



Business Guide to Energy Efficiency:

A Practical Guide to Saving Energy in the Workplace

AUGUST 2003



New Zealand Business Council
for Sustainable Development



sustainable business network



Dedicated to making a difference

WHAT IS THE NEW ZEALAND BUSINESS COUNCIL FOR SUSTAINABLE DEVELOPMENT?

The New Zealand Business Council for Sustainable Development (NZBCSD), established in May 1999, is a coalition of leading businesses united by a shared commitment to sustainable development via the three pillars of economic growth, environmental protection and social progress.

The NZBCSD is a partner organisation to the World Business Council for Sustainable Development, a coalition of over 165 international companies with members drawn from more than 30 countries and 20 major industrial sectors. We also benefit from the WBCSD's global network of 43 national and regional business councils and partner organisations, involving some 1000 business leaders globally.

OUR MISSION

To provide business leadership as a catalyst for change toward sustainable development, and to promote eco-efficiency, innovation and responsible entrepreneurship.

OUR AIMS

Our objectives and strategic directions, based on this mission, include:

Business leadership – to be the leading advocate on issues connected with sustainable development.

Policy development – to participate in policy development in order to create a framework that allows business to contribute effectively to sustainable development.

Best practice – to demonstrate business progress in environmental and resource management and corporate social responsibility and to share leading-edge practices among our members.

Global outreach – to contribute to a sustainable future for developing nations and nations in transition.

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SECTION 2 MAKING ENERGY MANAGEMENT HAPPEN

A selection of the following advice & tools sheets has been inserted at the back of this guide based on your specific energy management needs. Please contact NZBCSD or the Sustainable Business Network if you are interested in copies of any additional advice sheets. Ph: 09 920 2403 or email: office@sustainable.org.nz



ADVICE AND TOOLS FOR FACILITIES MANAGEMENT

Energy Efficiency Checklist

- Sheet 1: General Facilities Management
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ENERGY EFFICIENCY TIPS FOR RESIDENTIAL LANDLORDS

How can landlords facilitate energy efficiency in the buildings they own?



INDEX OF WEBSITES, TOOLS AND RELEVANT ORGANISATIONS

A list of all websites and tools referenced throughout the Advice and Tools sheets

Introduction



Message from the Chairman

Cold shower threats ... low lake levels ... electricity price hikes ... gas reserves running low ... climate change and the Kyoto Protocol. In my experience there has never been so much uncertainty around our energy supply and prices. Fortunately we (NZ business) need not be helpless victims of this uncertainty. We can manage it by understanding and taking control of our energy usage.

For example, at The Warehouse we have halved our energy usage per square metre of shop space and are saving around \$3 million a year. A number of our energy management initiatives are simply the clever application of commonsense. It makes perfect sense – we've reduced our:

- costs
- exposure to price hikes
- greenhouse gas emissions.

We have written this guide to help you manage your own energy usage and emissions. We were delighted to partner with the Energy Efficiency and Conservation Authority and the New Zealand Climate Change Office at the Ministry for the Environment on this project. It has been a pleasure working together.

We welcome your feedback and are keen to profile case studies about your activities.

We'd also love to hear your suggestions on collaborative solutions for addressing the climate and energy challenge.

Let's work together to take this wonderful country of ours from strength to strength.

Stephen Tindall

PURPOSE AND USE OF THIS GUIDE

Around 210,000 businesses in New Zealand have energy bills less than NZ\$100,000 (99% of which are less than NZ\$40,000). For many in this group, maintaining a profitable business requires attentive budgeting in order to make the most of often limited resources. These businesses are also likely to be hit the hardest by the coming 2007 Kyoto Protocol carbon emissions charge, which will have the greatest impact on energy and fuel costs.

This guide has been designed to enable these New Zealand businesses to reduce their energy bills by providing practical guidance and assistance.

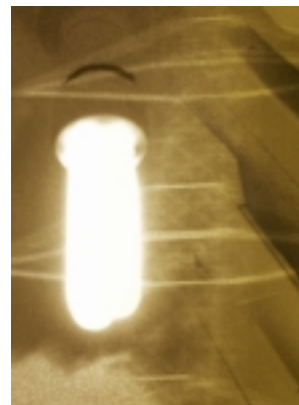
The first section of this guide provides an introduction to energy management – why it is important, how the Kyoto Protocol will affect energy and fuel prices, and the opportunities available for taking action in energy management.

