



OUR SUSTAINABLE DEVELOPMENT

R e s o u r c e s

Resources are naturally occurring items that exist in our environment. Resources are not static; they change over time and their use depends on the technological level of the society. For example, metals that we use today are dependent upon sophisticated technology for their extraction and processing before we can utilise them.

Finite and infinite resources



Many of the earth's natural resources are termed finite, which means that if used continuously they will eventually be exhausted. Fossil fuels including coal, oil and natural gas are finite resources. The coal of the Latrobe Valley used today was formed 26 million years ago in a great swamp. Even though we have swamps accumulating sediment and plant material today, the coal they may form will not be ready for use by today's societies, therefore it is deemed a finite resource.

It is important to remember that water is also a finite resource. Only a certain amount of water circulates through the water cycle and only a tiny percentage is available for human use.

In a sustainable society, we aim for more efficient utilisation of finite resources through methods such as the use of energy efficient houses and adherence to water restrictions. The modern global economy, however, is heavily dependent upon the use of finite resources, and this will only change gradually as resources decline and new technologies are developed.

Infinite resources such as plants, animals, wind and solar energy can theoretically be replenished in a timeframe that can be used by today's societies. However the resource that has renewed may not always support the rate of biodiversity it once did, possibly leading to species becoming threatened or even extinct. For example whilst a plantation of trees may be ready in 70 years time, the tree hollows required as habitat for birds and possums may take over 100 years to form.

Planning for resource use

Prior to contemporary planning and resource assessment, many ad-hoc planning decisions were made. For example to obtain the coal deposits beneath the township of Yallourn, the State Electricity Commission announced in 1969 that it was phasing out the town, with demolition commencing in the 1970's and being completed in 1982. The people were relocated to Moe, Traralgon and Morwell.

The Planning and Environment Act of 1987 governs the utilisation of our landscape resources. This legislation enables for the protection of valuable resources such as mineral deposits. Each municipality in Gippsland has a planning scheme that guides local decisions on the use of land.



Planning projects with potential objections and environmental impacts must undertake an environmental assessment under the Environmental Effects Act 1978. An Environmental Effects Statement (EES) identifies the potential environmental effects of a planning decision. The EES outlines requirements within the development of a proposal to minimise or prevent environmental problems occurring.



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Reduce, reuse and recycle



Ecorecycle is a state government initiative to help raise awareness on resource depletion and waste production. They state that if everyone in the world consumed resources and created waste like Victorians, we would need three earths to support us! Our local councils have the job of disposing of our wastes, but we can help in several ways, such as separating our rubbish in recyclable and non-recyclable, using 'green' shopping bags instead of plastic and composting in the garden.

Resources

Environmental Protection Agency

www.epa.vic.gov.au

Ecorecycle

www.ecorecycle.vic.gov.au

CASE STUDY

Recycling in Latrobe City Council

Rubbish tips are slowly being phased out, and as land values increase, it is harder for municipalities to find landfill sites.

At Latrobe City Council, residents have access to four waste transfer stations. At the waste transfer stations, there are no charges for recyclable rubbish that is properly sorted for disposal such as paper and cardboard, plastic bottles and aluminium cans, steel and glass. The transfer station will also accept car batteries and domestic amounts of car oils. Fridges and car bodies can also be recycled.

Up to one-third of the waste in Latrobe City is made up of organic material such as garden clippings, vegetable scraps, tea leaves, and eggshells. When organic material is dumped in landfills it emits methane gas which is much more potent than carbon dioxide as a greenhouse gas.

Turning this resource into compost in the home garden saves the use of inorganic fertilisers and improves your garden's fertility, as well as reducing our impact on climate change.

More information on home composting can be found at the Latrobe City Council website.

References

www.latrobe.vic.gov.au

www.ecorecycle.vic.gov.au



Forest Industry

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Timber resources have traditionally been obtained from our native forests. The need for a sustainable forest industry has seen the development of commercial plantations and private agro-forestry. These emerging industries are reducing pressure on our native forests.

The history of forestry in Gippsland

The utilisation of timber in Gippsland is associated with different phases of settlement and development. When gold mining first commenced in the 1850's there was a need for timbers to reinforce mines and for fuel and construction. This saw the first wave of timber cutting in the foothills of central Gippsland. Pastoralisation also required timber for fencing, fuel and construction, and much timber was utilised from the coastal plains.

In the 1880's construction of the Latrobe Valley railway saw increased timber cutting on the coastal plains, not only for the railway, but increased demand from Melbourne as it developed. The timber industry boomed until the depression reduced demand for construction timbers.

