
Evaluation, Measurement & Verification Report for City of Gridley Electric 2009

Energy Efficiency Programs

- Commercial Lighting
- Keep Your Cool

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ABSTRACT

The following Evaluation, Measurement and Verification (EM&V) report for the City of Gridley Electric provides a systematic review of the Commercial Lighting and Keep Your Cool programs. Recommendations were made to implement an internal quality assurance process for data entry of rebate application information.

Table of Contents

Executive Summary	4
Introduction & Purpose of Report	4
Program Descriptions.....	5
Evaluation Standards	6
Evaluation Plans	6
Findings & Recommendations	7
Appendix A – Rebate Application.....	8
Appendix B – Commercial Lighting Rebate Form	10
Appendix C – Commercial Lighting Program Procedure.....	11
Appendix D – Rebate Form.....	13

Executive Summary

This report provides findings from an independent Evaluation, Measurement and Verification (EM&V) analysis of two energy efficiency programs for the City of Gridley Electric's (GE) 2009 fiscal year. The programs evaluated were selected by GE and include Commercial Lighting and Keep Your Cool.

It should be noted that after review of GE's programs it was found that the Keep Your Cool program was not implemented until the 2010 fiscal year.

After a thorough review of GE's energy efficiency programs, we recommend the following to improve GE's energy efficiency programs and report them more accurately:

- Implement an internal quality assurance protocol for data entry of rebate application information

For more detail on this recommendation please refer to the Findings & Recommendations section of this report.

Introduction & Purpose of Report

EM&V is the documentation of energy savings using direct measurements, engineering calculations, statistical analyses, and/or computer simulation models. EM&V is a requirement of two bills adopted during the 2005-2006 California legislative session:

- **SB 1037 (Kehoe):** Requires all publicly-owned utilities to report to the California Energy Commission and their local governing boards about current and projected energy efficiency programs, including expenditures and savings.
- **AB 2021 (Levine):** Reaffirms SB1037 mandates but also requires publicly-owned utilities to develop energy efficiency targets on a triennial basis and provide an independent assessment of measured savings.

This report provides unbiased, independent third-party auditing of programs selected by GE. Specifically, this report sets out to assess 1) demand and consumption savings of the Commercial Lighting program and 2) the savings calculation accuracy of the Keep Your Cool program.

Program Descriptions

Commercial Lighting

GE's Commercial Lighting program consists of three parts; 1-For-1 Lighting Upgrades, Lighting Upgrades with Delamping, and Custom Lighting projects. All lighting projects are contingent on the availability of funds and the inspection of completed projects by the City of Gridley's Efficiency Services Department.

- **1-For-1 Lighting Upgrades**

Qualifying 1-For-1 Lighting Upgrade projects are projects where the number of existing and proposed fixtures and lamps are the same. Qualifying rebates under this program do not require pre-approval from the City of Gridley if the lighting measure is listed in the "1-For-1 Upgrades" section of the City of Gridley's Commercial Lighting Rebates chart (Appendix C). If the job is completed as submitted, the customer will receive the rebate amount confirmed or 60% of the installed job cost, whichever is less.

- **Lighting Upgrades with Delamping**

Lighting Upgrades with Delamping projects reduce the total number of lamps and fixtures installed in a facility. To qualify for the delamping rebate the contractor must be able to document the number of existing lamps and fixtures at the beginning of the project.

- **Custom Lighting Projects**

Lighting projects not described in the City of Gridley's Commercial Lighting Rebate chart are can also be eligible. The customer must contact the Efficiency Services Department for details.

A full program description with application steps can be found in Appendix D and an application form for this program is included in Appendix E.

Keep Your Cool

The *Keep Your Cool* program targets energy saving within the food and beverage industry, focusing on reducing electrical consumption of refrigeration equipment.

Common measures include:

- Door gaskets
- Strip curtains
- Auto-closers

This program did not begin until after August 2009, so no data was available for the 2009 fiscal year.

Evaluation Standards

The requirement for utilities to provide independent third-party assessments of measured savings is relatively new and subject to some interpretation. There are published references (such as International Measurement and Verification Protocol and the Technical, Methodological, and Reporting Requirements for Evaluation Professionals), but it is apparent from the body of previous third-party assessments that there is a range of interpretations and application of these references.

Our stance and approach is to:

- 1) Provide a rigorous review of the utility's programs.
- 2) Meet them where they are at and identify actionable improvements.
- 3) Minimize costs so more public benefits funds can be devoted to energy efficiency programs.

With this approach, our goal is to provide an "optimized" assessment resulting in an actionable review at minimal cost to the utility. This Continuous Improvement approach begins with process evaluation, followed by data analysis and detailed savings verification. If, in the course of evaluating a process or analyzing the data, we discover significant opportunities for improvement, we will stop and document the needed improvement actions. In such cases we do not make assumptions or otherwise fill in gaps in the data.

