



# TAKING A PORTFOLIO APPROACH TO FINANCING ENERGY EFFICIENCY RETROFITS IN INDUSTRIAL BUILDINGS

**A Feasibility Study**

***Summary Report***

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**VANCOUVER**  
ECONOMIC COMMISSION

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## BACKGROUND

The Vancouver Economic Commission (VEC) has been working with businesses in The Flats light industrial district over the past several years to identify common environmental challenges. As part of this investigation, two major sources of GHG emissions were identified from businesses in the area—buildings and transportation. A Building Energy and Emissions Profile (BEEP) completed by ClimateSmart in 2015 suggests buildings account for approximately 46% of total GHG emissions from business operations in the district, and transportation accounts for 44% of total GHG emissions from businesses in the area.

The Flats Economic Development Strategy, published by the VEC in May 2017, outlines the need to address environmental issues and real estate affordability issues in Vancouver’s central industrial districts. Rising real estate values present a significant challenge for light industrial businesses operating close to downtown, putting these businesses at risk of being displaced from the city. By pursuing building energy retrofits to reduce energy costs and GHG emissions, this project can help address rising costs of doing business.

Existing light industrial buildings represent 13% of Vancouver’s GHG emissions. Despite this insight that industrial facilities make up a large portion of the inefficient building stock in Vancouver, energy efficiency retrofit programs in Vancouver have focused on residential and office buildings. This is likely because industrial facilities tend to have more divided ownership and management, they can be seen as riskier investments (small and mid-size businesses fail), and they can be harder to engage (non-consumer facing businesses have traditionally been slower to hop on the sustainability bandwagon).

**Building off the VEC’s success with the Flats Climate Action Program, where businesses tackle their GHG emissions as a collective cohort, this feasibility study is testing a novel approach to engaging small and mid-size industrial business and property owners in energy efficiency retrofit projects through collective financing and project management. We anticipate that the collective approach will yield not only financial savings (through group purchasing, de-risking retrofit investments, and streamlining administration), but also social incentives (through community-building and peer pressure).**

If this model proves effective, it can be used to incent industrial retrofit projects throughout Vancouver; if it proves ineffective, we will have gleaned a number of new insights to the barriers to retrofit projects in industrial areas.

## MOTIVATIONS

One of the main drivers of this study is a gap in scale between the scale of retrofit projects associated with Vancouver businesses and scale of investment desired by impact investors across Canada. The majority of Vancouver businesses have less than 50 employees, which means the scale of energy efficiency retrofit projects for individual industrial buildings is relatively small and present significant investment risks for investors—projects typically range from \$6,000-\$60,000. Impact

investors and energy efficiency investment firms have traditionally sought larger projects with lower risk clients when developing financing tools that are most attractive for retrofits—the typical threshold is a minimum \$500,000 investment in order to attract equity investment whereby the business does not need to take on additional debt or in-house risk. This study investigates the potential to aggregate industrial retrofit projects into a single portfolio to examine whether or not a portfolio approach can unlock this type of financing for smaller industrial players by increasing the investment scale and reducing investment risk for private financiers.

This approach is also anticipated to reveal opportunities for:

- reducing costs through group purchasing of technologies and/or equipment;
- securing lower interest rates and flexible repayment options;
- streamlining retrofit administration and management costs;
- simplifying retrofit processes by leveraging single engineering and engagement partners; and
- creating social and community pressure to encourage retrofit uptake

## BUILDING INVENTORY

The Flats area is comprised mostly of small and medium sized businesses (SMEs) that occupy buildings either as owner/operators or tenants. Based on city-wide statistics, it is estimated that about 30% of businesses are owner/operators and the remaining 70% of businesses are tenants with various lease agreements with the building owners.

In 2013, Light House Sustainable Building Centre (LHSBC) conducted a study that estimated there are approximately 780 businesses occupying around 325 buildings in the Flats (with a redrawn boundary for the area that included connected industrial zones to the north and east of the Flats). About 50% of the buildings included in the study were over 50 years old and only a handful were built in the last 10 years. It was identified through this LHSBC work that the remaining buildings between 10-50 years old are good candidates for green building retrofits, which indicates that there is significant potential to pursue a building retrofit program for this area.

