



DCEO **ILLINOIS ENERGY NOW**

AN OVERVIEW OF THE IEN SMART ENERGY DESIGN ASSISTANCE CENTER (SEDAC)

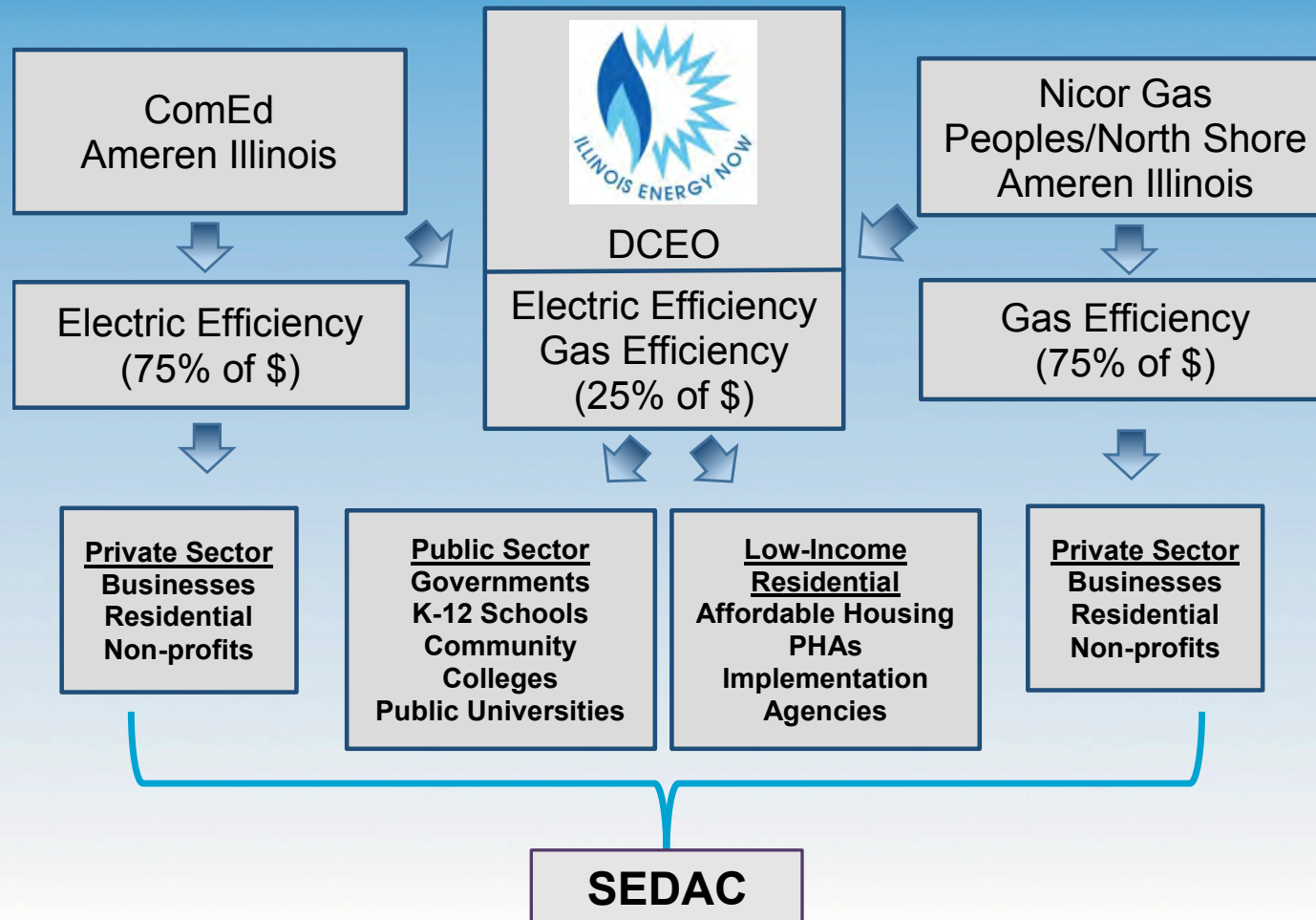
Brian Deal

Smart Energy Design Assistance Center, Director



Illinois Energy Now | 1-800-214-7954 | www.ILenergynow.org

EEPS STRUCTURE



WHO WE ARE

the IEN Smart Energy Design Assistance Center (SEDAC)

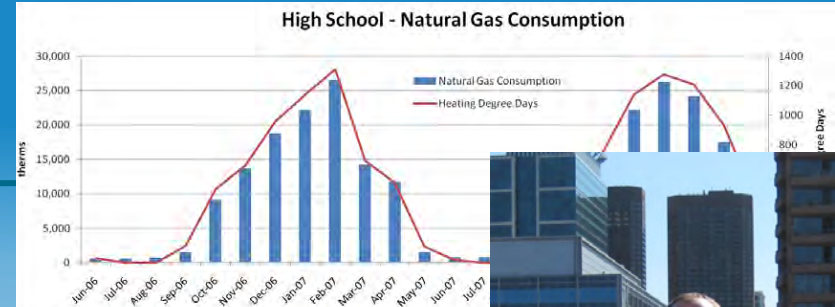
A Public/Private Partnership

- DCEO
- University of Illinois
 - Students, staff, faculty
- 360 Energy Group
 - Private sector energy specialists
- Energy Resources Center
 - Students, staff

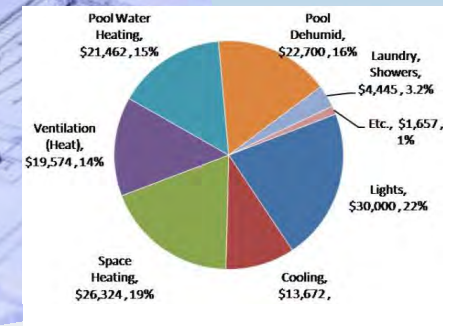


OUR MISSION

To help reduce the energy footprint of the State of Illinois



Energy Cost Reduction Measures (ECRM)	Additional First Cost	Annual Savings	Rebates	Final Cost	IRR	NPV
ECRM 1 Super T8 and Reflector Retrofit	\$190,000	\$41,249	\$95,000	\$95,000	42%	\$212,872
ECRM 2 Gym Metal Halide to T8 Retrofit	\$25,420	\$5,667	\$7,741	\$17,679	30%	\$24,836
ECRM 3 LED Exit Signs	\$12,000	\$1,754	\$2,200	\$9,800	12%	\$3,564
ECRM 4 Pool Cover	\$0	\$7,043	\$0	\$0		
ECRM 5 Solar Pool Heating	\$105,600	\$8,000	\$0	\$105,600		
ECRM 6 Vending Machine Controls	\$1,611	\$0	\$0	\$1,611		
ECRM 7 Boiler Stack Economizer	\$35,000	\$0	\$0	\$35,000		
PKG 1 Package of all ECRMs	\$369,631	\$77,053	\$104,941	\$291,637		



IEN SEDAC

Clients assisted :

- 1,507 energy assessments (as of June 22, 2014)

RCx program

- 97 RCx completed

SEDAC can:

- Assist in verifying data
- Answer program questions
- Provide additional services

Fun Facts:

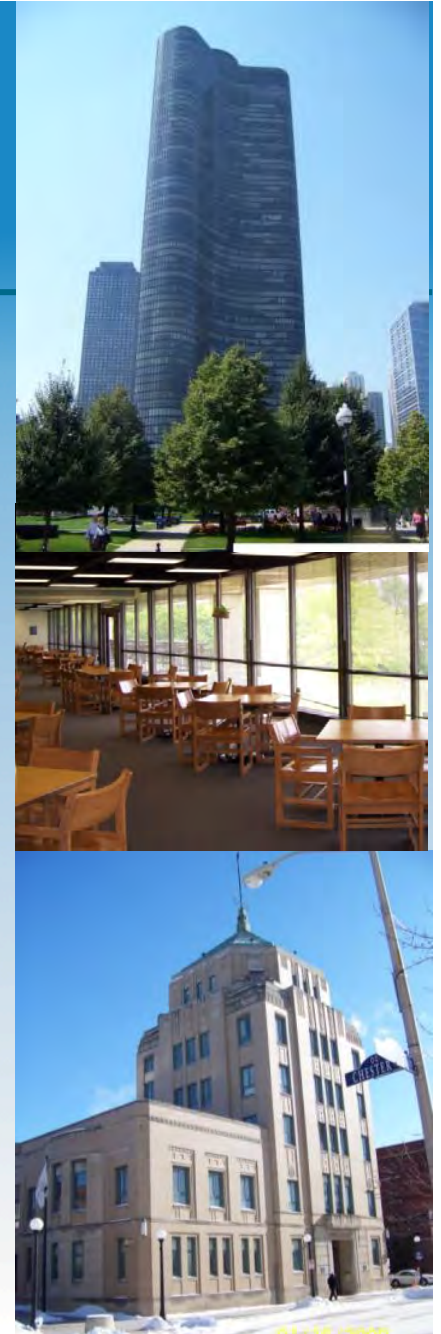
- Completed studies of over 158 million sf with an additional 8.9 million sf underway
- Recommended energy savings of \$54.8 M annually
- Typically identify 10-49% annual cost savings!
 - About 25% on average
 - Approximately 20-30% ROI
- Nearly half of recommended measures have simple payback of 3 years or less!



