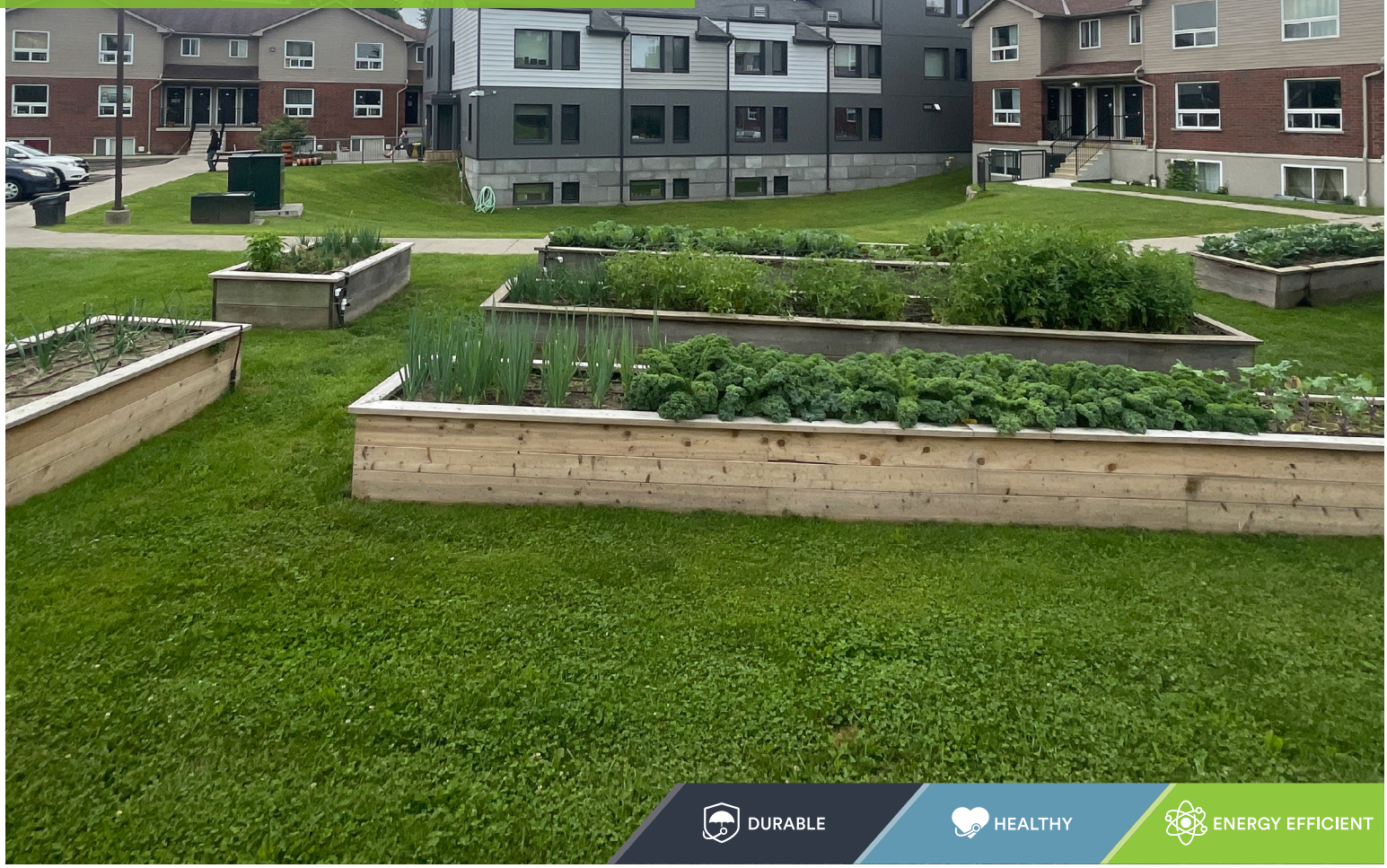
2025

PROJECT

Case Study

Blossom Park Energy Retrofits



DURABLE HEALTHY ENERGY EFFICIENT

BUILDING KNOWLEDGE CANADA INC.