After the 1939 bushfires, and leading into World War II, the industry boomed again. There was also a demand for charcoal. Bruthen, Nowa Nowa and Briagalong had charcoal plants where vast quantities of timber were converted into charcoal for fuel.

In the post war building boom there were nine mills in Heyfield alone employing 300 people. Today timber is still a big industry in Heyfield. Neville Smith Timber and Heyfield Timber employ one hundred and eighty of Heyfield's sixteen hundred residents.

Our Forests, Our Future

Reviews into Victoria's forest industry have recommended industry reform in several practices. The policy statement, Our Forests, Our Future has four key outcomes. Firstly, sawlog supply levels must be reduced by a third (around 31%) across the State to achieve sustainable forest management. Reductions will be the most significant in East Gippsland, Central Gippsland and Midlands Forest Management Areas.

Other key outcomes include: establishing a more innovative and dynamic timber industry, managing our forest resources in a more open, transparent and responsive manner, and engaging regional communities in decision making. Reducing sawlog levels does not mean the end of timber supply. There are other timber resources apart from our native forests.

Types of forest resources

Forestry can be divided into several different categories. Traditional state forestry, which is managed by the Department of Sustainability and Environment, Commercial Plantation Forestry and increasingly, Private Farm Forestry also called Agroforestry.

State forestry

The Department of Sustainability and Environment (DSE) has the major responsibility for managing Victoria's public land. This includes our state forests, which are forested public land, managed under the Forest Act (1958). This land is managed for many purposes such as conservation recreation, water catchment and also forestry.

Forestry Victoria is a unit of the DSE, and is responsible for management of commercial forest operations within the state forests of Victoria. It's mission is '*To manage the commercial native forest business in Victoria in a sustainable and commercially viable manner which yields an equitable return to the people of Victoria*'.

Forestry Victoria is responsible for the extraction of forest products in the commercial native forests of Victoria. It is also responsible for the marketing and sales of forest products, and has a role in improving the productivity of our native forests.

Commercial plantation forestry

In Gippsland there are both Softwood and Hardwood Commercial Forestry operations. Amcor controls all the pine plantations previously managed by Australian Paper Manufacturers. The harvested timber is used for pulp and paper production at Maryvale Mill, sawn timber through mills, treated pine through various plants, and export pulpwood.

Victorian Plantations Corporation has both pine plantations and eucalypt hardwood plantations. It was established under the State Owned Enterprises Act 1992, and began operations on 1 July 1993 as an independent State Business Corporation. In November 1998, VPC was purchased by the Hancock Timber Resource Group. In Wellington Shire, Hancock's have approximately 36,000 ha of land.



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Of this, 13,395 ha are softwood pine plantations and 3,277 ha are hardwood. There is also a nursery that provides stock for all of Hancock's operations in Victoria, as well as selling stock interstate.

Agroforestry

In 1996 the Ministerial Council on Forestry, Fisheries and Aquaculture, a federal body, endorsed the plantation industry's target of trebling the plantation estate by the year 2020. This target can be achieved by planting an average of 80,000 ha a year.

There are many benefits to farmers, communities and the environment from farm forestry. Areas of Gippsland that experience high rainfall can produce commercially viable plantation timber in 10–15 years. This diversifies farm income and is a secure investment for the future improved farm productivity. Increased farm value is also a benefit. Improved catchment and environmental management is a by-product also. On many farms there are areas that can benefit from tree planting.

Communities benefit through regional industry development and employment via continuity in timber product processing. There is also the landscape feature benefits and reduced pressure on native forests.

The value of forestry in Gippsland

In Wellington Shire alone, the timber industry employs nearly five hundred persons and accounts for \$52,250,000 of the local economy's turnover. Approximately \$10 million of this is to export markets. This includes forestry operations, milling and value adding activities, such as timber treatment plants producing treated pine logs.

Resources

Department of Sustainability and Environment
www.dse.vic.gov.au

Gippsland Farm Plantations
www.gippslandfarmplantations.com.au

Melbourne Museum
www.museum.vic.gov.au/forest

CASE STUDY

Radial sawn timber

Wastage from traditional timber saw milling techniques can see less than 50% of the log being utilised. An innovative company called Radial Timber Australia have developed a method of saw milling which utilises more of the tree and results in less waste.

