

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

A REPORT EVALUATING THE COMMITMENTS  
MADE AND THE EXPECTED ACHIEVEMENTS  
OF THE PROGRAM

A report prepared by Environment Link Pty Ltd  
for EPA Victoria

**Environment**



Link

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

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## ABBREVIATIONS

ABARE	Australian Bureau of Agricultural and Resource Economics
CO <sub>2</sub> -e	Carbon dioxide equivalent
EES	Environmental Effects Statement
EPA	Environment Protection Authority Victoria
GHG	Greenhouse gas
Mt	Million tonnes
PEM	Protocol for Environmental Management “Greenhouse Gas Emissions and Energy Efficiency in Industry”
PJ	Petajoules (10 <sup>15</sup> joules)
Program	EPA Victoria Industry Greenhouse Program
SEAV	Sustainable Energy Authority of Victoria (now Sustainability Victoria)
SEPP (AQM)	State Environment Protection Policy (Air Quality Management)
TJ	Terajoules (10 <sup>12</sup> joules)
VGS	Victorian Greenhouse Strategy

## FOREWORD

The greenhouse effect, and its likely climate impact, is acknowledged as one of the key environmental issues facing mankind today. Greenhouse gas emissions are closely linked to our use of energy, though other sources of these emissions also exist. In Victoria, almost 85 per cent of greenhouse gas emissions arise from the use of energy.

Improving the way we use our energy resources is vitally important for ensuring a sustainable future. The Government, through its Growing Victoria Together framework, is building a prosperous, fair and environmentally sustainable State, and one component of this is the Victorian Greenhouse Strategy (VGS), which was released in June 2002.

Under the VGS, EPA Victoria was charged with implementing an industry greenhouse program, through which its industry clients have committed to achieve greenhouse gas emission reductions by undertaking financially viable energy reduction measures. Details of the program requirements were set out in the Protocol for Environmental Management "Greenhouse Gas Emissions and Energy Efficiency in Industry" (EPA publication 824, January 2002).

This report presents the findings of an assessment, conducted for EPA Victoria by Environment Link Pty Ltd, of the industry greenhouse program. The report summarises the outcomes that will be achieved from implementation of the commitments made by participating industries.

In brief, the report finds that the program will achieve:

- greenhouse gas reductions in excess of 1 million tonnes of CO<sub>2</sub>-e emissions per year
- energy cost savings of some \$34 million per year, at a total implementation cost of \$49 million, representing a simple payback period of 17 months on average.

Implementation of the commitments made under this program is continuing and is scheduled for completion by the end of 2006. We are now undertaking an audit/ verification process to ensure that the commitments made in good faith are actually delivered.

Three companies, BlueScope Steel at Hastings, SPC Ardmona at Shepparton and Mooroopna, and Riverside Meats at Echuca, have highlighted the benefits of undertaking energy reduction measures under the Program, through case studies presented in the report.

The outstanding success of the program, as revealed in this report, has resulted in Government further funding EPA Victoria, through the Victorian Greenhouse Strategy Action Plan Update 2005, to work on further enhancing the program. We commend this report as an insightful overview of a program that demonstrates what industry in co-operation with government can do to reduce its greenhouse footprint.



Mick Bourke  
Chairman, EPA Victoria



The Hon John Thwaites  
Minister for Environment

## **EXECUTIVE SUMMARY**

The EPA Victoria Industry Greenhouse Program (the Program) is the first regulatory greenhouse and energy efficiency program for industry in Australia. This Program requires approximately 1000 businesses subject to the EPA works approval and licensing system to assess their energy usage and greenhouse gas (GHG) emissions. Those exceeding defined thresholds are required to undertake an energy audit and prepare an action plan of cost effective measures to improve energy efficiency and reduce GHG emissions. All action plan initiatives under the Program are due to be completed by the end of 2006.

In addition, companies wanting to construct new works or modify existing works are, through the EPA works approval process, required to meet best practice for energy efficiency and GHG emissions.

This report provides relevant background to the Program and an assessment of its outcomes to date. Using the commitments and information contained in energy action plans approved under the Program, it reports on:

- the expected outcome of the Program in achieving greenhouse gas (GHG) emission reductions from industry
- the cost-effectiveness to industry of the Program
- a range of analyses of the Program outcomes.

The report also provides three case study examples of companies that have been able to achieve significant GHG reductions while also providing financial benefits through reduced energy costs.

### **Program results**

#### ***EPA licence holders***

Based on the information collated to date, the Program appears to have successfully engaged the target EPA licence holders, particularly the higher energy users, in improving their energy efficiency. The Program, as at August 2005, has had the following outcomes:

- Nearly 2,500 energy efficiency actions have been committed to by EPA licence holders under the action plans approved by the Program;
- GHG emission reductions committed to currently amount to 1.1 Mt of CO<sub>2</sub>-e annually;
- Total annual energy cost savings to business, from approved actions, are estimated to be \$34 million;
- The average financial payback period for individual actions is 17 months;
- Committed GHG reductions represent a 3.5 per cent overall reduction in GHG emissions relative to a 2003 baseline, and are equivalent to nearly 1 per cent of Victoria's total GHG emissions.

- With approved actions having a total implementation cost of \$49 million, the average GHG emission reduction will be 20.6 tonnes of CO<sub>2</sub>-e per \$1,000 spent and the average implementation cost per action will be around \$20,000; these costs will be recovered within an average time of 17 months and ongoing savings will accrue thereafter.
- Approximately 20 per cent of the GHG reductions will come from the 24 per cent of actions having very short payback periods (less than 3 months), indicating that significant quantities of “low hanging fruit” were available and had not been acted upon previously.
- A significant number of businesses that have previously participated in voluntary programs (for example Greenhouse Challenge) have been able to identify additional actions above and beyond those already undertaken, achieving further savings within the three year payback period of the Program.
- The cost to Government was in the order of \$2 million.

### ***Works approvals***

Under the Program, EPA has approved 262 projects, or nearly \$1.5 billion worth of capital investment for plant construct or modification, through the works approval process since mid 2002. These projects have implemented energy efficiency best practice as required by the Program.

### ***General***

EPA has gained significant new skills and knowledge through this Program and the collaborative association between Sustainable Energy Authority of Victoria (SEAV) and EPA, using EPA’s relationship with its industry clients and SEAV’s technical knowledge, has been highly beneficial in driving energy efficiency.



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## 1. SETTING THE SCENE

The EPA Victoria Industry Greenhouse Program (the Program) is the first regulatory greenhouse and energy efficiency program for industry in Australia, and one of the first in the world. The Program has been developed in response to the actions outlined in the 2002 Victorian Greenhouse Strategy (VGS), and in accordance with the requirements of the State Environment Protection Policy (Air Quality Management) (SEPP (AQM)) and its incorporated Protocol for Environmental Management “Greenhouse Gas Emissions and Energy Efficiency in Industry” (PEM). Implementation of the Program is well advanced and is scheduled to be completed by the end of 2006.

This report provides relevant background to the Program and an assessment of its outcomes to date<sup>1</sup>. Using the commitments and information contained in energy action plans approved under the Program, it reports on:

- the expected outcome of the Program in achieving greenhouse gas (GHG) emission reductions from industry
- the cost-effectiveness to industry of the Program
- a range of analyses of the Program outcomes.

The preparation of this report has involved a review of relevant literature, a selection of Australian greenhouse programs and EPA’s databases that monitor the progress of the Program’s implementation, as well as consultation with EPA, the former Sustainable Energy Authority of Victoria

<sup>1</sup> The report relies upon data from the Program available as at August 2005. The outcomes of the Program may vary by the end of 2006 when implementation is scheduled to be completed and more complete data will be available.

(SEAV) (now Sustainability Victoria) and industry personnel.

### **Victorian greenhouse and energy efficiency policy and statutory framework**

#### ***Victorian Greenhouse Strategy***

The Victorian Government, concerned about the threat posed by climate change, and in the perceived absence of an adequate national response, launched the Victorian Greenhouse Strategy (VGS) in June 2002. The VGS provides a framework and a program of actions designed to deliver significant reductions in GHG emissions. It targets all sections of the community responsible for GHG emissions by recognizing that GHG reduction must be tackled by concerted and cooperative action by all members of the community including government, business and individuals. The VGS also integrates the principles of ecologically sustainable development to deliver the multiple benefits that are needed to ensure a strong and thriving economy. This approach of equally valuing our economic, social and environmental goals is consistent with the Government’s vision for Victoria, as enunciated in Growing Victoria Together.

Of particular relevance to the EPA Program, Action 3.1 of the VGS outlines the requirement for those Victorian enterprises subject to EPA’s works approval and licensing system to implement cost effective opportunities for improving energy efficiency and reducing greenhouse gas emissions.

The VGS commits a range of industry support services to assist businesses in meeting these requirements. The VGS also points out that efforts to reduce greenhouse gas emissions and improve

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energy efficiency will deliver not only 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 relations with the local community.

## ***State Environment Protection Policy (Air Quality Management)***

The release of the VGS was preceded by the proclamation of the revised SEPP (AQM) in December 2001.

One of the SEPP (AQM) policy aims is to ‘support Victorian and national measures to address the enhanced greenhouse effect and depletion of the ozone layer’ (Clause 6). This aim is supported by the ‘Policy Principles’ in Clause 7 and the ‘Policy Intent’ in Clause 8. The ‘Beneficial Uses’ that the SEPP (AQM) aims to protect now include ‘climate systems that are consistent with human development, the life, health and well being of humans, and the protection of ecosystems and biodiversity’ (Clause 9).

