ENERGY EFFICIENCY AND RENEWABLE ENERGY FUNDING OPPORTUNITIES
JANUARY 21, 2010

Michael Stanch, Energy Solutions Manager
360 Energy Group – SEDAC; (312) 264-8568
EERE Funding Opportunities

- Who am I?
  - Energy Solutions Manager, 360 Energy Group
  - 18 years experience in lighting and energy efficiency projects including solar PV
  - Member of IASBO and its Sustainability Committee
- I will present my estimation of what is available and meaningful to Illinois K-12 schools in the areas of energy efficiency and renewable energy audits, grants, financing and rebates
- More importantly, what not to waste time on
EERE Funding Opportunities

- What we will do today - Review of Illinois and other programs available to K-12 Schools
- Carol Kulek, IL DCEO, will present broad overview of IL DCEO programs available for K-12 schools
- Mike Stanch, 360 Energy Group/SEDAC, will provide concrete examples of how to apply for energy efficiency and renewable energy audits, grants and rebates under the IL DCEO programs
- We will also present other sources like the federal and local governments, private foundations and companies
EERE Funding Opportunities

- Introduction- Who are you?
- Why are you here?
- **Main interests- $, energy, environmental, work place comfort and productivity?**
- Maintenance issues- breakdowns, increased maintenance costs?
- Reliability issues with utilities?
- The money is out there and will be spent by you or others- it is up to you!
Illinois adopted the Energy Efficiency Portfolio Standard three years ago and tasked IL DCEO with implementing the benefits for public entities in the state—good for schools.

EERE Funding Opportunities

- Definitions- acronyms mean POWER
- EERE= Energy Efficiency and Renewable Energy
- EECEBG= Energy Efficiency and Conservation Block Grants- direct and indirect allocations to states and municipalities to use to fund EERE projects nationwide
- EEPS- Energy Efficiency Portfolio Standard- IL law that funds energy efficiency measures through recovery of costs from ComEd and Ameren customers- the best game in town!
- Others in handout- check them out and impress your friends
EERE Funding Opportunities

- What did the Recovery Act do for EERE?
- Money and lots of it- billions and billions
- For? - almost everything including biomass, geo thermal, loan guarantees, green jobs, smart grids, advanced batteries, plug in vehicles, public transportation, alternative transportation, assisted housing EE, home appliance rebates, tax credits, weatherization for homes- **but with short timeline- 36 months from February 2009- February 2012**
- Schools- Green Schools Programs for K-12 Schools- $9.75 Billion; State Energy Programs- $3.1 Billion; EECBG Grants- $3.2 Billion- Nationwide Numbers
EERE Funding Opportunities

- **Green Schools Programs for K-12 Schools** - $9.75 Billion - Department of Education? - was not in final bill except for financing

- **State Energy Programs ("SEP")** - $3.1 Billion - Each state was allocated $ based on population by the US Department of Energy ("US DOE") - state energy offices are administering these funds

- **EECBG Grants** - $3.2 Billion - Counties and municipalities are administering these funds through the US DOE

- **Federal tax credits and financing incentives may also be applicable to school EERE projects**
Illinois Energy Fun Facts

- Illinois coal reserves rank third in the nation
- Illinois ranks 33rd in total energy consumption per capita
- Illinois ranks 7th in electric consumption in the USA—(48%-49% coal to nuclear ratio)
- Transportation accounts for 27% of all energy used—ranks 2nd in consumption of ethanol
- Population of 12,720,000 (5th in nation)
- 84.1% urban population
- $36,264 per capita income
Illinois EERE Opportunities

- **IL Energy Efficiency Portfolio Standard**: started in 2008 as a public benefit. IL DCEO administers for public K-12 schools—only available to Com Ed and Ameren delivery customers in Illinois.

- **IL State Energy Programs**: $101 million. IL DCEO is administering these Recovery Act funds—grants for non-EEPS public entities, thermal efficiency, green roofs, large customers and non-direct EECBG grants—being finalized by IL DCEO now.

