



Illinois Innovation
Talent
(ILIT) Pilot Program

Energy Reduction Challenge (ERC)
ComEd 2009 Sponsor

A yellow diamond shape is centered on the page. A large orange crayon with a red eraser and a black band is positioned diagonally across the top left of the diamond. A blue wavy line starts from the bottom right of the diamond and extends towards the right edge of the frame.

Advisory Members

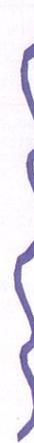
- Illinois State Board of Education
- Department of Commerce & Economic Opportunity (DCEO)
- Illinois Mathematics & Science Academy (IMSA)
- Sponsor Partners



Three crayons (orange, green, and yellow) are clustered together in the bottom left corner. A blue wavy line starts from the tip of a blue crayon in the top right corner and extends downwards along the right edge of the frame.

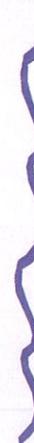
Rationale

- Recognizing the need for students to become globally competitive
- Increase student achievement in math, science and engineering
- Critically examine and solve complex problems



Initiation

- Aug 2007 - Launching of 1st pilot program
- 23 high schools across the state participated
- Included projects in the fields of
 - Healthcare
 - Biotechnology
 - "Green" Design
 - Manufacturing
 - Information Technology
 - Logistics



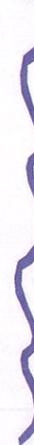
Intent

- To introduce real-world problem-based learning (PBL) experiences among schools
 - Process administered by IMSA
 - Encourages team effort to provide a solution
- To involve industry, government and community partners
 - One sponsoring partner assigned to one high school



Objectives

- Engage all levels of students in problem-based learning (PBL)
- Establish a pipeline of projects for Illinois schools
- Provide students with career awareness through
 - examining real-world problems
 - networking with outside professionals
- Prepare educators to be able to
 - establish connections with outside partners
 - develop curriculums around PBL



Energy Reduction Challenge

- 2008-2009 pilot program included Energy
- ComEd sponsored six high schools
 - Genoa-Kingston HS
 - Manteno HS
 - Reavis HS
 - Thornton Township HS
 - Waubonsie Valley HS
 - William Fremd HS



Outcome

- Five HS presented energy projects for school infrastructure
 - Primarily Lighting Improvements
 - Electric Operated Transportation
- One HS presented energy projects for community infrastructure
 - Lighting Improvements in Village Buildings
 - WWTP Improvements



How to Approach an Energy Audit



Energy Audit Topics

- Obtaining Energy Data
- Developing Energy Usage Profile
- Review of Lighting Systems
- Motor Efficiency Upgrades
- HVAC Support Systems
 - Boilers
 - Pumps & Fans
 - Cooling Towers
 - Chillers



Resources



Resource Topics

- Introduced hands-on tool kits available through National Energy Education Development (NEED)....
 - www.need.org
- Directed them to the ComEd Online energy store
 - Kill-A-Watt meters at a discount
- Provided misc. resources on the IMSA "Moodle" sharing website (need to be a member to access)
- Discussed procedure for future specific project related questions



Type of Audit Tools

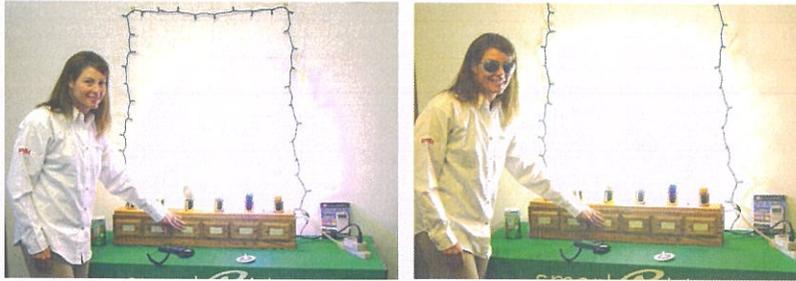
- Light FC Meter
- Ballast Checker
- Kill-A-Watt Meter
- Temperature Measurement



Resources Tools



Comparison of Light Bulbs



Discussion on DCEO Incentives



DCEO Incentives

- Up to \$5,000 per school to compensate for teacher time & expenses to purchase energy measuring and related equipment
- 1st year Public Sector Energy Efficiency Portfolio Standard prescriptive & custom incentives for implementing ECMs
 - Similar to ComEd's 1st year Smart Ideas Portfolio
 - Allowance for material savings and labor cost in payback calculations
 - Choose best incentive opportunity: prescriptive or custom



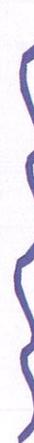
Ballast: Magnetic or Electronic?



