



**Assessment Date:** Feb. 21, 2007

#### Benefits:

- Unnecessary equipment and equipment operating out of range was removed or adjusted.
- Recommendations already implemented saved almost \$178,000 annually
- Nine recommendations were made to reduce energy usage throughout the plant, and only two remain to be implemented.

#### Applications:

The IAC assessment team discovered opportunities to decrease energy usage, increase capacity, and enhance corporate competitiveness. To reduce energy usage, the assessment team focused primarily on the manufacturing process as well as the pumping systems. The results at Osram Sylvania will guide IAC assessments at similar facilities, where the savings can be replicated.

## Glass tubing and bulb manufacturer: Osram-Sylvania of Rhode Island gets unanticipated benefits from energy audit

### Summary

Thanks to a study conducted by the Department of Energy's Industrial Assessment Center located at the University of Massachusetts, Osram-Sylvania of Rhode Island, a manufacturer of glass tubing and bulbs, found that several pieces of equipment were operating out of range or operating needlessly. As a result, Osram-Sylvania was able to shut off or fine tune their equipment and realize significant cost and energy savings. As a result of the UMass IAC investigation, for example, the company identified a Lehr that was operating out of range. By setting it to its normal operating band, the company saved between \$6,000 and \$7,000 per month.

All the remaining recommendations made by the IAC audit team have been or will be implemented; so far annual savings total nearly \$178,000.

### Company Background

Osram-Sylvania of Central Falls, Rhode Island employs 97 people, and manufactures borosilicate glass tubing and glass bulbs for HID lighting. The facility comprises nineteen buildings constructed between 1901 and 1962. Total floor space for all the buildings is 600,000 ft<sup>2</sup>, of which 80,000 ft<sup>2</sup> is for manufacturing. The facility operates 24/7 with one major shutdown in June. Annual energy expenses include \$2.7 million for electricity, and nearly \$2 million for natural gas.

### Assessment Approach

A team of students and faculty from the Industrial Assessment Center (IAC) at the University of Massachusetts Amherst performed an industrial assessment at Osram-Sylvania in Central Falls, Rhode Island in the winter of 2007. The assessment was led by center Director, Dr. D.B. Kosanovic, from the Department of Mechanical and Industrial Engineering at the University of Massachusetts.

### Variable Speed Drives

The UMass team identified three opportunities for variable speed drives: on the furnace cooling fans, on exhaust fans, and on the cooling water pumps. Together, these three measures will result in annual cost savings of nearly \$93,000, and energy savings of 779,365 kWh. The company reported a combined implementation cost of \$157,000, for a simple payback of approximately 1.7 years.



## Lehr Adjustments

After receiving the report which included a heat recovery recommendation, Osram-Sylvania contacted the vendor to request support in recovering heat and fine-tuning the Lehr. Closer examination revealed that the Lehr was operating far out of the range of efficient operation. The Lehr was adjusted and put back to its normal operating band, which allowed the plant to save \$6,000- \$7,000 in gas a month.

## Tank Insulation

Osram-Sylvania's manufacturing process includes four ultrasonic strip tanks used to prepare moulds, and a condensate return tank used for the boiler. All those tanks were uninsulated, and the IAC team recommended insulating them, which Osram-Sylvania did with its in-house maintenance team, to keep costs down. Energy savings for these measures is 67,779 kWh plus 95 MMBtu, for a combined annual cost savings of \$8,865.

## Emissions Reduction

In addition to cost saving realized from the energy efficiency measures, Osram-Sylvania reduced its carbon dioxide emissions by approximately 390 tons, and its NOx emissions by about 175 lbs. Carbon dioxide is a leading contributor to global warming, and NOx are major contributors to smog formation and acid deposition.

## Results

Table 1 shows the annual cost savings to accrue at the Osram-Sylvania facility from implementing the energy conservation opportunities identified by the IAC team during the assessment. Based on these results, the facility can reduce its energy consumption by over 850,000 kWh and 7,100 MMBtu in natural gas. These reductions will consequently reduce annual utility costs by a total of \$177,893.

Implemented opportunities are described in the following table:

Implemented Opportunities at Osram-Sylvania

Assessment Recommendation	Annual Savings	Annual Cost Savings	Implementation Cost	Payback Period
Install VSD on Furnace Cooling Fans	Electricity: 401,662 kWh Demand: 578 kW	\$47,879	\$86,100	1.8 years
Install Variable Speed Drive on Exhaust Fan	Electricity: 275,340 kWh Demand: 396 kW	\$32,820	\$28,800	11 months
Heat Recovery on The Annealing Oven	Nat. Gas: 6,730 MMBtu	\$72,000	\$3,220	3 months
Install VSD on Throttled Pumps	Electricity: 102,363 kWh Demand: 148 kW	\$12,204	\$42,100	3.4 years
Insulate Strip Tanks	Electricity: 67,779 kWh	\$7,795	\$1,924	3 months
Implement Temperature Setback	Nat. Gas: 284 MMBtu Electricity: 9,445 kWh	\$4,125	\$1,200	10 months
Insulate Condensate Tank	Nat. Gas: 95 MMBtu	\$1,070	\$340	11 months
Total	Electricity: 856,589 kWh Demand: 1,122 kW Nat. Gas: 7,109 MMBtu	\$177,893	\$163,684	

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