The Royal New Zealand
College of General Practitioners
Te Whare Tohu Rata o Aotearoa

Greening General Practice.

A toolkit for sustainable practice

GP
Heart of the community
Kāinga Tupu

Acknowledgements

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Contact

Email: greeningyourpractice@gmail.com
RNZCGP policy team email: policy@rnzcgp.org.nz

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Introduction

The importance of kaitiakitanga (stewardship) is being increasingly acknowledged as climate change threatens our future.[1] The health sector, including primary care, has a responsibility to protect health by increasing the environmental sustainability of its facilities and practices. As health professionals, we are particularly skilled and practised at making decisions regarding the use of limited resources.

It is prudent to think beyond just the financial costs of running a practice and consider the wider costs of practice. These include costs to the global environment, the energy required to manufacture a product, any toxins or waste resulting from the manufacturing process, the emissions in packaging and transporting the product and the conditions and wages of the workers who manufacture the product for us. This is the concept of the triple bottom line, which refers to balancing outcomes in three areas:

- The finances of the practice.
- The outcome for the environment.
- The welfare of all the people involved in the practice's work (both direct employees and those manufacturing the resources used in the practice).

If we create a demand for certain items (for example, disposable speculums), this results in an increase in their manufacture, competition around their pricing, their long-distance transport and eventually their disposal. This process includes hidden costs to the planet and to people, termed 'externalities', which are the costs related to the product that are not figured into their per unit price. If all of these externalities were figured in, often the product would become so expensive as to be unviable.

The decisions that we make about how to run our practice and the products we choose to use do matter. Individually and cumulatively, our choices can make a positive difference to the environment and, consequently, to the health of our patients and our communities.

This concept is gaining traction internationally. In the UK, for example, the National Health Service (NHS) has been tackling the issue of environmentally responsible health care and, in 2009, produced the report *Fit for the future: scenarios for low-carbon healthcare 2030*.[2] The NHS has some excellent online resources available through its **Sustainable Development Unit (SDU)** website.

The move towards more sustainable health care practices is steadily building momentum in New Zealand, with an increasing number of district health boards (DHBs) taking on sustainability officers, undertaking institutional carbon accounting and recognising the potential of a triple bottom line approach (for example, **Waitemata DHB**).

Individually and cumulatively, our choices can make a positive difference to the environment and, consequently, to the health of our patients and our communities.

The purpose of this toolkit

This toolkit has been developed to help general practitioners (GPs), nurses and practice managers make environmentally responsible changes where possible in the day-to-day running of their practice. It is designed to make these changes as easy as possible and aims for changes that are at least cost neutral.

Green business plan

Depending on the size and structure of your practice, it may be helpful to put in place a plan for what actions you would like to take and when, rather than a seemingly random introduction of green practices. Planning the greening of your practice will give you a clear idea of the overall benefits that can be achieved – environmentally, financially and in terms of staff welfare. Ideally, you should also monitor your actions and progress. This is particularly important for getting staff and/or other entities on board later on.

The most comprehensive way to ensure that your practice is operating as sustainably as possible is to have a green business plan. Ideally, this would be integrated with your regular business plan to ensure that green practices are part of business as usual. Incorporating your sustainability goals into your financial and other goals also simplifies accounting (ie calculating the costs of implementation and the gains made).

Alternatively, your sustainability plan could be an entirely separate project with its own set budget.

Planning the greening of your practice will give you a clear idea of the overall benefits that can be achieved – environmentally, financially and in terms of staff welfare.

Big ideas

While this toolkit covers many small actions to reduce your practice's carbon footprint, there are more-intensive actions you can take that would come under a green business plan. Here are some options:

- **Banking and investment policy:** You may like to consider choosing banks and investment schemes that include environmental impact criteria in their investment profiles – worldwide, fossil fuel divestment is gaining traction.
- **Renovation:** This would allow you to cover all **Infrastructure** ideas outlined in this toolkit in one go.

  Building designers can apply energy-efficient strategies early in the design process by combining **passive solar design** techniques (such as daylighting, solar **thermal mass** and shading), conventional energy-saving measures (such as insulation, **double glazing** and high-efficiency lights) and new green technologies such as solar/heat pump water heating. **Retrofitting** double glazing, insulation, shade, solar tubes and some of the above technologies is also possible and advisable.

Championing change in your practice

Tips for creating enthusiasm and buy-in from your colleagues

A toolkit is a helpful resource, but what it really needs to fly is constant championing of the cause – someone (or a small team) who is persistently enthusiastic about encouraging the changes and ensuring that momentum is maintained.

Some ways to champion change:

- Provide regular updates to staff via an intranet/email about progress the practice is making.
- Consider using a real-time power-monitoring tool. These tools measure the electricity (and the cost) that your business is using on a continuous basis. It encourages you to reduce electricity usage by giving constant feedback on current energy use.
- Have a go-to person for problem-solving issues that could otherwise stall progress.
- Give regular positive verbal feedback, especially to reluctant staff members.
- Rubbish audits are a useful tool for keeping up momentum. Going through the biohazard waste is obviously not recommended, but keep an eye out for inappropriate waste in the biohazard bin (such as loads of paper hand towels). Similarly, spotting plastics and fruit in the general waste bin can be a clue that a friendly reminder is necessary.
- Incentives (such as chocolate fish) can be left on those computers switched off at night (positive reinforcement).
- If your practice has a website or a newsletter, include updates on the recycling efforts of the practice and energy use feedback to motivate staff and patients.

Aesthetics matter

Often aesthetics is cited as a reason not to proceed with changes, for example, "We don't want the staffroom looking like a recycling depot". Be mindful of this. Take time to consider what recycling-related containers or other new green purchases will be the best fit aesthetically and shop around. Things looking 'right' can make a surprisingly big difference to buy-in from staff.

Involve your practice manager and other key staff

A large proportion of the ideas in this toolkit can be actioned by your practice manager. Ask them to keep the toolkit on their desktop and to work through the suggestions step by step. Other key staff, such as the chief nurse and other partners in the practice, will value being involved.

There might be initial resistance, but give staff a bit of time to mull it over and quietly persist. Take action on the roads of least resistance first. The many co-benefits of these changes (teamwork, stewardship, integrity) often end up being the clincher in the negotiation process.

Changing habits takes practice

We can all be trained to adopt new habits into our routine, at first intermittently, but with time, these will become automatic as per the conscious competence model (right).

Infrastructure

Energy assessment

Energy is a hidden cost that is often managed more by default than by design. Most businesses think of energy (ie electricity use) as an overhead rather than a variable cost they can control.

> "Companies with energy management programmes generally achieve far greater savings than those without, because they review and manage energy use across the whole organisation, on an ongoing basis. The savings go straight to your bottom line which can free up your capital for other things…"
> **– EECA; 2016**

Most New Zealand businesses can shave at least 20 percent off energy costs with smarter energy use.

The Energy Efficiency and Conservation Authority (EECA) is a government agency that encourages, supports and promotes energy efficiency, energy conservation and the use of renewable sources of energy in New Zealand. EECA provides a wide range of excellent resources through its websites:

- **EECA homepage: www.eeca.govt.nz**
- **EECA Business: www.eecabusiness.govt.nz**. This provides independent, authoritative advice to help New Zealand businesses boost productivity through energy efficiency, energy-saving technology and renewable energy
- **EECA Energywise** (EECA's residential-targeted website): **www.energywise.govt.nz**

EECA has specific resources for introducing the concept of energy efficiency to business settings, including where savings can be made and advice on how to get other team members on board with these initiatives. Information and resources are provided to help businesses **develop and implement an energy plan**.

While government subsidies for full energy audits of businesses are restricted to larger energy users, in many cases, it would be cost-effective for practices to have a walk-through energy use assessment carried out. These can be performed by EcoSmart electricians or energy industry professionals who specialise in providing advice and assistance to both householders and businesses on the best and simplest ways to reduce their electricity consumption.

There are also a variety of real-time **electricity monitoring devices** available that can pinpoint high-draw items in your practice.

Once you (or a professional) have assessed the energy use of your practice, an energy-use profile can be developed that shows how energy use is distributed throughout your business and where there is the most potential for targeted efforts.