Buildings and business owners within the Strathcona Business Improvement Association (SBIA) were also considered within the scope of this study. The SBIA has been working closely with industrial businesses in their district for a number of years to help improve the environmental performance of industrial operations. The building stock is very similar in this area to that found in the Flats—primarily light industrial distribution, repair, and production spaces.

## RETROFIT OPPORTUNITIES

The following non-exhaustive list of energy efficiency improvements highlight the typical retrofit measures available to improve the energy performance of industrial buildings. These measures are highlighted as potential technologies to achieve the buildings emissions reductions outlined in the Greenest City Action Plan as well as identified for the False Creek Flats area by LHSBC. The potential and specific costs of implementing these opportunities in actual buildings were unclear prior to this study; a key outcome was to be able to identify and quantify the costs and savings associated with



each measure in actual buildings through on-site energy assessments. The specific energy savings opportunities identified for each building will be discussed in the building assessment summary section.

*Typical Energy Efficiency measures in Industrial Buildings*

- Fuel switching (biomass, renewable natural gas)
- Natural gas heating (space heating and hot water)
- Electrification (electric heating, heat pumps)
- District energy system (centralized hydronic heating, large heat pumps)
- Passive solar heating
- Solar thermal hot water

*Typical Energy conservation measures in Industrial Buildings*

- Electricity reduction (metering, storage, load shifting)
- Waste heat recovery (hot water, wastewater)
- Improve insulation and building envelope



## RETROFIT FINANCING MODELS

Energy efficiency retrofit financing in The Flats should be focused on creating the maximum value for building owners, tenants and investors. Through discussions with business owners, technical contractors, and financing partners, the key metrics to measure the viability of a project should include:

- **Cost savings**—Financial return on investment (%); Investment payback period (years)
- **Energy savings**—Greenhouse gas emissions reductions (tCO<sub>2</sub>/year); Total energy consumption reductions (kWh/year)
- **Social and marketing impact**—Brand lift; Employee engagement

There are several financing options available for energy efficiency retrofits in industrial buildings. A brief description of each option, along with pros and cons for each, and an assessment of its applicability to the Vancouver industrial context is described below.

**DEBT FINANCING:** Building or business owners access debt financing through traditional sources (ie. commercial banks, lenders) and are responsible for ensuring that they will be able to recoup their costs through projected energy savings.

### PROS

Building and business owners can access debt financing easily at reasonable rates.

Debt financing is simple and avoids additional administration and project management costs.

### CONS

On-balance-sheet liability means investments with longer payback periods (>2 years) and higher capital costs can be seen as too risky for SMEs

### APPLICABILITY

Business owners that are well-established and do not have challenges to accessing capital would likely take advantage of traditional financing if the ROI on proposed retrofits is attractive.

**ENERGY SERVICES MODEL:** An energy services company (ESCO) installs and owns the actual energy efficiency retrofits in an owner's building. The savings from the installed equipment are managed by the ESCO and a contracted percentage of the savings are repaid to the building owner over a negotiated period of time.

### PROS

The ESCO model does not require the building owner to take on additional on-balance sheet debt.

### CONS

In order to access these energy savings-based models, projects or portfolios must be large-scales (>\$500k) and savings must be well-defined (low technical and credit risk).

### APPLICABILITY

This model has been effective for large scale projects but has not been used for smaller projects. Variations on the ESCO model exist, such as the EPSA from Efficiency Capital and a special purpose vehicle (SPV) from CoPower.

**LEASING MODEL:** The leasing model allows a business owner to purchase retrofit equipment through a negotiated contract with periodic payments over a set amount of time. This could be a lease-to-own model where a lessor would transfer ownership of the asset after the end of the leasing period.

**PROS**

The lease-to-own model avoids the upfront capital cost of implementing retrofits.

**CONS**

The business owner is responsible for ensuring that they can repay the lease and would need to ensure that the projected energy savings present a viable business case after the leasing interest payments are considered.

**APPLICABILITY**

Atticus Financial provides a lease-to-own model that matches lease payments with expected savings from the installed equipment. Business credit risk and technical risk of the expected savings are key considerations.

**MUNICIPALITY ADMINISTERED:** The property assessed clean energy (PACE) model allows a municipality to provide financing through a local improvement charge (LIC) placed on the building owner's property.