One of the measures in the SEPP (AQM) attainment program specifies that EPA ‘will develop protocols for environmental management as incorporated documents to this policy’. These protocols, or ‘PEMs’, may be developed for ‘managing the emissions from industrial, commercial, domestic or mobile sources and impacts on air quality, the production and use of goods and services, the management of wastes that may generate emissions and any other requirements necessary for effective air quality management’ (Clause 15, SEPP (AQM)).

Further, Clause 33 of the SEPP (AQM) provides that any Protocol for Environmental Management relating

to GHG emissions developed by EPA will be applied to generators of emissions subject to works approvals and licences, and in assessing the potential impacts of other development proposals.

Clauses 18 and 19 of the SEPP (AQM) require generators of emissions, whether existing or new, to apply best practice and to pursue continuous improvement in the management of those emissions. In regard to the management of GHG emissions, further guidance about what constitutes best practice is provided in the PEM described below.

## ***Protocol for Environmental Management: Greenhouse Gas Emissions and Energy Efficiency in Industry***

The PEM was released in January 2002 and is an incorporated document of the SEPP (AQM). It provides ‘guidance for businesses on the SEPP (AQM) and its requirements for the management of GHG emissions and energy consumption (primarily under Clause 33(1), (2) and (3) of the SEPP (AQM))’. The PEM specifies the steps businesses must take to demonstrate compliance with the SEPP (AQM) in relation to energy efficiency and GHG emissions and how EPA assesses compliance.

The PEM applies to businesses subject to EPA’s works approval and licensing system. It requires them to take up cost-effective opportunities for GHG mitigation. The benchmark for cost-effectiveness is generally that actions should provide a financial payback within three years or less.

The main features of the PEM are that it:

- establishes requirements for improving the energy efficiency of existing licensed premises

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- recognises differences in the level of energy consumption of different businesses
- requires new works to implement best practice with respect to GHG emissions and energy usage
- integrates consideration of energy efficiency and GHG emissions with other EPA licensing requirements
- recognises prior actions to improve energy efficiency and reduce GHG emissions as contributing to demonstration of compliance
- is supported by a range of services that will assist businesses in achieving compliance.

The Government committed \$2.65 million over the three-year period 2002–04 for support services to assist businesses in complying with these requirements.

The requirements of the PEM are outlined in more detail in section 3 of the paper below.

## **VGS update**

In April 2005 the Government released the Victorian Greenhouse Strategy Action Plan Update 2005 (VGS Update) to further progress work initiated through the VGS. This acknowledges the need for further action to reduce greenhouse gas emissions and its key actions include that: “\$600,000 will be provided in 2005/06 for EPA to continue its work with energy-intensive industry sectors to drive improvements in energy efficiency and resultant reductions in greenhouse gas emissions, and to continue to develop and employ appropriate statutory greenhouse tools in line with Victorian Government policy”.

## **2. VICTORIAN GREENHOUSE GAS EMISSIONS AND ENERGY USE**

Greenhouse gas inventories present data on emissions for a range of greenhouse gases. The most recent greenhouse gas inventory data available for Victoria is from 2002. The Victorian inventory, summarised as carbon dioxide equivalents (CO<sub>2</sub>-e)<sup>2</sup> in Table 1, gives total greenhouse gas emissions for 2002 as 119.5 Mt CO<sub>2</sub>-e, (or 117 Mt CO<sub>2</sub>-e when greenhouse sinks such as reforestation are included). This is an increase of 18.3 Mt CO<sub>2</sub>-e or 18.1 per cent above 1990 emission levels (10.5 Mt CO<sub>2</sub>-e, or 9.9 per cent, when sinks are included) (DSE, 2002).

Victoria’s 2002 total net emissions of 117.0 Mt CO<sub>2</sub>-e represented 21.3 per cent of the national total. Victorian per capita GHG emissions are 24.0 tonnes CO<sub>2</sub>-e, compared with Australia’s per capita emissions of 28.0 tonnes CO<sub>2</sub>-e.

The above inventory reports on source emissions. The contribution to GHG emissions arising from energy use in industry is included in the total of 99 Mt CO<sub>2</sub>-e. The data in Table 1 is not sufficiently detailed to determine the contribution made by EPA licence holders, but EPA database information indicates that the emissions arising from the energy used by those licence holders with approved action plans are 28.4 Mt CO<sub>2</sub>-e per annum.

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<sup>2</sup> Total emissions figures are usually expressed in terms of CO<sub>2</sub> equivalent (CO<sub>2</sub>-e). Total CO<sub>2</sub> equivalent is derived by using the Global Warming Potentials of individual greenhouse gases to determine their individual CO<sub>2</sub> equivalent. These are then combined to come up with a single figure.

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**Table 1: Net greenhouse gas emissions by sector, Victoria, 2002 (i)**

Sectors/subsectors	Net emissions, 2002 (Mt CO <sub>2</sub> -e) (ii)	% contribution of sector to total emissions, 2002	Change in emissions 1990 to 2002	
			Mt	%
<b>Energy</b>	<b>99.0</b>	<b>84.6</b>	<b>18.4</b>	<b>22.9</b>
Energy industries	64.2	54.8	17.0	36.1
Manufacturing industries and construction	5.0	4.3	- 2.2	- 30.6
Transport	19.3	16.5	2.9	17.4
Fugitive emissions from oil and natural gas	2.5	2.2	- 1.2	- 31.5
Other (including 'other sectors' and 'lubricants')	8.0	6.8	1.9	31.6
<b>Industrial processes</b>	<b>2.2</b>	<b>1.9</b>	<b>- 1.2</b>	<b>- 33.4</b>
<b>Agriculture</b>	<b>15.8</b>	<b>13.5</b>	<b>1.0</b>	<b>7.2</b>
<b>Land use, land use change and forestry</b>	<b>- 2.4</b>	<b>- 2.1</b>	<b>- 7.7</b>	<b>(iii)</b>
<b>Waste</b>	<b>2.4</b>	<b>2.1</b>	<b>- 0.1</b>	<b>- 4.9</b>
<b>Total emissions/removals (including sinks)</b>	<b>117.0</b>	<b>100</b>	<b>10.5</b>	<b>9.9</b>
<b>Total emissions excluding sinks</b>	<b>119.5</b>	<b>102.1</b>	<b>18.3</b>	<b>18.1</b>

- i) Adapted from the Victorian Greenhouse Gas Inventory – 2002, Information sheet (DSE).
- ii) Carbon dioxide (CO<sub>2</sub>), which is the most significant greenhouse gas, contributed 79.3% (or 92.9 megatonnes carbon dioxide equivalent (Mt CO<sub>2</sub>-e) of Victoria's total net emissions. Methane contributed 14.4% and nitrous oxide 4.4%. The remaining 1.9% was comprised of HFC, PFC and SF<sub>6</sub> emissions.
- iii) Under Kyoto Protocol accounting rules, net emissions associated with 'afforestation and reforestation' are set to zero in 1990. Consequently, a percentage change figure cannot be provided given the zero base for 1990.

Table 2 and Figure 1 below show energy consumption by the main sectors after electricity generation, transmission and distribution are allocated to energy users. Data from the Australian Bureau of Agricultural and Resource Economics (ABARE) shows that Victoria's industrial sector uses more gas and electricity than either the residential or commercial sectors. Its current energy consumption is estimated to be 233 PJ. Based on anticipated production output, this is predicted to increase by approximately 2 per cent per year and be 26 per cent above 2004–05 levels by 2020.

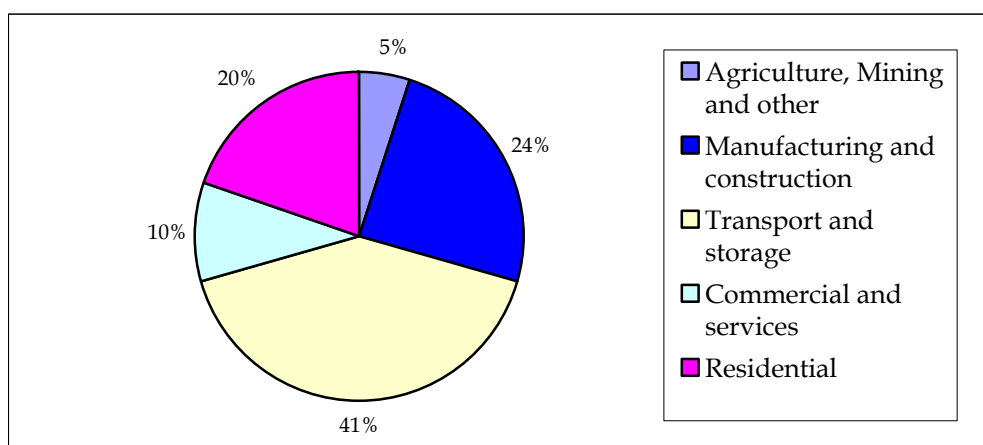
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**Table 2: Victoria’s energy consumption and projected growth, by sector**

Sector	Energy consumption (PJ)					Growth projection 2004/05 – 2019/20
	2001–02	2004–05	2009–10	2014–15	2019–20	
Agriculture, mining and other	39.3	40.5	43.1	46.1	49.5	22.2%
Manufacturing and construction	184.6	192.1	206.8	223.8	242.7	26.3%
Transport and storage	310.1	325.8	359.8	399.8	445.9	36.9%
Commercial and services	69.8	75.5	87.3	101.3	117.1	55.1%
Residential	148.6	156.4	174.4	193.1	213.7	36.6%
<b>Total</b>	<b>752.4</b>	<b>790.2</b>	<b>871.3</b>	<b>964.1</b>	<b>1068.7</b>	<b>35.2%</b>

Source: Adapted from *Australian energy: National and state projections to 2019–2020*, ABARE

**Figure 1: Victoria’s energy consumption, 2004–05**



Source *Australian energy: National and state projections to 2019–2020*, ABARE

The ABARE data, excluding energy consumed by transport, shows that industry consumes 233 PJ (50 per cent of the State’s energy), the commercial sector uses 75.5 PJ (16 per cent) and the residential sector 156.4 PJ (34 per cent).

