



ENERGY EFFICIENCY AND CONSERVATION STRATEGY

Submitted to the U.S. Department of Energy to fulfill the grant requirements of the
Energy Efficiency and Conservation Block Grant (EECBG) Program

Thursday, March 11, 2010

Grantee: City of Altoona
1301 12th Street
Altoona, Pennsylvania 16602

DUNS Number: 96-9035203

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- 1. Describe your government's proposed Energy Efficiency and Conservation Strategy. Provide a concise summary of your measurable goals and objectives, which should be aligned with the defined purposes and eligible activities of the EECBG Program.*

The City of Altoona's Energy Efficiency and Conservation Strategy (EECS) is built on our *Green City Assessment*: a set of strategies for saving energy and becoming more environmentally responsible that was developed prior to the EECBG program and presented to Altoona City Council on March 12, 2008. More specifically, our EECS focuses on the EECBG project activity "Energy Efficiency and Conservation Programs for Buildings and Facilities." Being an older community, much of the City's infrastructure is not lighted, heated, and/or cooled using the latest, most efficient technology. Our primary goal for the use of EECBG funds is to correct this shortcoming.

To meet this goal, we proposed to use our 2009 EECBG allotment of \$205,700 to replace the lighting elements in 169 street lights Downtown with more energy efficient LED units. These LED units would reduce the City's annual electricity costs by an estimated \$5,355, our annual sulfur-dioxide emissions by 438 lbs., our annual nitrogen-oxide emissions by 91 lbs., and our annual carbon-dioxide emissions by 62,727 lbs. The funds were also proposed to be used to replace 40 windows in Fire Station #1. These windows would save an estimated \$793 in natural gas costs and 6,572 lbs. of carbon-dioxide emissions annually.

For *future* EECBG funding, the City of Altoona proposes the following objectives.

- Establish a City Energy Efficiency Committee that will likely meet quarterly to develop new means of saving energy and to monitor the success of the City's efforts to date. This Committee is proposed to be composed of both citizens and City employees, and is to "follow up" on not only those strategies identified here, but those identified in the 2008 *Green City Assessment* as well.
- It has been estimated that over 85% of the City's energy costs are lighting, including street lighting. Thus, lighting remains the main focus of our efficiency efforts. To this end...
 - The City proposes to retrofit its street and intersection lighting elements with LED technology as quickly as EECBG funding, our capital budgeting process, and the Pennsylvania Department of Transportation (PennDOT) allow. It is estimated that each lighting element replaced with LED technology could reduce our energy usage and emissions by up to 40% per light. Note that all of the City's stoplights have already been retrofitted with LED elements over the past six years.
 - As quickly as EECBG funds and our capital budgeting process allow, the City proposes to retrofit lighting with LED/CFL lighting elements throughout the interior of City buildings, including Altoona City Hall, the City Council Chambers/Training Facility, the Police Station, the highway yard, all recreation centers, and all four fire stations. It is estimated that this could reduce our energy usage and emissions by as much as 40% per light.
 - As quickly as EECBG funds and our capital budgeting process allow, the City proposes to retrofit its lighting with motion sensor activating switches in appropriate places throughout the interior of City buildings, including Altoona City Hall, the City Council Chambers/Training Facility, the Police Station, the highway yard, all recreation centers, and all four fire stations. It is estimated that this could reduce our energy usage and emissions by as much as 16% per building.
- The City proposes to replace existing, older windows and furnaces in several of its facilities, including Fire Station 2, Fire Station 3, Fire Station 4, the highway yard garage, and all recreation centers. Each facility's energy costs and emissions could be reduced by as much as 10% in this manner, according to our estimates. The 2008 *Green City Assessment* proposes the use of waste oil heaters in the highway yard garage, which could save even more than 10%.

The timeframe needed to accomplish these objectives will depend greatly on our capital budgeting and the levels of future EECBG program funding. We believe that the expected cost savings from our 2009 EECBG investments in streetlighting and fire station windows will make continued future retrofits a priority for our City for years to come.

2. *Describe your government's proposed implementation plan for the use of EECBG funds to assist you in achieving the goals and objectives outlined in the strategy described in question #1.*

Because an estimated 85% of the City of Altoona's energy costs are lighting, retrofitting our lighting with LED elements and motion sensor activated switches (where appropriate) is our top

goal. Increasing the efficiency our heating systems, cooling systems, and windows are secondary goals. Thus, as quickly as EECBG funding and our capital budgeting processes allow, we propose to follow the following schedule of implementation activities.