**PROS**

PACE financing allows building owners to access capital through the municipality by leveraging the ownership of their property.

Able to avoid on-balance-sheet liability.

**CONS**

The repayment of capital loan is repaid through a local improvement charge (LIC) property tax bill, adding to already rising property taxes.

**APPLICABILITY**

Previous experience with PACE programs in Vancouver have been unsuccessful due to challenges in uptake as well as administration and management.

**UTILITY-BASED MODEL:** The utility based model allows the costs and savings of improvements made to be tracked and repaid through building utility bills—generally off balance sheet debt administered through the utility.

**PROS**

Utility provides the capital for retrofits similar to an ESCO model and can integrate incentives such as rebates or grants for uptake.

**CONS**

Natural gas and hydro are run by separate utilities; therefore programs would need to be established with both and businesses would potentially need separate financing from each to take on various retrofits.

**APPLICABILITY**

There are currently no utility-based programs specifically for retrofits in industrial businesses and buildings in BC.



## POTENTIAL PROGRAM PARTNERS

Throughout this study, several potential program partners were identified for addressing industrial retrofits in Vancouver:

### COPOWER

**Role** - Provides financing via an SPV to be managed by third-party implementation partners

**Motivation** - CoPower is looking for a \$500k to \$1MM investment threshold for a portfolio that can be scaled to further investments in Vancouver as well as across Canada. CoPower is a revolving credit facility model that is looking for green investments that is both a source of financing for energy projects as well as provides attractive ROIs for their investors. A major consideration for CoPower is the environmental impacts of its investments, in particular the reduction of GHGs through its projects.

### EFFICIENCY CAPITAL

**Role** - Provides financing via its EPSA (energy performance service agreement) through an implementation partner

**Motivation** - Efficiency Capital is looking for minimum of a \$500,000 investment threshold for a portfolio of retrofits. Ideally, the total utility costs should be at least \$200,000 to take advantage of a large-scale investment. A major consideration for EC is the legal counterparty risk; i.e. what the aggregation model looks like and who would be responsible for administering the program.

### ATTICUS FINANCIAL

**Role** - Provide financing via a leasing (lease-to-own) model

**Motivation** - Atticus is interested in supporting sustainability and energy efficiency retrofits and is open to matching leasing repayment terms for projected cost savings. The rates and terms of leasing agreements depend on individual projects and business owners are responsible for due diligence in selecting appropriate improvements.

### VANCITY CREDIT UNION

**Role** - Provides traditional bank debt-financing for small and mid-size businesses

**Motivation** - VanCity is interested in the potential to create a unique portfolio financing option to support local businesses and their sustainability goals.

### CITY OF VANCOUVER

**Role** - Municipal government support; enact changes to policy and buildings standards

**Motivation** - The City of Vancouver has approved a number of building energy performance goals through the Greenest City Action Plan and is looking to encourage the adoption of retrofits among existing building owners. In the past, the City has developed and supported retrofit programs for Multi-Unit Residential Buildings.

### FORTIS BC, BC HYDRO

**Role** - Provides utility access (natural gas and hydro); sometimes provide incentive programs for energy conservation

**Motivation** - Fortis and BC Hydro both have mandated energy conservation and GHG reduction goals. They are also responsible for regulating energy supply costs.

### KAMBO GREEN SOLUTIONS

**Role** - Provides technical and engineering support and project management for retrofits

**Motivation** - Kambo is looking for additional clientele for their services which include energy audit, design, engineering, installation and monitoring services for energy efficiency retrofits as well as custom energy solutions for businesses. Leveraging Kambo's technical expertise in this area assists in accurately quantifying the technical and economic feasibility of implementing various building retrofit options.

### CLIMATE SMART BUSINESS

**Role** - Provides engagement and educational programs for businesses looking to reduce their GHG emissions and costs

**Motivation** - ClimateSmart is a social enterprise that is focused on working with SMEs in reducing GHGs and improving environmental performance. Their primary interest in engaging more businesses in climate action programs and increasing the breadth and depth of environmental initiatives that their clients pursue.

### SAUDER S3i at UBC

**Role** - Develops unique research and educational opportunities for students interested in social enterprise and impact investing; projects span finance, investment and policy research

**Motivation** - Sauder s3i is engaged with an impact investor network interested in energy efficiency and sustainability investments. This is an opportunity to build around local sources of investment for a future program.