Radial timber Australia's mission is to '*take our revolutionary timber production technology to the world – to reduce wastage of natural resources and to realise the technical, social, environmental and economic benefits that the adoption of radial sawing will bring*'

The benefits of radial sawing include:

- Less trees cut to end up with the same volume of usable timber, therefore more houses or construction from a given volume of logs
- Better quality and more versatile products from younger trees, increasing the viability of plantation forestry and reducing the demand upon old growth forests
- Energy savings, as the nature of the radial cut reduces the need for kiln drying to prevent warping
- Radial sawing eliminates or minimises geometry losses that occur when round trees are cut into rectangular timbers. It also enables more efficient removal of log defects that could not be utilised. Overall it results in higher timber utilisation from saw logs

Radial sawn timber technology was used to construct East Gippsland Institute of TAFE's Forestech Campus.

More information on radially sawn timber can be found at: www.radialtimber.com

Reference
www.wellington.vic.gov.au



Fishing Industry

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Gippsland has had a long association with fishing. The fishing industry in the Gippsland Lakes started with William Corstairs from Hastings in 1876. He used cotton mesh nets to fish in the fresh water lakes. The nets were tanned weekly by boiling them in a galvanised tank of wattle bark and water to prevent them rotting.

History of the fishing industry in Gippsland

- 1830's** Whalers used the area around Port Welshpool. Mallacoota is also a deep sea whaling port.
- 1841** Angus McMillian, while looking for a suitable port from which to ship livestock to Tasmania, discovered the harbour of Port Albert.
- 1888** The entrance to the Gippsland Lakes was first opened, and changed the lakes into the estuarine system of today.
- 1891** The arrival of the railway in Port Welshpool allowed local produce to be transported to Melbourne for sale.
- 1892** The railway linking the town of Bowen (now Port Franklin) to Melbourne was finished, and with a wharf and safe anchorage it soon developed into a busy fishing port.
- 1890's** Local Australian salmon fishers started a cooperative at Lakes Entrance. They caught ocean salmon and kept them in wire pens, so as not to depress the market. When there were no salmon around they caught barracouta instead.
- 1946** Danish seine boats started to arrive from Eden. The first boats were horizontally planked so that the navy would not take them away for use during the war years.
- 1964** The Lakes Entrance Fishermen's Co-Operative Society Limited (LEFCOL) was established. It is the largest co-operative of its kind in Australia.
- 1965** A fish meal factory was built next to the co-op to process pilchards.
- 1969** Scallop fishers from Port Phillip Bay started fishing from Lakes Entrance.
- 1967** Deep-sea trawlers started working from Lakes Entrance. These boats fish in the South East Fishery and were involved in the development of catching orange roughy.
- 1988** Squid fishing began. The boats fish at night with lights to attract squid.

Changes over time

Licensed fishermen

Up to 100 fishermen once fished in the Lakes, each using a small sailing or row boat to set their nets. There are now only eighteen Lakes fishers remaining after the recent voluntary license buy-back. Many of the participants have long family associations with the industry, some being able to trace back five generations to original settlers. This makes fishing an important part of the area's heritage.

Transport

Fish caught in the Lakes were originally packed into boxes with gum leaves acting as the preservative instead of ice. The fish were transported to Sale by ferry and then to Melbourne by train. When the roads improved the fish were then sent by truck to Melbourne. The fish are now sent to the Melbourne Wholesale Fish Market or to the Sydney Fish Market by refrigerated trucks.



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Fishing in East Gippsland

Mallacoota is Victoria's most isolated fishing port, located 542 km east of Melbourne. The township of Mallacoota and the small port are located on the protected waters of Mallacoota inlet.

Originally the first fishermen came from the Gippsland Lakes to fish at Mallacoota Inlet. They made their camp in tents along the banks, before returning home after the winter netting season. After World War II shark fishing, rock lobster fishing and abalone diving gained popularity.

Abalone diving is now the major fishery in Mallacoota. There are 21 abalone license holders based at Mallacoota with 18 selling their catch to the local Abalone Fishermen's Co-operative.

The co-operative processes the abalone for export markets in Japan, Hong Kong, Singapore and Taiwan. The cooperative provides important employment to the local community, employing five full-time workers and 30 casual staff.

Resources

Seafood Industry Victoria

www.siv.com.au

References

www.siv.gov.au

www.wellington.vic.gov.au

CASE STUDY

Carp and eels – less likely resources

Carp

The introduced European Carp has had a significant impact upon waterways in Gippsland. It is believed to make aquatic habitats less favourable for our native fish. Carp are now being harvested for European markets. This reduces numbers in the lakes and is also good for the local economy.

