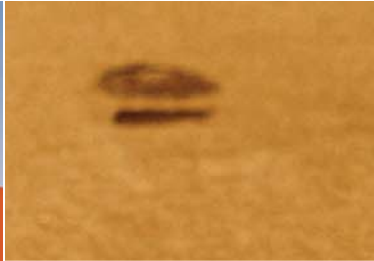




Australian Government
Department of Resources,
Energy and Tourism



CLIMATE CHANGE GUIDE

Mitigation and Adaptation Measures for
Australian Tourism Operators





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Energy and Tourism

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Minister's Message

As Minister for Tourism, it is my pleasure to present you with the *Climate Change Guide: Mitigation and Adaptation Measures for Australian Tourism Operators*.

The Guide supplements a series of free workshops being held across Australia in June and July 2009. These workshops will provide practical tools to help businesses adapt to the impacts of Climate Change while also benefiting their bottom line.

I encourage you to read this Guide, attend the workshops, and explore the case studies provided.

It is important the Australian tourism industry is prepared to deal with Climate Change and remain competitive. This Guide is aimed to assist you on that journey.

Yours sincerely

Martin Ferguson AM MP
Minister for Resources and Energy
Minister for Tourism

Welcome and thank you for taking an interest in climate change and how it relates to the Australian Tourism Industry. Reading this Climate Change Guide is your first step to becoming more aware of what part you can play in reducing your carbon footprint and understanding how climate change is likely to affect your tourism business in Australia.

Objectives

What can you gain from reading this Guide? It will:

- help you to understand climate change
- outline the impacts of climate change
- inspire you to save money and reduce environmental impacts by measuring and reducing your carbon footprint
- provide practical, prioritised and achievable solutions that will enable you to prepare for and adapt to the consequences of climate change
- provide guidance and real case studies that demonstrate how you can adapt, maintain or improve your business, in the face of climate change

The Guide has been developed for use by all operators in the tourism industry. However, it is recognised that larger tourism operators often have greater capacity and resources to adapt to these environmental challenges. Therefore the core elements of this Guide have been developed specifically with small to medium sized operators (SMOs) in mind.

Why should I read this guide?

Business operators often ask the question '*why bother with climate change or sustainability when it probably doesn't affect the bottom line?*' In reality, improved environmental performance is often accompanied by improved business performance in terms of operational costs, business independence and efficiencies. Put simply, reducing energy, waste and transport costs reduce greenhouse gas emissions (GHGe) AND reduces the direct costs of the operator.

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Steps to using this guide

This Guide has been structured to provide user-friendly information about our current knowledge of climate change and easy-to-access recommendations on how we can all respond to climate change.

STEP 1 GETTING STARTED

This section provides you with:

- an explanation of what climate change is and what causes climate change
- a summary of the key impacts of climate change
- an evaluation of what climate change means for the tourism industry
- Information on what next steps you should take

STEP 2 EVALUATING YOUR BUSINESS

This section provides information on how you can:

- evaluate the key impacts of your business
- develop some preliminary business objectives that can be achieved and will save you money
- engage your customers and staff from the outset

STEP 3 REDUCING YOUR EMISSIONS

This section provides you with information on how you can:

- calculate your carbon footprint
- reduce your carbon footprint and your resource consumption
- understand the key benefits of reducing your carbon footprint

STEP 4 ADAPTING YOUR BUSINESS

This section provides you with information on how you can :

- keep your business successful and reduce the risks of climate change
- achieve a competitive advantage over others
- make small changes now to save you money, time and effort in the longer term
- diversify your business

STEP 5 EDUCATION AND MONITORING

This section provides you with information on:

- developing an environmental policy for your business
- advertising the environmental credentials of your business
- refining your preliminary business objectives
- reviewing what you have done to see if you can improve each year

Case studies

Case studies are provided throughout this document. They are intended to help you understand how even the smallest changes can help your business and assist with adapting to climate change.

Quick tips

Various 'quick tips' have been included throughout this guide to identify easy and practical 'quick wins' that will benefit you and your business.

What is climate change?

The basics

Climate change is a global issue that affects us all. Changes in climate patterns mean that extreme weather events such as heat waves, floods, storms, droughts and bushfires will become more frequent, more widespread or more intense.

Climate change is the result of changes in our weather patterns because of an increase in the Earth's average temperature. This is caused by increases in greenhouse gases in the Earth's atmosphere. These gases soak up heat from the sun but instead of the heat leaving the earth's atmosphere, some of it is trapped, making the Earth warmer. Climate change is also known as global warming.

Greenhouse gases have always been a natural part of the atmosphere. They absorb and re-radiate the sun's warmth and maintain the Earth's temperature at a level necessary to support life.

However, since the Industrial Revolution there has been a steep rise in the concentration of these gases in the atmosphere because of human activity.

This increased concentration is known as the enhanced greenhouse effect, which is contributing to a warming of the Earth's surface.

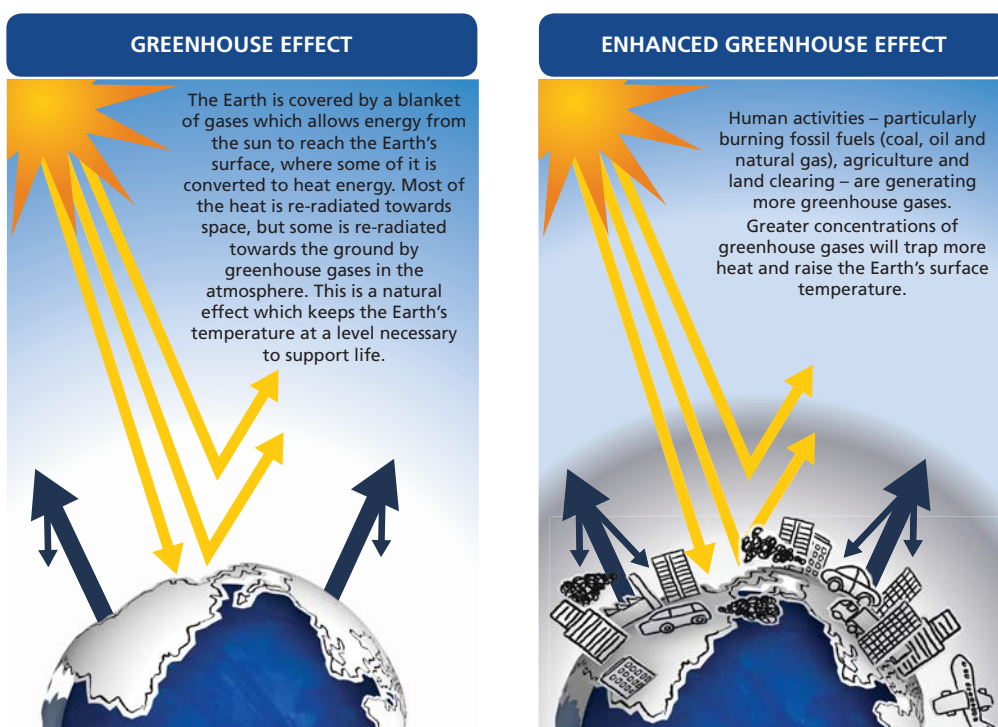
Research by the world's leading scientists suggests that without actions to reduce greenhouse gas emissions, the Earth's surface temperature is likely to rise by 1.0C-6.4C by the end of this century. Likely outcomes are reduced water availability, more heat waves, fewer frosts, less snowfall, more storms, stronger tropical cyclones and rises of 18-59cm in sea levels by 2030.

For Australia, it is impossible to precisely predict what the impacts of climate change will be as they will vary with each region. However, best estimates indicate that by 2030 Australia will face:

- around 1C of warming in temperatures
- up to 20% more drought-months
- up to 25% increase in days of very high or extreme fire danger
- increases in storm surges and severe weather events.

Australia is particularly vulnerable to the impacts of climate change. If levels of greenhouse gases continue to rise, the resulting climate change could lead to serious impacts on coastal communities, iconic areas such as the Great Barrier Reef and the Kakadu wetlands, biodiversity, agriculture, water supplies, human health, transport and communications infrastructure.

Figure 1 Representation of enhanced and natural greenhouse effect



What activities produce greenhouse gases?

Whilst we have no control over the natural causes of climate change, we have direct influence over the human causes of climate change.

Greenhouse gases are produced by human activity, including:

- burning fossil fuels
- using energy generated by burning fossil fuels
- some aspects of farming, such as raising cattle and sheep, using fertilisers and growing some crops
- clearing land, including logging
- breakdown of food and plant wastes and sewerage
- some industrial processes

The main greenhouse gases generated by human activity are carbon dioxide, methane and nitrous oxide, and some manufactured gases such as chlorofluorocarbons (CFCs), halocarbons and some of their replacements.

Water vapour is also a powerful greenhouse gas but the amount in the atmosphere is not directly linked to human activity.

For more information visit the Department of Climate Change website www.climatechange.gov.au. Publications include Australian Government guidance on climate change impacts through the publication: Climate Change Impacts and Risk Management: A Guide for Business and Government.

What does this mean for me?