For example, if required program data is missing then we will document this as a needed improvement activity rather than spend additional time to estimate the data which should have been provided.

Evaluation Plans

Using the approach explained above, the specific evaluation plan for GE was as follows:

Process Review

Evaluate the database for overall structure and accuracy. Conduct staff interviews to identify any specific issues with the energy efficiency program and identify improvement opportunities.

Commercial Lighting

Calculate 90 percent confidence interval for program Demand (kW) and Consumption (kWh) savings as a "per fixture" savings, review GE's database for accuracy of program savings data, and review deemed savings assumptions.

Keep Your Cool

Evaluate third-party proposed energy savings and review deemed energy savings assumptions.

Findings & Recommendations

Process Review - Evaluation of Database

GE recorded one (1) Commercial Lighting rebate for the 2009 fiscal year. GE tracks rebates using a spreadsheet. There are no immediate recommendations since this system is more than adequate, given the level of rebate activity.

Process Review - Staff Interviews

On February 8, 2010 a “Kick-off” meeting was conducted with Karin Helvey, Finance Director. It was discussed that rebate applications are not processed on site. They are mailed directly to a third party for evaluation (Efficiency Services Group, LLC). The City receives yearly summary information to track program results. Basic program background and details were discussed and contact information for Efficiency Services Group was verified.

Evaluation of Commercial Lighting

It was not possible to calculate a 90% confidence interval for the Commercial Lighting program since only one (1) Commercial Lighting rebate was issued.

- **Contractor Inaccuracy:** The installing contractor recorded a demand savings (kW) for the six (6) T5 high output fixtures significantly (more than 50%) lower than what a typical manufacturer’s cut sheet lists for these fixtures (222W per the contractor vs. 351W per manufacturer, see reference cited below). This resulted in a stated annual savings over two times what would be expected using the applicant’s Annual Hours of Operation and typical manufacturer’s input watts.

The difference is illustrated in the last two rows of the following table:

Fixture Location	Open Area
Pre-Retrofit Fixture	400 Watt MH
Pre-Retrofit Watts per Fixture	458
Fixture Qty	12
Annual Hours of Operation (per applicant)	2800
New Fixture	6-Lamp, T-5 HO
New Watts per Fixture (per applicant)	222
New Watts per Fixture (Per Mfr)*	351
New Watts per Fixture % Difference	-58%
Annual kWh Savings (per applicant)	7929.6
Annual kWh Savings (Adjusted per Mfr Watts)*	3,595

* Example: See <http://www.1stsourcelight.com/downloads/cs-ulb4654.pdf>

- We recommend a validation step be instituted to confirm applicant data is correct.

Evaluation of Keep Your Cool

It was found that GE began this program in the 2010 fiscal year, thus no analysis or recommendations will be made for this program until after fiscal year 2010

Appendix A – Rebate Application



City of
Gridley

Energy Efficient Commercial Lighting Rebate Application

Please complete and sign this form. (Please print clearly)

Utility Account Number GUS 0003
Company Name: G.U.A.R.D.I.A.N.
Contact First Name: CLARK Last Name: Redfield
Installation Address: High School Campus (200 E SPRUCE) Suite: _____
City: Gridley State: CA Zip: 95948
Phone: (530) _____ E-Mail (optional) credfield@gridley.k12.ca.us
Mailing Address (if different): 429 Magnolia Apt: _____
City: Gridley State: CA Zip: 95948

Rebate Amount Applying For: \$ 2679.26 (From City of Gridley's Commercial Lighting Spreadsheet)
Note: Rebates will not exceed 60% of installed job cost. Project must be pre-approved by City of Gridley prior to work beginning to assure availability of funds.

Upon signing this agreement, customer acknowledges the following:

This rebate offer may be discontinued at any time by City of Gridley, and is limited to availability of funds. The City of Gridley disclaims any warranty, whether expressed or implied, regarding the lighting equipment installed, or for any materials or labor associated with its installation, maintenance, repair, or any energy savings associated with its use. I understand the above and certify that I am a customer of City of Gridley and the above mentioned products will be installed at the location indicated above.

Lighting project must be inspected and approved by City of Gridley prior to payment of rebates. Call 1-888-883-9879 for availability of funds, and to schedule your inspection when your project is complete.

