ENERGY AND GREENHOUSE MANAGEMENT TOOLKIT

6

MODULE 6

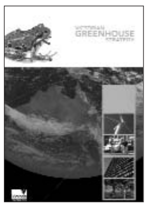
COST EFFECTIVE AND FEASIBILITY ANALYSIS

Victoria
The Place To Be

The *Energy and greenhouse management toolkit* is a Victorian Government initiative developed in partnership by EPA Victoria and the Sustainable Energy Authority Victoria, and funded through the Victorian Greenhouse Strategy.

EPA Victoria
EPA is a Victorian State Government statutory authority established to enable the safe clean and sustainable environment that Victorians seek. Based on a philosophy that prevention is better than cure, EPA Victoria takes an integrated approach to delivering its mission by providing environmental leadership, promoting public awareness and working with all sectors of the community. It also provides best practice guidelines and standards, together with regulation and policing where required.
For further information visit www.epa.vic.gov.au

Sustainable Energy Authority Victoria
The Sustainable Energy Authority Victoria (SEAV) is a State Government statutory authority. SEAV's objective is to accelerate progress towards a sustainable energy future by bringing together the best available knowledge and expertise to develop leading-edge initiatives which provide Victorians with greater choice in how they can take action to significantly improve energy sustainability.
For further information visit www.seav.vic.gov.au



Victorian Greenhouse Strategy (VGS)
Climate change is an issue which impacts on the whole community, including individuals, business and all levels of government. If a truly sustainable solution is to be achieved, all members of the community must play their part. The VGS will facilitate the establishment of partnerships, and build capacity throughout the community for greenhouse action. The development of the VGS has benefited from extensive public consultation and is a significant first step on the long road to addressing the threat of climate change.
For further information visit www.greenhouse.vic.gov.au or call the Department of Natural Resources and Environment Customer Service Centre on 136 186.

Cost effective and feasibility analysis.

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Contents

Energy and greenhouse management toolkit

Introduction

This module provides a framework for the financial evaluation of energy and emissions reduction initiatives. When evaluating any such project, the decision to proceed should occur within the broader decisionmaking process of your business.

To ensure the successful implementation of any new energy saving or emissions reduction measure you should, as a minimum:

- perform a detailed cash flow of each alternative;
- undertake the financial appraisal of each alternative using the methods outlined;
- consider any depreciation, investment allowance and taxation issues; and
- implement and monitor the performance of the project with the aid of suitable reporting mechanisms.

A number of evaluation techniques are detailed in this module. Although the examples demonstrated have been kept simple, the principles put forward remain relevant to more complex projects.

Evaluation of projects

Opportunities to improve energy efficiency and reduce greenhouse emissions are often opportunities to cut costs and improve services as well. Moreover, some projects are more easily sold on the basis of improved services with energy and cost savings as mere bonuses.

Financial evaluation is only one element of a comprehensive evaluation of an option. Other criteria may include safety, health, quality, environmental, social and other non-financial outcomes. For instance, if an energy efficient greenhouse reduction measure meets financial as well as safety criteria, this creates a strong case for adoption.

Different financial thresholds may be applied to different kinds of decisions. Apply the type of criteria usually applied to core activities to energy management projects.

Many opportunities for reducing greenhouse gas emissions are missed because their financial attractiveness is hidden by:

- not considering all the costs, and basing decisions on purchase price alone;
- not considering all the benefits;
- expecting investments to pay for themselves too quickly; and
- ignoring the low risk of investments in waste and energy minimisation, which makes actions with even a moderate return very attractive.

CONSIDER ALL THE COSTS

Typically, the initial purchase cost is the prime consideration when investing in new equipment. A choice made on this basis alone can result in paying too much every month for many years. This is a particular problem where the capital budget and future operational budgets are treated separately, which can occur with anything from the purchase of a small printer to large building projects. A measure that increases the capital cost beyond the budget limit may be rejected, regardless of the potential for future savings.

Running costs

Consider all the running costs over the life of the equipment or process. These may include:

- energy (e.g. electricity, gas, transport fuel);
- materials (e.g. consumables, maintenance, water, waste disposal); and
- labour for operation, maintenance, administration, etc.