Find **energy professionals** who can assist your business and **industry associations** that deliver energy efficiency programmes for specific sectors.

Assessing your practice's efficiency – EcoSmart electricians

The **Electrical Contractors Association of New Zealand** (ECANZ) can direct you to an EcoSmart electrician via the **Find an Electrician** tool (choose 'EcoSmart' from the 'Select Category' menu).

These specialist electricians can provide advice and assistance to householders and businesses on the best and simplest ways to reduce their electricity consumption, thereby saving money and reducing their greenhouse gas emissions at the same time.

EcoSmart electricians are Master Electricians who focus on energy-efficient products, technology and installations and can identify and implement energy efficiency opportunities for lighting, appliances and machinery. For example, they can install timers on lights and hot water boilers or a single kill switch at the front door for non-essential lighting and appliances. EcoSmart electricians can also assist with energy management, including ensuring that, where possible, off-peak power tariffs can be applied.

Renewable energy sources

All forms of electricity generation have impacts on the environment. Hydroelectric dams alter the natural flow of water and submerge land, while wind turbines alter the visual landscape. Geothermal fluids contain heavy metals and release CO_2 so must be dealt with carefully. However, the emission of greenhouse gases (including nitrous oxide) resulting from burning fossil fuels (coal and gas) has the greatest potential to damage global ecosystems. In 2013, New Zealand sourced 73 percent of its total energy from renewable resources.[3]

Consumers who wish to make use of power from renewable sources have two options:

- Generating electricity from renewable sources (for example, installing solar panels).
- Buying energy from power companies that derive their electricity from renewable sources.

While individual consumers cannot choose which power they take from the National Grid, they can support power companies that derive their electricity from renewable sources.

Office set-up

Office set-up includes staff facilities, lighting choices, heating and cooling systems and insulation. It forms the environment in which all other green decisions will sit both physically (such as appliance selection) and in terms of practice policy (for example, recycling). Decisions you make about the layout of your office affects energy usage.

Staff facilities

Ensuring that your practice is set up to accommodate staff involvement in sustainable living practices is a supportive action you can take that will reinforce office policy. Here are some ideas:

- **Bike parking spaces** for staff (or patients) who wish to cycle to the clinic. Cycling is a much more environmentally friendly (and healthier) mode of travel.
- **Shower facilities** for staff who cycle, walk or run to work.

Lighting

Good lighting can be environmentally friendly and can lower electricity costs and contribute to a positive staff and patient experience. If you do nothing else, simply replacing light bulbs wherever possible with energy-efficient bulbs will save energy and cut costs in the long run – find out more about this in the **Appliances, equipment, office and medical supplies** section. For a thorough assessment of where you can save power and costs, complete a stocktake (or get a professional opinion) of the lighting in your practice and how each lit space is used. You could increase your lighting efficiency and reduce electricity costs by:

- making the best use of natural light
- choosing light colours for walls, ceilings and some reflective surfaces
- using automatic timers and/or sensors to zone the use of electricity (such as bathroom occupancy detectors that turn lights off if no movement is detected for around 15 minutes and turn on again when anyone enters the space)
- having a practice policy of switching off lights when not required
- utilising automatic daylight-reactive dimming control that precisely controls how much light is received in the room (note that light fittings with special features will need compatible bulbs)
- modifying external lighting – consider solar-powered low-level lights if continuous night-time lighting is required plus motion-triggered mains-supplied spotlights.

Heating and cooling systems

Improving the efficiency of your heating, ventilation and air conditioning (HVAC) system so that it only provides heating or cooling when necessary can offer some of the most significant and lowest-cost energy savings.

The basic energy saving principles for HVAC systems are to only cool or heat as much and for as long as necessary, to not heat and cool the same space at the same time (this occurs in about one-third of New Zealand buildings) and to only use heating and air conditioning if the windows and doors to the outside are shut.

Lighting accounts for 30–50 percent of business electricity bills.

Heating, ventilation and air conditioning equipment generally accounts for about 40 percent of the energy used by commercial buildings.

— EECA

Low-cost actions include:

- setting your heating and cooling system's timers for business hours only
- setting the air conditioner to turn off at least one hour before the end of the working day
- regularly maintaining your air conditioning system – this can save up to 25 percent of the cost of once-a-year maintenance
- having a building services engineer optimise the controls of your HVAC system at least annually, including looking at the set points
- having a wide band for set points so that your equipment is not working too hard – four degrees (for example, 20–24°C) is generally found to be comfortable (staff and patient comfort is the best guide when adjusting your HVAC system)
- making sure thermostats are correctly calibrated and not located in unusually hot or cold areas
- setting your air conditioning humidity control so it floats between 30 percent and 60 percent relative humidity.

Further information is available on the **EECA Business** website.

Heating and cooling options other than electricity

- **Make the most of the sun:** Passive solar heating is financially and environmentally superior so, if possible, design the practice to make maximum use of its natural sunlight resources as appropriate for the season (encouraging solar heat capture in winter and shade in summer).
- **Install windows or vents** for natural airflow and fresh air where appropriate.
- **Don't use unflued LPG gas heaters:** These are problematic due to hazardous gas byproducts (carbon monoxide and nitrogen dioxide), and they are heavy moisture producers, which accelerates the growth of mould and dust mites. They are also very inefficient and, hence, the most expensive heating to run.[4]

Insulation

Well-insulated buildings require less energy to maintain comfortable working temperatures, as well as being healthier environments for your staff.

Low-cost measures you can take to improve insulation include:

- installing **ceiling** and **underfloor insulation** if it doesn't currently exist – the recommended insulation levels for houses also work for business premises
- draughtproofing external doors and windows
- weatherproofing your building by filling gaps around pipes entering the walls
- insulating your hot water cylinder (for example, cover a standard A-grade cylinder with a cylinder wrap) as well as insulating the first couple of metres of the hot water pipe from the cylinder, any high-use hot water pipes and external hot water pipes with pipe lagging.

Further information on insulation is available on the **EECA Business** website.

Appliances, equipment, office and medical supplies

Avoiding 'greenwash'

The Commerce Commission has produced a fact sheet (in reference to the Fair Trading Act) and other informative material that considers recyclability and green claims being made by brand owners and businesses, which can be found at the bottom of their **Environmental claims** webpage.

This fact sheet discusses the widespread use of generalised, unsubstantiated environmental claims and how the claim must be simple, clearly verifiable and likely to be interpreted correctly by the range of potential consumers.

Takeaway message: Keep an open mind to companies' green claims and ask questions until you are satisfied they are genuine.

Full life-cycle considerations of supplies (including medical supplies)

Recycling is one step you can take, but the ultimate goal is to purchase and consume fewer products and less packaging to begin with.

We can reduce the demand on the earth's resources:

- **Buy quality products** that will last a lifetime and that are repairable when they malfunction. Although the initial cost may be higher, the longer life of the product saves money in the long run.
- **Be mindful of waste reduction** in every step of medical processes.

Some manufacturers and retailers are starting to look at their part in this cycle. As practices and as individuals, we can support companies that show genuine engagement with product stewardship.

The purpose of product stewardship, as set out in the Waste Minimisation Act 2008 section 8, is to encourage (and in certain circumstances require) people and organisations involved in the life of a product to share responsibility for ensuring effective reduction, reuse, recycling or recovery of products and managing environmental harm arising from the product when it becomes waste.

Find out more about **Product stewardship** on the Ministry for the Environment's website.

Recycling is one step … but the ultimate goal is to purchase and consume fewer products and less packaging to begin with.

Light bulbs

While energy-efficient light bulbs are sometimes more expensive to buy at the checkout, traditional (incandescent) light bulbs burn far more electricity, and they don't last as long. It is also worth noting that there are many more options available than just those in the supermarket.

Tips for selecting energy-efficient bulbs:

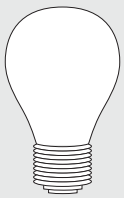
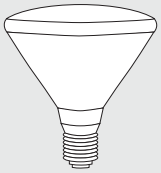
- Different bulb suppliers describe the light colour in different ways. The colour temperature marked on the pack is the best guide to the colour of light you'll receive. 'Warm white' is often used to describe 2700K or 3000K, 'cool white' equates to 4000K and 'daylight colours' will be marked at around 6000K or higher.
- Look for ENERGY STAR® qualified bulbs to find the most energy-efficient, best-performing LEDs.

