

# Brown Drake ZPS installation

## Overview

Status: Completed

Project Lead: Zach Platsis

### Description

This project will install Zone Presence Sensors on the fume hoods in Brown and Drake. This will allow the Hood control system to set back the air flow during periods when the hood is not being used. The reduction in airflow results in electric and thermal energy savings via reduction in the amount of conditioned air that must be supplied to the room. This project has been vetted by EHS for safety of airflow reductions. Data collected during this project will also provide useful information for the development of future fume hood airflow reduction projects.

### Project Types

Building Heating, Ventilation, Air Conditioning (HVAC)  
Fume hoods

### Campus/Site

Newark Campus

### Facilities

Name	Type	Gross Floor Area
Brown Lab	Laboratory	126500 Sq. Ft.
Drake Hall	Laboratory	55500 Sq. Ft.

**Proposed Cost:** \$ 115,000.00

### Timeline

Project Approved	Install Start Date	Actual Install Complete Date	Lifespan
2016-12-12	2016-12-12	2017-04-30	10 years

### Resources Tracked

Resource	Units	Cost x Unit	Annual Savings
Electricity	kWh	\$ 0.10	142,000 kWh
Natural Gas	MMBtu	\$ 6.64	1,365 MMBtu

### Measurement and Verification Methodology

## Performance

### Savings Over Time

	AVERAGE ANNUAL	TOTAL TO DATE	LIFE OF PROJECT
FINANCIAL SAVINGS (\$)	22,883	121,689	228,833
ENERGY SAVINGS (MMBTU)	1,850	9,835	18,495
EMISSIONS ABATED (MTCO <sub>2</sub> E)	152.3	819.7	1,532.8

### Financial Metrics

SIMPLE PAYBACK PERIOD (YEARS)	LOAN REPAYMENT PERIOD (YEARS)	LIFETIME RETURN ON INVESTMENT (ROI)
<b>3.81</b>	<b>3.81</b>	<b>162.8%</b>
ANNUAL ROI	NET PRESENT VALUE (NPV)	INTERNAL RATE OF RETURN (IRR)
<b>16.3%</b>	<b>\$ 89,742.28</b>	<b>23.08%</b>
UNIT COST PER MTCO <sub>2</sub> E ABATED		
<b>\$ 56.81</b>		

### Project Transactions

Transaction Type	Date	Amount
Expenditure	2017-07-21	-\$ 65,692.00
TRI-M GROUP LLC - TRI-M GROUP LLC		
Expenditure	2017-08-23	-\$ 4,601.20
TRI-M GROUP LLC - TRI-M GROUP LLC		
Expenditure	2017-09-22	-\$ 2,061.40
TRI-M GROUP LLC - TRI-M GROUP LLC		
Expenditure	2017-10-24	-\$ 6,018.71
TRI-M GROUP LLC - TRI-M GROUP LLC		
Expenditure	2017-11-30	-\$ 8,708.16
TRI-M GROUP LLC - TRI-M GROUP LLC		
Loan Repayment	2018-06-20	\$ 10,212.00
Loan Repayment	2019-06-19	\$ 19,217.00

### Summary

Project cost \$ 87,081.47

(Options from the International Performance Measurement & Verification Protocol)

Adjusted project cost to be repaid \$ 87,081.47  
 Current amount owed on loan \$ 57,652.47

Option A: Retrofit Isolation with Key Parameter Measurement

More details about measurement and verification methodology: Brown and Drake labs are equipped with building level sub-metering of Electric, Steam, and Chilled water. The measured values will be compared before and after the project

Annual Tracking Data

DATE	SAVED FUEL PRICE (\$/MMBTU)	ENERGY SAVED (MMBTU)	ANNUAL FINANCIAL SAVINGS (\$)	ANNUAL PAYBACK INTO GRF (\$)	CUMULATIVE PAYBACK INTO GRF (\$)	MONEY OWED BACK TO GRF (\$)
2017-04-30	0.0000	0	(87,081.47)	0.00	0.00	87,081.47
2017-06-30	12.3726	314	3,887.03	3,887.03	3,887.03	83,194.44
2018-06-30	12.3726	1,850	22,883.34	22,883.34	26,770.37	60,311.10
2019-06-30	12.3726	1,850	22,883.34	22,883.34	49,653.71	37,427.76
2020-06-30	12.3726	1,850	22,883.34	22,883.34	72,537.05	14,544.42
2021-06-30	12.3726	1,850	22,883.34	14,544.42	87,081.47	0.00
2022-06-30	12.3726	1,850	22,883.34	0.00	87,081.47	0.00
2023-06-30	12.3726	1,850	22,883.34	0.00	87,081.47	0.00
2024-06-30	12.3726	1,850	22,883.34	0.00	87,081.47	0.00
2025-06-30	12.3726	1,850	22,883.34	0.00	87,081.47	0.00
2026-06-30	12.3726	1,850	22,883.34	0.00	87,081.47	0.00
2027-04-29	12.3726	1,535	18,996.31	0.00	87,081.47	0.00
<b>Total Realized</b>	-	<b>9,835</b>	<b>121,689</b>	<b>87,081</b>	-	-
<b>Average</b>	<b>12.3726</b>	<b>1,850</b>	<b>22,883</b>	-	-	-
<b>Total Realized and Projected</b>	-	<b>18,495</b>	<b>228,833</b>	<b>87,081</b>	-	-

Brown Drake ZPS installation : Financial Savings Over Time