Because businesses use energy in a variety of different ways, a more tailored approach is required to meet the resulting variety of energy management needs. The second section of the guide (inserted at the back of this folder) contains advice on specific areas of energy usage (general facilities, lighting, travel to work etc). We have included the inserts that we think are most relevant to your energy usage. Please check the contents on page 1 and if you would like the information on other areas, just let us know.

This guide does not cover waste management or supplies/procurement and all estimations of dollar (\$) values in this guide are calculated in \$NZ.

We hope that this more tailored approach will help you reduce your energy bills without great effort or expense.

For further information about the guide package, or to obtain additional copies, please contact NZBCSD on [09 488 7404](tel:094887404) or the Sustainable Business Network ph: [09 920 2400](tel:099202400) or email: office@sustainable.org.nz.





Why should I care?

FOR BUSINESS AND ENVIRONMENTAL REASONS

Reducing your energy costs makes great business sense, and has a direct positive impact on the environment. Energy efficiency measures have always been win-win options, and represent some of the best low risk return on investment that you can find. Like other people, you may have ignored them thinking they are unmanageable.

But now, with New Zealand ratifying the Kyoto Protocol agreement, the high level of energy insecurity at home and internationally, and environmental awareness continuing to impact trade and domestic regulations, it makes more sense than ever to take action.

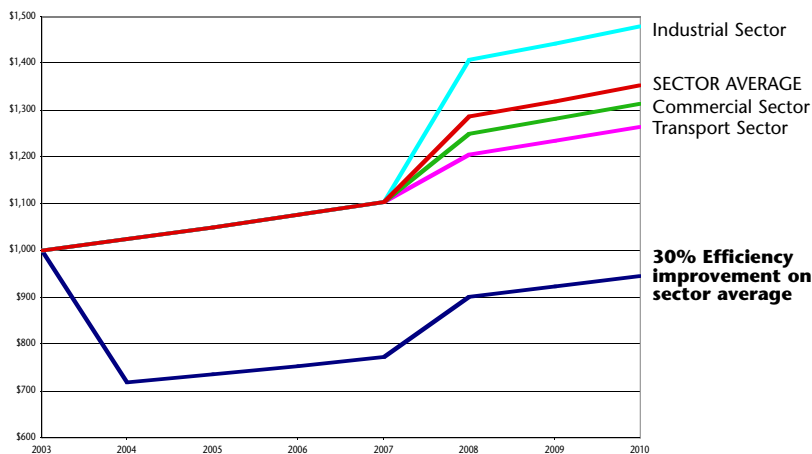
YOUR ENERGY BILLS WILL SOON INCREASE

What does the proposed 2007 carbon charge mean for you? If the charge was set at \$10/t or the maximum of \$25/t, you will see price increases in your energy bills in the ranges listed below:

When the Kyoto Protocol comes into force in 2008 (the so-called first commitment period), a carbon charge may already have been applied for a year (starting 2007). The charge will be applied to fossil fuels based on the level of carbon they contain, to reflect the environmental cost of the CO₂ emissions from that fuel. The price of that charge will be set on the international carbon market, and is still unknown, but has been capped at \$25 per tonne of CO₂.

WHAT YOUR ENERGY BILLS MIGHT LOOK LIKE (UNDER A \$25/TONNE OF CO₂ CHARGE)

	\$10/tCO ₂ equiv		\$25/tCO ₂ equiv	
	RES	IND	RES	IND
Petrol	3 c/L	2%	6 c/L	6%
Diesel	3 c/L	5%	7 c/L	12%
Electricity	4%	6%	9%	16%
Gas	3%	9%	8%	24%
Coal	8%	17%	19%	44%



ENERGY COST REDUCTIONS ENABLE AN INCREASE IN PROFIT

- If energy makes up a quarter of the costs of running your business, then 20% energy savings reflect a 5% increase in overall profit.

THE COST OF MANY PRODUCTS WILL INCREASE

- Everyone else's costs will rise as a result of the carbon charge, so resource or transport intensive products will increase in price.
- Minimizing physical waste, including reducing, re-using and recycling also makes financial sense and will help reduce your freight costs etc, though it is not addressed explicitly in this guide.