Find out more about lighting options on the **EECA Business** website and **EECA Energywise** website.

"Energy-efficient bulbs produce more light with less energy than standard incandescent bulbs, so if you're replacing a 100 W incandescent bulb, you'll only need to use a 20 to 24 W CFL or 15 to 18 W LED."

— Energywise

For a 'warm white' light (2700–3000K)[a]

Bulb type	 **Incandescent**	 **Light fluorescent tubes (LFTs)**	 **New-generation halogen**	 **Compact fluorescent lamps (CFLs)**	 **Light-emitting diodes (LEDs)**
Wattage	75	40	28	11	5
Cost per bulb ($)	1.5	29.9	7.9	9.9	19.9
Lifespan (hrs)	1000	10,000	2000	12,000	25,000
Number of bulbs used in one year	2.8	0.28	1.40	0.23	0.11
Wattage use based on 2800 hr[b] per year (kWh)	210	112	78.4	30.8	14
Cost of wattage ($0.26 per kWh)	54.60	29.12	20.38	8.01	3.64
Total cost per year ($)	58.80	37.49	31.44	10.32	5.87
Total cost 5 years ($)	294.00	187.46	157.22	51.59	29.34

NOTES:

a. Table created using data and prices from **The Lightbulb Man** website. Based on bulbs using similar voltage and base (except for fluorescent tubes, which must use a different base) to create 'warm white' light.

b. 2800 hours based on a practice that is open approximately 55 hours per week, 50 weeks per year.

Compact fluorescent lamps, light fluorescent tubes and mercury

Compact fluorescent lamps (CFLs) and light fluorescent tubes (LFTs) contain a small amount of mercury; however, it is unlikely to pose a health risk. It is advisable to take care when handling and to be sure to **dispose of used bulbs appropriately**.

Computers and appliances

Decisions about energy-efficient electronics and appliances are made easy by energy labels such as EPEAT, the ENERGY STAR® and the Energy Rating system. As well as using these tools when replacing or upgrading appliances, it is also worth considering:

- choosing the smallest and most energy-efficient refrigerator possible (full refrigerators are more efficient)
- choosing a printer that can print double-sided
- videoconferencing technology, which can also sometimes be used in place of attending learning activities and meetings in person.

Office paper

Whenever possible, try to avoid paper entirely. When you do need to print, switch to post-consumer waste (PCW) paper, products and packaging.

Why recycle or buy recycled paper?

Office paper is the largest component of solid waste generated by general practices. Recycling paper has these benefits:

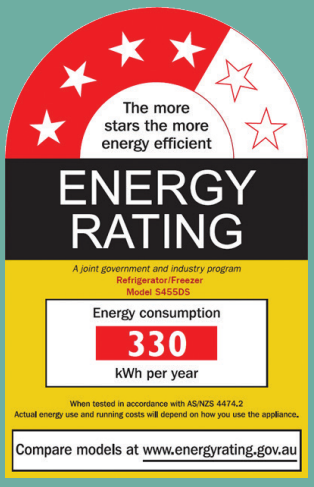
- Diverts paper waste from landfills – paper in landfills is a significant contributor to methane gas emissions.
- Creates energy savings and conserves water (at industry level), as producing paper from recovered fibres consumes less energy and water than production from virgin pulp.
- Reduces consumption of natural resources. New Zealand uses about 48,000 tonnes of office paper annually,[5] which equates to the consumption of approximately 1.152 million trees (based on 24 trees consumed to produce 1 tonne of virgin office paper[6]). Trees are natural carbon sinks and important for many aspects of biodiversity.
- Reduces environmentally toxic byproducts from pulping trees.
- Increases the demand for recycled products and leads to improvement in the processing infrastructure and supply chains, thus promoting economic growth in environmentally sustainable industries.

Recycled paper products

Purchasing products labelled as 100% PCW ensures you are using papers with the least environmental impact. If 100% is not available, look for options with as much PCW content as possible, and don't forget to recycle all your paper scraps instead of sending them to the landfill.

Electronic Product Environmental Assessment Tool (EPEAT) is an easy-to-use resource for identifying high-performance, environmentally preferable products.

ENERGY STAR® is the global mark of energy efficiency. It is typically awarded to the top 25 percent most energy-efficient appliances, home electronic products and office equipment in each category. Subsections include a comprehensive list of ENERGY STAR® products.



The **Energy Rating** logo helps compare energy use between similar models. The more stars, the more energy efficient the appliance is in comparison with similar models.

Paper fibres can be recycled five to six times before they become damaged and are no longer strong enough to form paper. This means that some virgin fibres will still be required to be processed to ensure adequate paper quality. Buying paper that is 100% recycled is recommended, but any recycled content is beneficial to the environment. Where the paper has only partial recycled content, it is recommended that you choose a brand that has sourced its virgin fibres from an independent third-party certified legal and sustainable forest (such as FSC, PEFC or ecolabels).

Favour products with Type 1 ecolabels (certified to international standards ISO 14001). Ecolabel members, who keep these standards, can be found on the **Global Ecolabelling Network**. In New Zealand, the standards are maintained by **Environmental Choice New Zealand** and in Australia by **Good Environmental Choice Australia**.

A4 paper	The New Zealand Sustainable Business Council recommends the following paper companies as being the most sustainable:[7] ■ BJ Ball ■ Spicers ■ B&F Papers ■ OfficeMax ■ Staples Advantage (formerly known as Corporate Express)
A5 paper	Currently, recycled A5 paper is not readily sourced in New Zealand. It is possible to negotiate with your paper supplier to have recycled A4 paper cut to size locally or sourced from overseas; however, this is likely to be cost prohibitive for individual practices. If your PHO is willing to negotiate a bulk order on your behalf, it is likely that suppliers will be able to reduce the cost dramatically. In the interim, it is recommended that your preferred choice of A5 virgin paper is a sustainable third-party certified product (FSC or one of the ecolabels) and that you work towards reducing the use of paper as much as possible.
Envelopes	Envelopes with a high recyclable content are also available. If you currently purchase postage-included envelopes, ask your supplier to include a recycled option. Where possible, reuse envelopes (for example, address relabels, in-house mail, multi-use envelopes).
Hygiene paper	Don't forget about other types of paper consumed in your workplace. Choose unbleached, recycled brands where possible for the following items: ■ Tissues ■ Toilet rolls ■ Hand towels (consider composting after use). Look for brands that are 100% recycled, have the Environmental Choice New Zealand mark and that are PEFC and/or FSC approved.[8] Some practices may choose to source these items at low cost from their local supermarkets.

NOTE: This toolkit does not promote any individual supplier over any other. The above suppliers may not be the best for your practice but can be used as pricing and availability benchmarks. Larger, more established suppliers will often have lower prices due to their economies of scale, but it is important to take the time to shop around and negotiate the best price – or get your PHO to do so.

What about the increased cost of recycled products?

As sustainability increasingly becomes part of regular business practice, the price difference between recycled products and non-recycled products is closing.

For example, a practice that consumes two reams of A4 paper per month (1000 pieces of paper) at $5.91 per ream expends $141.84 per annum. Substituting this with 100% recycled paper at $6.43 per ream increases annual expenditure by only $12.48 – not a great price to pay, considering the costs of climate change.

Importantly, the financial savings from a reduction in the total amount of office paper consumed will help to cover the increased costs of purchasing 100% recycled paper.

Paper suppliers in New Zealand

There are many office suppliers within the New Zealand market, so utilise the bargaining power that can be achieved through buyer coalitions. Ask your PHO to help negotiate the cheapest price possible in your local area for its members. If you think you have a good deal on your recycled office supplies, spread the news! Increased demand will usually lower prices.

GLOSSARY

Paper certification

ECF Elemental Chlorine Free: Bleached with a chlorine derivative to reduce toxic emissions.

EMAS Eco-Management and Audit Scheme: European environmental standard for manufacturing plants.