Since many investments in reducing greenhouse emissions involve an up-front expenditure balanced by future savings in operational costs, it is extremely important to specify an appropriate lifetime over which to calculate the savings. Failure to fully consider future savings could lead to rejection of a worthwhile emissions reduction measure.

For example, the price premium for purchase of high-efficiency electric motors can be recovered quickly, with a motor typically using energy valued at ten times it's capital cost in each year of operation.

True capital costs

While adopting a more energy efficient solution may increase direct capital costs, it will usually create capital savings elsewhere. For example, a more efficient lighting system could reduce the capital cost of a building's electrical distribution and cooling systems due to the reduced electrical and heat load requirements. The true capital cost of equipment and systems can only be assessed when all 'avoided' capital costs are subtracted from the more obvious purchase price.

COUNT ALL THE BENEFITS

Energy and waste management actions often have benefits other than the obvious reductions in direct costs. For example, converting from standard fluorescent tubes to triphosphor tubes would:

- increase lamp life, thereby reducing the cost of ordering, purchasing, storing and installing replacement lamps;
- improve lamp light output, potentially allowing the use of fewer fittings; and
- improve lighting reliability.

Some of these ‘flow-on’ benefits are easy to evaluate, others will be hard to quantify but may help get the investment approved. Product and equipment suppliers should be able to help identify these additional savings.

PROFITABILITY THROUGH ENERGY EFFICIENCY

Companies can significantly improve profitability by improving overall energy efficiency in their operations. The Ready Reckoner chart (Figure 1) shows a company’s boost in profitability based on existing profitability and current energy costs as a proportion of total costs. This assumes a 25% energy efficiency gain, the average project payback is three years and the life of the project is ten years.

For example, if a company’s current energy costs as a proportion of total costs is 3% and their existing profit earning before interest and tax (EBIT) is 5%, this will lead to approximately a 10% increase in company profit (EBIT), as highlighted in Figure 1.

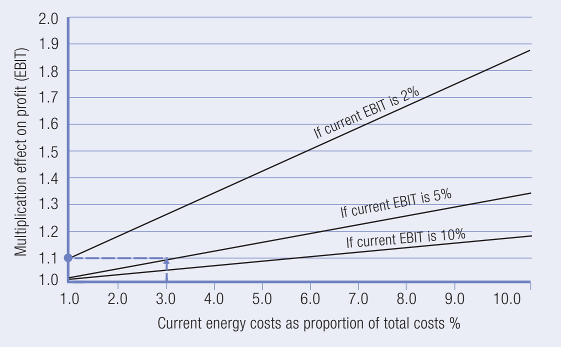

Figure 1: Boost to profit margin from a 25% energy efficiency gain

ALLOW PROJECTS ENOUGH TIME TO PAY FOR THEMSELVES

In Australia, energy management and greenhouse emission reduction initiatives are often expected to pay for themselves in just one or two years. In Europe, many organisations consider an eight-year period to be satisfactory.

Short payback periods may be justified for investments where opportunities for increased revenue or reduced costs will be created for a limited time only. Management must be confident it will recoup its money quickly. For example, advertising expenditures must repay their costs over a short period.

However, energy efficiency projects often have a life of ten to 50 years, as energy efficiency measures continue to provide returns long after the initial investment has been paid back. Indeed, to apply a short payback criterion to a long-lasting measure is false economy, as options with much larger lifecycle savings may be rejected.

The term ‘payback’ doesn’t tell the whole story. ‘Return on investment’ is a better concept as it acknowledges that the financial benefits start flowing immediately, instead of after the ‘payback period’ has elapsed.

Return on investment

Most organisations are likely to have more energy management opportunities for investment than they have money to spend. They have to decide where and how to invest funds to their optimum advantage.

The return is the net benefit each year resulting from the investment. This is expressed as a percentage of the real amount invested (the purchase price minus any ‘avoided’ capital costs). This return can be compared with the cost of capital, or the return that could be gained from alternative investments. For example, an organisation may gain a return of 6% p.a. (or 4% real return after subtracting 2% inflation) by investing funds in banks. In principle, investment in an energy-saving measure that achieves a higher than 4% p.a. real rate of return on investment over its life would bring a greater return than the standard investment strategy.

