



Banking on Green

Financial Innovation in Building Retrofits

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The Economics of Green Retrofits

When considering the major sources of greenhouse gas (GHG) emissions, we often think of transportation and heavy industry as the main culprits. However, the reality is that buildings are responsible for nearly 50% of the Greater Toronto and Hamilton region's GHG emissions, producing over 25 megatonnes in 2022, equivalent to the annual emissions of approximately 5.4 million passenger vehicles.

Municipalities throughout the region are actively designing home energy retrofit programs, Green Development Standards, and establishing ambitious targets for emissions reductions in buildings. However, as the City of Toronto's final report on its [Net Zero Existing Buildings Strategy](#) shows, while it is possible to reduce existing building emissions by as much as 80% by 2050, a business-as-planned approach would only reduce emissions by 34%.

Given the age of existing building stock in the region as well as our current energy mix, bridging that gap poses a significant challenge for businesses of all sizes. Eco-retrofits on buildings are multifaceted and costly, requiring significant investment of resources such as labor and capital, amidst competing priorities. Overcoming these challenges will require compelling incentives, and the implementation of innovative strategies and technologies.

The Board's Climate Economy Strategic Council (CESC) was established to address exactly this type of complex challenge. Recognizing that financing was a major obstacle for climate projects, the Council formed the Financial Innovation Working Group, which developed this playbook to provide actionable insights to help the Toronto region lead in the climate economy. The Board continues to champion this work through the newly formed [Business Council of Toronto](#), which includes a focus on growing the region's clean technology sector and adoption of new energy solutions.

Eco-retrofits on buildings are multifaceted and costly, requiring significant investment of resources such as labor and capital, amidst competing priorities. Overcoming these challenges will require compelling incentives, and the implementation of innovative strategies and technologies.



Four Strategies to Maximize Retrofit Projects

1. Derisking Investments

Securing public capital and leveraging government programs can significantly mitigate the financial risks associated with these large-scale projects, thereby encouraging private investment in this space. A notable example of this strategy is the funding provided by the Canada Infrastructure Bank (CIB). The CIB has been instrumental in the success of various projects featured in this playbook, particularly those that serve as high-profile pilot initiatives. By aligning with CIB funding criteria and priorities, project developers can not only secure essential financial backing but also enhance the project's visibility and appeal to private investors, thus creating a strong foundation for achieving long-term success and sustainability.

2. Integrating Emerging Clean Technologies

The integration of emerging clean technologies, such as AI-managed energy systems, advanced HVAC, smart lighting, waste, and water management solutions offers significant efficiency gains for adopters. These technologies enable precise monitoring and optimization of resource usage, leading to substantial cost savings and reduced environmental impact.

For businesses and institutions, clear targets and regulatory certainty from government bodies play a crucial role in fostering innovation. The government's direction not only encourages the adoption of cutting-edge technologies but also helps organizations focus their investments effectively. By aligning corporate strategies with defined sustainability goals and regulatory frameworks, businesses can improve their energy efficiency and contribute to broader environmental objectives.

The synergy between technological advancements and supportive policy frameworks accelerates the transition towards more sustainable practices, positioning adopters at the forefront of the green economy.



3. Leveraging Energy as a Service

The financial services sector is uniquely positioned to play a pivotal role in accelerating the adoption of energy retrofits by providing essential capital and risk mitigation strategies. The energy as a service model allow property owners and businesses, particularly those with limited upfront capital, to implement clean energy technologies without bearing the full cost burden. By structuring financing in a way that aligns payments with energy savings, these models reduce financial barriers and encourage broader participation in energy retrofits.

Moreover, energy as a service providers offer a proactive approach to seeking out strategic partnerships with experienced partners in the energy sector. Such collaborations can provide valuable insights and access to the latest innovations, ensuring that the most effective and efficient solutions are identified and implemented.

4. Aggregating Projects

Implementing multiple necessary upgrades in a single, cohesive effort is more advantageous than addressing them individually. A comprehensive approach not only ensures the timely achievement of energy efficiency and sustainability goals but also enables organizations to leverage economies of scale, reducing overall costs by bundling multiple projects together. Larger aggregated projects are often more attractive to investors and lenders, resulting in better financing terms.

Additionally, this strategy mitigates transaction costs associated with incremental implementation, prevents higher costs or missed savings from delayed projects, and streamlines operational processes. By creating a cohesive improvement plan, organizations can optimize financial outcomes, enhance long-term sustainability, and contribute to a more sustainably built environment.



