

Introduction to maximising your investment in technology

Planning for success

EECA has helped many businesses implement new but proven energy efficient technology through its grant programmes.

From our experience we've seen that the businesses that benefit most with maximum return on investment from these projects are those that follow 'best practice'. Businesses that experience less than optimal results have often overlooked certain key steps in the process.

This resource identifies those gaps, and why they're important.

It's not a complete 'how-to' of project management. It's intended mainly for people running energy projects who are not trained project managers.

Most of the issues that impact on a project's success are in the early stages - the planning and design.

Planning the project

There are two steps in planning that businesses sometimes overlook or do inadequately: scoping/feasibility studies, and scoping out suppliers.

Always do a scoping study and a feasibility study before committing to a course of action.

Planning is where you identify the opportunity and define the outcomes you want.

A scoping study is essential to define the various ways of addressing the need that has been identified. Scoping will ensure that all the options are considered before one is settled on.

A feasibility study is just as important, to confirm the net financial benefit of whatever option has been chosen.

Each of these studies can be 'short and sweet' (except of course for major projects) but

ensuring you've considered all options including checking the benefits, will add credibility to your final choice.

It may be necessary to support the selected option with technical confirmation such as an energy audit. This will confirm whether this particular project has a better return on investment compared to other energy efficiency opportunities.

Scope your prospective suppliers

If you do a Level 3 energy audit it will automatically identify your prospective suppliers.

However, if you don't need a Level 3 audit, this is something that must be done early on – compiling a list of prospective technology suppliers and evaluating them for their ability to meet your project's requirements.



Alpha Laboratories is maximising the return on its project investment through taking a system-wide approach.



Southern Pine Products' briquette press turns MDF dust into fuel, creating a new revenue stream for the business.

Energy audits

An energy audit is like a financial audit and one of the first steps in effective energy management. It involves getting an independent expert to look at your energy accounts, match what you've spent on energy with where it is used and find opportunities to reduce energy costs.

The New Zealand Energy Auditing Standard has three levels:

- Level 1 is very basic and simply compares your energy costs with a benchmark like floor area
- Level 2 adds a site inspection, one-off 'snapshot' measurements and staff interviews and is usually the minimum for justifying capex investment
- A level 3 audit is more detailed and comprehensive. Using measurements taken over time it estimates costs and savings to within 10%.

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Building the business case

This is the 'numbers' stage where you define the type of information or evidence you need and work out likely costs and benefits. Here too there are two issues that are often overlooked or 'underdone' – viewing the project holistically and confirming the costs, benefits and risks.

Consider the bigger picture

You need to look beyond one department or process, define all the areas of the business that will be affected and quantify the impacts. There are several reasons:

- Sometimes, the performance of a project is less than expected because the energy savings aren't well integrated with the total process. For example, recovering waste heat from one process is only worthwhile if the heat is required by another process at that time or with minimum storage. Think about the total production cycle
- Thinking more broadly can help identify shortcomings in the project, such as heat transfers that are only needed seasonally rather than all year round. These may reduce the project's benefits, but it's better to know about them before you implement the project, rather than finding out afterwards
- Showing how the project integrates with other parts of the business can help you gain support for it. Share this information with colleagues elsewhere in the business. They may be able to identify benefits you wouldn't have considered because you're not as familiar with their processes
- When you're quantifying benefits think of environmental and social benefits too. They can strengthen the value of a project.

System-wide thinking can enhance savings

The most costly item in an energy efficiency project for an Auckland laboratory making soft gel medicine capsules was a dryer to pre-dry air entering its dehumidifiers.

However, looking at the drying system as a whole greatly enhanced overall ROI. A raft of measures such as adding humidity sensors, introducing more flexible programming and reducing air loss delivered an eventual reduction in natural gas of 70%, saving \$66,000 a year.

Thinking end-to-end can generate innovation

Getting into the MDF (medium density fibreboard) business created a \$180,000 a year dust disposal problem for a Canterbury building solutions company.

By thinking end-to-end and seeking synergies, it managed to turn that cost into a positive revenue stream netting \$25,000 a year. Their solution was to install a press that turns the dust into briquettes that can be used as fuel in industrial boilers.

Consulting widely generates results

Seeking input from the widest range of people helped a district council re-house staff from four different buildings into one with an annual energy spend of just \$14,400.