The tourism industry will be affected

Climate change will not just affect some people in specific environments. It is a complex global issue, with far-reaching direct and indirect impacts to our current quality of life, health and economy.

Some examples of how the tourism industry may be affected include:

- The attractiveness of certain tourist destinations may change depending on the extent and nature of climate change in that area. However, the extent of attraction may depend upon other variables such as personal preferences, vulnerability to storms, sea level rise, access to facilities and environmental conditions.
- Potential decrease in tourism in areas where bush fire and cyclone risks may be higher or flooding risks may increase.
- Tourism could potentially be favoured in areas where essential resources are available, for example where clean water resources are abundant and accessible.
- Winter tourism hotspots could be significantly affected with overall reductions in frequency and volume of snowfalls, reductions in area of snow cover and shorter seasons.

Climate change is everyone's responsibility

The Australian Government is committed to tackling climate change and ratified the Kyoto Protocol in late 2007. The key principles of the Australian Government's response are:

- reducing greenhouse pollution in Australia in the short and long term
- working with the international community to develop a global response that is effective and fair
- preparing for the climate change that we cannot avoid, namely adaptation.

What can I do?

Now that you have an understanding of the basics of climate change and how it may affect the Australian tourism industry (Step 1), we can look at the next steps.

You can evaluate your business and commit to making changes (Step 2). This means that your staff members, customers and partner companies should be involved in developing your objectives and making the change. This will foster support, encourage responsible actions, educate others about the benefits that environmental sustainability can provide, and ensure that others are made to feel part of the solution.

You can be part of the solution by reducing your impact on climate change (Step 3). This involves identifying your actions that generate greenhouse gas emissions, either directly or indirectly, and then taking measures to reduce these emissions. Often, the best way to do this is to pick the 'low-hanging fruit'. In other words, real measures or policies that are easy to implement, save money, benefit businesses and maintain our quality of life.

You can prepare your business for the consequences of climate change (Step 4). Adapting to climate change involves understanding the likely impacts of climate change in the future and looking at options for dealing with them.

You can educate and monitor your impacts (Step 5). This includes developing a refined environmental policy with clear, tailored objectives that will outline your commitments and engage staff and customers. It is also important to continuously review your progress and remain aware of changes in policy and research.

Overall, early planning by the tourism sector is likely to bring considerable advantages for both the viability and international competitiveness of the industry.'

You can commit to making continuous change in your business. This can be achieved by developing an environmental policy, engaging your staff and customers and continuously reviewing your objectives.

Did you know?

Tourism is fundamental to Australia's economy. The direct GDP contribution of the tourism industry was \$38.9 billion in 2006-07. However, many of these tourism-related goods and services contribute to significant GHG emissions. (Source: *Tourism Australia, 2008*)

Evaluate the key impacts of your business

For most people, climate change is a daunting prospect. It affects everyone but it may feel like a problem that is too big to change by one person or one business. However, the reality is that, if people start with taking responsibility for their own environmental impacts and their own businesses, a collective, measurable change will occur.

Firstly, think about the major costs and environmental impacts of your business. This may involve looking through your electricity, gas and water bills, looking at your accounts to see how much fuel you have used, working out how much time and money you spend on sourcing materials and services, costing your maintenance activities, or seeing what your staff ongoings are.

Split your operations up into relevant categories, so that they become manageable for you. When you have done this, you will have completed a basic audit of your operations.

Engage your customers and staff from the outset

Involving your staff members, customers and suppliers is critical in making a change. Engaging them will foster support, provide 'out of the box' ideas, encourage responsible actions, educate others about the benefits that environmental sustainability can provide, and ensure that others are made to feel part of the solution.

A great way to start this process is by developing a 'green team', made up of an individual or staff group who are keen to improve the business and make positive environmental changes. The tasks of a green team can vary, but key objectives can include:

- highlighting areas for concern or possible change
- discussing issues and exploring alternative ideas with other staff and customers
- raising staff awareness of the environmental impact of their workplace
- setting goals of environmental or efficiency improvement
- monitoring and promoting the improvement in environmental or efficiency goals

If a green team is not suitable for your business, consider other ways in which you can engage your staff, customers and suppliers, such as:

For staff

- running a workshop or educational seminar for your staff focussing on environmental impacts and climate change
- providing a staff induction guide or worksheet with tips on environmental awareness and how to reduce their impact at work
- holding regular team meetings to raise concerns and ask for ideas
- develop a suggestions box for staff
- reward innovation and good practice

For customers

- develop a feedback form with a specific section for environmental recommendations
- ask your customers about their thoughts on 'going green' or sustainability. Would it influence their decision to visit you again?
- develop a website with a 'suggestions' section, or a tab focussing on your environmental commitments.

For suppliers

- invite speakers or external environmental businesses to present their products, services or ideas
- ask your suppliers to provide information on their environmental credentials.

Develop some preliminary business objectives

With your business audit complete and will full support from your staff and customers, it will be useful to develop some preliminary environmental objectives or a 'preliminary vision statement' for your business. You should base these objectives on what you currently believe your impacts to be and what you think are achievable, cost effective and will benefit your business in the short-term. Example of preliminary objectives include to:

- measure your carbon footprint and see what your biggest emissions are
- reduce your energy costs by $\$x/y\%$ by next year by installing energy-efficient light-bulbs and installing insulation in the roof
- reduce your transport-related fuel consumption by $\$x/y\%$ a year, by maintaining your vehicles more often and cycling to the shops
- reduce your water bills by $\$x/y\%$ per year by installing low-flow shower heads
- investigate the use of recycled paper products from local suppliers.

Benefits of reducing your emissions

This section will examine strategies for reducing (mitigating) your environmental impacts while improving operational performance and costs.

The key benefits to reducing carbon emissions for tourism operators are:

1. It's good for the environment

By reducing your emissions, you can assist with protecting natural assets, enhancing the sustainability of the Australian tourism industry and minimising your impact on climate change.

2. It's good for your business

You can enjoy savings in operating costs in the following ways:

- By reducing your energy costs through improvements in lighting, heating, cooling, appliances, fuel use and energy management, among others.
- By reducing the amount of waste generated, you can reduce the costs of waste storage collection, transport and disposal.
- By reducing your use of chemicals and other pollutants, you can improve the quality of your local environment, which will have long-term benefits for your business and bottom line.

- By implementing water efficiency measures, you can reduce your water usage costs and reliance on external providers.
- By implementing effective management and educational practices, you can ensure that your business can better adapt to changes in policy, impacts and economics.
- By focussing on your supply chain practices, you can directly influence the costs of ethically and/or sustainably sourced products.

3. It's good for your customers

One of the most significant benefits of reducing the carbon footprint for small to medium operators is the most intangible: the goodwill that is generated through engaging customers (tourists) and other stakeholders.

4. It's good for your health

Doing your bit for climate change will reduce your exposure to the possible impacts of climate change. By preparing to adapt to climatic shifts you may reduce your exposure to impacts, have an improved local environment in which to live and work, and can assist with ensuring the environment that you are on relying on will be there for future generations to enjoy.

Quick tip: Waste

Use the waste hierarchy as a guide to establish waste reduction priorities. Remember, it's much better to reduce the generation of waste in the first instance than to recycle it.

Benefits of reducing your carbon footprint

How to reduce your carbon footprint

A carbon footprint is a measure of emissions associated (directly or indirectly) with your business operations. Calculating your carbon footprint is a good way of understanding which areas of your business have the biggest contribution to climate change. The key GHG mitigation strategies for the tourism industry can be split into six categories, as shown in the 6 wedge wheel:

FIGURE 4 Key GHG mitigation strategies



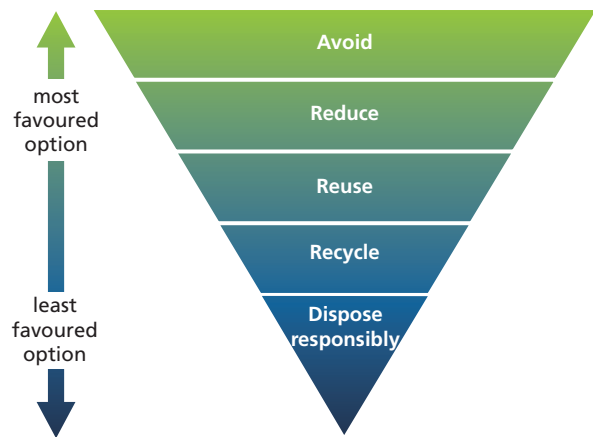
1. Energy

Reducing your overall energy use is a very effective measure to reduce your direct GHG emissions. This can be achieved through energy efficiency measures, use of renewable energy, switching to less carbon-intensive fuels, and behavioural changes in the way we use energy.

2. Waste

Reducing the waste you send to landfill reduces your indirect GHG emissions and also provides you with a competitive advantage when considering the increasing influence of environmentally aware travellers.

FIGURE 5 Waste hierarchy



3. Chemicals

Chemicals are often overlooked as a contributor to climate change. However, the production, use and disposal of chemicals can have far-reaching effects for both the natural environment and human health. Gases that are used in air-conditioning systems can have a significant contribution to our GHGe and should be carefully managed.