Case Studies

Eco-retrofits & Financial Innovation in Practice

The following section presents case studies from four organizations recognized for their exemplary leadership in addressing complex eco-retrofit challenges. Each case study illustrates unique forms of financial innovation tailored to residential, institutional, and commercial contexts. These examples are presented in the organizations' own words, and provide valuable insights into how creative financial strategies are being deployed to overcome obstacles and drive progress in their respective sectors. Through these examples, we gain a deeper understanding of the diverse approaches and solutions that are shaping the future of financial innovation.

University of Toronto's Project LEAP: Derisking Investments

The University of Toronto's (U of T) [Low-Emissions Accelerator Project \(LEAP\)](#) exemplifies the strategy of derisking investments using public capital and leveraging government programs. By securing financing from the Canada Infrastructure Bank's Building Retrofits Initiative, the university has been able to mobilize additional loans from the private sector, thereby reducing the financial risks associated with the project. This blended finance model not only lowers the risk for private lenders but also fosters collaboration among various industries, which are participating in similar infrastructure projects. By aligning emissions reduction incentives from multiple levels of government and utilizing a principled framework focused on conservation and renewable energy, Project LEAP serves as a model for other institutions and organizations seeking to undertake large-scale, impactful emissions reduction projects in a fiscally responsible manner.

THE CHALLENGE

As a research-intensive university, specialized facilities, including laboratory equipment, data centers, and advanced computational resources consume substantial amounts of energy. These energy needs were being supplied by a 120-year-old district energy system. This contributed significantly to U of T's carbon emissions. At the same time, deferred maintenance costs for historic and energy-inefficient buildings on the St. George campus had been estimated at over \$960 million in 2022.

THE SOLUTION

In 2019, the university began work on Project LEAP, which sought to meet the energy demands of a 21st century globally leading university while also updating the maintenance backlog where possible.

The project includes retrofits, equipment upgrades and the largest geexchange field in urban Canada. The field is located at the centre of the St. George campus and uses the earth as a thermal battery for the storage of heat in the summer and its release in the winter. Together, these measures will lead to a reduction of approximately 46,000 metric tonnes

ORGANIZATION PROFILE

U of T was ranked as the most sustainable university in the world, across 95 countries and among 1,400 institutions. One of the world's most research-intensive universities, U of T is home to almost 100,000 students, 16,500 faculty and more than 8,000 staff. The success of its entrepreneurship and commercialization programs place it among the top five university business incubators in the world. Through the Low-Emissions Accelerator Project (Project LEAP), U of T will reduce more than half of its Scope 1 & 2 emissions by 2027, reaching 2030 targets set by the UN Intergovernmental Panel on Climate Change three years in advance.



The savings from its utility, facilities, and operations budgets can be deployed to support its central research and teaching missions.

of CO². Simultaneously, the university sought to identify financial strategies for this project, which will reduce energy consumption within years, but take decades to provide a financial return.

Three approaches are facilitating an accelerated timeline to addressing climate change:

1. Financing from the Canada Infrastructure Bank's Building Retrofits Initiative is supporting the suite of programs within Project LEAP and mobilizing loans from the private sector. This blended finance model reduces risks for the private sector lender and provides an important network for sharing information among organizations and industries participating in similar infrastructure projects across the country. To date, industries such as steel, agriculture, hydroelectric and wind utilities, and construction are participating in the CIB program. U of T projects include investment in new technology such as heat pumps, battery storage units, and electric boilers.
2. U of T is coupling investments in infrastructure and energy renewal with the leveraging of provincial incentive programs for energy cost savings, including through the IESO's Industrial Conservation Initiative.
3. U of T is adopting principles that support energy savings and ensuring projects meet these standards. Project LEAP is guided by several principles that inform the selection of projects and strategies to reduce emissions. They include: Conservation First, Balance Carbon with Cost, and Foster Innovative Solutions.

An external energy solutions firm is guiding the activities undertaken, validating and guaranteeing the energy reductions, and has found multiple ways to further drive down energy consumption. This integrated approach combines retrofits and upgrades, reduces disruption to building users while a project is underway, and reduces the financial risks of the project to the lenders and the university.

Emissions reduction improvements are being timed to coincide with required infrastructure upgrades. For example, a 21,000 m² research facility will switch to LED lighting as part of a lighting upgrade. Similarly, new and more efficient ways to provide building humidification are being evaluated as part of converting steam heating to low temperature hot water heating systems throughout several buildings.

Measures to electrify the energy supply are being supported through participation in Ontario's Industrial Conservation Initiative. For example, a boiler currently powered by fossil fuels will be replaced with an electric boiler. As a Class A customer with the Independent Electricity System Operator, U of T is eligible for cost savings on the Global Adjustment Charge if it lowers energy consumption during top predicted demand periods.¹ Shifting energy usage to lower demand periods helps Ontario manage grid capacity while reducing costs for the university.