Customer Signature: JB for CLARK Redfield

Date: 1/16/09

Please submit this completed form and a copy of your lighting project proposal (from City of Gridley's Commercial Lighting Spreadsheet) to:

City of Gridley
Attn: Efficiency Services
PO Box 421
Clackamas, OR 97015

Note: Your contractor can acquire a copy of the City of Gridley's Lighting Spreadsheet by calling 1-888-883-9879

FOR OFFICE USE
Project Approved

Date: _____

Initials: _____

City Of Gridley - Commercial Lighting Program - Custom Proposal

Cost Per kWh:	\$ 0.16
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Business:	Guardian Building	Site Address:	Gridley High School Campus
Contact Person:	Brad Wilkie	Phone:	

[illegible]

Job Cost:	\$	4,104.26
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Estimated Annual kWh Savings:	7930	Contractor Name:		Phone:	
Estimated Annual kWh \$ Savings:	\$1,269	Contractor Signature	Date:		

Custom lighting project proposals will be reviewed by the City of Gridley's Energy Efficiency Department to determine eligibility for rebates.

Appendix B – Commercial Lighting Rebate Form



City of Gridley Energy Efficient Commercial Lighting Rebates

1-For-1 Upgrades			
Existing Equipment	Proposed Equipment	Rebate	Rebate Multiplier
4 ft T-12 Lamps	4 ft T8 Lamps (Re-Lamp or New Fixture)	\$15	Rebate per lamp (tube)
8 ft T-12 Lamps	8 ft T8 Lamps (Re-Lamp or New Fixture)	\$20	Rebate per lamp (tube)
250W Metal Halide or T-12	3 Tube T-5 HO (New Fixture)	\$150	Rebate per Fixture
400W Metal Halide or T-12	4-Tube T-5 HO (New Fixture)	\$250	Rebate per Fixture
Incandescent	Screw-In CFL (1-13W)	\$5	Rebate per CFL
Incandescent	Screw-In CFL (14-26W)	\$6	Rebate per CFL
Incandescent	Screw-In CFL (>=27W)	\$7	Rebate per CFL
Incandescent	Hardwired CFL (1-13 Watt)	\$40	Rebate per fixture
Incandescent	Hardwired CFL (14+ Watt)	\$50	Rebate per fixture
No timer	Time Clock	\$75	Rebate per Time Clock
Timer only	Photocell	\$30	Rebate per Photocell
No Occupancy Sensor	Occupancy Sensor	\$50	Rebate per Occupancy Sensor
No timer or Controls	Photocell	\$100	Rebate per Photocell
Exit Sign - Incandescent	Exit Sign - LED or Electroluminescent	\$50	Rebate per Fixture

Upgrades w/Delamp			
Existing Equipment	Proposed Equipment	Rebate	Rebate Multiplier
4 ft T-12 Lamps	4 ft T8 Lamps w/10% delamp (Re-Lamp or New Fixture)	\$25	Rebate per lamp (tube)
4 ft T-12 Lamps	4 ft T8 Lamps w/25% delamp (Re-Lamp or New Fixture)	\$30	Rebate per lamp (tube)
4 ft T-12 Lamps	4 ft T8 Lamps w/33% delamp (Re-Lamp or New Fixture)	\$40	Rebate per lamp (tube)
8 ft T-12 Lamps	8 ft T8 Lamps w/10% delamp (Re-Lamp or new Fixture)	\$30	Rebate per lamp (tube)
8 ft T-12 Lamps	8 ft T8 Lamps w/25% delamp (Re-Lamp or new Fixture)	\$40	Rebate per lamp (tube)
8 ft T-12 Lamps	8 ft T8 Lamps w/33% delamp (Re-Lamp or new Fixture)	\$50	Rebate per lamp (tube)
<i>Note: A City of Gridley lighting audit or digital photos are required to qualify for delamp rebates. Number of existing lamps must be documented and verified prior to work beginning.</i>			

Custom Lighting Projects

Lighting projects not described in the above tables may still qualify for incentives. These are considered Custom Projects, and require pre-approval by City of Gridley before work can begin. Contact the City of Gridley's Energy Efficiency Department at 1-888-883-9879 for more information on custom lighting projects

City of Healdsburg lighting rebates will NOT exceed 60% of the installed job cost

6/1/2007

Data supplied by Efficiency Services Group, LLC.

Appendix C – Commercial Lighting Program Procedure



City of Gridley

Commercial Retrofit Lighting Program Procedures

The following procedures explain how the City of Gridley's commercial lighting customers can participate in and receive rebates through the Commercial Retrofit Lighting Program. There are two important points regarding participation in this program:

1. **Availability of Funds:** The rebate funds for this program are limited, and are allocated to customers on a first come, first served basis. Projects must be pre-approved by the City to assure availability of funds.
2. **Inspection of Completed Projects** – All completed projects will be inspected by the City of Gridley's Efficiency Services Department (ESG). Completed jobs must be approved by ESG before rebate funds will be released.

1-For-1 Lighting Upgrades

1-For-1 Lighting Upgrades are projects where the number of existing and proposed fixtures and lamps are the same. 1-For-1 lighting upgrades do not require pre-approval from the City of Gridley to qualify for rebates.