FSC Forest Stewardship Council: Paper has received a Chain of Custody certification, for example, FSC 100%, FSC mixed source, FSC recycled. Considered more robust than PEFC.

PCF Processed Chlorine Free: Recycled paper bleaching process totally chlorine free but original used paper may not have been. Process uses ozone or oxygen bleaching, which requires more energy than ECF.

PEFC Programme for Endorsement of Forest Certification: Paper has received a Chain of Custody certification, for example, PEFC 100%, PEFC mixed sources, PEFC recycled.

SFI Sustainable Forestry Initiative: Industry-based standard; primarily USA forests.

WMF Well Managed Forests: Certification by industry allowing the landowner to use the FSC trademark logo on their products.

Operational actions

Reducing energy consumption from appliances and computers

Plug loads (items plugged into outlets by the user) such as computers, servers, printers, staff kitchen appliances, refrigerators, washing machines and lamps can account for as much as 50 percent of an office building's energy use.

Sector (and national) movement towards electronic patient records and the general efficiencies gained through the use of information and communications technology have meant that most health care providers are now dependent on computers (including servers and data centres) and their attachments – printers, scanners, copiers etc. This technology is estimated to account for about 15–20 percent of the energy used in office buildings.[9] Typically, nearly half of the energy used by computers – especially older models – is simply wasted as heat.

Fortunately, appliances and computers are an energy expenditure that can be controlled and are amenable to reduction strategies. EECA has a fact sheet for **Saving energy in business: equipment and appliances**.

A five-step process for plug load reduction (Adapted from NBI's *Plug Load Best Practice Guide*)	
Review	**Identify your needs, inventory your equipment and focus on the devices that use the most energy – usually, that's the equipment you use the most.** Part of your plug load review should consider appliance placement: ■ Avoid placing the fridge next to a heat source or in direct sunlight. Leave space behind it for air circulation to dissipate heat. Make sure the seals are working well and the appliance is regularly defrosted. ■ Consider where your computer servers, copiers and printers are placed – they can waste considerable energy to keep cool. Consider placing them in naturally cooler spots where there is good ventilation.
Remove	**Eliminate or unplug unnecessary devices.** ■ When recycling your office's computers, be sure to destroy patient data securely. This requires more than a quick format of your hard drive. Dedicated data eraser programs and companies exist to aid this process, for example, the New Zealand company **ITRecycla**. ■ Unplug phone and other chargers (if it's warm, it's consuming energy).
Replace	**When it's time to replace, purchase the most energy-efficient devices for the job.** See **Appliances, equipment, office and medical supplies**.

A five-step process for plug load reduction
(Adapted from NBI's *Plug Load Best Practice Guide*)

Reduce	**Turn it off or power it down when not in use.** "Switching off a computer and monitor at the end of each day can save up to $120 over the course of a year. For an office of 20 computers, this equates to $2,400." – EECA ■ **Switch off** – not just lights, but also heat pumps, computers, printers, photocopiers, coffee machines and other appliances at the end of the day. If individual staff are reluctant, build it into the daily routine for a nominated staff member – for example, make it part of the administrator's job description to turn on all the computers in the morning so they are ready when the rest of the staff arrive and vice versa at the end of the day. It may be easiest to have an electrician set up a single kill switch for all non-essential standby power. ■ **Two-thirds (the majority!) of a computer's energy goes on powering the monitor.** Screen savers don't save energy, so it's better to turn off the monitor when going away from your desk for more than 10 minutes. Flat-screen monitors are much more efficient than older ones. Laptops are more efficient than desktop monitors. ■ **Efficient appliance use.** For example, only use dishwashers when there is a full load. There are also electricity-monitoring devices such as the OWL, Efergy monitors and the TED, which measure the electricity (and the cost) that your business is using on a continuous basis. It encourages you to reduce electricity usage by giving constant feedback on current energy draw.
Retrain	**Engage staff – make sure they understand why, when and how to power down.** ■ Consider **power management settings on PCs**. Even without replacing current computers and printers, efficiency savings can be made. Power management settings allow the machine to consume less power when not in use for a period. This setting usually needs to be specifically enabled. It can be wise to ask your equipment provider or IT advisor (in case of issues with security or network settings) for their advice. ■ IT advisor Matt Leahy (Leahy M, PrimaryIT, personal communication, August 2016) confirms there is no security issue with power management, but suggests you select carefully which power management setting you use: – **System standby** and **System hibernate:** These settings are not recommended as they usually cause a disconnection from Medtech on reopening. Often following this, a connection to Medtech cannot be re-established until the computer is shut down and rebooted, ie it would be quicker just to shut down the PC in the first place. – You could instead choose a timed **Turn off monitor** setting, for example, after 15 minutes. – Similarly, you can use **Turn off hard disks** and select your preferred time. The hard disk is revolving at 7000 revs/minute, and turning off the hard disk causes the whirring to slow right down (saving power). It will then start up again when the mouse/keyboard is touched. It is fine to remain logged in to Medtech/Profile in this mode. These settings can be made centrally at the main server so they can be easily applied practice-wide.

Reducing paper use

The following are key tips for reducing/reusing/recycling paper in your practice:

- Use **recycling trays** in your office.
  - Place within easy reach (for example, under your desk).
  - Have one for confidential papers that will be shredded and one for all other paper.
- **Discontinue unnecessary incoming mail**, and recycle any that is received.
  - Ask pharmaceutical companies to discontinue/minimise paper advertising.
  - Receive results electronically, and avoid paper duplication of results.
- When possible, consider double-sided printing and photocopying. Only print out what you need, and make sure your printing is efficient (ie use appropriate paper size, alter font and margins to minimise the number of sheets used).
- If you continue to use paper appointment slips, consider using the appointment book of your practice management system instead. Notes can be entered electronically for the reception staff if required (such as consult type, fee etc).
- Use electronic reminders instead of paper notes.
  - All practice management systems have easy-to-use **task manager programs** that can record job lists for patients, which can be assigned to various staff members. Using these tools will save you time.
- Where available, use **email referral systems** and Electronic Data Interchange (EDI) transfers.
  - Encourage all private specialists to whom you refer to accept email referrals – secure pathways exist, for example, HealthLink.
  - Use for transferring patient notes, immigration medical forms and insurance medical forms.
- Prefer paper packaging that has recycled content, is reusable or is recyclable (envelopes, boxes).
- Reuse single-sided paper (without patient-identifiable information) for drafts/notepaper prior to recycling.
- Receive newsletters/bulletins electronically or receive a single paper copy, display centrally and alert all staff electronically to its arrival.
- For frequently accessed contacts, such as the local pharmacy, try using multi-use envelopes or a document wallet that can be hand delivered between you, rather than using a fresh envelope every time.

Supply chain sustainability

- Consider whether there is a need for single-use disposable items (such as plastic speculums), and return to sterilising/cleaning reusable equipment wherever possible.
- Provide reusable shopping bags for any shopping done by the staff.
- Source supplies from local suppliers where possible (reduce transport), minimise packaging where appropriate and request green (low hazard, low production wastage, low carbon footprint) or recycled materials where available.
- Streamline orders to reduce frequency of deliveries.
- Consider horizontal efficiencies, such as pooling with other local practices to gain efficiencies, especially in transport.

- Recycle printer toner cartridges. Many recycling companies provide this service and can provide a padded bag (small volume) or microwave-sized box (medium volume). Some companies have introduced a small charge to cover the transport of each box. However, many companies still provide a **free service** under manufacturer-subsidised schemes. Ask your printer supplier or manufacturer what recycling options exist for your own practice's printer cartridges.
- Some electronics stores offer a free cartridge and toner recycling service, for example, Harvey Norman and Cartridge World (Cartridge World also offers refurbished cartridges to be reused, with a guarantee).
- Choose printer cartridges that are recycled/remanufactured. When trying new products, insist on a guarantee to allow right of return if there are any problems.
- Look for other stationery supplies that are recyclable. Many office-supply companies have an eco range.
- Encourage local cold chain suppliers who deliver in polystyrene chilly bins to run an exchange system, or find a local polystyrene recycling service.

