



State of the Environment: Energy

17 December 2007

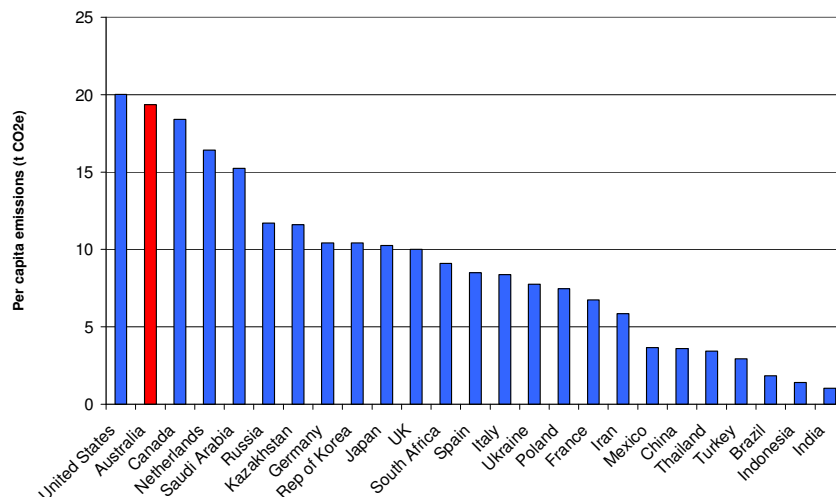
Change is required to make Victoria's energy system more sustainable - clear and planned action must be accelerated

My Office is finalising a complete picture of the nature of Victoria's energy system as part of the State's first comprehensive State of the Environment Report, to be released next year. This statement will include an overview of the environmental impacts of energy production and use and highlights the need to reduce greenhouse emissions from these activities.

In November 2007 the world's most credible climate scientists affirmed that climate change is well underway and that without urgent mitigation efforts will lead to grave consequences in shorter timeframes than previously assumed.

Australia's ratification of the Kyoto Protocol will reinforce global efforts to reduce greenhouse emissions.

Nowhere will the task for Australia be greater than in the field of energy. Victoria lies at the heart of that challenge because our energy legacy has positioned Victoria as one of the highest per capita greenhouse polluting states in one of the highest per capita greenhouse polluting countries in the world.



Source: World Bank

Per capita greenhouse gas emissions of top 25 greenhouse emitting countries in 2004

It is clear that Victoria must move ahead more swiftly than previously contemplated in light of the scientists' warnings, observed impacts and new national and global policy responses.

The energy challenge

The overriding objective of energy policy responses in the context of climate change must be to decrease energy related greenhouse pollution. This should be done at least cost while simultaneously maintaining security of energy supply.

Victoria is taking its place in national and global efforts to control greenhouse pollution and both the Victorian and Commonwealth Governments have committed to a range of renewable energy targets, energy efficiency and technology development policies.

The Victorian Government has committed to introduce legislation for a binding target to reduce the State's greenhouse emissions by 60% by 2050 (compared to 2000 levels) and has supported the commitment to introduce a National Emissions Trading Scheme. The Scheme must place an effective price on carbon to make cleaner energy sources more competitive and our use of energy more efficient.

The Scheme will be underpinned by environmental and economic modelling currently being undertaken by Professor Ross Garnaut for the new Labor Commonwealth Government. In early statements about this work Professor Garnaut acknowledges that global emission growth rates are higher than those noted within the U.K Government's Stern Review and the need for an effective policy response is even more urgent than we thought.

We need to be clear, while careful planning is vital to ensure the transition to a low carbon economy does not create unnecessary economic or social risks, fundamental change is urgently required to how our energy system operates and to improve the efficiency of our energy use.

With this in mind, the Victorian Government should seek to influence the shape of the emissions trading scheme in the establishment of carbon caps, and keep special treatment for trade-exposed industry and the allocation of free permits to a minimum. This should be done in order to drive the required investment in new low-emissions technology and individual behavioural change.

In parallel with this the Victorian Government should continue to pursue stringent energy efficiency standards and practices in electricity use. The Victorian Government should also pursue these for transport use.

By world standards, Victoria has extremely low electricity prices. These prices take advantage of the low extraction cost of brown coal and, in so doing, perpetuate the dominance of the present highly polluting generating system at the expense of cleaner energy options.

Generally, clean energy technologies are either not commercially viable in the current energy market or are still technically unproven at a scale suited to investment. Victoria's low energy prices do not allow investors to make an economic return on the significantly higher capital cost of these technologies, which therefore require subsidies to achieve commercial viability.

The Victorian Government has provided financial support to develop low-emissions energy technologies through the Energy Technology Innovation Strategy. In addition, the Government introduced the Victorian Renewable Energy Target (VRET) scheme to increase electricity consumption from renewable sources. To date, however, the growth of energy demand in Victoria has not been met by a proportionate increase in clean energy supply.