4. Water

Water is a precious resource and its availability is likely to be significantly affected by climate change. Taking small measures now to reduce your water use, maximise your water availability and change the way that you heat and handle your water will significantly reduce your GHGe, better prepare you for the consequences of climate change and save you money.

5. Management: people and emissions

You can develop training programs aimed at behavioural change for your staff, suppliers and customers. A training program is an effective aid to introduce energy reduction targets and to encourage others to 'do their bit'.

6. Supply chain

You can also take a big step in reducing supply chain GHGe by looking at your purchasing practices. The best way to do this is to develop a sustainable or ethically-sourced purchasing policy.

Reducing your emissions

Energy

ALL SECTORS

- Think about purchasing energy from a clean energy provider e.g. Greenpower.
- Monitor energy consumption to determine where opportunities for reduction lie.
- Install energy-efficient lighting – replace incandescent lamps with compact fluorescent lamps or LEDs.
- Install sensors for lighting in areas and rooms that are not constantly used.
- Install sensors and timers to control heating/lighting based on occupation of areas.
- Insulate your buildings to keep your property warm in winter and cool in summer.
- Install double-glazing and draught excluders.
- Undertake draught-proofing throughout your property.
- Insulate your hot water tanks and heating systems.
- Install environmentally-friendly hot water systems (such as solar thermal or heat recovery systems). Ensure well maintained Heating, Ventilation, Air-Conditioning (HVAC) systems.
- Maintain equipment regularly - this includes appliances, pipes, air-conditioning systems and insulation. This prevents efficiency losses and also reduces heat losses or gains.
- Regularly monitor energy usage and observe any trends.
- Explore ideas from staff – they may suggest useful energy-saving options.
- Install shading to reduce heat gain from the sun.

SECTOR-SPECIFIC

Marine



- Tune engines regularly to optimise their performance.
- Replace two-stroke outboard engines with more efficient four-stroke outboards.
- Consider fuel-switching to sustainably-sourced biodiesel.

Accommodation



- Install a key card system so that rooms only use energy when they are occupied.
- Encourage guests to re-use towels and linen.
- Use reminder notices to encourage guests to switch off lighting, appliances and air conditioning. Display a visible environmental policy.
- Switch off lighting, fridges, heaters and other appliances when the rooms are empty.
- Avoid the use of standby switches on TV's, electrical equipment and chargers.
- Purchase energy efficient appliances. Bear in mind that an average plasma screen TV can use greater than 50% more energy than an average LCD or rear-projection TV.

Transport



- Service engines regularly to optimise their performance and fuel economy.
- Keep tyre pressure to the recommended maximum.
- Plan your trips to reduce fuel consumption. Offer collective transport for large groups.
- Understand the aerodynamics of your vehicle: at speeds below 80 km/h, an open window is often better for fuel consumption than air conditioning.
- Undertake efficient driver training programs.
- Drive as smoothly as possible, minimising aggressive acceleration and braking.

Did you know?

In a typical home, up to 12% of your energy bill is standby power. Most TVs, DVDs, stereos and computer equipment use standby power all the time. The easiest way to reduce standby power use is to switch appliances off at the wall, not just with the remote control

(Source: NABERS)

Reducing your emissions

Waste

ALL SECTORS

- Conduct a waste audit to characterise the wastes generated and materials recycled by your operations.
- Follow the waste hierarchy as much as possible: avoid, reduce, recover and reuse, recycle, and dispose responsibly.
- Purchase food and guest amenities in bulk (for example, use refillable dispensers).
- Use recycled paper products (with high post-consumer recycled content) that are either unbleached or bleached using a chlorine-free process. Forest Stewardship Council products are a good choice. Print with soy-based inks.
- Segregate hazardous wastes and ensure you approach local council to confirm appropriate disposal methods.
- Minimise the amount of paper used for fixed activities such as billing – consider reducing paper size of invoices.
- Purchase goods with minimal packaging. This will reduce your waste generation.
- Create recycling areas at prominent locations on your premises and ensure they are clearly labelled.

SECTOR-SPECIFIC

Marine



- Purchase goods in bulk to avoid unnecessary packaging waste when onboard your vessel.
- Ensure oil absorbent pads are available as these will absorb oil spills and repel water.
- Do not dump fats, solvents, oils, paints, poisons, phosphates, nappies or sanitary products directly into any boating waters, or marine toilet systems.
- Do not add detergents or other chemicals to bilge water before pumping as this mixture is very toxic.
- Investigate the use of a vacuum pump. This will remove bilge water and pump it into drums for further off-site treatment/disposal.
- Use bilge oil filters to clean bilge water on the boat prior to its discharge overboard.

Attractions



- Separation of wastes is important: e.g. do not mix high quality waste paper with dirty paper products such as paper cups.
- Provide reusable items such as cloth napkins, glass cups where there are food and beverage services provided.
- Minimise amount of paper used for fixed activities such as billing – consider reducing the paper size of invoices.

Restaurants/ catering services



- Separation of wastes is important (e.g. do not discharge oil, grease and fats to the sewerage system, put strainers in your sinks).
- For catering events, use reusable products; if this is not possible then biodegradable or agricultural plastic are an acceptable alternative.
- Compost organic kitchen waste.

Did you know?

Australians are the second highest waste producers in the world. We throw away 3.3 million tonnes of food a year - the equivalent of a quarter of the nations food supply.

(Source: NSW Department of Environment and Climate Change)

Reducing your emissions

Water

ALL SECTORS

- Monitor water usage every month to understand consumption patterns, and determine where opportunities for improvement lie.
- Fix all leaking taps, pipes and fixtures.
- Recover grey water from specific activities (e.g. laundry) and re-use it for other purposes (e.g. gardening).
- Install high-efficiency plumbing fixtures and appliances as these can save significant quantities of water (automatic turn-off taps, low-flow shower heads, waterless urinals, dual flush toilets, kitchen appliances).
- Engage staff and customers to adopt water-saving practices e.g. encourage guests to follow a 'water budget' by using devices such as shower timers to educate them about their water consumption.
- When washing items, use water-efficient approaches, such as low-volume, high-velocity hoses
- Install oil/water separators in stormwater catchpits located around paved car parking areas.
- Use biodegradable detergents and cleaning agents.

SECTOR-SPECIFIC

Marine



- Reduce water usage on vessels so that grey water discharge is minimised. This can be done through simple measures such as minimising shower use.
- If practical, store grey water in holding tanks onboard and either reuse as toilet flushing water or pump out on shore for treatment.
- Install a holding tank or sewage treatment system onboard vessel, so that you can pump sewage to on-shore facilities for proper treatment.
- Avoid chemical-based holding tank additives, aim for an enzyme-based approach to break down bio-solids.
- Do not dump untreated sewage into sea within specific distances from high water marks, marine farms, marine reserves or in water of a specified minimum depth that all vary by location.

Accommodation



- Consider installing shower timers or other behavioural change practices.
- Install rainwater tanks to collect roof water from rainfall.
- Encourage guests to re-use linen and towels to limit washing.

Attractions



- Investigate on-site water supplies such as bores.
- If you have any septic tanks, check them regularly or at least every 18-24 months depending on location.

Did you know?

Did you know that up to **40%** of your energy bill is hot water? The shower is the **largest user of household hot water**. Installing efficient showerheads – 3 star or better – may save you up to \$100 a year on your water and energy bills.

As much as **60%** of your hot water bill is due to heat losses from the tank and pipe work. Add extra insulation to your storage tank to reduce heat losses, particularly if it's in a cold or exposed position such as the south side of your home. Foil-backed insulation blankets wrapped around the tank are most suitable

(Source: NABERS)

Reducing your emissions

Supply chain

ALL SECTORS

- Inform your suppliers that you have started to look at environmental criteria and ask if they know the carbon footprint of their products.
- Give preference to suppliers who are environmentally responsible and have collection/reuse services for packaging.
- Choose publishers that have environmentally friendly options for your marketing materials. These might include material printed on 100% post-consumer content, chlorine-free paper.
- When purchasing materials consider bulk-purchasing with other local operators.
- Take a 'cradle-to-grave' holistic approach when purchasing goods and services. This approach considers the entire 'life cycle' of materials including extraction, processing, manufacturing, transport, usage and disposal.
- When purchasing appliances and other equipment, choose those that are most suitably energy rated (energy rating) and water rated (WELS stars).
- Purchase less carbon-intensive commodities. For example, purchase locally-sourced goods and services, reduce your purchases of meat and animal-related products, reduce your use of intensively manufactured and imported goods.

SECTOR-SPECIFIC

Marine



- Use renewable on-board power sources for vessels such as solar hybrid marine power systems.
- When selecting new vessels consider fuel-type, efficiency and emissions and how they match to your operational needs.

Transport



- Consider use of renewable on-board power sources for vessels such as solar hybrid marine power systems.
- When selecting new vehicles consider fuel-type, efficiency, emissions, (e.g. bio-fuel powered or clean burning diesel vs. other fuel options like diesel).
- Ensure that your employees handling trade waste discharges from vehicle washing follow best practice management.