In 2003, energy consumption by companies with EPA licences was 175 PJ per annum (EPA databases). This represents 22 per cent of the State’s total energy consumption and 75 per cent of energy

consumed by industry (including manufacturing, construction, agricultural and mining sectors).

### 3. UNDERSTANDING THE EPA INDUSTRY GREENHOUSE PROGRAM

The PEM provides the necessary guidance to businesses for meeting the requirements of the

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SEPP (AQM) with respect to energy efficiency and GHG emissions.

As the PEM states:

‘The approach underpinning the PEM is to ensure that individual businesses understand and manage their energy consumption and greenhouse gas emissions as part of ongoing integrated environmental management processes, systems and reporting. While it is recognised that some businesses are already well advanced down this path, it is also recognised that many businesses in Victoria, to date, have not regarded energy efficiency and greenhouse gas emissions as important issues.’

The PEM only applies to those businesses defined under the *Environment Protection (Scheduled Premises and Exemption) Regulations 1996* as scheduled premises requiring works approval and/or a licence under the *Environment Protection Act 1970*. Approximately 1,000 Victorian businesses are currently subject to this licensing and works approval regime<sup>3</sup>.

Significant industries that hold EPA licences include power stations; oil, gas and mineral processors; chemical and manufacturing industries; food processors; waste treatment and disposal facilities; and animal by-products processors.

## **Actions required by EPA licence holders**

The PEM specifies actions required of each licence holder depending on its annual energy consumption and/or CO<sub>2</sub>-e energy-related emissions. These requirements are shown in Table 3.

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<sup>3</sup> The exact number changes over time as businesses change their operations and hence their need for EPA licences.

The annual energy use referred to in Table 3 is determined by adding all electricity and other forms of fuels (LPG, diesel, briquettes, natural gas, etc) used within a site’s boundaries including production plants, offices and amenities and site equipment. As different fuel types generate different levels of greenhouse gases, the relevant Australian Greenhouse Office emission factors (AGO, 2004) are applied to calculate the total energy-related GHG emissions as equivalent tonnes of carbon dioxide (t CO<sub>2</sub>-e) per annum. Each site is then placed into one of the three categories according to its energy use and energy related GHG emissions.

As indicated by Table 3, a Category A site (small energy user) is not required to undertake an energy audit or prepare an action plan. Energy awareness is encouraged for these sites. Medium and large energy users (Category B and C) are required to undertake energy audits to analyse energy usage and to identify options for reducing energy usage. However, where an energy audit has been undertaken at the site within the previous three years, this may be used to demonstrate compliance.<sup>4</sup>

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<sup>4</sup> Generally this will apply to energy audits which are consistent with the requirements specified in the AS/NZS 3598:2000 “Energy Audits” and are less than three years old, and where the actions recommended by the audit have been implemented. EPA will also take into consideration actions taken by a company under SEAV’s Energy Smart Business Program and the Commonwealth’s Greenhouse Challenge Program and may negotiate other matters on a case by case basis. Action plan items accounted for under the PEM program are additional to energy efficiency measures included under other programs such as the Greenhouse Challenge.

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**Table 3: Categorisation and audit requirements of sites**

Category*	Level of energy use	Level of energy audit required
A	<500 gigajoules (GJ) energy p.a. OR <100 tonnes (t) of energy-related CO <sub>2</sub> -e GHG emissions p.a.	No energy audit or action plan required
B	>500 GJ energy p.a AND >100 t of energy-related CO <sub>2</sub> -e GHG emissions p.a. BUT <7,000 GJ energy p.a OR <1,400 t of energy-related CO <sub>2</sub> -e GHG emissions p.a.	Undertake level 1 audit followed by action plan where appropriate.
C	>7,000 GJ energy p.a. AND >1,400 t of energy-related CO <sub>2</sub> -e GHG emissions p.a.	Undertake a minimum of a level 2 audit, followed by action plan

\* While the three category descriptors are provided in the PEM, the actual A, B and C categorizations were introduced in a supporting toolkit (SEAV, 2002) and are used here for simplicity.

Energy audits required for Category B and C sites must be performed in accordance with the Australia/ New Zealand Standard AS/NZS 3598:2000 “Energy Audits” which defines three levels of energy audits:

- a Level 1 audit, which assesses the overall energy consumption of the site to determine whether energy use is reasonable or excessive against energy consumption benchmarks
- a Level 2 audit, which identifies the source(s) of energy used at a site and identifies areas where savings can be made, recommends measures to be taken, and provides a statement of costs and potential savings for the identified energy efficiency measures
- a Level 3 audit, which provides a detailed analysis of energy usage and energy efficiency measures and may concentrate on an individual item, such as a specific service or industrial process.

For a Category B site where the level 1 energy audit indicates that energy use is ‘excessive’ (that is, high when benchmarked against other similar sites, or where there is obvious energy wastage or inefficiencies), the licence holder is required to prepare an action plan that addresses the cause of the excessive energy usage in a cost-effective manner.

For all Category C sites, the licence holder is required to prepare an action plan that will implement the cost-effective recommended actions identified in the level 2 energy audit. Cost-effectiveness is defined primarily on the basis of actions having a simple payback period of three years or less.

A licence holder must also estimate its annual GHG emissions that are not associated with energy use (that is, any process emissions of greenhouse gases). These emissions must be reduced to a level

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consistent with best practice through an action plan. Best practice is determined by considering such factors as benchmarking against other similar operations and technical and economic feasibility.

In implementing the Program, licence holders were required to submit a report to EPA containing the above information, including an action plan where applicable, by 31 December 2003. Action plans are being implemented over the period 2004 to 2006.

Once an action plan has been developed and approved by EPA, licence holders then need to report annually to EPA on progress in implementing action plans, annual energy consumption, and associated GHG emissions.

## **Actions required by works approval applicants**

Under the *Environment Protection Act 1970*, an EPA works approval is required to be obtained prior to the construction of new works or the modification of existing works. The application and approval process allows EPA to ensure, prior to its construction, that a proposal will meet all environmental requirements.

The SEPP (AQM) now requires that new proposals will achieve best practice standards for their industry. The PEM ensures that the best practice standard will also be applied to the energy efficiency and greenhouse gas emissions associated with a new proposal.

For proposals where the anticipated energy use associated with the application is 500 GJ or more per annum (or GHG emissions greater than 100 t CO<sub>2</sub>-e per annum), applicants must demonstrate that they have identified, and will implement, best practice in relation to energy use and GHG

emissions with respect to the activities that are the subject of the application. Best practice must also be identified and implemented in relation to any non-energy related GHG emissions associated with the application.

Where anticipated energy use is less than 500 GJ per annum (or GHG emissions less than 100 t CO<sub>2</sub>-e per annum), applicants are not required to identify and evaluate options to reduce energy as part of the application.

## **Operational aspects of the program**

EPA has allocated significant staff and resources to the implementation of the Program, and SEAV has provided additional expertise to advise and assist in evaluating audits and action plans on a needs basis.

EPA had the immediate responsibility for providing information about the Program's requirements to industry and for collating data received from Program participants.

This has been carried out in several ways:

- The *Energy and Greenhouse Management Toolkits*, published by SEAV in June 2002, were sent to all licence holders in hard copy and were made available on the SEAV and EPA websites.
- In the first half of 2003, EPA held seventeen half day seminars in city and regional centres to advise industry about the Program requirements, compliance issues and energy efficiency measures. A total of 449 people attended these seminars, including representatives of 62 per cent of Category C and 42 per cent of Category B sites. Only 26 per cent of Category A licence holders attended. In addition a number of consultancies and

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relevant industry associations were represented at the seminars.

- EPA developed a greenhouse reporting database to allow companies to submit their audits, action plans and annual reports electronically. EPA uses this database as a monitoring and reporting tool and to record submitted audits, action plans and annual reports.

## 4. RESULTS DELIVERED BY THE PROGRAM

The Program's main outcomes to date can be summarised as follows:

- As of August 2005, GHG reductions committed to under action plans approved by the Program amounted to 1.1 Mt of CO<sub>2</sub>-e per annum.
- The action plans from companies indicate that 51 per cent of the total greenhouse gas reductions should have occurred in 2004, 24 per cent will occur in 2005 and 25 per cent in 2006.
- The committed GHG reductions represent a 3.5 per cent reduction in greenhouse gas emission relative to the 2003 baseline quantified in site audits.
- To the extent that data has been available, it is estimated that the total annual energy cost savings from these reductions are approximately \$34 million<sup>5</sup>.