## METHODOLOGY

### BUSINESS IDENTIFICATION

- Identified businesses and buildings that are high-value/high-potential targets for a larger building energy efficiency upgrade program
- Completed through internal Vancouver Economic Commission, Strathcona Business Improvement Association and ClimateSmart input



### DATA COLLECTION

- Developed of quantitative data for current businesses in the Flats & SBIA
- Performed building assessments with Kambo Green Solutions, creating quantitative data that can be used to analyze industrial retrofit opportunities in Vancouver.



### BARRIER VERIFICATION

- Verified barriers to building retrofit financing for industrial businesses
- Compiled individual business answers to interview questions to uncover additional barriers to building retrofits and collect feedback on the role that the VEC needs to fill to catalyze the uptake of industrial building retrofits.



### ASSESSMENT OF FINANCING OPTIONS

- Assessed potential financing options for industrial businesses in Vancouver
- Outlined and communicated financing options to the business owners participating in this study with a specific focus on cost savings from taking a collective approach to implementing energy efficiency retrofits



### PORTFOLIO OPPORTUNITIES ASSESSMENT

- Assessed viability of portfolio retrofit model from a project management and financing perspective
- Identified advantages and challenges of pursuing a portfolio financing model through meetings with a number of financiers and stakeholders for pilot portfolio

## PILOT PORTFOLIO OVERVIEW

Discussions with financing sources and energy conservation and management consultants were used to develop the following criteria for building a pilot portfolio of buildings/businesses to focus on in this study. From a technical building energy retrofit perspective, energy consultant partners Kambo Green Solutions suggested the following criteria.

- Businesses that are owner-operators or leasing businesses that intend on occupying their building for the long-term (i.e. longer than 10 years)
- Square footage over 10,000 square feet and buildings that are >5 years old represent the potential for significant energy savings
- Highest energy and fuel users; i.e. buildings with high heating requirements, refrigeration requirements, industrial equipment

Other suggestions to engage businesses included:

- Establishing a simple business case (ensuring that proposed savings are significant)
- Targeting highly engaged businesses from previous studies (for example, businesses that have previously engaged in the Flats Climate Action Program through ClimateSmart and are motivated by environmental and social concerns along with costs)
- Creating a sense of urgency (for example, establishing the availability of a rebate or special rate associated with a deadline)

## ENGAGEMENT PROCESS

The steps in narrowing down our potential target portfolio began with a review of Light House Sustainable Building Centre Study on building stock in the Flats and the Climate Smart Business Energy and Emissions Profile (BEEP) on GHG emissions by sector in the Flats. The ClimateSmart BEEP study was based on a NAICS categorization of businesses in the area. This included a description of the type of use, ownership information, whether it is city owned land, business type and brief details on the activities carried out in the space.

The targeted businesses were selected through a series of inputs and filters:

### 1. *Evaluation of whether there are occupied commercial/industrial buildings on site.*

- There are a number of empty lots, public parks, parking spaces, works yards, gardens and unoccupied buildings in the inventory. These land uses and buildings would not be good candidates for building retrofits.
- There are a number of large car and auto dealerships in the inventory, which have limited potential for building energy efficiency retrofits because these dealerships are typically newer buildings and represent a non-industrial type of land use.

### 2. *Scan of available data sets for optimal businesses and land uses.*

- From a detailed scan of the building and land use inventory, there are a number of buildings



that are not suitable for building retrofits. For example, these include temporary structures (greenhouses), outdoor works yards, maintenance lots, new buildings, and railway ROWs

- This analysis also considered prior business engagement and political issues that are key factors to effective business participation and prospective uptake of potential building upgrades. For example, this includes the large food and produce warehouses on Malkin Avenue that are not interested in pursuing building upgrades due to uncertainty in transportation corridor projects.