WHAT WE DO

Free technical services to Illinois entities planning energy improvements:

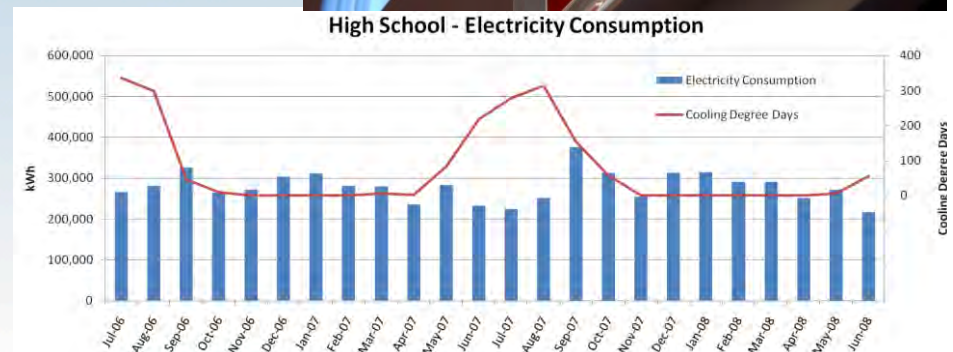
- Local (county, township, municipal), State and Federal Government
- Public Schools
- Community colleges
- Public universities and colleges
- Public Safety, Water and Park Districts
- For-Profit Businesses



WHAT WE DO

SEDAC Services

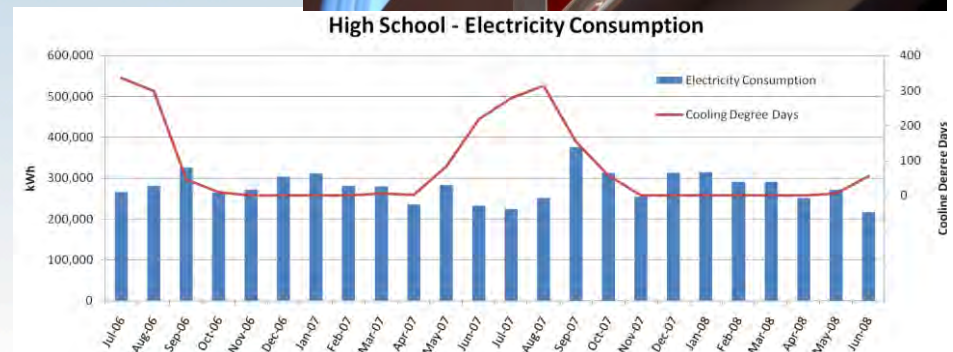
- Outreach and Training
- Energy Assistance and Assessments
- Retro-Commissioning (Public Sector)
- New Construction Design Assistance
- Pilot Projects
- DCEO Program Support



WHAT WE DO

SEDAC Services

- Outreach and Training
- Energy Assistance and Assessments
- Retro-Commissioning (Public Sector)
- New Construction Design Assistance
- Pilot Projects
- DCEO Program Support



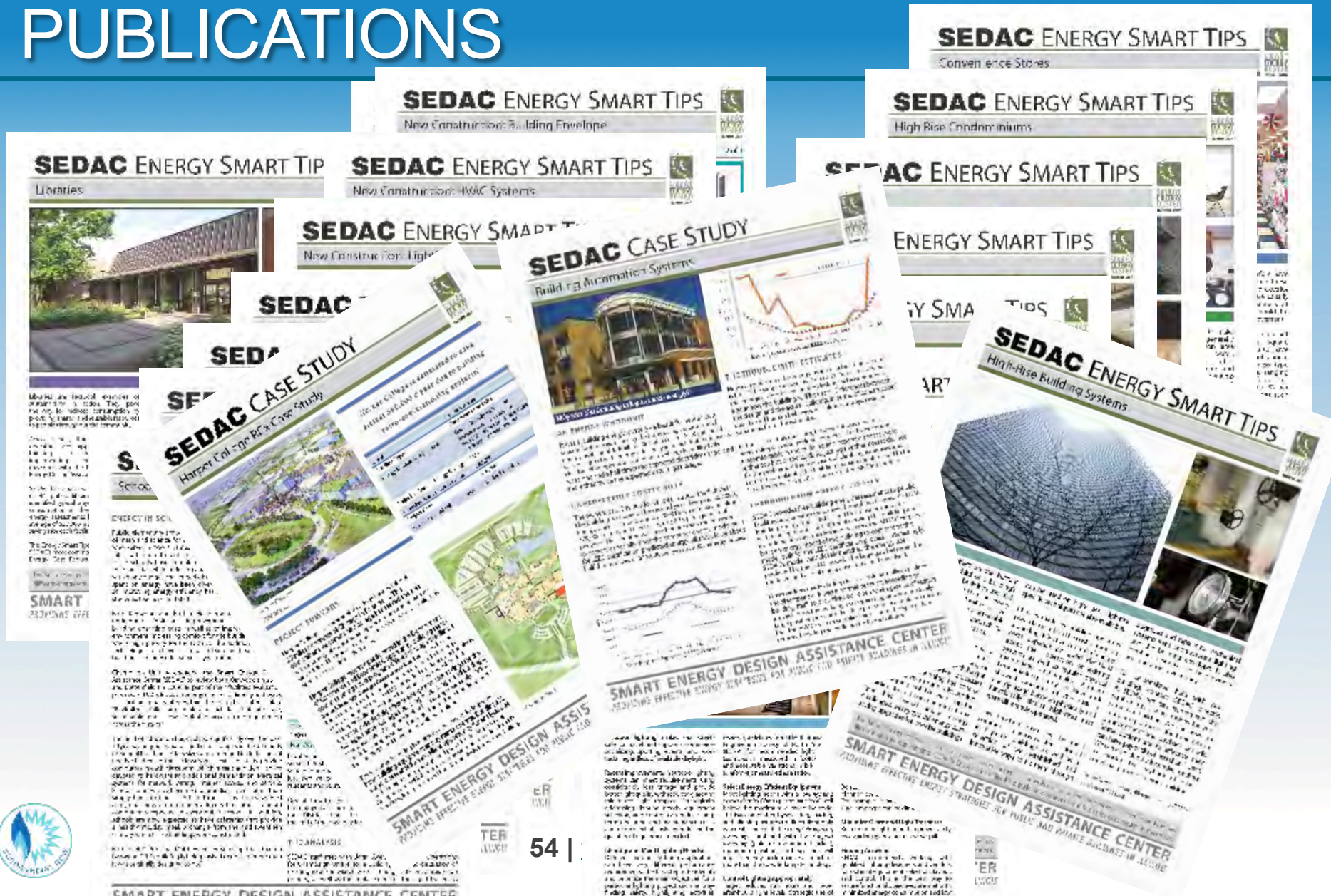
OUTREACH AND TRAINING

Expanding energy and program literacy in Illinois

- SEDAC Workshops
 - Targeted for building owners and managers, architects, building operators
- Other presentations and training
 - Workshops
 - Topic specific conferences (i.e park districts, schools, and libraries)
 - Energy literacy
- Monthly newsletters
- Educations
 - Student Training
 - Internships
 - Online modules
- **Publications**
 - Case studies, Fact sheets, Technotes
- **Website**

