Impact of Higher Fuel and Energy Prices

Senate Select Committee on Fuel and Energy

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1. Introduction

Engineers Australia is the peak body for engineering practitioners in Australia, representing all disciplines and branches of engineering. Membership is now approximately 89,000 Australia wide and Engineers Australia is the largest and most diverse professional engineering association in Australia. All Engineers Australia members are bound by a common commitment to promote engineering and to facilitate its practice for the common good.

Engineers Australia has had a strong commitment to sustainable development principles for over 20 years. Sustainable development is an integral component of Engineers Australia's code of ethics which are agreed by all members. The issues addressed by the Committee's Terms of Reference essentially address questions of sustainability.

Australia has had amongst the lowest energy prices in the world and has consolidated this situation through an extensive process of energy market reform over the past two decades. The benefits of lower energy prices have been reflected in higher economic growth, but there are signs that aspects of Australia's energy policies are not sustainable. Energy infrastructure has been neglected and the cost of remediating generation, transmission and distribution infrastructure will mean that prices will rise whether or not climate change mitigation policies are simultaneously pursued.

There are significant international risks to Australian energy consumption. Liquid fuel prices are determined by world prices. Recent increases in the price of oil have been offset by the appreciation of the Australian dollar but there are limits to further appreciation. There are risks associated with another oil price spike as global demand for oil encounters reduced supply production capacity resulting from a collapse in investment during the global financial crisis. Australia's increasing dependence on imported liquid fuels means increased vulnerability to global price fluctuations. Also global demand for natural gas will create pressures for parity between domestic and export prices for natural gas in some parts of Australia.

Australia has been slow to appreciate the benefits of energy efficiency. Low energy prices have resulted in increased energy use and has created secondary problems that now must be addressed. Two key examples are peak demand for electricity and poor fuel economy for road vehicles. Excessive expenditure on energy is a misallocation of resources with consequential impacts on growth. Engineers Australia believes that energy efficiency offer practical ways to moderate the demand for energy. This is particularly important in a context of rising energy prices. Australia has a national energy efficiency policy framework but progress has been slow, fragmented and lacks cohesion. Engineers Australia believes that instead of pursuing icon and peripheral energy efficiency projects, Australia needs a cohesive and aggressive approach to energy efficiency. Energy planning should be broader than maximising the sale of cheap and should include energy efficiency to ensure energy productivity is increased.

2. Energy Prices and Energy Markets

The Household Expenditure Survey[1] administered by the Australian Bureau of Statistics (ABS) records expenditure on energy in two categories. Domestic power and fuels measures expenditure on electricity, gas, oil and other fuels consumed. This measure shows that although actual expenditure increased by 32% between 1984 and 2003-04, (the most recent figures available) the proportion of average weekly expenditure spent on fuel and power fell from 2.9% to 2.6% because total expenditure increased by for times as much. The proportion of expenditure on fuel and power was lower in higher expenditure (income) households and lower in lower expenditure (income) households. In 2003-04, these proportions were 4.0% for the lowest and 2.1% for the highest quintile expenditure groups.

Household expenditure on transport fares and direct expenditure on transport fuels are measured as components of expenditure on transport. The share these items in transport expenditure is not known but like domestic fuel and power the proportion of average weekly expenditure on transport has fallen. However, far more is spent on transport in dollar terms ($132.25 in 2003-04) than on domestic fuel and energy ($23.59 in 2003-04).

OECD and IEA reports[2] regularly show that Australia has amongst the lowest energy prices in the world. Australia has also experienced two decades of energy market reform. The benefits of this process has been to ensure that energy prices are pressured by competitive forces within the Australian economy. For some time energy market reform led to falling energy prices as government owned monopolies were restructured and excess capacity was eliminated. While there is now evidence that prices are rising, the structural benefits of completed reforms remain present and present strong arguments for the completion of outstanding reforms.

Several factors point to an end to the era of low energy prices. These include both domestic and international factors. Key among domestic factors is dealing with past infrastructure neglect and failure to understand the critical role that energy efficiency plays. Key among the international factors are the influence of growing demand for energy in rapidly developing countries, Australia's growing dependence on some energy imports, the influence of energy exports on some domestic energy prices, notably natural gas and petrol prices, and climate change mitigation. While some have argue that climate change action is the most important of these, in so far as energy prices are concerned, climate change mitigation is more critical in respect of Australia's dependence on coal-fired electricity. So far as petrol and natural gas prices are concerned, global demand factors are likely to be more important.