Quick tip: Insulation

Consider installing roof insulation in buildings and offices. This is a very cheap and easy method to save you money, maintain a constant temperature in your building and reduce your emissions. Over its projected life of 60 years, an average householder will have unnecessarily paid for the cost of the insulation 12 times over through the cost of wasted energy.

Source: <http://www.icanz.org.au/>

Reducing your emissions

Chemicals

ALL SECTORS

- Clean surface areas with natural products such as vinegar, low toxicity cleaners and vegetable-based soaps.
- Give preference to suppliers who supply environmentally friendly products.
- Keep an updated database of hazardous substances used in your operations.
- Keep hazardous substances in covered and sealed containers and deposit them in secured areas.
- Phase out any ozone-depleting gases in refrigeration equipment and air conditioning.
- Maintain air-conditioners and associated equipment regularly by licensed contractors.
- Use environmentally-friendly chemicals and techniques for gardening and landscaping.
- Use automatic dosing for cleaning chemicals to minimise human handling and also to ensure that correct amounts of chemicals are used.
- Train staff who come into most contact with the various chemicals about their safe use and disposal.

SECTOR-SPECIFIC

Marine



- Frequently repaint your vessel hulls with fluoropolymer-based paint to ensure hydrodynamic efficiency.
- Ensure that barnacle removal (using non-toxic chemicals) is carried out as frequently as possible to ensure hydrodynamic efficiency.

Quick Tips - Lighting

- Replace standard incandescent light globes with energy efficient compact fluorescent globes. They last 6 to 10 times longer and use **80% less energy** than standard globes. For each 75 watt standard bulb you replace with a 15 watt compact fluorescent bulb, you can save around \$10 per year. So replacing just 10 globes could save you around \$100 a year. (Source: NABERS)
- A typical compact fluorescent lamp can save around a third of a tonne of greenhouse gas and up to \$45 per year! It also avoids the cost of 6 incandescent globes and you don't have to change the bulbs as often.

Source: Department of Environment, Water, Heritage and the Arts

Reducing your emissions Management

Plans and policy

- Develop an environmental/sustainability policy with specific targets for emissions reductions (e.g. to reduce your energy-related emissions by 10% every year for 5 years). Such a policy is useful to guide your business decisions and should include a commitment to continual improvement.
- Develop a 'roadmap' or action plan for how you will achieve your emission reduction targets; focus on the big areas of energy consumption that offer the largest financial savings opportunities.
- Seek accreditation with an eco or environmental organisation. This will highlight your competency and allow you to regularly review your environmental policies and procedures.
- Consider purchasing accredited carbon offsets after you have taken all other reasonable measures to reduce your emissions.
- Consider what public funding you can apply for. There are numerous grants that you might have access to.
- More information is available at the Department of Climate Change website www.climatechange.gov.au, and in the ACCC Guidelines on Green Marketing and the Trade Practices Act at www.accc.gov.au.

Customer, staff and business relations

- Seek feedback from your staff, customers and suppliers about your sustainable ideas and seek to improve on these ideas. This may include conducting a staff survey.
- Place responsibility for actions with various staff; by creating a team or individual dedicated to energy reduction measures. This will engage staff in key decisions. Reward innovation or effective practices amongst your staff.
- Publicise your environmental policy and any accreditations to customers and other businesses.
- Provide information on how customers can decrease the carbon footprint of their holiday. This may alleviate concerns about the impact of travel and holidays and encourage longer stays.
- Develop a strategy to involve your local community in your environmental initiatives (e.g. community composting areas) and publicise these actions. This is a powerful way of establishing a relationship with your community and local government and obtaining further ideas from them.
- Develop a training program that includes sustainable practices as an important element, including the staff induction process.

Quick tip

Most people do not realise that over 90% of their electricity is generated by burning coal, creating significant greenhouse gas pollution. GreenPower is government accredited electricity generated from clean renewable sources such as the sun, wind, water and organic matter. By choosing accredited GreenPower you can have up to 100% of your household's energy usage generated from renewable sources. Further information is available from <http://www.greenpower.gov.au>.

(Source: NABERS)

Reducing your emissions

A checklist

To help you get started on reducing your GHG emissions, a checklist has been provided.

End-use activity	Actions	Long, medium or short term	
		YES	NO
ENERGY	Have you installed energy-efficient lighting in all areas and rooms?		
	Do you use a green energy provider?		
	Do you and your customers switch off all lighting and appliances when rooms or facilities are not being used?		
	Are your windows double-glazed?		
	Do you use thick curtains for cold weather?		
	Do you use the most suitable energy-efficient appliances?		
	Do you use air conditioning only when you really need to?		
	Do you shut windows and doors when using air conditioning and encourage customers to do the same?		
	Do you open windows for natural air flow and ventilation?		
	Do you use natural light as much as possible?		
	Do you regularly defrost your fridge and freezer?		
	Do you use suitable shading to prevent heat gain?		
	Are your hot water pipes and boilers insulated to minimise heat loss?		
	Do you clean your hotplate reflectors so that when you cook the heat is transferred directly to the pans more efficiently?		
	Have you fitted power points with timers so that equipment can be turned off outside of operating hours?		
	Have you painted your rooms lighter colours? Dark colours absorb light thereby increasing the need for more lighting.		
	Have you installed motion detectors for outdoor/indoor security lighting?		
	Have you installed motion detectors for other areas and rooms which are not used regularly?		
	Do you monitor your energy usage (using your energy bills)?		
Are your buildings (roof and walls) insulated?			
WASTE	Have you conducted a waste audit to characterise the waste generated by your operations?		
	Do you purchase locally produced products and services?		
	Do you purchase sustainable, recyclable, ethical and/or organic products?		
	Do you re-use or recycle everything that you can?		
	Do you have separate recycling bins available throughout your premises?		
	Do you segregate hazardous wastes?		
	Do you purchase products with minimal packaging or returnable/reusable packaging?		

End-use activity	Actions	Long, medium or short term	
		YES	NO
WATER	Do you have any water saving devices in your operations (rooms, kitchens, toilets, gardens)?		
	Have you installed efficient water fixtures such as dual flush toilets, waterless urinals and AAA rated taps and showers?		
	Do you encourage guests to reuse towels and linen?		
	Have you installed rainwater collection systems?		
	Do you recycle water?		
	Do you regularly check for leaks?		
	Do you encourage users to wait for a full load before using washing machines?		
	Do you wash items (such as cutlery) in basins to avoid running the taps constantly?		
	If you have a swimming pool, do you cover it with a pool cover to reduce evaporation?		
	Have you applied a light top dressing to your lawn to minimise water requirements?		
	Do you water your garden/lawn during cooler hours (early morning) to minimise evaporation?		
	Do you use drip irrigation instead of spray watering of your garden/landscaping?		
Do you monitor your water usage (using your water bills)?			
TRANSPORT	Have you considered purchasing smaller or more fuel-efficient vehicles?		
	Do you use public transport or more sustainable transport methods (such as walking and cycling) whenever you can?		
	Do you ensure that your vehicles are properly maintained and do you regularly check your tyres, oil and air filters?		
	Do you drive as smoothly and efficiently as possible, minimising aggressive acceleration and braking?		
	Do you use your vehicle air conditioning only when you need to?		
	Have you reasonably considered your use of air travel?		
	Can you encourage sustainable transport options as part of your business (i.e. provide bicycles or bus/train/walking timetables and maps)?		
SUPPLY CHAIN	Have you discussed opportunities for minimising packaging or returning packaging with your suppliers?		
	Have you explored the availability of recycled or recyclable goods, or sustainable materials in the goods you purchase?		
	Have you partnered with other local businesses to source your supplies together in bulk and require your suppliers to reduce packaging?		
	Have you considered alternative packaging like reusable?		
	Have you considered the 'food miles' that your food has to travel to reach you?		
	Have you investigated whether your suppliers can offer products or services that have been created in a more sustainable way? Accreditation can help you here because if your suppliers are accredited then they are more likely to be sustainable as well.		

Reducing your emissions: a checklist (continued)

End-use activity	Actions	Long, medium or short term	
		YES	NO
CHEMICALS	Have you got a centralised purchase system so that you can better monitor the chemicals you use?		
	Do you use natural products with no toxic content?		
	Do you consider environmentally-friendly chemicals and techniques when undertaking landscaping and/or gardening?		
	Do you have a database of the chemicals that you use in your operations?		
	Have you trained staff on how to handle and dispose of chemicals?		
	Have you provided the correct Personal Protective Equipment (PPE) to be used when handling chemicals?		
	Do you have emergency measures in place in case of accidents with chemicals?		
	Have you investigated non-chlorine alternatives for your swimming pool such as salt water?		
MANAGEMENT	Have you written up and displayed your environmental policy?		
	Do you provide information on how clients can decrease the carbon footprint of their holiday?		
	Have you sought eco-accreditation with various providers?		
	Have you developed and implemented an ongoing environmental training program or induction process for your staff?		
	Have you considered a staff incentive program to reward staff innovations in reducing individual/team/customer emissions and/or business costs?		
	Do you have any business insurance policies that cover you for damage to property/equipment/illness/injury/loss of earnings as a result of extreme weather events?		
	Have you researched what other similar businesses are doing to improve their environmental performance?		
	Have you designed your facilities according to core environmental principles, such as basing designs on microclimate characteristics like wind, soil, native vegetation and exposure.		
	Have you considered tree planting and sustainable landscaping management practices?		