- First, retrofit all street and intersection lights with LED elements, subject to PennDOT approval.
- Retrofit all lighting in the interiors of our buildings with LED/CFL elements where such elements will clearly save us money and emissions over a decade.
- Retrofit all lighting in the interiors of our buildings with motion sensor activated switches where appropriate and possible.
- Replace older and less efficient windows in City buildings.
- Replace older and less efficient furnaces in City buildings.

Without full knowledge of future EECBG funding and capital budgeting priorities, the City cannot project exactly how many years it will take to accomplish these activities. However, the City is committed to fulfilling this program over a decade or more if it is financially necessary. Note that the actual work will either be done by the Public Works Department or private contractors – whichever is cheaper.

3. *Describe how your government is taking into account the proposed implementation plans and activities for use of funds by adjacent units of local government that are grant recipients under the program.*

Neither of the City's two adjacent neighbors – Logan Township and Allegheny Township – have applied for EECBG funds. To the City's knowledge, the nearest recipient of such funds is the Borough of State College in Centre County – 45 miles to the northeast. In developing our initial application for EECBG funding as well as this EECS, City staff was in contact with State College Borough's Planning Director – Carl Hess -- exchanging ideas for energy conservation and helping each other with interpreting and meeting the program's requirements.

4. *Describe how your government will coordinate and share information with the state in which you are located regarding activities carried out with grand funds to maximize energy efficiency and conservation benefits.*

The City of Altoona will share the cost savings realized through our EECBG-funded and other investments in lighting, heating, cooling, and insulation systems with the Commonwealth of Pennsylvania and all local municipalities nationwide if contacted.

5. *Describe how this plan has been designed to ensure that it sustains benefits beyond the EECBG funding period.*

The EECBG-funded investments in LED or CFL lighting elements, replacement windows, and furnaces will, in and of themselves, outlast the EECBG funding period in which they were

purchased and installed. The LED lighting elements have an average lifespan of five years, and the furnaces and windows should last far longer. Throughout their lifetimes, the City will continue to track the savings incurred by these investments on a project-by-project basis via monthly utility bills. The number of jobs created/maintained will be tracked as well.

But more importantly, the proposed City of Altoona Energy Efficiency Committee will outlast EECBG funding and keep continued and new energy and emissions savings projects a City priority for years to come.

6. *The President has made it clear that every taxpayer dollar spent on our economic recovery must be subject to unprecedented levels of transparency and accountability. Describe the auditing or monitoring procedures currently in place or that will be in place to ensure funds are used for authorized purposes and every step is taken to prevent instances of fraud, waste, error and abuse.*

The City of Altoona's Department of Planning and Community Department will administer these funds, and will be responsible for monitoring and auditing their usage. This Department's staff engages in monthly meetings to review the status of every program it administers, as well as each individual project. Problems are identified and a plan of action formulated to correct any matters requiring such action.

The City staff prepares purchase orders prior to the payment of any invoice. Each invoice is reviewed by at least three people in the Department before it is paid, and if an inconsistency is detected, payment is withheld until it is rectified. All invoices submitted must be accompanied by backup documentation so the staff is able to ascertain whether the funds requested are for legitimate purposes as authorized by the EECBG program.

In addition to the above review, staff will conduct site visits to monitor specific projects or subgrantees if necessary, as well as compile quarterly reports submitted by the subgrantees (note that the City's own Department of Public Works will be the likely subgrantee here). They will be informed in writing before the visit takes place and told of the areas that will be reviewed. During the review, the areas monitored are project eligibility, project progress, project documentation, regulatory compliance, and more as appropriate. Also reviewed are financial management and audit submissions.

The City of Altoona also undergoes an annual audit to ensure compliance with federal and state regulations, local practice, as well as established accounting practices. Issues discovered in the audit are presented to the Department, which then responds with appropriate steps to address the finding.

The City's Energy Efficiency Committee, with the staff of the Department of Engineering and the Department of Planning and Community Development, will monitor the energy and emissions savings earned through the EECBG-funded investments.

Estimates of Baseline Energy Usage, Energy/Emissions Reductions, and Jobs Created

The City of Altoona proposed to use our 2009 EECBG allotment of \$205,700 to replace the lighting elements in 169 street lights Downtown with more energy efficient LED units. These LED units, combined, would reduce the City’s annual electricity costs by an estimated \$5,355, our annual sulfur-dioxide emissions by 438 lbs., our annual nitrogen-oxide emissions by 91 lbs., and our annual carbon-dioxide emissions by 62,727 lbs. The funds were also proposed to be used to replace 40 windows in Fire Station #1. These windows would save an estimated \$793 in natural gas costs and 6,572 lbs. of carbon-dioxide emissions annually.