Indwell

TrimTab Energy Retrofits

Above: Blossom Park apartments in Woodstock, Ontario. The older townhomes (to the left and to the right of the building in the centre) are the subject of the trial. They consist of single-bedroom stacked townhomes that were built in 2005.

Summary

Indwell, a community housing provider, and Trim Tab, a start-up energy contractor, partnered to test out an innovative approach to scaling up energy retrofits. They received a climate grant through the Peter Gilgan Foundation[1] to trial the approach on stacked townhomes in Woodstock, Ontario. The approach centres on the innovative use of technology and the well-timed intervention during unit turnovers. The result is deep decarbonization, quick turnarounds, and better tenant quality of life. This approach can potentially apply to a very large segment of low-rise housing across Canada.

An Innovative Approach

Social housing providers such as Indwell experience periodic tenant turnover in their rental units. Having the occupants and contents out of a unit presents a unique opportunity to integrate energy retrofits with the renovations that typically occur during a 'turnover'. But time is money, so the focus is on a practical and innovative package of measures that improve energy efficiency, the indoor environment, and achieve decarbonization. The retrofit strategy adopted by Indwell and Trim Tab was three-fold: seal, ventilate, and electrify.

[1] https://www.petergilganfoundation.org/grant-recipients/environmental-grants/

Envelope Innovation

With the unit vacant, there was an initial focus on comprehensive air sealing. Doing so reduces the heating load, which facilitates switching the heating system to a heat pump, and mitigates the infiltration of pests, moisture, and smoke.

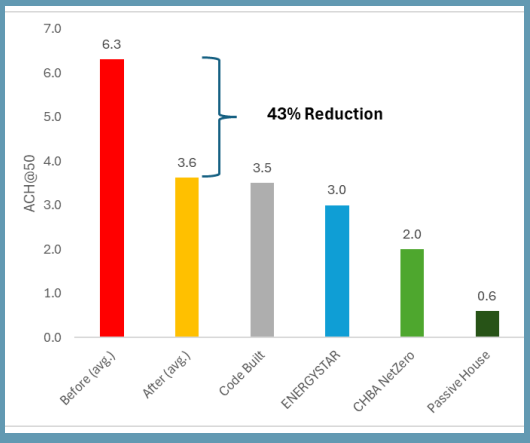
The innovative aspects of this work were successfully deploying AeroBarrier® in a retrofit application and integrating it with conventional methods of air sealing to maximize the benefit and minimize the risks. The result was that each unit could achieve a result that approached Ontario Building Code new construction standards of 3.5 air changes per hour at 50 Pa. These results could be further improved by installing a damper shut-off kit on the newly installed HVAC equipment. Bringing the performance up to new construction standards is an excellent result for a 20-year-old building, considering there were no air tightness standards when these units were built. The key here is that these units have been tested to this level of performance, and it's not just an assumed level of performance.

It's worth noting that Units 25 and 19, being mostly below grade with Insulated Concrete Form (ICF) construction, naturally benefit from lower air leakage, while Unit 3, with the most exposed surface area, demonstrates the full potential of the retrofit approach.

Unit	Pre-Retrofit [ACH50]	Post-Retrofit [ACH50]	Improvement
3-273 Blossom Park Rd	8.31	3.61	57%
19-373 Blossom Park Rd	5.96	3.42	43%
25-373 Blossom Park Rd	4.65	3.85	17%

Table 1: Improvements in unit airtightness for each retrofit unit.

The importance of air sealing: Getting to the root cause of air leakage uncovers issues that get worse with time if left unaddressed. In unit 19, the back window frame became a source of ingress for insects and snakes. Joe sealed up and refinished the window.



Airtightness testing results compared to standards.

HVAC Innovation

Each unit had a closet that contained a gas water heater that supplied domestic hot water and a hot water air handler. The units provided no central air conditioning and only point-source ventilation. Overhauling this system presented an opportunity to modernize the heating, cooling, and ventilation systems.