### 3. *Discussions with various stakeholders*

- Discussions with staff at the Vancouver Economic Commission on their past experience engaging businesses in the district revealed additional considerations for engagement, including building lifetime, owner/tenant relationships, knowledge of future business plans and potential future redevelopment of lands. This was a key input into capturing this prior engagement into a database that can be used in the future to quickly identify high-value/high-probability building retrofit targets.
- Discussions with Climate Smart who have been actively engaging businesses and conducting programming to improve the environmental footprint of businesses in the district revealed businesses that have been or are currently engaged in sustainability initiatives.
- Discussions with the Strathcona Business Improvement Association (SBIA) uncovered an ongoing initiative to evaluate solar installation potential on three buildings in Strathcona. Insights included description of effective engagement contacts including appropriate business owners and building managers that have been captured and incorporated into a business list for future implementation of a program.

### 4. *Refinement of engagement shortlist*

- Input from different stakeholders was used to shortlist a group of ~20 businesses to contact and interview for the study. A full list of identified buildings and their potential for inclusion in a future portfolio is attached.
- A confirmed list of 9 businesses were interviewed and moved forward with a building energy assessment study. The full list of businesses is shown in [Appendix A](#).

## BUSINESS ENGAGEMENT SUMMARY

A series of business and stakeholder engagement meetings and discussions were carried out over the course of the project. The questions asked each participating business and/or building owner what were the barriers to undertaking energy efficiency retrofits. A final business engagement session was also held at the Vancouver Economic Commission on August 17, 2017 to solicit additional feedback to the portfolio retrofit concept. The full list of interview questions and answers are recorded in [Appendix B](#).

Initial interviews with businesses revealed a number of key insights, including:

- *Electricity use, rather than natural gas, is the largest utility cost among the portfolio businesses.* In particular, for unheated warehouses and facilities, the major energy costs are

for lighting and operation of power equipment.

- *Prior sustainability work has focused on behaviour change for energy conservation.*
- *In some cases, there are opportunities to take a lower financial ROI if retrofit projects can meet alternative business goals and supports marketing and branding.*
- *There is significant uncertainty around future lease agreements and rental costs for non-owners.* This is a major barrier to implementing long-term retrofits.
- *Access to financing for upgrades is generally not an issue, particularly for building owners and upgrades that have short payback periods.*
- *The administrative and management burden is the most significant barrier to retrofit implementation.* Almost all business owners identified a need for external help to curate resources and minimize internal time requirements, i.e. being able to quantify what the costs and savings opportunities are without having to dedicate a significant amount of time.

## ENERGY ASSESSMENT SUMMARY

Kambo Green Solutions was contracted to provide detailed building energy audits and assessment reports to quantify the costs of potential upgrades and savings opportunities for the participating businesses. Kambo has provided a detailed energy assessment and analysis for each participating business. A summary of the costs and opportunities for each building can be found in [Appendix C](#).

The net cost of upgrades for individual buildings in the portfolio study range from \$5,000 to \$50,000 with payback periods ranging from 1 to 6 years depending on technology type, size of building and cost of materials. Additionally, Kambo provided a rooftop solar photovoltaic system design and estimate and a window retrofit design and an electricity sub-metering proposal for individual businesses that requested additions to the level one energy assessment scope of work.

Technical assessments revealed a number of key insights about light industrial retrofit opportunities:

- *Several businesses were located in primarily unheated warehouse spaces.* The BEEP report indicated that 46% of total business emissions are from natural gas (heating) use in the district, but buildings that are unheated represent low potential for GHG & energy reductions.
- *For distribution businesses (as opposed to manufacturing) energy use and emissions are primarily transportation based.* For example, Mills Office Productivity occupies an old and relatively inefficient building, but most of their costs and emissions come from fleets.
- *Buildings that have already completed an initial round of energy efficiency retrofits, incremental projects have generally lower ROI and longer payback periods.* For example, Eclipse Awards is looking to install solar PV because they have already retrofitted building envelopes, heating and lighting.
- *Businesses that are 24/7 have proportionally higher potential for energy savings than those that are 9-5 on weekdays.*

## PORTFOLIO OPPORTUNITIES

The final aggregated opportunities report from Kambo Green Solutions shows that the portfolio of 9 businesses would generate a net investment of \$160,000 resulting in annual cashflow savings of \$20,000. The life-cycle payback of the portfolio is 5 years with a net present value (NPV) of \$227,000 and a 10-year internal return on investment (IRR) of 15%. See [Appendix D](#) for full portfolio assessment.