Quick Tips - Shading

External shading is the best way to prevent summer heat gain through windows. Shade 'hot' windows, particularly those facing west, with deep eaves, awnings, shutters or trees, to reduce heat absorption by up to 80%. Eaves should be placed to block summer sun but admit the lower-angled winter sun to keep premises comfortable.

Source: NABERS



Hidden Valley Cabins (Queensland)

Overview

Hidden Valley cabins (HVC) is located one and a half hours north west of Townsville. It is a family run business priding itself on warm hospitality and home cooked meals.

Guests have the choice of staying in single or double homestead rooms, or single, double triple or family rustic outback cabins.

What were their key sustainability drivers?

Reducing the cabins' electricity usage

- HVC is 100% solar powered, saving 78% tonnes of carbon dioxide equivalent (tCO₂-e).
- Conventional light bulbs replaced with energy-saving compact fluorescent light bulbs. This reduced power consumption from 2220 watts to 430 watts and saved 18 tCO₂e.
- Televisions around the complex are turned off at the switch every night .

Spreading the message of climate change awareness

- Guests are educated on the value of renewable energy through workshops and information guides at checkout and inside each cabin.
- HVC works with local government and industry to ensure that climate change risks are incorporated into infrastructure planning and management.

Becoming carbon neutral

- Purchasing of carbon credits to offset operational activities.

Recycling products wherever possible

- All aluminium cans, paper and cardboard are recycled.
- HVC uses recycled products whenever possible.
- Food and paper are composted for use in the gardens.

Did you know that HVC are owned by Bonnie and Ian McLennan who were tin miners before becoming current owners of HVC. The McLennans were always environmentally conscious. It took them two years to complete the landscaping, adding the pool, building new cabins and rebuilding older ones. All structures were built from local timbers.

We would like to acknowledge the courtesy and permission of HVC to include them as a case study.

Climate change mitigation: **case study**



GreenTomatoCars (London, Sydney)

Overview

GreenTomatoCars is the brainchild of two Cambridge University graduates who were keen to operate a business with minimal impact on the environment.

GreenTomatoCars uses the Toyota Prius and adds to that by investing in offset projects to account for unavoidable emissions. They aim to not charge extra for the green services they provide, thereby developing a competitive advantage

What were their key sustainability drivers?

Smart choices

- GreenTomatoCars turn down journeys not considered 'green'. e.g. they may recommend that a customer use a more localised service rather than send one of their cars a long way to perform a relatively short journey.
- They suggest that passengers share a car when they book multiple cars for a single route.
- Drivers are regularly assessed to ensure environmentally friendly driving techniques.
- Drivers are trained to 'plot where they drop' to avoid having to drive back to pick up next passengers from near a previous drop-off point.

Lowering their carbon emissions

- Double the carbon emissions that are produced by road activities of GreenTomatoCars are offset through UK-based Climate Care.

Offsetting remaining carbon emissions

- Toyota Prius hybrid vehicles are used. These engines use 40% of the fuel used by comparable cars and produce 60% less GHGe.

GreenTomatoCars' environmental policy shows it is committed to "meet, and where appropriate, exceed all relevant legislative, industry and other relevant standards". They also aim to "engage in dialogue with key suppliers in order to encourage them in the development of environmental best practice.

We would like to acknowledge the courtesy and permission of GreenTomatoCars to include them as a case study



Dynasty Chinese Restaurant (Sydney)

Overview

This medium sized restaurant is located in the Canterbury Bulldogs Club in Belmore. It has 50 staff and 4 two-burner stoves. While it was established to prepare Chinese cuisine, it is geared to a very diverse market.

What were their key sustainability drivers?

- The restaurant decided to invest in waterless wok stoves as part of the Ethnic Communities' Council of NSW 'Saving Water in Asian Restaurants Project', funded by the NSW Government's Climate Change Fund. Water meters were installed prior to the waterless woks being installed to gauge the existing water use of the restaurant. It was found that the restaurant used an average of 15,000 litres of water per day.
- Following installation of the new waterless woks, this figure reduced to 2,000 litres per day, resulting in an average saving of 13,000 litres of water per day. The restaurant spent \$14,000 on the new stoves, while saving \$11,000 per annum in water costs.
- The restaurant invested in steel bars to place across the stoves to reduce the direct stove heat. As a result, chefs have become more willing to reach across the tap head to conserve water. Ice is also now used in place of running water for cooling the food.

The restaurant's owner, Mr Johnny Lim, was always concerned about the large amounts of water used by the wok stoves. He had migrated from Singapore and has operated Japanese restaurants there and in Australia. So when he changed to a restaurant that served primarily Chinese food, he was quite surprised by the restaurant's large water bill. A big part of the problem was behaviour-related. He found that it was common practice for taps to be left running continuously for a minimum of 8 hours a day!

We would like to acknowledge the courtesy and permission of Dynasty Chinese Restaurant and the Ethnic Communities' Council of NSW to include them as a case study.

Climate change mitigation: **case study**



Cullen Wines (Western Australia)

Overview

This medium sized winery is located in Margaret River, Western Australia. The 45 hectare vineyard was established in 1971 and produces 100-250 tonnes of grapes per year.

What were their key sustainability drivers?

Lowering their carbon emissions

- They explored different methods of transport with varying carbon dioxide emissions.
- Investing in green power options such as wind and solar as well as accredited green energy.
- The Carbon Reduction Institute completed a Solar Power Feasibility Study for Cullen Wines.

Offsetting remaining carbon emissions

- In September 2006 Cullen Wines linked up with the not for profit group Men of Trees and donated over 1,000 native trees. These were planted to rehabilitate the WA wheat belt and sequester emissions from air travel and direct emission from fuel usage onsite.
- The winery has the Carbon Neutral: NoCO2 certification, achieved by offsetting the 561 tonnes of carbon dioxide produced each year by investing in tree planting.
- They became the first winery in Australia to make 100% of their air travel and fuel usage emissions carbon neutral.

In the early 1960s detailed climatic studies of various regions in South-western Australia revealed that during the winegrowing season, Margaret River's climate was similar to that of Bordeaux.

The vines are grown using biodynamic techniques and have 'A' Grade Organic Certification. The restaurant overlooks the historic vineyard and in keeping with the organic philosophy in the vineyard, all dishes are prepared using fresh, organic produce sourced from their own garden and select local producers.

We would like to acknowledge the courtesy and permission of Cullen Wines to include them as a case study.



Go West Tours (Victoria)

Overview

Go West Tours is a Melbourne based company which began operating in 2000.

They operate sightseeing coach tours from Melbourne to the Great Ocean Road and the Phillip Island Penguin Parade. The company employs 15 staff including the proprietors and operators.

What were their key sustainability drivers?

Minimising waste generation

- In 2005, Go West Tours was accredited with 'ButtsOut Australia', a campaign aiming to encourage smokers to use personal ashtrays. Passengers are given free personal ashtrays and signs are posted throughout the coaches.
- All paper printed in the main office is printed on double sides and then reused as note paper while plastic drinking containers from the coaches are recycled.

Offsetting carbon emissions

- The tour company has planted 461 trees to offset the entire fleet's annual emissions of 123.47 tonnes of carbon.
- The company plans to recalculate its carbon emissions each year to ensure it continues to offset their vehicle's emissions.

Education

- iPod translation services have been recently introduced to accommodate international customers, while the tour operators raise environmental awareness and promote positive environmental messages to customers by maintaining a high level of communication with their customers.

Reduce resource demand

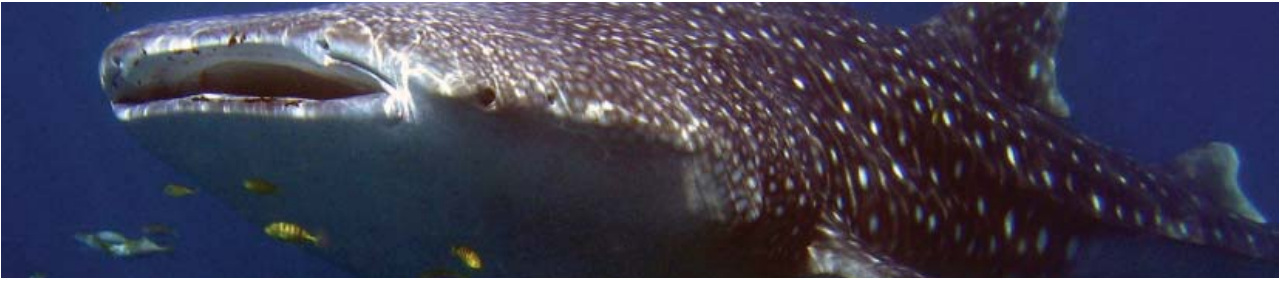
- The firm's head office has converted to low-energy light bulbs, and free low-energy light bulbs have been distributed to employees for use in their own homes.
- The owners of the company estimate that they save around 25% per year by reducing their fuel, power and water usage.

