Energy management investments

When your organisation decides to invest in increasing its energy efficiency it should apply exactly the same evaluations to reducing its energy consumption as it applies to all its other investments.

Before your organisation commits itself to an energy reduction investment program, it is important to ensure that:

- you are getting the best performance from existing buildings, plant and equipment;
- your energy charges are set at the lowest possible tariffs;
- you are using the most appropriate fuels as efficiently as possible;
- good housekeeping practices are being regularly employed.

On the basis that these energy and cost saving measures are in position, let's now examine the process that helps you decide when and where to invest in energy efficiency, and shows you how to predict a return on any particular investment measure.

There are basically two different investment routes you can take. The first and obvious type is where the investment decisions are carried out by your organisation as part of the regular operation of the business—the rest of this section is based on this route being taken.

However, there is another possibility. There are companies that will invest in improving the energy efficiency of your operation and will receive payment from the energy cost savings they can make for you. You will usually also receive some immediate financial benefit and once the contract is complete (usually five to seven years) you will receive all of the benefits. This third party financing is provided by an energy service company and is becoming well established in Australia (performance contracting). The Energy Smart Allies Directory lists companies that provide these types of services under its Sustainable Energy Services section. The process works best when a systematic approach is applied to locating investment opportunities.

Identifying opportunities

Experience indicates that the most common approach is to tackle those areas with the largest energy expenditure first. Of course proportionately larger savings can be made from big bills than from smaller ones. This can be a good but limiting tactic to show that energy management activities provide value for money.

Your first objective is to identify areas in your organisation where improvements can be made. Depending on your type of organisation, you will need to analyse your energy consumption inputs and flows for each of your premises, plant and equipment, with the aim in mind to locate those areas where energy efficiency can be improved. The Energy Smart Allies Directory can then help you to locate organisations that will assist you in introducing measures to improve your systems, plant and equipment. Sustainable energy service companies can also help you to identify profitable opportunities, quantify savings and facilitate their implementation.

High quality, off-the-shelf energy efficient technologies are now widely available. The Energy Smart Allies Directory provides a comprehensive listing of companies that can supply, install and commission different types of energy efficient systems and technologies. The directory also contains checklists for assessing your operations.

Setting priorities

Your second objective is to establish the order of investments. To assist your endeavours here, consider the following factors for each priority:

- the energy consumption per unit of the building or piece of equipment;
- its current state of repair and energy efficiency;
- the residual life or length of tenancy of the building;
- the effect of any proposed initiative on staff attitudes and behaviour.

You need to give close attention to each of these factors when you are setting your investment priorities.

An important issue to remember is that when a new building or manufacturing process is being sought, or refurbishment work is being undertaken on existing premises, it is an excellent time to invest in energy efficiency. At such times, the marginal cost of increasing energy efficiency can be very low and highly profitable in terms of returns on your investment.

Investment evaluation

The aims of investment evaluation are:

- to determine which investments make the best use of available money;
- to ensure optimum benefits from any investment made;
- to minimise the risk of making investments;
- to provide a basis for subsequent analysis of the performance of the investment.

Since most organisations are likely to have more viable opportunities for investment than they have money to spend, they have to decide where and how to invest their money to its best advantage.

Your third objective is to make the final decision about the selection of the appropriate energy saving measures.

To assist you in making that decision, there are four common evaluation techniques (if you do not have the financial expertise to calculate these figures yourself, you will need to ensure that you have access to people who can employ them on your behalf). These are:

1. Average Rate of Return
2. Payback Period
3. Internal Rate of Return
4. Net Present Value

Average Rate of Return (ARR)

This technique represents the ratio of average annual profits to the initial cost of the project. It is quick and simple to calculate and can be used where two or more alternatives generate similar income streams and costs, but differ because of the initial capital outlay. Once the average rate of return has been calculated it can be compared with alternatives, and against your organisation's required rate of return.

However, it is limiting in its application, as it represents only approximations for assessing the economic worth of the investment, rather than actual results. Furthermore, it fails to recognise the timing of cash inflows and outflows.

Payback Period

The Payback Period evaluation technique is also an approximate method of assessing the economic worth of a project. Put simply, the payback period represents the time it takes to recover the initial outlay of funds for the purchase of energy saving equipment.