In the first year in which all components of Project LEAP will be operational, the university estimates saving almost \$9,000,000, an amount that will increase in future years.

¹ The Global Adjustment Charge is a billing component that includes the cost to deliver conservation and demand management programs.



(Photo: Johnny Guatto/utoronto.ca)

TAKEAWAYS

With buildings accounting for the third-largest source of emissions in Ontario, infrastructure adaptation and mitigation are critical. The principles, actions, and partnerships that enable Project LEAP are highly relevant to private sector organizations evaluating the feasibility of emissions reductions. Developed and implemented over several years, Project LEAP offers approaches to the questions that a cost-effective and impactful emissions reduction plan must address including: why now, what, and how.

Through LEAP, the university has brought together public and private lenders and innovative clean economy firms to reduce its GHG emissions. By aligning emissions reductions incentives from multiple levels of government, U of T is pursuing decarbonization in a fiscally responsible way. The

savings from its utility, facilities, and operations budgets can be deployed to support its central research and teaching missions. These lessons are being shared with higher education institutions around the world, including through the U7, an alliance of top universities committed to addressing shared global challenges.

The green transition will require multiple approaches to ensure the energy needs of a dynamic economy can be met while reducing emissions. Similarly, organizations wanting to reduce their emissions, and their costs must address multiple challenges simultaneously. U of T's principled framework, the focus on conservation and renewable energy, and the unlocking of private capital through public support provides an important pathway that businesses of all sizes can confidently follow.

Fairmont Royal York Hotel: Integrating Emerging Clean Technologies

Retrofits at the Fairmont Royal York highlighted the benefits of integrating emerging clean technologies by leveraging advanced solutions such as AI-managed energy systems, heat pumps, deep lake water cooling, and a centralized building automation system. This comprehensive decarbonization strategy, facilitated by detailed data analysis, 3D scanning, and modeling, enabled precise monitoring and optimization of resource usage, leading to substantial cost savings and a significant reduction in carbon emissions. The project not only replaced outdated mechanical systems but also introduced innovative approaches to heating, cooling, and energy management, achieving an 80% reduction in the hotel's annual carbon emissions. By collaborating with trusted engineering and construction partners, and securing \$46.5 million in financing from the CIB, KingSett successfully transformed the historic hotel into a model of sustainability, demonstrating the potential of clean technologies to enhance environmental performance, economic viability, and resilience in the real estate sector.

ORGANIZATION PROFILE

Founded in 2002, KingSett Capital is a leading Canadian private equity real estate firm that co-invests with institutional and ultra-high net worth clients to deliver sustainable, premium risk-weighted returns. KingSett manages \$18 billion in assets across its Growth, Income, Urban, Mortgage, Residential Development, and Affordable Housing strategies.

Fairmont Royal York is the city's destination for wedding celebrations and inspiring and sustainable events – embracing a legacy that is famous for generations. Opened in 1929, the iconic hotel is located in the heart of Toronto and is comprised of over 1,300 rooms.

"KingSett Capital's transformation of a Toronto landmark, Fairmont Royal York Hotel, has culminated in the achievement of a Zero-Carbon Building certification from the Canada Green Building Council. This project demonstrates the potential to significantly decarbonize even the most historic and complex properties, a 1,300 room hotel built in 1929, challenging the common myth that substantial reductions are only possible in new builds."

"The technology and financial incentives exist to make impactful zero carbon projects a reality today. We need innovators to assemble an experienced team and start actioning the studies that are being created across the industry."
- KingSett Capital

THE CHALLENGE

When KingSett began reviewing its assets for opportunities to decarbonize, the Fairmont Royal York became a prime candidate. The historic hotel's major mechanical systems were at end-of-



The \$65 million project was completed after close to five years of detailed planning and execution. It will reduce over 7,000 tonnes of carbon annually, or 80% of the hotel's annual carbon emissions - the equivalent of taking 1,558 cars off the road.

life, major infrastructure upgrades were needed, and significant operational cost savings were attainable with the right strategy. To find the right set of measures, KingSett needed to approach the challenge in a new and novel way.

THE SOLUTION

The project brought trusted engineering and construction partners to the table early, and worked to find innovative solutions to complex problems. Through data analysis, 3D scanning and extensive modelling, a plan was developed that would capture the most significant financial, environmental, and customer experience benefits.