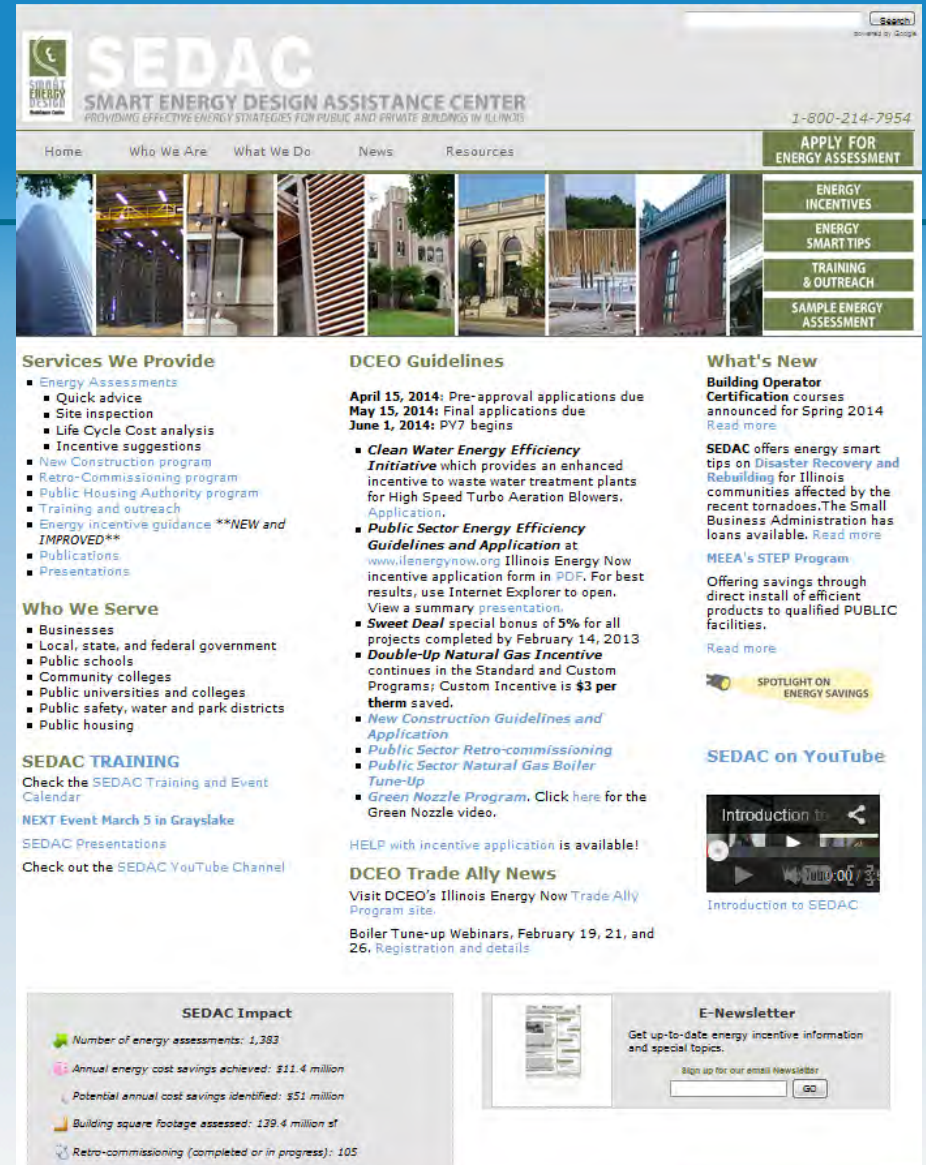


PUBLICATIONS



WWW.SEDAC.ORG

- Important links
- Our services
- Our clients
- Training opportunities
- DCEO guidelines
- New items of interest
- E-news list sign-up
- Experts, service providers and Trade Allies
- SEDAC impact



The screenshot shows the SEDAC website homepage. At the top, there is a search bar and the SEDAC logo with the text "SMART ENERGY DESIGN ASSISTANCE CENTER" and "PROVIDING EFFECTIVE ENERGY STRATEGIES FOR PUBLIC AND PRIVATE BUILDINGS IN ILLINOIS". The phone number "1-800-214-7954" is also visible. Below the header is a navigation menu with links for Home, Who We Are, What We Do, News, and Resources. A vertical sidebar on the right contains buttons for "APPLY FOR ENERGY ASSESSMENT", "ENERGY INCENTIVES", "ENERGY SMART TIPS", "TRAINING & OUTREACH", and "SAMPLE ENERGY ASSESSMENT". The main content area is divided into three columns: "Services We Provide" (listing energy assessments, quick advice, site inspection, etc.), "DCEO Guidelines" (announcing pre-approval applications due May 15, 2014, and final applications due June 1, 2014), and "What's New" (highlighting Building Operator Certification courses and disaster recovery rebuilding). Below these are sections for "Who We Serve" (businesses, local/state/federal government, etc.), "SEDAC TRAINING" (training calendar, next event in Grayslake), and "SEDAC on YouTube" (introduction video). At the bottom, there is an "SEDAC Impact" section with statistics and an "E-Newsletter" sign-up form.

SEDAC
SMART ENERGY DESIGN ASSISTANCE CENTER
PROVIDING EFFECTIVE ENERGY STRATEGIES FOR PUBLIC AND PRIVATE BUILDINGS IN ILLINOIS
1-800-214-7954

Home Who We Are What We Do News Resources

APPLY FOR ENERGY ASSESSMENT
ENERGY INCENTIVES
ENERGY SMART TIPS
TRAINING & OUTREACH
SAMPLE ENERGY ASSESSMENT

Services We Provide

- Energy Assessments
 - Quick advice
 - Site inspection
 - Life Cycle Cost analysis
 - Incentive suggestions
- New Construction program
- Retro-Commissioning program
- Public Housing Authority program
- Training and outreach
- Energy incentive guidance ****NEW and IMPROVED****
- Publications
- Presentations

Who We Serve

- Businesses
- Local, state, and federal government
- Public schools
- Community colleges
- Public universities and colleges
- Public safety, water and park districts
- Public housing

SEDAC TRAINING
Check the SEDAC Training and Event Calendar
NEXT Event March 5 in Grayslake
SEDAC Presentations
Check out the SEDAC YouTube Channel

DCEO Guidelines

April 15, 2014: Pre-approval applications due
May 15, 2014: Final applications due
June 1, 2014: PY7 begins

- Clean Water Energy Efficiency Initiative** which provides an enhanced incentive to waste water treatment plants for High Speed Turbo Aeration Blowers. Application.
- Public Sector Energy Efficiency Guidelines and Application** at www.ilenergynow.org Illinois Energy Now incentive application form in PDF. For best results, use Internet Explorer to open. View a summary presentation.
- Sweet Deal** special bonus of 5% for all projects completed by February 14, 2013
- Double-Up Natural Gas Incentive** continues in the Standard and Custom Programs; Custom Incentive is **\$3 per therm** saved.
- New Construction Guidelines and Application**
- Public Sector Retro-commissioning**
- Public Sector Natural Gas Boiler Tune-Up**
- Green Nozzle Program.** Click here for the Green Nozzle video.