The Go West Tours owners, Terry and Fiona Smit, estimate that they have saved 25% of operating costs per year by reducing their fuel, power and water usage.

Did you know that Go West Tours is the first tour operator in Australia that offers a mobile personal translation service so that non-English visitors can receive their tour information in their native languages (13 languages so far)!

We would like to acknowledge the courtesy and permission of Go West Tours to include them as a case study.

Climate change mitigation: case study



Ningaloo Reef Retreat (Western Australia)

Overview

This retreat is a high quality tented camp within Cape Range National Park. It offers accommodation for up to 12 guests in a unique coastal landscape overlooking a fringing coral reef. The retreat employs 3 fulltime staff and 2 casual staff.

What were their key sustainability drivers?

Lowering their energy consumption:

- Ningaloo Reef Retreat relies on solar power for all lighting needs.
- Two 75 watt solar panels are connected to a 12 volt battery in each tent.
- Energy efficient lighting is used throughout the retreat.
- Gas is used for cooking in the kitchen.
- Showers are solar heated.
- Vehicles are excluded from the retreat.

Reducing water use:

- Each tent is provided with 20 litres of water a day for cooking and washing.
- Water is transported in 20 litre containers around site on electric golf buggies.

Managing waste:

- Composting toilets are used on site
- Grey water is disposed into grease traps and then soaking trenches.
- Solid and organic waste is transferred to the local waste disposal system.

Using local resources:

- Locally sourced plantation timber is used for all timber platforms.
- The retreat has a 'buy local' policy. Where possible, goods are purchased in Exmouth.

Ningaloo Marine park is visited seasonally by Humpback Whales (August to October) and Whale Sharks (April to June).

We would like to acknowledge the courtesy and permission of Ningaloo Reef Retreat to include them as a case study.

Adapting your business to climate change

What is adaptation?

Adapting to climate change means taking actions in response to actual or projected climate change, and its impacts, that lead to a reduction in risks or a realisation of benefits.

Some global and local efforts have been made to reduce greenhouse gas emissions but, as a result of current and historic emissions, some level of climate change is now inevitable. As a result, the overall numbers of tourists, the types of tourism experiences available, the degree of customer satisfaction and even the levels of safety in some environments are all likely to be different from what we experience today.

Therefore, we will need to adapt the way we do things to maintain the viability of the Australian tourism industry. This may include changing our behaviour, our business models, our marketing strategies, our use of resources and the environment, as well as changes to infrastructure and social attitudes.

Benefits of adapting

For example, hotel operators, who are heavily dependent upon the provision of hot water, may prepare for projected climate change-induced droughts and increased energy prices by using water and energy-efficiency measures.

Some of the benefits of adapting include:

- money savings for the operator
- maintaining a competitive advantage over other operators
- saving time and effort in the future
- achieving a marketing edge by emphasising the ethical or environmental practices in your business
- improving business certainty for the longer-term.

Is my business adaptable?

It is acknowledged that some tourism operators cannot readily adapt to the consequences of climate change. Indeed, some operators directly depend upon the weather, the natural environment and natural resources for their business and cannot individually prevent the consequences of global climate change. Furthermore, small operators often have limited funds or local resources to make the necessary changes to their businesses.

However, there can be significant benefits to any business from planning ahead, being aware of the consequences and preparing as well as possible for any impacts on your own operations.

When should I adapt?

When planning adaptation responses, we can either take action now based on our existing knowledge of potential impacts, or we can respond to the change as and when it occurs. The decision to act and the measures to take should be evaluated on a case-by-case basis.

Early action may help reduce the need and cost of future changes and may also provide some additional benefits in the short-term. For example, improving water efficiency will have immediate benefits, but also better prepare you for times in the future when there is less water available.

In other cases, a 'wait and see' approach may be more appropriate. For example, tourist operators may not want to build expensive additional infrastructure to reduce the risks of extreme weather until these changes are actually occurring.

Each tourist operator should undertake a risk assessment and prepare a plan or strategy for adapting to climate change.. Further information can be obtained from 'Climate Change Impacts & Risk Management: A Guide for Business and Government, listed in the References section.

Did you know?

Australia is home to more than one million species. Australian plants and animals have evolved to cope with large year-to-year climate variability, but many terrestrial species have narrow long-term average climate ranges.

Source: Department of Climate Change

What can you do to adapt to climate change?

What are some of the climate change impacts for tourism operators?	What can tourism operators do to adapt?
Reduced rainfall and increased temperatures may reduce water levels in inland lakes, waterways and rivers, and increase water restrictions	<ul style="list-style-type: none"> • Reduce dependence on external supplies by installing on-site water tanks. • Install water efficiency devices at both supply and demand points e.g. low-flow shower heads, timers on showers, AAA rated fittings. • Work with water industry to ensure that risks are incorporated into water resource & infrastructure planning/management.
Increased sun exposure may create human health impacts	<ul style="list-style-type: none"> • Develop robust health and safety policies for staff and clients. • Offer sun screen as part of your business.
Physical climate change impacts will affect the operation and structural integrity of infrastructure	<ul style="list-style-type: none"> • Provide marketing and educational material to visitors demonstrating what your business is doing to reduce its environmental impacts. • Work with local government and industry to ensure that climate change risks are incorporated into infrastructure planning, management, maintenance and operations. • Purchase and maintain generators for extreme weather events. • Reduce dependence on imported electricity and fuel by looking into alternatives such as on-site production (micro-wind, solar photovoltaics, solar thermal), energy efficiency measures and fuel switching.
Less available land due to erosion caused by sea level rise	<ul style="list-style-type: none"> • Develop a plan to reduce erosion from beach activities and exposure from weather.
Marine and terrestrial ecosystem health and diversity/abundance of species will be adversely affected and may make the destination less attractive to tourists	<ul style="list-style-type: none"> • Build artificial reefs and rompings (offshore fish aggregation devices) in areas of current degradation and lobby designation of national parks, marine parks and no-take zones. • Obtain understanding of how climate change will affect local resources. Develop an environmental management plan to reduce other controllable impacts on the local environment, such as logging, pollution, erosion, development, invasion of non-native species, waste, and disturbance.
More frequent extreme weather events may reduce the number of days that businesses can operate	<ul style="list-style-type: none"> • Diversify business to take account of bad weather days. Examples include scuba clubs developing indoor training pools, fishing operators focussing on land-based fishing opportunities, kayaking/canoeing operators offering additional adventure tourism.
Increased exposure to bushfires	<ul style="list-style-type: none"> • Work with local fire teams to determine what measures can be taken to reduce risks and assist local communities.
Reduced availability and increased expense of food due to environmental and economic impacts of climate change	<ul style="list-style-type: none"> • Diversify business or ingredients to reduce environmental impacts, take account of local conditions and reduce costs. For example, source local and sustainable fish species, reduce dependence on certain meat products (which may be affected by carbon taxation) and use in-season or abundant produce.
Increased temperatures and reductions in snowfall may reduce viability of winter operations	<ul style="list-style-type: none"> • Diversify business to focus on higher altitude skiing areas, artificial ski slopes and non-winter activities. • Introduce stringent mitigation measures such as fences to maintain snow drift.



Mount Buller Ski Resort (Victoria)

Overview

This ski resort is located 3 hours from Melbourne. It has a lift system that covers over 300 hectares of terrain. There are ski areas designed for different skill levels and over 30 bars and restaurants. There are also many forms of accommodation.

The resort operates a shuttle service between various destinations. They are an operation that employs 15 people and as a small operator they believe they have the advantage of smaller overhead costs than many large operations.

What were their key drivers?

Increase snow cover

- Mount Buller Ski Resort has invested \$3.5 million to create a system that uses recycled water to produce artificial snow.
- Previously, the water used for sewage was being treated and released into alpine streams. The resort now uses a disinfection system of UV irradiation, chlorination and ultrafiltration to purify the wastewater, providing up to two million litres of recycled Class A water a day.

Water

- Resort encourages residents and guests to minimise water consumption.

Waste management

- The resort generates about 700 tonnes of waste per year. About 75% of waste ends up in landfill and the rest is recycled.
- The resort has identified that the key step to reducing waste to landfill is to segregate wastes.
- A recent study showed that about 40% of garbage bags contained recyclables so this is an opportunity they are working on via the public place recycling program.

Provision of all-year round services

- The resort has begun to focus on year-round tourism to ensure that tourism in the area remains sustainable.
- They have introduced: bushwalking, mountain biking, 4WD tours, indoor rock climbing, archery, abseiling, gyms, health retreats, spa treatments, health clubs, cinemas and museums.

We would like to acknowledge the courtesy and permission of Mount Buller Ski Resort to include them as a case study.

Climate change adaptation: **case study**



Community farm example

Overview

This example considers a Community farm that offers tourists the opportunity to participate in and experience many kinds of activities, events and attractions developed specifically for them.

What are the key drivers and solutions for this example?

