



MEETING DATE: June 24, 2010
SUBJECT: Electrical Construction Bid Award
SUBMITTED BY: Steve Sceiford

DESCRIPTION:

Bids were received June 2, 2010 for the electrical lighting upgrade project. The project architect reviewed the bids and recommends awarding the contract to the low bidder, Electrical & Mechanical Systems.

The lighting upgrade project was approved at the March 2010 JOC meeting for a complete retrofit of all lighting fixtures in the high school and skill center buildings to significantly reduce electrical energy consumption and to comply with US DOE light bulb requirements. The project is estimated to have a 6.5 year payback of the investment:

Construction cost:	\$213,259
Architect design and project management:	\$ 7,500
First Energy rebate - Act 129	less <u>(\$ 78,500)</u>
Net investment	\$142,259
Annual electric cost savings -estimated	<u>\$ 22,000</u>
Payback –years	6.5 years

The rebate from First Energy has been applied for but the amount is estimated and has not been approved. Approval is expected soon and the construction contract will not be entered into until the rebate is known and approved.

Electrical Construction Bid Tabulation- June 2, 2100

Bidder	Base Bid
Electrical & Mechanical Systems	\$ 213,259
Church & Murdock	\$ 226,000
Muzyka Builders	\$ 229,178
Connecto Electric	\$ 234,800
Newco Electric	\$ 256,500
Keystone Electric	\$ 297,000

RECOMMENDATION:

Motion to award the electrical construction contract to Electrical & Mechanical Systems for \$213,259.00 per the bid specifications, contingent upon receiving approval of the Act 129 First Energy rebate

Erie County Technical School

Lighting Retrofit Project

Proposal

Rationale

Why are we considering a complete retrofit of all lights?

1. A lighting retrofit will help to reduce costs of the anticipated spike in electricity rates.
2. The retrofit will significantly reduce electricity expenses for many years.
3. Will ensure we are compliant and able to accommodate the new U.S. Department of Energy's standard for the exclusion of T-12 light bulbs beginning in July 2012.
4. The First Energy incentive program makes the 'payback' two years or less on the project costs.
5. Demonstrates the school's effort to be a 'greener' operation.

Scope of Work

Erie County Technical School

1. Replace ballasts in all lighting fixtures (classrooms, hallways, offices, closets, restrooms)
2. Replace lamps in all fixtures with T-8 lamps
3. Replace metal halide fixtures in labs with ballasts and T8 lamps
4. Reduce the number of lamps/foot-candle ratings in classrooms and offices per lighting study

Skill Center

1. Replace lamps in all fixtures with T-8 lamps
2. Replace metal halide fixtures in labs with ballasts and T8 lamps
3. Reduce the number of lamps/ foot-candle ratings in classrooms and offices per lighting study

Questions/Assumptions

1. Status/response on Ownership of Credits in First Energy incentive application?
2. Ability to amend First Energy application pending light survey verification by Tower Engineering?
3. Bid specifications designed around separate high school and Skill Center bids for labor only, materials only, labor and materials
4. Difference in cost of materials through contractor or governmental contract?
5. Impact of this project on future alterations/additions—fixtures would be reused
6. All costs/savings based on current electricity rates—any additional cost associated with a higher electricity rate would be reduced
7. Project Financing
 - a. Capital Reserve Fund used to cover initial costs
 - b. First Energy incentive deposited in Capital Reserve Fund
 - c. General Fund reimburses Capital Reserve Fund, over a one- or two-year payback period, for any costs not covered by First Energy incentive

Project Timeline

Date	Action	Responsible Party
March 25, 2010	Approve submittal of PlanCon 3074	JOC
March 25, 2010	JOC approves engineering contract with Tower Engineering	JOC
April	Finish light study	ECTS Staff
April	Submit PlanCon 3074 to PDE for approval	ECTS Staff
April	Submit incentive application to First Energy	ECTS Staff
April	Verify light study	Tower Engineering /HRLC
April	Compose bid specifications	Tower Engineering /HRLC
May	Advertise bid specifications	ECTS
May	Obtain quotes on materials through governmental contract	ECTS Staff
May 27, 2010	Award bid	JOC
June	Order materials—bid awardee	Contractor
June	Schedule Work/Obtain clearances	ECTS Staff & Contractor
June-July-August	Scope of Work conducted	Contractor

Bottom Line

All figures are estimates

Total Cost of Project	\$115,000
(Less) First Energy Incentive	(90,000)
ECTS Out-of-Pocket Cost	25,000
(Less) Payback First-Year Electricity Savings	(21,000)
Remaining Payback Cost Second-Year Electricity Savings	4,000



Met-Ed • Penelec • Penn Power

**Your First Source for
Energy Savings**

Non-Standard Lighting Incentives for Business Program

FirstEnergy's Non-Standard Lighting Incentives for Business Program offers incentives and information to encourage participants to undertake comprehensive projects to install high-efficiency lighting equipment. The program is funded by FirstEnergy's commercial and industrial electric utility customers in Pennsylvania in accordance with Act 129 of 2008.

Effective Dates

To qualify for incentives, equipment must have been purchased on or after **October 28, 2009**.