- The average payback period for individual actions is 17 months.

A breakdown of the expected CO<sub>2</sub>-e reductions and expected annual savings based on site category is provided in Table 4. In examining this table, it is important to note that the final statistics associated with the Program are likely to increase as outstanding action plans are approved and implemented.

The above table clearly shows that the most significant reductions and the major investment in energy efficiency is taking place at Category C sites. It is suggested that this outcome should be borne in mind in designing future GHG reduction programs.

Regional data on energy consumption, GHG emissions and Program GHG reductions are provided in Appendix A.

### Energy efficiency actions

Table 5 categorises the different energy reduction actions committed to by Program participants. As might be expected, this shows that the highest number of actions (620) and the most significant greenhouse gas reductions (37 per cent) result from industrial process modifications. The next most significant energy related action type is 'plant drives', which typically includes the installation of high efficiency motors and variable speed drives on equipment.

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<sup>5</sup> Note that these figures are conservative on the basis that not all action plan items have been costed, nor have all energy savings from actions have been provided by licence holders and therefore could not be factored into the calculations.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

**Table 4: Cost and savings summary by site category**

(Source: EPA databases)

Site category	Number of Sites	Expected CO <sub>2</sub> annual reduction		Expected annual cost saving		Expected cost	
		Mt	% of total	\$ million	% of total	\$ million	% of total
<b>A*</b>	502	NA	NA	NA	NA	NA	NA
<b>B</b>	216	0.02	2.3	0.6	1.9	2.3	4.6
<b>C</b>	306	1.07	97.7	33.8	98.1	47.2	95.4
<b>TOTAL</b>	<b>1024</b>	<b>1.09</b>	<b>100</b>	<b>34.4</b>	<b>100</b>	<b>49.5</b>	<b>100</b>

\*There is limited information on category A sites as they are not required to submit action plans

**Table 5: Summary of energy efficiency actions undertaken**

Description	No. of actions	Expected GHG reduction, kt CO <sub>2</sub> -e/yr	Expected annual energy cost saving, \$K	Expected cost of actions, \$K	Average payback period, years
Air conditioning/ heating/ refrigeration/ventilation	148	67.2	\$ 2,037	\$ 2,140	1.0
Appliances/office equipment	20	0.9	\$ 117	\$ 140	1.2
Boilers/steam plant/steam reticulation	209	91.8	\$ 5,756	\$ 5,767	1.0
Building construction/modification	20	2.2	\$ 125	\$ 103	0.8
Compressed air systems	269	46.7	\$ 1,950	\$ 2,257	1.2
Energy management systems	334	82.9	\$ 4,235	\$ 2,797	0.7
Hot water systems	43	4.8	\$ 328	\$ 513	1.6
Industrial/manufacturing process modifications	620	402.5	\$10,106	\$19,520	1.9
Lighting	351	45.9	\$ 836	\$ 5,510	6.6
Non energy	45	185.3	\$ 1,215	\$ 1,806	1.5
Other	70	47.9	\$ 1,667	\$ 1,801	1.1
Plant drives (motors)	327	110.0	\$ 5,073	\$ 6,687	1.3
Power generation	10	5.7	\$ 1,057	\$ 44	<0.1
<b>TOTAL *</b>	<b>2,466</b>	<b>1,095</b>	<b>\$34,502</b>	<b>\$49,084</b>	<b>1.4</b>

\* Due to rounding, columns may not add exactly

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

The information in Table 5 can be used to show that the average GHG emission reduction was 20.6 tonnes of CO<sub>2</sub>-e per \$1,000 spent and the average cost per action was approximately \$20,000.

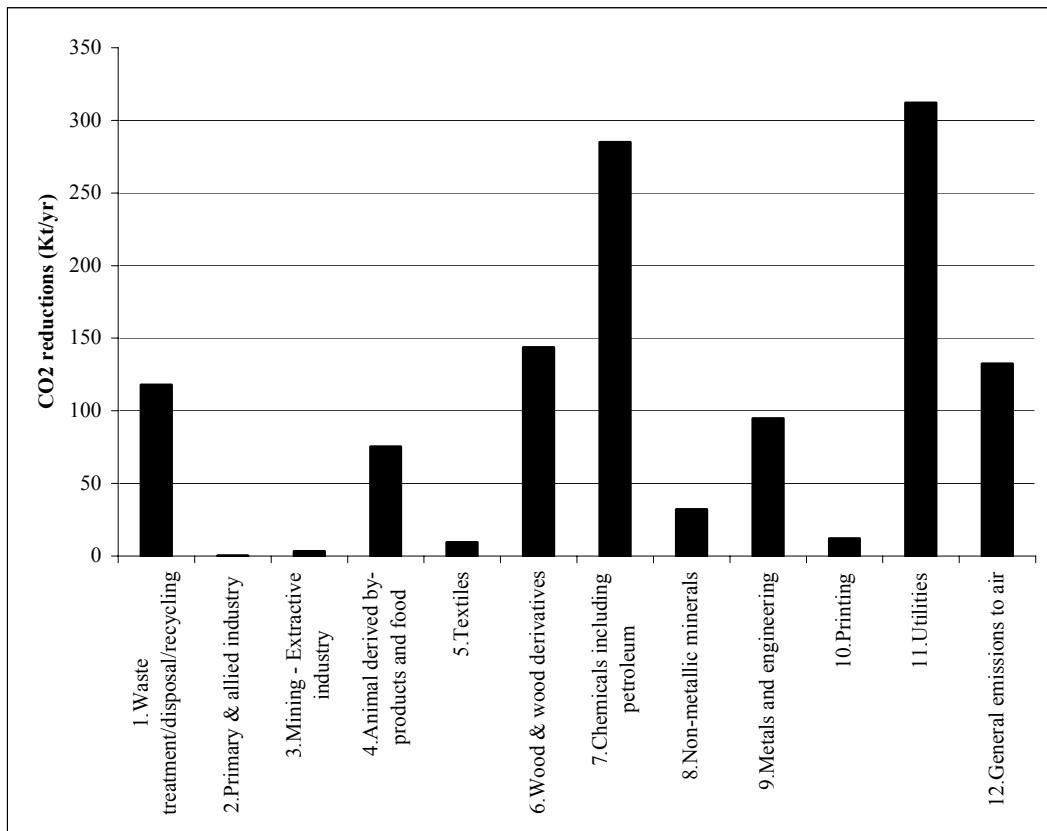
Descriptions of typical actions taken to reduce emissions in each category are given in Table 6. This table, which provides information based on 1654 actions for which full data is available, also shows that the biggest GHG reductions per dollar spent have resulted from instigating energy management systems, improving compressed air systems, the use of timers and sensors to control air conditioning, heating and ventilation and through

actions such as steam leak prevention for boiler systems. Emission reductions from building modifications, lighting, changes to appliances and office equipment, and hot water systems were less on a per dollar spent basis.

## GHG Reductions by scheduled premises type

Expected annual GHG reductions by scheduled premises type are shown in Figure 2. This gives some indication of the efficiencies achieved by different types of industries. As would be anticipated the large firms, the utilities (power plants and water treatment plants) and chemical

**Figure 2: Expected annual GHG reductions by scheduled premises type**



Note. The number before the scheduled premises type refers to the EPA schedule classification. Most of these classifications are further divided into subcategories. This level of detail is not provided here to maintain confidentiality.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

related industries (which includes refineries), achieved the greatest reductions. Lesser reductions were achieved by primary industries such as

intensive animal farming, the extractive industries and the textile industries.

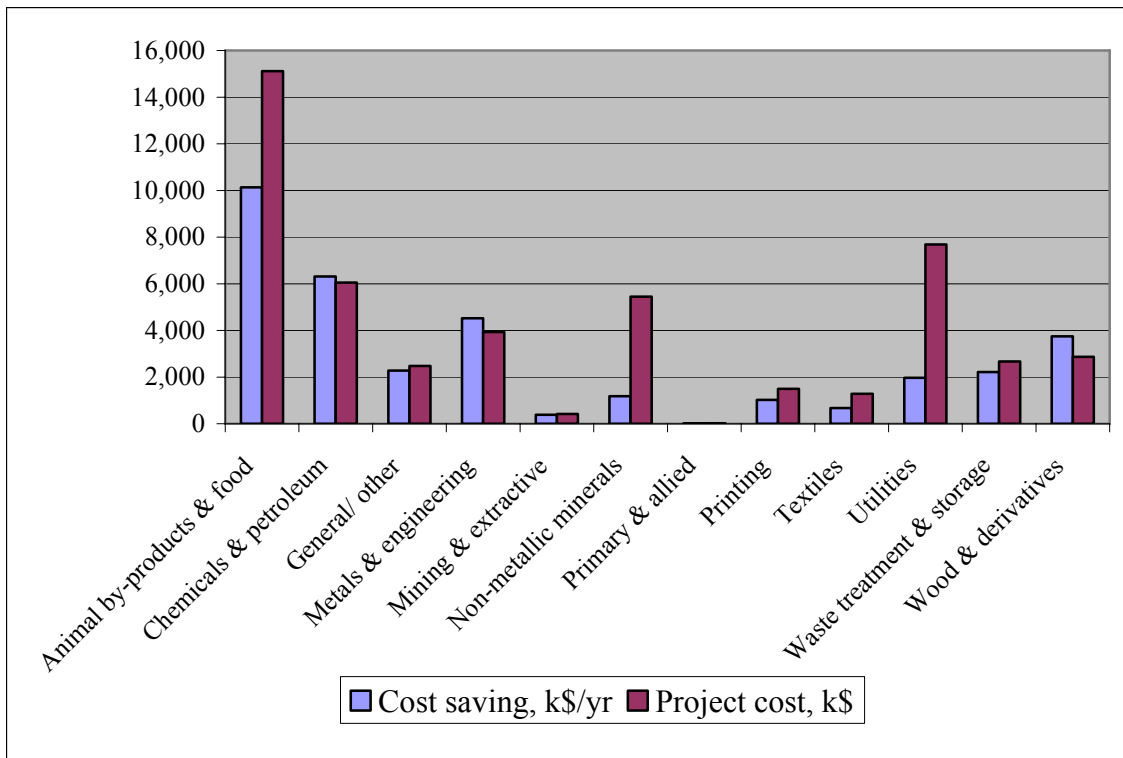
**Table 6: Description of typical actions and greenhouse gas reductions per thousand dollars spent.**

