

MODULE 1
OVERVIEW

Climate change is one of the most serious challenges facing the world community. All countries and all communities are vulnerable to climate change and its related social, environmental and economic impacts.

Addressing this challenge is a shared responsibility of governments, business and the wider community. If a truly sustainable solution is to be achieved, all members of the community must play their part.

The Victorian Government is committed to a better quality of life for current and future generations, and will pursue this commitment by ensuring Victoria's economy, society and environment are developed in a balanced way. The Government's framework for the future *Growing Victoria Together* has a vision for Victoria as being a State where:

- protecting the environment for future generations is built into everything we do; and
- innovation leads to thriving industries generating high quality jobs.

The Victorian Greenhouse Strategy is a practical demonstration of how the Government is working to realise this vision. Through this Strategy the Government will ensure Victoria plays its part in national and international efforts to reduce greenhouse gas emissions.

To ensure that Victorian industries develop appropriate responses to greenhouse issues, and to stimulate investment in energy efficiency, the Government introduced changes to the State environment protection policy (Air Quality Management) in December 2001. The policy requires businesses subject to EPA Victoria works approvals and licensing to take action with respect to their energy use and greenhouse emissions. A Protocol for Energy Management, *Greenhouse gas emissions and energy efficiency in industry*, has been established detailing these requirements.

The *Energy and greenhouse management toolkit* is a Victorian Government initiative developed by EPA Victoria in partnership with the Sustainable Energy Authority Victoria, and funded through the Victorian Greenhouse Strategy. The *Toolkit* will assist businesses in meeting the new policy requirements.

The *Toolkit* will also help other businesses that are concerned about energy and emission reduction issues to embrace and integrate environmentally sound and sustainable practices into their operations.



The Toolkit

The *Energy and greenhouse management toolkit* provides Victorian business with the necessary information, tools, case studies and guidance to achieve real cost savings, improved productivity, compliance with legislation and licence conditions (if relevant), and benefits for the Victorian and global environment.

Comprising seven booklets and two CDs, the *Toolkit* provides practical references to assist your business to become financially and environmentally sustainable. The booklet modules are numbered for ease of identification and cross-referencing, but do not denote a sequence.

MODULE 1

MODULE 1: OVERVIEW

Module 1 outlines the purpose of the *Toolkit*, explains the enhanced greenhouse effect and the contents of each module.

MODULE 2

MODULE 2: HOW TO COMPLY WITH THE SEPP (AQM) ENERGY AND GREENHOUSE REQUIREMENTS

Module 2 has been prepared to assist businesses and enterprises to comply with the State environment protection policy (Air Quality Management) and Protocol for Environmental Management relating to greenhouse gas emissions and energy efficiency. The policy and PEM applies to all EPA licence holders and works approvals applicants.

MODULE 3

MODULE 3: CALCULATING ENERGY USE AND GREENHOUSE EMISSIONS

Module 3 will help your business quantify energy consumed, and calculate energy-related and non-energy related greenhouse gas emissions.

MODULE 4

MODULE 4: DEVELOPING AN ENERGY MANAGEMENT SYSTEM

Module 4 is designed to be used either as a guide to developing and implementing a tailored energy management system for your organisation, or as a resource to evaluate how your existing systems are positioned in relation to energy management.

MODULE 5

MODULE 5: BEST PRACTICE DESIGN, TECHNOLOGY AND MANAGEMENT

Module 5 outlines the principles of best practice for emissions and energy management and can assist you in establishing benchmarks. It provides case studies to demonstrate actual best practice examples and contains a list of other resources to assist you in researching best practice.

MODULE 6

MODULE 6: COST EFFECTIVE AND FEASIBILITY ANALYSIS

Module 6 provides a framework for the financial evaluation of energy and emissions reduction initiatives, and includes worked examples of the evaluation techniques.

MODULE 7

MODULE 7: WHERE TO GET HELP

Module 7 directs you to sources of energy and greenhouse service providers to assist you in reviewing and implementing sustainable practices into your operations, and provides guidelines for engaging and getting the best from consultants. An extensive list of energy and greenhouse information sources is also provided to direct you to useful information on all aspects of energy efficiency, best practice and sustainability.

