation.



# Upcoming Web Conferences

- Appliance Recycling Programs
- PHEV
- Evaluation

*Remember, archived recordings and presentations are always available at [www.esource.com](http://www.esource.com).*



## DSM Sessions at Forum

- DSM Experts Panel
- Energy-Use Displays
- Business Program Standouts
- Residential Program Standouts
- Smart-Grid Benefits
- M&V: Claiming Savings



Also, five technology sessions; plus Marketing, Customer Service, and Climate Change tracks



## What Should You Do Next?

1. Create a login and click “remember me”
2. Browse the library; see what others have asked
3. Sign up for e-mail announcements
4. Submit a Member Inquiry
5. Download DSMdat

**Remember, we're here to help!**



# Member Services Roles

As your E SOURCE concierges, we can help:

- Discuss your research needs
- Put you in touch with researchers and utility peers
- Familiarize your colleagues with how to use E SOURCE through teleconferences or site visits
- Provide information about events such as meetings and web conferences
- Get answers to your inquiries



## For More Information



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