Check what products are used for laundry and for cleaning the practice. Request usage of Environmental Choice products where possible. Environmental Choice New Zealand was initiated and is endorsed by the New Zealand Government. Environmental Choice recognises the genuine moves made by manufacturers to reduce the environmental impacts of their products and provides a credible and independent guide for consumers who want to purchase products that are better for the environment.

Practice policies

Consider how you might green your operational policies. For example, if you or your staff occasionally travel for continuing professional development events, how does your practice's policy reflect sustainable values?

To green your travel policy, you could:

- mandate videoconferencing/teleconferencing wherever possible, rather than travelling
- use carbon calculators (for example, **CarboNZero**), and offset your footprint when you have to drive or fly (for example, **tree planting**)
- use more carbon-neutral transport options such as trains.

Clinical actions

Pharmaceutical management and wastage

How big is the problem?

A **carbon footprint study of NHS England** (2008) showed that procurement of pharmaceuticals and medical supplies causes more carbon emissions than either total building energy use or travel (including patients, visitors and staff).

Nearly 60 percent of NHS England's total carbon footprint is associated with the products and services it procures. This figure combines the carbon emissions used in extraction, processing, assembly, packaging, transport, storage and handling of products and materials that are consumed by service providers. Just over one-third of this figure relates to pharmaceuticals, which equates to one-fifth of the carbon expenditure of the NHS.

In primary care, this proportion is probably larger than one-fifth, and a significant proportion of medications go to waste.

> "In a 2009 survey of 452 individuals across New Zealand, 56 percent reported that they collected all of their prescribed medications from a pharmacy, even if they did not intend to take them. Just over 25 percent said they collect all of their medication prescription repeats, even if the medications are no longer needed. Over 60 percent of respondents indicated that there were leftover, or unwanted prescription medications present in their house, at the time of completing the questionnaire." – Braund R, et al; 2009.[10]

Approximately 50 percent of patients will discontinue using their medications within a few months for reasons that include forgetting to follow the dosing instructions, adverse effects, inefficacy or the condition resolving.[11]

Quantification of the problem of medical wastage is difficult, but local initiatives that encourage patients to return unused medication to the pharmacies gauge some extent of the problem in New Zealand.* Notably, medications returned to pharmacies cannot be reused as the pharmacist cannot guarantee the storage conditions (especially temperature) of the returned medication.

"In a 2009 survey of 452 individuals across New Zealand … over 60 percent of respondents indicated that there were leftover, or unwanted prescription medications present in their house, at the time of completing the questionnaire."

– Braund R et al; 2009[10]

* An additional resource on this topic: Tong A, Peake B, and Braund R. Disposal practices for unused medications in New Zealand community pharmacies. J Prim Health Care. 2011;3(3):197–203.

Figure 1. *Medication returns from a single patient on admission to care (it includes 20 dispensing packs of gabapentin)*

Problem areas

- **Elderly patients** are a group that has high pharmaceutical wastage patterns – particularly frail elderly about to enter care facilities/rest homes where medications are usually administered from medipacks.
- **Inhalers:** Studies have been conducted in Taranaki and Hutt Valley where it was found that inhalers accounted for 20 percent of the total cost of returned medications, a large proportion of which (69 percent) were preventer inhalers.[11]
- **New medications:** An important problem period is during the initiation of a new medication. Some medications stand out, especially medications that are relatively expensive and have a reputation for side effects, for example, anithypertensives, pain modulators and epilepsy medicines.
- Wastage is further compounded if the drug requires a **frequent dosing** regimen.

Why do we care?

Aside from the concerning implications for the patient's health (from non-compliance or overdose on stockpiles), this situation comes at a high financial and environmental cost from pharmaceutical manufacture, transport and disposal.

There are also several co-benefits of reducing pharmaceutical wastage, including:

- alternative spend for the health dollar – funding spent on the unused medications could be redirected to areas of need in the health system (such as more joint replacements, CABGs, psych services, community nurses)
- improved health eventuating from improved compliance, leading to better managed health conditions
- reduced secondary care costs
- reduced chance of overdosing
- a safer environment – unused medication is often not disposed of correctly and can enter the human food chain after leaking from landfills into waterways or being washed directly down the sink.

Actions to reduce pharmaceutical wastage

The number one way to reduce medicine wastage is to ensure good prescribing practice alongside open, two-way communication with the patient (or their carer) about the purpose of the medication.

Pharmacist medications management services tend to increase patient compliance, reduce contraindications and reduce medication wastage.

In its article on prescribing appropriate quantities of medicines, bpac[nz] recommends the following:[12]

- Prescribing new medicines for trial periods only in case they are not continued due to intolerability or ineffectiveness.
- Prescribing appropriate quantities of 'as required' medicines.
- Encouraging patients to put prescription items on hold at the pharmacy if they are not currently required.
- Prescribing smaller quantities of 'safety medicines' which may pose a risk to certain patient groups.
- Considering if a patient is eligible and likely to benefit from being registered under the Long Term Conditions scheme managed by community pharmacists.
- Choose reusable sharps disposal containers.

Additionally, the Choosing Wisely programme has a list of **recommendations for clinicians** to consider, and another source of ideas is the New Zealand Ministry of Health's **Advance Care Planning programme**.

Prescriber actions: guard against over-prescribing

Repeat medications

- Check patient compliance – ask open questions that consider non-compliance, for example:
  - What tablets are you taking at the moment?
  - How many days a week do you forget them?
  - Are there any side effects?
  - Are you happy to keep taking all your current medications?
- Ask the patient that orders 'everything' about what they have at home already.
- For 'when required' medication, specify a quantity, not a time period.
- For medications renowned for side effects, prescribe smaller quantities with repeats.
- Encourage all staff in the practice who handle prescription requests to be aware of the above. We all have a role to play in reducing medication wastage.
- Review medications regularly. This also applies to **medications started in secondary care**. The patient's circumstances may have changed or new information may have come to hand. GPs should review all prescriptions at regular intervals to see if they are still required or should be changed. A useful resource in this area is The Royal New Zealand College of General Practitioners' policy brief on **Problematic polypharmacy and deprescribing**.

"Ask what's in store before giving more."

New medications

- When starting new medications, use samples if possible. This is a good use of resources because samples distributed by pharmaceutical companies often only have a short time to run before expiry.
- Limit the initial time period of a new regular medication, for example, a statin or antihypertensive. Most side effects will be evident within two weeks of initiating, so splitting the three-month script into a 2/52 dispensing, then

a 10/52 dispensing is ideal. This is called a 'variable repeat'. Pharmacy software allows this, yet general practice software generally does not. Instead, use close control with one repeat, for example, for OD dosing, prescribe 45 tabs with one repeat but then use a keyword to clarify your instruction ("2/52, then 10/52 supply if tolerated") to the pharmacist. You will need to programme the keyword into your practice management software, for example, Medtech, Profile or other system. Once entered, it can be used by the entire practice whenever anyone is initiating a patient on a new medication.

Back-pocket scripts

Print back-pocket scripts separately and note the suitable date for filling the script, for example, two days in the future. This is to discourage patients from filling prescriptions 'just in case' – particularly for antibiotics.

Pharmacist action

Most pharmacists undertake varying degrees of opportunistic patient education. However, some more formal services exist and can be encouraged that have the added advantage of feedback to the GP.

- **Medication use reviews (MURs)** allow for a structured and systematic review by an accredited pharmacist to improve patient use, understanding of and adherence to their medications.†
- **Comprehensive medicines management programmes** are usually carried out in the community (patient's home) with the aim of optimising the medical management of service users with chronic disease or complex medication regimes. Specialised pharmacists are especially trained and accredited to provide this service.†

Access to the above and other programmes (for example, the Long-Term Conditions Programme and Medicines Therapy Assessment) varies greatly between different pharmacies and DHBs. To find out what is available in your local area, contact your local pharmacies and ask if they can provide the above. Alternatively, approach your PHO, as some employ in-house pharmacists to provide these services or, failing that, contact the **Pharmaceutical Society of New Zealand**, which can advise what is available in your area.

† See pages 5–8 of the Pharmaceutical Society's **New Zealand National Pharmacist Services Framework 2014.**

Biohazard waste and cleaning

The definition of biohazard waste is contentious. Some practices treat all contaminated waste (any matter originating from patient care areas that has been in contact with any body fluids such as blood, saliva, vomitus, urine, faeces etc.) as biohazard. The reality is that much domestic refuse also contains such contaminated matter but may not be in the same concentration.