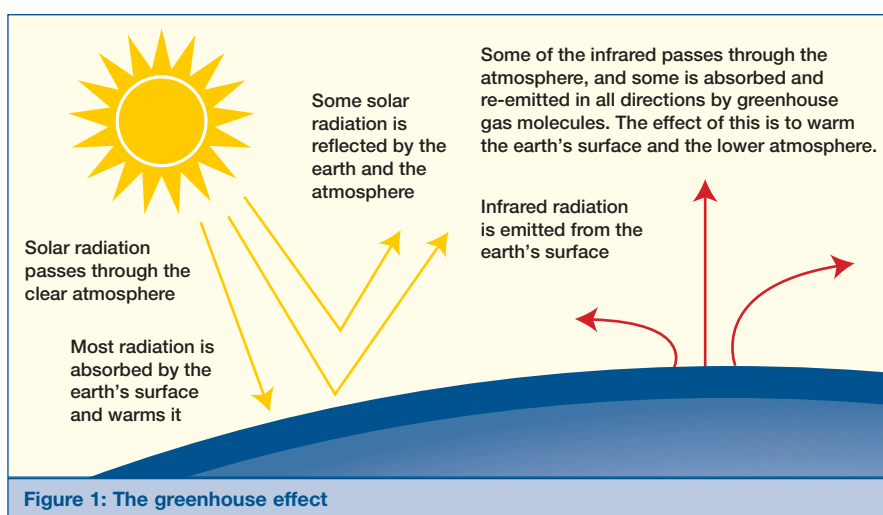


ENERGY SMART TRACKER AND GREEN POWER BUSINESS GUIDE CDs

The *Energy Smart Tracker* software program can assist businesses to monitor energy consumption, greenhouse gases and minimise energy costs.

The *Green Power business guide* aims to assist commercial energy users understand Green Power and the benefits to them of purchasing Green Power.

The enhanced greenhouse effect



About half of the Sun's energy reaching the top of our atmosphere penetrates to the Earth's surface. The rest is either reflected back into space by the atmosphere or absorbed by gases and dust particles. The solar energy that does reach the Earth's surface warms the land and oceans. In turn, the land and oceans release heat in the form of infrared radiation.

Greenhouse gases absorb some of this radiation, warming the lower atmosphere. This absorption of heat, which keeps the surface of our planet warm enough to sustain us, is called the greenhouse effect. Without heat-trapping greenhouse gases in the air, the Earth's surface temperature would average a frigid -18°C , rather than 15°C .

Water vapour is responsible for about three-quarters of the natural greenhouse effect. The next most significant greenhouse gas is carbon dioxide.

Emissions of greenhouse gases due to human activities are leading to an increase in the concentration of greenhouse gases in the Earth's atmosphere. This results in increased trapping of infrared radiation and adds to the natural greenhouse effect, producing an **enhanced** greenhouse effect.

The Earth's climate system is finely balanced. Increased temperatures in the lower atmosphere are likely to produce changes to weather and climate worldwide. Consequently, the enhanced greenhouse effect is often referred to as climate change or global warming.

IMPLICATIONS OF THE ENHANCED GREENHOUSE EFFECT

The Third Assessment Report of the Intergovernmental Panel on Climate Control (IPCC) included the following key findings:

- the 1990's was the warmest decade, and 1998 the warmest year in the instrumental record since 1861;
- the globally averaged surface temperature is projected to increase by 1.4 to 5.8°C from 1990 to 2100;
- sea levels are projected to rise by 0.09 to 0.88 metres from 1990 to 2100;
- recent regional climate changes, particularly temperature increases, have already affected many physical and biological systems;
- natural systems are vulnerable to climate change, and some will be irreversibly damaged;

- in Australia water is likely to be a key issue due to projected drying trends over much of the region and change to a more El Niño-like average state;
- Australian ecosystems that are particularly vulnerable to climate change include alpine systems and freshwater wetlands; and
- some species with restricted climatic niches and which are unable to migrate due to fragmentation of the landscape, soil differences, or topography, could become endangered or extinct.