A licensed commercial fisherman has been specialising in carp. In January 1998, this enterprise sent their first 16 tonne export container of carp to Europe for human consumption. This contract is for 400 tonne of cleaned fish, which requires about 800 tonne of carp in addition to that currently being caught and processed.

Carp are slowly making inroads into the Australian domestic market, with small amounts being sent to the Sydney and Melbourne fish markets. These fish are popular in the Asian and European diet. All fish caught are treated as if they are to go to the markets. As new opportunities become available in the domestic markets, they are able to be supplied.

When fishing for carp other species are often caught. If these are caught in large quantities they are sent to the fish markets but if not, they are returned to the water.

Two methods of fishing for carp are used. When fishing in the lakes, seine nets are used. The majority of fishing is in the lakes. Rivers are also fished and when this is done, electro fishing is used. This method has been perfected in that the only species affected is the carp. No other fish or aquatic life is harmed.

Eels

East Coast Eels have a processing facility at Stratford. They are licensed to fish the Gippsland Lakes and many rivers from Mallacoota to Dandenong. They also have aquaculture dams. This operation is also licensed to catch carp, tench and roach, though this option is not used. There are five full time employees, with three to four working on a casual basis.

The catch is delivered live to the processing plant, where it is sorted into Short Fin and Long Fin and kept live in different tanks. Eels underweight for the export market are kept for smoking or returned to stocked facilities. The eels are chilled, bagged and sent live to the Asian markets weekly. South Coast Eels is the largest live exporter of eels in Victoria.



Dairy Industry

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Victoria has the highest production of dairy products in Australia. Approximately one third of this industry is in Gippsland. Many dairy farmers are involved in developing sustainable practices.

History of the dairy industry in Gippsland

The first dairy cows arrived in Gippsland after 1861 with the creation of stock routes. Butter was first made by women on farms and was distributed locally for sale. After the advent of refrigeration and the mechanical cream and milk separator in the late 1880's, the government subsidised the establishment of butter factories.

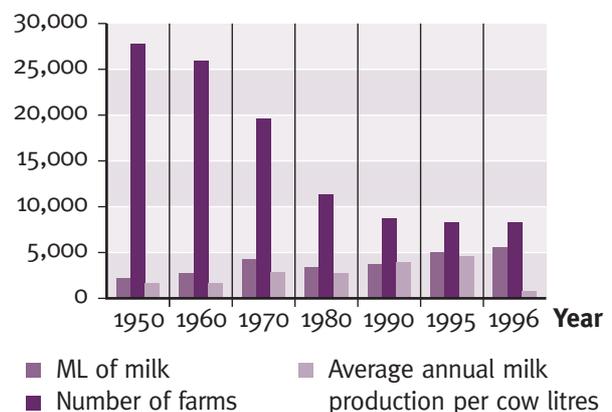
By 1905 there were over 200 butter factories in Victoria, with butter being Victoria's third most important export.

Today, Gippsland has approximately one third of Victoria's dairy cows. Monash University through its Gippsland Region Information Service (GRIS) surveyed the industry in 2000, and determined for every \$1.00 of income to a dairy farm there was a flow-on to the immediate area of \$2.64.

Changes over time

The golden days of butter factories in many small Victorian dairy towns are gone. Improvements in road transport and milk processing led to the closure of smaller factories. Cowwarr butter factory is a typical example.

Changes in the dairy industry 1950-1996



Timeline for the butter factory at Cowwarr

- 1865** Originally, Cowwarr was known as 42nd – after the 42nd clause of the Land Act, which enabled selectors to gain a plot of 20 acres to produce food. This was targeted at failed gold miners from the Walhalla diggings.
- 1869** After lobbying the government that these plots were too small, the selection size was increased to 320 acres.
- 1880** The Fresh Food and Storage Company opened a creamery.
- 1897** Cowwarr Cheese and Butter Factory Co. Ltd opened in an old wooden building in the main township.
- 1918** New factory built near the railway line.
- 1933** Victoria Milk Board was formed to regulate prices paid to farmers.
- 1959** Butter and cheese manufacturing ceases at the Cowwarr Factory and moves to Heyfield.
- Today** Production has been consolidated to Maffra's Murray Goulburn Co-operative Limited.