Description	No. of costed items	Tonnes CO <sub>2</sub> -e reduced per \$1000 spent	Common types of actions
Air conditioning/heating/refrigeration/ventilation	105	19.1	Use of timers and sensors in office and production areas, seasonal temperature adjustment, heat recovery
Appliances/office equipment	10	6.1	Activate energy saver features on PCs, switch off equipment out of hours, buy energy efficient appliances.
Boilers/steam plant/steam reticulation	163	18.7	Boiler upgrades, optimising for improved efficiency, insulate, leak repairs.
Building construction/modification	13	4.4	Use draught excluders, building use rationalisation
Compressed air systems	213	21.2	Leak detection, leak monitoring programs, shut down during weekends
Energy management systems	144	35.5	Energy metering and monitoring. Uncosted actions including staff awareness and training, energy and purchasing policies, performance targets, equipment labelling
Hot water systems	34	9.3	Heat recovery, use of timers, insulation, temperature reduction
Industrial/manufacturing process modifications	432	14.2	Temperature controls, insulate pipes and tanks, decommission redundant equipment, convert to less polluting fuel, optimise process controls, heat recovery, use of standby controls on equipment, investigate and trial different process controls
Lighting	259	4.5	Switching to energy efficient light globes, use sensors to detect movement or light intensity.
Other	29	7.6	Fleet management, fuel switching, tree planting, Greenpower, waste reduction.
Plant drives (motors)	240	16.1	<b>Install variable speed drives (VSD) to optimise drive efficiency, upgrades and replacements</b>
Non energy*	6	*	Methane capture from sewage treatment and landfills, staff newsletters, community awareness, recycling, vehicle maintenance, cleaner production, work with suppliers and customers
Power generation*	6	*	Switching fuels
<b>TOTAL</b>	<b>1,654</b>	<b>20.6</b>	

\*Estimates have not been provided for power generation and non energy, either because there was insufficient data to make an estimate or to maintain confidential information.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

**Figure 3: Costs and savings by industry sector**



### Costs and savings by industry sector

Figure 3 compares the project costs with the energy savings by industry sector. The chemical and petroleum industry and the metals and engineering industries are, in general, implementing measures that will result in project costs being returned in approximately one year. The return on project investments for the utilities (power generation, wastewater treatment) and animal by-products and food industries in particular will take longer.

### Payback period

The average payback period for actions being taken under the Program is 17 months. Figure 4 shows the payback period for actions and their associated GHG reductions. Around 430 actions, or 24 per cent of all actions where full cost details have been provided,

have payback periods of less than three months.

This indicates that many actions are low cost and easily implemented. A number of action plans had items that had no cost and involved simple actions such as flicking a switch.

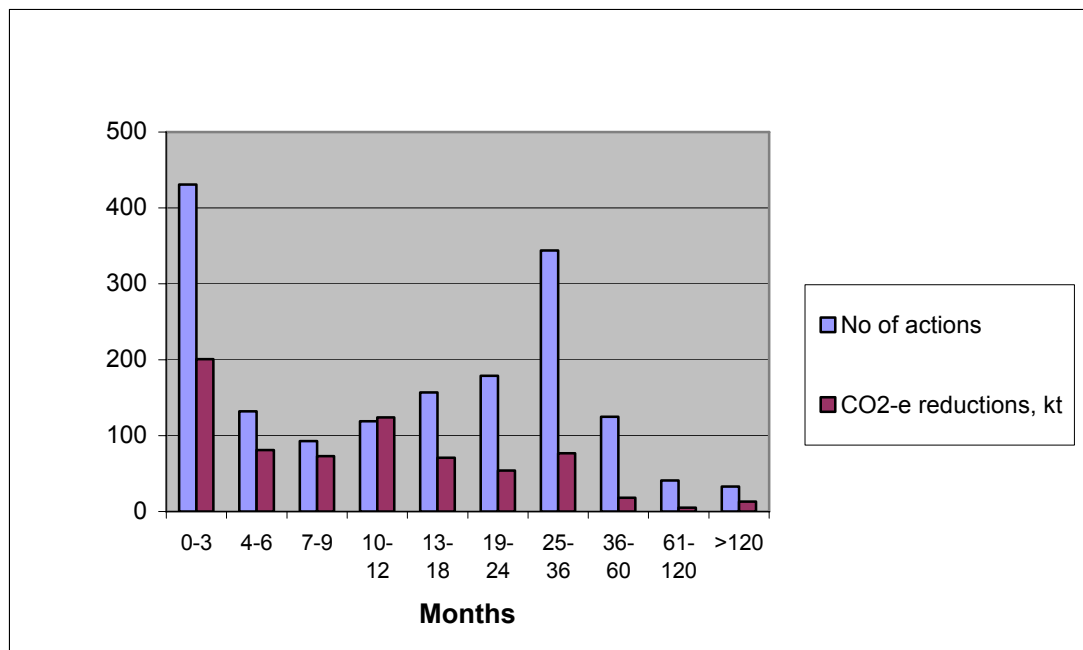
It is also notable that about 12 per cent of the actions have payback periods of more than 3 years, indicating the longer term commitments made by some companies that wished to maximise the benefits of improved energy efficiency.

### Relationship to Greenhouse Challenge/Greenhouse Challenge Plus

Forty-four businesses with EPA licences are also members of the Commonwealth's Greenhouse Challenge Plus program. A total of over 700 actions have been approved under the Program for these businesses. These actions are additional to GHG

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

**Figure 4: Payback periods and associated greenhouse gas emission reductions**



reductions undertaken through the Greenhouse Challenge/Challenge Plus. An analysis of the data compiled by the Program for these businesses indicates that:

- twenty-two of these action plans are for very high emitters (GHG emissions in excess of 28,000 t CO<sub>2</sub>-e per annum), and all but two relate to Category C businesses
- they account for 370 kilotonnes, or 37 per cent of the total expected annual GHG reductions under the Program
- they account for \$8.1 million (or 24 per cent) of the estimated total annual energy cost savings and \$17 million (or 35 per cent) of the expected implementation costs
- the average cost of each action is estimated at just over \$24,000.

This data suggests that the Program has contributed to these businesses identifying and committing to

significant further energy and GHG reductions, above and beyond those already achieved under the Greenhouse Challenge programs (which some businesses had participated in for up to 9 years).

Further background information on the Greenhouse Challenge and other energy efficiency programs is provided at Appendix B.

### Case studies

The following case studies provide three examples of actions that companies have undertaken to reduce energy and their greenhouse gas emissions. Appendix C provides some details of GHG reductions being made by individual companies.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## **SPC ARDMONA**

SPC Ardmona, a leading Victorian food processor and household name, will reduce greenhouse gas emissions by more than 6,000 tonnes CO<sub>2</sub>-e under the EPA Greenhouse Program, a saving of 6.6 per cent, through implementing a package of 16 actions. The company expects these measures to shave more than \$260,000/yr off the combined electricity and gas bills for its Shepparton and Mooroopna sites.

SPC Ardmona will make its greatest savings from heat recovery and boiler efficiency measures that will mean less gas is required to fire the boiler system. Other measures include improving refrigeration systems to use less energy, and preventative maintenance programs to ensure any future steam or compressed air leaks are identified and fixed quickly.

SPC Ardmona is taking a holistic approach to energy conservation; its action plan includes both operational improvements as well as staff, suppliers and community education actions about energy conservation and making line managers accountable for energy use.

## **BLUESCOPE STEEL Western Port Steelworks**

BlueScope Steel's Western Port plant at Hastings produces cold rolled, metallic coated and prepainted steel coils and is a significant user of energy in Victoria. In compliance with the EPA's Greenhouse Program, BlueScope Steel undertook a comprehensive energy audit of its production plant. The audit investigated energy usage at various stages in the production process and highlighted energy reduction actions.

BlueScope Steel identified 16 energy conservation actions at Western Port that will reduce greenhouse gas emissions by an estimated 36,240 t CO<sub>2</sub>-e/yr and will achieve significant annual energy savings. Just two actions at the paint lines - optimising the temperature on the incinerator used to destroy solvents (currently in the early stages BlueScope Steel's President, Western Port. of implementation) and reducing the air flow through the ovens used to continuously cure painted strip on number 2 Paintline (fully implemented) have so far contributed more than 40 per cent of BlueScope Steel's greenhouse gas savings, and both have paybacks of around 2 years or less.