The Victorian Government's 5-Star energy standard for new homes is a positive step towards saving energy in new homes although average energy performance under the scheme remains well below that in Europe. The current standard, requiring the installation of either a solar hot

water service or a rain water tank serves different objectives, yet regrettably compromises both by fostering a price-drive choice between them.

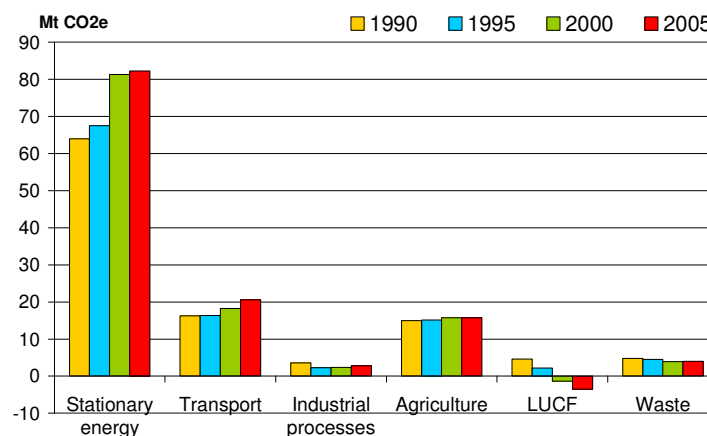
The Victorian Government is further developing the 5 Star standard. The new standard should include more stringent energy standards and be extended to include fixed appliances including hot water systems and lighting and mandate the installation of both solar hot water units and rain water tanks in all new Victorian homes.

Other Victorian Government current initiatives to reduce energy use include Minimum Energy Performance Standards (MEPS), which apply to a range of electric appliances and the Victorian Energy Efficiency Target (VEET) scheme which will place an obligation on energy retailers to help householders improve their energy efficiency.

However, while the Government should be credited for introducing these greenhouse abatement policies, Victoria's total greenhouse gas emissions are increasing and projections indicate further policies are needed.

Energy and greenhouse gas emissions

Energy production and use is the single largest contributor (84%) to Victoria's greenhouse pollution through the release of carbon dioxide from the combustion of fossil fuel. This is comprised of transport and stationary energy.

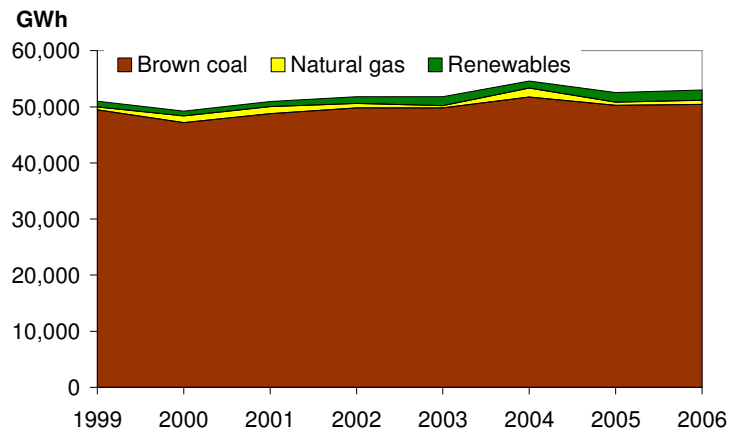


Source: Australian Greenhouse Office

Victoria's greenhouse gas emissions by sector, 1990 - 2005

Note: LUCF represents land use change and forestry

In the stationary energy sector, burning coal for electricity generation is the major contributor to greenhouse pollution. Seventy-eight percent of Australia's electricity is generated from coal, making Australia's per capita greenhouse pollution the sixth highest in the world. Approximately one quarter of Australia's total greenhouse emissions come from Victoria, which generates over 90% of its electricity from brown coal, the most greenhouse-intensive fossil fuel energy source. Victoria's reserves of brown coal are estimated to be sufficient to meet the demand for electricity for more than 450 years.



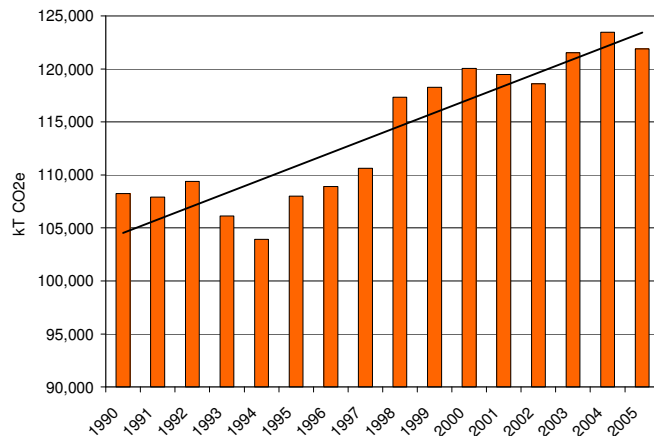
Source: Erisk, National Electricity Market

Electricity generation by fuel type in Victoria, 1999 – 2006

Within the last 30 years, Victoria’s total energy consumption has increased by more than 80%. In the same time, the State’s population grew by only 35% while the economy increased by almost 400%. These figures reflect the reliance of the Victorian economy on energy intensive industries which have been attracted by the low price of electricity.