The team installed ‘all-in-one’ vertical stack HVAC systems, sourced from Italy, that provide central heating and cooling, with a heat pump, balanced mechanical ventilation, and dehumidification. This enabled the bathroom exhaust fan to be tied into the ERV (Energy Recovery Ventilator) to improve efficiency. All of this could be completed with two vent connections to the exterior, and without the need for any outdoor unit installation. This is a unique retrofit application of this technology and shows that there are many heat pump solutions worldwide that Canada could be quicker to adopt.

Above: The HVAC team installing the Innova HRA-I Plus “all-in-one” system, essentially, a heat pump and ERV combined in one unit, without the need for any outside equipment. Combined with a small electric water heater, the unit no longer requires natural gas, thus eliminating a utility bill for the tenant.

Process Innovation

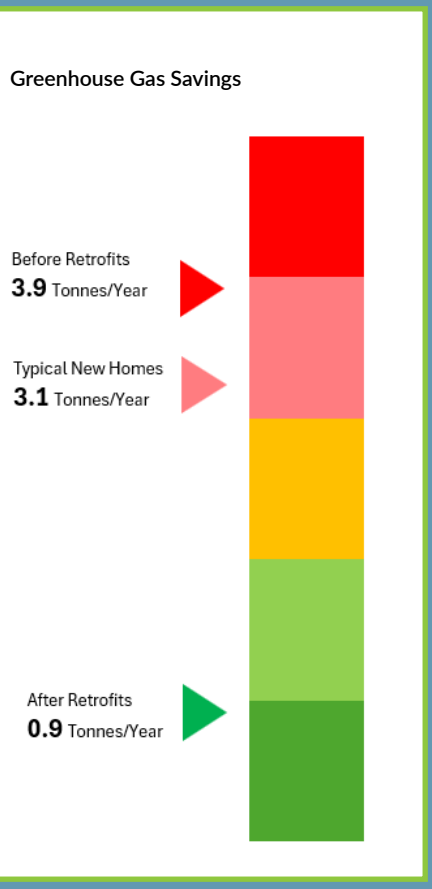
It is a major advantage not to have to work around tenants—it reduces stress on everyone, and makes the work considerably easier and more cost-effective. However, time is money, so it's important to get in and out quickly. Integrating the energy retrofits with the typical renovation activities that accompany turnovers —repair, paint, for example—requires changing the typical sequence of work so that technologies such as AeroBarrier can be efficiently deployed. Table 2 shows the total turnaround time for the three retrofit units. By the third unit, the entire turnover took place in the span of a single month, which is the typical timeframe for a turnover at Indwell – highlighting remarkable progress compared to the first turnover.

Unit	Work Begins	Work is Complete	Duration (Days)	Notes
3-273 Blossom Park Rd	July 24, 2024	October 30, 2024	97	Delay with receiving HVAC equipment.
19-373 Blossom Park Rd	October 15, 2024	December 11, 2024	58	Significant mold remediation.
25-373 Blossom Park Rd	January 6, 2025	February 5, 2025	31	Minor remediation, well established process.

Table 2: Turnover times for each unit that underwent an energy retrofit.

Cost Savings and Carbon Reduction

One of the byproducts of this innovative approach is that the retrofit units no longer need a natural gas supply. This eliminates a fixed charge that tenants must pay every month, whether they use it or not. It also significantly reduces the carbon footprint of these units. There is an increase in electrical utility costs that results from electrification, which is offset by the Ontario Electrical Support Program. Tenants also no longer need to purchase or rent portable air conditioners. It's a major win for tenants and the environment. The retrofit units are currently being monitored to quantify their cost and carbon savings.



Capital Costs

The capital costs of this project are provided in Table 3 and broken down between the typical turnover costs and the incremental costs for energy retrofits.

	Unit 3	Unit 19	Unit 25
Turnover costs without energy retrofits	$10,486.56	$29,003.53	$15,364.57
Energy retrofits	$26,384.61	$26,229.61	$26,341.61
Total:	**$36,871.17**	**$55,233.14**	**$41,706.18**

Table 3: Capital costs for each unit, before tax and rebates.