Only lighting measures listed in the "1-For-1 Upgrades" section of the City of Gridley's Commercial Lighting Rebates chart can be processed in the following steps:

1. Contractor and customer enter into an agreement for the installation of new, energy efficient lighting equipment.
2. The lighting contractor calculates the customer rebate by completing the worksheet on the back of the customer Commercial Lighting Rebate Application form.
3. Customer completes the rebate application form. Customer submits completed rebate application form and the rebate worksheet to ESG for review.
4. ESG will review the contractor rebate calculations for accuracy, and check for availability of rebate funds. Upon approval, ESG will initial the rebate application form and the calculations worksheet and return to the customer.
5. Contractor installs lighting measures.

6. Customer contacts ESG to schedule an inspection of the completed job.
7. ESG contacts the customer to set up a post-installation inspection.
8. ESG visits the job site and inspects the lighting installation. ESG records the quantity and description of the equipment installed. At this time, the customer will need to provide ESG with a copy of the contractor invoice. The contractor invoice should include the customer name, address, phone, quantity and description of equipment installed, and the final job cost.
9. Based on the equipment that was verified installed during the post-inspection, ESG finalizes the customer rebate amount.

If the job was completed as submitted, the customer will receive the rebate amount confirmed in step #4 OR 60% of the installed job cost, whichever is less.

If, based on the equipment that was verified during the post-installation inspection, the job was not completed as submitted, ESG will adjust the final rebate to the customer accordingly.

10. ESG submits the approved rebate to the City of Gridley for payment.
11. City of Gridley provides rebate as agreed to by customer and City.

Lighting Upgrades w/Delamp

Lighting upgrades w/delamp are projects that reduce the total number of lamps and fixtures installed in the facility. These are common in facilities that have existing light levels that are too high for their needs. The rebates are higher for delamp projects due to the additional energy savings resulting from the reduced number of lamps/fixtures.

Application for delamp rebates are made the same way as 1-For-1 rebates. ***However, to qualify for delamp rebates the contractor must be able to document the number of existing lamps and fixtures at the beginning of the projects.*** This can be done in one of two ways:

- Contact ESG to perform a lighting audit prior to the start of work. ESG will visit the site and verify the number of existing fixtures and lamps.
- Take digital photos that clearly document the number of existing lamps and fixtures, and provide them to ESG at the time of the post-installation inspection. Note: If, at ESG's discretion, the photos do not adequately document the pre-existing fixtures and lamp counts, the customer rebate will be based on the 1-For-1 rebate amounts and the equipment that is verified installed by ESG during the post-installation inspection.

Custom Lighting Projects

Lighting projects not described in the City of Gridley's Commercial Lighting Rebate chart may still qualify for incentives. These projects require pre-approval by ESG before the work can begin. Contact ESG at 1-888-883-9879 for more information regarding custom lighting projects.

Appendix D – Rebate Form

 City of Gridley	<h3>Energy Efficient Commercial Lighting Rebate Application</h3>
Please complete and sign this form. (Please print clearly)	
Utility Account Number _____	
Company Name: _____	
Contact First Name: _____ Last Name: _____	
Installation Address: _____ Suite: _____	
City: _____ State: _____ Zip: _____	
Phone: () _____ E-Mail (optional) _____	
Mailing Address (if different): _____ Apt: _____	
City: _____ State: _____ Zip: _____	
Rebate Amount Applying For: \$ _____ (From City of Gridley's Commercial Lighting Spreadsheet)	
Note: Rebates will not exceed 60% of installed job cost. <u>Project must be pre-approved by City of Gridley prior to work beginning to assure availability of funds.</u>	
Upon signing this agreement, customer acknowledges the following:	
This rebate offer may be discontinued at any time by City of Gridley, and is limited to availability of funds. The City of Gridley disclaims any warranty, whether expressed or implied, regarding the lighting equipment installed, or for any materials or labor associated with its installation, maintenance, repair, or any energy savings associated with its use. I understand the above and certify that I am a customer of City of Gridley and the above mentioned products will be installed at the location indicated above.	
<u>Lighting project must be inspected and approved by City of Gridley prior to payment of rebates. Call 1-888-883-9879 for availability of funds, and to schedule your inspection when your project is complete.</u>	
Customer Signature: _____	Date _____
Please submit this completed form and a copy of your lighting project proposal (from City of Gridley's Commercial Lighting Spreadsheet) to:	
City of Gridley Attn: Efficiency Services PO Box 421 Clackamas, OR 97015	
Note: Your contractor can acquire a copy of the City of Gridley's Lighting Spreadsheet by calling 1-888-883-9879	
FOR OFFICE USE Project Approved Date _____ Initials _____	

2/08