

# Developing a business case for an energy-efficiency retrofit

This factsheet for housing providers explains what a business case is, its purpose and how you can develop one for an energy-efficiency retrofit.

## How a business case leads to a successful project

A business case is a comprehensive, convincing presentation of the costs and benefits of an energy-efficiency retrofit project. A well-developed business case will streamline your decision-making process, and ultimately allow you to secure funding for more ambitious and better retrofit projects.

**A business case is developed and used during the initial steps of a project.**

**Your business case is:**

**A process starting-point**



At the start of the project, the business case acts as an important rallying point for decision-makers and stakeholders to find common ground on project elements that matter to them. Successful projects are the ones that were planned in an inclusive and collaborative fashion.

**A guide map during energy audits**



Your business case will lead you to the construction stage, through a series of studies involving one or many energy-efficiency experts (“energy experts”). Clearly communicating your objectives and needs to these experts will help them focus their efforts, allowing you to get the best value from their services.

**A means to secure funding**



Ultimately, your business case should result in one or several documents that you can submit to funders to secure financing (grants or loans) for your energy-efficiency retrofit project. Identify possible funding sources, note their requirements and criteria, and work toward meeting or exceeding them from the beginning. Get support from your energy expert. A good one can advise on how to maximize incentives and grants.

Consult the factsheet in this series, [How to Undertake Deep Energy Retrofits](#), to learn about the five key steps of an energy-efficiency project.

# How to develop your business case

A business case will keep you and your advisors focused on what matters. Use the following questions to guide the development of your project scope and outcomes for your business case:

## 1. What is the scope of the project?

What buildings within your portfolio (and perhaps those of nearby housing providers) is your project targeting? Do you want to consider all fuels? Is water conservation included? Which of the following types of energy-efficiency measures are included in the project scope: lighting (indoor/outdoor), heating, ventilation and air conditioning (HVAC), hot water, building envelope, appliances? A well-defined project scope will ensure that your resources are properly allocated to your priorities. A single comprehensive retrofit project is generally more cost-effective than multiple retrofits and allows you to realize the savings sooner.

## 2. Do you want a high-performance project or low-cost tune ups?

Capital-intensive measures such as replacing lighting and HVAC equipment are ideal for rehabilitating older buildings but tend to result in a longer payback period. Low-cost measures such as HVAC tune-ups and recommissioning have an attractively quick payback and are ideal for newer buildings. Most energy experts can help you with either type of project.

Consider different approaches for different buildings. Bundling low-cost measures with capital-intensive measures can help you achieve an overall project payback threshold that is acceptable, allowing you to include measures with long paybacks. Consider the value of other objectives that can be achieved at the same time, such as seismic upgrades.

## 3. What are the “must-replace” pieces of equipment?

Sometimes equipment and elements of the building envelope have reached the end of their useful life and must be replaced. Make it clear to your energy expert what equipment must be replaced as part of the project, irrespective of the payback. The incremental cost for energy-efficient replacements compared to standard equipment is often very low.

## 4. What is your targeted energy savings?

Let your energy expert know what level of energy savings you'd consider meaningful, as a percentage of current use. Be ambitious. A low-cost building tune-up project should yield energy savings of 10–20 percent. For a deep energy retrofit, aim for 40–50 percent. All energy sources can be converted to one common energy unit, often the gigajoule (GJ), to allow for comparison. You may need to make different plans for different buildings in your portfolio.

## 5. What financial metrics will you use to guide project designers and energy auditors?

Energy experts often use the payback period initially, as a quick and easy metric to screen measures until more detailed figures on savings are obtained through energy-efficiency audits. The payback period is defined as the total initial cost (sometimes minus incentives and grants) divided by annual savings on operations and maintenance (O&M) and energy bills. For low-cost building tune-up projects, consider suggesting a maximum payback threshold (often five or six years). Deep retrofits require longer payback periods. While payback is a useful indicator, the final project should not be evaluated exclusively on that basis. The next section outlines three other useful indicators: net present value, debt ratio, and debt service coverage ratio.