HELP with incentive application is available!
Visit DCEO's Illinois Energy Now Trade Ally Program site.
Boiler Tune-up Webinars, February 19, 21, and 26. Registration and details

What's New

Building Operator Certification courses announced for Spring 2014
[Read more](#)

SEDAC offers energy smart tips on **Disaster Recovery and Rebuilding** for Illinois communities affected by the recent tornadoes. The Small Business Administration has loans available. [Read more](#)

MEEA's STEP Program
Offering savings through direct install of efficient products to qualified PUBLIC facilities.
[Read more](#)

SPOTLIGHT ON ENERGY SAVINGS

SEDAC on YouTube
[Introduction to SEDAC](#)

SEDAC Impact

- Number of energy assessments: 1,383
- Annual energy cost savings achieved: \$11.4 million
- Potential annual cost savings identified: \$51 million
- Building square footage assessed: 139.4 million sf
- Retro-commissioning (completed or in progress): 105

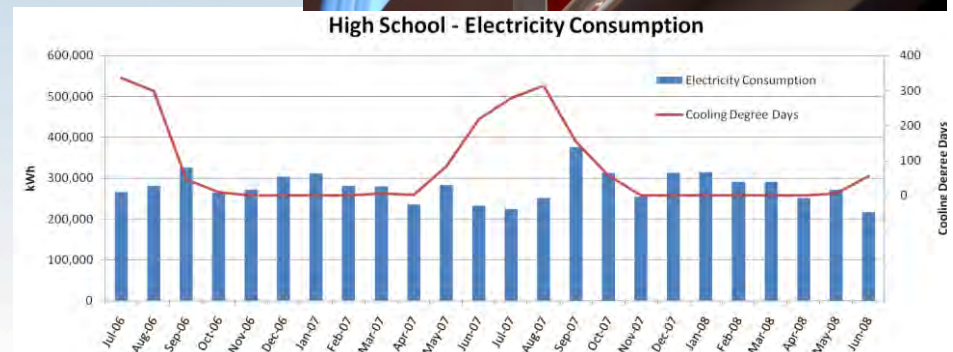
E-Newsletter
Get up-to-date energy incentive information and special topics.
Sign up for our email newsletter



WHAT WE DO

SEDAC Services

- Outreach and Training
- **Energy Assistance and Assessments**
- Retro-Commissioning (Public Sector)
- New Construction Design Assistance
- Pilot Projects
- DCEO Program Support



DESIGN ASSISTANCE

4 levels of service

- Of increasing complexity
- Level 1
 - General assistance
- Level 2
 - Qualitative and basic quantitative
- Level 3
 - Detailed quantitative approach
- Level 4
 - Implementation follow up



DA LEVEL 1

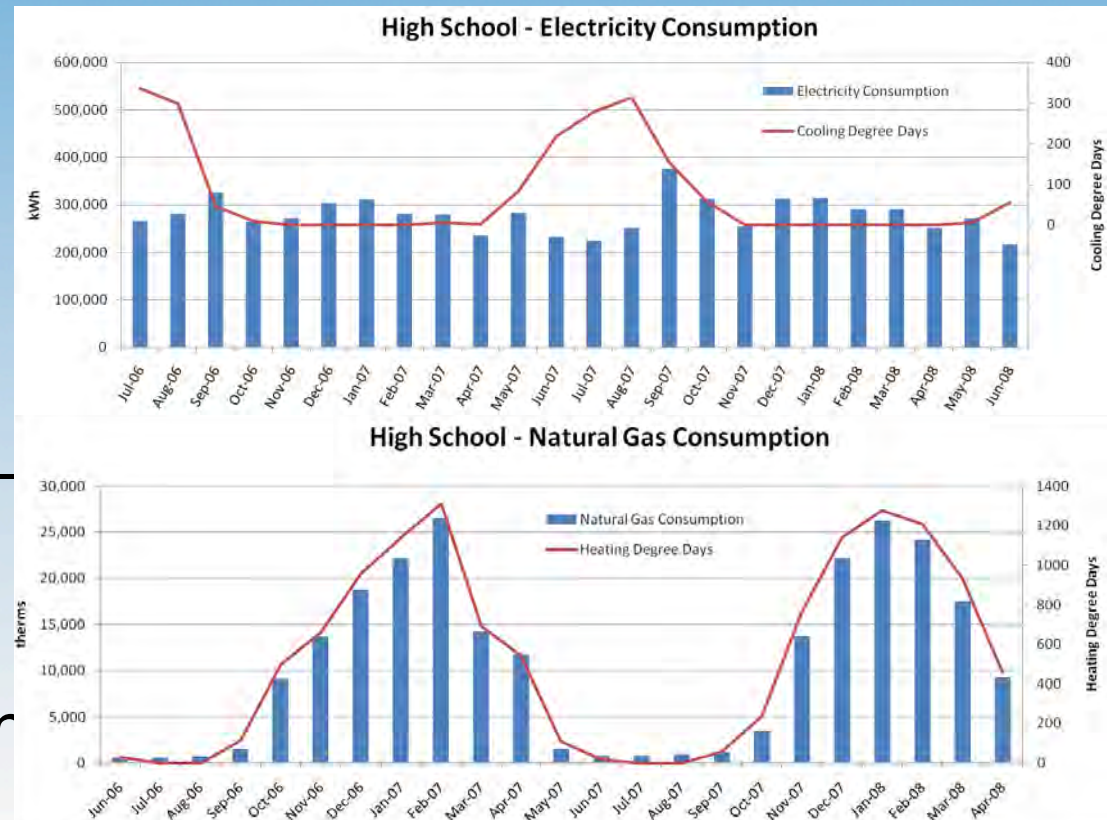
- Quick advice
- General energy questions
- Telephone calls
- One-on-one advice
- Printed material
- Meetings
- Correspondence



DA LEVEL 2

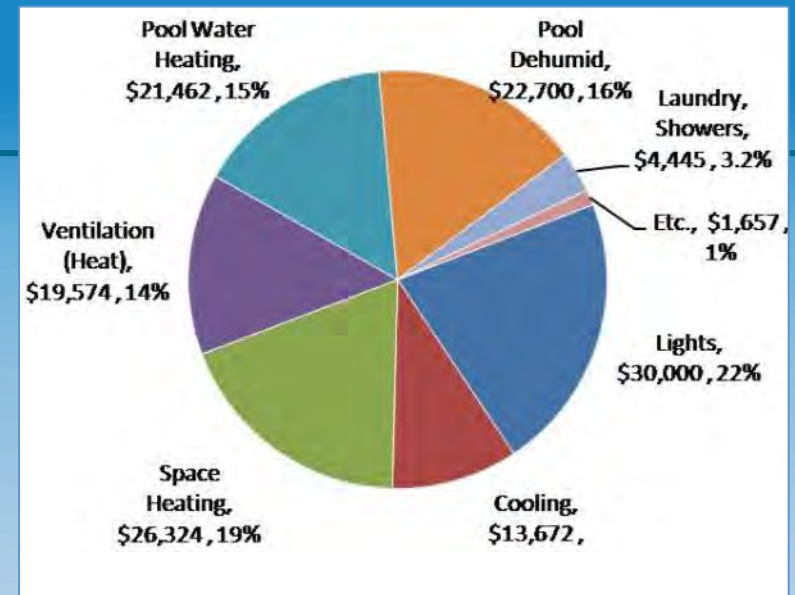


- Utility bill analysis
- Benchmarking
- Quick analysis
- Site visit – existing conditions
- Energy assessment – strategy recommendations
- Incentive coordination



DA LEVEL 3

- Level 2 Benchmarking
 - utility analysis
 - First cut recommendations
- More Robust Analysis
 - Energy simulation models
 - ECRM Scenarios
 - Life cycle cost analysis
- More Detailed Recommendations



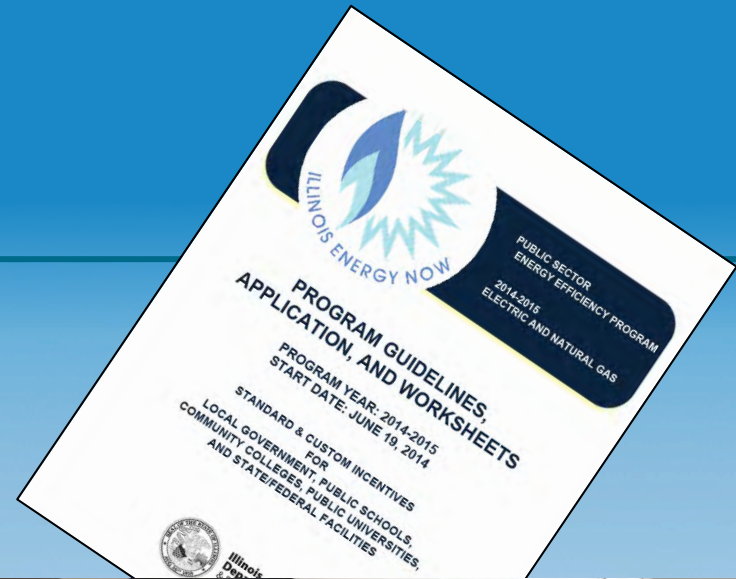
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ECRM 3 LED Exit Signs	\$12,000	\$1,754	\$2,200	\$9,800	12%	\$3,564
ECRM 4 Pool Cover	\$0	\$7,043	\$0	\$0	∞	\$51,796
ECRM 5 Solar Pool Heating	\$105,600	\$8,054	\$31,680	\$73,920	9%	\$25,191
ECRM 6 Vending Machine Controls	\$1,611	\$1,282	\$900	\$711	180%	\$8,750
ECRM 7 Boiler Stack Economizer	\$35,000	\$6,905	\$0	\$35,000	19%	\$48,624
PKG 1 Package of all ECRMs	\$369,631	\$71,361	\$137,521	\$232,110	30%	\$484,378



DA LEVEL 4

Follow up!