Electricity consumption has more than doubled over the past 20 years and now accounts for 19% of the State’s energy consumption but more than 60% of energy related greenhouse emissions.

Since 1990 total greenhouse emissions in Victoria have increased by 12%. In the same time, energy related emissions have increased by 28% and continue to grow at an average of 1.7% per annum.



Source: VGGI

Total Victorian greenhouse emissions 1990 – 2005

Projections suggest that unless different pathways are taken, total energy consumption in Victoria will be almost 70% higher in 2030. Most of this energy would be supplied by brown coal generated electricity and unless we change the technology and or fuel source mix this will generate further damaging greenhouse gases.

The big energy consumers

The transport sector is the greatest consumer of energy in Victoria, consuming 37% of the total. At a time of increasing concern about the security of supply and expense of oil, this consumption is almost entirely in the form of petroleum.

This rate of energy consumption is directly related to increasing demand for mobility, driven by rising affluence and rates of car ownership, Australians' preference for large cars, population growth, taxation policies and funding programs that have favoured roads and cars for decades.

The Victorian Government, through its 2006 Meeting Our Transport Challenges program, has committed \$6.2 billion to public transport. Nevertheless, with strong patronage growth, many areas of the public transport system are struggling to meet demand rather than actively driving a shift to more sustainable transport options.

Despite recent policy commitments, and attempts to contain urban growth and reduce travel demand, the legacy of inadequate funding of public transport and car-oriented urban design has provided society with little encouragement to any alternatives other than the car. The current level of car dependency means we are not well placed to address the challenges of climate change and peak oil.

Greenhouse gas emissions are the most serious environmental impact of Victoria's transport sector having grown 26% since 1990. Emissions from transport continue to grow both in absolute terms and as a proportion of overall emissions. Passenger cars contribute most even though nearly half of all car trips last less than three kilometres. Even Melbourne's trains and trams are powered by electricity generated from the combustion of brown coal.

After transport, the manufacturing and residential sub-sectors account for the next largest shares of energy use (31% and 17% respectively).

Energy consumption in the manufacturing sector grew more than 45% from 1973-74 to the late 1990s. Within the manufacturing sector it is the metal products sub-sector which accounted for over 30% of Victoria's total electricity consumption in 2005-06 and around 67% of manufacturing electricity consumption in the same year.

Energy intensive industries have been encouraged to locate to Victoria. For example, the two aluminium smelters at Point Henry and Portland account for more than half of the manufacturing sector's total energy consumption and 18% of the State's total electricity consumption. Electricity prices for these smelters are supported by the taxpayer via complex commercial-in-confidence arrangements which are locked in until 2014 and 2016 respectively.

These agreements were made by government at a time when supporting new industries in regional areas to build Victoria's economic profile was of highest priority and knowledge about the dangers of greenhouse pollution was in its infancy. They illustrate the effectiveness of government intervening through policy for the benefit of the State. It is now time for government to review these and a range of other National and State Government perverse subsidies in the light of the State's most pressing current challenge: climate change.

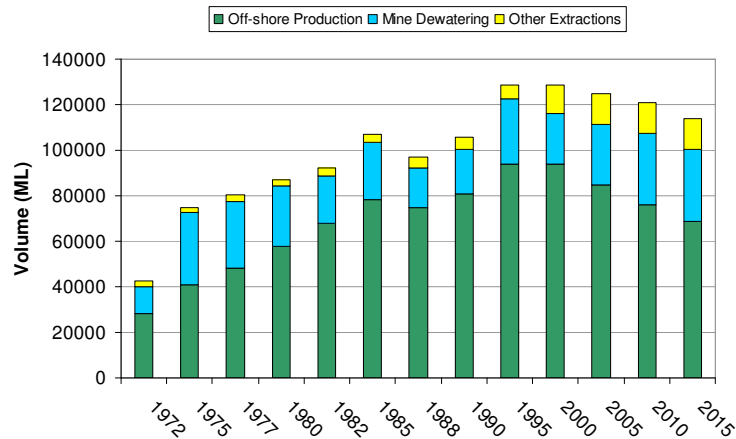
The energy intensity of the residential sector is increasing with the recent trend toward bigger house sizes and decreasing occupancy rates. Intensity is further exacerbated by the trend towards an increasing number of electric appliances. Sale of white goods is estimated to have doubled from 1993-2005 although there was a rise in population of only 13% over the same period.