## 6. What social or economic benefits are you seeking as part of your project?

Ask yourself some questions to identify and prioritize the other benefits you want from the project. For example: Do your buildings have indoor air quality issues that need fixing? Are there issues with comfort during cold snaps or heat waves? Do you want to create work for local contractors?

## 7. What additional environmental benefits are you seeking from your project?




Do you want to incorporate innovative or leading-edge technologies such as ground-source heat pumps, solar water heaters, biomass heating or solar photovoltaic systems? Would you like the construction materials and methods to have other environmental benefits? Are you willing to trade off some of the project's financial performance in the pursuit of these attributes?

A key consideration is your chosen energy source: Do you want to maximize carbon abatement or avoid certain energy sources? Be aware that electricity is a more expensive but lower-carbon source of energy compared to fossil fuels in many Canadian provinces, such as BC, YT, MB, ON, QC and NL. Again, the trade-off for maximizing carbon reduction could be financial performance.

As you progress through your building energy audits—a key step in planning your project (see the factsheet in this series, [How to Undertake Deep Energy Retrofits](#))—collaborate with your energy expert to collect information about the requirements and criteria for possible funding sources. Work towards meeting those requirements.

## Use your business case to secure funding

After completing these steps, you're ready to create your final business case. A final business case will help you in securing funding for your project. Energy-efficiency projects are building renovations with benefits. Not only do you get access to incentives and grants from energy suppliers and multiple orders of government; you also get lower utility bills and O&M costs, which lowers the total cost of ownership of your buildings. Payback period is a great indicator during the earlier stage of project design, but before talking to lenders (if you are seeking a loan) it's a good idea to calculate three important financial metrics: net present value, debt ratio, and debt service coverage ratio.

 <b>Net present value</b>	 <b>Debt ratio</b>	 <b>Debt service coverage ratio</b>
<p><b>Discounted lifetime benefits (e.g. energy bill savings, O&amp;M savings) minus all upfront costs</b></p> <p>The higher the NPV, the more financially attractive the project.</p>	<p><b>Loan(s) being sought as a percentage of the initial project cost</b></p> <p>A low debt ratio demonstrates your ability to secure a large cash down payment, perhaps in the form of grants and incentives.</p>	<p><b>Net operating income (including energy bill savings and O&amp;M savings) divided by total debt service (principal and interest payments)</b></p> <p>A high debt service coverage ratio shows lenders that you will have the ability to make your payments.</p>

Energy-efficiency projects entail risks and uncertainties. You want to be prepared for them, and your potential lenders will demand evidence that you have risk management strategies in place.

## Key risks and mitigation strategies

### **Project costs are higher than expected**

There is a degree of uncertainty around any estimate and forecast. You can mitigate the risk with a contingency budget. Keep in mind that investment-grade audits typically aim for an error of  $\pm 20\%$  in estimates of costs and savings. Some measures may need to be studied further. Be forthcoming with your contractors and share any available information. It's also worth the effort to carefully review their assumptions. Budget an appropriate amount for M&V and commissioning.

### **The project fails to deliver promised energy bills savings and O&M savings**

For portfolio-level projects, consider doing business with an energy service company (ESCO). They typically offer a performance guarantee, albeit for a premium, that can protect you against energy performance risk. Plan and implement performance measurement and verification (M&V) post-construction. M&V holds all parties accountable for delivering on promises and allows you to identify problems quickly and correct them. M&V may also be required to prove savings for incentive and grant programs. Because M&V has its own cost, it should be focused on the projects with the largest and most uncertain savings potential.

## Get started!

Consult the following resources and factsheets in this series for tips on how to plan and implement your project:

[FCM's Sustainable Affordable Housing initiative](#)

[Why undertake energy-efficiency retrofits](#)

[How to undertake deep energy retrofits](#)