- Follow-up support
- Help to overcome technical and knowledge barriers
- Revised incentive calculations
- Incentive application assistance



FOLLOW-UP ASSISTANCE IMPACT

- Increased focus on **getting clients to implementation** and **getting energy savings**
- Implemented energy savings reported by Energy Assessment clients this year **up 42%** over previous five years
- Result of SEDAC's expanded initiatives:
 - Addition of Implementation Coordinator
 - Continued engagement with clients
 - Up-to-date incentive information
 - Targeted outreach in case of special incentive programs
 - Mini case studies (Spotlight on Savings) highlighting implementation by peer facilities
 - Assistance with follow up analyses and incentive applications
 - Referral to other assistance programs including utility programs, BITE, ICECF, EPA mitigation program



DESIGN ASSISTANCE IMPACT

- Conducted over 1,500 energy assessments
- Inspected over 158 million square feet
- Identified over \$54 million in annual savings, over \$12 million implemented
- Typically identify 10-40% annual cost savings
- Half of recommended measures have a simple payback of < 3 years




DESIGN ASSISTANCE IMPACT

Energy assessment clients are annually saving
102.1 million kWh and 3.6 million therms!


That's like avoiding the annual emissions from
8,180 homes



 = 1,000 Homes

or 18,873 cars!



 = 1,000 Cars



CASE STUDY – ENERGY ASSESSMENT



Indoor Tennis and Pool	
Building Type	Park District
Energy Measures	Lighting, HVAC, DHW, plug loads
Annual Energy Savings	\$27,941
Total DCEO Incentives	\$60,000
Total Project Cost	\$55,000 (after incentives)
Payback	1.9 years

Recommended...

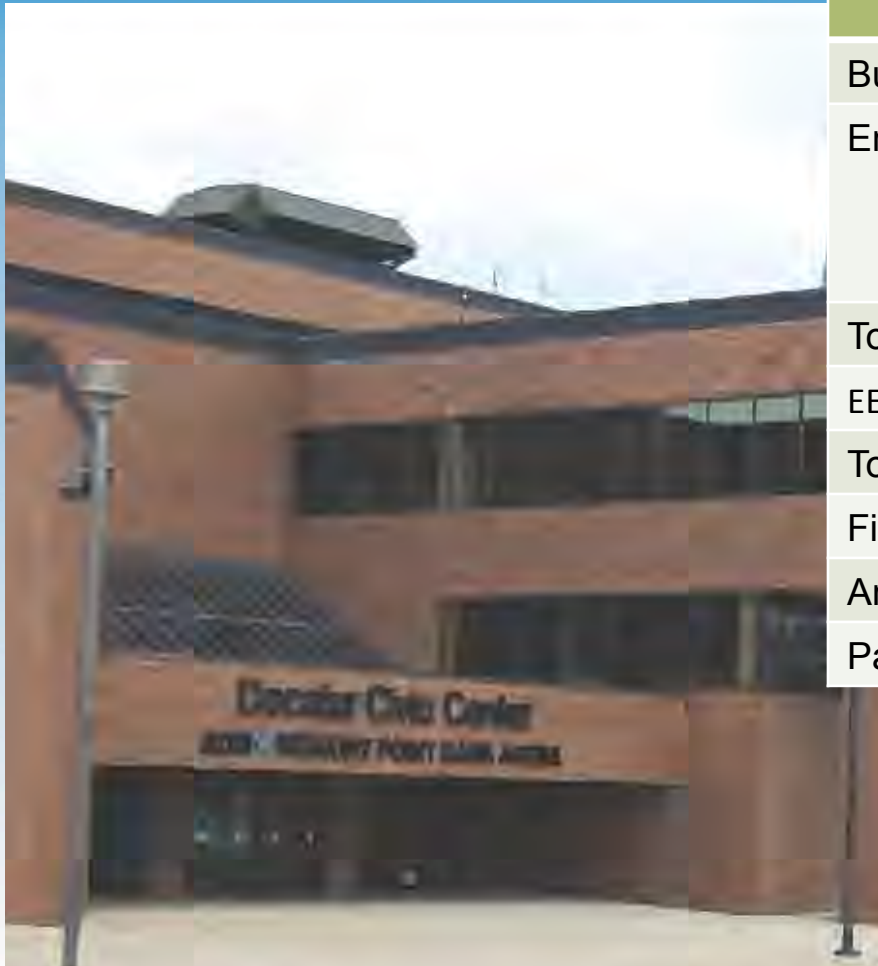
- Lighting upgrade
 - MH to high bay
 - Exterior LEDs
 - Reduce linear wattage
- Install VSDs on pool pumps
- Vending misers
- Thermostat setbacks

Recommended but not included in savings...

- Install pool covers
- Pool dehumidification / heat recovery
- Daylighting controls
- Ozone laundry



CASE STUDY – ENERGY ASSESSMENTS



City of Decatur – Civic Center	
Building Type	Municipal Civic Center
Energy Measures	Lighting, Occupancy Sensors, Boiler Pump Controls, Chiller Water Pump, Sequencing
Total Project Cost	\$308,550
EECB Grant	\$283,054
Total DCEO Incentives	\$25,496
Final Project Cost	\$0
Annual Energy Savings	\$60,000
Payback	0 years

Funding...

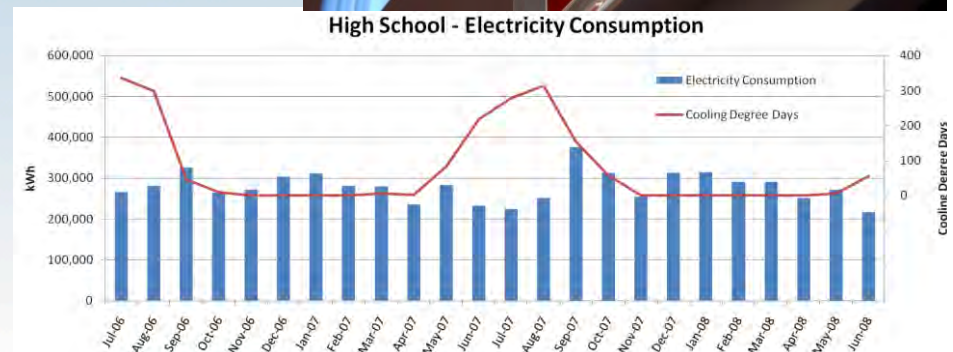
- DCEO Illinois Energy Now
- Conservation Block Grant from American Recovery and Reinvestment Act
- Fully funded