## GROUP PURCHASING

The aggregated opportunities report from Kambo indicates that there is a group purchasing benefit of between 20-30% should the businesses move forward as a portfolio. The advantage of a portfolio approach takes advantage of Kambo's network of contractors which allows for bulk project discounts on materials, project management and packaged work. In addition, the group purchasing discount further takes advantage of rebates on energy efficiency products from suppliers.

## COLLECTIVE FINANCING

Discussions with all financiers indicated that aggregating projects to increase scale would result in improved financing terms, but only if that aggregation resulted in a reduction in credit risk. To provide information to complete a financial model, financiers would require an individual credit assessment of each participating business which is beyond the scope of this project. In addition, for CoPower and Efficiency Capital, additional program information such as the definition of a legal counterparty, investment management structure and establishment of loan guarantee structures are required to evaluate the potential costs and savings in administering a portfolio financing product.

Discussions with CoPower and Efficiency Capital indicated that the pilot portfolio size of around \$160,000 is not significant enough to attract investment through an SPV and managed portfolio at this time. It was suggested that a minimum threshold of approximately \$500,000 is necessary to fully take advantage of the managed and contracted savings as part of an energy services model. In terms of timeframe, a project portfolio between 2 and 7 years is ideal to ensure that aggregated projects are within the same timeline for completion. Atticus Financial is open to supporting an aggregated portfolio of projects, however the management and administration of an aggregated portfolio would not be included in adjusting for a leasing agreement; i.e. a third-party to manage the aggregation of potential projects would be required.

This project aimed to understand the limitations and risks associated with financing energy efficiency upgrades collectively. CoPower and Efficiency Capital suggest that for large, aggregated projects, financing terms are dependent on credit and performance risk. Without an equity partner involved in a large retrofit project, a legal counterparty who can backstop the investment is crucial to provide attractive financing terms for individual businesses to access the capital.

In terms of insurance and loan guarantee needs, insurance is suggested by Efficiency Capital to be required once a portfolio is larger than around \$1MM in value. Below that threshold, alternate performance risk measures such as contractor holdbacks may be used to ensure performance. In terms of backstopping investment into a large portfolio, CoPower suggests a loan loss reserve of

5-20% of the total investment to provide access to an SPV with competitive rates and repayment options. Atticus Financial already provides leasing options for relatively small projects (around \$10,000) and places the performance risk on the projected cost savings agreed upon between the building owner and technical contractor.

In terms of measurement and reporting needs, managed investments such as those through CoPower and Efficiency Capital would have built-in measurement and reporting as part of the investment product. As a portfolio investment increases in size, the relative costs of measurement and reporting decrease through economies of scale. For a smaller scale investment such as the current portfolio of projects, Kambo and Atticus Financial indicate that detailed measurement and reporting to ensure performance are likely not worth the additional costs associated.

Vancity has expressed an interest in collective financing as a means of building new community investment channels. This option is yet to be explored in detail.

## STREAMLINED ADMINISTRATION AND MANAGEMENT

The need for administrative and management help was a common finding between all project participants through the engagement and assessment process. The businesses participating in this study were able to quantify their costs and savings potential with minimal administrative and time commitments, which will allow them to have access to information to pursue savings opportunities individually. The time and resources savings from having the Vancouver Economic Commission provide energy assessments with Kambo Green solutions was a valuable step in encouraging the uptake of energy efficiency retrofits.

It is estimated that by taking a collective approach to administering and managing retrofit implementation, businesses can reduce their administrative expenses by at least 10%.

## COMMUNITY BUILDING

This study was primarily focused on the technical and financial opportunities for a portfolio approach to retrofits. However, significant opportunities for building communities of practice around industrial retrofits were identified. By moving forward collectively, businesses are able to learn from one another and build confidence in taking incremental steps toward improving the efficiency of their operations.

Engagement was completed with not only business owners, but with local and national financing sources as well as numerous other stakeholders such as the City of Vancouver, VanCity, ClimateSmart and Sauder s3i. This outreach was valuable for building a network of parties that are interested in supporting industrial retrofits.

The implementation of the retrofit opportunities identified through this study will continue beyond the scope of this project, and it is anticipated that the cost saving benefits through group purchasing discounts will encourage the uptake of improvements.



## CONCLUSION + RECOMMENDATIONS

This study was launched with a specific question in mind: Is it worthwhile for the VEC to pursue portfolio-based retrofit programs for small and mid-size businesses?

