Calvin Natural Gas Savings

Engineering 333 Section A, Calvin College CEAP: 2017

Calvin College
COLLEGE
1876

Introduction

Calvin College uses 161,000 MMBTU of natural gas per year, which correlates to $836,000 of annual expenses. However Calvin could save as much as $240,000 on natural gas if they were as efficient as the top performer in an energy audit of similar colleges and universities in the Midwest, conducted by Sightlines Institute.

The goal of this project was to see what actions could be taken to save the college $75,000 in annual natural gas costs.

Methods

Work Breakdown

Table 1: Project Groups

Group	Task
Finance	
Boilers	
Academic Building	
Dorms and Dining	
PE Complex	

http://futurelibraries.net/wp-content/uploads/2017/06/Money-Sign-Golden-CLEAR-250px-PNG24-NOINF-OPTIMIZED.png
http://www.spthermal.com/files/hurst_boiler4.jpg
https://cdn.instructables.com/FZW/IHL3/F5FEQ1DB/FZWIHL3F5FEQ1DB.LARGE.jpg
https://images.homedepot-static.com/productImages/fea9c23a-acca-45ec-b551-35438e34c956/svn/whites-nest-programmable-thermostats-t3017us-64_1000.jpg
https://calvin.edu/dotAsset/66a9904f-5f63-495c-8a42-4186a332b6a7.jpg

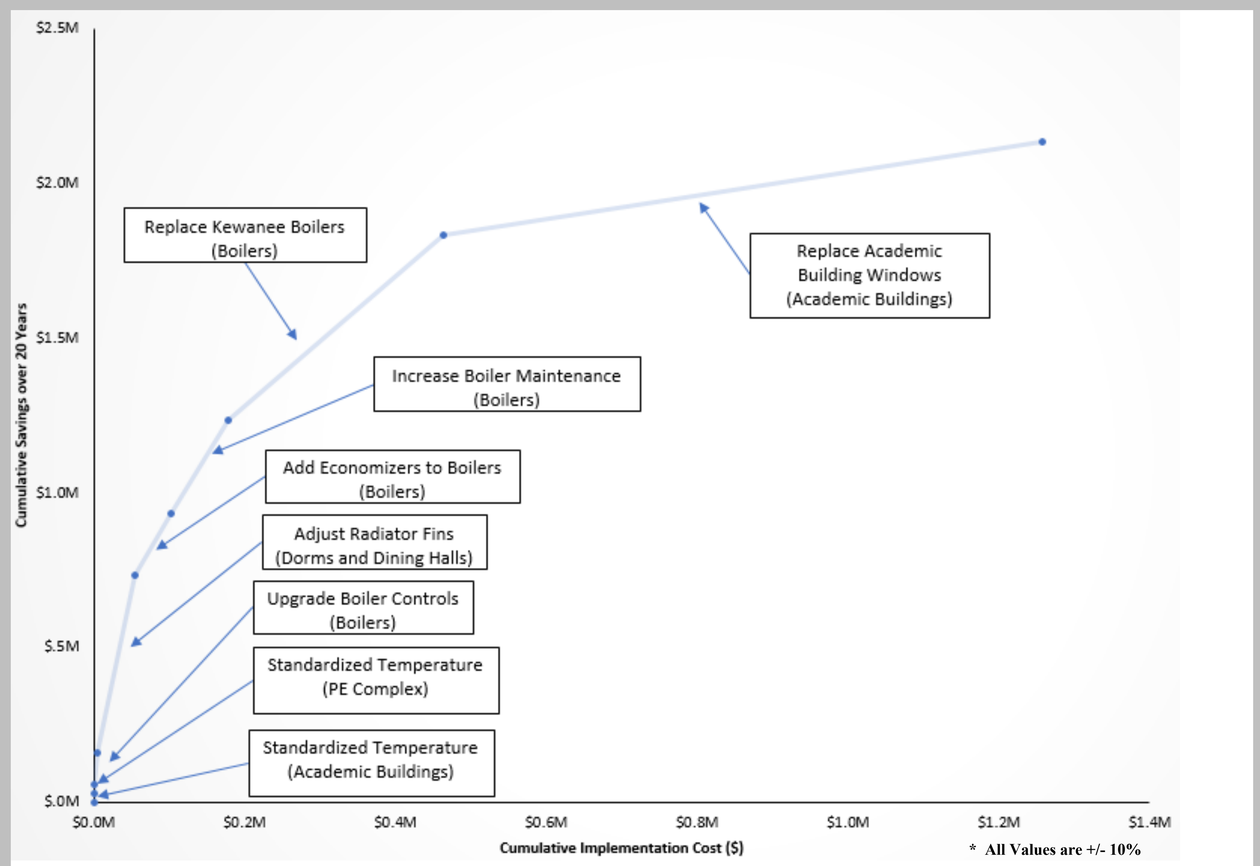

Figure 1: 20 Year Cost Savings Analysis

Results

From the projects that the class researched and modeled, it is believed that there is the potential to save approximately $85,000 per year, by implementing the five projects that had the highest return on investment. The total annual savings, implementation cost, and years to payback of these five projects can be seen below in Table 2.

Table 2: Total Annual Savings

Total Annual Savings ($/yr)	$85,000
Implementation Cost ($)	$460,000
Payback (Years)	6

Top 5 Projects

- Standardize Building Temperatures throughout Campus
- Upgrade the Boiler Controls
- Adjust Radiator Fins in the Dorms
- Add Economizers to Boilers
- Increase Boiler Maintenance

Conclusions

The ENGR-333A class has developed a pathway for Calvin to decrease its natural gas spending by $85,000 annually. The top ideas the class would recommend implementing based on their research are: to upgrade and replace the boilers, adjust the radiator fins for dorms, and standardize the temperature for all buildings on campus.

The team believes that they were successful in finding the top cost savings projects for Calvin College, given the current information about its natural gas consumption.

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Engineering 333 Class A - Calvin College