

## Core Financial Measures

Measure	Explanation	Pros	Cons
Comparison to another building on a usage per square foot basis	Examining the results for a building that has similar properties	Quick way of determining whether to look at a retrofit – but comparison must be made to a retrofitted building	No building is exactly the same – footprint and orientation of the building can have an impact. Better to look at a pool of buildings
Simple payback	The time it takes to return back to the organization the funds invested through the savings generated	Easy to apply and a good risk indicator – how long will my capital be at risk? For projects beyond 4–6 years, results more uncertain	<p>Ignores continuing cash flows beyond the payback period and the “time value of money” (what it costs to use capital for these purposes).</p> <p>Biased against investments for which the highest returns actually occur in the 8-10 year time frame. Short-term focus can therefore rule out better decisions.</p> <p>More of a “take out” rather than “invest in” approach to running the business and biased against the very measures that are important to long-term success.</p>
Financial payback	The time it takes to return the funds invested plus the financing costs through the savings generated	Reflects more of the cost of capital in the investment equation	Cons very similar to simple payback

Measure	Explanation	Pros	Cons
Internal rate of return (IRR)	The interest rate that brings the value of the investment back to zero – the output of the calculations is the interest rate that achieves this result. If the organization has to achieve or exceed a hurdle rate (say an <i>IRR of 6%</i> ) and the result of the calculations shows a rate of return greater than that value, the project has positive cash flows and a positive return	Good measure that has practical application and clearly reflects the time value of money	Needs to be combined with NPV
Net Present Value (NPV)	The value of an organization will increase by the amount equal to the present value today of future cash flows. Therefore, if the increase in NPV is positive, the increase in the value of the organization (or business) has increased by the same amount.	Clearly focuses on the time value of money and confirms (or denies) the net positive value of the investment	Some work involved: Needs to be combined with IRR and payback to provide an overall picture of the project – calculating the cost of capital can become an intellectual exercise!
Increase in building value using Net Operating Income (NOI)	An investment in capital equipment that improves NOI improves the value of the building. That value improvement will depend on the “CAP” rate (see note below). Divide the NOI by the cap rate to see the increase in value.	Concentrates decision on long term and short term value of building $100,000/6\% = \$588,000$ (17 years to pay for itself)	Cost of appraisal – methods vary somewhat – cap rates vary

Life Cycle Costing	Comprehensive measure that encompasses the expected cost and expected repair and replacement costs over an extended period of time	Comprehensive approach takes into account most reliable measures.	Usually needs a specialist and significant research is required on product longevity. Many assumptions are used with regards to escalation of prices
Cost of waiting for incentives – lower rates	Demonstrates the benefit of moving forward with the decision to retrofit		

**(1) The “Cap Rate”**

An investment in equipment that improves energy efficiency and increases the building’s cash flow will both pay back the original investment and increase the value of the building.

Once the investment is paid back the additional cash flow may continue on for many years, to the benefit of the owner. For example, consider a \$500,000 investment yielding a \$100,000 improvement in cash flow. The investment will be repaid in five years with improved cash flow potentially continuing for many years after that.

The amount of value improvement depends on the capitalization rate (“CAP rate”). The value of a commercial building is based on the expected earnings expressed as a percentage return. For example if a building yields a net income of \$70,000 and the market expects a return of 7%, the value of the building is \$1 million ( $\$1 \text{ million} \times 7\% = \$70,000$ ). The expected return is called the CAP rate.

To determine the increase in the value of the building, we divide the increase in cash flow by the CAP rate. For the example above, that is \$100,000 in additional cash flow divided by 7% for an improvement in building value of \$1.4 million. The net benefit for the building owner, therefore, is \$900,000 ( $\$1.4 \text{ million} - \$500,000$  invested in upgrades) or, put another way, an investment return of 180%.

These numbers are real and achievable. Therefore it obviously makes good business sense to reduce the waste of non-renewable energy usage.