'BlueScope Steel is committed to making our contribution to the global response to greenhouse gas emissions and has focused resources on improving the energy and greenhouse gas intensity at our steelmaking plants in Australia and overseas', said Greg Waters, Greg Waters, BlueScope Steel's President, Western Port.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## RIVERSIDE MEATS

Riverside Meats is a family-owned regional meat processing facility located in Echuca and employs 75 people. Riverside Meat's Greenhouse Action Plan, developed by a local consultant, has twenty-two energy saving actions most with pay back times of two years or less. The Action Plan, which includes replacing key equipment, improving running efficiencies and implementing an energy awareness program, is regarded by EPA as an excellent example of practical energy conservation. Riverside Meats has already implemented a number of actions and has noticed significant savings on its monthly energy bills.

The company is on track to reduce greenhouse gas emissions from the 5774 tonnes CO<sub>2</sub> -e emitted in 2003, by up to 50 per cent by the end of 2006. The company, working in conjunction with EPA, aims to further reduce its impact on the environment and save energy through the implementation of cleaner production processes. "The results of the energy audit were amazing. The energy savings from implementing the Action Plan will help ensure Riverside Meat's long-term survival in a competitive market", said Bruce Peat, Managing Director of Riverside Meats.

## Works approvals

The *Environment Protection Act 1970* requires companies that wish to construct new works or modify existing works to gain EPA's approval prior to construction. Through this mechanism EPA can ensure that investment by industry in Victoria meets the highest possible environmental standards, which will assist the State's future economic prosperity and sustainable development.

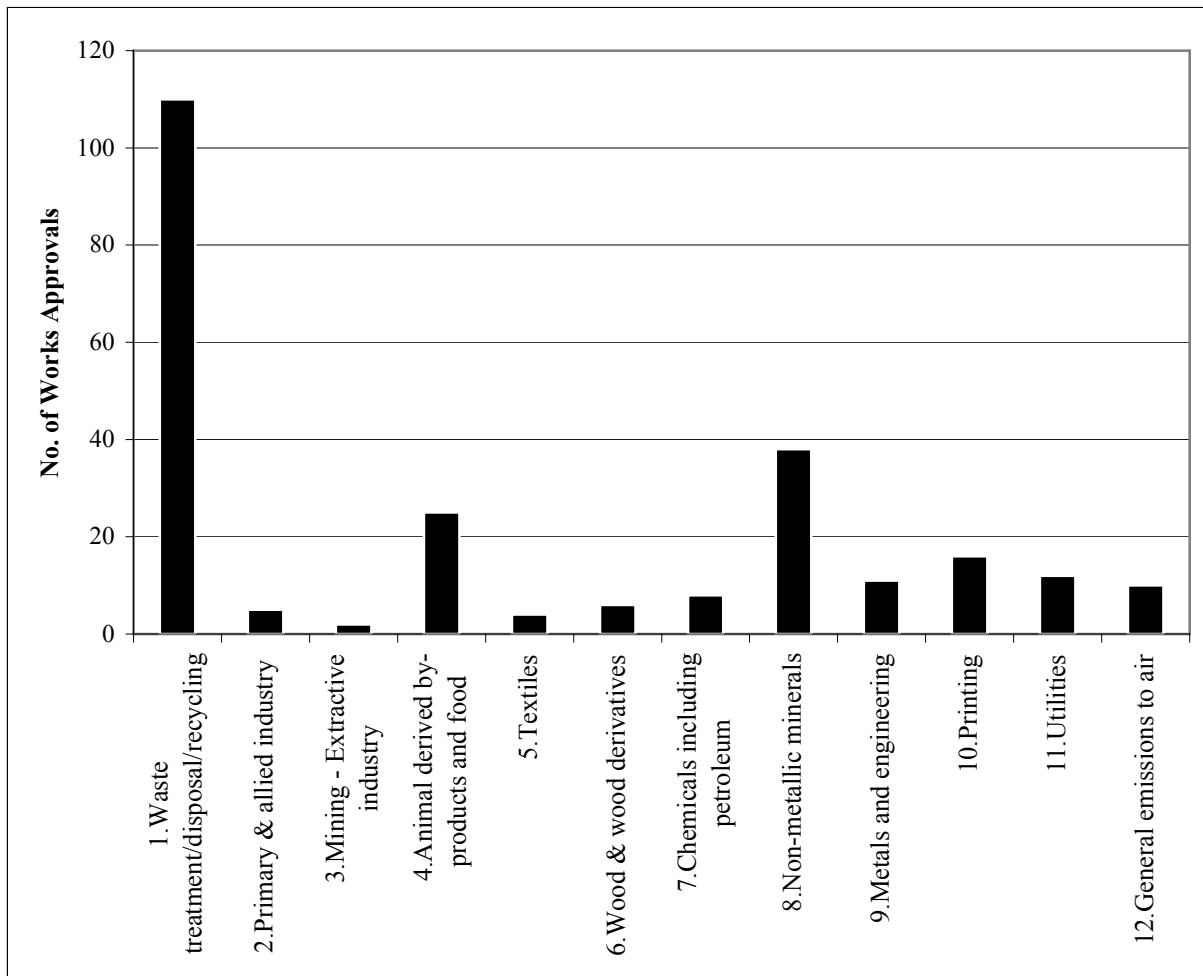
All works approvals are carefully examined by EPA to ensure the implementation of best practice. In relation to energy efficiency and greenhouse gas emissions, the best practice requirements are explained in Chapter 3 above. Proposed works in excess of \$1 million receive high level scrutiny before approval is given. Proposals may be referred to SEAV for technical assessment of energy efficiency. Between 1 July 2002 and mid July 2005 there were 262 works approvals worth \$1.5 billion processed by EPA, 93 of which were for works valued at more than \$1 million each. In addition, at July 2005 there were 32 works approvals estimated to be worth \$146 million of capital investment undergoing assessment.

Figure 5 provides details on the types of works approvals submitted to EPA. It shows that the most significant investment over the three-year period has been in sewage and effluent disposal systems, waste treatment and storage and in cement works and concrete and bitumen batching works, perhaps reflective of the building boom of recent years.

Detailed regional data on works approvals are provided in Appendix D.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

**Figure 5: Works approvals processed, July 2002 – July 2005, by industry type**



Note. The number before the scheduled premises type refers to the EPA schedule classification. Most of these classifications are further divided into subcategories. This level of detail is not provided here to maintain confidentiality.

## 5. ASSESSMENT OF THE PROGRAM ACHIEVEMENTS

### Valuing the greenhouse gas abatement under the program

In the absence of a national carbon emissions trading scheme, it is difficult to estimate a monetary value of the greenhouse reductions through energy efficiency measures under the Program. However, the following examples provide some guidance on this:

- The NSW Greenhouse Gas Abatement Scheme, which commenced on 1 January 2003, imposes mandatory GHG benchmarks on all NSW electricity retailers and certain other parties. It sets progressively decreasing State greenhouse gas benchmarks expressed in t CO<sub>2</sub>-e. Benchmark participants are required to reduce their emissions of GHG in line with the progressive reduction. Since August 2005 a greenhouse shortfall (being the difference between the actual reductions

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

and benchmarked greenhouse gas reduction requirement) attracts a penalty of \$11.00 per tCO<sub>2</sub>-e<sup>6</sup>. Energy efficiency measures implemented through the Program can therefore be valued at approximately \$12 million (that is 1.1 Mt of CO<sub>2</sub>-e x \$11).

- The European Union Emissions Trading Scheme (EUETS) commenced trading on 1 January 2005. It accounts for 45 per cent of GHG emissions in the European Union and applies to emissions from 12,000 installations (Hartridge, 2005). Recent trades value one tonne of CO<sub>2</sub> at between 21.50 and 25 Euros or A\$33.60 - \$39. This values the cost of reductions in CO<sub>2</sub> emissions through the EPA Program at between \$37 and \$43 million.
- The New Zealand government has announced that a carbon tax will apply from April 2007. The tax is to be set at NZ\$15 per tonne of CO<sub>2</sub>-e (approximately A\$13.90). This rate is expected to apply until 2012. This would place a market price for CO<sub>2</sub> reductions through the EPA Program at A\$15 million.

The notional values discussed above indicate the level of potential additional benefits, over and above the actual energy savings of \$34 million per year, that the energy efficiency measures being undertaken under the Program will achieve, resulting in notional total benefits of between \$46 million (using NSW GGAS) and \$73 million (using EUETS) per year. The realisation of this notional

potential benefit will depend on whether any such scheme is introduced with applicability in Victoria.

The Program has required firms to undertake system-wide energy audits. As illustrated in the short case studies in this report, the audits and the development of the action plans has required these firms to focus on the relationship between their processes and their energy use. These audits and action plans have resulted in many firms implementing awareness programs for their staff, and others (such as suppliers) and, in the case of Riverside Meats and others, to look for more ways to reduce their environmental impacts – all contributing to a more sustainable Victoria.