Decreased rainfall

- Development of a low cost desalination plant to use saline groundwater on the property.
- Reduce water consumption through on and off farm water capture, improved water storage and recycling methods.
- Improve irrigation management practices.
- Implement crop and livestock variety diversification and management practices to maintain and improve productivity under conditions of increased temperatures and winds, and moisture stress.
- Encourage customers to reduce their water consumption and usage through signage and educational documents.
- Install water-saving devices in accommodation and facilities.

Extreme temperatures

- Diversification of activities to encourage visitors during extremely high temperature periods. Examples include additional eco-conscious opportunities such as horse-riding, cycling tours, tree planting, producing fuel from animal waste and creating an organic farm with rare breeds and vegetables.

Indirect impacts such as power cuts and extreme weather

- Adaptation measures could include installing a sustainable biofuel backup generator or renewable energy options such as solar thermal and micro wind generation.
- Undertaking a risk assessment to ensure key threats to operations are reduced as far as possible.

Australia's agriculture industry is projected to be one of the most adversely affected from climate change, given the climate's influence on agricultural productivity. For example, in the Murray Darling Basin (MDB), there is likely to be less water available in the future. By 2030 the median decline in flows for the MDB is projected to be 11 per cent– 9 per cent in the north and 13 per cent in the south.

This case study is a combination of various situations and should therefore not to be considered as a real-life case study



Island resort example

Overview

This example considers a medium-sized island resort located adjacent to the ocean, catering for luxury guests.

What are the key drivers and solutions for this example?

Extreme cyclone events and sea-level rise

- Storm surges and cyclones will become a major problem as a result of climate change, often leading to widespread structural damage. To combat this, this resort example could ensure that all new buildings are built well above sea level and the high tide mark. Older buildings could have structural re-inforcements, with a focus on more highly susceptible locations.
- All structures could be designed to withstand in excess of 60 km/h wind gusts in accordance with the building code.
- The resort could prepare a risk assessment to ensure that all areas have evacuation zones and insurance cover in place.
- Over-water accommodation could be built on stilts with no masonry up to maximum surge levels to minimise vulnerability to extreme winds and rising water levels.
- Buildings could be constructed in a square shape so that high winds can go around them (square shapes resist wind well). They could also be clustered rather than arranged in row formation, to provide extra stability.
- Staff training could be undertaken for how to act in an emergency with water, food and first aid kits readily available.
- The resort could organise a direct communication line to a local meteorological service to ensure that cyclone warnings are communicated early.

Did you know? Did you know that, contrary to popular belief, few building structures are actually blown over during extreme wind events like cyclones? They are actually pulled apart by winds forces gathering around and over the buildings which has the effect of lowering the pressure on the outside and creating suction on the walls and roof thereby tearing them apart.

It is not the materials used but the way they are used that determines building's potential to resist such effects.

This case study is a combination of various situations and should therefore not to be considered as a real-life case study

Climate change adaptation: **case study**



Outback motel example

Overview

This example considers a small-sized motel close to the waters edge, located in a remote area that is susceptible to flooding, fires and extreme weather events.

What are the key drivers and solutions for this example?

Extreme cyclone events

- Vulnerable equipment and services within the motel could be located in elevated positions, above projected minimum water levels.
- A floodwall could be constructed around the hotel and services to ensure limited impacts during extreme storm events.
- Flood awareness and education could be provided through brochures and handouts in each room, with evacuation routes posted on the walls.

Fires

- Ember-resistant building materials could be used throughout the motel, with openings that allow fire ingress reduced as much as possible.
- A sprinkler system could be installed throughout the motel.

Extreme temperatures

- The hotel could maximise external wall areas to encourage the movement of breezes through each room.
- Reflective insulation and vapour barriers could be used as a cooling measure as well as light coloured roof and wall materials.
- Rooms could be elevated to permit air flow beneath floors.
- Designated sleep-out areas could be created.

Quick Tips

Don't over cool your premises. Did you know that every 1°C lower in your AC settings can add about 15% to your costs? (Source: NABERS)

Paint your rooms light colours. Dark-coloured walls absorb light, thereby increasing the amount of lighting needed.

This case study is a combination of various situations and should therefore not to be considered as a real-life case study

Education and Monitoring

As the public's awareness of environmental issues grows, there is going to be a tipping point where environmentally-conscious tourism becomes the preference. It is important, therefore, that tourism operators are prepared for this change.

Once you have taken steps to reduce your carbon footprint and taken reasonable measures to adapt to the consequences of climate change it is important to ensure that your new processes are continually updated, reviewed and promoted. Here are some key measures for you to focus on.

Develop an environmental policy for your business

Developing an environmental policy or 'vision statement' is a very useful promotional tool that allows you to refine your preliminary objectives for your business and demonstrates to your clients that you are serious about making changes. A formal environmental policy usually includes three separate elements:

1. An official statement of commitment to environmental sustainability from all of your operations
2. A breakdown of responsibilities and reporting procedures
3. A set of refined objectives and timetables to achieve your commitments, such as to:
 - reduce your energy-related emissions by 10% per year over five years
 - reduce your water usage by 10% per year over five years
 - reduce your landfill waste by 25% this year
 - purchase 100% accredited green energy by 2012
 - install solar hot water by 2013
 - become carbon neutral in your operations by 2015

Streamline your operations

Doing things in a sustainable way also helps you to streamline the operations of your business. This wider look at the business has benefits in costs and operational efficiency.

Advertise the environmental credentials of your business

When you are committed to making changes, it is time to publicise the positive influences you have had so far, and the benefits you will be providing to your community and environment in the longer term. This does not necessarily mean that by going green, you are automatically assured of extra customers. It is simply a measure of the increased potential of improving your reputation, especially for the many tourists who are increasingly selecting destinations and activities that are known to be sustainably managed. For further information, refer to the ACCC guidelines on marketing environmental credentials, listed in the References section.

Educate your staff and engage your customers

Continuing to engage your staff and customers is as important as making the changes yourself. It provides a forum for exchanging ideas, can improve staff morale and involvement, and is likely to result in more repeat and satisfied customers. Addressing their issues can only benefit your business.

Review and monitor

It is a good idea to review your objectives and your carbon footprint at least once a year. This allows you to keep a tab on your costs and identify any lapses in your procedures. This can be achieved by monitoring your energy use and cost data, analysing your energy efficiency improvements, comparing your energy performance to the original data baselines and comparing your business's performance against the original objectives.

Research and keep aware

Be sure to keep up-to-date with the latest legislation, policy and educational support. This may save you time in the long run and will allow you to access training seminars, professional assistance and even grants at the earliest opportunity.

Be wary of false promises

Merely paying lip service to sustainable operations (known as 'greenwash') without doing anything of essence can be a dangerous practice. Not only is the consumer market becoming more educated, but with the internet age, any poor reviews about tourist services spread particularly fast.

Did you know?

Australia's National Greenhouse Accounts are a comprehensive set of reports outlining Australia's greenhouse gas emissions - as a nation, by state, and by industry. If you'd like to see how Australia is performing as a whole on reducing our emissions, see <http://www.climatechange.gov.au/inventory/index.html>

Education and monitoring: case study



Waverley Council and Elton Consulting

Overview

High-visitation tourism sites such as Bondi Beach are increasingly challenged to deal with the environmental impacts of visitors. In this instance, the NSW Stormwater Trust was concerned about trying to reduce litter, as this was the primary source of stormwater pollution in the Bondi Beach catchment.

Traditional regulatory-based approaches were of questionable value, particularly with the increasing numbers of international visitors. Policies were often not enforced and there was little awareness of the consequences of littering among visiting populations.

A new evidence-based approach to visitor education and participation was trialled at Bondi Beach by Waverley Council and Elton Consulting. Working directly with hosts, Council and visitors, the project went beyond awareness raising to instigate large scale changes that enabled people to work together to improve the environment. Activities included volunteer litter clean-ups involving visitor groups commonly perceived as 'the problem' and a host-based best practice covenant to reduce impacts.

What were the solutions and outcomes with this approach?

The following measures were used to engage stakeholders and the community:

Backpacker volunteer cleanups

The project team organised a regular volunteer event which was targeted at specific tourists (i.e. backpackers) but which promoted inclusive participation of other tourism stakeholders (i.e. local residents, businesses). Volunteers worked together to pick up litter around the beach and park. Emphasis was placed on raising awareness. This allowed a working relationship to develop between different tourism stakeholders. Importantly, the volunteer clean-up operations also helped promote a 'shared responsibility' for the local environment.

Social marketing

Target groups were identified through the research phase and specific approaches were taken for each. A poster campaign was developed and posters were placed in specific locations (e.g. hostel bedrooms, internet cafes) and more general 'impact' posters were placed around the public areas (beach and parks). A range of media were used, including radio and magazine articles and commercials. An innovative approach which specifically targeted at capturing and educating the transient backpacker group involved a 'welcome kit' which was given to all new hostel guests in the target area.

Best Practice Covenant

Extensive co-operative work was undertaken with local tourism businesses in order to develop a best-practice agreement aimed at minimising the impacts of businesses on the local stormwater system. The agreement addressed issues such as litter from outdoor dining tables and business waste management. Media coverage and publicity was generated for the businesses involved, encouraging wide-spread participation between many tourism stakeholders.