- **IL EECBG Grants**: $112 million. Counties and municipalities are administering these funds through the US DOE—check with your county or municipality for any funding opportunities.
Illinois EERE Opportunities

- IL Energy Efficiency Portfolio Standard- First Year- $12.9 million- several million left on the table
- We are now in the second year of a $26.8 million dollar benefit and many millions will go unused
- Why? - lack of awareness
- The third year beginning June 1, 2010 will go to $41.6 million
Illinois EERE Opportunities

- How do you take benefit of the EEPS benefits?
- You need to apply for funds to upgrade lighting, motors, drives, HVAC, refrigeration and any other custom measure that saves electricity
- Lighting has typically been 90% of the totals used so we can start there
Illinois EERE Opportunities

- Application needs to be filled out but it is fairly easy- SEDAC can help with an audit
- First review [the guidelines](#)
- You need to audit your existing fixtures and determine what you want to do with the- retrofit, replace or re-design
- The form is on an excel spreadsheet from a link on [the IL DCEO Energy Efficiency page](#)
Illinois EERE Opportunities

- **Smart Energy Design Assistance Center ("SEDAC")** - created in 2004 to help businesses and municipal entities with energy efficient design for new and existing buildings

- SEDAC has completed over 400 audits of facilities in IL through its center at UIUC and its design assistance experts - many have implemented some or all of these recommendations

- IL K-12 schools can **apply** for design assistance for new or existing buildings - the service is **free** to public schools and is funded by ComEd, Ameren and the IL Department of Commerce & Economic Opportunity, Bureau of Energy & Recycling
K-12 Facilities

- Loss of tax revenue equals less services
- Need to reduce energy costs
- Older, inefficient facilities
- Do as I say.....
- Lack of technical expertise
- No impetus for action- incentives help a lot
- Vendors selling unproven technology
SEDAC- Eligibility

- Apply to SEDAC for technical assistance
- Level 1: Anyone
- Levels 2, 3, and 4:
  - For Profit Business or Public Building- no non-profits
  - Usually greater than 8,000 square feet and/or $50,000 annual utility cost
  - Multiple locations larger than 5,000 square feet
SEDAC- Level 1: Initial Consultation

- Answer basic energy related questions.
- Provide list of energy cost reduction measures (ECRMs).
- Provide sources for literature, web resources and other information.
- Determine if additional level of service is appropriate.
SEDAC- Level 2: Energy Audits

- Review Architectural Plans
- Visit Site and Inspect
- Estimate the Breakdown of Energy Usage
- Provide list of ECRMs with preliminary suggestions for consideration.
- Determine if additional level of service is appropriate.
- Lighting Level 2- look only at lighting opportunities- best paybacks and easiest to do
SEDAC- Level 3: Design Assistance

- Design Review and/or Site Inspection
- Computer Modeling of Base Case and Alternatives with ECRMs
- Energy Savings Analysis
- Life Cycle Cost Analysis
- Final Report with Recommendations
SEDAC- Level 4: Implementation

- Meeting with client to review report
- Finding a service provider
- Technical information and design support
- Locating funding sources
- Assuring customer satisfaction
- Apply for IL EEPS incentives
### SEDAC- Energy Modeling Results

<table>
<thead>
<tr>
<th>Energy Cost Reduction Measure (ECRM) or Package of ECRMs</th>
<th>Electricity</th>
<th>Natural Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annual kWh</td>
<td>kWh Cost</td>
</tr>
<tr>
<td>Base Building</td>
<td>1,425,452</td>
<td>$85,875</td>
</tr>
<tr>
<td>ECRM1 - Cogeneration</td>
<td>306,751</td>
<td>$30,140</td>
</tr>
<tr>
<td>ECRM2 - Ventilation Heat Recovery</td>
<td>1,448,954</td>
<td>$87,281</td>
</tr>
<tr>
<td>ECRM3 - High Efficiency Electric Motors</td>
<td>1,388,264</td>
<td>$83,650</td>
</tr>
<tr>
<td>ECRM4 - Boiler Tune-Up</td>
<td>1,425,452</td>
<td>$85,875</td>
</tr>
<tr>
<td>ECRM5 - Pump Impeller Trim or Replace</td>
<td>1,395,292</td>
<td>$84,071</td>
</tr>
<tr>
<td>PKG1 - Vent. + Motors + Tune Up + Pumps</td>
<td>1,381,606</td>
<td>$83,252</td>
</tr>
</tbody>
</table>
## SEDAC - First Costs, Savings, and Cash Flow