## Overall assessment

The outcomes from the Program to date indicate the following:

- *It has, in the main, successfully engaged industry in reviewing energy efficiency at an enterprise level.*

At August 2005, almost 100 per cent of sites in Categories C and B had made an initial submission to EPA and 78 per cent of Category C sites (high GHG emitters) and 44 per cent of Category B (medium GHG emitters) had approved action plans.

Where applicable, energy efficiency best practice has been required for 262 works approval applications worth a total value of \$1.5 billion. 93 of these applications related to works in excess of \$1 million.

- *It has significantly reduced energy use and greenhouse gas emissions by licence holders.*

<sup>6</sup> Prior to August 2005, the penalty was \$10.50 per t CO<sub>2</sub>-e.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

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Action Plans under the Program are projected to reduce energy usage and thereby reduce GHG emissions by 1.1 Mt CO<sub>2</sub>-e per annum. This represents a reduction of 3.5 per cent on the baseline GHG emissions from these companies prior to the Program.

- *It has achieved this in a cost effective manner to industry and to government.*

Industry will save \$34 million per year from reduced energy use, at an average payback period of 17 months on a total investment of \$49 million.

The Victorian Government committed an initial \$2.65 million over 3 years 2002/3 - 2004/5 to provide support services to assist businesses in complying with the Program requirements. EPA applied this funding to, amongst other things, industry seminars; salaries and other costs associated with EPA's internal Greenhouse Team (including staff seconded from SEAV); development of the EPA Greenhouse Database; and other general Program expenses. SEAV used approximately \$300,000 to develop the Toolkits.

Under the *Victorian Greenhouse Strategy Action Plan Update 2005*, an additional \$600,000 is being provided in 2005/06 to allow EPA to complete the current Program and develop future GHG programs for industry.

- *EPA has successfully gained significant new skills and knowledge in running this program (particularly in energy efficiency assessments and GHG mitigation).*

- *The collaborative association between SEAV and EPA, using EPA's relationship with its industry clients and SEAV's technical knowledge, has been highly beneficial in driving energy efficiency.*

The Program has proven to be successful and Government has now funded EPA Victoria, through the *Victorian Greenhouse Strategy Action Plan Update 2005*, to work on further enhancing the program.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## APPENDIX A: REGIONAL INFORMATION

This appendix provides a breakdown of detailed information on the Program implementation on a regional basis.

Table A1 shows the energy consumption, energy related greenhouse gas emissions and the expected reductions by region.

Energy consumption in the South West and Gippsland regions accounts for 59 per cent of the state's total, which is not surprising as the major energy intensive industries are located in these regions: Gippsland has the major power generators together with large paper making and food processing companies, and the South West region has petroleum refining, aluminium smelting, food processing and cement manufacturing. The West Metropolitan region, which accounts for 16 per cent of energy consumed, has glass and steel manufacturing, petroleum refining and chemical

production. The other four regions, two metropolitan and two regional, account for 25 per cent of the energy consumed in Victoria.

These results are in line with expectations based on some knowledge of Victorian industry. Gippsland, being the centre of Victoria's power industry and with some significant manufacturing companies, makes the greatest contribution. This is followed by the West Metropolitan and South Metropolitan regions, which include the highly industrialised areas of the western suburbs and Dandenong respectively.

The South West region (which includes major industries around Geelong and aluminium smelting at Portland) does not make a major contribution to the Program's GHG emission reductions because the existing Greenhouse Challenge commitments made by companies such as Alcoa were not counted in the results of the EPA Program.

**Table A1: Energy consumption, greenhouse gas emissions and reductions by EPA licence holders by region**

Region	Total Energy Usage, PJ/yr	Total energy related GHG emissions, kt CO <sub>2</sub> -e/yr	Approved GHG reductions kt CO <sub>2</sub> -e/yr	% Contribution to total GHG reduction
Gippsland	52.6	7,613	400	36.5
North East	7.4	829	51	4.7
North West	3.6	446	43	3.9
South Metro	16.4	1,966	267	24.4
South West	50.7	14,341	38	3.5
West Metro	28.6	4,008	193	17.6
Yarra	15.3	2,090	104	9.5
<b>TOTAL</b>	175	31,294	1,095	

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## APPENDIX B: OTHER RELEVANT GREENHOUSE PROGRAMS

There are a number of national programs in place, or proposed, which are designed to improve energy efficiency. Participation in these programs will potentially play a role in influencing measures undertaken by Program participants and include:

- Greenhouse Challenge and the Greenhouse Challenge Plus
- Generator efficiency standards
- Mandatory energy audits for larger energy users
- Cities for Climate Protection® (CCP®).

### Greenhouse Challenge and Greenhouse Challenge Plus

The Greenhouse Challenge was a voluntary program launched in 1995 by the Commonwealth Government's Australian Greenhouse Office (AGO), Department of the Environment and Heritage. The Greenhouse Challenge was replaced in 2005 by Greenhouse Challenge Plus, which operates in a broadly similar fashion to its predecessor.

Organisations participating in the Greenhouse Challenge and the Challenge Plus give certain undertakings to the Government to abate GHG emissions. Its participants are required to report annually on their actions, planned and undertaken, and on actual emissions. Reports are required to be independently verified.

As at December 2004, there were 277 Victorian members of the Greenhouse Challenge. The Victorian membership profile is broad and encompasses industry, professional and industry associations, banks, bus companies, hotels and other businesses. Less than ten per cent, or just over 50, of the companies covered by the EPA Program were also members of the Greenhouse Challenge in December 2004<sup>7</sup> (DEH, 2004).

In 1999, the Greenhouse Challenge scheme had an annual budget of \$6 million and covered 47 per cent of the commercial and industrial sectors, including 100 per cent coverage of the aluminium and cement industries, 98 per cent of oil and gas extraction and 91 per cent of coal mining (AGO, 1999).

The key change to the Greenhouse Challenge program is that, from 2006, the Greenhouse Challenge Plus will be compulsory for recipients of fuel excise credits of more than \$3 million. Early AGO estimates suggest the new mandatory requirements to join Greenhouse Challenge Plus will affect around 100 to 200 businesses nationally (AGO, 2004b). Most of these are likely to be in the transport, mining and resources sectors (DEH, 2005a). It could therefore be anticipated that 20 to 50 Victorian companies will be required to participate in the Greenhouse Challenge Plus program<sup>8</sup>.

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<sup>7</sup> The exact number is difficult to determine due to difficulties in cross matching companies between the two programs: Greenhouse Challenge and Challenge Plus participants may be whole companies, subsidiaries, sites or industry association members whereas the Program participants is for EPA licence holders and is site specific.

<sup>8</sup> Author's estimate based on review and discussions with AGO and EPA.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## **Generator Efficiency Standards**

The Commonwealth Government's Generator Efficiency Standards (GES), which commenced in July 2000 and were foreshadowed in the Prime Minister's *Safeguarding the Future: Australia's Response to Climate Change* statement, apply to any power generating plant that uses fossil fuels, has an electrical capacity of at least 30 megawatt-hours (MWh) and generates 50 gigawatt-hours (GWh) of electricity or more per year. Each participating generator is required to enter into a five year Deed of Agreement with the Government, which specifies the approach the generator will take to improve plant efficiency and reduce greenhouse intensity within the lifetime of the agreement (AGO, 2000; DEH, 2005a). Generator Efficiency Standards currently apply to eleven Victorian sites (DEH, 2005b).

There is integrated reporting for the Greenhouse Challenge Plus, the National Greenhouse Inventory and Generator Efficiency Standards.

## **Mandatory energy audits for larger energy users**

The *Energy Efficiency Opportunities Bill 2005* was introduced into the Federal Parliament in September 2005. The Bill outlines the broad requirements for large energy using businesses, and allows for Regulations to require mandatory Energy Efficiency Opportunities Assessment (EEOA) for large energy users. The Regulations which were foreshadowed in the Commonwealth Government June 2004 Energy White Paper, *Securing Australia's Energy Future*, are expected to be published in early 2006.

Through these Regulations it will be mandatory for energy companies consuming more than 0.5 petajoules annually to conduct energy efficiency assessments once every five years. Under the proposal, firms will be required to identify all opportunities to reduce their energy use with a payback period of four years or less, and to disclose this information to the public through the Greenhouse Challenge Plus program. However companies are not bound to implement any measures identified in the assessment report. The Regulations will apply to firms engaged in large scale mining and other extractive industries, power generation, civil construction, and the manufacture of metal, metal products, paper and wood products and food and beverages (Australian Government 2004a, 2004b).

Nationally around 250 businesses will be required to undertake an EEOA over the next five years (Australian Government, 2004b). These businesses are estimated to account for about 60 per cent of Australian business energy use. It is estimated that 20 to 30 Victorian firms will be required to undertake an EEOA many of which would be companies with EPA licences<sup>9</sup>.

## **Cities for Climate Protection® (CCP®)**

Cities for Climate Protection® (CCP®), which is run by the International Council for Local Government Environmental Initiatives (ICLEI), and is primarily funded by its program partner the AGO, is a program for local

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<sup>9</sup> Author's estimate based on review and discussions with AGO and EPA Vic.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

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government. ICLEI actively works with local government to reduce emissions that cause global warming and air pollution by using a milestone approach that takes councils from formal commitment, goals setting, developing and implementing a local action plan and monitoring and reporting on greenhouse gas reductions. ICLEI provides software and other assistance to participating councils (ICLEI).

The majority of Victorian Councils (59 of 79 councils representing almost 90 per cent of the Victorian population) are members of Cities for Climate Protection® (ICLEI).