Eligible Participants

The Non-Standard Lighting incentives are available to commercial and industrial retail customers of Met-Ed, Penelec and Penn Power. New construction projects and the portion of building addition projects that increase a facility's footprint are eligible for Non-Standard Lighting incentives.

Federal facilities and residential customers may take advantage of separate programs.

Pre-Approval Requirements

Program pre-approval is not required for projects that are purchased and installed before March 31, 2010.

Non-Standard Lighting projects to be completed (installed) after March 31, 2010 will require program approval prior to the purchase and installation of equipment (pre-approval), regardless of the total incentive requested.

Existing Facilities vs New Construction

Existing facilities and new construction projects, as defined above, are eligible for these incentives. Existing facilities should consider the currently installed equipment when calculating the baseline energy usage. New construction projects should follow applicable building energy construction codes when calculating baseline energy usage.

Questions?

If you have further questions, please review the FAQ section of the program website – www.energysavePA.com. This information is being updated regularly.

Specific questions can also be sent to program representatives via email – energysavePA@saic.com

How Do I Apply for Incentives?

Please review the Business Program Terms & Conditions and application requirements.

Step 1: Review program materials to confirm the energy efficiency measures meet program requirements. Visit www.energysavePA.com and/or contact us at 1-866-554-4430 with questions.

Step 2: Complete the program application and the FirstEnergy Lighting calculator spreadsheet. Collect supporting technical documentation required to verify equipment energy use, such as manufacturers' cut sheets. Please note that the FirstEnergy Non-Standard Lighting calculator spreadsheet is state mandated documentation required before your application can be reviewed by the program.

Sign the application form and submit a complete application package to the program manager for consideration, review and approval. Incomplete applications will not be considered and will be returned to the applicant for completion.

A complete application package includes:

- A signed application form with the summary information fields entered on page three,
- FirstEnergy Non-Standard Lighting calculator spreadsheet showing both annual kWh and kW demand reduction, and
- Manufacturers' specification (cut) sheets for each installed fixture type to verify that the equipment is rated at the efficiency levels used in the calculations.

Complete application packages may be returned via email, fax or hardcopy:

Mail: **FirstEnergy Non-Standard Lighting Incentives for Business Program**
6059 Allentown Blvd.
PMB #573
Harrisburg, PA 17112
Fax: 610-743-8629
Email: energysavePA@saic.com

Step 3: The program manager will notify the applicant via email when the pre-approval technical review is complete and funds have been reserved. Upon receipt of program pre-approval, participants may purchase and install their energy efficient equipment.

Step 4: Once the project is complete, you should review your approved application for any changes to the project that occurred during installation and make the needed corrections. Resubmit the application, along with a dated proof of purchase, to the program for payment.

Applications and supporting technical documentation will be reviewed by program staff, and an onsite inspection to verify the installation may be conducted. Upon receipt and verification of all required documentation, the incentive check will be processed and mailed to the applicant or to an authorized representative, if requested on the application.

Following review and approval, you will be required to submit a W-9 with Tax Identification associated with the incentive recipient to enable processing. W-9s are not required until approved.

www.energysavePA.com

CUSTOMER AND PROJECT INFORMATION

Customer Information

Company Name:		Utilities Company: ☐ Met-Ed ☐ Penelec ☐ Penn Power	
Tax ID (SSN/FEIN):		Account Number (Required) _____	
Mailing Address (check mailed to):	City:	State:	Zip:
Contact Name/Title:			
Email Address:	Telephone:	Fax:	
Physical Installation Address (if different from above):	City:	Zip:	
How did you hear about the program? ☐ Program Contact ☐ Utility Contact ☐ Trade Ally ☐ Direct Mail ☐ Mass Media ☐ Seminar ☐ Other _____			

Contractor / Program Ally Information - if applicable

Company Name:	Contact Name/Title:		
Mailing Address:	City:	State:	Zip:
Email Address:	Telephone:	Fax:	

Authorization for Incentive Payment to Third Party

Please note that payment will be made to Contact at Company listed above unless Third Party payment is authorized.
If check is to be paid to a Third Party, please fill this Authorization box completely.

Payable To:	Representative Contact:	
Mailing Address:		
Phone:	Email Address:	Tax ID (SSN/FEIN):

Customer Contact Signature: _____

Print Name: _____ Date: _____

Facility / Project Information

Facility Type ☐ Education – Primary School ☐ Education – Secondary School ☐ Education – Community College ☐ Education – University ☐ Grocery ☐ Medical – Hospital ☐ Medical – Clinic ☐ Lodging Hotel (Guest Rooms) ☐ Lodging Motel ☐ Manufacturing – Light Industrial ☐ Multifamily – Common Areas ☐ Office – Large ☐ Office – Small ☐ Restaurant – Sit-Down ☐ Restaurant – Fast-Food ☐ Retail – 3-Story Large ☐ Retail – Single-Story Large ☐ Retail – Small ☐ Storage – Conditioned ☐ Storage – Unconditioned ☐ Streetlighting ☐ Warehouse ☐ Other: _____	Please choose the best description of the predominant space type included for this project: ☐ Air Conditioned Space ☐ No Air Conditioning ☐ Freezer Space ☐ Refrigerated Space Is natural gas available at your facility? ☐ Yes ☐ No	Customer Class (Check all that apply): ☐ Not-for-Profit ☐ Multifamily ☐ Commercial ☐ Industrial ☐ Government (State, County or Municipal) ☐ Institutional ☐ Low Income <i>Note: Federal Facilities may take advantage of a different program.</i>
	Facility Size: (Approx. Sq. Ft.) _____	
	Project Schedule: Start date: _____ Completion Date: _____	
	Estimated total Cost: _____	