The decarbonization strategy focused on:

- Converting heating and domestic hot water from steam to heat pumps
- Converting cooling from electrical chillers to Deep Lake Water Cooling
- Additional measures to further decarbonize the hotel and boost resilience are focused on:
 - Replacing and up-sizing the emergency generators
 - Upgrading the building's automation system
 - Replacing the exhaust system and supply fans

In 2022, KingSett partnered with the CIB through their [Building Retrofits Initiative](#) to help make this decarbonization strategy a reality. CIB provided \$46.5 million in debt financing to help bring this project to life. The \$65 million project was completed after close to five years of detailed planning and execution. It will reduce over 7,000 tonnes of carbon annually, or 80% of the hotel's annual carbon emissions - the equivalent of taking 1,558 cars off the road.

The Fairmont Royal York achieved the [CAGBC Zero Carbon Building](#) – Performance Standard certification, and demonstrated how partnership between the private and public sectors can meaningfully accelerate action towards meeting Canada's carbon reduction commitments.

The [Zero Carbon Project](#) advances KingSett's sustainability strategy and leadership in the Canadian real estate market while adding strength and resilience to one of KingSett's key assets. It adds to KingSett's broader decarbonization strategy of decarbonizing over 5.4 million square feet of Canadian real estate, reducing 35% of carbon emissions over 2019 baseline by 2027 in its core fund.

Additional Details:

- The Fairmont Royal York decarbonization project will remove over 165,000 tonnes of carbon emissions from 2023 to 2050.
- The reduction of carbon emissions will generate over 35% of utility cost savings in the first year.
- All spending and project impacts were independently verified through the CAGBC's Investor Ready Energy Efficiency (IREE) certification program.
- All carbon emission reductions will be independently monitored and verified annually by a third party as required by CIB and CAGBC.
- The project has employed over 70,000 hours of labour, creating valuable job opportunities for skilled workers and showing how environmental responsibility and economic benefits can work hand in hand.
- The hotel removed over 475 tonnes of old infrastructure, diverting over 90% from landfills.



(Photo: <https://thefairmontroyal.com>)

The building's path to the CAGBC's Zero Carbon Building – Performance Standard certification was achieved by:

- Detailed study and analysis of building energy load, seeking to effect meaningful efficiencies.
- Converting heating and domestic hot water from steam to electric heat pumps that utilize heat recovery from Enwave's district energy network
- Converting cooling from electrical chillers to Enwave's Deep Lake Water Cooling system.
- Significantly improving energy efficiency with a centralized building automation system and smart technologies.

TAKEAWAYS

Fairmont Royal York's decarbonization demonstrates the potential to complete a large and complex project in a way that is environmentally impactful, socially responsible, and economically viable. It is a compelling example of what can be accomplished through collaboration, innovation, and creativity. For KingSett, this investment highlights how decarbonization can strengthen a key asset in our portfolio as part of our sustainability and value enhancement strategy.

This decarbonization project represents the largest heritage hotel retrofit of its kind within the Fairmont global brand portfolio and offers a definitive roadmap for creating sustainable energy sources for similar properties.

Efficiency Capital: The Energy as a Service Model

Efficiency Capital's (EC) collaboration with Serene Properties demonstrates the financial and operational viability of decarbonizing residential and small commercial properties through energy as a service models and partnerships. EC's energy as a service model simplifies the adoption of low-carbon technologies by offering turnkey solutions without any upfront capital requirements, making it accessible for those with limited resources. This project highlights the transformation of century homes into efficient, low-carbon residential properties, highlighting both the viability and profitability of mission-oriented asset ownership.

*"Evaluating and implementing low-carbon and efficiency retrofits **requires a shift in thinking from cost minimization to value creation.** This is no longer just an equipment upgrade but is an infrastructure investment whose return must be optimized. This requires deep expertise that can integrate technical, financial, legal, operational and behavioural practices. It's rare to find this on staff so consider working with an Energy-as-a-Service company who specializes in this. Regardless of which path you choose, make sure to work with partners who are willing to take a financial risk in your success."*
- Efficiency Capital

THE CHALLENGE

Already facing several challenges, businesses and asset owners are being asked to rapidly decarbonize, while also creating value for themselves. For some industries, this has come from customers and clients and for others the pressure is coming from regulators and even investors.

There is a cost to doing this though, and it can be quite complicated. Decarbonization is largely tied to energy use in buildings and processes. From energy efficient lighting, to pumping water, to properly ventilating a production floor, to providing digital connectivity, these pieces are all tied together and

ORGANIZATION PROFILE

EC is Canada's first energy as a service (EaaS) company that develops, funds and manages net-zero projects in the built environment. Incubated by The Atmospheric Fund (TAF) – a regional climate agency for the Great Toronto and Hamilton Area – EC delivers fully-funded, turnkey low-carbon projects to building owners of all types.

