



# Efficiency Bid<sup>SM</sup> Pre-installation Report

Administrative Use Only	
Application #	
Date Received	
Date Approved	
Approved By	

## Host Profile

Organization Name:	Example, Inc.	Project Contact:	John Doe
Parent Company:	N/A	Contact Address:	123 Efficiency Lane
Tax ID No.:	123456789		Exampleville, IA
Type of Business:	Brick Manufacturer		Contact Phone:
Business Sector:	Industrial	<input checked="" type="checkbox"/> X	Commercial
		Contact Fax:	555-4321
		Contact E-mail:	jdoe@exampleinc.com

## Project Sponsor Profile

Organization Name:	-----SELF SPONSORED-----	Contact Phone:	
Parent Company:		Contact Fax:	
Project Contact:		Contact E-mail:	
Contact Address:			

## Project Information

Project Description <small>(Please list all measures providing a detailed description. Attach additional sheets if necessary.)</small>	The metal halide HID lighting in Warehouse A will be replaced with high-bay fluorescent fixtures.		
	Replace steam boiler water heating with direct contact water heating.		
	Replace a 250 ton chiller with a new more efficient unit.		
	NOTE: No changes have occurred in the project since we submitted the initial bid.		
Projected Cost	\$194,00.00	Projected Annual Savings (\$)	\$53,261.38

## System Savings Data

Estimated System Savings		
Peak Summer Demand <sup>1</sup> (kW)	Annual Electricity (kWh)	Annual Gas (therms)
72.59	396,537	43,337

<sup>1</sup>Peak demand savings occur during the periods of 4 to 5 p.m. on weekdays in June, July, Aug. or Sept., excluding holidays.  
Please attach all assumptions and formulas used to calculate the project cost, estimated electricity and/or gas energy savings, and electric peak demand savings (if applicable). Please also provide descriptions of all variables used in these formulas and example calculations for each measure. Electronic copies of all files, spreadsheets, or computer simulation input files should be included with this PIR.

## Bid Cycle Information

Bid Cycle Number	1	Project Implementation Deadline	3/1/2005	Project Completion Deadline	9/1/2005
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We, the undersigned, agree that, to the best of our knowledge, the energy efficiency measures listed above are representative of the project we expect to implement as part of the MidAmerican Energy Efficiency Bid Program. By signing this document, the customer acknowledges that the project sponsor listed above has discussed with the customer or others in the customer's organization the implementation of energy efficiency measures within the customer's facility or facilities in conjunction with Mid American's Efficiency Bid Program, corresponding to the bid cycle shown above. The customer's signature also indicates that:

- 1) The customer's company intends to undertake the installation of these measures.
- 2) All installation and/or construction activities will be completed no later than the project completion date listed for the appropriate bid cycle.
- 3) Company management has given the necessary authorization to install these measures.
- 4) The customer agrees to allow MidAmerican to verify the energy-savings achieved as a result of the installed measures by providing reasonable access during normal business hours. MidAmerican's review or inspection of any energy conservation measures will not constitute any representation as to the technical or economic quality of the measure. MidAmerican, its officers, employees and contractors will not be liable for the performance of these measures. MidAmerican will not release any proprietary information about the customer's business without its permission.

John Doe  
\_\_\_\_\_  
Customer Contact Name

John Doe  
\_\_\_\_\_  
Customer Contact Signature

7/1/04  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Project Sponsor Contact Name

\_\_\_\_\_  
Project Sponsor Contact Signature

\_\_\_\_\_  
Date

## **Warehouse A Lighting**

**Description:** Warehouse A is currently lit by 112 - 400 W metal halide HID lights. The lights are configured in 8 rows of 14 fixtures. The metal halide HID lighting will be replaced with high-bay fluorescent lighting on a one-to-one basis. Example, Inc. is using internal labor to install the fixtures, thus no labor is included in the project cost.