Staff from various disciplines within council joined councillors on a working party which sat with the architects and worked through issues to find the best outcome, sometimes going back to staff for further input. The public was also involved through community consultation.

At the end of the process, energy design auditors were called in and they managed to shave another 56% off the annual energy spend.

Out-of-the-box thinking can spread capital costs

Many businesses understand the benefits of investing in energy efficiency but are put off by the initial capital cost outlay.

Under an arrangement with its industrial process engineers, one winery is paying off the cost of its heat recovery unit with the savings that the unit is delivering. It will have paid off the costs in four years, after which it will own the equipment outright and transfer the savings in full to their bottom line.

Confirm costs, benefits and risks early on

Check and double check the costs and benefits of your project early on. The reasons for this are:

- underestimating costs or overestimating savings weakens a project's investment value and your business is always the loser
- overly optimistic costing exposes you to overruns
- overestimating the savings can mean the project ends up costing capital that could be invested more profitably elsewhere.

Remember also to consider the total costs of ownership over the lifetime of the equipment, that is both direct and indirect costs, including fuel costs, where relevant. For example, converting to wood pellets for boiler fuel will require modifications to the boiler and bunker. The difference in running cost between wood pellets and the previous fuel, usually coal or diesel needs to be taken into account when considering the total costs of ownership.

Information gaps can limit results

A winery's heat recovery project delivered a 21 year payback – considerably longer than was originally estimated.

The amount of energy the winery could expect to recover from its refrigeration plant was always going to depend on how hard the plant was working and generating heat that could be extracted. However the forecasters had worked on an assumption of a constant 85% system load over the peak three months when the actual system load was often much less.

High temperatures trim plastics firm's heat pump savings

Hot water at constant, relatively high temperatures was critical for a plastic injection moulding business when replacing a resistance-type hot water cylinder. Heat pumps seemed to offer considerably better performance, operating at 200-300% efficiency.

Heat pump efficiency is determined by the co-efficient of performance (COP). Using the manufacturer's published COP of 3, the company forecast a 5.5 year payback. In practice, the COP has turned out to be around 1.61, giving a payback of 10.4 years.

This situation could have been avoided by discussing the exact application of the technology with the equipment supplier, as it is unlikely that the COP stated by the manufacturer related to this application.

Managing the contract

Robust contract management is an important component of good project management.

Fix costs, timings and risks

Contract costs should be fixed as far as possible. In case escalations become unavoidable, there should be a pre-agreed process for managing them.

Milestones and execution timelines should also be fixed and laid out in Gantt charts, and your suppliers should commit to meeting these timelines.

Be realistic about timelines – it helps confirm the economics of a project. Unexpected holdups delay the delivery of energy savings. They can also signal unexpected, extra costs.

Contingencies or risks that might affect the project should be identified and there should be an agreed way of managing any overruns. Setting this up involves looking at all the inputs including cost, time, internal and external resource, defining acceptable ‘boundaries of risk’ and setting out what will be done if a boundary is crossed.

Seek an energy performance guarantee

We’ve seen from experience that technology suppliers often provide a ‘best case’ scenario that further analysis subsequently proves to be unrealistic. So it’s good practice to seek some form of energy performance guarantee.

Asking for a guarantee gives suppliers a strong commercial incentive for delivering savings at a projected level. It means better management of the investment risk.

Stay actively involved

Good project management means keeping a keen eye on every aspect of the project, right through the process. That includes being vigilant about site safety, decommissioning old plant, installing new plant, resolving problems as they arise, commissioning new plant and maintaining all the administration and liaison involved with the project.

Verifying your project

Evaluating results is always ‘best practice’ in project management. Having independently verified results helps justify your investment in terms of ROI and provides a good basis for building a better case for future projects.



Selwyn District Council headquarters benefited from a design audit prior to building commencing.

At a glance

To summarise, these are the steps or actions that can help you implement better and more successful energy projects:

- do a scoping study
- do a feasibility study
- scope prospective suppliers
- think holistically:
 - o consider the total production cycle
 - o consult widely, seek input from around the business
 - o consider environmental and social benefits
- confirm costs, benefits and risks early
- negotiate with suppliers to fix costs, timings and risks
- seek some energy performance guarantee
- stay actively involved
- facilitate monitoring and reporting.

For more information:

Find out what other companies are doing to improve their bottom line through energy efficiency and renewable energy at

www.eecabusiness.govt.nz/case-studies

www.eecabusiness.govt.nz

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