Other environmental impacts of energy

At the same time as the energy system is contributing most to Victoria's total greenhouse gas emissions, it is also a significant user of the State's increasingly scarce water resources. Over 50% of the total surface water use in the Latrobe Basin is extracted annually by brown coal electricity generators. On average, over 2 litres of water is used in the generation of every

kilowatt-hour (kWh) of electricity sent out in Victoria; higher than in any other State or Territory.

A further 120,000 million litres of groundwater is extracted by the energy industry, the bulk of this for offshore production of oil and gas. This dwarfs the small amount extracted for irrigation and town water (shown in the graph below as "Other Extractions").



Source: CSIRO

Annual volume of groundwater extracted by the energy sector from aquifers in the Latrobe Valley

Conclusion

Whilst Australia’s ratification of the Kyoto Protocol is important and symbolic, commitment to binding emission reductions are essential. Domestically, actions count for everything.

The Government has the complex task of accelerating the development of an effective policy framework to guide the State’s energy future. This framework should assure the community that the environmental impacts of Victoria’s energy system are being addressed and implemented in a timely manner, and should provide private sector investors and operators with clear signals on the direction and speed of required change in the energy system.

The IPCC has stated that global emissions have to peak by 2015. Time is now pressing. The need for Victoria’s energy transformation runs deep and is required faster than previously assumed.

Achievement of the national and State target will be, *in reality*, the sum of all abatement steps, big and small, public, private and personal, actually initiated and implemented.

However in reality the ability of the States to make major change will be heavily dependent on national action through the Commonwealth government. First, the characteristics of the needed change will rest to a large extent on the conclusions drawn by Professor Ross Garnaut in his economic report to the Commonwealth government due by June next year. This will outline the pace of change required to reduce emissions and not risk present economic stability, while ensuring that in 20 or 30 years time the economy will not be at risk of significant price shocks from crisis investment due to delayed action in the face of the changed climatic regime, including sea level rise. Second, the National Emissions Trading Scheme will be vital to setting the market framework within which the necessary private investment will be made.

The National Emissions Trading Scheme has a commencement date but the features of the system will be critical to ensure that it encompasses the widest range of emissions with the

fewest exceptions to allow the market to lift the price of carbon sufficient to drive full-blooded investment and to unleash the innovative power of the economy.

The task in relation to technology and infrastructure response is to take the decisions, make the investment, and timetable completion. Many of the technologies must be decided and scheduled as soon as possible, as long lead times in investment and commissioning must be catered for. Any component of the abatement targets which are based on unproven or undeveloped technology simply cannot be added to the sum.

The stationary energy sector must decide rapidly on the combustion technology of choice, such as gasification, as well as the capture and storage approach as soon as feasible, deferral for some single technology breakthrough in twenty years time carries great risk. Alternative generation from natural gas, and non-fossil sources, including solar, must become economic through lower unit costs, while traditional methods will be tested in a competitive carbon price regime. Asset life and lead times would suggest that the possibility of a significant reduction of emissions from stationary energy sources in the short term is unlikely.

In the transport energy sector new fuel efficient drive trains, hybrid engines, and alternative fuels again require lengthy lead times, therefore the decisions to begin their introduction are needed sooner rather than later and cannot be deferred.

The State Government has made an impressive new investment in public transport which heralds a significant shift in emphasis. The increased geographic spread of and capacity in the public transport system requires continued and early investment decisions given the long lead times in construction and commissioning.

The Commonwealth government must reconsider its preference for motor vehicles in the taxation system and roads in infrastructure provision. Major new freight rail lines, and significantly improved track and rolling stock, in association with continually improved modal interchanges are vital. Today's State governments are faced with the inertia of present transport preferences and the under-funding of public transport over the last fifty years. Needless to say, urban design and planning are powerfully influential in setting the transport task.

It is a complex policy task at all levels. In the same way that the targets are the sum of many actions, the policy response should be the sum of many large and small initiatives that lead to the achievement of the needed reduction. However it is only after the actions have begun that the emissions savings can be 'banked' - aspirational targets or reliance on some future king-hit technology can only be an indication of intent.

Victoria through its deep involvement in State and national developments to mitigate greenhouse gas emissions has the policy history and depth of experience to continue to drive the next set of policy programmes and plans that are needed.

Victoria has multiple options available to improve the environmental impacts across all aspects of energy; stationary and mobile, coal and oil.

It is vital that the State builds on its leadership and actions taken to date to seize the opportunities afforded by growing international, community and media momentum around climate change to ensure real change in the energy and greenhouse intensity of our economy and our lives.