Source: Article reproduced from Victorian Year Book, 1998 (ABS Cat No. 1301.2)

Gippsland's dairy statistics

On current trends, Victorian milk production is expected to increase from 5,482 ML to 10,800 ML in 2010 (70% of Australia's production). The number of farms is expected to decline from 8,275 to about 7,000, and the average herd size will increase from

145 cows to 250 cows. Annual production per cow will increase from about 4,745 L to 5,800 L. 80% of the Victorian herd will be artificially bred, and 50% of herds will have automatic milk recording. Dairy farm numbers will generally decline, mostly in West Gippsland due to residential and other land use pressures.



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The dairy ecosystem

All organisms in ecosystems have relationships between one another and their physical environment. In a dairy context, this is simplified. The main producer is grass, the primary consumers are cows and the tertiary consumers are man. What is recognisably different is that vast amounts of biomass in the form of milk and cattle leave the system altogether. Decomposers do not break them down, with the nutrients being released to the producers to start the cycle over.

To keep the system in balance, the farmer needs to put nutrients back into the system in the form of fertilisers. These fertilisers can become pollutants when they make their way into our waterways.

There can also be pressures from cattle on the soil. If the soil is not supported by the growth of healthy pasture, it can wash away into rivers and streams, muddying the water. This increase in turbidity and nutrients can also unbalance stream ecosystems. There are many agricultural practices that make the dairy industry more sustainable. For example:

- Dairy effluent ponds can be constructed to catch dairy shed runoff. Waste water from sheds are high in nutrients. The effluent pond water can be used to fertilise and irrigate pastures. This prevents the nutrients from entering our waterways
- Shelter belts around paddocks have many benefits. They buffer harsh winds, shelter cattle and slow down evaporation of water from soils in hot weather. Native plantings also encourage wildlife for pest control and increase biodiversity.

CASE STUDY Environmental Management Systems

Environmental Management Systems (EMS) are a methodology to look at farms via the triple bottom line; Ecologically, Socially and Economically. Farms can be accredited with the international standard of ISO14001. Sustainable farms are farms that can support people and rural communities and that are profitable.

The first step of an EMS is for farmers to assess the environmental aspects of their farm and farming practices, and plan to reduce the impact on the environment while still maintaining returns, e.g. implement nutrient management strategies to reduce fertiliser inputs by 10%.

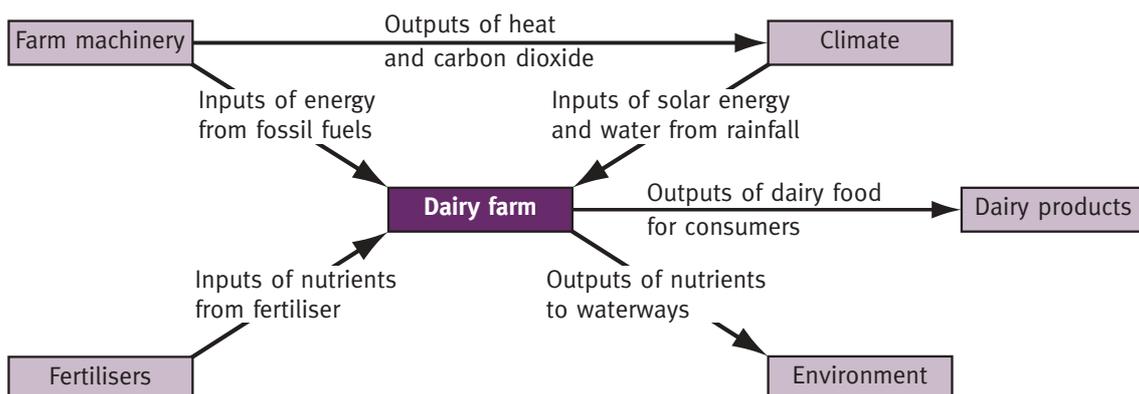
The next phase is to implement changes of practice over a decided period of time. Once these changes have taken place, it is time to check them again to identify improvements against original benchmarks. Then targets are reviewed and new ways to improve are identified. It is a continual cycle of Plan, Do, Check and Review.

Resources

Virtual Galleries on Butter Factory History
www.nre.vic.gov.au/virtualexhibition/butter/index.htm

References
www.abs.gov.au
www.cowwarr.com

The dairy ecosystem





Power Industry

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The Latrobe Valley Energy Industry is a collective of four energy generating companies located adjacent to the Valley's brown coal deposits - Edison Mission Energy, International Power Hazelwood, Loy Yang Power and Yallourn Energy. Together these stations supply in excess of 80% of Victoria's electricity needs.