More sophisticated methods of calculating rates of return on investment can also be used. These can include factors for depreciation of equipment value, inflation, etc. Liaise with your financial group to find out the methods they use and, if they place insufficient emphasis on operating costs, work with them to revise their methods.

The experience of SEAV and its NSW counterpart SEDA in working with hundreds of companies has shown that many energy efficiency projects can deliver internal rates of return of over 39% and payback periods of 1–2 years. Furthermore, some leading companies from a range of industry sectors have implemented projects with paybacks of over five years while still fully satisfying their return on investment criteria for capital projects.

The four following evaluation techniques are the most common to assist you in making a decision on investing funds.

AVERAGE RATE OF RETURN (ARR)

This technique represents the ratio of average annual profits to the initial project cost. It is a simple calculation that can be used to compare alternative projects that generate similar ongoing costs and benefits, but differ because of the initial capital outlay. The ARR can also be compared against the organisation's required rate of return. It is an approximate assessment of a project's economic worth.

Applying this technique to the cash flows in Tables 1 and 2 the following rates of return are calculated.

Table 1: Calculating average annual profits

	Project A	Project B
Year 1 savings	$11 200	$2 000
Year 2 savings	$9 450	$4 000
Year 3 savings	$5 350	$28 600
Average annual profits of	$26 000/3 = $8 666	$34 600/3 = $11 533

Table 2: Calculating average rate of return

	Project A	Project B
Average annual profits	$8 666	$11 533
Cost of energy saving asset	$20 750	$26 750
Average rate of return	41.7%	43.1%

If the company's benchmark standard is set at 42%, Project A fails to meet the rate of return. Therefore in this instance Project B appears to be a better project and would probably be selected over Project A, if no other evaluation was done.

PAYBACK PERIOD

Payback period is a simple and approximate method of evaluating the benefits of implementing energy saving measures, such as replacing one piece of equipment with another. However, it takes no account of the magnitude or timing of cash flows during or after the payback period.

Essentially, the payback period represents the time it takes for the savings from investment in energy saving equipment to equal the initial expenditure. Shorter payback periods mean that the benefits from improvements will recover the costs sooner.

$$\text{Payback period} = \frac{\text{Cost of energy saving asset}}{\text{Annual cash flows}}$$

Applying this technique to the sample cash flows in Tables 1 and 2 is a little more difficult to calculate because the annual cash flows vary in each year for both projects. For Project A the payback period is approximately two years, while for Project B it is two years 8.75 months. These timeframes have been calculated as follows.

Project A

In Year 1 and 2 the annual cash flows are $11 200 and $9450. The addition of these two amounts equals $20 650. Therefore after two years $20 650 of the cost of the investment of $20 750 has been recouped. The balance of $100 will be recouped over the first few days of the third year.

Project B

In Years 1 and 2 the annual cash flows are $2000 and $4000. The addition of these two amounts equals $6000. Therefore after two years $6000 of the cost of the investment of $26 750 has been recouped. The balance of $20 750 will be recouped over $20 750/ $28 600, which equals 0.73 years or 8.75 months.

INTERNAL RATE OF RETURN (IRR)

The internal rate of return is the discount rate at which the benefits equal the costs (i.e. net present value = 0). This measure indicates whether funds to be spent on energy saving investments could be better deployed in other projects, or in an interest bearing deposit. Investments are assessed against a required rate of return that a business sets itself for proposals. This required rate might reflect the profit margin of the business or the interest rate at which money is borrowed, and is determined by the organisation.

In regard to Projects A and B, Tables 3 and 4 show an indicative cash flow to determine the IRR for these projects.

