THE AUSTRALIAN COLLABORATION

A Collaboration of National Community Organisations

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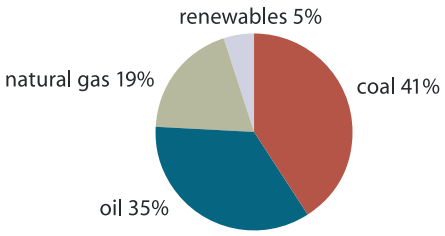
Energy issues in Australia

Energy policies are some of the most contentious facing Australia. A radical revision of the country's energy policies and programs is needed to help reduce Australia's greenhouse gas emissions, now the highest per capita in the developed world. Australia also needs to protect itself from the impact of decreasing oil supplies and increasing prices. These are matters of great urgency.

Patterns of energy consumption in Australia

Energy use needs to be looked at from two different perspectives: first, primary energy use by fuel – the forms of energy we depend on - and, second, energy consumption per sector – how we use energy.

Figure 1: Primary energy consumption by fuel 2005-06 (Australia)



Source: ABARE Energy Update 2007: http://www.abareconomics.com/publications_html/energy/energy_07/energy_update_07.pdf

The figure illustrates vividly our dependence on fossil fuels (oil, black and brown coal and gas) for the sources of our energy. Currently, 95 per cent of our primary energy is derived from fossil fuels.

Second, we need to consider where our energy is used. Table 1 (on the next page) shows energy consumption in households and in industry sectors.

The table illustrates that although radical reform is needed in every sector, the greatest efforts need to be made in electricity generation, transport and manufacturing industries.

What are the problems that we face?

There are three crucial problems relating to energy supply and use in Australia. The first is to ensure that there are sufficient energy sources for the Australian economy and for the daily use of households and citizens. The second is to find ways of cushioning the Australian economy from the impact of future oil shortages and high oil prices. The third is to find ways of making very large reductions in greenhouse gas emissions. These problems are interconnected because a policy designed to deal with one has also to find solutions for the other two.

In general terms, the first issue - guaranteeing the availability of energy to support the economy and household use far into the future - is only a problem of the cost of supply for particular applications since Australia has abundant energy resources. Australia has large black and brown coal resources: 8 per cent per cent of world reserves of black coal and 15 per cent of world reserves of brown coal. It has the richest reserves of uranium in the world. It has 1.8 per cent of world natural gas reserves although only 0.3 percent of world oil reserves. Australia receives around 60 million PJ of solar energy per annum, around 20,000 times current energy use in Australia. Solar energy could therefore meet all energy demands if it could be satisfactorily harnessed. Australia has many sites with significant potential for wind energy. It has the opportunity to develop fuels from wood and biomass. Australia has abundant sources of geothermal energy with several thousand cubic kilometres of hot, dry granite rock resources. Australia also has the potential to harness ocean energy from waves, tides and currents around its extensive shorelines. Related to current supply, two of our major challenges are to make the most productive use of the energy we do use and to manage peak demand for electricity in hot weather since it is expensive to provide and blackouts can have major economic and social impacts.

Table 1: Energy consumption by sector 2005-06

Sector	Consumption (PJ)	Sector share (%)	Approx sector share (electricity allocated to end use sectors %)
Agriculture	92.8	1.6	2
Mining	379.6	6.7	10
Manufacturing	1368.5	24.3	34
Electricity generation	1681.1	29.8	-
Construction	26.3	0.5	1
Transport	1340.1	23.8	25
Commercial and services	249.5	4.4	11
Residential	423.6	7.5	16
Other	79.2	1.4	1
Total	5640.7	100	100

Source: http://www.abareconomics.com/interactive/energy_july07/index.html (approx. sector share allocations by authors)

The second issue, reducing our oil dependency, is the necessary means of lessening the impact of dwindling oil stocks and high oil prices and also of reducing fossil fuel use and greenhouse gas emissions.

The third issue, finding primary energy sources and taking other steps that significantly reduce our greenhouse gas emissions, is by far the most important since upon its successful resolution may depend the very existence of human civilisation as we know it today. The problem is that such a high percentage of our primary energy consumption is from fossil fuels which, when burnt, are the principal causes of greenhouse gas emissions.

The energy problem is not therefore the availability of energy resources. It is rather reducing our dependence on fossil fuels, in particular, black and brown coal for electricity generation and oil for transportation. We need to reduce this dependency as quickly as possible and without major economic disruptions.

What is Australia currently doing?

When the Rudd Government came into office in November 2007, the Department of Climate Change was established. The Government committed to increasing the Mandatory Renewable Energy Target (MRET) from 9,500 gigawatt-hours to 45,000 gigawatt-hours in 2020, in an effort to reach the target of a 20 per cent share for renewable energy by 2020. At the COAG meeting in December 2007, the Commonwealth and States agreed to cooperate in order to develop a single national MRET scheme by early 2009.

