

# Beyond Building Certification

The Impact of Environmental Interventions on Commercial Real Estate Operations\*

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October 2019

## Executive Summary

There is growing awareness of the need to further develop sustainable practices by taking a deeper look inside buildings at resource consumption (e.g. energy, natural gas, and water), the impact of capex targeted at reducing these, and the behaviour of space users.<sup>i</sup> We broaden the definition of investment in sustainability and energy efficiency from just building certification to also include three additional types of interventions: environmentally-focused capex; monitoring; and, tenant engagement.

**Research Question: What is the impact of environmentally-focused building interventions on utility consumption?**

Recent research suggests that a large portion of a building's possible energy reduction is not controlled by building design and equipment, but rather by occupants.<sup>ii</sup> Tenant behavior can have a substantial impact on overall building energy consumption. Thaler's "Nudge Theory" posits that consumer behavior can be influenced by small suggestions and positive reinforcements.<sup>iii</sup> Through this lens, we explore if tenant and property management engagement acts as a "nudge" to affect behavior that has energy consumption implications complementary to those associated with environmental building certification.

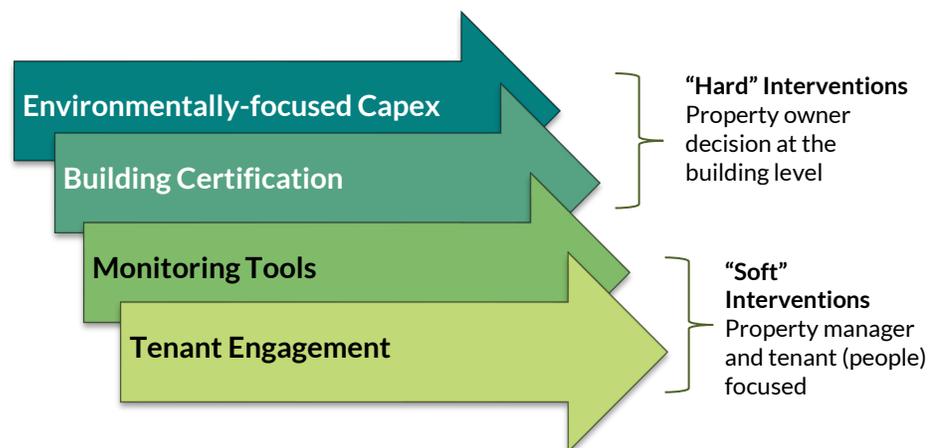


Figure 1: Four Types of Environmental Building Interventions

## DATA AND METHODS

BentallGreenOak<sup>iv</sup> has been actively pursuing all four types of interventions for several years. Using 15 years of monthly operating statements for hundreds of assets located in Canada and the U.S. and a rigorous building-fixed effects model capturing variation in building and management quality, we measure the impact of the interventions on electricity consumption (measured in kilowatt hours per occupied square foot).<sup>v</sup> Environmental building certification schemes included are:

- LEED Existing Buildings Operations and Management (EBOM) and various design and construction-related programs (LEED D&C); U.S. & Canada
- BOMA BEST; Canada
- ENERGY STAR; U.S.

\* We gratefully acknowledge BentallGreenOak, the Real Estate Research Institute, and Lawrence Berkeley National Laboratory for funding, and BentallGreenOak for the data. All errors are the responsibility of the authors. This is an executive summary of the related white paper.

The firm has also implemented a comprehensive sustainability data management system (Eco Tracker) and a sustainability tenant engagement (ForeverGreen) program.<sup>vi</sup>

- **Eco Tracker** is a proprietary sustainability data management system and visualization tool that provides reporting and management for utilities and waste. It also includes a modeling tool to predict reductions in consumption costs and greenhouse gas emissions. Providing this type of information to building management and tenants increases transparency which can lead to altered behavior.
- **ForeverGreen Tenant Engagement Program** focuses on creating and reinforcing awareness and collaboration among property managers and tenants in making environmentally-related decisions. The goal of the program is increased resource efficiency and a healthy, productive work environment for occupants.

Analyzing a subset of assets which report environmental capex, we measure the impact of pursuing such projects on electricity consumption, while controlling for the other three intervention activities. These effects are determined by systems-focused capex (e.g. those related to control and optimization of HVAC systems, and a matching of supply of resources to times of demand).

## COST ANALYSIS

Reductions in electricity consumption translate to cost savings, both in terms of dollars and emissions. Figure 2 displays our estimates as a range of possible outcomes, derived by combining our regression results with annualized low to high resource cost estimates. The upper portion of the graph presents the cost savings in local currency based on 2018 billed rates, and the lower portion presents the related carbon dioxide reduction using 2018 Canadian and U.S. federal government estimates, by province and region, respectively.