IT'S GOOD BUSINESS PLANNING

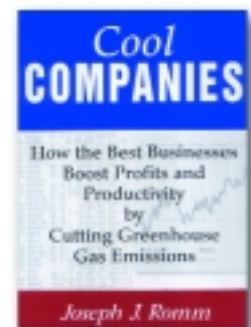
- **Risk Management:** Taking a careful look at the structure of your costs is good business practice. The risks associated with energy use are high, given New Zealand's supply issues, and the unknowns relating to climate change, so anything you can do to understand and manage them better will help to protect you from the uncertainties of the future.
- **Internal operational benefits.** Taking a look at efficiency gains in your company tends to highlight many related improvements you can make in your daily processes and activities.

OTHER GOOD REASONS

- **Improve comfort.** Most of the actions you can take to improve energy efficiency also improve the comfort of your workers, such as improving the quality or appropriate level of lighting, or making temperatures more stable and uniform.¹
- **Motivate your staff.** Environmental initiatives are excellent ways to provide a common goal to motivate and boost staff enthusiasm. Don't under-rate the value of this.
- **Get positive press.** There are many venues where environmental leadership of companies is acknowledged, leading to positive stories in the local, regional and national press. For a small business, differentiation of this kind can open doors, tie you into new networks, as many of the examples in this guide have done for these businesses.
- **Differentiate yourself to your customers.** From a marketing perspective, taking a proactive step to brand yourself as an environmentally responsible company can give a competitive edge. With the general growth of the 'Green Market' this is an opportunity to improve your market share. For example, tourism businesses know the value of Green Globe 21 certification², and many food producers are receiving direct pressure from their overseas supermarkets³ to take specific sustainability measures.
- **Beat your peers to it.** Don't wait until your competitors have all done it. Do it first and you'll secure that first mover advantage.
- **Do the right thing.** Whether its pressure from your kids who learn this from school, or from your customers who demand it from their companies, or possible future regulatory or trade requirement, the trend is clear. People increasingly expect businesses, however small, to care about doing things right.

Improve comfort

1. The book '*Cool Companies: How the Best Businesses Boost Profits and Productivity by Cutting Greenhouse Gas Emissions*' by Dr Joseph Romm highlights many case studies where worker productivity gains reduce the payback on energy efficiency measures to under one year – more than a 100% return on investment.



Differentiate yourself...

2. 64% of UK tourists are prepared to pay £10 to £25 more to selected tourism operators to ensure commitment to environmental protection.
(Source: Tearfund 2000)

3. Tesco's are asking some NZ produce suppliers to complete energy audits.



What can I do?

TAKE ACTION

Almost all businesses can find cost savings in their energy bills, which translate directly into profits. Some things to keep in mind are:

- Take small incremental steps in your improvements – it is better than being daunted by long lists and taking no action at all.
- The ideal time to make many of these choices is when you first buy or rent a facility, remodel your shop, expand your fleet, or replace equipment, as many of the costs would be incurred anyway.
- Some things are worth replacing right away – others can wait until their natural life is over.

If you have a small or simple business, you can do many things yourself. If your overall bill is large (> **\$15,000**), or you have many facilities or more complex machinery, you should seriously consider getting professional help, which will likely pay for itself. A professional auditor will give you a financial cost-benefit analysis, with payback period or internal rates of return for each suggested measure.

If you're not sure how to proceed, **call the Sustainable Business Network: 09 920 2403**

DOING-IT-YOURSELF

This guide gives recommendations on simple things you can do to reduce your energy bill. Many are no-cost or low-cost investments that pay for themselves in a year or less and save you money from then on.

If you do nothing else, at least action the Simple Energy Savers which focus on easy things to do for your facility. You could put this on your notice board and invite suggestions. An Energy Efficiency Quicklist is provided in Section 2.

The rest of this guide attempts to help you prioritise what actions you should take, and describes what's involved in each. We list the main options available to you, tools you can use to estimate the cost savings, as well as organisations and web sites that can provide further help. There are also some examples of companies that have done these things successfully.

This information has been compiled from several key sources, including the New Zealand Energy Efficiency and Conservation Authority (EECA), the US Energy Star Program, and energy efficiency organisations in Australia. It has been selected to provide you with only the key practical information you need.