Table 3: Indicative format for cash flow statement, Project A					
Year	**0**	**1**	**2**	**3**	**Total**
ANTICIPATED COSTS $					
Feasibility study	3 200	0	0	0	3 200
Purchase of asset	20 750	0	0	0	20 750
Ongoing training	0	0	650	650	1 300
Re-training	2 100	0	0	0	2 100
Installation costs	1 550	0	0	0	1 550
Maintenance costs	0	750	850	950	2 550
Miscellaneous	650	1 250	1 250	1 250	4 400
	28 250	**2 000**	**2 750**	**2 850**	**35 850**
ANTICIPATED SAVINGS $					
Sale of asset	5 500	0	0	0	5 500
Staff savings	0	6 500	5 500	1 500	13 500
Power costs	0	6 700	6 700	6 700	20 100
	5 500	**13 200**	**12 200**	**8 200**	**39 100**
Net cash flows	**(22 750)**	**11 200**	**9 450**	**5 350**	**3 250**

Table 4: Indicative format for cash flow statement, Project B					
Year	**0**	**1**	**2**	**3**	**Total**
ANTICIPATED COSTS $					
Feasibility study	3 200	0	0	0	3 200
Purchase of asset	26 750	0	0	0	26 750
Ongoing training	0	0	350	350	700
Re-training	2 100	0	0	0	2 100
Installation costs	1 550	0	0	0	1 550
Maintenance costs	0	750	850	950	2 550
Miscellaneous	650	1 250	1 250	1 250	4 400
	34 250	**2 000**	**2 450**	**2 550**	**41 250**
ANTICIPATED SAVINGS $					
Sale of asset	5 550	0	0	0	5 500
Staff savings	0	0	0	20 650	20 650
Power costs	0	4 000	6 450	10 500	20 950
	5 500	**4 000**	**6 450**	**31 150**	**47 100**
Net cash flows	**(28 750)**	**2 000**	**4 000**	**28 600**	**5 850**

Table 5: Net cash flows (from Tables 3 and 4)					
Year	**0**	**1**	**2**	**3**	**Total**
Project A	($22 750)	$11 200	$9 450	$5 350	$3 250
Project B	($28 750)	$2 000	$4 000	$28 600	$5 850

The internal rate of return for Project A can be calculated by solving the following equation:

$$22\,750 = \frac{11\,200}{(1+r)^1} + \frac{9450}{(1+r)^2} + \frac{5350}{(1+r)^3}$$

The internal rate of return for Project B can be calculated by solving the following equation:

$$28\,750 = \frac{2000}{(1+r)^1} + \frac{4000}{(1+r)^2} + \frac{28\,600}{(1+r)^3}$$

To find the value of 'r' in this equation, where 'r' represents the internal rate of return, requires the use of:

- an established computer program (such as Excel or Lotus 123);
- a financial calculator which incorporates internal rate of return; or
- the basic trial and error method.

Table 6 can help to determine the approximate IRR based on the life of the project and the payback period.

It should also be noted however, that financial calculators have the IRR formula built in, which makes the process of calculation relatively straightforward. The cost of such a calculator is very small in relation to the cost consequences of making the wrong investment decision.

The IRR technique assesses an investment proposal against a pre-determined benchmark. This benchmark is the required rate of return a business sets itself for investment proposals. The selection of a rate of return will vary from business to business and industry to industry and, like other benchmarks, you will need to consider all peculiarities of your business in determining a suitable rate of return.

Accordingly, the selection of a required rate of return can be somewhat arbitrary and hence be a limiting factor of this technique.

Having identified a required rate of return you can now proceed to calculate the IRR. If a project's IRR is greater than your required rate of return then it can be accepted. If, however, it falls below the required rate of return then it should be rejected. Acceptance of such a project would result in the lowering of the performance of the business against the standards already used.

In this example Project A returns 7.94% and Project B 6.96%. Furthermore, if the business benchmark was greater than 7.94%, then both projects would be rejected as the net present value of cash flows is negative, and hence the benchmark has not been achieved. If, however, the benchmark was 7.5%, then Project A would be accepted and Project B rejected. That is, Project B has not reached the required benchmark.

NET PRESENT VALUE (NPV)

This technique accounts for the changing value of money over time. Cash flows of both the benefits and costs over the life of the project are discounted at a nominated interest rate to reflect their present day value. If the benefits exceed the costs, the NPV will be positive. The project is therefore viable and could be accepted. If NPV is negative, the project should be rejected. An advantage of the NPV technique is that alternative energy management projects can be ranked in order of attractiveness. This is valuable when considering projects that differ markedly to each other in scope or the technologies used.