The energy retrofit costs are stable and predictable from unit to unit, whereas the turnover costs fluctuate according to the extent of repair and remediation required. These costs average to $44,600 before tax and rebates. This is considerably cheaper than the per unit costs of many other decarbonization approaches being offered through programs such as CMHC[2] and NRCan[3], which mandate deep energy reductions and expensive building envelope overhauls.

[2]https://www.cmhc-schl.gc.ca/professionals/project-funding-and-mortgage-financing/funding-programs/all-funding-programs/canada-greener-affordable-housing-program/retrofit-funding

[3]https://www.canada.ca/en/natural-resources-canada/news/2025/03/canada-invests-in-deep-energy-retrofits-for-affordable-housing-in-hamilton.html

Testimonial

"I live in a slightly below-ground level unit. I look out upon the world from three feet above our lawns and level with our raised gardens.

I'm pleased and personally excited with the results of the energy retrofits. I appreciate the availability of central air conditioning. No more struggling with portable units. The continuous, steady, fresh air keeps my unit less stuffy and reduces odours.

Eliminating the gas bill simplifies my life, reduces my costs, and protects the environment.

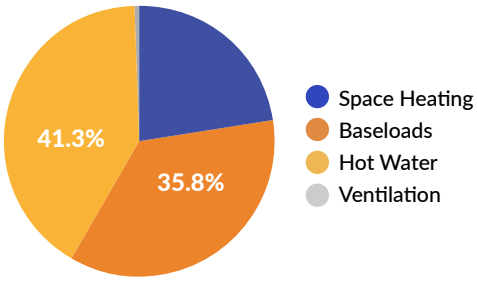
For me, and for those that matter most, my children and grandchildren, thank you Indwell!"

- J. B. Patterson

Energy Savings

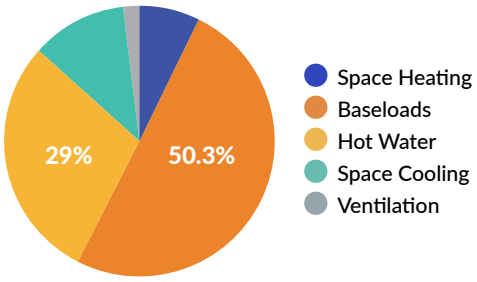
A feasibility level energy model was completed to estimate the before and after energy consumption of the units. Using the standard software for Part 9 Residential buildings (Hot2000), we've estimated the effect of the upgrades to the homes. For Unit 3 (shown below), you can see the reduction in estimated annual energy use from 43 GJ/y down to 31 GJ/y. A gigajoule (GJ) is equivalent to approximately 2 standard BBQ tanks' worth of energy. Keep in mind that this reduction includes the expected increase in energy that comes from using the newly installed air conditioning. This represents a 27% reduction overall.

Unit 3 Estimated Pre-Renovation Energy Use



Energy End Use	
Space Heating	9.73 GJ
Baseloads	15.35 GJ
Hot Water	17.72 GJ
Space Cooling	0.00 GJ
Ventilation	0.13 GJ
Total	**43 GJ**

Unit 3 Estimated Post-Renovation Energy Use



Energy End Use	
Space Heating	2.27 GJ
Baseloads	15.35 GJ
Hot Water	8.86 GJ
Space Cooling	3.47 GJ
Ventilation	0.55 GJ
Total	**31 GJ**

Total Estimated Energy Consumption	Before	After
Electricity (kWh)	13,042	24,123
Natural Gas (m3)	1,861	-
Total Energy [Electricity + Natural Gas (GJ)]	116	87
Savings		**25%**

Table 4: Estimated utility energy consumption for all 3 units

Next Steps

Trim Tab is also piloting this approach on row housing with another community housing provider, Chatham Hope Non-Profit Housing. Preliminary results are available through a Building Knowledge Canada webinar.[4]

Building Knowledge Canada Inc. — buildingknowledge.ca

Indwell — indwell.ca

TrimTab Energy Retrofits — trimtabretrofits.com

[4] https://www.buildingknowledge.ca/post/air-tightness-air-source-heat-pump