WHAT WE DO

SEDAC Services

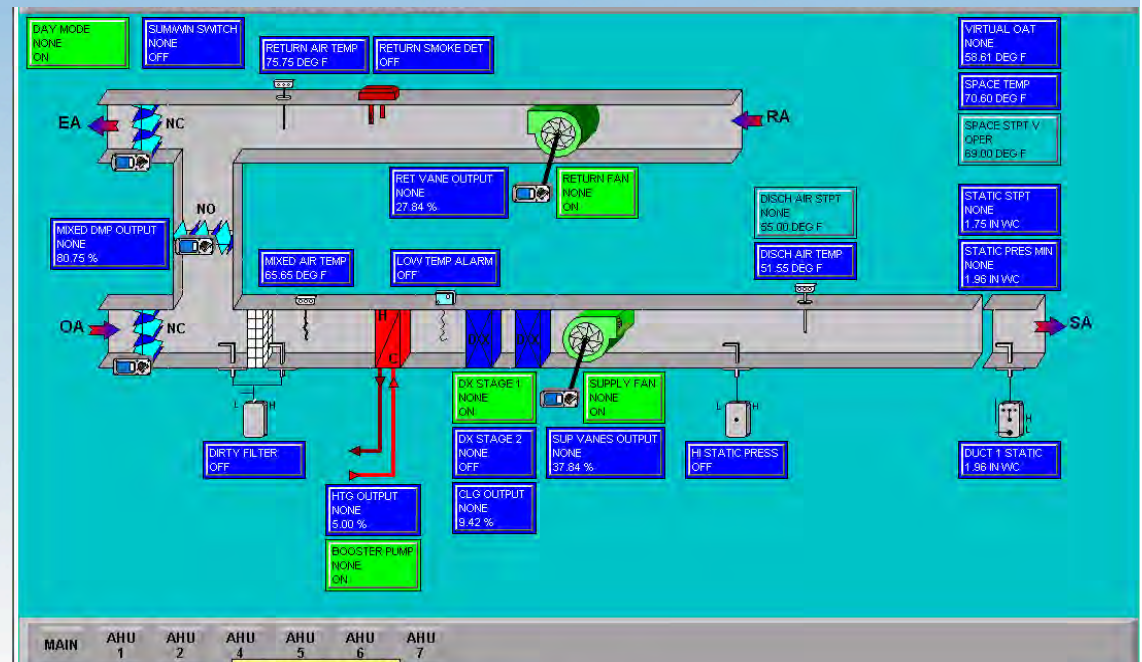
- Outreach and Training
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- **Retro-Commissioning (Public Sector)**
- New Construction Design Assistance
- Pilot Projects
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RETRO-COMMISSIONING

The systematic improvement of energy operations through repair and control of existing equipment.

- 16-24 month process
- >150,000 sf buildings
- \$10,000 client obligation

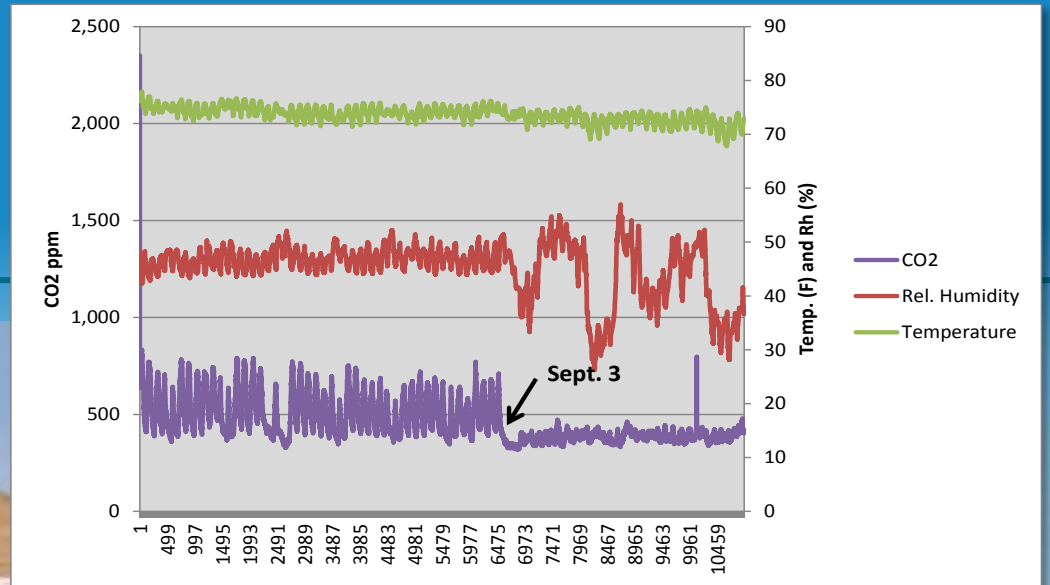
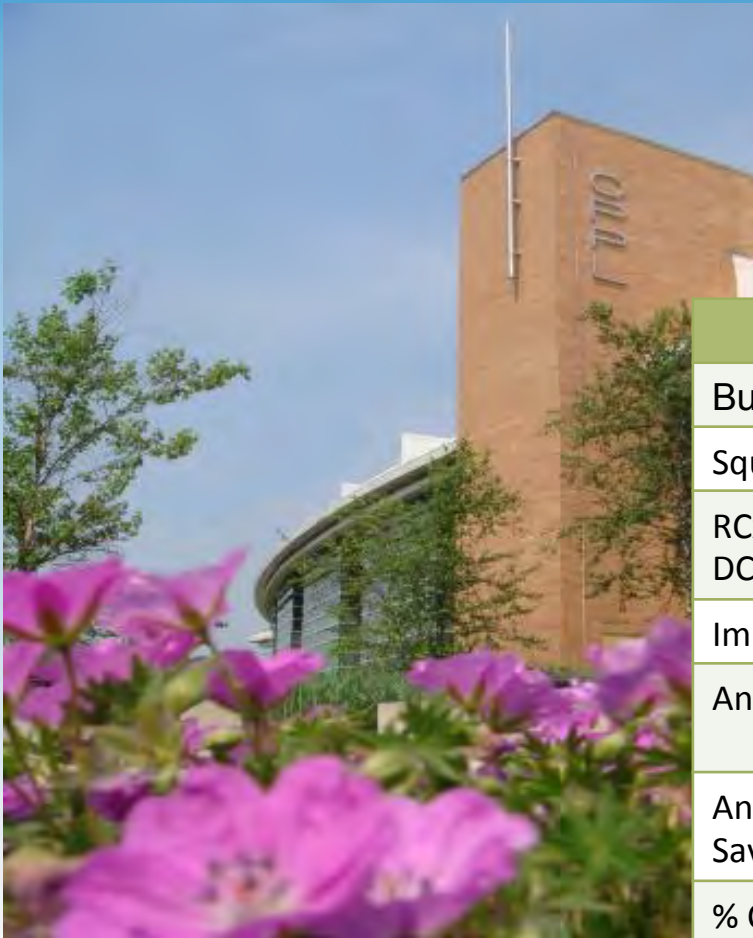


RETRO-COMMISSIONING IMPACT

- Results in longer equipment life, lower utility bills and lower maintenance costs
- Implemented measures have a quick payback, usually **18 months** or less
- Implementation results in a typical annual energy use reduction of **16%** or more
- SEDAC has provided RCx analyses for over **100** facilities, totaling **40 million square feet** and identified over **\$9.9 million *per year*** in savings



RCx CASE STUDY



Public Library	
Building Type	Library
Square Footage	95,568 sf
RCx Study Cost (paid by DCEO)	\$0 to Owner
Implementation Cost	\$10,797
Annual Energy Savings	172,804 kWh, 10,394 Therms
Annual Energy Cost Savings	\$26,739
% Cost Savings	14%
Payback	0.40 years

Implemented Strategies

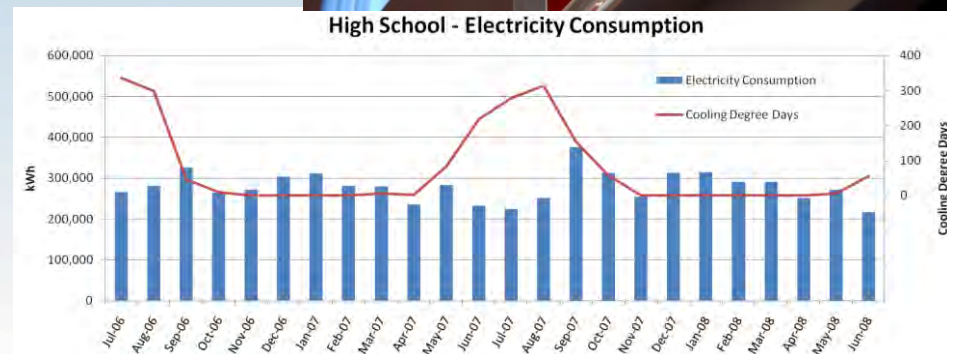
- Adjust fan system schedule
- Boiler system measures
- Operation of VFDs
- Minimize reheat
- Improved lighting control
- DCV



WHAT WE DO

SEDAC Services

- Outreach and Training
- Energy Assistance and Assessments
- Retro-Commissioning (Public Sector)
- **New Construction Design Assistance**
- Pilot Projects
- DCEO Program Support



NEW CONSTRUCTION (2 APPROACHES)

Design Assistance

Work with owner and design team to develop and meeting energy efficiency goals

- Set goals
- Develop strategies
- Identify incentives
- Open to public and private (work with ECW)

Incentive Review

- Provide review of incentive applications for DCEO
- Review claimed energy savings
- Recommend funding levels.