This feasibility study identified a portfolio of nine businesses and buildings that were broad and diverse in terms of business types and building uses. The net investment value for the portfolio is \$160,000 with a 5 year payback period. The cost savings of moving forward with a group is estimated at 20-30% as opposed to moving forward individually.

This study shows that there is a cost benefit to a portfolio approach by being able to leverage a single technical partner to design and install energy efficiency retrofits for a group of businesses. At this time, the financing for this pilot portfolio will likely be sourced from a local partner (Atticus Financial) or a commercial lender. Based on this cost benefit, there is a motivation to support a portfolio based approach; however, the actual costs of administration, business engagement and management provide by the Vancouver Economic Commission and other partners are unclear at this time and would have to be factored into the potential cost savings to ensure that there is a positive net benefit.

In order to access large, managed SPVs with national partners such as CoPower and Efficiency Capital, it is necessary to increase the size and scale of a retrofit investment portfolio. The minimum threshold for these investors is likely around \$500,000 indicating that additional work needs to be completed to develop a portfolio that can attract this type of financing.

## RECOMMENDATIONS

The following recommendations were put forward for further work on developing an industrial retrofits program:

***1. Focus on a specific building or business type to better align financing needs in terms of scale and business type.***

Large distribution warehouses such as Mills Office Productivity and Espressotec are more similar in scale than a small studio type space such as Eclipse Awards. It was also suggested that retrofit projects could be grouped by technology type; i.e. switching natural gas heaters, improving insulation, lighting and sub-metering. A focus on specific building types (age, size) would be better suited to maximize potential retrofit value. This would support the larger size and value of investment that CoPower and Efficiency Capital are interested in for a portfolio financing concept, as well as better target deep retrofits with greater emissions reductions impact.

***2. Recognize that access to financing may not be the biggest barrier to the uptake of retrofits.***

Through the business engagement process, the major gap identified was the lack of time, knowledge and resources from businesses to pursue retrofit opportunities. This is a gap that could be filled through establishing an accessible network of technical partners to provide quantified costs and opportunities and engagement and marketing resources to reduce the time and effort required to

implement building retrofits.

**3. Continue to identify high-value partnerships and to implement a full-scale industrial retrofit program.**

The financing parties engaged in this study were interested in supporting a portfolio of projects, but the major concern was the counterparty risk and requiring a third-party to manage the distribution of funds and collection of payments. This is an opportunity to develop or identify an implementation partner to fill this role as part of a formal retrofit program.

**NEXT STEPS**

<p><b>PHASE 1</b> CONTINUE ENGAGEMENT WITH PILOT PROJECT PARTICIPANTS</p>	<p><b>PHASE 2</b> CONTINUE TO REFINE A COLLECTIVE APPROACH TO INDUSTRIAL RETROFITS</p>	<p><b>PHASE 3</b> DEVELOP AND REFINE KEY RETROFIT PROGRAM PARTNERSHIPS</p>
<p>Pursue identified retrofits on an individual or collective basis with Kambo Green and a local financing partner such as Atticus Financial.</p> <ul style="list-style-type: none"> <li>• Report back to businesses on benefits of collective approach, as well as individual retrofit opportunities</li> <li>• Collect feedback on intention to implement retrofits and anticipated timelines</li> <li>• Develop retrofit implementation groups to capitalize on group purchasing, financing, and administration savings</li> </ul>	<p>Develop additional test-groups targeting buildings with higher potential for retrofits (i.e. major consumers with around the clock operations).</p> <ul style="list-style-type: none"> <li>• Conduct further outreach with food manufacturers and distributors, business collectives sharing a large facility, and materials processors</li> <li>• Consider partnerships with Richmond and Surrey to identify a critical mass of similar businesses to create high-value project groupings</li> </ul>	<p>Formalize partnerships with a technical partner, engagement partner, a financing partner, and an institutional partner to lend credibility and viability to a portfolio-based industrial retrofit program.</p> <ul style="list-style-type: none"> <li>• Develop roles, responsibilities, and proposed partnership structures for each partner</li> <li>• Build a collective budget for program implementation and secure program funding</li> <li>• Sign contracts for program implementation in the lower mainland of BC</li> </ul>



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