PROJECT ESTIMATED ANNUAL SAVINGS SUMMARY

Estimated Annual kWh Savings <i>This is the sum of the Annual kWh Saved in column W of the FirstEnergy Lighting Calculator spreadsheet.</i>	
Total Estimated kW Reduction (Column P)	
Annual Estimated Cost Savings	
Annual Operating Hours	
Incentive @ \$0.65/W <i>Multiply the sum of the values in column P of the NonStandard Lighting Calculator by 1,000 to convert to watts, then by \$0.65/W to determine the total incentive. (Total Incentive = Total from column P x 1,000 W/kW x \$0.65/W)</i>	

If an energy savings analysis, other than the FirstEnergy Lighting calculator spreadsheet, was performed for this project, please attach a copy of the calculations to the application. Please indicate the page or section of the document that describes the project and shows the relevant calculations and assumptions.

Brief description of existing equipment:

Brief description of new, efficient equipment and how energy is saved:

When lighting controls are being installed or improved, please include a description of the controls and how they will be used to save energy.

BUSINESS PROGRAM TERMS & CONDITIONS

Definitions	FIRSTENERGY COMPANIES ("THE COMPANY" OR "COMPANIES") - Metropolitan Edison Company, Pennsylvania Power Company and Pennsylvania Electric Company. PROGRAM or Programs – Company programs approved by the Pennsylvania Public Utility Commission ("PUC") for implementation under Pennsylvania Act 129. This application relates to the Business programs supporting energy efficiency in the Companies' Commercial and Industrial customer facilities including, municipal, government and institutional facilities. PROGRAM MANAGER – The party contracted by the Company for management of the Programs. ENERGY-EFFICIENCY MEASURES – Any equipment or action eligible to receive a Program Incentive payment under the Program. PARTICIPANT (or PARTICIPATING CUSTOMERS) – Those non-residential electric service eligible customers of the Companies who participate in this Program. PROGRAM INCENTIVES – Refers to the monetary incentive, rebate or service that the Program provides to participating customers pursuant to the Program. CREDITS – Refers to the energy, capacity or environmental attributes from Alternative Energy Portfolio Standards (including Energy Efficiency and Demand Response) associated with measures for which incentives were provided, or PJM Capacity Credits.
Eligibility	"Participant" or "Participants" are Program customers identified above served by Metropolitan Edison Company, Pennsylvania Power Company and Pennsylvania Electric Company as defined above. Residential customers are not eligible for incentives through the Commercial and Industrial Programs. Incentives are awarded only to Participants, or their assigned agents, for qualifying equipment ("Energy Efficiency Measures") that is installed in the Commonwealth of Pennsylvania at the location identified in this Application, and such Participants are responsible for compliance with the Terms and Conditions set forth herein.
Ownership of Credits	Ownership of Credits shall be in accordance with the following: a) Equipment purchased and installed with the support of the incentives provided by the Program are the property of the Participant, subject to any limitations contained within these Terms and Conditions. b) Notwithstanding the above, unless otherwise requested in writing by the Participant prior to installation of the equipment, the Companies possess sole and exclusive rights to any Credits that may be associated with equipment for which incentives were received, and the Companies can retire or otherwise utilize these Credits in any manner authorized by law or regulation. c) In no event shall activity associated with any Credits noted above result in interference with the Participant's sole discretion to operate equipment supported by an incentive award.
Compliance	The Participant is responsible to comply with all applicable laws, rules and regulations, and to comply with all federal, state, and local codes.
Publicity	With Participant's written permission, the Companies may publicly recognize participation in the Programs and disclose information relating to the Participant's participation in the program, including such data as: projected project energy savings, the incentive amount, and other similar information.
Application and Eligibility Process	The Programs provide for payment of incentives after the installation of qualified energy efficiency measures and review of final documentation for compliance with program requirements by the Program Manager. In order to be eligible for incentives, a Participant, or an agent (contractor/vendor) authorized by the Participant, must submit a properly completed pre-installation application package, including an application and technology worksheets, to the Program Manager before the equipment is purchased. If eligible, the Participant will receive an approval letter with the estimated incentive amount and the date by which the equipment must be purchased and installed for the approval to remain in effect. After installation is completed, the Participant must finalize and resubmit the completed equipment application reflecting the "as built" project, along with the invoice, the manufacturer's equipment performance sheet, and any other required documentation as may be specified on the application or in the program's initial approval letter. Applications must be filled out completely, truthfully and accurately, and include signatures of the Participant and its authorized agents (as appropriate). Final payment will be based on the "as-built" documentation provided with the final project application. Exceptions: Program applications for projects completed between October 28, 2009 and March 31, 2010 do not require pre-approval to be eligible for Program incentives. Similarly, Lighting, HVAC or motor equipment purchased with a total incentive of less than \$3,000, do not require pre-approval from the Program Manager before the purchase or installation of equipment. However, such applications must be submitted no later than nine months following equipment Proof of Purchase date to be considered for payment.
Dates of Program	Incentives are available for eligible Energy Efficiency Measures for which equipment is purchased and installed on or after October 28, 2009. Dated Proof of Purchase and complete documentation will be required with final applications for the participant to be eligible for incentive payment. The program is subject to revision or termination at any time by the Company.
Installation Schedule Requirements	Pre-approved projects will receive approval letters defining terms for payment and a commitment expiration date. If the Participant: (1) has not engaged in installation of the pre-approved project; and (2) has not applied to the Program Manager for a project extension within 6 months from the date the Program Manager pre-approves the project, the Program Manager may cancel Participant's application without liability.
Acceptable Proof of Purchase	Acceptable forms of Proof of Purchase include paid invoices or receipts. The documentation must show item numbers, quantities and descriptions that are of sufficient detail to verify that the installed equipment meets efficiency requirements. Additionally, the post-installation documentation must include manufacturers' specifications ("cut sheets") that list the efficiency ratings of the equipment. <i>The Program Manager may, at its sole discretion, accept other forms of proof of purchase.</i>