EC uses the approaches that have been successfully proven in the infrastructure and renewable energy industries but simplifies and offers them as a service to building owners. Businesses can partner with EC to have their energy infrastructure upgraded and immediately enjoy the benefits of an expanded capital pool for asset renewal, increased building valuations, and improved occupant productivity and health – all delivered upfront and paid for over time.

Today, EC has access to over \$120 million in low-cost project funding to deliver fully funded, turnkey and de-risked decarbonization solutions across Canada. In 2021, EC was named to the Globe and Mail's "Fastest Growing Companies" and in 2023 was awarded "Best ESG Solution" by Global Financial Markets Review.



Most business owners are focused on their operations and growth and simply don't have the time, money, or expertise required to plan, design, fund, procure, install, and manage retrofit projects in a way that optimizes the benefits and guarantees success.

a 'systems thinking' approach is needed, but upgrading multiple integrated systems at the same time can be prohibitively expensive. There's a lot to control, optimize and manage at one time - especially if it's not your core business. Most business owners are focused on their operations and growth and simply don't have the time, money, or expertise required to plan, design, fund, procure, install, and manage retrofit projects in a way that optimizes the benefits and guarantees success.

THE SOLUTION

Recognizing that businesses have other priorities, EC's offering incorporates several flexible features:

- No upfront capital requirements (solving the issue of **capital constraints**)
- Turnkey design and delivery (adding **expert capacity** to your team)
- Data-driven performance with guaranteed outcomes (increasing **confidence through performance**)
- Ability to scale/simultaneously execute retrofit projects across markets and asset classes (solving for **scalability while delivering highest returns**)
- Easy buyout/buyback options
- Flexible financial structures (on or off-balance sheet approaches to **optimize balance sheet** strategies)
- Vendor and technology agnostic - finding the best fit solutions crafted for unique use cases and triple-bottom-line client objectives.

Depending on each client's specific requirements for capital structure, level of risk transfer, and ongoing operations and maintenance, EC has several investment and project delivery options:

1. The **Energy Savings Performance Agreement™ (ESPA)** is the evolution of the Energy Service Company model in Canada. This unique investment approach features a shared-savings structure, where the cost of the turnkey retrofit is paid directly from the savings generated over time. If savings are missed, the client doesn't pay them, which is much simpler than first having to pay and then later claiming on a performance guarantee. This gives owners the highest level of confidence in their future utility budgets and reserve fund forecasts.
2. The **Energy Upgrade Agreement (EUA)** is an evolution of the equipment leasing model because it's a contract for an integrated system of measures and not just a single piece of equipment. This is a value-add approach where EC designs, funds, and executes the project and has its third-party design certified to ensure the performance targets will be met, such as a specific efficiency or GHG reduction target.
3. **Energy-as-a-Service (EaaS)** is the full outsourcing of an energy-related system, or even the whole system. This can be designed as a light as a service or heat as a service for example where the owner only pays for what they use, and EC is responsible for upgrading and maintaining the systems needed to deliver those service levels.

CASE STUDY

Leveraging EC's EUA solution, commercial real estate entrepreneurs and self-proclaimed "accidental landlords" Steven and Sonia Tran of Serene

Properties transformed two single-family century homes in downtown Hamilton into highly efficient, low-carbon multi-unit residential properties.

Serene Properties plans to make rental units available for an affordable price while attracting long-term, high-quality tenants to the community. By leveraging EC's investment, the project returns increased 79%, and their return in equity increased by 321%, while also achieving a five-fold increase in housing supply in a local neighbourhood.

This project demonstrates mission-oriented asset investment can be technically viable and financially attractive, but it requires the right partners with the right mix of capital, expertise, and a willingness to take on risk.

For this project, GHG emissions were reduced by 90%, while also:

- Improving metro housing supply and availability in the GTHA while preserving affordability
- Increasing building value while lowering operating costs, improving net operating income (NOI)
- Preserving history while combating NIMBYism
- Futureproofing against climate transition risk

TAKEAWAYS

Serene Properties' Hamilton conversion project shows you can upgrade your buildings and related infrastructure in a systematic way without having to change your capital allocations or to sacrifice your returns.

While this case focuses on the commercial real estate space, SMEs and other operating businesses and manufacturing organizations can take advantage of EC's offerings to achieve multiple goals of improved cashflows and modernized equipment, technologies and digital infrastructure, while also preserving core capital for growth and decarbonizing for long-term resilience. It's a win-win-win approach for the people, profits and the planet.

What is Energy as a Service (EaaS)?