INTERNATIONAL POLICY RESPONSE—THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

The United Nations Framework Convention on Climate Change (FCCC) arose from increasing international concern about the implications of climate change and a recognition that international cooperation is needed if this global problem is to be tackled effectively. The ultimate objective of the FCCC is to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human-induced interference with the climate system. One hundred and eighty-six countries, including Australia, have ratified the FCCC.

The first Conference of the Parties (COP1) to the FCCC in 1995 set in train a process to establish a protocol to the FCCC to specify commitments by developed countries to reducing their greenhouse gas emissions. These negotiations were successfully concluded at COP3 in Kyoto, Japan in December 1997, where agreement was reached on the Kyoto Protocol.

Under the Kyoto Protocol, 'Annex B' countries (i.e. developed countries and countries undergoing the process of transition to a market economy) agreed to reduce their greenhouse gas

Benefits for your business

emissions as a whole from 1990 levels by at least 5% by 2008–2012. In recognition of the fact that Annex B countries have different economic circumstances and differing capacities and costs in achieving emissions reductions, each country was assigned a specific, differentiated target. Australia's target is to limit its growth in greenhouse gas emissions in the 2008–2012 period to no more than 8% above 1990 levels.

The Victorian Government supports the Kyoto Protocol as being a responsible framework for international action on climate change and believes the Australian Government should ratify the Protocol.

AUSTRALIA'S CONTRIBUTION TO THE ENHANCED GREENHOUSE EFFECT

Australia has the world's highest greenhouse gas emissions per person at 26.7 t CO₂ equivalent (CO₂-e). This is four times the world average, twice the average level for OECD countries (13.4 t CO₂-e) and 25% higher than emissions per person in the USA (21.2 t CO₂-e).

Victoria's greenhouse gas emissions increased by 15.4 megatonnes, or 15.9%, between 1990 and 1999. This increased Victoria's share of total national emissions from 19.7% in 1990 to 21.3% in 1999.

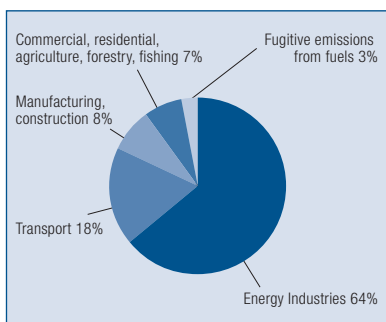


Figure 2: Victoria's energy sector greenhouse gas emissions 1999

Efforts to reduce greenhouse gas emissions and improve energy efficiency will not only deliver environmental benefits. Such efforts can also enhance business competitiveness by reducing costs, improving risk management, increasing the confidence of investors, insurers and financial institutions, and by improving relationships with local communities.

For all industries, the pursuit of eco-efficiency and triple bottom line outcomes (economic, environmental and social) is an increasingly important management strategy. Pursuing eco-efficiency objectives—such as reducing the material and energy intensity of goods and services; enhancing the recyclability of materials; and maximising the use of renewable resources—ensures business sustainability and provides business opportunities, as well as benefits to the environment.

The adoption of greenhouse best practice will be an important factor in maintaining the future competitiveness of Victorian enterprises and securing the long-term sustainability of Victoria's economy and the environment. Measures to reduce greenhouse gas emissions—especially those promoting the development and use of energy efficient technologies, practices and processes—will help Victorian commerce and industry compete in the national and international marketplace.

Nufarm-Coogee P/L has improved the energy efficiency of its chlorine cells which are part of a chlor-alkali process to produce chlorine. This led to savings of \$370 000 p.a. and reduced greenhouse emission by 5750 tonnes CO₂-e. The simple payback was under two years.

Melbourne Water's East Treatment plant in Carrum will be modernised to enable sludge gas to be used as an environmentally friendly renewable energy source. This will lead to 24 500 tonnes of CO₂-e savings and \$13 million p.a. cost savings.

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Overview

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1. Energy conservation - Victoria.
2. Greenhouse gas mitigation - Victoria.
3. Environmental management - Victoria.
- I. Sustainable Energy Authority Victoria.
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