The New Zealand standard uses different terminologies that are intuitively understood: sharps, cytotoxic and radioactive. 'Infectious waste' is defined as 'substances known to contain, or reasonably expected to contain, pathogens'. The term 'controlled' waste' is discussed without any clear definition but should 'not contain any expressible liquid'.

It is also a requirement to check with your local authority about any region-specific bylaws that they may have with regard to medical waste.

In general, it is best at this stage for practices to take the information available to them and make decisions regarding their waste as they feel appropriate, given their local area and the resources available to them. For instance, in Wellington, there was discussion between The Royal New Zealand College of General Practitioners and Infection Control at Capital and Coast DHB that yielded the following understanding:

The general understanding is that the Standards New Zealand document 'Management of Healthcare Waste NZS 4304:2002' says that the only classified infectious waste is fluid-filled, ie waste that contains fluid that can be expressed under pressure. Infectious waste needs a controlled waste system (yellow bins etc).

Thus, in the Wellington area, infectious waste is considered to include (but is not limited to):

- discarded laboratory specimens, cultures and materials that have been in contact with them
- sharps other than those categorised as radioactive or cytotoxic
- receptacles containing body fluids
- waste containing expressible body fluids
- waste from isolation rooms
- waste from patients known to be suffering from infectious diseases and/or transmissible wound infections, for example, MRSA.

Hence, all other waste can be disposed of in the general waste disposal system as long as it goes to a sanitary landfill. This includes:

- discarded dressings – yellow bin if body fluid can be wrung out (standard exudate would not meet this, hence, general disposal)
- saline-moistened cleaning swabs – once used on patients, these are not generally able to be wrung out
- swabs used in minor surgery – same as above
- compostable cardboard trays – standard disposal as not able to be wrung out
- single-use items – also not able to be wrung out (use discretion – if heavily soiled then maybe yellow bin, otherwise standard disposal)
- throat sticks
- gloves
- soiled nappies.

First of all, consider how you can minimise waste of single-use items, such as swabs, dressings, betadine, drapes, 'blueys' etc.

Why does it matter?

Contaminated **medical waste undergoes more energy-intensive disposal procedures**, ie higher resource use (water/gas/electricity) is associated with its disposal.

New Zealand contaminated waste is steam-sterilised in combined loads with sharps and pharmaceutical waste, then taken to dedicated 'sanitary' (fully lined) landfills. In the past, medical waste used to be incinerated (with dioxin byproducts from the PVC plastics) but now is autoclaved under pressure. This is achieved by tumbling the waste around under pressure (400 kPa) using water/steam heated to 145°C within a rotating steriliser. The plastic sharps containers melt under these conditions (hence the value of reusable ones), but the sharps are unaltered in appearance. The same equipment is used for destroying products quarantined by Customs.

Cleaning of clinical areas

Lin Lochead is an independent infection control consultant from Australia involved in writing the Australian standard AS 4187 – Cleaning, disinfecting and sterilizing reusable medical and surgical instruments and equipment, and maintenance of associated environments in health care facilities. She has presented many seminars and lectures around Australia and has published a booklet *Cleaning, disinfection, sterilisation – A guide for office-based practice, 2001*.

Her general feeling is that **we use too many chemicals in primary care**. For the cleaning of surfaces such as examination benches, it is usually adequate to use warm water and a good detergent, for example, Clinidet® (which gets rid of all proteinaceous substances). Occasionally, further disinfection is required with a chemical disinfectant, for example, Viraclean®. A disinfecting agent needs to be in direct contact with the microorganism for 10–15 minutes so must be left to dry, otherwise there is no real point in disinfecting.

In summary, detergent clean whenever required, then disinfect properly several times a day depending on the frequency of use of that area – for example, mid-morning, lunchtime, end of the day – during breaks in patient flow when the chemical disinfectant can be left to dry.

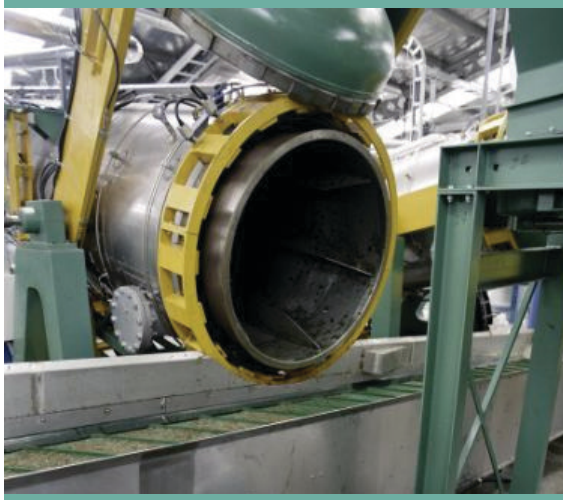


Figure 2. *One of the Mediclaves at Interwaste's Seaview plant*

Waste management

Water waste minimisation

- Fit aerators to taps and fix any leaking taps or toilets.
- Ensure toilets are dual flushing or cistern regulated (user determines length of flush).
- Ensure frequency of laundry deliveries are minimised yet still practical.

Composting

Composting food waste does result in some release of CO_2, but this is far preferable to it decomposing in anaerobic conditions (landfills), which creates methane. Methane has a global warming potential 21 times greater than carbon dioxide.

There are many websites with information about how to get started with composting. Some New Zealand–based examples:

- **Tui Garden**
- **Create Your Own Eden**
- **Green Ideas**

A number of local authorities have resources about composting as well, such as **Christchurch City Council's sustainable living site**. This site has well set out guides to composting, including worm farms and bokashi techniques that are suitable for apartments and dwellings without suitable places for traditional compost heaps.

For a medical practice, these are the easiest composting options:

- **Traditional composting** – a lidded bucket in the kitchen collects food waste and at the end of each day, it is added to a compost bin kept in the practice garden. Alternatively, it can be taken home by an enthusiastic staff member to add to their domestic compost.

- **Fermentation composting** – for example, bokashi. This method is ideal for an office setting as it is compact and odour free. Food waste is collected daily, and once a day it is added to the sealed bokashi bin. The food is lightly compacted down and a thin layer of powder is added (it resembles sawdust and contains microorganisms that enhance fermentation). Day by day, layers are added until the unit is full, at which stage it is left to ferment undisturbed for 14 days and can then be used in the garden.

Figure 3. *Bokashi composting*

Recycling

New Zealanders send about 2.46 million tonnes of solid rubbish to landfills every year.[13] Much of it is not rubbish but resources that can be recycled, composted and put to good use. We're running out of space for landfills, and they cost a lot of money to manage and look after once they are closed. Many district councils in New Zealand have adopted a **goal of zero waste** – for example, **Auckland Council has the aspirational goal of zero waste by 2040**.

Recycling and processing recovered materials into new resources makes good sense. It conserves energy, reduces pollution, saves money, creates jobs and helps contribute to healthy, vibrant communities.

Recycling collection is usually cheaper than general waste and gives a cost advantage – especially since from 1 July 2009 when, under the Waste Minimisation Act 2008, an additional fee was added to all waste going to landfills.

We're making progress and improving our recycling practices, but we still have a long way to go.

Accessing recycling

While some local authorities provide free business recycling (for example, cardboard collection), commercial recycling providers will usually provide collection bins and will collect recycling at the same time as general waste. They can also provide small cardboard receptacles in which offices can collect recyclable paper. If your local authority does not provide a list of commercial recyclers in your region, try searching the **Yellow Pages** or **WasteMinz**.

The availability of recycling services tends to follow the local council – that is, if the local council collects domestic recycling, commercial companies are more likely to a provide service as the council's domestic volume makes the business financially worthwhile. For the same reason, commercial recycling tends to follow the council in terms of types of plastic collected (the number in the little arrowed triangle on the bottom of plastic packaging). For example, Auckland, Christchurch and Wellington recycle plastic types 1–7. Check your local council's list for exclusions such as polystyrene.

The selection of plastics that the council chooses to recycle is largely a financial decision, as companies like Transpacific Waste Management charge small additional fees that deter some councils if it is not considered a priority for rates funding. You can improve recycling in your area by putting pressure on your council to include a wider range of materials in the recycling collection.

There is a sense of collaboration among recycling providers, who will often refer to each other to help find a recycling solution even for remote areas. Most have small minimum pickup requirements, even if it is only once a month in remote areas.

Where does it go?

The essential role of recycling companies is to collect and redistribute the recyclable products to the local market and/or ship overseas.

A portion of New Zealand's recycling is shipped overseas for processing, while steel cans, glass and some plastics and paper are recycled in New Zealand. Where your recyclables go for recycling can depend on where in New Zealand they are collected and sorted.

Paper and cardboard	Some paper and cardboard is recycled locally in New Zealand and goes to Carter Holt Harvey's pulp and paper plant and used again as cardboard (for cardboard, it can be reused up to nine times before fibres get too small to hold strength), yet much of it is exported, for example: ■ cardboard goes to Vietnam and Indonesia and is recycled into corrugated cardboard ■ office paper goes to Korea and is recycled into tissue products ■ other papers, such as newspaper and glossy paper, are sent to Thailand and the Philippines and recycled into newsprint.
Plastic	Plastic is processed in New Zealand, Australia, Asia and China. It is recycled into softdrink bottles, pillow and sleeping bag filling, recycling bins, packaging and speed bumps. Plastics are also reused in synthetic clothing manufacture.
Glass	Glass is recycled into new glass bottles and jars and can also be used as a sand substitute in road construction. Glass is recycled in New Zealand at the O-I New Zealand recycling plant where it is first sorted into its seven colours (clear, amber, blue and four shades of green).
Cans	Most steel cans are recycled locally (by the New Zealand division of Sims Pacific Metals). It is 'fragmentised' in Auckland and Christchurch, then melted back into steel bars and used for reinforcing bars for construction. Aluminium cans are sent to Australia or Japan for recycling.

Hazardous or specialty waste

Harsh chemicals, batteries (that contain heavy metals), fluorescent light bulbs and other hazardous material can severely impact the environment and ecosystems if disposed of via general waste methods or through being flushed down sinks, drains and sewers. You can assess whether an item is hazardous using the **Environmental Protection Authority's guidance**. Disposal of hazardous waste can vary regionally, so it is best to contact your local council for advice on correct disposal.

The first step to ensuring your practice is safely and correctly disposing of hazards is to provide clear information, instructions and receptacles for staff. Common items in a practice that should be considered are fluorescent lights, batteries and electronics.

Fluorescent light bulb disposal

The mercury from fluorescent lights can be collected and recycled. Here are some possible ways to do this:

- Interwaste and other organisations provide special disposal boxes for long fluorescent tubes.
- Ask your practice's electrician if they can dispose of these safely.
- Some local councils collect spent CFLs (if they are separated from your general waste), and work is continuing to improve this.
- Some hardware stores will accept these (for example, Bunnings and some Mitre 10 stores) as part of a lighting product stewardship initiative.

More information is available in the Ministry for the Environment's resource **The safe use and disposal of household lamps.**

Batteries

Hazardous batteries used in general practice include batteries for mobile phones, hearing aids, pacemakers, cameras, watches, personal stereos and laptop computers.

If batteries containing heavy metals are disposed of incorrectly, the metals can leach out and pollute the soil and groundwater, endangering humans and wildlife. Pollutants include:

- cadmium, which is a carcinogen and can cause liver and lung disease
- mercury, which affects the nervous system, kidneys and liver
- sulphuric acid, which can cause burns and skin irritation.

Protect practice staff and the environment by correctly disposing of all types of batteries. Both non-rechargeable and rechargeable batteries can be recycled, and wherever possible, all should be disposed of safely.

Notably, domestic batteries are dry cell non-rechargeable batteries (that is, they come in sizes AA, AAA, C, D). These contain zinc, which is not categorised as a hazardous chemical so can be disposed of in general waste. Alternatively, some battery manufacturers will accept them back or you can try the HazMobile service run by some local authorities (mainly northern) – look it up on your local authority website.

It is preferable to use rechargeable batteries and a battery charger rather than non-rechargeable batteries as they tend to use far less natural resource.[14] Additionally, they will also save you money in the long run.

NOTE: Rechargeable batteries are unsuitable for smoke alarms as they may slowly self-discharge, preventing the alarm from warning when the battery power is low.

If you have to use single-use batteries, choose brands with the longest life, and whenever possible, purchase low-mercury or zero-mercury batteries.

Electronic waste and e-recycling

Electronic waste (e-waste), such as mobile phones, laptops, computers and tablets, is a fast-growing problem in New Zealand. Many electronic products contain toxic substances such as lead and mercury. Internationally, much IT hardware waste ends up in developing countries, causing health problems amongst those who strip it for copper and other valuable components without appropriate safety precautions. Some countries, including New Zealand, have

If batteries containing heavy metals are disposed of incorrectly, the metals can leach out and pollute the soil and groundwater, endangering humans and wildlife.

signed the Basel Convention Ban Amendment in 1995 to prevent harmful products being exported to developing countries.

What can you do?

- Take-back schemes exist for many PCs, mobile and electronic devices, and other manufacturers may also be considering or initiating such schemes so it is always worth asking.
- Consider refurbishing/upgrading the equipment if possible – extra memory, new hard drive etc.
- Try to reuse any unwanted equipment that is in good working order, either by donating to charities or community groups or selling/gifting online (see below).
- Make the decision to sell or donate equipment sooner rather than later, as leaving equipment in storage depletes its useful value. Donation-receiving organisations have limited resources to repair hardware, so make sure the equipment is in good working order and reusable.
- Remove all data from disk drives using appropriate software. Safe wiping of data is now very achievable, but many people are unaware of the reliability of the process. Ask your IT provider to do this for you, or use **Blancco Technology Group**, as recommended by the Government Communications Security Bureau.
- If you use an IT support company, encourage them to set up an e-waste recycling scheme for the businesses they serve.
- IT recycling companies offer pick-up services (for example, **ITRecycla**); however, make sure your data is properly destroyed if the company does not specifically offer this service.

Sale or gifting of unwanted equipment

Rather than dumping obsolete equipment, dispose of it in a more sustainable manner. **Sell it** through websites like **Trade Me**, or **gift it** via online (free) websites (NOTE: It is usually the recipient of the goods who is responsible for arranging pick-up). For example:

- **The Waste Exchange** is a unique free service that helps businesses connect their unwanted materials and recyclables with new owners through a free online service. This service is run by local councils specifically for businesses in order to keep reusable items out of the landfills.
- **Freecycle** is a global movement aimed at reducing waste by recycling unwanted items amongst members for free. It is unlikely that a business would be on the receiving end of any of the items on offer, but it could certainly be good way to get rid of unwanted furniture. (NOTE: It is advisable to change your settings to avoid getting notified about every new offer in your area.)

Promoting sustainable action

There are a number of ways that you can promote further sustainability action in the health sector and in your community. Whatever action you do choose to take to increase your sustainability should be celebrated and advertised.

Promote green and healthy lifestyles to staff and patients

- Encourage walking, cycling and public transport use.
- Encourage pedometer use.
- Consider carpooling where appropriate.
- Offer discounts to patients arriving on foot or bike or using public transport.
- Install bike racks so staff and patients can store their bikes safely.
- Educate patients about dangers of unflued gas heaters.
- Promote healthy eating habits focusing on locally sourced foods, including fruit and vegetables.
- Plant shrubs and greenery (to absorb carbon) where appropriate around the practice site.
- Assist eligible patients to gain subsidised home insulation (see the table on following page). As a GP, you are in a position to write letters for eligible patients to get free home insulation through the Warm Up New Zealand: Healthy Homes project.‡ This is beneficial for patients' health and helps reduce their energy use (and energy bill).
- Writing Green Prescriptions[15] is another way of helping patients live sustainability (for example, encouraging walking to work). For a Green Prescription to be truly useful, it is important to also explain the connection between climate and health.