Energy as a Service (EaaS) is an innovative approach to facilitate the retrofitting of existing buildings for improved energy efficiency and accelerated decarbonization. In this model, building owners and operators collaborate with specialized service providers to optimize energy consumption, reduce costs, and enhance sustainability:

• **Energy Performance Contracts**

EaaS agreements often involve performance-based contracts. Providers guarantee energy savings, and payments are tied to actual performance, which is measured through comprehensive energy audits, implementation of energy-saving measures, and ongoing monitoring. The service provider typically finances the upfront costs, which are repaid through the savings achieved over time. This incentivizes efficiency improvements and risk-sharing between parties while helping organizations meet regulatory requirements and reduce operational costs.

• **End-to-End Solutions**

Strategies are tailored to each building's unique needs, considering factors like occupancy patterns, climate, and equipment.

• **Technology Integration**

EaaS leverages smart technologies, such as IoT sensors, data analytics, real-time monitoring and predictive maintenance.

• **Financial Flexibility**

Building owners avoid upfront capital costs. Instead, they pay a service fee based on energy savings. This model makes energy-efficient upgrades more accessible to smaller businesses.

• **Sustainability Goals**

EaaS helps companies meet local sustainability targets. Retrofitted buildings reduce greenhouse gas emissions, enhance comfort, and contribute to a more resilient energy grid.

EaaS transforms building retrofits from isolated projects into ongoing partnerships, driving energy efficiency, innovation, cost savings, and environmental benefits.

NERVA Energy: Aggregating Projects

The case of NERVA Energy demonstrates the power of aggregating projects by addressing the entire portfolio of 85 buildings in a single, coordinated initiative. This approach allowed for comprehensive energy conservation measures, including data-driven benchmarking, energy and equipment audits, and the implementation of smart controls and a unified management interface. By tackling all necessary upgrades simultaneously, Drewlo Holdings not only achieved significant energy savings and a notable reduction in greenhouse gas emissions but also capitalized on economies of scale. This method ensured that investments were strategically targeted and executed, enhancing the overall efficiency and sustainability of the portfolio while delivering a substantial return on investment. This case underscores the benefits of a holistic, upfront investment in energy efficiency retrofits, demonstrating that such projects can be both environmentally and financially advantageous.

*“NERVA Energy’s portfolio-wide optimization of Drewlo Holdings is recognized as **The Largest Multi-Residential Smart Building Conversion in North America**. This landmark project, encompassing over 85 properties, 10,000 suites, and 13.3 million square feet, is celebrated for its turn-key delivery, achieving a 34% reduction in HVAC load, a 36% reduction in GHG emissions, and a 16% return on investment.”*
- NERVA Energy

THE CHALLENGE

Large-scale building energy performance often involves coordinating various experts, conflicting approaches, and complex systems, which can obscure project objectives and compromise outcomes. NERVA Energy’s innovative approach and engineering expertise streamlined this process for Drewlo Holdings, enhancing their energy efficiency and sustainability without the usual chaos and costs associated with disparate systems.

THE SOLUTION

Drewlo Holdings, Canada’s 10th largest private real estate portfolio, partnered with NERVA Energy to develop an innovative energy conservation program to meet their ambitious performance

ORGANIZATION PROFILE

NERVA Energy specializes in delivering turnkey energy conservation projects with guaranteed financial and environmental outcomes for large-scale buildings. As Canada’s fastest-growing energy engineering firm, we excel in delivering practical and proven energy conservation solutions. The multidisciplinary team, comprising award-winning engineers, certified energy managers, and skilled mechanical technicians, provides clients with a holistic, turnkey approach that ensures long-term financial sustainability, transforming ambitious energy and carbon reduction goals into tangible realities.



With over 2.1 million apartment units housing 34% of the Canadian population, crafting a proven and engineered solution that is both financially viable and replicable across any multi-residential portfolio is critical.

goals across all 85 buildings, resulting in the largest project of its kind in North America.

NERVA Energy was responsible for the design, development, and implementation of this comprehensive program. The phased approach included:

1. **Data-Driven Benchmarking:** Detailed analysis of historical utility data enabled accurate performance benchmarking for each building.
2. **Comprehensive Audits:** Energy and equipment audits were conducted at each site, identifying inefficiencies and informing targeted enhancements.
3. **Detailed Reports:** Reports provided insights on equipment sizing and operational effectiveness, essential for strategic optimization.
4. **Mechanical Submetering:** Granular consumption monitoring through system-wide submetering enabled precise management for optimal performance.
5. **Smart Controls:** Innovative controls, intelligent thermostats, and sensors allowed real-time responses to thermal demands, modernizing outdated methodologies.
6. **Unified Management Interface:** A central energy management system facilitated live monitoring of systems, buildings, and regions, simplifying key metric reporting.

Following these successfully evaluated and optimized steps, the client is advanced to Phase 2, focusing on “right-sizing” equipment and transitioning to air or ground source heat pumps, and geothermal design for additional carbon reduction.