Measuring Light Levels



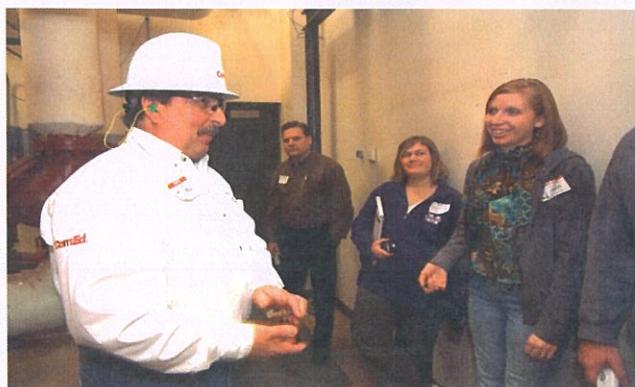
Realizing Contribution from Skylight



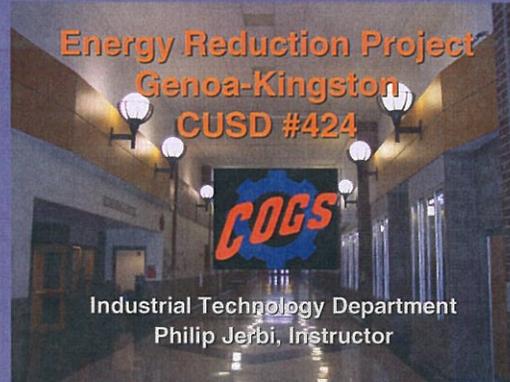
Obtaining Motor Info



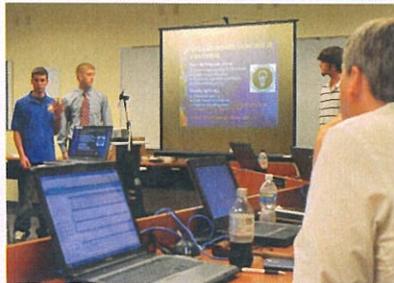
If You Don't Ask - I Won't Tell



Genoa-Kingston HS Presentation to School Board



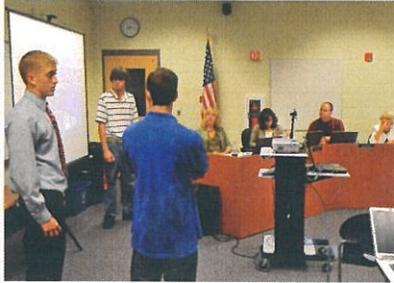
Genoa-Kingston HS Objectives



- Reduce energy consumption.
- Improve visual environment to enhance the learning environment.
- Provide improved color rendition for increased visual acuity.
- Decrease the lighting system's operating costs.
- Use sustainable recycling process for disposal of used equipment.



Genoa-Kingston HS Solutions

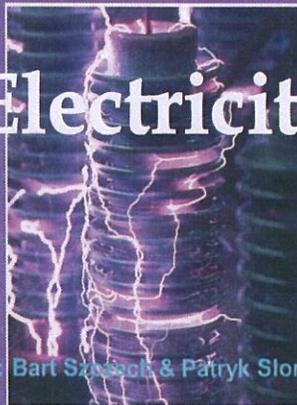


- Replace the existing classroom 2x4 luminaries with color-enhanced, longer-life, higher lumen, and lower wattage T-8 lamps with the new step-dimming ballast that works with daylight harvesting photocells.
- Replaced existing HID fixtures with new energy efficient T-8's.
- DCEO incentive available to offset costs.
- Payback time could be as minimal as 4 years.



Reavis HS Presentation at IMSA

Electricity



By: Bart Szasch & Patryk Slomba



Reavis HS Presentation at IMSA



Waubonsie Valley HS Presentation at IMSA

Design Problem- Solving Process

Energy Reduction Challenge

**Waubonsie Valley High School
Aurora, Illinois**



Waubonsie Valley HS Student Home Energy Audit



Waubonsie Valley HS Evaluate the Solution



\$55610.74/YR Current Change Savings
= T12 and T8s

\$2642.20/YR Future Change Savings
= all T8s and updates

\$58,250.97/YR

**TOTAL SAVINGS
2004-2010**



Manteno HS Presentation

Village of Manteno Energy Reduction Plan



By: Manteno High School Students



Manteno HS Village of Manteno



Show & Tell Types of Bubble Diffusers



WWTP Aeration Tanks



WWTP Aeration Blower Data Taking



Measuring Blower Performance



Manteno HS Presentation to Village Board



Project 1: Replace Old Blower Motors (86% Efficiency) With New Blower Motors (93% Efficiency)