Evaluation, Measurement and Verification	The Program Manager may, but is not obligated to, conduct an inspection of the facility to verify pre- and post-installation conditions or verify documentation prior to incentive payment, at anytime after receipt of applications and up to 5 years after payment of incentives. In addition, the Pennsylvania Public Utility Commission and the Companies have engaged Evaluation Measurement and Verification ("EM&V") contractors to evaluate program performance which may involve additional visits. The applicant must provide reasonable access to the facility, the equipment, and related documentation and data. The Companies or their agents may install simple/standard metering devices on equipment for program data collection, measurement and verification purposes. The Companies and their agents are not obligated to pay any incentive awards until it has performed a satisfactory post-installation verification, unless it has waived this requirement. If the Program Manager determines that the equipment was not installed in a manner consistent with the approved application, or if non-qualifying equipment was installed, it may require changes before making payment. If qualifying equipment cannot be located at the Participant's facility or is not installed in a manner consistent with the provisions of these Terms and Conditions, the Company may seek recovery of the incentives paid.
Assignment	The Participant may assign Program Incentives to a specified third party.
Participating Customer's Certification	Participant certifies that he/she purchased and installed the equipment listed in its application at its defined Pennsylvania location listed therein. Participant agrees that all information is true and that he/she has conformed to all of the program's eligibility requirements, terms and conditions.
Incentive Amounts	Program Incentives will equal either: a) the approved Program Incentive amount reflecting incentives in effect at the time of approval, or b) the actual equipment cost of the Energy-Efficiency Measure, whichever is less, as determined by the Program Manager. Please allow ninety (90) business days for delivery of the Program Incentive. Applications requiring post-installation inspections and unanticipated high volume of activities may require additional time. If information is missing or incorrect on the application, processing and delivery of the Program Incentive may also require additional time.
Taxes	Incentives received by the Participant under this Application may be taxable by the federal, state, and local government. The Participant is responsible for declaring and paying all such taxes. Companies shall have no liability or obligation for any taxes.
Indemnification and Limits of Liability	The Participant shall protect, indemnify, and hold harmless the Companies' and their agents contractors, employees, officers and directors from and against all liabilities, losses, claims of death or injury or other damages, judgments, penalties, causes of action, costs and expenses (including, without limitation, attorney's fees and expenses) incurred by or assessed against the Companies or their agents, contractors, employees, officers and directors arising out of or relating to the performance of this Application or arising out of or relating to the installation, use and maintenance of the equipment, designs, practices or methods involved in this Participant's project. In no event shall any indemnified party be liable for any punitive, exemplary, special, indirect, incidental or consequential damages (including, but not limited to, lost profits, lost business opportunities, loss of use or equipment down time, and loss of or corruption to data) arising out of or relating to this Agreement or Program, regardless of the legal theory under which such damages are sought.
Warranties	The Companies make no express or implied warranties regarding the performance of installed equipment, the quality of any contractor's work, or that the equipment will result in any energy or cost savings. THE COMPANIES AND THEIR CONSULTANTS DO NOT ENDORSE, GUARANTEE, OR WARRANT ANY PARTICULAR MANUFACTURER OR PRODUCT, AND THEY PROVIDE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR IMPLIED WARRANTY OF FITNESS FOR ANY PRODUCT OR SERVICES. THE COMPANIES ARE NOT LIABLE OR RESPONSIBLE FOR ANY ACT OR OMISSION OF ANY CONTRACTOR (IF ANY). THE CUSTOMER'S WARRANTIES ARE LIMITED TO ANY WARRANTIES THAT MAY BE PROVIDED BY CONTRACTORS, VENDORS OR EQUIPMENT MANUFACTURER. NEITHER THE COMPANIES NOR THEIR CONSULTANTS ARE RESPONSIBLE FOR ASSURING THAT THE DESIGN, ENGINEERING AND CONSTRUCTION OF THE FACILITY OR INSTALLATION OF THE EQUIPMENT IS PROPER OR COMPLIES WITH ANY PARTICULAR LAWS, CODES, OR INDUSTRY STANDARDS. THE COMPANIES DO NOT MAKE ANY REPRESENTATIONS OF ANY KIND REGARDING THE RESULTS TO BE ACHIEVED BY THE ENERGY EFFICIENCY MEASURES OR THE ADEQUACY OR SAFETY OF SUCH MEASURES.
Recycling (Proper Disposal of Waste)	The Company and its agents are not responsible for the proper disposal or recycling of any waste generated as a result of this project.
Endorsement (Product/Vendor Neutrality)	The Company and its agents do not endorse any particular market provider, manufacturer, product, labor or system design by offering this Program.
Termination	Incentives are available for energy efficiency measures on a first-come, first-served basis subject to the availability of funds. Program availability, program terms and equipment eligibility may change without notice at the discretion of the Companies. Submission of any application does not give rise to any obligation to make any incentive payment by the Companies and their agents.