### **Existing System:**

Total Wattage per Fixture: 465 Watts

Total System Demand:  $465 \text{ W} * (1 \text{ kW}/1000 \text{ W}) * 112 \text{ fixtures} = 52.08 \text{ kW}$

Operating Hours: 8,760 hours per year

Energy Consumption:  $52.08 \text{ kW} * 8,760 \text{ hours} = 456,221 \text{ kWh}$

### **Proposed System:**

Total Wattage per Fixture: 224 Watts

Total System Demand:  $224 \text{ W} * (1 \text{ kW}/1000 \text{ W}) * 112 \text{ fixtures} = 25.09 \text{ kW}$

Operating Hours: 8,760 hours per year

Energy Consumption:  $25.09 \text{ kW} * 8,760 \text{ hours} = 219,788 \text{ kWh}$

### **Demand Savings:**

Demand Savings = Baseline Demand – Proposed Demand

Demand Savings =  $52.08 \text{ kW} - 25.09 \text{ kW} = 26.99 \text{ kW}$

### **Energy Savings:**

Energy Savings = Baseline Energy Consumption – Proposed Energy Consumption

Energy Savings =  $456,221 \text{ kWh} - 219,788 \text{ kWh} = 236,433 \text{ kWh}$

## Process Water Heating Upgrade

**Description:** Brick manufacturing process requires supply of hot water to mix raw materials. Current system utilizes a steam boiler with a heat exchanger to produce the required hot water. Example, Inc. proposes to replace the boiler system with a direct contact hot water heater.

### **Process Requirements:**

Process requires 200 GPM for 6 hours. The water is heated from the supply temperature of 55 F to 120 F. The clean-up crew utilizes 100 GPM at the same temperature for 2 hours per day.

### **Energy Savings:**

The system operates for 6 hours a day for production year-round. Total production annual operating hours =  $6 * 300 = 1,800$  hours. The additional 100 GPM is required 2 hours per day year-round =  $2 * 300 = 600$  hours.

#### Energy Consumption

$200\text{GPM} * 60 \text{ min/hr} * 8.34 \text{ lb/gal} * 1 \text{ Btu/lbm-F} * (120 \text{ F} - 55 \text{ F}) = 6,505,200 \text{ Btu/hr PROCESS LOAD}$

$100\text{GPM} * 60 \text{ min/hr} * 8.34 \text{ lb/gal} * 1 \text{ Btu/lbm-F} * (120 \text{ F} - 55 \text{ F}) = 3,252,600 \text{ Btu/hr CLEAN UP LOAD}$

Total Annual Energy Load =  $1,800 * 6,505,200 + 600 * 3,252,699 = 13,660.98 \text{ MMBtu}$

Boiler system has an AFUE of 73 percent thus total baseline consumption is:  $13,660.98 / 0.73 = 18,713.67 \text{ MMBtu}$

The Direct Contact Water Heater has an AFUE of 95 percent thus total energy is:  $13,660.98 / 0.95 = 14,379.98$

Total Savings =  $18,713.67 - 14,379.98 = 4,333.69 \text{ MMBtu} = 43,337 \text{ Therms}$

## Chiller Upgrade

- Operating Schedule: **6:30 a.m. to 7:30 p.m. Mon. through Fri.**
- Sequence of Operation and Control Set Points: **CHWS 44F, CWS 78F**
- Model and Serial Number: **Existing Chiller: PCV-10**  
**Proposed Chiller: RTHC-1**
- Cooling Capacity: **Existing = 250 tons**  
**Proposed = 250 tons**
- Nameplate Efficiency: **Baseline Chiller Efficiency<sup>1</sup>: 4.2 COP (0.837 kW/ton)**  
**Post-retrofit Chiller Efficiency: 6.0 COP (0.583 kW/ton)**
- Nameplate Data: **See attached cut sheets**
- Design Temperatures and Loads with Supporting Engineering Calculations:  
**See attached trend logs from EMCS.**  
**Estimated Load during Peak Period<sup>1</sup>: 198 tons**
- Manufacturer's Performance Information: **See attached cut sheets**
- Site Plans: **See attached**

### Savings Equation:

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$$kWh_{savings} = \sum_n \left( kWh_{post,n} * \left( \frac{COP_{new}}{COP_{baseline}} - 1 \right) \right) = 11,848 \text{ kWh}$$

$$Project \ Target \ Demand \ Reduction = \frac{kWh_{savings}}{T} = 11,848 \text{ kWh}/260 \text{ hrs} = 45.6 \text{ kW}$$

$$Annual \ Energy \ Savings: 45.6 \text{ kW} * 3511 \text{ hours} = 160,101 \text{ kWh}$$

Estimated  $kWh_{post} = 198 \text{ tons} * 0.537 \text{ tons} * 260 \text{ hours}$

260 hours = Number of hours in summer peak period.

$COP_{new} = 6.0 \text{ COP}$

$COP_{baseline} = 4.2 \text{ COP}$

Estimated number of operating hours: 3511 hours

<sup>1</sup>**Based upon trended data from EMCS during summer of 2001.**