The following tables show the baseline and reductions for each 2009 EECBG-funded project described above.

Replacing 169 High Pressure Sodium Streetlights with LED Elements					
	KWH	Costs	Sulfur Dioxide Emissions (lbs)*	Nitrogen Oxide Emissions (lbs)*	Carbon Dioxide Emissions (lbs)*
Existing energy usage with the 169 streetlights (1 yr.)	124,000	\$13,200	1,078.80	223.20	154,628.00
Engery usage with 169 Philips/HADCO 100W LED Elements (1 yr.)	73,697	\$7,845	641.16	132.65	91,900.16
Reduction	41%	\$5,355	437.64	90.55	62,727.84

*Estimates based on http://www.eia.doe.gov/cneaf/electricity/st_profiles/pennsylvania.html

Replacing 40 Windows in Fire Station #1			
	MCF	Costs	Carbon Dioxide Emissions (lbs)*
Existing natural gas usage at Fire Station #1 (1 yr.)	547.7	\$7,928	65,724
Estimated gas usage at Fire Station #1 with new windows (1 yr.)	492.9	7,134.9	59,152
Reduction	10%	\$793	6,572

*Estimates based 0.120 lbs. of CO2 being released from the burning of each cubic ft. of gas.

The City of Altoona has not prepared detailed baseline energy usage estimates or energy/emissions reduction estimates for the projects proposed for future EECBG and local capital funding, which are described starting on page two of this document. Given the tables above, however, it is not difficult to extrapolate estimates for these projects. Based on the first table, we can estimate that any conversion from conventional street lighting to an LED element could save up to 41% on energy costs and emissions. Based on the second table, we can estimate that any window replacement project could save up to 10% of that building’s heating costs and emissions. Based on independent consultations with vendors, we estimate that installing motion sensor activated light switches could also save up to 16% of a building’s energy costs and

emissions. And the sky is the limit for the energy and emissions reductions that an active Energy Efficiency Committee could instigate.

Potential Obstacles and Our Evaluation, Monitoring, and Verification Plan

There are few potential obstacles to the implementation of our two funded EECBG projects: the replacement of 169 streetlights Downtown with LED elements and the replacement of windows in Fire Station Number 1. However, replacing any of the City's 3,500 streetlights over actual streets – as is proposed for future EECBG funding – will require the approval of LED technology for use on roadways by the Pennsylvania Department of Transportation. We do not expect this to be much of a regulatory hurdle, however, it could take some time.

The greatest potential obstacle to implementing the projects proposed for future EECBG funding remains just that: the funding – both at the federal and local levels. The City of Altoona has limited capital funds available to make these improvements on its own, and even then, these improvements must compete with other pressing needs. EECBG funding has been tremendously valuable to overcoming this obstacle.

The City of Altoona plans to monitor the effectiveness of the energy and emissions saving improvements purchased with both EECBG funds and local capital funds by simply recording our utility bills. These bills will show our usage reductions, and we can calculate our emissions reductions from that. The Energy Efficiency Committee will then evaluate the effectiveness of our energy investments and recommend changes, improvements, or next steps on a likely quarterly basis.

As part of next year's EECBG grant application, the City of Altoona plans to adopt this Energy Efficiency Conservation Strategy by resolution of Altoona City Council.

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**MONTHLY STATUS REPORT
2009 EECBG PROGRAM**

PROJ#	ASAP #	PROJECT	BUDGET	EXPENDED	BALANCE	PROG	ENV	BENE	AMENDMENTS
12		City Street Lights Lighting Elements	\$155,522.81	\$150,158.75	\$5,364.06	96.55%			+\$6,641.35 from 14
5		Fire Station #1 Energy Efficient Windows	\$40,000.00	\$0.00	\$40,000.00	0.00%			
14		EECBG Program Administration	<u>\$10,177.19</u>	<u>\$7,644.82</u>	<u>\$2,532.37</u>	75.12%			-\$6,641.35 to 12
		YTD BUDGET TOTALS	<u><u>\$205,700.00</u></u>	<u><u>\$157,803.57</u></u>	<u><u>\$47,896.43</u></u>	76.72%			

As of April 30, 2010

COMMENTS

Installation of lights complete
delivery costs to follow

Advertising for bids mid
June 2010