It too has shortcomings, the principal one being that it fails to consider cash flows after the payback period, as well as the magnitude and timing of cash flows during the payback period. As a result, it is not a good benchmark of profitability of a project. However, it is usually argued that it provides some insight into the risk of a project.

Internal Rate of Return (IRR)

This calculation provides additional information to assist in making a decision to either reject or accept an energy management investment proposal.

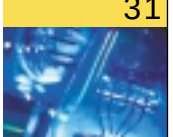
This technique generally provides a more objective basis for selecting investment projects. It does so because it considers both the magnitude and timing of future cash flows. Moreover, the IRR is a measure of profitability of a project and indicates whether the funds to be spent on energy saving investments could be better deployed elsewhere in the business, either through an alternative project, or by placing the funds in an interest bearing deposit.

The IRR technique assesses an investment against a predetermined benchmark. This benchmark is the required rate of return a business sets itself for investment proposals. This rate can be the net profit, or gross profit margin, of the business, or it may represent the interest rate the business receives on funds placed at its bank. The selection of a rate of return will vary from organisation to organisation and like other benchmarks, you will need to consider all the peculiarities of your business in determining a suitable rate of return.

Net Present Value (NPV)

This technique suggests that all future net cash flows are discounted back to their present value. This counters the affects of inflation.

With the Net Present Value technique, the business is provided with cash flows and the required rate of return. A formula is used to determine whether the NPV of those cash flows is equal to or greater than zero. If the NPV is equal to or greater than zero, then the investment meets the business standards and it could be accepted.



CASE STUDY 7

Arnott's Biscuits on the outskirts of Sydney have completed a lighting upgrade of their factory office areas. For an investment of $27 000 the company is saving $13 740 per annum. By changing the lamps to new generation triphosphors, they were able to reduce the number of lamps by 30%. They installed time delay switches, occupancy sensors and devices that detect daylight to control lighting levels. All of these measures localise the control of the lights so they are not running unnecessarily. 'I was not expecting this single project to be markedly noticeable on our million dollar electricity bill,' Mike Dwyer, at Arnott's said. 'It was a reasonably small project, with a $27 000 investment, but I know it's having an effect. We have more efficient lighting, we have fewer lamps and early indicators show we've got an internal rate of return of 25.4%.'

Conclusion

The decision-making process does not end with these techniques. Additional factors such as economic uncertainty, inflation, taxation, depreciation and investment allowances are ever present.

Additionally, when your organisation decides to invest in increasing its energy efficiency, it should apply exactly the same evaluations to reducing its energy consumption as it applies to all other investments. It should not require a faster rate of return on investment in energy efficiency than it demands elsewhere. Unfortunately, this is often not true in practice. Because of the multiple benefits of energy efficiency (e.g. productivity gains, lower maintenance costs, reduced environmental impact) there is good reason for such projects to generate a slower rate of return on investment.

Checklist of potential costs and benefits when considering the purchase of energy saving equipment

Potential cost savings

- resale value of redundant equipment
- resale value of replacement equipment
- does the purchase of the equipment entitle you to any R&D allowances?
- lower maintenance costs
- increased time between replacement of parts (= lower costs)
- lower energy costs
- reduction in energy to provide associated services

Potential costs

- feasibility study to select equipment
- purchase price
- installation costs
- ongoing maintenance costs
- availability of qualified support and back up in relation to spares
- down-time and set up costs
- staff training costs and training guaranteed charges

Ranking of investments

Having undertaken the financial evaluation techniques outlined, your organisation may be presented with a number of alternatives that meet the required rates of return, payback and net present value. Deciding which investment is the best for your organisation sometimes presents you with a difficult decision.

In instances where returns are similar, it may be necessary to undertake further sensitivity analysis. However, in all instances the investment that aligns closest to the strategies of the business, as well as delivering efficient and reduced energy use, should be the investment that receives the highest priority.

Tips

In building a case for investment, you need to identify how energy savings can be maximised for your organisation. To do this, work out whether, in your own case, the benefits of increased energy efficiency are best sold as:

- reducing operating/production costs
- increasing employee comfort and well-being
- improving cost-effectiveness and/or profits
- protecting under-funded core activities
- enhancing the quality of customer service
- protecting the environment
- demonstrating good corporate citizenship