We would like to acknowledge the courtesy and permission of Waverley Council to include them as a case study.

Final thoughts

Climate change is a complex issue, but doing your bit for climate change isn't. Here are some final tips for you to remember.

Get started early

Early planning of ways to reduce your emissions and adapt to the consequences of climate change is likely to bring considerable advantages in the long run.

Evaluate your emissions

Knowing what your carbon footprint is and where your main emissions are derived from can help you focus on the most important elements for your business.

Reduce your emissions

Remember the six wedge wheel – focus on these elements and the rest should follow.



Think about adaptation

Do you need to do anything to adapt to the consequences of climate change? Preparing in advance may give you a competitive advantage and help your business in the long run.

Educate and monitor

Develop an environmental policy, advertise your credentials, engage your staff and customers, review your objectives regularly and look out for changes to policy that may benefit your business.

We can all contribute to making a big difference

It is common to think that our personal efforts are too insignificant to change the world. However, there are many instances in history where collective small efforts have resulted in big changes. If everyone takes responsibility, everyone will benefit.

Doing your bit for climate change will benefit your business – full stop

There are many simple measures that tourism operators can take to reduce their costs, reduce their GHG emissions and improve their competitiveness in the tourism market at the same time.

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Air travel Calculator	http://www2.icao.int/en/carbonoffset/Pages/default.aspx
Climate Change	
<i>and snow</i>	http://www.cmar.csiro.au/e-print/open/hennessy_2003a.pdf
<i>adaptation</i>	http://www.climatechange.vic.gov.au/Greenhouse/wcmn302.nsf/childdocs/-0A075FE0F68F56D6CA2575C40007BF74?open
<i>and agriculture</i>	http://books.google.com.au/books?id=TKOhTRyFVikC&pg=PA117&lpg=PA117&dq=animal+husbandry+climate+change&source=bl&ots=DayA92w77r&sig=XgT0hiBYD0hGcTKzDv3lvDuZs1E&hl=en&ei=R18DSr26EIPQswPG-vWDAg&sa=X&oi=book_result&ct=result&resnum=6#PPA119,M1
<i>causes of</i>	http://edugreen.teri.res.in/explore/climate/causes.htm
Climate Change Impacts and Risk Management: A Guide for Business and Government	http://www.climatechange.gov.au/impacts/risk-management.html
Examples	http://www.tourism-climate.de/good-examples.htm ; http://unesdoc.unesco.org/images/0015/001506/150600e.pdf
Emissions	http://unstats.un.org/unsd/environment/air_co2_emissions.htm
Offsets	http://www.climatechange.gov.au/nav/carbon_offset.html
Solar savings	http://www.austrade.gov.au/Invest/Opportunities-by-Sector/Clean-Energy/Solar-Energy/default.aspx
Sustainable Living	http://www.environment.nsw.gov.au/households/index.htm
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Sustainable Tourism	http://www.environment.gov.au/heritage/publications/strategy/pubs/steps.pdf http://www.sustainabletourism.net/questions.html http://www.greentourism.org.uk/STchallenges.html http://www.sustainabletourismcriteria.org/index.php?option=com_content&task=view&id=58&Itemid=188 http://tourismintelligence.ca/2008/04/04/assessing-the-demand-for-sustainable-tourism/
Tourism	http://www.tra.australia.com/content/documents/forecasts/Forecast%202008%20Issue%202.pdf
Tourism Queensland Sustainability and Climate Change	http://www.tq.com.au/resource-centre/sustainability-and-climate-change/where-do-i-start/where-do-i-start.cfm

Trade waste	http://www.sawater.com.au/NR/rdonlyres/512CD7CF-23C6-4247-B819-2B096956E0F3/0/TWGuideline18.pdf
Various funding	http://www.environment.gov.au/settlements/renewable/pv/index.html http://www.environment.gov.au/water/programs/nrgi/index.html http://www.environment.gov.au/energyefficiency/index.html http://www.environment.gov.au/greenloans/index.html
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Vessel Management	<ul style="list-style-type: none"> • http://books.google.com.au/books?id=xYsehOZOMkQC&pg=PA72&lpg=PA72&dq=cleanest+boat+engines+inboard+or+outboard&source=bl&ots=oKfUkQ2yDo&sig=xwC62MqE1QEgRrJhanWUVCUamkU&hl=en&ei=EwwSSSt6vJKTgtAOHu-TqDQ&sa=X&oi=book_result&ct=result&resnum=1 • http://au.boats.com/news-reviews/article/boatus-offers-fuel-spill-prevention-tips-6640 • http://www.mass.gov/czm/marinas/guide/pdf/cmzg_chapter_4-4.pdf
Wind Events	<ul style="list-style-type: none"> • http://www.ndmindia.nic.in/techAdvGroup/rvs/CycloneArchitecture.pdf

Useful websites

General Information	
Australian Tourism Export Council	http://www.atec.net.au/
CRC for Sustainable Tourism	http://www.crctourism.com.au/
CSIRO	http://www.csiro.au/
Department of Climate Change	http://www.climatechange.gov.au/
Department of Resources, Energy and Tourism	http://www.ret.gov.au
Ecotourism Australia	http://www.ecotourism.org.au/
Energy Star	http://www.energystar.gov.au/index.html
IPCC	http://www.ipcc.ch/
Leave No Trace Australia	http://www.lnt.org.au/
Pacific Asia Tourism Association	http://www.pata.org/
Tourism Australia	http://www.tourism.australia.com/
Tourism and Transport Forum	www.ttf.org.au/
UNFCCC	http://unfccc.int/2860.php
UN Conference-Copenhagen (December 2009)	http://en.cop15.dk/
World Tourism Organisation	http://www.unwto.org/index.php
WWF-Australia	http://wwf.org.au/ourwork/climatechange/
State Tourism Organisations	
ACT	http://www.visitcanberra.com.au/
South Australian Tourism Commission	www.tourism.sa.gov.au http://www.southaustralia.com/
Tourism Queensland	http://www.tq.com.au http://queenslandholidays.com.au
Tourism Northern Territory	http://www.tourismnt.com.au http://en.travelnt.com/
Tourism NSW	http://corporate.tourism.nsw.gov.au/ http://www.visitnsw.com/
Tourism Tasmania	http://www.tourism.tas.gov.au http://www.discovertasmania.com/
Tourism Victoria	http://www.tourism.vic.gov.au http://www.visitvictoria.com/
Tourism WA	http://www.tourism.wa.gov.au http://www.westernaustralia.com

Glossary

Adaptation	An adjustment in natural or human social or economic systems in response to actual or expected climate change that moderates harm or exploits beneficial opportunities.
Alternative Energy	Clean and environmentally sound energy that isn't derived from traditional, non-renewable resources such as coal, oil and natural gas
Carbon footprint	A measure of the amount of carbon dioxide equivalents emitted through the combustion of fossil fuels; it is commonly used at an individual, household or business level.
Carbon Neutral	Reference to the fact that no extra carbon dioxide is released as a result of a particular manufacturing process, service or lifestyle. This is brought about by balancing the amount of carbon dioxide released into the atmosphere with an equal amount of carbon dioxide that has been sequestered or offset.
Carbon sequestration	The long-term storage of carbon dioxide in the forests, soils, oceans or underground in depleted oil and gas reservoirs, coal seams and saline aquifers.
Climate Change	As defined by the UNFCCC, a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability over comparable time periods.
Compact Fluorescent lightbulb (CFL)	An energy-efficient alternative to traditional incandescent light bulbs, CFLs use about 75% less energy than incandescent bulbs and last up to 10 times longer.
CO₂	Carbon dioxide – A naturally occurring gas; it is also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the earth's temperature.
Energy Efficient	Products and systems that use less energy than their conventional counterparts to perform the same tasks.
GHG	Greenhouse gases – The atmospheric gases responsible for causing global warming and climate change. The major GHGs are carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF ₆).
GHGe	Greenhouse Gas Emissions
Greenhouse effect	The trapping of heat by naturally occurring heat-retaining atmospheric gases (water vapour, carbon dioxide, nitrous oxide, methane and ozone) that keeps the earth about 30°C warmer than if these gases did not exist.
Greenwashing	The practice of making misleading or unsubstantiated claims about the environmental benefits of a product or service.
Global warming	Refer to 'climate change'
Mitigation	A human intervention to reduce the sources of, or enhance the sinks for, greenhouse gases.
NGA	National Greenhouse Accounts Factors
Organic	Refers to foods and materials that are grown and processed without the use of chemical fertilisers and pesticides. Organic livestock are reared without the use of antibiotics or hormones.
Sustainable	The use of natural resources to meet present needs without compromising the ability of future generations to meet their own needs.
tCO₂-e	Equivalent tonnes of carbon dioxide
Waste audit	A formal process to quantify the types of wastes your business generates and the amount of each type

These definitions are obtained from leading sources such as the Commonwealth Department of Climate Change



We hope that you have found this information Guide informative and beneficial to you and your Australian tourism business.

This Guide has been developed by Parsons Brinckerhoff Australia Pty. Ltd. for the Department of Resources, Energy and Tourism, Tourism Australia. For further information please see <http://www.ret.gov.au>.



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