ACKNOWLEDGEMENT

I read, understand and am in compliance with all rules and regulations concerning this Program. I certify that all information provided is correct to the best of my knowledge, and I give the Companies permission to share my records with the Pennsylvania Public Utility Commission, or its contractors, who plan to evaluate my energy usage. Additionally, I will allow reasonable access to my property to verify the installation and performance of the Energy Efficiency Measures that are eligible for incentives under the Programs.

Signature: _____ Date: _____

Print Name: _____ Title: _____

By signing, I certify that I have read, understood and agree to the terms and conditions listed above and are authorized to sign on behalf of the participant.

FOR PROGRAM USE ONLY

Date Received: _____ Initials: _____ Pre-Approval? ☐ Yes ☐ No

Application Number: _____

Scope of Work

1. Remove 256 - 2 bulb 96" T12 ballasts and lamps from shop area's
Install new GE-286-HO-MV-N ballast and 2 F96T8/SP41 lamps
2. Remove 34 – 250 & 400 watt M.H. fixtures and lamps from shop area's
Install 34 new LHS4-454-M4R-4E-PUGE454MVPS90 fixtures with
4 F54W/T5/841/ECO lamps
3. Remove 35 - 1 bulb 48" T12 ballasts and lamps from night lights.
Install 35 new GE132MAX-L/ULTRA ballasts and 1 F28T8/XL/SPX41/ECO lamp
4. Remove 372 - 2 bulb 48" T12 ballasts and lamps from classroom, halls and labs area's
Install new GE232MAX-L/ULTRA ballasts and 2 F28T8/XL/SPX41/ECO lamps
5. Remove 835 - 3 bulb 48" T12 ballasts and lamps for classroom, halls and labs area's
Install new GE332MAX-L/ULTRA ballasts and 3 F28T8/XL/SPX41/ECO lamps
6. Remove 86 - 4 bulb 48" T12 ballasts and lamps for classroom, halls and labs area's
Install new GE432MAX-L/ULTRA ballasts and 4 F28T8/XL/SPX41/ECO lamps
7. Remove 20 - 2 bulb 36" T12 ballasts and lamps for classroom, halls and labs area's
Install new GE232MAX-L/ULTRA ballasts and 2 F25T8/SPX41/ECO lamps
8. Remove all fixtures, lamps and ballasts from premises and recycle all lamps.

Fixture needs for upgrade:

High School

1. 256 - 2 bulb 96" T8 ballasts and 28 watt T8 lamps for shop area's
2. 36 - 6 bulb 48" T8 fixtures and 28 watt T8 lamps for shop area's
3. 35 - 1 bulb 48" T8 ballasts and 28 watt T8 lamps for night lights.
4. 372 - 2 bulb 48" T8 ballasts and 28 watt T8 lamps for classroom, halls and Labs area's
5. 835 - 3 bulb 48" T8 ballasts and 28 watt T8 lamps for classroom, halls and Labs area's
6. 86 - 4 bulb 48" T8 ballasts and 28 watt T8 lamps for classroom, halls and Labs area's
7. 20 - 2 bulb 36" T8 ballasts and 25 watt T8 lamps for classroom, halls and Labs area's

Skill Center

1. 570 - 28 watt T8 lamps for classroom, halls and Labs area's
2. 78 - 6 bulb 48" T8 fixtures and 28 watt T8 lamps for shop area's

Total of 5390 T8 28 watt bulbs



Multiple Systems Energy Estimator

Calculate the energy costs associated with existing and proposed lighting systems and (optional) show environmental impact. Click on the first green cell and tab to the other input cells.