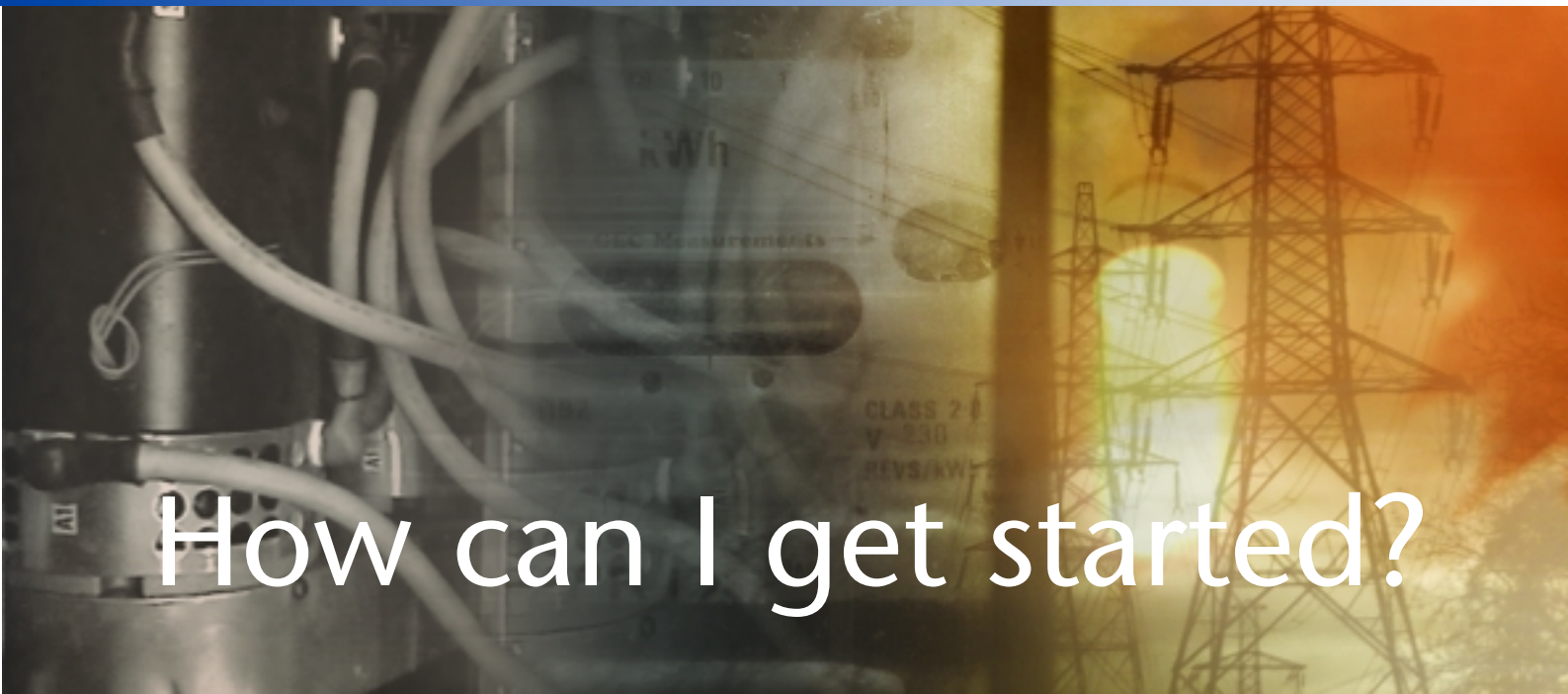
GETTING PROFESSIONAL HELP

- **Energy Audit:** If your energy bills are \$15,000 – \$100,000 per year, you should consider getting an energy audit from an auditor accredited by the Energy Management Association. An audit of a small/medium sized facility will cost you about \$5000, which you are likely to recover in the recommendations the auditor will find. Larger audits will cost approximately 10% of the annual energy bill, but this will vary depending on the complexity of the energy consuming systems. EECA offers a grants system for audits where- by they will subsidise 50% of an audit costing up to \$10,000; 30% of the next \$10,000; and 20% of the balance, up to a maximum grant level of \$10,000 (www.emprove.org.nz/50to500/grant.html).
 - ❖ To locate an accredited auditor in your area, see the list available on: www.ema.org.nz/ or call the EMA at 04 473 9444.
- **Emprove Program:** If your energy bills are \$50,000 per year or more, you can sign up with the Emprove program of EECA. Even if you don't sign up, EECA has some very valuable information available to guide you, as well as grants that cover up to 50% of your audit costs.
 - ❖ For more info, go to: www.emprove.govt.nz, or call EECA at 04 470 2200