3. Infrastructure

Australia's electricity prices have been increasing, and are likely to continue to increase because infrastructure needs to be renewed, upgraded and expanded. Engineers Australia has drawn attention to these issues in its Infrastructure Report Cards[3]. For many years electricity transmission and distribution infrastructure has been neglected and this has resulted in extensive new investment to remediate the situation, with even more proposed. For example, in NSW the

[1] ABS, Household Expenditure Survey, Cat No 6530.0, February 2006, www.abs.gov.au
[2] See for example, IEA, 30 Years of Energy Use in IEA Countries, OECD 2004, www.iea.org
[3] See www.engineersaustralia.org.au

Independent Pricing and regulatory Tribunal (IPART) recently allowed increases in retail electricity prices ranging from 20% to 42%, depending on electricity utility, justified by the pass through of new investment in transmission and distribution[4]. Similar increases have been reported in other jurisdictions and further increases in most jurisdictions can be expected.

The average age of Australia's fossil fuel electricity generation plants is now about 29 years with many individual plants older than the conventional economic age of 40 years. The life of infrastructure can be extended through renovation in some economic circumstances, but infrastructure does not last forever and must be renewed. Prior to the implementation of the National Electricity Market (NEM), the typical size of plant constructed by Government owned monopolies was 1000 and even 1500 MW. Since the market has adjusted to the competitive pressures in the NEM the average size of new plant has fallen to 400 to 600 MW. This means that when replacement does occur more plants, involving more investors, will need to be built to replace retired capacity.

ABARE[5] has projected that Australia's electricity demand will increase by about half by 2030. Additional generating and transmission capacity will be necessary to service this demand. The investment required inevitably will lead to higher prices.

The particular problem of summer peak demand is to be managed, under agreed COAG arrangements, by the installation of smart meters. Responding to summer peak electricity demand require generating capacity equivalent to several power stations that are not used to capacity outside peak periods. Smart meters enable electricity retailers to measure the amount of electricity consumption at particular times of the day. Implementation is already underway and is being presented to consumers as a mechanism to allow them to manage their electricity consumption and bills by deciding when to use electricity. The reality is that much of electricity consumption is not discretionary and smart meters enable implementation of time-of-day pricing for electricity. This will mean that at times of peak demand, electricity prices will be higher than at times of average demand to either discourage some of this demand or to provide the revenue stream to finance the additional infrastructure capacity necessary to service the peak.

The main benefit of reform in the electricity industry has been to first reduce prices and then to put a competitive brake on price increases. Reforms to how electricity prices are set are well advanced and completion of outstanding reforms will result in some further improvement, but at the margin. Engineers Australia supports the continuation of electricity market reform to maintain competitive pressures on prices. But, new infrastructure induced price rises are likely to be much higher than downwards pressure from reform. The main price benefit of reform is to avoid price rises being higher than can be justified. Engineers Australia believes that unless electricity infrastructure is regularly maintained and upgraded, the present situation will be repeated in the future. Infrastructure is not a free good and must be paid for by households and businesses. Artificially holding down electricity prices, as still occurs in Western Australia, is an impediment to infrastructure investment. Similarly, excessive dividend payments by electricity utilities to owners, especially in the case of Government owned utilities, reduces the capacity of the utilities to maintain existing infrastructure and to reinvest in infrastructure renewal.

[4] IPART, Review of regulated retail tariffs and charges for electricity, Final Report, March 2010, www.ipart.nsw.gov.au
[5] ABARE, Australian Energy, National and State Projections to 2029-30, December 2006, www.abareconomics.com

3. International Issues

Australia is often characterised as a net energy exporter. As a generalisation few can quarrel with this statement. However, as Figure 1 shows, Australia is a net importer of liquid fuels and Australian dependence on these imports is forecast to increase. According to the Australian Energy Resource Assessment recently released by the Department of Energy and Tourism, by 2030 three-quarters of Australia's liquid fuel requirements will come from imports[6]. Figure 1 is shown in terms of export and import values rather than the more common practise of comparing physical quantities and is derived from statistics on the Department of Energy and Resources web-site.