The first official action of the Rudd Government was to ratify the Kyoto Protocol in November 2007. In early 2008 "The Australian Government's Initial Report under the Kyoto Protocol" was submitted to the UNFCCC to facilitate the calculation of the assigned amount of emissions.

The Rudd Government made an election commitment to reduce Australia's greenhouse gas emissions by 60 per cent on 2000 levels by 2050. This is despite indications that cuts of up to 90 per cent may be necessary to avoid dangerous climate change, a view expressed in Professor Ross Garnaut's interim report released in February 2008. Professor Garnaut was commissioned by the Australian and State Governments to assess the economic effects of climate change. His final Review, released in September 2008, contained much weaker targets than the interim Review. In the final Review, Garnaut maintained that an international agreement is the only way forward and that such an agreement could only hope to achieve a 10 per cent reduction from 2000 levels by 2020, though a 25 per cent reduction would be a "desirable next step".

In December 2008, the Rudd Government released its emissions trading scheme and climate strategy. It named three key areas for action: reducing Australia's carbon pollution; adapting to unavoidable climate change; and helping to shape a global solution. The policy contained a

commitment to a medium-term national target to reduce Australia's greenhouse gas emissions by between 5 per cent and 15 per cent below 2000 levels by the end of 2020. The smaller reduction is guaranteed regardless of the actions of other nations, while the larger one is dependant on all developed nations taking on comparable reductions. In *The Age*, Garnaut criticized the Government for the weakness of these targets. In May 2009, Prime Minister Rudd made a commitment to reduce carbon pollution by 25 per cent of 2000 levels by 2020 if the world agrees to a global deal to stabilise levels of CO2 equivalent in the atmosphere at 450 parts per million or less by 2050. The Australian Greens have called this target "unrealistically conditional".

The emissions trading scheme, called the Carbon Pollution Reduction Scheme, was scheduled for implementation on the 1st of July 2010 and employs a 'cap and trade' mechanism. Setting a cap on emissions means that the right to emit greenhouse gases becomes expensive, thus encouraging businesses to lower their emissions. However the scheme has been widely criticized, with Garnaut arguing that revenue would be wasted on the concessions the policy makes towards the main polluters.

In May 2009, Prime Minister Rudd announced that the Carbon Pollution Reduction Scheme would be delayed by one year to manage the impacts of the global recession, with additional concessions for major carbon polluting industries. The Government also announced the establishment of the Australian Carbon Trust, which aims to encourage individuals and households to reduce their carbon emissions and to encourage energy efficiency in the business sector.

What should Australia be doing?

A successful greenhouse gas reduction energy policy needs to have three major strands. The first is to reduce energy demand. The second is to develop effective economic and market mechanisms that reward improved environmental outcomes. The third is to change energy supply through new cleaner technologies which will bring about significant reductions in greenhouse gas emissions.

Reducing demand

Reducing demand is essential because changes in supply are difficult to make in the short term due to the huge investments in existing technologies and the time needed to bring about major change. Changing demand for energy can, by contrast, be accomplished more quickly, in many cases through a combination of changing behaviour, eliminating waste, investing in low cost energy saving measures, and ensuring that all major investments incorporate energy efficiency. This does not mean that demand reduction is easy to accomplish but rather that it is feasible with full commitments from all sectors of society.

Market measures

The general principle underlying most market mechanisms is to price carbon emissions so that the polluter pays. The right price signals are then sent to the market, encouraging business innovation and enterprise.

One market mechanism is emission trading. Under emission trading regimes a limit is set on the amount of carbon dioxide that can be emitted. Companies which exceed their limits are required to purchase or trade permits from other companies which have lower emissions. This option is most favoured by economists because it allows participants to minimise the overall cost of compliance with a given target by trading among themselves. An international trading scheme, as has been implemented by the Kyoto Protocol, binds nations to setting caps on carbon emissions with the intention of trading in permits on the international market and facilitating investments in emissions reductions in developing countries. The Australian emissions trading scheme coming into effect in 2011 will be similar to the scheme already established in the European Union.

A carbon tax is a type of pollution tax on the use of fossil fuels. A carbon tax penalises polluters, rewards those who use clean, green technologies and contributes to the expansion of low emission alternatives. Sweden, Finland, the Netherlands and Norway have introduced carbon taxes since the 1990s. In Australia, the present cost of carbon-based energy does not adequately reflect its true cost so there is little market incentive to look for other options.

A third mechanism is the use of subsidies to make energy alternatives cheaper than they would otherwise be. Recent examples include direct financial incentives for more efficient energy use by households, such as $10,000 low interest loans for Australian households wanting to implement energy and water savings, rebates for better insulation of 300,000 rental homes, and $8000 rebates for rooftop solar panels. However, in the 2009 Federal Budget the Government announced a major cut to the funding for green loans, from 200,000 to 75,000 over five years.

