CASE STUDY

EndoTherm®

Concert Properties & Bentall Green Oak (5 Sites)

British Columbia & Ontario, Canada

11.34 %

AVG ENERGY SAVING

FINANCIAL SAVING

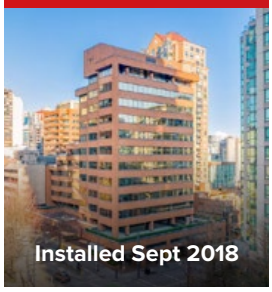
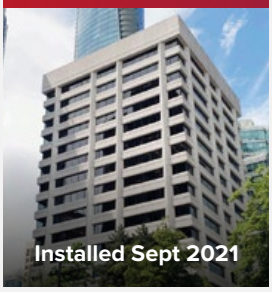
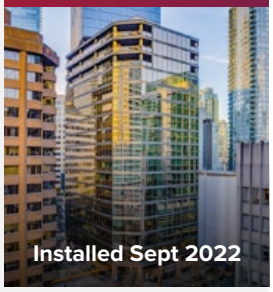
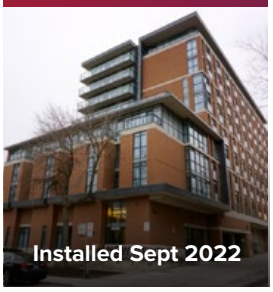
$40,591

CARBON SAVING

170,000Kg CO_2e

12-24 MONTH PILOT - 5 LOCATIONS

This case study is an overview of a number of pilot projects run by Concert Properties between 2018 and 2023. This includes 3 sites run in partnership with Bentall Green Oak in Vancouver, BC. The sites were as follows:

Commercial	Commercial	Commercial	Commercial	Residential
1190 Hornby Vancouver (BC)	**1130 W Pender** Vancouver (BC)	**1100 Melville** Vancouver (BC)	**1140 W Pender** Vancouver (BC)	**One32** Toronto (ON)
				
Installed Sept 2018	Installed Sept 2021	Installed Sept 2021	Installed Sept 2022	Installed Sept 2022

In partnership with BentallGreenOak

MEASUREMENT & VERIFICATION PROTOCOLS

The M&V will focus on 3 sets of analysis; 1190 Hornby (pre-COVID), 1130 W Pender and 1100 Melville.

Historical natural gas bills were collected for 2-3 years prior to EndoTherm dosage. Variances in baseline were identified to select a time period most suitable for comparison. This included operational / set-point changes as a result of COVID-19. Consumption data was normalized using Heating Degree Days (HDD) from Vancouver Airport (CYVR) at a base-load of 18.5°C.

From this baseline data, a trend-line (in the form y = mx + c) of the historical performance can be used to predict consumption during the post-install period. The performance of EndoTherm can be calculated as the difference between this predicted consumption and the recorded consumption from the monthly billing data.

For the three chosen trend-lines, the baselines have a strong Spearman's Rank Correlation Coefficient above 0.95. This shows a high level of confidence that consumption is driven by external temperature and HDD should be used in the comparison methodology.