Table 6: Internal rates of return that are equivalent to given payback periods

Payback period (year)	Investment lifetime (years)							
	3	5	7	10	15	20	25	30
1	83.9	96.6	92.9	99.9	100	100	100	100
2	23.4	41.0	46.6	49.1	49.9	50.0	50.0	50.0
3	0	19.9	27.1	31.1	32.9	33.2	33.3	33.3
4	0	7.93	16.3	21.4	24.0	24.7	25.0	25.0
5		0	9.2	15.1	18.4	19.4	19.9	19.9
6			4.01	10.6	14.5	15.8	16.5	16.5
7			0	7.07	11.5	13.1	14.0	14.0
8				4.28	9.13	10.9	12.1	12.1
9				1.96	7.19	9.20	10.6	10.6
10				0	5.56	7.75	9.31	9.31
12					2.93	5.45	7.34	7.34
15					0	2.91	5.22	5.22
20						0	2.84	2.84

Note: Implicit real discount rates as function of payback period and investment lifetime (percent per year)

NPV can be very useful when evaluating large capital projects such as a cogeneration plant, where the payback period might be in the range of five to ten years and considered unattractive, yet the NPV is positive over the 25 year life of the plant and could therefore make the plant a favourable investment.

The effort of working out an NPV is probably not justified for initiatives where you've calculated the return on investment as relatively high (e.g. over 25% p.a.), because in such cases the NPV will always be higher than the 'do-nothing' option. NPV calculations are probably not necessary for small investments either (e.g. less than $2000).

Net present value can be useful where:

- the return on investment is close to your organisation's 'hurdle rate';
- future cash flows will be uneven (for example, equipment will be replaced or overhauled); or
- the prices of inputs (labour, electricity, gas, liquid fuels and parts) are increasing at different annual rates.

Calculating an NPV involves specifying an annual 'discount rate' for the estimation of future savings (the rate at which the value of future savings is reduced). This discounting is meant to offset the returns that could be gained by investing the same money in alternative investments. But applying a high discount rate can heavily reduce the value placed on future savings. For example, at a discount rate of 5% p.a., a dollar saved 15 years from now is valued at 48 cents, but at a rate of 20%, that dollar saved is valued at only 6.5 cents. Therefore, when calculating the NPV of proposed measures to reduce greenhouse emissions, use a range of discount rates so that informed judgements can be made.

For the following example a benchmark of 10% is assumed. Accordingly, after performing the calculation Project A has a discounted cash flow of ($739). Because this is negative, the project does not meet the investment standards of the business.

Project A

NPV = (Discounted cash flows) – (initial cost of the project)

$$= \left(\frac{11\,200}{(1.1)^1} + \frac{9450}{(1.1)^2} + \frac{5350}{(1.1)^3}\right) - \left(\frac{22\,750}{1}\right)$$

= $(739)

Project B

NPV = (Discounted cash flows) – (initial cost of the project)

$$= \left(\frac{2000}{(1.1)^1} + \frac{4000}{(1.1)^2} + \frac{28\,600}{(1.1)^3}\right) - \left(\frac{28\,750}{1}\right)$$

= $(2138)

Project B is also negative. At a benchmark rate of 10%, both Projects A and B would be rejected as net discounted cash flows are negative. This shows the effect discounting has on cash flows as both Projects A and B had positive undiscounted cash flows of $3250 and $5850 respectively, yet following discounting both projects appear unprofitable.

Assuming that a benchmark rate of 7% was required by the organisation, Projects A and B would then be assessed as follows.

Project A

NPV = (Discounted cash flows) – (initial cost of the project)

$$= \left(\frac{11\,200}{(1.07)^1} + \frac{9450}{(1.07)^2} + \frac{5350}{(1.07)^3}\right) - \left(\frac{22\,750}{1}\right)$$

= $338

Project B

NPV = (Discounted cash flows) – (initial cost of the project)

$$= \left(\frac{2000}{(1.07)^1} + \frac{4000}{(1.07)^2} + \frac{28\,600}{(1.07)^3}\right) - \left(\frac{28\,750}{1}\right)$$

= $41

This would indicate that the best investment decision would be to accept Project A and reject Project B. This is consistent with the conclusions reached using the IRR technique.

CONSIDER RISK AS WELL AS RETURN

What your organisation regards as an acceptable rate of return (sometimes called an investment 'hurdle rate') generally depends on the riskiness of the investment—the higher the risk, the higher the return needed to justify the investment.

