

## **B. Campus Heating**

**1. Introduction:** The Heating Plant, located on the north side of the campus, provides steam to all campus buildings throughout the year for heat, hot water and process uses at Blackhawk Commons and the Halsey Science Complex. The primary fuels for making steam are low-sulfur coal and natural gas. These fossil fuels are a significant contributor of greenhouse gases. Coal is the primary source for creating steam in the winter months while natural gas is the primary fuel used to provide steam over the warmer periods. Wisconsin Dept. of Natural Resources permit requirements stipulate the burning of a 10% mix of natural gas along with the coal during the winter months. The graph provides an illustration of the typical fuel consumption pattern for the heating plant.

**2. Goal:** To reduce the annual consumption of fossil fuels for heating by 50% from 2000 levels by 2012.

**3. History:** Over the last six years, there have been a number of major renovations to the heating plant that have had a positive impact upon operational efficiency and environmental quality.

a. Controls Upgrade: In 2001 the controls system for the heating plant was upgraded to modern, digital based technology that allow for more precise control and monitoring of the combustion process.

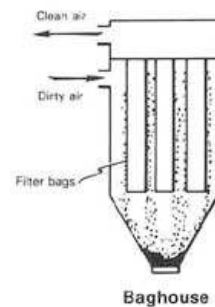
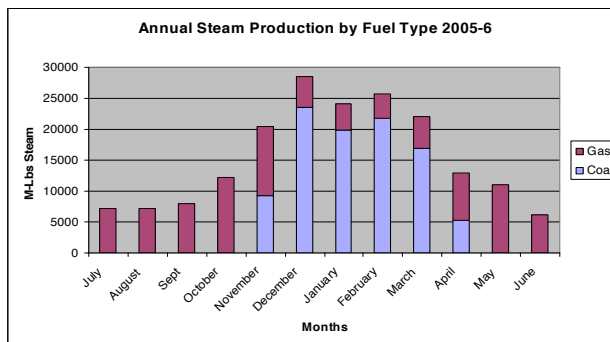
b. Baghouse: In 2002, an environmental controls system, or baghouse was added to the heating plant exhaust system. Baghouses are fabric collectors that use filtration to separate dust particulates from dusty exhaust gases. They are one of the most efficient and cost effective types of dust collectors available and can achieve a collection efficiency of more than 99% for very fine particulates.

c. New natural gas boiler: In 2004, the existing 40 year old 15,000 lb/hr natural gas boiler was replaced with a new 25,000 lb/hr natural gas unit. This upgrade in capacity allowed for a better match of summer steam demand to available production capability.

In addition to the above mentioned facility upgrades at the heating plant, the following changes were made to improve the efficiency of the heating process:

d. Beginning in 2003, Facilities Management began to aggressively schedule the energy management system with the goal to heat and ventilate buildings only as necessary.

e. In 2005, mechanical technicians lowered and calibrated thermostats campus wide. In



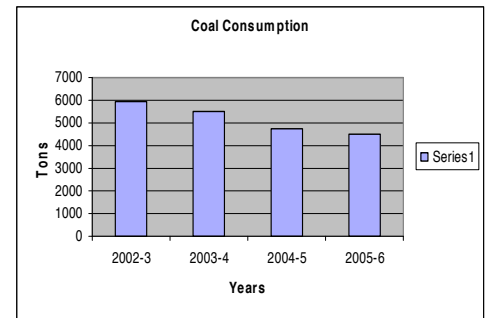
the process, they discovered and corrected numerous operational problems that were causing wasteful and uncomfortable levels of heating and cooling.

f. On an annual basis, steam traps are inspected and repaired. In 2005, as part of the Wisconsin Energy Initiative, the campus replaced and upgraded a significant portion of the campus inventory of steam traps.

#### **4. Results**

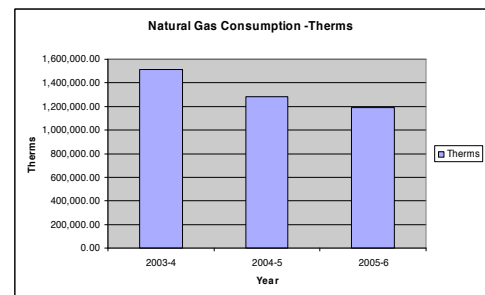
##### **a. Coal Consumption**

Annual coal consumption has dropped from 5,927 tons over the heating season of 2002-3 to 4,494 tons in 2005-6. This equates to a **24%** drop over four years. In addition, the exhaust from the heating plant is free from fine dust particulate that causes respiratory irritations and illness. This analysis factors in variations due to climate fluctuations. All of the reductions can be attributed to actual conservation/efficiency measures as opposed to a reduction based upon milder winter temperatures.



##### **b. Natural Gas Consumption:**

Annual natural gas consumption has dropped from 1,511,303.50 therms in 2004 to 1,192,987.2 therms in 2006. This equates to a **21%** drop in consumption over three years.



**5. Action Plan:** In order to achieve the stated goal to reduce the annual consumption of coal and natural gas by 50% from 2000 levels by 2012, a concerted effort must be made to significantly reduce our heating demand and consumption patterns. UW Oshkosh has already demonstrated that conservation works. This action plan is divided into three sections based upon priority. The following items are recommended (See Appendix F for details and justification):

##### **Initial Consideration:**

- *Review, verify and update campus audit data. Identify the campus facilities with the highest thermal energy consumption per square foot.*
- *Provide facility thermal energy usage feedback and education to campus users.*
- *During low useage periods (summer, interim, weekend) consolidate classroom useage to the most energy efficient buildings that meet course requirements.*

##### **Within Three Years**

- *Assess the possibility of burning alternative biomass fuels at the campus heating plant.*
- *Install solar hot water heaters at appropriate locations throughout the campus. Suggestions include Albee Hall and the Residence Halls.*

**Future Consideration (Five years or greater):**

- *Install alternative heating and cooling systems at facilities not connected to the central system.*
- *Replace older, single pane windows with high efficiency, low e, double or triple pane windows at appropriate locations such as Clow Classroom and Faculty Tower Complex.*