RESULTS

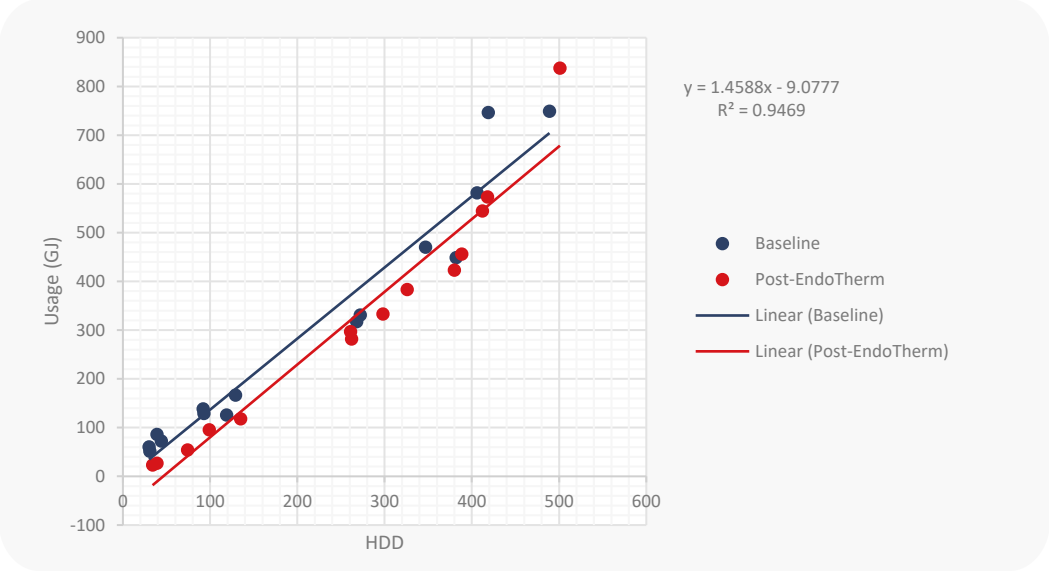


Figure 1: EndoTherm analysis at 1190 Hornby St

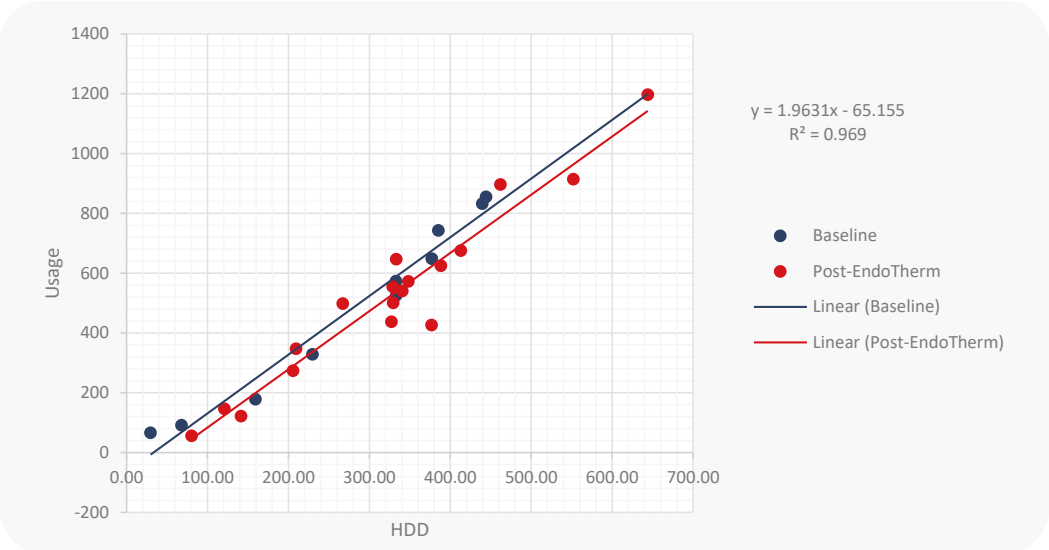


Figure 2: EndoTherm analysis at 1130 W Pender

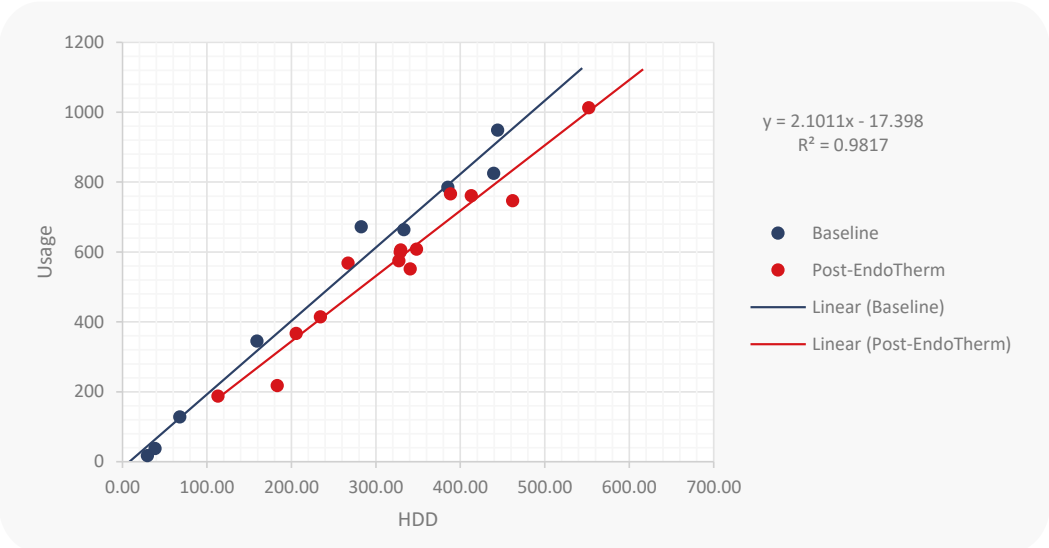


Figure 3: EndoTherm analysis at 1100 Melville

RESULTS continued

A summary of the results can be seen in the table below.

SITE NAME	INSTALL DATE	PILOT LENGTH	TOTAL GAS SAVING	HVAC ONLY SAVING	ENERGY SAVING	FINANCIAL SAVING
1190 Hornby	Sept 2018	14 Months	13.90%	17.38%	**718.01 GJ**	**$7,180.09** Based on $10/GJ
1130 W Pender	Sept 2021	24 Months	8.89%	11.11%	**919.44 GJ**	**$11,492.96** Based on $12.50/GJ
1100 Melville	Sept 2021	24 Months	13.77%	17.21%	**1,275.32 GJ**	**$15,941.49** Based on $12.50/GJ
1140 W Pender	Sept 2022	12 Months	6.41%	8.01%	**375.94GJ**	**$4,699.19** Based on $12.50/GJ
One32	Sept 2022	12 Months	1.80%	2.99%	**13,295 m³**	**$1,277.50** Based on $0.50/m³

ANALYSIS

The analysis for the 5 sites was carried out for the most suitable time period available. This includes:

1190 Hornby: Run until COVID-19 and subsequent BAS/Occupancy control changes.
1130 Pender: Run for 2 years.
1100 Melville: Run for 2 years. 3 Months removed between Nov 2021 and Jan 2022 due to confirmed set point change.
1140 W Pender: Run for 1 year.
One32: Run for 1 year. Investigation identified an increase in post-install occupancy vs the baseline which would increase space heating and DHW demand. Secondary analysis using a shorter baseline with similar occupancy shows savings above 10%.

The five sites show an **average saving of 8.95% in total gas consumption which is 11.34% once a base-load has been removed**.

Based on suitable unit prices for the periods in question; **the pilots saved $40,591 which means the cost of the 5 site project has been offset within the pilot period.**

The associated GHG savings are equivalent to: