



green your office toolkit



PROJECT 90 BY 2030
cut carbon · dare to change

"It is estimated that the operation of buildings accounts for about 15% of global greenhouse gas emissions"

**Bending the Curve –
Your guide to tackling
climate change in
South Africa**

1

infowise

Why green your office?

It means better business.

Sustainability and green-focused companies are more competitive. Green offices are a key component of this and tend to contribute to improved productivity, lower absenteeism, improved employee retention, strengthened brand value and operational cost savings.¹ Harvard Business Review describes how sustainability has become the key driver for business innovation.²

The bottom line is, a green office provides a cleaner, happier and more productive place to work and makes your company a better corporate citizen.





The cost-benefit of a retrofit

Some green retrofits can cost more than they save, others not. Adobe Systems undertook a \$1.4 million retrofit of their head office, which resulted in a 35% decrease in electricity consumption, amongst other savings. The payback period was about 10 months, saving the company \$1.2 million annually.³



What is a green office?

A space that is people and environment-friendly.

A green office is a place that offers a friendly working environment where comfort is not compromised, while the impact on the natural environment is continually being reduced. Whether retrofitted or built new, green offices and buildings reduce greenhouse gas emissions, air and water pollution and depletion of natural resources. They also have lower operating costs.

How can the toolkit help you?

The Green Your Office Toolkit provides useful background information, tools, and practical ideas to create a more sustainable workplace.

What does the toolkit include?

- This **Information Section** provides an overview of what this green office toolkit is about, what it covers and how to use it. Additional reading resources are provided at the end of each section to help you deepen your knowledge on specific topics.
- The **Action Sections** within this booklet provide in-depth information and suggestions on how to reduce your office's environmental footprint. Sections cover energy, waste, water and travel.
- An **Online Auditing Tool** allows you to calculate your baseline consumptions, targets and savings. Keep your eyes peered – the tool will be launched soon!
- A selection of **posters** and notices you can personalise to help create awareness around your workplace.

This toolkit refers to the following two organisations as case studies, which can provide you with inspiration and ideas:

1 Case study Kramer

The Centre of Criminology⁴ is based in the Kramer Law Building at the University of Cape Town – a large six-storey building, a part of the middle campus of the university. It consists of over 150 offices occupied by over 185 staff, seven classrooms, three lecture theatres and a cafeteria.



Areas covered in this toolkit: **Energy, Waste, Water, Travel**





2 Case study Cullinan's

Cullinan & Associates⁵ is a medium-sized law firm based in a three-storey converted house with three other small firms. The building contains seven bathrooms, an open plan kitchen, three boardrooms as well as a garden with outside seating.

Action sections

Energy-wise Why look at Energy?

Energy gives us the ability to more effectively function as a society. We value energy forms such as electricity and petrol because they provide ready access to heat, light and power. But this energy comes at a considerable cost as they are derived from fossil fuels. Fossil fuels used for energy generate greenhouse gases and pollute our air, soil and water. They are also non-renewable. Crude oil is already at or close to peak production, meaning demand is outstripping supply. For these reasons energy derived from coal, oil and gas will become increasingly unacceptable and expensive.

By making simple changes to reduce your office energy demand – through reducing usage, implementing new practices and technologies and finding alternative or renewable energy sources – you can improve your work environment, cut carbon and reduce your energy costs.

Waste-wise Why look at Waste?

Waste refers to any materials that are unusable and unwanted. Raw materials are extracted from nature and the earth to manufacture everyday products. Materials extracted from nature, such as wood, are often harvested faster than can be





replenished. Materials extracted from the earth, such as metals and fossil fuels, cannot be replaced. Take a few seconds to scan the room you are in spot all the products made from or containing plastic material derived from fossil fuels, and most of which currently ends up in the landfill.

As supplies of these resources dwindle, their cost will irrevocably increase. It makes economic and enviro sense to reduce consumption.

In nature's ecosystems, waste is forever becoming food for other life forms. So too, humans need to reduce waste, and instead create cyclical systems. By reducing the wastefulness of your operations following the slogan of Reduce – Reuse – Recycle, you can cut operational costs, and enable



South Africans produce approximately 566 million tonnes of waste each year, with more than 90% of this waste going into landfill sites.⁷





In a typical office building, energy accounts for around 30% of operating costs.⁶



Twenty-nine percent of South Africa's water is used in homes, factories and businesses. Fifty percent of water is used in agriculture (irrigation).⁹



everyone to change their perceptions about what qualifies as waste versus a valuable resource.

Water-wise Why look at Water?

Water is a natural resource, which all life forms depend on. That includes us!

With vast areas of Earth's surface covered by water, it appears the planet has an endless supply of this life-giving liquid. Yet only 3% of Earth's water is freshwater and only 1% is useable by humans.⁸

As economies continue to grow, so will the demand for water. Water is fast becoming one of the most highly priced commodities, with costs expected to continue to rise as supplies continue to drop.

Consider also that it requires a considerable amount of electricity to source, purify and pump water to your tap. Implementing simple technologies, changing habits and improving maintenance will reduce your water consumption and cost; and reduce national electricity demand.

Travel-wise Why look at Travel?

Re-evaluating the way you and your colleagues get to and from work will provide you with insights and alternatives to that frustrating and non-productive time spent stuck in traffic. This could free up your valuable time for more productive and fun activities.

Whether walking, cycling or travelling by public transport, private car or aeroplane, most people spend a significant part of their day commuting. In South Africa, walking and cycling accounts for nearly two-thirds of all day-to-day human mobility.

However, as economic well-being improves the number of people taking road transport is expected to continue to rise steeply.

There are currently seven million vehicles on South African roads, with this figure growing at a rate of about 2% every year. This means that traffic congestion, time spent travelling and pollution are all expected to increase. And as fuel prices escalate commuting will become more expensive.¹⁰

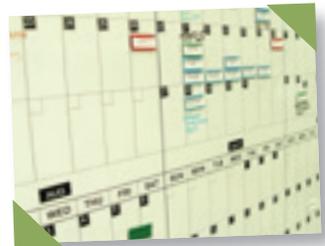
Giving your initiative vooma

We are now almost ready to delve into the details on how you can become energy-wise, water-wise, waste-wise and travel-wise in your office. But before we do that, you may want to consider these seven steps to accelerate and build enthusiasm among colleagues for about your green office transformation:

- 1 Build commitment** Achieve buy-in from senior management to help establish a green-thinking office culture.
- 2 Entrust responsibility** For each area of change, find a green champion passionate about the topic and who will drive the greening process in that area.
- 3 Create momentum** Champions can form green teams to help brainstorm and implement ideas, and check on progress regularly.
- 4 Communicate** Let staff know what is planned, invite feedback, and get buy-in for the vision.
- 5 Implement** Get everyone involved in taking action and implement periodic special initiatives that involve all staff and stimulate interest.



It is estimated that traffic congestion costs the South African economy R15 million every hour.¹¹





“Never doubt that a small group of thoughtful, committed citizens can change the world: indeed it's the only thing that ever has.”

Margaret Mead



- 6 **Motivate** To help build excitement, offer recognition and rewards for ‘most improved’ and ‘best ideas’.
- 7 **Quantify** Measure your impacts, set targets and report progress. Knowing that actions taken result in savings will motivate ongoing change.

Suggested Further Reading

- “The dollars and sense of green retrofits” Deloitte and Charles Lockwood; www.greenbiz.com/sites/default/files/document/us_re_Dollars_Sense_Retrofits_190608_.pdf
- “Why sustainability is now the key driver of innovation” Nidumolu R., Prahalad C.K., Rangaswami M.R.; *Harvard Business Review*; September 2009; <http://hbr.org>



*"If you cannot
measure it, you
cannot improve it."*
Lord Kelvin

2

energywise

We take electricity for granted, but not only are its costs increasing dramatically, energy production is a highly polluting process. It is an eye-opener to realise that for every 1 kWh (kilowatt hour) of electricity saved, you prevent about 0.5 kg of coal being burnt, 1.3 litres of water being used and the release of about 1 kg of climate-change-causing CO₂ and almost 9 kg of acid-rain-causing sulphur dioxide.¹²

Fortunately, there are many ideas for saving electricity. But before we look at those, the first step is to measure your current energy consumption.





Conduct an energy audit

The online audit tool (coming soon!) contains an 'energy component' which offers a simple means to calculate and track the useage of all the electricity powered devices in your office, such as lighting, air-conditioning and computer technology.

Once the number of devices, their energy consumption and frequency of use have been entered, the audit tool will calculate the total energy consumption per device or device category.

Past electricity bills are very useful to have handy, they can be used to provide an accurate baseline energy usage, and savings can be calculated depending on which energy saving initiatives are implemented.



Take action

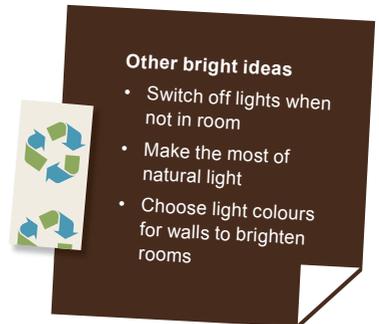
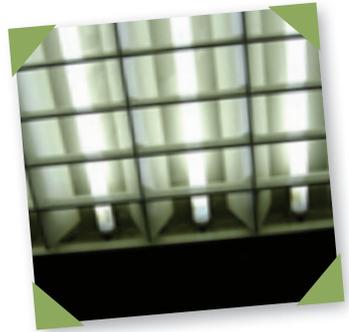
Once the energy audit has been completed, you can identify and prioritise your preferred areas of greening. The following pages offer suggestions for maximising your office's energy efficiency. Suggestions are also provided within the audit tool.

Re-think: Lighting

Look up, what do you see? Most offices are lit with central overhead lighting. One of the most effective means to reduce energy demand is to minimise or eliminate overhead or space lighting and maximise dedicated task lighting equipped with energy saving bulbs.

If this is not possible, consider changing the overhead lighting systems. Fluorescent tubes typically rely on T8 technology – the number refers to the tube diameter. By switching to newer T5 light fittings and tubes, you save about 40% of electricity while producing comparable levels of light. While a complete upgrade of an office with T5 technology may not be achievable in the short run, there are other alternatives you may want to consider.

Fluorescent tubes require current-regulating ballast systems. By asking your electrician to replace the widely used magnetic ballasts – which convert considerable energy into heat – with newer electronic ballasts, an energy saving of 12 to 15% can be achieved. Electronic ballasts also increase tube life span while reducing the 'flickering' effect. However the pay-back period of implementing this change is rather slow.



Other bright ideas

- Switch off lights when not in room
- Make the most of natural light
- Choose light colours for walls to brighten rooms



The economics of desk lamps:

Kramer Scenario

Where overhead lighting fixtures contain multiple fluorescent tubes or lamps, simply remove a number of these and introduce small CFL (compact fluorescent light) desk lamps to compensate for the reduction in lighting. Using this methodology, UCT's Kramer Law Building achieved a 45% reduction in lighting energy use.

Many businesses are also installing occupancy sensors to control lighting, particularly for areas such as corridors, storerooms and conference and consultation rooms.

Case Study: Kramer

Selection of lighting technologies implemented:

- Occupancy sensors in seminar room and library
- Replacement of halogen lights with low-wattage LED (light emitting diode) lights
- Partial shift from ceiling to desk CFL lighting

These initiatives resulted in a **drop of 36%** in controllable energy demand and **5 147 kWh** of energy was saved (resulting in a saving of about 5 tonnes of CO₂), which at 2008 energy costs meant a saving of **R2 500** over the course of that year.

Re-think: Office Equipment

Office equipment individually may not be a large energy user, but collectively it constitutes a significant proportion of your office energy bill.

A laptop can save you as much as 85 percent in energy costs per year compared with to a desktop computer. Not only do laptops save more energy, they also have a smaller manufacturing footprint compared to conventional computers. While it may take longer to change all the office computers to laptops, it would be wise to gradually introduce laptops over a period of a few years.



CFLs are at least three times as efficient as incandescent bulbs, and LEDs are several times as efficient as CFLs.



Note that CFLs contain mercury. Used CFLs can be disposed in special bins found at most local supermarkets. Despite this, CFLs are a good option because of the electricity they save.¹³



So when you are next in the market for a computer upgrade, consider purchasing a laptop.

Change computer settings to save

So, the next computer upgrade is looking like it's still a long way off. What can you do in the mean time to cut your computer's energy use?

- Reduce the brightness of your screen
- Choose hibernation rather than standby mode
- Switch off the screen when you intend to be away from your computer
- Turn the wireless card and Bluetooth functionality off, when you are busy working on a document and not needing to check your emails
- Replace a CRT (cathode ray tube) monitor with a more energy efficient LCD (liquid crystal display) – which can use up to 75 percent less energy.

Re-think: Printers & photocopiers

Individual printers may not be big energy users, but when there is a printer linked separately to each and every computer in an office it is quite a different story.

There are a number of benefits for replacing individual printers with a multi-functional (printer, photocopier and fax) and networked printer in an office setting. Not only are there energy savings from not having many individual machines, which are often in stand-by mode;



Save money by switching fonts

- By switching the default font to the less ink-intensive Century Gothic font, you can save up to 30% in ink and toner.¹⁴
- Another option is the Eco font, the 'green font with holes', which can reduce ink and toner requirements by up to 25%.
- Print in draft mode and, where feasible, print two pages per A4.
- Have your printer cartridges refilled.



The power of standing by

Many gadgets and appliances such as cell phone chargers and computer monitors draw energy even when they are not in use or switched off, simply by being plugged in. Wasted standby power is also referred to as 'phantom energy'.

The collective effect of equipment 'standby power' accounts for up to 10% of commercial and residential electricity use.¹⁶



there are also energy and paper savings as people become more aware of their printing habits – people may think twice about whether to print an email, particularly if they have to walk back and forth from the printer. Another way to further cut the energy demand of the printer is to place timers on the printers, set to switch on at the beginning of the work day and turn off at the end of the day.

Should there be a genuine reason for having a small, individual printer, opt for one which has duplex printing capabilities.

More tips:

- Design documents for and encourage onscreen reading and create hard copies only when absolutely necessary.
- Use page layouts that reduce document length and ink requirements.
- Avoid energy and resource-intensive colour printing.
- Switch off printers and copiers at night, or automate by installing a plug-in timer switch. They don't cost much, and pay back their cost in time.

Further office equipment ideas:

- Draft a green procurement policy for all your equipment purchases.
- Buy energy-efficient equipment from manufacturers that will take back old devices for recycling.
- Unplug chargers when they are not in use.
- Dispose of old equipment safely (they typically contain toxic materials).



Monitoring your energy use - wirelessly

Energy monitors allow you to track electricity usage and assist in identifying equipment drawing a lot of energy.

The monitors have three components - a sensor that is attached to the electricity meter, a transmitter and a receiving display unit.



Re-think: Heating and Cooling

Most, if not all, medium to large sized offices come equipped with central air-conditioning systems. Set the programmable thermostat at a comfortable temperature (in summer at about 4 degrees Celsius below the outside temperature) and ensure that the air-conditioning is turned off when there is no one in the office for long periods of time (overnight and over the weekend).

Ensure systems are well maintained and when eventually replacing it, install the most energy efficient ones available. Consider installing a heat pump, which provides hot water and air-cooling at the same time.¹⁷

Installing better insulation is an economical method for keeping warmer in winter and cooler in summer. Some of the best ceiling insulation products are now made from waste materials, including PET bottles, denim and newsprint.

By installing reflective films on north-facing windows you can reduce heat penetration and thus the need for air-conditioning. Possibly better still, depending on office orientation and external structures, use moveable external shading to reduce heat penetration in summer and increase it in winter.

Let's not forget clever tricks for natural air-conditioning. On those hot summer days, open any south facing doors and windows to create a draft through the office and close the shades on north facing windows and doors. On cold, blustering days, keep doors and windows closed to retain warmth.



Let's talk about renewable energy

Renewable energy refers to any source of energy that can be replenished naturally. The five most common types are: solar, wind, hydro, geothermal and biomass energy.

The cost of energy derived from fossil fuels will continue to rise as resources are depleted and their negative environmental and social impacts become more apparent. On the other hand, the cost of buying renewable energy and retrofitting your office with small-scale clean energy generation technologies, such as wind and solar, will pay back with time.

Start exploring clean options today.





Re-think: The Office Kitchen

The office kitchen is usually a place to gather and catch up, with consequences. It too is a place where by making some of the following small changes you can save on electricity consumption:

- Boil only as much water as you need.
- Avoid energy-gobbling hot water urns that stay on standby mode.
- Check that the fridge thermostat is not set too cold and place it in a cool spot. Keep fridge doors closed as much as possible.



- If you use a geyser for hot water, install solar water heating, or at least reduce the thermostat setting and install a geyser blanket, if you are staying with a conventional geyser.
- Always choose appliances with the highest energy efficiency ratings available.



What's Next...

- 1 Complete a baseline energy-wise audit.
- 2 Put together a prioritised plan for which areas, technologies and practices to focus on to achieve maximum energy savings.
- 3 Where necessary, obtain budgetary and implementation buy-in from colleagues.
- 4 Consider displaying posters announcing your initiatives (see additional resources section).
- 5 Now it is time to have fun implementing the technologies and practices. Good luck.
- 6 Conduct follow-up audits (three to six months later) to calculate the reductions achieved. Expect to be pleasantly surprised. (Note: Expect there to be seasonal differences)
- 7 Put in place maintenance plans to ensure that technologies function well and new practices are maintained.
- 8 Continue exploring and implementing new ideas.



Last but not least – enjoy and experience working in an office, which offers a functional and practical work-space that is energy-wise.



Suggested Further Reading & Contacts

Useful Contacts

- Going Green Directory:
www.goinggreen.co.za/directory/energy-and-energy-storage.html
- Liveeco: *www.liveeco.co.za/?m=8&s=1*
- Energy efficiency tips: *www.edinburgh.gov.uk/CEC/Corporate_Services/Sustainable/energy/staffguidelines/staffenergyguidelines.html*
- Energy explained: *<http://tonto.eia.doe.gov/energyexplained/index.cfm>*
- Eskom 'Energy Saving Advice':
www.eskomdsm.co.za/?q=home
- Smart Living Handbook – Making sustainable development a reality in Cape Town homes: *www.capetown.gov.za/EN/ENVIRONMENTALRESOURCEMANAGEMENT/Pages/SmartLiving-Handbook.aspx*



The water-carbon connection

In South Africa, it takes about 0,48 kWh of electrical energy to get one litre of water to our taps. This works out to: for every litre of water we use, 0,47 kg CO₂ is produced (1 kWh of electricity produces 0,98 kg of CO₂).



3

waterwise

South Africa is a semi-arid country with an average rainfall of only 450 mm per annum, which is well below the global average of 860 mm. As a result, we are experiencing ever more acute water shortages and we have had to dam most of the country's major rivers to supply the water needs of our growing population. Of course supplying clean water is also an energy-intensive affair. Saving water thus needs to be a top priority.



Conduct a water audit

The 'water' component of the online audit tool (coming soon!) will assist you to establish and track your total office water consumption for your bathrooms, kitchen and other areas.





Once you have itemised taps, showers, toilets and so on and estimated their water consumption and frequency of use, the audit tool allows convenient calculation of the total consumption per category.

Before you carry out the water audit:

- You will need to create an inventory of the number and type of water-using facilities within the office and estimate their consumption and frequency of use.
- It will also be useful to collect past water utility bills, which can be used to calculate a water consumption baseline against which you can list savings achieved in time.



Take action

Once the water audit has been completed, you can use the results to identify and prioritise focus areas for your 'greening' efforts. The following pages offer suggestions for reducing your impact and becoming more water-wise.



The bottled water debate

Bottled water is often seen to be more convenient, fashionable and safe than tap water. Yet South Africa's tap water is of the "highest quality" and numerous reports demonstrate bottled and tap water in South Africa to be of similar quality. In South Africa bottled water costs about 800 times as much as tap water – about R13,20 for bottled versus 1.6 cents for tap water per litre! If that is not argument enough, about three litres of water are required to bottle one litre of water and the production and shipping of a litre of mineral water generates 600 times more greenhouse gases than a litre of tap water.^{19,20}

If you are concerned about the quality of tap water, install a small in-line filter. The simplest filter systems cost about R300, and are available at many local supermarkets.

Handwasher vs. Dishwasher

Running a full load in an energy and water-efficient dishwasher can use up to 35% less energy than washing the equivalent load by hand; and it will save you time too.²¹ Depending on the frequency of use, it is likely that the impact of producing the dishwasher is recouped over its lifetime. However, if you only have a small quantity of dishes to wash, then rather do so by hand.



H₂O Limited

The demand for water is expected to continue to rise, affecting its availability and quality. Both ground and surface water is increasingly at risk from being polluted by commercial, industrial and domestic activities.¹⁸



Choose Biodegradable.

A switch to biodegradable cleaning products from harsh cleaning chemicals in the kitchen and bathrooms, will be less abrasive on the kitchen and bathroom facilities, while being gentler on your hands, and to top that off - have less of an impact on the environment.



If it isn't looking like the office budget is going to accommodate replacing the office toilets with dual-flush ones anytime soon - a quick and easy way to save water (and of course) money is to fit the cisterns with water displacing devices such as the HIPPO or the Save-a-Flush. The device displaces around 1 litre of water per flush.

Another effective alternative is to place a 500 ml filled plastic bottle in the cistern.



More water-wise ideas

For more water-saving ideas, visit: www.capetown.gov.za/en/EnvironmentalResourceManagement/tips/Pages/Water-SavingTips.aspx

You can further improve the electricity savings from the dishwasher by allowing the dishes to air dry instead of using the drying cycle. Make sure that all filters are regularly cleaned and use eco-friendly dishwashing tablets or liquid – these are available at supermarkets and health food stores.

Re-think: toilets

Much of our scarce good water is flushed down toilets, and higher income households can flush as much as 37% of their water away.²² By installing a dual-flush system (allowing for half and full flushes) or a multi-flush (allowing flushing for the duration the handle is held down) you can save a considerable amount on your water bill. Multiflush systems are typically cheaper to install and often the current flush mechanism can be easily modified.

For the next step up, why not consider installing a composting or waterless toilet? These loos have been in commercial use in Europe for decades and should not be confused with smelly long-drops in the mountains.^{23,24}

Re-think: Urinals

On average a flush urinal can waste over 5 700 litres per year.²⁵ By installing waterless urinals you not only save on water bills, but also on the need for harsh cleaning chemicals. Only a jug of water twice a day and an occasional wipe down are necessary.

So what about the odour? Waterless urinals can be more effective than flushable types at preventing odours. They utilise airtight and special odour-removing enzyme systems.

Re-think: Taps

By replacing existing tap aerators in the bathroom and kitchen with flow-reducing ones, you can reduce their water usage by a staggering 50 - 75%.²⁶ The aerators work by integrating tiny air bubbles through a series of meshes into the water stream. Aerators typically also improve the 'feel' of the water and cost R50 or less.

Also check for and repair leaking taps. A single leaking tap can waste up to 22 litres of water per day.



Case Study: Kramer

Selection of water-saving technologies implemented: - Aerators on all taps - Installation of waterless urinals

With the installation of these technologies, a total of 196 000 litres of water was saved, enough for about 32 000 flushes of a six litre cistern.

Re-think: The Office Garden

The office garden offers a great place for those who are stuck indoors all day to reconnect with the outside world. Having quiet spaces in the garden can make breaks particularly rejuvenating.

There are a number of things you can do to keep your urban oasis green and water-wise. Watering times of the gardens should be set to early morning or evening when evaporation is lowest. Another possibility is to consider connecting the garden to a drip irrigation system or installing a grey water system. The use of surface-covering mulch and planting of indigenous, lower maintenance plants will also save water.



Not everything can go down the drain!

Flushing non-biodegradable items and harsh cleaning and other chemicals down the drain or loo - including sanitary products, medicines and cotton buds - can cause damage to the environment and the solids can block the drainage system.

Inform everyone at the office of what can and cannot go down the drain, and if necessary, like in the case of sanitary products, arrange for alternative, safe disposals.





A healthier office

Healthy work environments reduce stress and absenteeism, while improving concentration, creativity and productivity. Here a few useful tips:

- Use indigenous plants in your office. Besides being attractive and softening the space, they emit oxygen.
- Ensure sufficient air exchange through good ventilation.
- Use non-toxic organic cleaning products. These are increasingly available in supermarkets.
- Use furniture, carpeting and paint that are free of volatile organic compounds (VOCs).



What's Next...

- 
- 
- 1 Complete a baseline water-wise audit.
 - 2 Put together a prioritised plan for which areas, technologies and practices to focus on to achieve maximum water savings.
 - 3 Where necessary, obtain budgetary and implementation buy-in from colleagues.
 - 4 Consider displaying posters announcing your initiatives (see additional resources section).
 - 5 Have fun implementing the technologies and practices. Good luck.
 - 6 Conduct follow-up audits (three to six months later) to calculate the reductions achieved. Expect to be pleasantly surprised.
 - 7 Put in place maintenance plans to ensure that technologies function well and new practices are maintained.
 - 8 Continue exploring and implementing new ideas.
- 

Last but not least - Enjoy and experience working in an office, which offers a functional and practical work-space that is energy-wise and waterwise.



Suggested Further Reading & Contacts:

Useful Contacts

- Urban Sprout: www.urbansprout.co.za/ubergreen_organic_eco_directory
- My Green Choices: www.mygreenchoices.co.za/index.php/Directories/Directories/
- 'Water' section in the Smart Living Handbook – Making sustainable development a reality in Cape Town homes: www.capetown.gov.za/EN/ENVIRONMENTALRESOURCEMANAGEMENT/Pages/SmartLiving-Handbook.aspx
- Water basics: <http://ga.water.usgs.gov/edu/mwater.html>
- Water saving tips: www.savetherain.info/water-saving-tips/water-saving-tips-in-the-work-place.aspx



Rainwater Harvesting

Despite being a water-scarce country, few offices and households capture the clean water we receive free from above. Rainwater can be harvested from roofs and stored for outdoor use such as watering the garden or indoor purposes such as toilet flushing.





Waste

verb 1 use carelessly, extravagantly, or to no purpose. 2 fail to make full or good use of.

noun 1 an act or instance of wasting. 2 unusable or unwanted material

4

wastewise

The average South African produces 255 kg per year – similar to the average of developed countries. And the amount we throw away continues to grow each year.²⁷

In nature the concept of waste doesn't exist, because one's waste essentially always becomes an input for other organisms. Now, we humans, however produce an increasing diversity and quantity of artificially produced compounds, such as plastics, paints, cleaning agents, toiletries and other chemicals, which are destructive to our environment; and often us too. And the organic waste we generate is now produced in such vast quantities that ecosystems often struggle assimilating it.





Have you ever asked yourself, when you throw something away, where that 'away' is?

Waste is only created when it is not able to nourish something new, and most things we throw away, can in fact be of value again. The concept of Reduce – Reuse – Recycle is central to this philosophy.

Conduct a waste audit

The 'waste' component of the online audit tool (coming soon!) will assist you to establish and track the production of office waste quantities. All waste produced over a fixed period, ideally a week, needs to be collected and sorted according to type (e.g. organic, plastic, glass, tin, paper and others). The waste then needs to be weighed and the data entered into the audit



tool to allow the calculation of the total amount of waste produced by category and in total over time – this is your baseline.

Take action

Once the waste audit has been completed, you can use the results to identify and prioritise focus areas for your 'greening' efforts. The following pages offer suggestions for reducing your impact and becoming more waste-wise.

Re-think: Paper

Almost every office desk has a bin alongside it, and an average office employee will generate almost 0,5 kg of waste paper daily²⁹, much of it remaining unread; and most of this is good quality paper destined for our overflowing landfills. Producing paper is also surprisingly resource-intensive.

The first objective should be to reduce the use of paper, by encouraging staff to print less and read more on-screen. Refer to the 'Printers and photocopiers' heading in the Energy-wise section for more ideas.

Next, collect paper that has only been used on one side can be reused for printing on the other side or to make notepads for scribbling on.

Once the paper has been used on both sides, it can finally be sent to be recycled, thus providing input material for new paper products, and reducing the demand for new raw materials.

For effective and convenient paper collection, you may want to consider setting up paper recycling stations in strategic locations around the office.



Giving printer cartridges a second chance

An astonishing 25 million printer cartridges – 80% of those used – end up in South African landfills every month. This is a waste of a valuable resource, because printer cartridges can be refilled up to about 15 times. Once they have reached the end of their useful 'printing' life, 97% of the components of a cartridge can be recycled or re-manufactured.

A number of organisations operating in South Africa, offer cartridge collection services.²⁸





How plastic can live again

In South Africa, most of the recycled plastic is turned into fibre for winter jackets, geo-textiles for road stabilisation and ceiling insulation.

Other products made from recycled plastic include outdoor furniture, compost bins and even clothing.

Nine Soccer World Cup teams, including Brazil and Portugal, regretfully not South Africa, wore tops entirely made out of recycled plastic, with each shirt containing up to eight plastic bottles.³⁴

Case study: Kramer

The following recycling programmes have been implemented:

- A custom-made recycling depot for paper, glass, plastic and metal was placed adjacent to the cafeteria.
- A larger recycling depot located in the basement for staff and students to bring in recycling from home was set up.
- A job-creating, community-based waste management organisation, Solid Waste Network, collects and sorts the waste.

Weekly, 410 kg of paper, plastic, glass and metal are collected for recycling.

Re-think: Plastics

Over the last few years, plastic recycling figures have increased markedly. In 2008, only 28% of South African plastic was recycled.³⁰

Most of the plastic we come across on a daily basis – from ice cream and milk containers, to plastic bottles and vegetable foam trays – is recyclable. To check whether a plastic item is recyclable, check for the logo – the triangle with the number – identifying the plastic type. If the logo is present, the plastic is recyclable. Each kind of plastic needs to be recycled separately.³¹



Munch on this

Everyday a mountain of food waste is carted to our landfill sites around the country. On the flip side, it is estimated that over 19 million South Africans face hunger everyday.³²

Any excess clean food from the office canteen can be donated to local food charities who can redistribute the food through their various schemes.

Other food waste and garden clippings can be recycled using a number of different composting options. Food waste is best composted using worm boxes (vermiculture) and garden waste is best processes using traditional compost.³³



Where to recycle plastic?

For a list of plastic recovery stations in Cape Town, Gauteng and Durban - visit www.petco.co.za and click on 'PET recycling' and 'Drop off locations'.





Recharging those batteries

It is estimated that over 95% of batteries purchased in South Africa are non-rechargeable, virtually all of which, despite their toxicity, are not safely disposed of and end up in the landfill.³⁵

Rechargeable battery technology has now reached a point where they can be used in most devices and over the longer term are cheaper to use. So make the switch today.

Irrespective of whether you use rechargeable or non-rechargeable batteries, when the batteries reach the end of their lifetime, take them to recycling points found in local supermarkets, where they can be safely disposed of.



Case Study: Cullinan's

Example of waste reducing practices implemented:

- Donation of old computers and other electronics to charities
- Food scraps are composted using worm boxes (vermiculture)
- Each office is equipped with a waste paper collection box
- Waste is collected by the Oasis Association, a Cape Town-based not-for-profit recycling company

Reusable versus Disposable

To produce one ceramic cup requires three times as much energy as a paper cup, and the energy needed to wash a ceramic mug is about half of that required to produce a paper cup.³⁶ But it is more likely than not that the paper cups will end up in the landfill before their ceramic counterparts. The impact of reusable plates and mugs can be reduced by washing them in an efficient way and if they are looked after for a long time.

Re-think: Glass

Even though plastic products are cheaper and the use of plastic seems to be growing, glass still remains the material of choice for good quality containers.

While the raw materials for glass are abundantly available, manufacturing glass requires a lot of energy. As an example, the energy saved from recycling one glass bottle is sufficient to power a desktop computer for 25 minutes.³⁷

One particular advantage that glass has over other materials is that it can be recycled almost endlessly, so it makes sense to recycle the glass we use.

For a list of glass collection points visit [The Glass Recycling Company website](#).



Buying in bulk not only saves you money, it also saves on packaging.

What's Next...

- 1 Complete a baseline waste-wise audit.
- 2 Put together a prioritised plan for which areas, technologies and practices to focus on to achieve maximum waste savings.
- 3 Where necessary, obtain budgetary and implementation buy-in from colleagues.
- 4 Consider displaying posters announcing your initiatives (see additional resources section).
- 5 Have fun implementing the technologies and practices. Good luck.
- 6 Conduct follow-up audits (three to six months later) to calculate the reductions achieved. Expect to be pleasantly surprised.
- 7 Put in place maintenance plans to ensure that technologies function well and new practices are maintained.
- 8 Continue searching for and implementing new ideas and we hope you become an evergreener office.



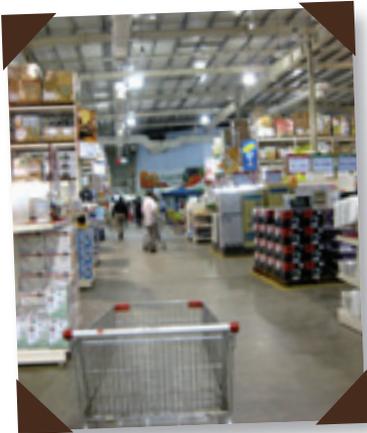


Last but not least - Enjoy and experience working in an office, which offers a functional and practical work-space that is energy-wise, water-wise and waste-wise.

Suggested Further Reading & Contacts:

Useful Contacts

- The Big Green Directory (type “waste” in keyword search): www.thebiggreendirectory.co.za/?search
- Reuse and recycling in South Africa: www.going-green.co.za/green-it-yourself/112-reuse-and-recycling-in-south-africa.html
- Types of waste: www.sawic.org.za/?menu=61
- Glass recycling: www.enviroserv.co.za/pages/content.asp?SectionID=1007
- Paper recycling: www.paperonline.org/environment/paper-recycling/the-paper-recycling-process
- Plastic bottle recycling: www.petco.co.za/ag3nt/system/recycling_03_sorting.php





5

travelwise

Whether it is a weekend in Cape Town, a meeting in Johannesburg or a conference in London, we live in a world where we travel on a whim and take our mobility for granted. But at what expense?

Transport is one of the largest sources of greenhouse gases and globally accounts for at least 14%, some say as high as 25%, of emissions. In South Africa, 91% of our CO₂ emissions are attributed to the energy sector – which refers to the burning of different fossil fuels – with 15% of the emissions from this sector coming from transportation. Transport is also the energy-using sector that is growing fastest.^{38,39}





Flexi-hours

Increasingly, employers are offering their employees the option of working outside of the normal nine-to-five hours.

This allows employees to reduce time wasted in traffic and accommodate their other personal preferences and responsibilities. The benefits of offering flexi-hours have been found to range from reduced stress levels and fuel costs to increased employee morale and reduced absenteeism.⁴⁰



To make matters worse in South Africa, we have a poor public transport infrastructure, which makes our many commuters highly reliant on the use of private motor vehicles and taxis.

Conduct a travel audit

The 'travel component' of the online audit tool (coming soon!) will assist you establish and track the travelling patterns and its resulting carbon emissions for your office.

By simply entering such details as mode of transport and distance travelled, you can develop an accurate overview of your overall travel impact. This then forms your baseline, which you can use to plan changes and against which you can calculate and track savings achieved.

Take action

Once the travel audit has been completed, you can use the results to identify and prioritise focus areas for your 'greening' efforts. The following pages offer suggestions for reducing your impact and becoming more travel-wise.

Re-think: Flying for work

Flying, because of the long distances covered, is often by far the largest component of someone's travel footprint. Just one inter-continental return flight or two or three domestic return flights are enough to blow your personal sustainable carbon budget for the year.⁴¹

Undoubtedly the best solution is – whenever possible – to avoid flying and rather opting for travel by bus or train. Virtual travel is of course the best solution - saving you time and money.

If, after much deliberation, you still need to fly, consider the following options/solutions to reducing the environmental impacts of your flights:

- Avoid stop-overs, choose to fly direct.
- Fly economy class (more seats per area).
- Optimise your trip by fitting in as many meetings as possible.
- Choose airlines with the most efficient aircraft.
- Stay at green hotels at your destinations and hire fuel-efficient vehicles if you are not travelling by public transport.



Short haul versus long haul flights

Take-offs and landings burn more fuel than high altitude cruising – this means that short distance flights consume more fuel per passenger mile than medium or long flights. Take a moment and re-think your next flight to Cape Town or Jo'burg - is it really necessary?





Meeting; In person vs. Skype

A meeting online is definitely more gentler on the wallet. A return trip Cape Town to Jo'burg (including airport transfers) costs R2000. Assuming monthly meetings have been scheduled, the video conferencing system will payback itself in about 10 months. In terms of the amount of time you need to get to and from the meeting: face-to-face - 8.5 hours versus skype - 15 minutes.

Re-think: Meeting in cyber-space

Tired of waiting in line to board the plane for your fifth trip this month? How about meeting up online?

As fuel prices skyrocket, it is making less business sense to fly for brief meetings. An alternative is to set up a video conferencing facility at the office. While the set up cost will depend on the capabilities required – a simple system comprising of speakers, a microphone, a video camera, a data projector and a computer should not cost more than R20,000 – that is equivalent to just over 10 return trips from Cape Town to Jo'burg (without taking into consideration the car rentals, traffic congestion and meals along the way).



Video conference programmes like Skype and Google Talk are user-friendly and can be accessed freely. Online programmes like Skype and Google Talk are, despite their relatively low video quality, of course free and very user-friendly.

Re-think: Your driving techniques

Your vehicle's carbon emissions will depend not only on how far you drive each day, but also on the vehicle you use, as well as your driving techniques. On the one hand you may consider switching to a more fuel-efficient vehicle. On the other hand, you may want to practice your 'hypermiling' techniques to reduce fuel consumption to a minimum:

- At low speeds, such as driving around town, air conditioning can add 5 - 7% to fuel costs.
- Driving fast with an open window or sunroof can add a further 3 - 6% to fuel costs.
- You can improve fuel consumption by up to 2% if you keep your tyres inflated to the correct pressure.
- Drive slower. Did you know that by driving at 100 kph instead of 120 kph you can save up to 25% of fuel?
- Sudden acceleration and deceleration of your vehicle increases your fuel consumption – "... an efficient driver is a smooth driver".⁴²



Moving closer to work

If you are spending too much time commuting, you may want to consider moving closer to your place of work. By just cutting 20 minutes off your travel time each way, frees up over 145 hours a year.





HSBC Bank flies low

The world's greenest large bank, is expecting to reduce emissions per employee from flying by 10% in 2009 and an additional 5% each year in the following two years, by implementing practices such as those mentioned in this section.⁴³



Re-think: Public Transport

Owning a personal vehicle is a privilege not open to many. Yet as our urban sprawl increases and the number of vehicles grows, the daily commute will become increasingly frustrating – that liberating feeling of owning a car, rapidly vanishes with a day-to-day bumper-to-bumper situation.

Fortunately the football World Cup was not only a resounding success. It brought with it an expansion of our public transport system in the major cities. Whenever possible opt for public transport, which is often more convenient and relaxing.

Your company, instead of subsidising employee parking, may want to consider offering incentives that encourage the use of public transport, such as subsidies for using public transport, shuttle services to the nearest public transport node and car pool facilitation schemes that link up staff living in close proximity – this last option can also stimulate conversation and rapport among staff that normally don't work directly with each other.



Re-think: Office location

If you are thinking about moving your office, you may want to site it close to public transport nodes and to where the bulk of your employees live. You can encourage staff to take public transport by ensuring the office is conveniently situated. If your office is not close to the bus or train station, consider organising a subsidised car-pool or shuttle service, that takes staff from the office to specific public transport points in the area.



"Every time I see an adult on a bicycle, I no longer despair for the future of the human race."
H.G. Wells



Re-think: Car-parking

Although this might be unpopular, you may want to consider reducing the number of parking spots available at the office in a bid to encourage staff to consider alternatives – this strategy has been successfully used the world over, including by cities such as Amsterdam and London. Just be sure that good alternatives exist or are created.

Re-think: Riding a bike to work

While there may be plenty of excuses for not cycling to work, there are many more compelling reasons for choosing the two-wheeler, including improved health of employees, cost savings, less traffic congestion and improved air quality.

In many cases, people who drive to work actually live within cycling or walking distance of their offices. In one particular case study, it was found that a large number of staff that drove to work lived within just 5 km of their workplace.

Encourage cycling (and walking) by organising events such as 'Bike to Work' days every month and offering showering and bike parking facilities.

Re-think: Walking to work

Finding it hard to find time to hit the gym regularly? Why not consider walking into work one day each week. A brisk walk – at a pace of five kilometres an hour, for just over an hour will burn enough calories equivalent to a hot dog.⁴⁴

Carbon Offsets

Project 90 by 2030 focuses on carbon reduction and we believe that carbon offsets should be engaged with very carefully, if at all. Given what we know about global carbon emissions trends, it does not make ethical sense to simply keep up a carbon intensive lifestyle while simply paying for the option to do so.

Instead, we urge the steady reduction of carbon footprints and addressing what can't be changed any further in our own lifestyles or organisations by supporting low carbon technologies and the shift towards a low carbon economy for all.

The cost of speed

The faster you go, the more expensive it becomes to run your car.

- Driving at 115 km per hour uses up to 9 percent more fuel than at 95 km per hour
- Driving at 130 km per hour uses up to 25 percent more fuel at 115 km per hour

What's Next...

- 1 Complete a baseline travel-wise audit.
- 2 Put together a prioritised plan for which areas, technologies and practices to focus on to achieve maximum travel emission savings.
- 3 Where necessary, obtain budgetary and implementation buy-in from colleagues.
- 4 Consider displaying posters announcing your initiatives (see additional resources section).
- 5 Have fun implementing the technologies and practices. Good luck.
- 6 Conduct follow-up audits (three to six months later) to calculate the reductions achieved. Expect to be pleasantly surprised.
- 7 Put in place maintenance plans to ensure that technologies function well and new practices are maintained.
- 8 Continue searching for and implementing new ideas and we hope you become an ever-greener office.

Last but not least - Enjoy and experience working in an office, which offers a functional and practical work-space that is energy-wise, water-wise and waste-wise, complete with travel-wise employees.

Suggested Further Reading:

- Travel, Transport & Lodging:
www.goinggreen.co.za/gg-links/green-lifestyle.html?start=10



References

- 1 The dollars and sense of green retrofits; Deloitte and Charles Lockwood; www.greenbiz.com/sites/default/files/document/us_re_Dollars_Sense_Retrofits_190608_.pdf
- 2 Why sustainability is now the key driver of innovation; Nidumolu R., Prahalad C.K., Rangaswami M.R.; Harvard Business Review; September 2009; <http://hbr.org>
- 3 The dollars and sense of green retrofits; Deloitte and Charles Lockwood; www.greenbiz.com/sites/default/files/document/us_re_Dollars_Sense_Retrofits_190608_.pdf
- 4 www.criminology.uct.ac.za
- 5 www.cullinans.co.za
- 6 www.greenbuilding.co.za/content/green-building/index/item/50-controlling-energy-costs-how-an-energy-assessment-can-help-you-get-started.html
- 7 www.90x2030.org.za/view.asp?ItemID=1&name=tblComponent2&name=Waste&pg=fro nt
- 8 ga.water.usgs.gov/edu/earthwherewater.html
- 9 www.dwaf.gov.za/WaterConservation/Programs_Arc.htm
- 10 soer.deat.gov.za/themes.aspx?m=361
- 11 www.sacci.org.za/index.php?option=com_content&view=article&id=196:sacci-expresses-concern-at-the-cost-of-traffic-congestion&catid=19:latest-news&Itemid=70
- 12 Bending the Curve – Your guide to tackling climate change in South Africa; Zipplies R; page 260; www.bendingthecurve.co.za
- 13 www.energystar.gov/ia/partners/promotions/change_light/downloads/Fact_Sheet_Mercury.pdf
- 14 www.environmentalleader.com/2010/04/07/save-thousands-by-switching-printer-fonts



- 15 www.ecofont.com/en/products/green/printing/sustainable-printing-using-ecofont-software.html
- 16 <http://standby.lbl.gov>
- 17 <http://home.howstuffworks.com/home-improvement/heating-and-cooling/heat-pump.htm>
- 18 www.environment.gov.za/soer/nsoer/issues/water/index.htm
- 19 www.insidethebottle.org/south-africa-water-tap-please
- 20 Bending the Curve – Your guide to tackling climate change in South Africa; Zipplies R; page 74; www.bendingthecurve.co.za
- 21 www.nationalgeographic.com/everyday/greenhouse/tips.html
- 22 Smart Living Handbook – Making sustainable development a reality in Cape Town homes; page 85; www.capetown.gov.za/EN/ENVIRONMENTALRESOURCEMANAGEMENT/Pages/SmartLivingHandbook.aspx
- 23 <http://science.howstuffworks.com/environmental/green-tech/sustainable/waterless-toilet1.htm>
- 24 <http://tlc.howstuffworks.com/home/composting-toilet.htm>
- 25 www.waterrating.gov.au/products/index.html; 2.2 L per flush, 10 flushes a day, 260 days a year
- 26 Smart Living Handbook – Making sustainable development a reality in Cape Town homes; page 91; www.capetown.gov.za/EN/ENVIRONMENTALRESOURCEMANAGEMENT/Pages/SmartLivingHandbook.aspx
- 27 www.sawic.org.za/?menu=16
- 28 www.popularmechanics.co.za/content/home/singlepage.asp?fid=2046&pno=3
- 29 www.greenstaysa.org.za/ag3nt/sat/GSSA/Waste/R6_Office_Paper_Reduction_Programme.pdf
- 30 www.engineeringnews.co.za/article/pet-waste-recycling-doubles-in-four-years-2009-08-21
- 31 www.petco.co.za/ag3nt/system/what_is_PET_01_identifying.php

- 32 www.foodbank.org.za/press/in-the-press/51-national/79--19-million-face-hunger-in-sa- daily-food-bank
- 33 <http://capetowngreenmap.co.za/go-green/compost-heap-wormbins> www.popularmechanics.co.za/content/home/singlepage.asp?fid=2046&pno=3
- 34 www.dailymail.co.uk/news/worldnews/article-1253892/Nine-World-Cup-sides-wear-shirts-entirely-recycled-plastic-bottles-South-Africa.html
- 35 www.popularmechanics.co.za/content/home/singlepage.asp?fid=2046&pno=3
- 36 www.gmagazine.com.au/features/1017/disposable-coffee-cups-vs-ceramic-mugs www.petco.co.za/ag3nt/system/recycling_06_drop.php
- 37 www.theglassrecyclingcompany.co.za/main%20pages/FactsAndFigures/GlassRecycling.html
- 38 <http://soer.deat.gov.za/172.html>
- 39 Bending the Curve – Your guide to tackling climate change in South Africa; Zipplies R; page 214; www.bendingthecurve.co.za
- 40 http://humanresources.about.com/od/employeebenefits/f/flex_schedules.htm
- 41 This assumes a sustainable carbon footprint per person globally is somewhere between 0 and 3 tonnes of CO₂ per annum – the numbers vary, depending on whether one takes the most recent, but already dated and watered-down, IPCC data or more recent updates that indicate we may have already used up our ‘safe carbon space’. Also see: Bending the Curve – Your guide to tackling climate change in South Africa; Zipplies R; page 76; www.bendingthecurve.co.za
- 42 www.guardian.co.uk/money/2010/may/01/save-800-pounds-year-petrol
- 43 www.environmentalleader.com/2009/05/27/hsbc-meets-targets-for-emissions-waste-and-energy/
- 44 www.weightloss.com.au/articles/healthy-diets/food-treats-are-they-worth-it.html page 91; www.capetown.gov.za/EN/ENVIRONMENTALRESOURCEMANAGEMENT/Pages/SmartLivingHandbook.aspx

green your office, think...

infowise



energywise



waterwise



wastewise



travelwise



The Green Your Office Toolkit was jointly developed by the Environmental Security Programme of the UCT (www.criminology.uct.ac.za), Project 90 by 2030 (www.90x2030.org.za) and Indalo Yethu (www.indaloyethu.co.za)