CASE STUDY – NEW CONSTRUCTION DESIGN ASSISTANCE

Recreation Center

- **Recommended Strategies beyond code:**

- Install demand control ventilation throughout facility
- Increase efficiency of mechanical systems
- Utilize higher performance glazing
- Add air sealing to building specifications
- Further reduce lighting power density

**51% Energy Cost Savings
(vs. ASHRAE 90.1-2007)**

- **Recommended Strategies to add:**

- Building Automation System
- Full building commissioning
- Bi-level switching in stairs

**Potential of
\$63,969 in DCEO incentives!**



CASE STUDY – NEW CONSTRUCTION INCENTIVES

Park District	
Building Type	Recreation Center
Energy Measures	Lighting, HVAC, envelope, DHW
Annual Energy Savings	\$10,643
Incremental Cost	\$57,152
Total DCEO Incentives	\$77,467
Simple Payback	5.3 years

What they did...

New 39,115 recreation center

- Increased roof and wall R-values
- Reduce lighting power density by almost .3 W/sf
- High Efficiency GSHP

Case study by SEDAC

What they got...

- Prescriptive Incentive for individual measures.
- They did not model the building due to costs constraints



NEW CONSTRUCTION IMPACTS

New Construction

- Design Assistance
- Incentive and guideline development
- Incentive application review
- Currently have more projects in queue for PY7 incentives than applied in entire PY6!

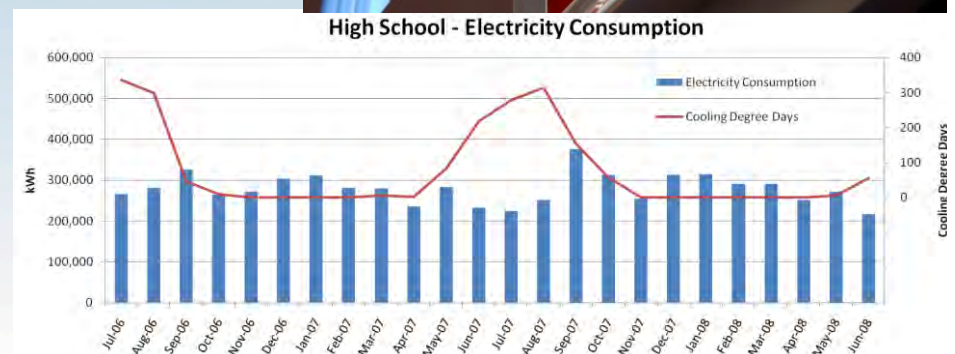
	EPY6 /GPY3	SEDAC total
New Construction Incentive Review Services		
Incentive Reviews complete--total	15	37
Prescriptive	3	5
Custom	8	28
Combined Prescriptive/Custom	4	4
Potential annual savings identified		
therm savings (annual)	276,438	438,941
kWh Savings (annual)	4,718,892	12,489,221
Incentive identified	1,641,397	2,815,472
Average % beyond code (cost)	25%	28%



WHAT WE DO

SEDAC Services

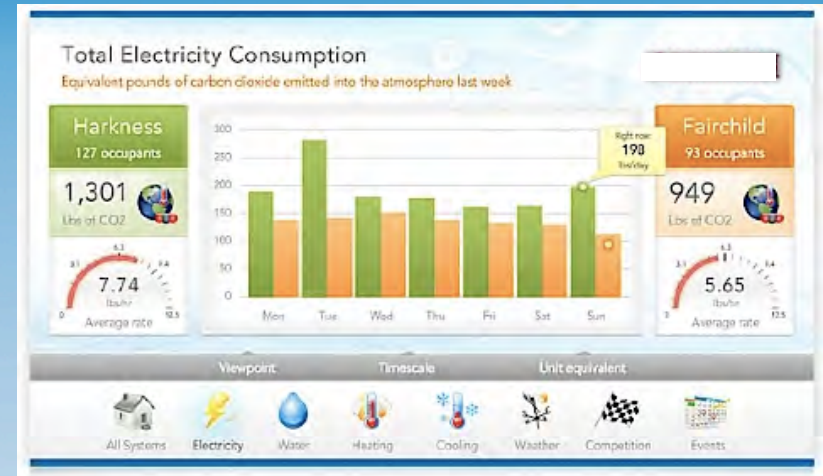
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- **Pilot Projects**
- **DCEO Program Support**



PILOT PROGRAMS

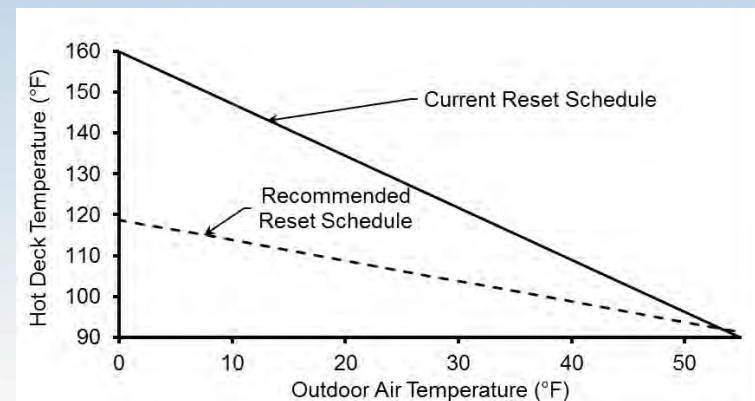
Dashboards

- 9 electric and gas dashboards installed.
- Being used to identify system operations problems



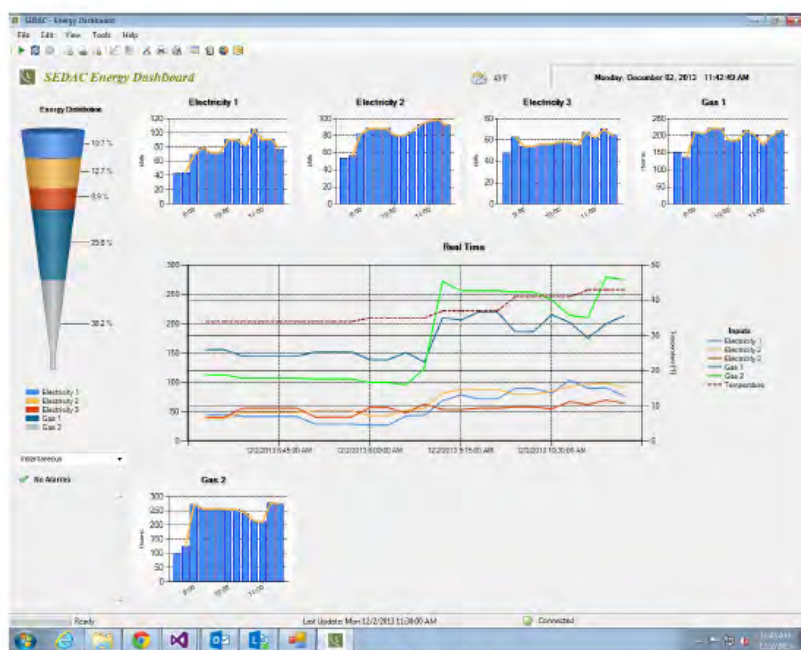
Mini-RCx

- 14 Mini-RCx projects completed
- Quick review of setpoints and scheduling
- Projects do not qualify for regular RCx services