Reducing the impact of existing energy technology
The third strategy is to find new technologies that significantly reduce emissions from current energy supply sources. Energy sources such as renewable energy, low emission coal, LPG or natural gas, could replace conventional coal and petroleum. COAL21, a partnership between the coal and electricity industries and Federal and State governments, is, for example, seeking to discover ways to eliminate greenhouse gas emissions from coal-based electricity. COAL21 is evaluating two key technologies. One, carbon sequestration, involves capturing carbon dioxide and storing it deep underground. The 2009 Federal Budget contained $2 billion in new funds over nine years for researching carbon capture and storage in the coal industry.

Other energy efficiency gains can be made through the development of solar cities, improving building designs and creating more efficient machines and appliances and encouraging co-generation. The 2009 Federal Budget included a significant package to help Australians choose more energy efficient appliances, homes and buildings.

Using non-polluting energy supplies
The fourth strategy is to develop clean, renewable energy technologies. The five main potential technologies are wind, solar, biomass, geothermal and ocean energy. The first three are the fastest growing alternative technologies around the world. In Australia they still only provide a very small percentage of electricity supply and none as yet competes with coal in price. It is nevertheless on these technologies that attention needs to be focused because we will need to rely on them to a significant degree in the future. The 2009 Federal Budget included $465 million to establish a new body, Renewables Australia, to research renewable energy technologies. It also included a green stimulus package including spending on public transport and solar energy. However, much more can be done and the Australian Greens have called on the Government to deliver its election commitment to lift the renewable energy target.

There are two other much less attractive options for future development. The first is an extension of Australia's hydro energy resources and the second the development of nuclear reactors. In operation neither emits greenhouse gases but building dams has high environmental costs (including disruption of riverine environments, stream flows and habitats), and uranium mining and reactors pose many problems such as environmental, health and safety risks and the storage of nuclear wastes. The Rudd Government's stance on nuclear issues remains ambiguous. The 2009 Federal Budget included funds for both an international nuclear disarmament commission and funds to continue with the previous government's plans to site a radioactive waste dump somewhere in remote Australia.

Readers interested in clean technologies are referred to the list of Useful Sources.

Energy futures

The International Energy Agency (IEA) World Energy Outlook 2007 projects that the world's primary energy needs will grow by 55 per cent between 2005 and 2030. Fossil fuels are still the main source of primary energy, accounting for 84 per cent of the overall anticipated increase in demand between 2005 and 2030. This is an unsustainable vision of future energy use.

In Australia, an integrated energy strategy is needed which simultaneously reduces energy consumption, finds substitutes for fossil fuels, invests massively in energy research, subsidises and supports energy efficiency and the renewable energy sector, and systematically develops market mechanisms. A complementary package of incentives to encourage innovation and carry out trial projects and a public education program are also needed. The overall challenge for Australia is to move strongly towards environmental sustainability while maintaining economic prosperity. Today, energy exports deliver approximately $24 billion dollars a year in export income. A responsible policy would be to develop clean technologies in areas where Australia has abundant energy supplies, to put them in practice at home and to use them to supplement and in time replace, partly at least, its current energy export earnings.

Useful sources

The Government's white paper on climate change was released on 15th December 2008:
http://www.climatechange.gov.au/whitepaper/index.html

Australian Bureau of Agricultural and Resource Economics (ABARE), *Energy Update 2007*:
http://www.abareconomics.com/publications_html/energy/energy_07/energy_update_07.pdf
This site lists energy consumption and productions statistics for 1974-75 to 2006-07.

Australian Greenhouse Office (2002). *Pathways and Policies for the Development of a National Emissions Trading System for Australia,*
http://www.greenhouse.gov.au/emissionstrading/index.html
This paper outlines the key issues associated with a national emissions trading scheme.

A Clean Energy Future for Australia
http://wwf.org.au/publications/clean_energy_future_summary/
This publication sets out means of achieving a clean energy future for Australia.

International Energy Agency, *World Energy Outlook 2007*:
http://www.worldenergyoutlook.org/2007.asp
This is a comprehensive analysis of world energy trends, projections and assessments, with a particular emphasis on India and China.

The Productivity Commission (2006), *The Private Cost Effectiveness of Improving Energy Efficiency,* Productivity Commission Inquiry Report, No. 36, 31 August 2005,
http://www.pc.gov.au/inquiry/energy/docs/finalreport
This is an examination of the economic and environmental potential of energy efficiency measures.

The Australian Government Department of Resources, Energy and Tourism released a 93-page report on energy in Australian in February 2008:
http://www.abareconomics.com/publications_html/energy/energy_08/energyAUS08.pdf

The Department of Climate change has issued a fact sheet providing an overview of government action on climate change:
http://www.greenhouse.gov.au/about/publications/fs-overview.html

See also Australian Conservation Foundation – **http://www.acfonline.org.au**

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