<table>
<thead>
<tr>
<th>Energy Cost Reduction Measure (ECRM) or Package of ECRMs</th>
<th>ID</th>
<th>Additional First Cost</th>
<th>Annual Savings</th>
<th>Monthly Savings</th>
<th>Monthly Loan Payment</th>
<th>Net Monthly Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cogeneration</td>
<td>ECRM 1</td>
<td>$179,000</td>
<td>$30,500</td>
<td>$2,542</td>
<td>($2,055)</td>
<td>$486</td>
</tr>
<tr>
<td>Ventilation Heat Recovery</td>
<td>ECRM 2</td>
<td>$75,000</td>
<td>$18,732</td>
<td>$1,561</td>
<td>($861)</td>
<td>$700</td>
</tr>
<tr>
<td>High Efficiency Electric Motors</td>
<td>ECRM 3</td>
<td>$10,700</td>
<td>$3,771</td>
<td>$314</td>
<td>($123)</td>
<td>$191</td>
</tr>
<tr>
<td>Boiler Tune-Up</td>
<td>ECRM 4</td>
<td>$1,500</td>
<td>$3,523</td>
<td>$294</td>
<td>($17)</td>
<td>$276</td>
</tr>
<tr>
<td>Pump Impeller Trim or Replace</td>
<td>ECRM 5</td>
<td>$7,000</td>
<td>$2,260</td>
<td>$188</td>
<td>($80)</td>
<td>$108</td>
</tr>
<tr>
<td>Vent. + Motors + Tune Up + Pumps</td>
<td>PKG 1</td>
<td>$94,200</td>
<td>$28,689</td>
<td>$2,391</td>
<td>($1,082)</td>
<td>$1,309</td>
</tr>
</tbody>
</table>
# SEDAC- Life Cycle Costing for ECRMs

<table>
<thead>
<tr>
<th>Energy Conservation Measure (ECRM) or Package of ECRMs</th>
<th>ID</th>
<th>Internal Rate of Return (IRR)</th>
<th>Net Present Value (NPV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cogeneration</td>
<td>ECRM 1</td>
<td>18.3%</td>
<td>$93,709</td>
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<tr>
<td>Ventilation Heat Recovery</td>
<td>ECRM 2</td>
<td>29.0%</td>
<td>$90,667</td>
</tr>
<tr>
<td>High Efficiency Electric Motors</td>
<td>ECRM 3</td>
<td>44.2%</td>
<td>$22,422</td>
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<tr>
<td>Boiler Tune-Up</td>
<td>ECRM 4</td>
<td>292%</td>
<td>$29,001</td>
</tr>
<tr>
<td>Pump Impeller Trim or Replace</td>
<td>ECRM 5</td>
<td>39.6%</td>
<td>$12,881</td>
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<tr>
<td>Vent. + Motors + Tune Up + Pumps</td>
<td>PKG 1</td>
<td>36.8%</td>
<td>$158,451</td>
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</tbody>
</table>
SEDAC Reports also contain things like...