This methodical approach ensures timely, strategic investments, enhancing building performance, aiding grid relief, and contributing to community well-being and environmental sustainability.

KEY ACHIEVEMENTS

- 3.1 million kWh removed from Ontario’s electricity grid
- 1.3 million cubic meters of natural gas consumption eliminated
- 36% reduction in GHG emissions
- \$1.5 million in annual energy savings
- 16% return on investment
- Tailored energy conservation strategy satisfying the individual needs of each building while allowing for proven scalability at large

TAKEAWAYS

With over 2.1 million apartment units housing 34% of the Canadian population, crafting a proven and engineered solution that is both financially viable and replicable across any multi-residential portfolio is critical.

The multi-residential sector has often been slow to embrace technical innovation, commonly dealing with outdated, oversized, or poorly maintained mechanical systems.

Drewlo’s retrofit project demonstrates that energy-related investments should be viewed as an opportunity rather than a liability. Comprehensive energy conservation initiatives are not just environmentally beneficial but also key drivers for operational savings, reduced capital expenditures, and a quantifiable return on investment.



Actioning Solutions

This playbook is crafted to empower investors, building owners, and developers to accelerate their clean energy projects. Below you will find a curated list of financing programs, grants, and trusted service partners in the region, helping stakeholders navigate the complexities of funding and implementation, enabling more efficient and widespread adoption of clean energy technologies.

Retrofit Financing and Programs

Canada Greener Affordable Housing Program [🔗](#)

The Canada Greener Affordable Housing Program (CGAH), administered by the Canadian Mortgage and Housing Corporation (CMHC), funds low-interest repayable and forgivable loans to help affordable housing providers complete deep energy retrofits on existing multi-unit buildings through both pre-retrofit funding for planning activities as well as capital costs of retrofits.

Canada Infrastructure Bank's Building Retrofits Initiative [🔗](#)

The Canada Infrastructure Bank's (CIB's) Building Retrofits Initiative (BRI) provides attractive financing to reduce investment barriers and decarbonize buildings. CIB works with the public and private sector as well as other market participants to modernize and improve the energy efficiency of existing buildings.

City of Toronto Better Buildings Partnership [🔗](#)

Through the Better Buildings Partnership (BBP), the City delivers various programs that provide funding, expertise and support to help building owners improve energy efficiency and accelerate emissions reductions in their residential, commercial, industrial and institutional buildings across Toronto.

Deep Retrofit Accelerator Initiative [🔗](#)

The Deep Retrofit Accelerator Initiative provides funding to organizations (i.e., "retrofit accelerators") that help building owners in the development of deep retrofits in commercial, institutional and mid- or high-rise multi-unit residential buildings in Canada, and drive market transition in regions across Canada.

Enbridge Retrofits [🔗](#)

Enbridge offers a range of programs and incentives



for retrofit projects that deliver energy savings—from straightforward upgrades to custom projects in commercial, multi-residential, affordable multi-family housing and industrial buildings.

Green and Inclusive Community Buildings Program [🔗](#)

The Green and Inclusive Community Buildings Program (GICB), administered by Infrastructure Canada, is a \$1.5-billion program that supports green and accessible retrofits, repairs or upgrades of existing public community buildings and the construction of new publicly accessible community buildings that serve high-needs, underserved communities across Canada.

Green Industrial Facilities and Manufacturing Program [🔗](#)

The Green Industrial Facilities Manufacturing Program (GIFMP) provides financial assistance to support the implementation of energy efficiency and energy management solutions designed to maximize energy performance, reduce greenhouse gas (GHG) emissions, and increase competitiveness for industry in Canada.

Green Municipal Fund's Retrofit Programs [🔗](#)

The Green Municipal Fund (GMF), administered

by the Federation of Canadian Municipalities, combines funding and capacity building to deliver clear environmental, economic and social impact in Canadian municipalities. The GMF provides funding for retrofits, including through the Community Efficiency Financing program for low-rise residential properties, Sustainable Municipal Buildings program for deep-energy retrofits of municipal buildings, and the Community Buildings Retrofit Initiative.

Indigenous Energy Support Program [🔗](#)

The Indigenous Energy Support Program (IESP) promotes broad equitable participation in Ontario's energy sector for First Nation and Métis communities and First Nation and Métis organizations by supporting community capacity building, including energy planning and energy infrastructure development, as well as the building of energy knowledge and awareness, and skills related to energy projects.

Save on Energy Retrofit Program [🔗](#)

The Save on Energy Retrofit program offers businesses incentives to upgrade equipment, reduce energy bills, lower carbon footprints and enhance staff comfort. The program offers financial incentives through various streams.