With energy efficiency projects, the risk is normally very low because:

- the return on investment is relatively certain (as long as the building or equipment continues to operate the savings will be realised); and
- potential savings can be calculated relatively accurately (based on projected energy prices and past experience of energy savings potential).

This low risk means that energy management programs can be considered attractive investments even with a modest return. You might therefore consider implementing such programs wherever the annual return on funds invested is appreciably above the cost of capital. This could range from the 'lost opportunity' cost of not receiving interest on a bank deposit (say 5% p.a.) to the overdraft rate (say 15% p.a.).

CHECKLIST OF POTENTIAL COSTS AND BENEFITS WHEN PURCHASING ENERGY SAVING EQUIPMENT

Potential cost savings

- Resale value of the redundant equipment
- Resale value of the replacement equipment
- Can sales tax exemptions be obtained either directly or indirectly through associated entities?
- Are the inputs for the equipment sales tax exempt?
- Does the intended purchase of equipment entitle you to any research and development allowances?
- Can the business claim any Government subsidies in relation to purchaser training of staff?
- Does the vendor of the machine offer any packaging deals in relation to the purchase? For example, extended warranty programs, comprehensive service arrangements, agreements to re-purchase machinery at a later date, and ongoing services at a reduced rate or sliding scale.
- Is there a possibility of sub-contracting the equipment out?
- Can savings be made by the suppliers of inputs?

Potential costs

- Feasibility study to select the equipment
- Purchase price
- Freight, transportation and installation costs of the equipment
- Ongoing maintenance costs
- Waiting period for spare parts
- Availability of spare parts due to highly specialised equipment components
- Availability of qualified support and backup in relation to spares
- Cost of upgrades, particularly relevant to rapidly changing industries
- Future capacity and expansion capabilities
- Down time and set-up costs
- Staff training costs and training guarantee charges
- Unavailability of instruction manuals
- Insurance
- Marketing of enhanced capabilities and efficiencies
- Royalties and licensing agreements
- Changed supplier arrangements and costs associated with entering into new agreements.

When purchasing new equipment it may be necessary to incur costs in other areas of the business to accommodate the new equipment. Listed below are examples of such costs.

- Environmental costs, such as clean up of existing area, or new waste disposal procedures
- Conditions of the factory lease and zoning laws
- Additional soundproofing
- Modifications to the factory floor, provision of dust free areas, low lighting, heating etc.
- Enhanced security arrangements and other physical safeguards

Energy performance contracting

Energy performance contracting is a new and emerging service in Australia. Widely used in North America and Europe for more than 20 years, it is an innovative way for businesses to cut their energy bills and improve their equipment.

Energy performance contracts are an effective way of providing new energy efficient capital equipment, energy savings, or reducing maintenance costs. Under an energy performance contract, the contractor generally provides the capital, equipment installation and maintenance for a facility. In exchange, the contractor receives a fee over the length of the contract, which is generated by the equipment energy savings.

Overseas experience has shown that performance contracting is a convenient and low risk way to cut energy use and reduce the costs of maintenance and plant ownership. Typically, energy performance contracts can be used for industrial sites, hospitals, office buildings, hotels and shopping centres.

The best applications for an energy performance contract are in high capital cost equipment and systems with high savings-to-investment ratios.

A performance contract might typically enable energy saving measures such as those listed below, but without the facility owner having to make any upfront financial commitment.

- Computerised energy management systems
- Centralised control of heating, ventilation and air conditioning equipment
- Upgraded operational equipment or building controls
- Repair and replacement of ageing systems
- Energy efficient lighting retrofits
- Equipment maintenance
- Cogeneration facilities

HOW IT WORKS

A contractor will design, construct and, in many cases, finance improvements to the energy efficiency of a client's facility. The work and services the contractor undertakes are paid for by the savings which are gained from using less energy, operating more efficiently and reducing maintenance costs.

The contractor takes responsibility for analysis, design, construction, commissioning, performance monitoring, and operator training. As in many outsourcing situations, financial risk is often transferred to the contractor.