Existing Systems					Proposed System					
Existing Systems	Fixture count	Watts/Fixture	Hr burn per year	Energy \$ per yr.	Proposed Systems	Fixture count	Watts/Fixture	Hr burn per year	Energy \$ per yr.	
2-lamp F96T12HO	256	207	2100	\$9,570	4-lamp F32T8/HL & UMX	256	125	2100	\$5,779	
400 watt M.H.	86	458	2100	\$7,113	6-lamp F28T8	86	190	2100	\$2,951	
250 watt M.H.	24	295	2100	\$1,279	6-lamp F28T8	24	190	2100	\$824	
1-lamp F34T12	35	50	2100	\$316	1-lamp F28T8 & UMX	35	23	2100	\$145	
2-lamp F34T12	372	72	2100	\$4,837	2-lamp F28T8 & UMX	372	45	2100	\$3,023	
3-lamp F34T12	835	130	2100	\$19,604	3-lamp F28T8 & UMX	835	66	2100	\$9,953	
4-lamp F34T12	86	144	2100	\$2,237	4-lamp F28T8 & UMX	86	86	2100	\$1,336	
2-lamp F30T12	20	74	2100	\$267	2-lamp F25T8 & UMX	20	46	2100	\$166	
F32T8 lamps	578	32	2100	\$3,340	F28T8 lamps	578	28	2100	\$2,923	
Energy used per yr. (Existing System)				\$48,564	Energy used per yr. (Proposed System)				\$27,100	
Electrical Load (kilo-watts) (Existing System)				267.4	Electrical Load (kilo-watts) (Proposed System)				149.1	
Potential Energy Savings per year					\$21,464	kilo-Watt load reduction				118.3
Estimated total cost for complete upgrade						Simple Payback (based on energy savings alone)				months
Cost of Waiting (Cost of postponing the Lighting Upgrade)					\$1,789 per month	or	\$21,464 per year			
Environmental Impact of Lighting Upgrade Changing your lights can benefit the environment!										
Annual Carbon Dioxide emission reduction	384,358 lbs.	Coal burning avoided (EPA Nov. 2004)	179,606 lbs. Or	Equivalent acres of forest added	48 acres					
Annual Sulfur Dioxide emission reduction	1,508 lbs.		82 tons	Equivalent cars removed from road for a year	34 cars					
Annual Nitrogen Oxide (NO, NO2) reduction	741 lbs.	Atmospheric mercury contamination avoided	3,879 mg.	50% US Electric Power is from coal-burning power plants.						

Numbers used (based on EPA Energy Star Facts and Assumptions sheet, 2007)

Emission Factors: gases released per kWh of electricity generated (EPA 2007)		Carbon dioxide and mercury released per lb. of coal burned (EPA 2007) (can vary based on type of coal)		Annual carbon dioxide (lbs.) sequestration by forest and emission by cars (EPA 2007)	
lbs. of CO ₂ released	1.54	lbs. of CO ₂ generated	2.14	CO ₂ sequestration per acre	8066
lbs. of SO ₂ released	0.006	lbs. of mercury released	0.0216	CO ₂ emission per average car	11,470
lbs. of NO _x released	0.003	Click here to open EPA Energy Star Facts and Assumptions sheet, 2007.			

Customer: **Revised Erie County Vo-Tech** 3/22/2010
Prepared by:

The Lighting Assistant is a tool offered by GE that examines the projected impact of lighting decisions. Neither this tool nor the analysis generated by this tool, in any way constitutes or implies either a warranty of lamp or ballast performance or a guarantee of the actual costs or savings that will be realized or the appropriateness of the solutions suggested. Kindly see and examine the Full Disclaimer; use of this tool constitutes your acceptance of the Full Disclaimer. Copyright © 2006 General Electric Company. All Rights Reserved.

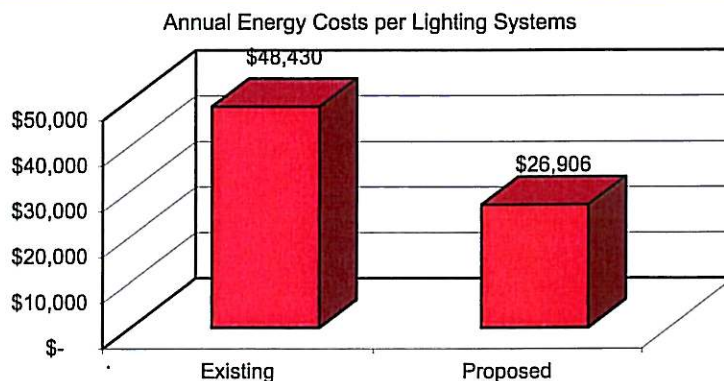
Lighting System Payback Analysis

Input
Output

Customer Information		Facility Information	
Project Name:	Erie County Vo-Tech	Area (sq. ft.)	150,000
Area:	School Areas per list provided	Cost Per kWh	\$ 0.086
		Annual Operating Hrs	2,100

System Information	Existing	Proposed
Luminaire Description	FI & HID	Fluor
Input Watts Per Luminaire	117	65
Quantity	2292	2292
System Watts	268,164	148,980
System kW	268.164	148.98
Annual kWh	563,144	312,858
Annual Energy Costs	\$ 48,430	\$ 26,905.79
Monthly Costs	\$ 4,036	\$ 2,242
Per Luminaire Cost		
Total System Cost		\$ 103,770.41
Labor/Materials/Disposal (Lot Price)		\$ 4,000.00
Per Luminaire Rebate/Incentive		
Total System Rebate/Incentive		\$ 90,289.55
Total Contract Price		\$ 17,480.86

Payback Analysis		
Watts Per Square Foot	1.78776	0.99
Annual Energy Savings		\$ 21,525
Cost of Waiting (Monthly)		\$ 1,794
Simple Payback (Years)		0.81
IRR (%)		123%
Five Year Energy Cash Flow		\$ 90,142



Note: These are estimated savings only. These annual and monthly savings are based on a number of variables and assumptions that could change over time. The actual savings derived by your firm may be higher or lower.