Retrofit Service Providers

The following is a non-exhaustive list of companies that offer innovative solutions to help companies meet their sustainability goals.

Efficiency Capital [↗](#)

Efficiency Capital (EC) works with owners of commercial, industrial and multi-residential buildings, coordinating with landlords and institutions to enhance their asset values by installing performance guaranteed energy efficiency upgrades. EC is a single-source provider of comprehensive, well-managed solutions and supervises the engineering, investment, installation, and monitoring of energy upgrade projects.

Element5 [↗](#)

Element5 is a mass timber manufacturer specializing in the design, fabrication and assembly of contemporary timber structures. We work with solid wood, the world's most flexible and only renewable building resource. Our products include: cross-laminated timber (CLT), Glulam and other mass timber components from sustainably-sourced, FSC certified lumber.

Morgan Solar [↗](#)

Morgan Solar collaborates to create the next generation of solar products paired with deep diagnostics. Their IoT-enabled hardware tools continuously collect data on a site to validate Photovoltaic system performance and DC side system health, which is then processed by their machine learning software to improve performance forecasts. They pride themselves on implementing solutions that reduce carbon emissions and create beautiful, high performing buildings that people love.

Noventa [↗](#)

Noventa offers end-to-end services to drive the green reinvention of commercial, residential, and institutional space in our communities. Through disruptive innovation like our Wastewater Energy Transfer™ projects, we are challenging conventional thinking to catalyze meaningful decarbonization of our world.

QuadReal [↗](#)

QuadReal is a global real estate investment, operating and development company committed to creating environments that enhance the lives of the people and communities they serve. As a global real estate leader and Responsible Company, they strive to make a positive impact in mitigating climate risk through investments in practical, cost-effective solutions to reduce our carbon footprint.

Rainforest Automation [↗](#)

Rainforest Automation combines comprehensive analysis with effective customer load management solutions to reduce and shift energy usage in homes, which helps customers understand where demand comes from and provides tailored programs that address the real problem for both utilities and end users.

Siemens Canada [↗](#)

As a system integrator, service provider and a product vendor, Siemens offers energy-efficient, safe and secure buildings and infrastructure. With our people, our global footprint, our decades of experience and our technical expertise, it's our passion to help you to create the perfect place. With our expertise a building owner can bring all aspects together to reduce energy consumption and GHG emissions.

SOFIAC [↗](#)

SOFIAC develops, manages and invests in decarbonization projects and major energy-efficient renovations for Canadian companies in the commercial, industrial and multi-residential sectors, as well as for Quebec municipalities. Our approach is based on performance and requires no investment from clients; project costs are reimbursed solely through a portion of generated savings.



Looking Ahead

As we look toward the future, the economic landscape for green building retrofits presents a compelling case for action. The financial benefits of implementing energy-efficient technologies are clear, with reduced operational costs, increased property values, and enhanced tenant satisfaction being just a few of the tangible returns. The economics of green retrofits are further bolstered by the availability of various financial incentives, grants, and low-interest loans that reduce the initial capital investment, making these projects more accessible and appealing.

To successfully navigate this evolving market, organizations must adopt a multi-faceted strategy. **Derisking investments** is crucial; by utilizing performance guarantees and energy savings insurance, investors can mitigate financial risks associated with retrofits. **Leveraging Energy as a Service** (EaaS) models offers another innovative approach, allowing building owners to outsource the management of energy systems to specialized service providers, thereby shifting the focus from capital expenditures to operational expenditures.

Aggregating projects across multiple buildings or within a single property can capture economies of scale, streamline processes, and reduce costs. This strategy not only accelerates the implementation of necessary upgrades but also ensures a more coordinated approach to achieving sustainability goals. Lastly, **integrating emerging clean**

technologies—such as advanced HVAC systems, smart energy management tools, and renewable energy sources—can dramatically enhance building performance, reduce environmental impact, and future-proof assets against evolving regulations and market demands.

To empower and normalize the financial viability of retrofits the Board will enable future eco demonstration projects through our newly launched [Business Council of Toronto \(BCT\)](#). The BCT was established to drive advocacy and provide pragmatic, evidence-based solutions for policy makers and government. Among the three partnership councils established as part of the BCT, the Climate & Energy Transition Council seeks to accelerate the region's clean energy transition by driving opportunities in the climate economy and accelerating the greening of our supply chain. We believe that by de-risking investments and promoting business-led innovation in this sector, we can enhance our region's competitiveness and establish ourselves as global champions in the export of clean technology solutions.

By embracing these strategies, stakeholders can position themselves at the forefront of the green building movement, driving innovation and sustainability in the built environment. The future is bright for those willing to invest in the transformation of our buildings, reaping both environmental and economic rewards.

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