Other services are available to help you reduce your energy use, and also approach the question of energy efficiency from a broader perspective. The following are some you should consider:

- **Landcare Research Ltd**, the crown research institute offers Ebex21 which allows you to measure, manage and mitigate your carbon impact. (For more info, contact Landcare on 03 325 6700).
- **Target Zero.** A Christchurch City Council resource efficiency/waste minimisation initiative which works with businesses. They have regular events, newsletters, and workshops to help guide businesses through these initiatives. See www.ccc.govt.nz/TargetZero/ for more info, or call Karyn Durham 03 941-8991.
- **Natural Step** offers a model for making sustainable development changes in a broader sense, and for identifying what can be done about it in practical terms. This includes energy efficiency. For more info, see www.naturalstep.org.nz or call 03 325 6711 to find out the best contact in your area to help you.
- **Trade organisations** also often have targeted information and can be a good place to check for an energy auditor that knows your industry. This can be very important to the success of your experience, as they will understand the constraints you are under, be it levels of cooling for food-related businesses, lighting and heat in hospital services, etc. The appendix lists some sector-based resources.
- **Meridian Solutions** is a business unit of Meridian Energy which applies its specialist expertise to identifying and implementing improvements in the way customers utilise heat, electricity and related utilities. Where projects identified require investment Meridian Solutions can fund this, with the capital recovered from a share of the savings, and the customer receiving the balance of the benefits. Meridian Solution's services are recommended for customers whose energy bills are over \$300,000. For more information go to www.meridiansolutions.co.nz or call Meridian Solutions on (04) 381 1330.
- **E-Bench:** E-bench at www.energyts.com can help you bench-mark your energy consumption against other similar operations. Phone Geoff Bennett at 04 384 6121 or gbennett@energyts.com





How can I get started?

(For more detailed information on how to develop an energy management program, visit [Emprove www.emprove.org.nz](http://www.emprove.org.nz))

1. SECURE ORGANISATIONAL SUPPORT

- Gather support for energy management by making a clear, compelling business case for action (see section on “Why should I care” [page 4] for information to support your case).
- Arrange a meeting to identify your team’s interest in energy management, their concerns, ideas and willingness to participate in energy management actions. Who is going to lead the project?

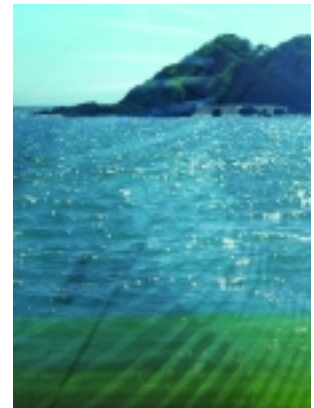
2. PLANNING AN ENERGY MANAGEMENT STRATEGY

- Assess your current energy use – take a look at your energy bills over the last two years (your accountant should be able to help you with this). Look at the monthly trends in terms of consumption (kilowatt hours – kWh for electricity and kWh or gigajoules – GJ for gas). Since energy prices fluctuate, it is best to monitor changes in consumption and then apply a rate at the end to work out what you have saved in terms of money.
- Does consumption on your monthly power bill match up with your meter reading? If not, contact your energy supplier.
- Identify where the energy is going. This will give you more specific information if you are planning to invest in energy efficiency (such as upgrading equipment etc). In order to do this, record the following:

Question	Example
What is the energy-using equipment?	light bulbs
Quantity?	40
Load of each (W)?	100 W
Time equipment is used (hours per day)?	hours / day
Total kWhs per day (multiply all the above and divide by 1000)	(40 x 100 x 8) / 1000 = 32kWh / day

There is a handy calculator at www.nzbcscd.org.nz/energyefficiency/content.asp?id=229 to help you do this

- Use this format to identify the target priority areas to manage, eg. lighting, building design, HVAC, hot water supply, office equipment, motors, pumps, refrigeration, transport etc.
- Identify the no- and low-cost options for managing your target areas. The inserts at the back of this guide provide this information. Set targets for energy reductions.
- What budget is available for actions which require some financial investment?