Twenty of the 25 Victorian councils that have Council sites subject to the Program, are CCP® members. Six of eight Program Category B sites (refer to Table 3) are the responsibility of CCP® members. The remaining council sites are Category A energy use sites and were not required to prepare an energy action plan. EPA licences held by councils are generally for landfill sites.

## **Relationship to EPA Industry Program**

The above information indicates that a comparatively small number of EPA licensees are required to take compulsory action to improve energy efficiency and reduce greenhouse emissions under other programs, while others voluntarily belong to programs such as the Greenhouse Challenge Plus and, in the case of local government, the Cities for Climate Protection® program. It is difficult to estimate the precise number of businesses that participate in these other programs because of the difficulties in cross matching company entities.

The benefits of the EPA Program discussed in this report exclude reductions achieved under these other programs.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## APPENDIX C: SOME GREENHOUSE GAS REDUCTION COMMITMENTS

The following table lists an indicative selection of GHG reduction commitments made by companies under the Program. These represent the reductions made by typical large sites, and in total give about 40 per cent of the Program's GHG reductions.

<b>Company*</b>	<b>Industry sector</b>	<b>Proposed GHG reduction, t CO<sub>2</sub>-e/yr</b>
AMI Toyota Ltd	Vehicle	8,635
Austin & Repatriation Medical Centre	General	1,375
Australian Vinyls Corp Ltd	Chemical	4,219
Bluescope Steel Ltd	Metal	36,240
Boral Recycling P/L	Landfills	118
Dow Chemical (Aust) Ltd	Chemical	380
Fanman P/L (Riverside Meats)	Rendering	1,295
Insulation Solutions P/L	General	2,438
Loy Yang Power Management P/L	Power	67,746
Melbourne Water Corp	Sewage	38,000
Mobil Refining Aust P/L	Petroleum	44,305
Murray Goulburn Co-Op Co Ltd	Milk/general	65,104
Peerless Holdings P/L	Rendering	3,485
Pilkington (Australia) Ltd	Glass	4,038
Qenos P/L	Chemical	14,700
Shell Refining (Aust) P/L	Petroleum	79,961
SPC Ardmona Operations Ltd	General/Food	6,290
Sugar Aust P/L	Food	3,242
Wodonga Rendering P/L	Rendering	4,062

\* All these companies have Category C energy use with the exception of Boral Recycling, which has Category B energy use.

# THE EPA VICTORIA INDUSTRY GREENHOUSE PROGRAM – THE STORY SO FAR

## APPENDIX D: DETAILED INFORMATION ON EPA WORKS APPROVALS APPROVED UNDER THE PROGRAM

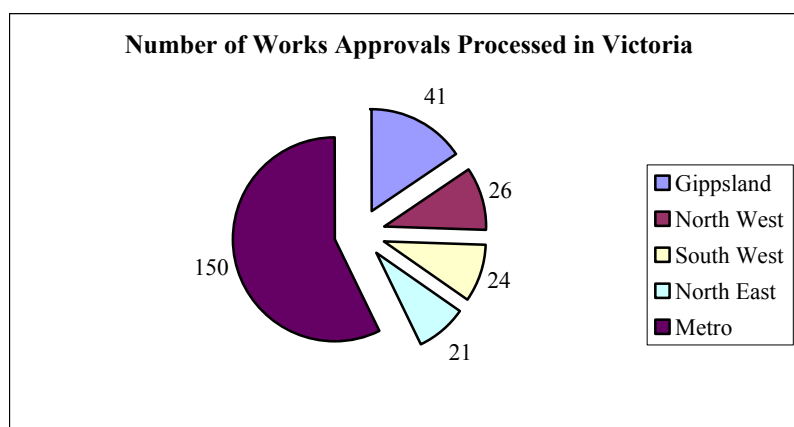
Table D1 and Figure D1 summarise, on a regional basis, the number and value of the \$1.5 billion worth

of capital investment that has been processed by EPA through works approvals between 1 July 2002 and mid July 2005. In addition, at July 2005 there were 32 works approvals estimated to be worth \$146 million of capital investment undergoing assessment.

**Table D1: Works approvals processed between July 2002 and July 2005**

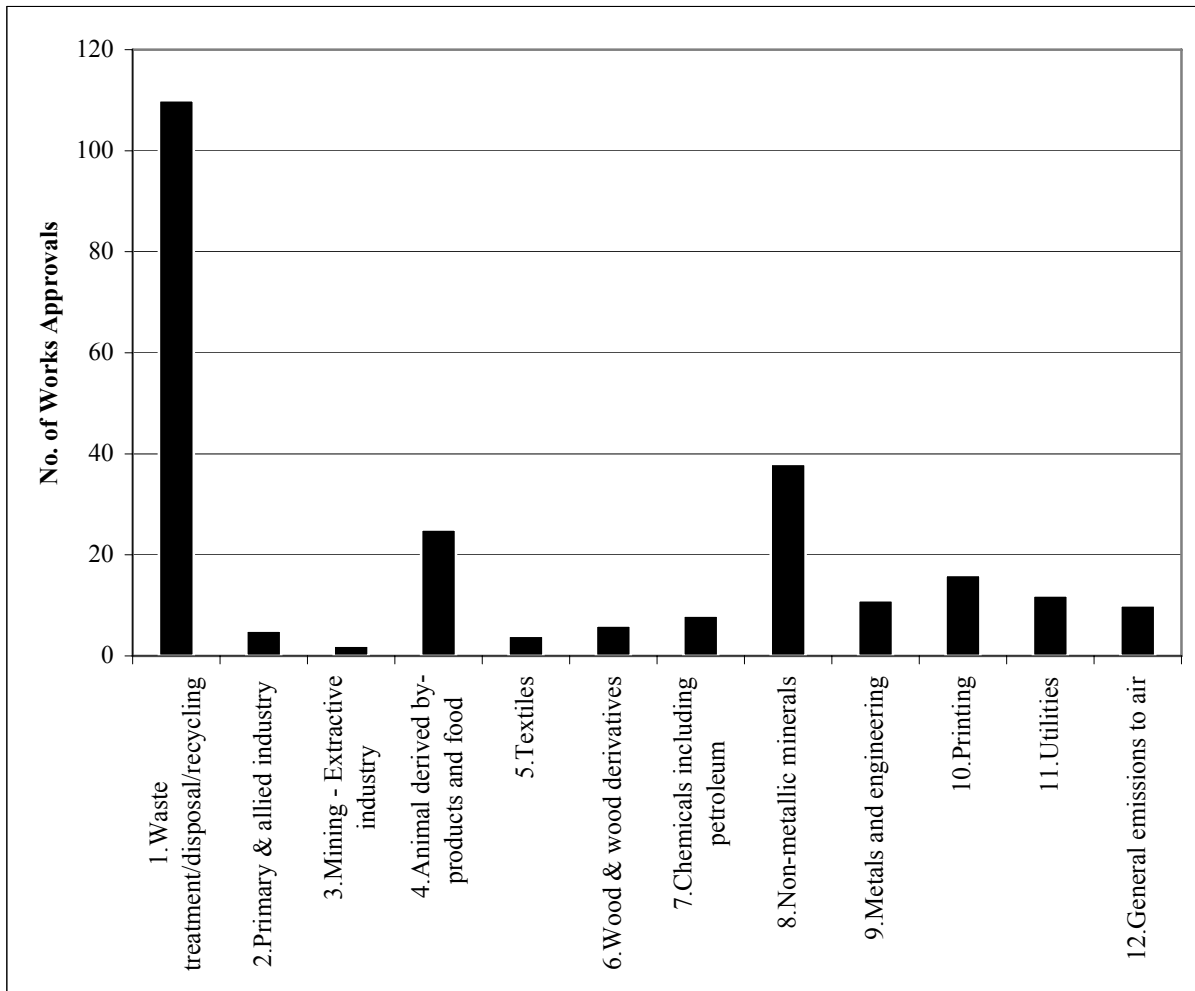
EPA region	No. of works approvals processed	Total value of works approvals, \$ million	No. of works approvals over \$1 million
<i>Gippsland</i>	41	\$100	15
<b>North West Vic</b>	26	\$72	7
<b>South West Vic</b>	24	\$574	10
<b>North East Vic</b>	21	\$90	4
<b>Yarra</b>	46	\$88	17
<b>South Metro</b>	55	\$212	19
<b>West Metro</b>	49	\$357	21
<b>TOTAL</b>	262	\$1,496	93

**Figure D1: Number of works approvals processed by region 2002–2005**



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**Figure D2: Works approvals processed between July 2002 and July 2005, by type**



Note. The number before the scheduled premises type refers to the EPA schedule classification. Most of these classifications are further divided into subcategories. This level of detail is not provided here to maintain confidentiality.

Figure D2 provides details on the types of works approvals submitted to EPA. It shows that the most significant investment over the three year period has been in sewage and effluent disposal systems, waste treatment and storage, and in cement, concrete and bitumen batching works, perhaps reflective of the building boom of recent years.

While the determination of best practice can be difficult to determine across a vast array of industries, EPA’s works approval system helps to

ensure that energy efficiency measures are incorporated before new plant and equipment are commissioned. This is particularly important in ensuring the future efficiency and viability of Victorian industry and reduces the likelihood of potentially expensive retrofitting.

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