The history of Latrobe coal

- 1873** The first recorded discovery of brown coal in the Latrobe Valley region.
- 1886** Henry Godridge, and William Tulloch, prospected these outcrops independently. From this activity came the application for a mining lease.
- 1889** Great Morwell Coal Mining Company began operating on the banks of the Latrobe River.
- 1899** Operations ceased, as brown coal could not compete with black coal.
- 1891** Victorian Government Geologist James Stirling told a Royal Commission that he believed the deposits were the largest in the world. He visited Germany in 1901 and reported the expanding use of brown coal, returning with technical details of briquette manufacture.
- 1900's** (early) Dr. Hyman Herman, the State Director for Geological Survey explored Victoria for resources of coal for large-scale mining. Seams were found at Anglesea, Bacchus Marsh and the Latrobe Valley, with the Latrobe Valley deposits most suitable for mining operations.
- 1918** Victoria's population was 1.5 million people. Manufacturing was increasing, and an adequate and uninterrupted supply of electricity was essential.
- 1921** Legislation was passed, creating 'The State Electricity Commission of Victoria (SECV)'. It had the responsibility to generate and distribute electricity, and to own and operate brown coal open cuts and briquette works.
- 1921** Under the watchful eyes of Electricity Commissioners, horse drawn ploughs turned the first sod on the site of the first permanent Yallourn A power station, clearing the soil to uncover the coal.
- 1924** Power began flowing down the transmission lines to Melbourne.
- 1928** Yallourn A power station had an output of 75 MW.
- 1929** The SEC's generating stations now aggregated 154 MW, enough to meet supply requirements for up to two years ahead. The SEC supplied nearly all of metropolitan Melbourne, as well as 141 country towns and centres.
- 1939** Demand rose 70% during the war. Because of reduced availability of black coal from both NSW and overseas, Victoria had to assist industry and other states who relied upon NSW coal.
- 1949** Restrictions on the use of electricity were implemented as black coal was no longer available to Victoria. The Morwell power and fuel project got underway.
- 1964** Hazelwood was proposed to join the grid due to the growing demand for power. It was originally envisaged as a 1200 MW complex but ultimately contained eight 200 MW units.
- 1968** Work began on the new Yallourn W power station, while the decision was made to close the ageing Yallourn A power station.
- 1973** The SEC announced plans for the giant Loy Yang Power Station project, this was to contain four 500 MW units
- 1984** The Loy Yang A Power Station was officially opened.
- 1985** The Loy Yang B Power Station was approved by the state government and construction began on its two 500 MW units.
- 1985** However, in an attempt to reduce debt, a decision was made by the state government to privatise power stations. Loy Yang B was the first to be partially sold and was officially opened in 1993, under the flagship of new owner Mission Energy.

Subsequently Yallourn, Hazelwood, and Loy Yang A were privatised. Each of these companies now sells electricity to the National Electricity Market. The distribution of energy has also been privatised. The five companies involved are United Energy, TXU, Powercor, Citipower, and AGL Electricity.



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The resource



The discovery and use of fossil fuels allowed for the industrial revolution, making it possible to manufacture iron and steel and power our industries. The majority of these changes occurred in the past 200 years, but the coal first started forming between 20 and 300 million years ago.

The coal of the Latrobe Valley is world famous. It is the largest single deposit of brown coal in the world. The coal seams are thick, ranging from 60–170 m, and total up to 770 m deep. The resource extends for 50 kilometres in length and between 8–16 km in width. At the current rate of mining, the Latrobe Valleys' brown coal reserve will last for at least 300 years.

Resources

Powerworks

www.powerworks.com.au

CASE STUDY

The Greenhouse Challenge

The Greenhouse Challenge is a co-operative effort by industry and government to reduce the greenhouse gas emissions through voluntary industry action groups, such as the Latrobe Valley Task Force. This group comprises the major industries, federal, state and local government, TAFE, Monash University and the Gippsland Trades and Labour Council.

A 20% cut to the 1988 level of carbon dioxide discharges is expected by 2005. Solutions being investigated include:

- **Enhanced generation practices**
Plant upgrades and improvements to today's electricity generation practices to minimise greenhouse gas emissions
- **Improved generation technology**
Utilising new technologies to optimise electricity generation efficiencies
- **Establishment of carbon sinks**
Extensive forest plantations in conjunction with environmental and conservation groups for the absorption of carbon dioxide
- **Productive use of carbon dioxide**
Harnessing carbon dioxide waste emissions for the production of carbon based products

By pursuing initiatives like these, a significant contribution can be made to the reduction of greenhouse gas emissions, and also to the economy of the region.

Reference

www.powerworks.com.au