Some regions have Home Energy Advice Centres, specialised insulation schemes and curtain banks – the latter provide good quality, thermal-backed, second-hand curtains to households on low incomes. One way to find out what is available in your area is to visit the **Community Energy Network** website.

‡ If you have any questions about Warm Up New Zealand: Healthy Homes please phone the Energy Efficiency and Conservation Authority (EECA) on 0800 358 676.

Table 1. Warm Up New Zealand: Healthy Homes Project – Eligibility. Source: Personal Communication, 8 June 2016, from Penny St John, Senior Communication Advisor, EECA.

Eligibility	How general practice can help
■ Main tenant has Community Services Card (CSC). ■ Living in rental accommodation.	Tell patients to visit **www.energywise.govt.nz** for a list of contracted insulation companies or call 0800 749 782 for details.
■ Low income (usually about $20,000 above CSC) and has a referral from a GP, hospital doctor or practice nurse for a respiratory condition. ■ Living in rental accommodation.	Write a note confirming the patient has a respiratory condition and advise them to visit **www.energywise.govt.nz** for a list of contracted insulation companies or call 0800 749 782. Patients will need to apply for a CSC to establish income.
■ Referral by a Ministry of Health Healthy Homes provider.	Tell patients to visit **www.energywise.govt.nz** for a list of contracted insulation companies or call 0800 749 782

Lead by example

Make environmentally responsible changes to your personal lifestyle:

- Consider becoming a member of **OraTaiao: New Zealand Climate and Health Council**.
- Purchasing choices: Be mindful of your purchasing choices. Buy well-made and durable products that last. Ask if the product contains repairable parts should a malfunction occur to avoid products that have planned obsolescence (ie built to be replaced by a newer model rather than repaired). For further tips, see **www.carbonaddict.org** – an excellent interactive website.
- Travel less by road and plane: For meetings, use teleconferencing where possible, for example, using Skype or other services. One co-benefit is a major time saving.
  - Air travel: Each journey by air carries a significant carbon footprint. A single passenger taking a return flight from Christchurch to Sydney results in carbon emissions similar to running a portable fan heater (2kW) non-stop for eight weeks.§ Air travel results in emissions being injected directly into the upper atmosphere. As well as carbon dioxide and other greenhouse gases, aircraft produce trails of soot and aerosols that result in clouding, acidification and damage to the ozone layer.[16]
  - Road travel: Keep your current vehicle running as efficiently as possible – see EECA's webpage on **Driving efficiently**. The government-led **Rightcar** website provides comprehensive and user-friendly information for those looking to purchase a new car.

§ Calculated using figures provided by the Ministry for the Environment for voluntary corporate reporting of **greenhouse gas emissions**. Return flight from Christchurch to Sydney: 2125 km x 2 x 0.132 kg CO_2 -e/km = 561 kg CO_2-e. Running a 2 kW fan heater: 1342 hrs x 2 kWh x 0.209 kg CO_2 -e/kWh = 561 kg CO_2-e.

APPENDIX 1:

Checklist of actions¶

☑	**Green values**
☐	**Make a commitment** – Where are the ideal places to start? Pick low-hanging fruit. – What values can you identify that will assist you as you proceed?
☐	Include sustainability in your business plan (ie a triple bottom line approach) or have a specific green business plan.
☐	**Champion change in your practice** – Inform and promote green activities in staff communications and reward good efforts.
☐	Exemplify an environmentally friendly clinic for students and residents.
☑	**Waste management**
☐	**Reduce** – Make use of electronic records, messaging, referral, task managers, newsletter systems and other paperless options for workflow. – Reuse paper printed on one side, provided confidential information is not released. – Set your printer to double-sided printing. Do audits to ensure that staff and the IT department reset any forms that result in wasted paper. – Ensure there is no wasted content on frequently printed documents. – Do a mail audit. What journals, bulletins or other publications are redundant or can be received by email? – Refuse unnecessary packaging from pharmaceutical companies.
☐	**Reuse** – Use multi-use envelopes, for example, between your practice and the local pharmacy. – Use non-glutaraldehyde sterilisers or steam autoclaves. – Stock reusable rather than disposable equipment such as speculums.
☐	**Recycle** – Recycle paper, glass, plastic and aluminium, and keep recycling bins in areas where these materials are used. – Ensure your recycling system is working. What percentage of your recycling actually ends up recycled?
☐	**Compost** – Set up a composting or bokashi system for your practice kitchen (for food scraps).
☐	Dispose of specialty waste (batteries, e-waste, fluorescent light bulbs) responsibly.

¶ Adapted from: Blau E, Asrar F, Arya N, et al. Greener medical homes. Can Fam Physician. 2016:62:381–4. Available from: http://www.cfp.ca/content/62/5/381.full

☑	**Energy management**
☐	Get an energy audit done.
☐	Make the best use of natural light and solar warmth.
☐	Support power companies that derive their electricity from renewable resources.
☐	Choose energy-efficient equipment (ENERGY STAR®, EPEAT).
☐	Use the heating, ventilation and air conditioning system (HVAC) only during business hours, ie turn down the thermostat at night and on weekends. Regular HVAC maintenance will also ensure your system is working efficiently. Make sure your system is working at the right level based on patient and staff comfort using a wide band for set points and appropriate humidity.
☐	Insulate wherever possible (including wrapping A-grade hot water cylinders) and draughtproof external doors and windows.
☐	Don't use unflued LPG gas heaters.
☐	Use energy-efficient lighting.
☐	Reduce plug load: review, remove, replace, reduce and retrain! Turn off computers and other electronic equipment when not in use. Set computers to sleep mode at the end of the day.
☐	Ensure that windows and exterior doors are sealed.
☐	Use motion sensors or automatic timers to zone the use of electricity, ie turn off lighting for unoccupied rooms. The low-tech version is to encourage 'lights-off' behaviour in common spaces.
☐	Modify external lighting such as solar-powered low-level lights or motion-sensor spotlights.
☑	**Buildings and green space**
☐	Choose light colours for walls, ceilings and some reflective surfaces.
☐	Consider the sustainability and toxicity of building and interior material choices.
☐	Plant shrubs and greenery around (or on top of!) the practice.
☐	Renovate to incorporate a more sustainable and carbon-neutral practice design.
☐	Retrofit insulation, double glazing, shade, solar tubes and other new technologies.
☑	**Pharmaceutical management**
☐	Use good prescribing practice (appropriate quantities, trial periods) and integration with local pharmacies for medication management.
☐	Encourage patients to dispose of unused medications via their pharmacy or your practice.
☐	Check patient compliance and review medications regularly.

☑	**Water management**
☐	Fix leaks.
☐	Install restrictors (aerators) on taps.
☐	Reduce or refuse the use of bottled water.
☐	Avoid water coolers, and install filters on taps.
☑	**Transportation (public transport, carpool, bike, walking, parking etc.)**
☐	Promote active transport (walking, cycling, public transport).
☐	Assist staff (and students) with carpooling options.
☐	Ensure there is a safe place for bike storage.
☐	Encourage teleconferencing and videoconferencing where feasible.
☐	Ensure staff have changing rooms and showers.
☑	**Purchasing and procurement (includes green cleaning)**
☐	Purchase environmentally friendly paper (including hygiene paper) – paper that has a high recycled content and that was manufactured using chlorine-free bleach (see page 15 for paper certification details).
☐	Purchase environmentally friendly office supplies, for example, recyclable printer toner cartridges and green cleaning products. It may be possible to pool purchasing with other practices to get a better deal.
☐	Purchase environmentally friendly medical equipment (ie that can be sterilised and reused and that has minimal packaging).
☐	Use certified environmental products such as those approved by the Forest Stewardship Council.
☑	**Partnerships and other green initiatives**
☐	Develop partnerships with local/national programmes that focus on environmental initiatives.
☐	Involve patients.
☐	Consider joining OraTaiao: New Zealand Climate and Health Council or other environmental health groups as an individual or as an organisation.

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The Royal New Zealand
College of General Practitioners

Level 4, 50 Customhouse Quay, Wellington
PO Box 10440, Wellington, 6143
T +64 4 496 5999
F +64 4 496 5997
rnzcgp@rnzcgp.org.nz
www.rnzcgp.org.nz