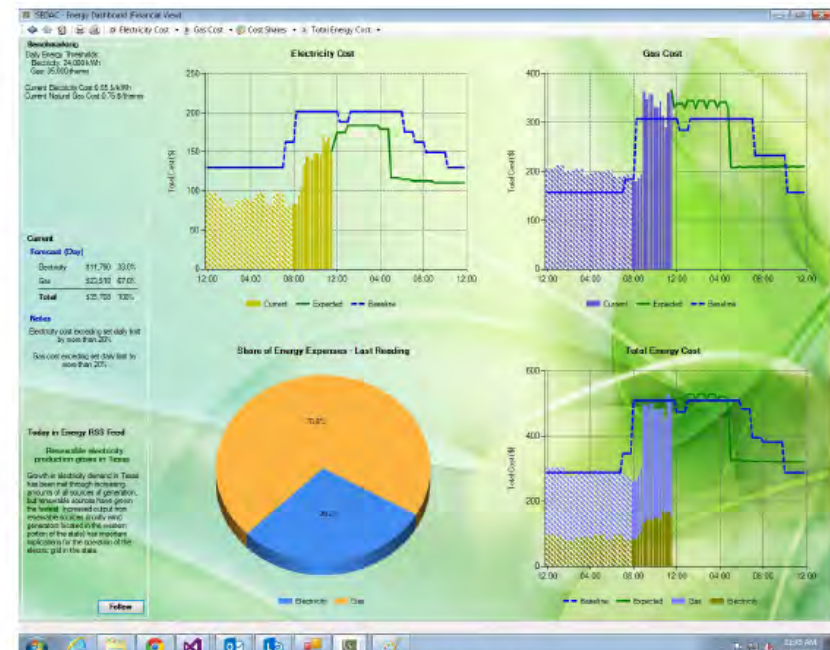


SEDAC ENERGY DASHBOARD

An energy dashboard helps to track energy use and manage expectations



Options screen of AEG energy dashboard



Financial screen of AEG energy dashboard

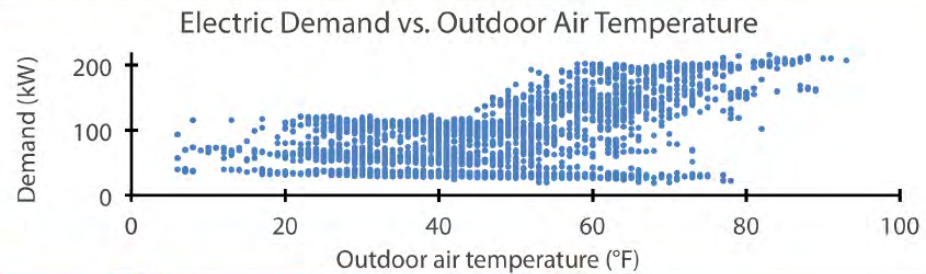


MINI-RCX

The Mini-RCx program was developed to provide additional services for public sector facilities that are not eligible for the traditional retro-commissioning program. The intention is to identify readily achievable savings opportunities through a quick review of energy use and system settings.

- Public sector facilities ~20,000 – 120,000 sf
- HVAC system settings, schedules, set points
- Focus on quick implementation

Mini-RCx for a Public Library



SEDAC identified energy savings related to air conditioning and outdoor air ventilation.



PY 2013-2014 Projects	Size, Initial Use	Identified Annual Savings	Implemented Annual Savings
Hoffman Estates Park District - Prairie Stone	90,775 sf 86,900 th/yr 1,867,000 kWh/yr	\$15,800 10,200 therms 100,500 kWh	Pending
Algonquin Main Library	35,000 sf 39,600 th/yr 892,000 kWh/yr	\$15,200 10,500 therms 64,600 kWh	Partial, in process \$4,000 4,700 therms
Decatur Public Library	141,000 sf 59,400 th/yr 2,415,000 kWh/yr	\$63,000 25,000 therms 581,000 kWh	\$63,000 25,000 therms 581,000 kWh
Gibson City Middle School	59,920 sf 26,000 th/yr 450,000 kWh/yr	\$12,000 4,400 therms 100,000 kWh	Partial, in process \$5,400; 1,900 therms 44,000 kWh
Champaign SD Stratton Elementary	71,433 sf 50,409 th/yr 1,000,251 kWh/yr	\$20,000 17,000 therms 88,000 kWh	Pending
Bucktown-Wicker Park Public Library	15,500 sf 10,661 th/yr 298,066 kWh/yr	\$11,000 5,000 therms 78,000 kWh	Pending
Messenger Public Library	24,800 sf 21,304 th/yr 454,193 kWh/yr	\$10,000 9,200 therms 80,000 kWh	Pending



IEN PROGRAM SUPPORT

Verification site visits

- Verify incentivized projects

Data collection and archive

- Detailed data base
- For statewide planning and program development

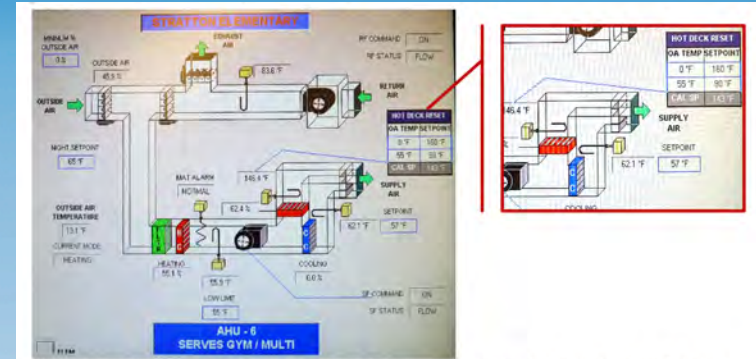


Figure 5: Hot Deck Reset and Cold Deck Setpoint Temperature at AHU-6. Screenshot from February 27, 2014, when the outside air temperature reading was 13.1°F.

The screenshot shows the MATLAB R2012b Database Explorer interface. The 'Data Preview' window displays a table with 15 rows and 9 columns. The columns are 'productDe...', 'January', 'February', 'March', 'April', 'May', 'June', 'July', and 'August'. The rows list various products and their sales volume for each month.

productDe...	January	February	March	April	May	June	July	August
Victorian Doll	1400	1100	981	882	794	752	654	773
Train Set	2400	1721	1414	1191	983	825	731	653
Engine Kit	1800	1200	890	670	550	450	400	410
Painting Set	3000	2400	1800	1500	1200	900	700	650
Space Cruiser	4300	NaN	2600	1800	1600	1550	895	700
Building Kit	5000	3000	2800	2300	1700	1400	1000	900
Tin Soldier	1200	900	800	500	399	345	300	175
Sail Boat	3000	2400	1500	1500	1300	1100	900	867
Sinky	3000	1500	1000	900	750	700	400	350
Teddy Bear	NaN	900	821	701	689	621	545	421
Convertible	6000	3100	8800	2300	1700	1400	1000	900
Huggy	1800	9700	800	500	3997	349	300	175
Pancakes	3100	9400	1540	1500	1350	1190	900	867
Shawl	235	1800	1040	900	750	700	400	350
Snacks	123	1700	823	701	689	621	545	421



APPLYING FOR ILLINOIS ENERGY NOW SERVICES

APPLICANT INFORMATION

Application date: 1/10/2012

Company/Organization name: Building Research Council

* Address: 1 East St Mary's Road

* City: Champaign

* County: Champaign

* State: Illinois

* Zip: 61820

* Contact name: Kristine Chalifoux

* Job title: Director of Management and Operations

* E-mail: info@sedac.org

* Phone: 800-214-7954

* Estimated building size in sq ft (use numbers only, no commas or words): 6780

PROJECT INFORMATION

Building name: Building Research Council

Please check here if the address is the same

Address: 1 East St Mary's Road

County: Champaign

State: Illinois

Zip: 61820

Project type: EXISTING BUILDING NEW CONSTRUCTION

Project description:

apply.sedac.org



WHAT WE ARE GOING TO DO

Program Year Goals:

Last PY Emphasis on getting things in and getting things in place

- Expanded implementation and follow up — greater coordination with utilities to provide clients with latest incentive info, expanded application assistance
 - Increased numbers of hits and projects
 - 42% improvement in implementation

New PY

- Continue Program Refinements
- Pilot refinements
- Education
- New ideas



WHAT THEY SAID

**very impressed with the knowledge of the group
friendly and respectful of our time**

expand the service

great experience

highly recommend working with SEDAC to everyone

**very responsive, knowledgeable, and easy to work
with**

a great group, mission, and service

helpful initiative

Grateful for this help

Superb individuals

Appreciated the thoroughness

**“Now we know best what and how to conserve
energy and dollars”**





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