![Bar chart showing estimated annual utility bills for different construction packages. The chart is labeled as follows: Estimated Annual Utility Bill (in $) on the y-axis and Construction Package on the x-axis. The packages are labeled as PKG4.2, PKG2, PKG4.1, PKG4.0, PKG1, and PKG3. The bars indicate the following utility bill amounts: PKG4.2: $18,000, PKG2: $16,000, PKG4.1: $14,000, PKG4.0: $12,000, PKG1: $10,000, and PKG3: $8,000. The date 04/06/2005 is shown on the image.]
and…

![Bar Chart](image)

- **Electric Bill ($)**
  - Months: 1 to 12
  - Bill values across months show variability, with peaks in months 7 and 8.
After performing a 20 year Life Cycle Cost Analysis

- Client stands to save over $10,000 annually
- Initial expense is approximately $58,000
- A 9.1% Internal Rate of Return on Investment

<table>
<thead>
<tr>
<th>Life Cycle Cost Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Period [years]</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>Discount Rate</td>
</tr>
<tr>
<td>5%</td>
</tr>
<tr>
<td>General Inflation Rate</td>
</tr>
<tr>
<td>1.75%</td>
</tr>
<tr>
<td>Electricity Inflation Rate</td>
</tr>
<tr>
<td>4.2%</td>
</tr>
<tr>
<td>Natural Gas Inflation Rate</td>
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<tr>
<td>3.7%</td>
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</table>

<table>
<thead>
<tr>
<th>Annual Savings</th>
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</thead>
<tbody>
<tr>
<td>Electricity</td>
</tr>
<tr>
<td>$4,218</td>
</tr>
<tr>
<td>Natural Gas</td>
</tr>
<tr>
<td>$5,271</td>
</tr>
<tr>
<td>Operation and Maintenance</td>
</tr>
<tr>
<td>$921</td>
</tr>
<tr>
<td>Total Annual Savings</td>
</tr>
<tr>
<td>$10,410</td>
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</table>

<table>
<thead>
<tr>
<th>Present Value Annual Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
</tr>
<tr>
<td>$77,671</td>
</tr>
<tr>
<td>Natural Gas</td>
</tr>
<tr>
<td>$92,306</td>
</tr>
<tr>
<td>O&amp;M</td>
</tr>
<tr>
<td>$13,391</td>
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<tr>
<td>Total PV of Savings</td>
</tr>
<tr>
<td>$183,367</td>
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</table>

<table>
<thead>
<tr>
<th>Additional Capital Expense</th>
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</thead>
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<tr>
<td>Additional Capital Expense</td>
</tr>
<tr>
<td>$58,139</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Payback [years]</td>
</tr>
<tr>
<td>5.6</td>
</tr>
<tr>
<td>Net Present Value</td>
</tr>
<tr>
<td>$125,228</td>
</tr>
<tr>
<td>Savings-to-Investment Ratio</td>
</tr>
<tr>
<td>2.15</td>
</tr>
<tr>
<td>Adjusted Internal Rate of Return</td>
</tr>
<tr>
<td>9.1%</td>
</tr>
</tbody>
</table>
Illinois EERE Opportunities

- Illinois Clean Energy Community Foundation ("ICECF") - created in 1999 with a $225 million endowment - was the only game in town for K-12 schools until the EEPS was enacted - funded millions of dollars of lighting upgrades for schools

- ICECF is concentrating on filling the gap in renewable energy projects for public institutions

- K-12 schools can apply for technical assistance in design of new buildings, renewable energy systems such as solar PV, solar thermal and wind. ICECF has wide discretion in awarding grants
There are several types of bond programs that we might be able to utilize:

- QUALIFIED ENERGY CONSERVATION BONDS (“QECBs”)
- QUALIFIED SCHOOL CONSTRUCTION BONDS (“QSCBs”)
- EXTENSION AND INCREASE IN AUTHORIZATION FOR QUALIFIED ZONE ACADEMY BONDS (“QZABs”).
- CLEAN RENEWABLE ENERGY BONDS (“CREBs”).

Several third party providers also offers many tailored solutions including off books financing and power purchase agreements.
Qualified Energy Conservation Bonds ("QECBs")

- The Energy Improvement and Extension Act of 2008, Section 301, authorized the issuance of qualified energy conservation bonds which can be used by state, local, and tribal governments to finance certain types of energy related projects.