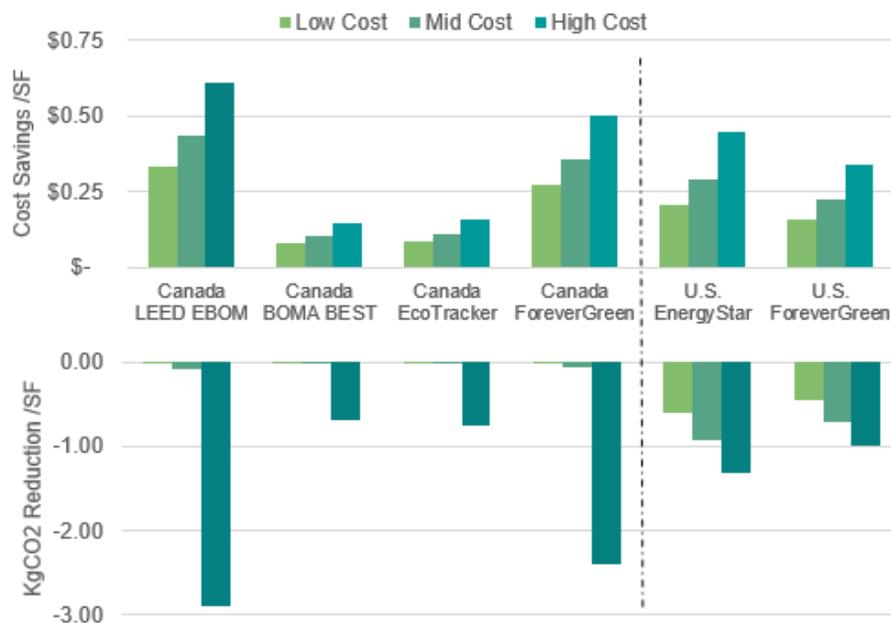


Figure 2: Annual Cost Savings and Carbon Reduction

Based on Canadian results, implementation of **ForeverGreen** would result in a **\$0.28 to \$0.50 per occupied square foot savings annually, and an offset of up to 2.4 kilograms of carbon dioxide**, depending on local costs. Considering the negligible cost of implementing the tenant engagement program, these are substantial savings.

## RESULTS

- In Canada, **building electricity consumption decreases 19%**, on average, after achieving both **BOMA BEST and LEED EBOM certification**.
- LEED D&C programs, ENERGY STAR certification are also related to an electricity consumption reduction.
- Canadian properties participating in the **ForeverGreen Tenant Engagement Program and Eco Tracker monitoring program** are associated with an, on average, **13.6% and 4.3% decrease** post-implementation, respectively.
- U.S. findings corroborate the ForeverGreen result, although the magnitude is considerably smaller than for the Canadian sample (7.3% reduction).
- **Environmentally-focused capex** is associated with a **7.3% and 6.2% reduction** in electricity consumption in Canada and the U.S., respectively.

## CONCLUSION

To maximize cost savings available to environmentally-sensitive properties, efforts must span across all building stakeholders. The collective impacts of design, operating efficiency, maintenance of equipment, and an effective strategy to engage tenants all interact to shape a buildings' bottom line. These findings have important implications for building owners and managers as well as ESG-related policy initiatives. While building certification remains important, to optimize savings, building operators must engage with and activate their tenants and other stakeholders.

<sup>i</sup> O'Dea, C. (2019). ESG data: Check your meter readings. *IPE Real Assets Magazine*

<sup>ii</sup> Heller, J., Heater, M., & Frankel, M. (2011). *Sensitivity Analysis: Comparing the Impact of Design, Operation, and Tenant Behavior on Building Energy Performance*. New Buildings Institute.

<sup>iii</sup> Thaler, R., & Sunstein, C. (2008). *Nudge: Improving Decisions About Health, Wealth and Happiness*.

<sup>iv</sup> Bentall Kennedy recently merged with GreenOak Real Estate. The transaction closed effective July 2, 2019. Bentall Kennedy formerly included Bentall Kennedy (Canada) Limited Partnership, Bentall Kennedy (U.S.) Limited Partnership and the commercial mortgage investment groups of certain of their affiliates, all of which comprise a team of real estate professionals spanning multiple legal entities. BentallGreenOak includes BentallGreenOak (Canada) Limited Partnership, BentallGreenOak (U.S.) Limited Partnership and the real estate and commercial mortgage investment groups of certain of their affiliates, all of which comprise a team of real estate professionals spanning multiple legal entities. The assets under management shown above include real estate equity and mortgage investments of the companies within BentallGreenOak.

<sup>v</sup> Water consumption analysis is also completed and presented in the full report.

<sup>vi</sup> For more information, see <https://www.bentallkennedy.com/corporate-responsibility.php>