New High Efficiency Motor Savings

Blowers	Current kWh	New kWh	
#1	25,000	16,250	\$8,125
#2	20,000	12,800	\$6,400
#3	10,000	6,400	\$3,200
Total	55,000	35,450	\$27,725



Village Board Meeting Attendees



ComEd Receives Sponsor Award



Certificate of Appreciation

Presented to

Commonwealth Edison

for your dedicated efforts and leadership with

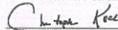
Manteno High School

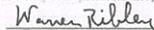
in the

Illinois Innovation Talent Pilot Project

You are an inspiration to others.

Presented on the 1st day of May, 2009, by the Illinois Innovation Talent Advisory Board.


Dr. Christopher Koch, State Superintendent
Illinois State Board of Education


Warren Ribley, Director Department of Commerce & Economic Opportunity



IL Race To The Top Initiative (RTTT)

- Organize learning exchanges to support STEM
- STEM-Science, Technology, Engineering and Math
- Involve business and industry leaders to partner/sponsor STEM learning exchanges



9 STEM Learning Exchanges

1. Architecture and Construction
2. Agriculture and Natural Resources
3. Energy
4. Finance
5. Health Sciences
6. Information Technology
7. Manufacturing
8. Research and Development
9. Transportation, Distribution, and Logistics



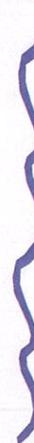
Energy Learning Exchange ERC 2010 Program

- Planned for Fall 2010
- Expand statewide
 - Include both state utilities: ComEd & Ameren
- Three Phase Project
- Incorporate 3rd year DCEO Public Sector Energy Efficiency Portfolio Standard (EEPS) incentives



Three Phase Project

- **Phase One:** Teams of students evaluate projects in their school infrastructure focusing on one or two categories of energy efficiency (e.g. lighting, motors, controls)
- **Phase Two:** Teams of students evaluate projects in their community, such as a library, water treatment facility, village hall, etc...
- **Phase Three:** Teams of students coordinate community-wide sustainability strategies



Scope

- Total number of Energy Reduction Challenges in 2010 would be 10 to 15
- Six schools that participated in the original ERC pilot project would be offered the opportunity to participate in Phase Two/Three
- Illinois State Board of Education will continue to refine career pathway guidance for those students participating in the program



Strategy

- ComEd and Ameren to sponsor five schools each as part of Phase One
 - Provide technical assistance and training during a two-day workshop in the fall of 2010
 - Serve as information specialists that can be contacted during project implementation
 - Assist the State in promoting ERC efforts through press releases and events



Strategy (cont.)

- Use local resources to mentor and provide direct assistance to the schools
 - Smart Energy Design Assistance Center (SEDAC)
 - Community Colleges and Universities
- Schools participating in Phase Two can also serve as mentors for schools participating in Phase One



DCEO Incentives

- Up to \$5,000 per school
- Incentives for 2nd Year EEPS
 - The incentive cap from \$100,000 to \$200,000 per site
 - Total Project Cost contribution amount from 50% to 75% (equipment + labor)
 - Prescriptive Incentives have increased
 - New measures have been added to the Prescriptive Incentive Program
 - Custom Incentive from \$0.07 to \$0.08 per annual kWh savings



DCEO Lighting Prescriptive Incentives

Equipment Type	DCEO Incentive	Equipment Type	DCEO Incentive
Induction Lighting		LED traffic signal modules.	
Interior Induction Fixture	\$30.00	LED Signal Head consists of 1 red, 1 green and 1 yellow ball module.	
Cold Cathode		Arrow and Pedestrian LED Modules consist of 1 module (any color).	
Cold Cathode	\$3.25	Pedestrian Combo consists of walk/hand/countdown.	
Controls		Incentive Per Watt Controlled	
Occupancy Sensors (per connected watts)	\$0.11	8" Traffic LED Signal Head	\$83
Plug Load Occupancy Sensor	\$20.00	12" Traffic LED Signal Head	\$100
Bi-Level Stairwell/Hall/Garage Fixtures w/ integrated sensors	\$25.00	8" Arrow LED Module	\$22
T8/T5 High bay Fluorescent Fixtures with Electronic Ballast		12" Arrow LED Module	\$38
<i>(Pre-approval application is required)</i>		8"-9" Pedestrian LED Module	\$33
Total Existing Fixture Watts less Total New Fixture Watts	\$0.44	12" Pedestrian LED Module	\$38
Total Existing Fixture Watts less Total New Fixture Watts	\$0.44	16"x18" Pedestrian Combo	\$38
Total Existing Fixture Watts less Total New Fixture Watts	\$0.44		