Setting Standards for Excellence

July 28, 2009

Summary: New 2012 Standards for General Service Fluorescent Lamps (GSFL)

Issued by the US Department of Energy June 29, 2009

Lamp Type	Correlated Color Temperature	Energy Conservation Standard lm/W
4-Foot (T8-T12) Medium Bi-pin ≥25W	≤ 4,500K	89
	> 4,500K and ≤ 7,000K	88
2-Foot (T8-T12) U-Shaped ≥25W	≤ 4,500K	84
	> 4,500K and ≤ 7,000K	81
8-Foot (T8-T12) Slimline ≥52W	≤ 4,500K	97
	> 4,500K and ≤ 7,000K	93
8-Foot (T8-T12) High Output	≤ 4,500K	92
	> 4,500K and ≤ 7,000K	88
4-Foot (T5) Miniature Bi-pin Standard Output ≥26W	≤ 4,500K	86
	> 4,500K and ≤ 7,000K	81
4-Foot (T5) Miniature Bi-pin High Output ≥49W	≤ 4,500K	76
	> 4,500K and ≤ 7,000K	72

Effective Date of new DOE standards: July 14 , 2012

Current exemptions continue [For example, lamps with CRI ≥87, cold temp. (CT), UV, etc.]

Impact for Lamps ≤ 4500K and > 4,500K and ≤ 7,000K

- T12 4-ft. & 2-ft U-lamps with medium bi-pin bases
 - Majority of F40 and F34T12 lamps and all FB40 and FB34T12 U-lamps fail.
 - 4-ft. requires 3560 lumens @ 40W and 3030 lumens @ 34W to pass @ 89 LPW.
 - 2-ft. U-lamps require 3360 @ 40W and 2856 @ 34W to pass @ 84 LPW.
 - CWX/DX/DSGN50/C50 are exempt due to CRI.
- T12 8-ft. Slimline with single pin bases
 - All 75W F96T12 lamps fail.
 - All 60W F96T12/ES fail except for the 800/SPX Series & some 700/SP long life Series.
 - CWX/DX/DSGN50/C50 are exempt due to CRI.
- T12 8-ft. 800mA HO with RDC bases
 - All 110W F96T12 HO lamps fail. Requires enhanced coatings with 10,120 lumens to pass.
 - All 95W F96T12/ES/HO fail except for enhanced 800 Series. Requires 8740 lumens to pass.
 - CWX/DX/DSGN50/C50 are exempt due to CRI; CW/CT & D/CT are exempt.
- T8 4-ft. & 2-ft. U-lamps with medium bi-pin bases
 - All 4-ft. T8 basic 700/SP Series lamps @ 2800 lumens fail. Requires 2850 lumens to pass.
 - All other 4-ft. pass.
 - All 2-ft. 800/SPX Series U-lamps pass. Some 700/SP Series pass.
- T8 8-ft. Slimline with single pin bases
 - All pass except some 700/SP Series. Requires 5723 lumens @ 59W to pass.
- T8 8-ft. HO with RDC bases
 - All pass except some 700/SP Series. Requires 7912 lumens @ 86W to pass.
- T5 4-ft with miniature bi-pin bases
 - All pass.

Lighting Survey

- A. Do a Lighting Inventory
1. Take a lighting inventory of each room in our school and complete the Room Lighting Checklist.
 2. Your team will need a floor plan of each room.
 3. A light meter that measures footcandles of illumination.
 4. Make a plan of attack, what rooms will do each day.
 5. It is important to find all of the lights (and ballasts if possible), as well as determining the type of controls that are used to turn them on and off. Most of the room lights are operated by a wall switch.
 6. You will need to ask the teachers about the light in their classroom and lab.
 - a. Is there enough light?
 - b. Is it too bright?
 - c. Do they need more light in some areas and less in others?
 - d. How is the color of the light?

Equipment needed:

1. Tape Measure
2. Light meter (measure foot candles)
3. Lighting Survey Form (data collection)
4. Paper to take notes
5. Pen or pencils

Procedures:

1. Inside Lights
2. Determine lamp type used to light the room space
3. Highlight areas with incandescent lights on the school floor plan
4. Take Light Level Readings (Foot-candles)
5. Note how many lights and their wattage
6. Note how lights are controlled
7. Note how many tubes per fixture (Luminare)
8. Where possible identify the type and make of the ballast
9. Note how lights are controlled
10. Note height of fixtures or mounting.

Application Examples



Classroom

For example, a classroom uses 2 ft. x 4 ft. lensed 277 volt troffers or suspended T5 luminaires and a 9.5 ft. ceiling for an IESNA recommended maintained light level of 40-50 footcandles in all example scenarios. Annual hours of operation are 1620 and utility rate is \$0.10 per kWh. Lighting Power Density for a classroom is 1.5 Watts/sq. ft. maximum using the ASHRAE/IESNA Standard 90.1-2001– Building Area Method of calculation.