3. UNDERSTAND YOUR GREENHOUSE GAS EMISSIONS

- If you would like to understand the greenhouse gas emissions that your business is responsible for, there is a handy calculator at:
www.nzbcscd.org.nz/climatechange/content.asp?id=17
Hard copy guides are available from NZ Business Council for Sustainable Development
09 488 7404
- Information on climate change and climate change policies is available at
www.climatechange.govt.nz
- EBEx21 has an extensive range of calculators, including free public domain calculators.
See www.ebex21.co.nz

4. IMPLEMENTING THE ENERGY MANAGEMENT STRATEGY

- Who will undertake the energy management actions? Can the elected techniques be undertaken by the team or will outside expertise be required? Empower team with responsibility for specific initiatives. Who will monitor the progress of these actions?

5. MONITORING THE ENERGY MANAGEMENT STRATEGY

- For both electricity and gas bills, your bill will detail the fixed charge (charge for having access) and a consumption charge (based on your meter readings). Energy management actions will have an effect on your consumption charges. Larger energy users may also be charged on peak demand.
- Record your monthly energy consumption (in kWh or GJ) – it may help to plot progress on a graph. Decreasing energy consumption indicates your energy management actions are having a positive effect. How close are these values to your targets? If your consumption is increasing, determine the reasons why – winter heating? Has production increased? Was new equipment installed?
- To isolate measurements for a specific piece of equipment or plant, it may pay to install a check-meter (costs around \$75/month to lease).

6. REPORTING YOUR PROGRESS

- Report progress every 2–3 months. Identify your dollar savings by using a standardised price per unit (kWh) of energy – use this value for each reporting interval. It is important to reward your team if energy savings are being achieved and to take remedial action if targets are not being achieved.



How can I get the team on board?

(With thanks to Dr. Stewart Carr, School of Psychology, Massey University at Albany)

PROVIDE INCENTIVES

Implementing energy efficiency actions may enable a business to achieve savings, improve processes and activities and get positive press. However, changing behaviour and implementing new systems is a challenge and it is important to recognise and acknowledge the people who have worked together to meet this challenge and make energy efficiency a reality.

Some incentives include:

- Using \$\$ savings from energy efficiency actions for a team event, eg. morning tea, lunch, outing.
- Putting \$\$ savings back into team salaries
- Run competitions – for larger organisations, reward teams or individuals who show outstanding achievement with eg. dinner for two.

PROVIDE INFORMATION

Information about the importance and benefits of undertaking energy efficiency measures will provide a backbone for understanding the reasons why the team are carrying out these actions. It is particularly useful if energy efficiency initiatives complement the existing work ethic within the organisation.

Information could be communicated in the form of brochures, training seminars, workshops, conferences, email, or web references.

PROVIDE MODELS

Leadership in energy efficiency needs to be strong and come from the top – if the CEO isn't interested in undertaking energy efficiency initiatives, why should anyone else be? The CEO's responsibility may not necessarily be to plan, co-ordinate and monitor actions, but to at least initiate the interest and decide how an energy efficiency plan will fit within the context of the organisation's wider vision. A leader's physical involvement in a plan can be an excellent means of team building as well.

Models can also come from looking at what partner organisations have done. This may serve to strengthen links both between organisations as well as customers on the receiving end. Some excellent models are outlined in our case studies within this document.

PROVIDE FREEDOM OF CONTROL

Before developing a plan, find out what your team think about it, where their own interests and values lie, and their thoughts and ideas on what the organisation could accomplish. In doing this, an organisation will identify the strengths and energies their team has for undertaking various initiatives.

Also, give staff freedom to take hold of energy efficiency responsibilities. Involving staff at an 'on-the-ground' level entails a sense of personal responsibility and initiative. Delegating different actions can also tie in with a rewards system (as outlined above).

PROVIDE COUNTER-INTUITIVE ARGUMENTS

Not everyone thinks that energy efficiency actions are useful or worthwhile. Even after providing educative seminars and information on energy efficiency, you may still find a sceptic amongst your team. That is why it is important to assess at the outset your team's interest in the concept (see above). After doing this, you may gather a sense of any concerns your team members have, and be able to develop strategies to counter any doubts.

PROVIDE FEEDBACK

Monitoring your progress right from the beginning will provide you with a benchmark from which to measure your achievements and savings and enable you to set goals and targets. Be sure to reward your team for meeting successful targets and provide feedback reports on your progress. Knowing that what you are doing is making a measurable difference provides motivation to continue with energy management actions.