For example, an industrial plant may have limited resources for improving the energy efficiency of its equipment. Working with a contractor, this organisation can upgrade its energy management system and equipment. As a result the plant will use less energy, which means savings on the annual energy bills. What happens to the savings will depend on the initial agreement between the company and the contractor. The cost of upgrading or buying new equipment, the requirement for upfront financing, and the way savings are split can vary according to the contract specifications.

TYPES OF ENERGY PERFORMANCE CONTRACTS

There are several types of energy performance contracts.

- **Fixed fee:** The client and contractor agree on capital and upgrading works, which are then undertaken by the contractor. As a result, the client makes the savings and, in turn, pays the contractor a set regular fee for the ongoing service provided. This option does not require a large upfront investment from the client.
- **First out:** The energy contractor retains 100% of the energy savings until all project costs, including an agreed upon profit, are paid out. The contractor generally sells the plant to the client at residual value when the capital cost is paid off.
- **Shared savings:** The contractor and the client each receive a fixed percentage or dollar value of the energy savings over the duration of the contract.
- **Chauffage:** The contractor pays the energy bills over the life of the contract and the client pays a fee only for the delivered service on a regular basis (much like many existing building maintenance contracts).

WHAT TO LOOK FOR IN A CONTRACT

A typical energy performance contract would include:

- a full energy audit, including an inventory of facility and energy systems and identification of environmental compliance issues;
- a comprehensive energy analysis which includes energy reduction opportunities and historical analysis of usage patterns and tariff schedules;

- selection and transparent costing of energy conservation measures;
- arrangement of financing;
- design and installation specifications;
- personnel training and handover regime; and
- implementation of monitoring and review programs.

Savings are specified in writing. If the savings go unrealised, the contractor pays the client the shortfall. Contracts will typically run between four and ten years.

When considering an energy performance contract recognise that developing and adhering to a change in the way your organisation uses energy, may also imply a change in the way your organisation does business. For some organisations the changes are relatively painless, while for others the changes require significant planning and coordination between different divisions or work sites.

The contract may be limited to specifics like building energy systems, or it may be used more creatively as a way of integrating all your environmental management activities under one umbrella. As well as energy consumed, a contract can deal with waste management programs, recycling, contaminated site clean-up or any aspect of good environmental practice.

The sustainable economy

To appreciate the real value of energy and emissions reduction initiatives in a wider context, it is worth understanding the principles of some new methods of measuring business success. Sound investment in projects that save energy costs and reduce greenhouse emissions can also contribute to business sustainability.

The concept of the 'sustainable economy' is gaining momentum. This can be seen through the emergence of concepts such as:

- natural capitalism (www.naturalcapitalism.org)
- triple bottom line (www.globalreporting.org)
- eco-efficiency (www.wbcsd.org)
- sustainable development (http://gssd.mit.edu)
- natural step system conditions (www.naturalstep.org)
- Dow Jones Sustainability Index (www.sam-group.com)

Each of these concepts is concerned with ensuring the planet remains healthy enough to continually support life as we know it. The common goal in each concept is that of maintaining and supporting a high quality of life, while ensuring that the global environment remains sufficiently healthy to support life for generations to come.

The 'triple bottom line' is an emerging indicator of corporate success in the new economy. The concept expands the traditional financial bottom line to account for environmental and social criteria.

Triple bottom line accounting and sustainability are reflected in the Dow Jones Sustainability Index. A company's appearance on the Sustainability Index indicates that they are performing well (in relation to other organisations within their industry sector) based on a range of questions that cover environmental, social and financial performance. Companies that appear on the Sustainability Index tend to look forward and recreate themselves with future challenges, demonstrating leadership qualities with regards to market development, and hence competitiveness.

There is an enduring myth that it is not possible to achieve economic benefits that also have wide-ranging social and environmental benefit. This myth has now been fundamentally disproved. Initiatives such as the Dow Jones Sustainability Index and eco-efficiency have demonstrated that these objectives can work to enhance one another.

An example of an organisation pursuing sustainability is BP. BP is showing a commitment to clean energy and sustainable development by:

- establishing triple bottom line reporting across Australasian operations;
- rolling out a staff Environmental Improvement Program;
- consulting with the community, other businesses and government on sustainable development; and
- investing in solar and other renewable energy technologies.

Further information

For sources of further information refer to *Module 7.*

References

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