System Description	Lighting System		System Wattage	Lighting Power Density	% below ASHRAE 90.1 2001	Gross Tax Deduction per sq. ft.	Annual Energy Cost per sq. ft. @ \$0.10/kWh	Annual Energy Cost Savings Over Base Case
	Lamp	Ballast	Watts/ luminaire	Watts/ sq. ft.	Percent	\$/sq. ft.	\$/sq. ft.	Percent
Base System	SYLVANIA SUPERSAVER® 34 Watt T12 – 3 Lamps	2 – Magnetic Ballasts	121	1.45	3%	\$–	\$0.23	0%
Basic Upgrade	OCTRON® 32 Watt T8 700 Series Standard – 3 Lamps	Basic Electronic Instant Start Ballast – Normal Ballast Factor (0.88)	86	1.03	31%	\$0.42	\$0.17	29%
Enhanced Upgrade	OCTRON XP® 30 Watt T8 800 Series Extended Performance Energy Saving Long Life – 3 Lamps	QUICKTRONIC® QHE High Efficiency Instant Start Ballasts – Normal Ballast Factor (0.88)	77	0.92	39%	\$0.58	\$0.15	37%
Enhanced Upgrade	OCTRON XP 28 Watt T8 800 Series Extended Performance Energy Saving Long Life – 3 Lamps	QUICKTRONIC QHE High Efficiency Instant Start Ballasts – Normal Ballast Factor (0.88)	72	0.86	43%	\$0.60	\$0.14	41%
Ultimate Upgrade	OCTRON XP 30 Watt T8 800 Series Extended Performance Energy Saving Long Life – 3 Lamps	QUICKTRONIC QHE High Efficiency Instant Start Ballasts – Low Ballast Factor (0.78)	68	0.82	45%	\$0.60	\$0.13	43%
Ultimate Upgrade	OCTRON XP 28 Watt T8 800 Series Extended Performance Energy Saving Long Life – 3 Lamps	QUICKTRONIC QHE High Efficiency Instant Start Ballasts – Low Ballast Factor (0.78)	63	0.76	49%	\$0.60	\$0.12	48%
Ultimate Upgrade plus Occupancy Sensor*	PENTRON® T5 28 Watt Premium Series – 2 Lamps	QUICKTRONIC PS Professional Programmed Start Ballasts – Normal Ballast Factor (1.0)	63	0.63	58%	\$0.60	\$0.10	56%
Ultimate Upgrade plus Occupancy Sensor*	OCTRON XPS® 32 Watt T8 800 Series Premium Extreme Performance Longest Life – 3 Lamps	QUICKTRONIC PSX Professional Programmed Start Ballasts – Low Ballast Factor (0.71)	71	0.85	43%	\$0.60	\$0.14	41%

*Occupancy sensor compatible for additional energy savings.

Application Examples



Industrial Manufacturing

For example, an industrial manufacturing space uses standard metal halide or fluorescent 277 volt hi-bay luminaires and a 30 ft. ceiling for an IESNA recommended maintained light level of 50 footcandles in all example scenarios. Some scenarios require fixture repositioning for existing retrofits. Annual hours of operation are 5840 and utility rate is \$0.10 per kWh. Lighting Power Density for Industrial is 2.2 Watts/sq. ft. maximum using the ASHRAE/IESNA Standard 90.1-2001 – Building Area Method of calculation.

System Description	Lighting System		System Wattage	Lighting Power Density	% below ASHRAE 90.1 2001	Gross Tax Deduction per sq. ft.	Annual Energy Cost per sq. ft. @ \$0.10/kWh	Annual Energy Cost Savings Over Base Case
	Lamp	Ballast	Watts/ luminaire	Watts/ sq. ft.	Percent	\$/sq. ft.	\$/sq. ft.	Percent
Base System	METALARC® 400 Watt Clear Metal Halide – 1 Lamp	Magnetic HID Ballast	458	2.29	–	\$–	\$1.34	0%
Enhanced Upgrade	METALARC 250 Watt Pulse Start Clear Metal Halide – 1 Lamp	Magnetic HID Ballast	290	1.45	34%	\$0.48	\$0.85	37%
Ultimate Upgrade	METALARC POWERBALL 320 Watt Ceramic Metal Halide – 1 Lamp	QUICKTRONIC® QHE MH Electronic Ballast	342	1.28	42%	\$0.60	\$0.74	45%
Ultimate Upgrade	OCTRON XP® 32 Watt T8 800 Series Extended Performance Energy Saving Long Life – 6 Lamps	QUICKTRONIC QHE High Efficiency Instant Start Ballasts – High Ballast Factor (1.20)	218	1.09	51%	\$0.60	\$0.64	52%
Ultimate Upgrade Occupancy Sensor*	PENTRON® T5 HO 54 Watt Premium Series – 4 Lamp	QUICKTRONIC PHO Professional Programmed Start Ballasts – Normal Ballast Factor (1.0)	236	1.18	46%	\$0.60	\$0.69	48%

*Occupancy sensor compatible for additional energy savings.