SIMPLE ENERGY SAVERS – “IF YOU DON’T DO ANYTHING ELSE...”

Source: Edited from US EPA Energy Star web site

If you don’t do anything else, at least implement all you can from this list of reliable, low-risk, high-return simple energy savers.

1. Turn off lights and equipment when they are not in use.

Seems obvious, but high utility costs often include paying for energy that is completely wasted.

To automate this function, read on.

2. Install ‘occupant sensors’ in the proper locations to automatically turn off lighting when no one is present, and back on when they return. Sensors add convenience as well as save money. But, even good equipment can be installed wrong, so don’t install the sensor behind a coat rack, door, or book case.

3. Buy energy efficient equipment (eg. ENERGY STAR labelled office equipment and other products), when needed, and be sure the ‘stand-by mode’ function is activated. This automatic ‘sleep mode’ saves energy and money when the equipment is not in use.

4. Adjust lighting to your actual needs; use free ‘day lighting.’ This means turn off or dim your lights when daylight is adequate, or use automatic ‘daylight dimming’ ballasts/controls to do this for you. To prevent computer screen glare, eyestrain, and headaches, use limited ‘task lighting’ and do not ‘over-light’ the area. Too much light can be as bad for visual quality as too little light – and it costs a lot more.

5. Maintain your equipment to ensure that performance is maintained. Clean light fittings and windows regularly, maintain good seals on refrigeration and oven appliances, thaw refrigeration appliances regularly, contract regular maintenance on your HVAC (heating/ventilation/air-conditioning) system and change clean filters. Just like a new car – equipment will decline in performance without regular maintenance.

6. Install a programmable thermostat to automate your HVAC system. An ‘old-fashioned’ thermostat turns the HVAC on and off based on temperature, not whether the building is occupied, or whether you benefit from the cooling/heating. This solid-state, electronic device can optimize HVAC operation ‘24/7’ based on your needs.

7. Replace incandescent light bulbs with compact fluorescent lamps (CFLs), wherever appropriate. CFLs cost about 75% less to operate, and last about 10 times longer. Enough said!

8. Control direct sun through windows. During cooling season (Summer), block direct heat gain from the sun shining through glass on the East (morning), and especially West (afternoon) sides of the building.

9. Use the sun. During heating season (Winter), with the sun low in the North, unobstructed northern windows can contribute heat gain during the day, but should be covered at night.

10. Use fans. Fans can help delay or reduce the need for air-conditioning.

11. Ceiling fans can be reversed in the Winter, and on low speed will pull warmer air down from the ceiling.

12. Plug the leaks with weather-stripping and caulking; another cheap ‘do-it-yourself’ job.

Make sure you **block all cracks** around windows, doors, utility switches/outlets, and any other holes between the inside and outside, to prevent the air which you just heated or cooled from leaking out.

13. Do you need to drive? If so, keep to the speed limit and avoid heavy breaking and acceleration – individual driving habits can influence fuel consumption by as much as 25%!

ACKNOWLEDGEMENTS

The content of this guide was developed by the New Zealand Business Council for Sustainable Development (NZBCSD) and the Sustainable Business Network (SBN). It was co-funded by the New Zealand Climate Change Office at the Ministry for the Environment (NZCCO) and the Energy Efficiency and Conservation Authority (EECA). Special thanks to the NZBCSD Climate Change Team including BP Oil, Holcim, Hubbard Foods, IAG New Zealand, Infrastructure Auckland, Landcare Research, Meridian Energy, NIWA, PwC, Telecom, Trustpower, Urgent Couriers, Watercare Services, the NZBCSD Executive, Remy Garderet (ARC), Sarah Burke (SBN), Rachel Brown (SBN), Alastair Hines (EECA), Bill Brander (EECA), Kathy Ogden (EECA), Rob Bishop (Energy Solutions). Also thanks to Bevis England (Telework NZ), Russell Baillie (EECA), Wayne Inger (The Warehouse Ltd), Dr. Stuart Carr (Massey University), Graeme Burke (Veritas Business Services), Michelle Dawson (Waitakere City Council), Rachel Hargreaves (BRANZ), Ray Skinner (Sustainability Matters).

DISCLAIMER

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