

EndoTherm[®]

CASE STUDY: Dillon Center, St Josephs College
Brooklyn, New York USA



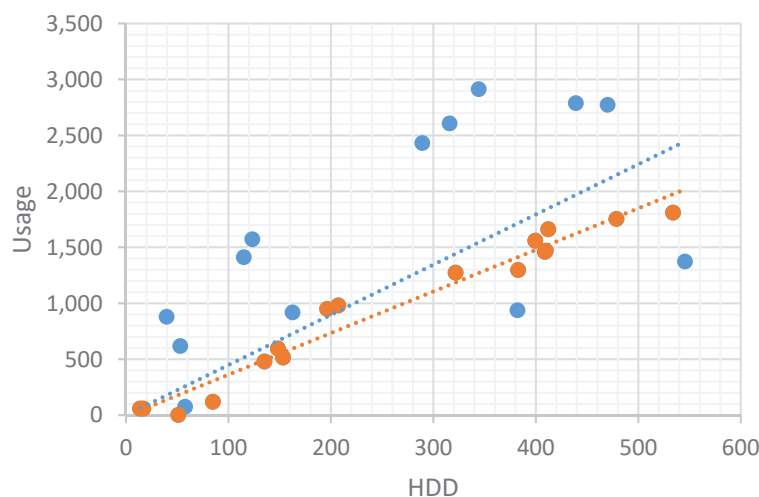
The Dillon Child Study Center at St. Josephs College was established in 1934 and was one of the first laboratory pre-schools on the East Coast. The two-story brick building is heated by a 64BHP boiler.

In a continued effort to lower operating cost, reduce emissions and expand on sustainability goals, Aramark facilities ran a pilot program to determine the viability of the energy conservation measure, EndoTherm. The Dillon Center at St. Joseph College in Brooklyn, New York was selected as the suitable trial site by the Aramark team.

BASELINE

Historical data was provided by Aramark from May 2015 until November 2018. This data was normalized using Heating Degree Days from nearby Central Park Weather Station at a baseload of 18.5°C (65°F). Initial data analysis showed that the oldest data sets had to be eliminated as efficiency improvements made since 2015 rendered the data unsuitable for use. Instead data from October 2016 onwards was used to calculate the predicted consumption post EndoTherm install. Summer consumption was also eliminated as the system is not in operation.

Dillon Center Baseline



$$y = 3.7163x - 9.3077$$
$$R^2 = 0.9627$$

- Whole Baseline
- Last 2 heating seasons
- Linear (Whole Baseline)

10.3
%

TOTAL SAVINGS

FINANCIAL SAVING



\$803.32

CO₂e SAVING

3,900 kg

KEY INFORMATION

Installed: Nov 2018
Trial period: 4 months

Boiler spec:
64BHP boiler

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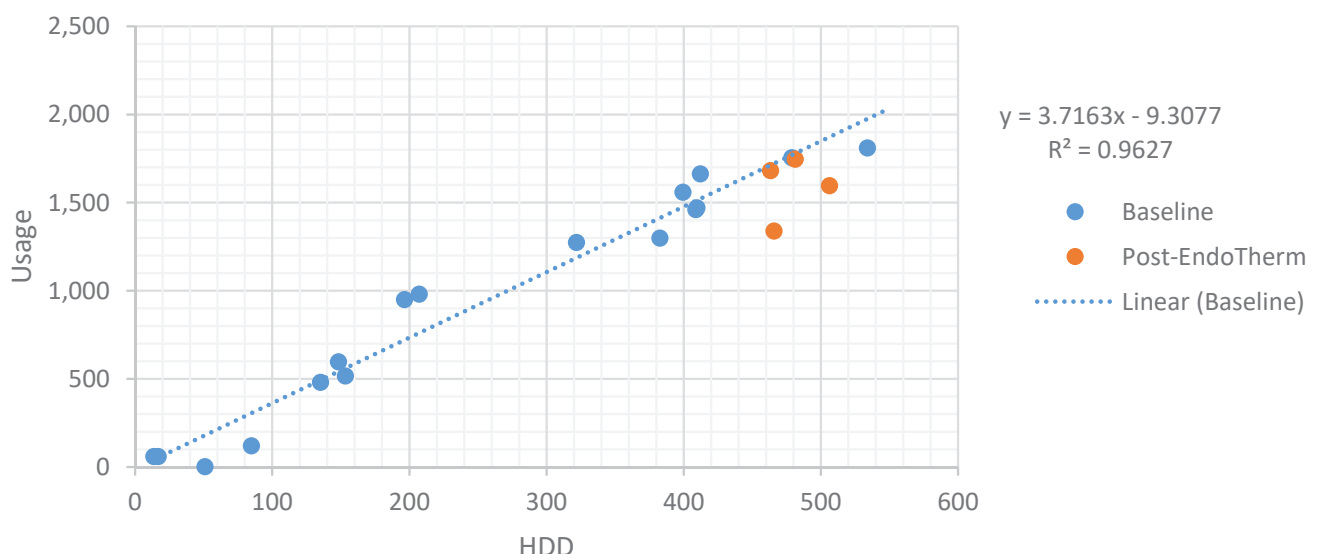
BASELINE continued

The trendline has a very strong R^2 at 0.9627 suggesting that (as expected) the consumption on site is driven by external temperatures. The trendline has a gradient that is 18% lower than the historical trendline ensuring any efficiency improvements are related to the addition of EndoTherm and not legacy improvements from 2015-2016.

ANALYSIS

A comparison of the recorded consumption and the predicted consumption from the baseline can be used to calculate the saving each month. The cumulative sum of this saving (CUSUM) can be utilised to determine the overall success of the pilot. The four months after installation (December 2018 – March 2019) were analysed before an unrelated issue ended the pilot.

Dillon Center - EndoTherm Analysis



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ANALYSIS continued

	HDD	Predicted Usage (thm)	Actual Usage (thm)	Difference (thm)
December 2018	463.4	1712.82572	1,680	33
January 2019	465.9	1722.11647	1,337	385
February 2019	506.4	1872.62662	1,595	278
March 2019	481.4	1779.71912	1,745	35

The pilot shows that January and February had strong savings whilst December and March had smaller savings. December is not unusual as the first month of any pilot can be impacted as the buildings control systems react to the change in heat transfer efficiency and performance. March is unusual but a further analysis comparing March 2019 with March 2018 showed that this time of the year is normally a higher consumption period for the site.

	HDD	Actual Usage (thm)	Usage/HDD
March 2018	400	1,558	3.89
March 2019	481	1,745	3.62

A direct comparison of March 2019 with the same period last year shows a 7% saving.

RESULTS

The total saving from the regression analysis can be cumulatively summed (CUSUM) to determine the overall success of the EndoTherm installation:

Predicted Usage (thm)	Actual Usage (thm)	Difference (thm)	Saving
7087.28	6,357	730	10.3%

This is a saving of \$803 based on a recorded unit price of \$1.1/Therm. The expected ROI of the project is within 12-18 months.

The greenhouse gas emissions, calculated online*, show that one therm is equivalent to the emissions of 5.34kg of CO₂e. The recorded 730 Therm reduction post-EndoTherm installation is equivalent to 3.9 Metric Tonnes of CO₂e. This is the equivalent emissions from a mid-sized passenger car driving 9,463 miles or the carbon sequestered by 4.6 acres of U.S forests in one year.

*(<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>)