DCEO Motor Prescriptive Incentives

MOTOR	DCEO	MOTOR	DCEO
Horse Power	Incentive per Motor	Horse Power	Incentive per Motor
1	\$11.00	25	\$128.00
1.5	\$14.00	30	\$144.00
2	\$18.00	40	\$160.00
3	\$25.00	50	\$200.00
5	\$32.00	60	\$240.00
7.5	\$56.00	75	\$280.00
10	\$72.00	100	\$285.00
20	\$120.00	125	\$314.00
		200	\$515.00



Additional WEB Based Resources

- DOE's Energy Star Benchmarking
- ComEd's Energy Insights Online (EIO)
- More information is available at ComEd's exhibit table



Energy Star Benchmarking

- Provide by Department of Energy
- The [Energy Star](#)® rating system allows owners and operators of buildings to compare the energy performance to that of similar buildings throughout the U.S.



Eligible Space Types

Hospitals



Retail



Office Buildings



Hotels



Medical Office Buildings



Waste Water Treatment Plants



Courthouses



Financial Centers



Warehouses



Dormitories



Supermarkets



Schools

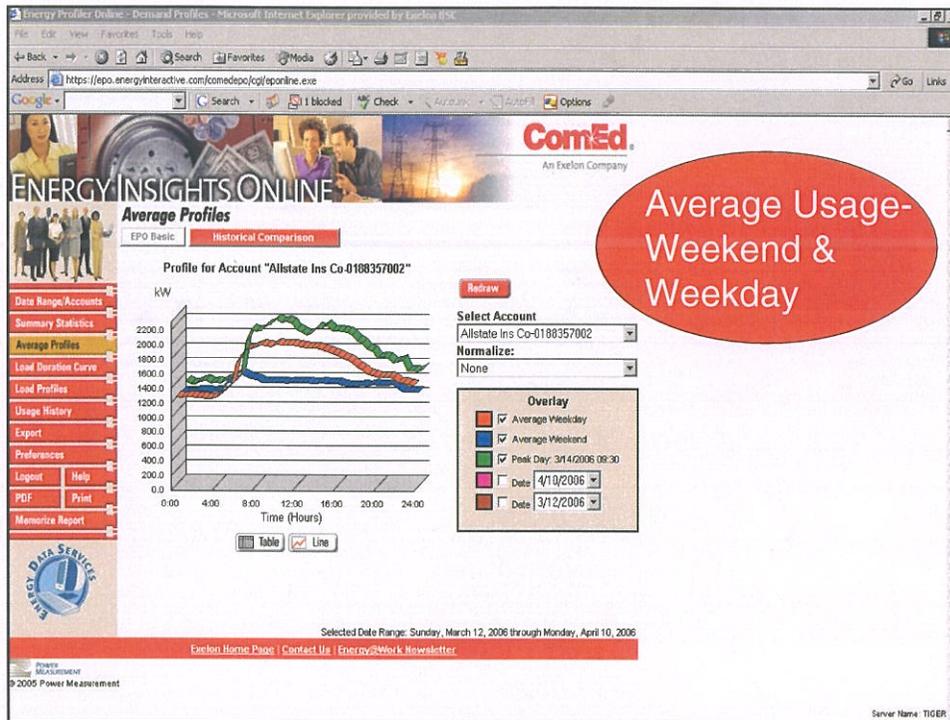


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Energy Insights Online

- *Provided by ComEd*
- *This web-based analysis tool interprets energy usage data gathered from the customer's recording meters and converts either monthly or daily data into easy-to-understand graphs and reports that show how much electricity they consume.*





WEB Addresses

For more information on Energy Star Benchmarking:
<https://www.energystar.gov/istar/pmpam/>

To access the Energy Usage Data System:
www.energyusedata.com

To access information on Energy Insights Online:
www.comed.com/eio

Energy Usage Data System:
energyusedata@comed.com or go to:
www.comed.com/energyusedata for training materials

Chicago Green Office Challenge
www.chicagogreenofficechallenge.org