- The advantage of these bonds is that they are issued -- theoretically -- with a 0% interest rate.

- The borrower pays back only the principal of the bond, and the bondholder receives federal tax credits in lieu of the traditional bond interest.

- The definition of qualified energy conservation projects is fairly broad and contains elements relating to energy efficiency capital expenditures in public buildings; renewable energy production; various research and development applications; mass commuting facilities that reduce energy consumption; several types of energy related demonstration projects; and public energy efficiency education campaigns.
Qualified School Construction Bonds (“QSCBs”).

- The bill creates a new category of tax credit bonds for the construction, rehabilitation, or repair of public school facilities.
- There is a national limitation on the amount of qualified school construction bonds that may be issued by State and local governments of $22 billion ($11 billion allocated initially in 2009 and the remainder allocated in 2010).
- There is a national limitation on the amount of qualified school construction bonds that may be issued by Indian tribal governments of $400 million ($200 million allocated initially in 2009 and the remainder allocated in 2010).
The bill would allow an additional $1.4 billion of QZAB issuing authority to State and local governments in 2009 and 2010, which can be used to finance renovations, equipment purchases, developing course material, and training teachers and personnel at a qualified zone academy.

In general, a qualified zone academy is any public school (or academic program within a public school) below college level that is located in an empowerment zone or enterprise community and is designed to cooperate with businesses to enhance the academic curriculum and increase graduation and employment rates.

QZABs are a form of tax credit bonds which offer the holder a Federal tax credit instead of interest.
Clean Renewable Energy Bonds (“CREBs”).

- CREBs are used to finance qualified energy production projects, including facilities for wind, bio-mass, geothermal and solar energy, trash combustion, refined coal production, and certain hydropower facilities.
- A total of $2.4 billion is available for CREBs issuance and is to be divided equally among electric cooperatives, public power systems and other state or local governmental units.
- To qualify, state and local governments and other entities must receive approval from the Treasury on their proposed projects.
Comfort/Power Purchase Agreements (C/PPAs)

- Methodology to take advantage of the 10% GHP tax credit and/or 30% solar tax credit
- Since public schools do not pay taxes, they are not eligible for tax credits, however, under this structure, they would be able to benefit from the tax credit.
- Under this structure, a third part provider will establish a single purpose entity to own the GHP and/or solar system and provide conditioned space (comfort) or power to the school at a monthly fee (fixed or variable with electricity pass through)
- The project will be a BOOM (Build Own Operate and Maintain)
- Length of financing would equal the length of agreement between the new single purpose entity and the school up to 15 years.
- To take advantage of the tax credit, the school can never own the system.
Other EERE Opportunities

- Energy performance contracts have been a proven way to take advantage of EERE opportunities.
- I would recommend an open process to choose providers and an open book pricing structure.
- Financing and incentives can be bundled together to allow you to do longer payback items.
- Keep your focus on real savings not operational savings that may never be achieved.
- Look for unbiased technical assistance from state energy offices—IL has a person on contract to help IL schools with the process.
Apples and Oranges Proposals - use tight specifications
Recycling of lamps and ballasts - put in contract
Labor costs - prevailing wage?
Contractor experience - 3 a.m. call
KISS - use accepted technology
New players in industry - follow incentives
Procurement requirements - bidding?
Unintended consequences - motion sensors v. ballasts v. lamps v. fixtures
The old metal halide fixtures provided inadequate light levels and quality and waste energy.
Church gym in Illinois

They installed new fluorescent fixtures and saved 50% on their energy bills and got great light levels and quality!
Norris Center Lighting Upgrade

Tennis Court Before Picture
Norris Center Lighting Upgrade

Tennis Court After Picture
Norris Center Lighting Upgrade

Tennis Court After Picture
Pool Before Picture

Norris Center Lighting Upgrade
Norris Center Lighting Upgrade

Pool After Picture
Thank You for Your Interest

- Feel free to call Mike Stanch at (312) 264-8568
- Save energy, money and the environment!!!