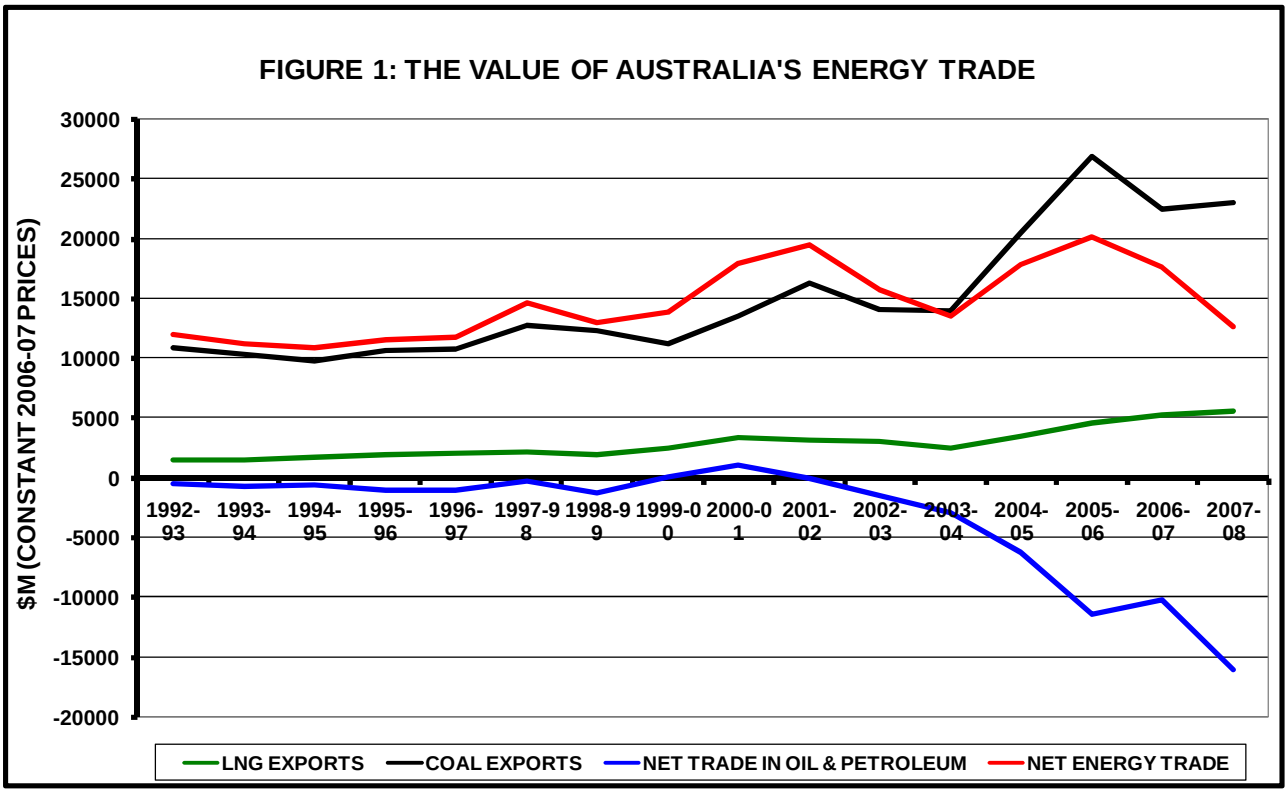

Figure 1 does not show the effects of the most recently announced liquid natural gas projects. It does, however, provide an insight into the important inter-dependency between net liquid fuels imports and the export of natural gas and coal. Engineers Australia is concerned that the implications contained in Figure 1 are not receiving the attention they deserve.

The Copenhagen Climate Conference was not the success that many expected and here in Australia the Carbon Pollution Reduction Scheme (CPRS) was not passed by the Senate. Despite these setbacks, Engineers Australia is convinced that action to mitigate accumulations of greenhouse gases in the world atmosphere is essential and action to achieve this will ioccur in the next 2-3 years. Engineers Australia believes that contingency plans that recognise the implications of a CPRS on the future coal exports are essential. The Treasury Modelling of the CPRS drew attention to the criticality of carbon capture and storage technologies, not just in Australia but in the

[6] Department of Energy and Tourism, Australian Energy Resource Assessment, March 2010, www.ret.gov.au

countries that are the destinations for Australia's coal exports. The Treasury conclusion was that "the future of coal depends heavily on the development of carbon capture and storage technologies. Without such technologies, Australia's coal production could fall to 4 per cent below current (2008) levels by 2030, and 18 per cent below by 2050."[7] This outcome means that one of the two export supports for Australian net imports of liquid fuels is effectively removed. It also has serious implications for Australia's exchange rate. Australia's exchange rate is also likely to fall.

The 2007 oil price spike was resolved by the global financial crisis, the demand for oil collapsed and its price fell to as low as $US35/barrel. In recent weeks the oil price has fluctuated at around $US80/barrell but the impact on Australian petrol prices has not been great because the Australian dollar has appreciated against the US dollar. There are limits to such appreciation and the International Energy Agency anticipates supply problems due to a collapse in investment with similar implications for Australian petrol prices.

The International Energy Agency (IEA) in May 2009 considered the impact of the global financial crisis on energy investment[8]. The IEA noted that capital investments in upstream oil had fallen by about 21% in 2009 compared to 2008 as profits fell in line with falling demand. The IEA noted that the global crisis had weakened demand, so in the near term there would be an increase in reserve production capacity. But, over the medium to long term, reduced investment in production infrastructure will mean oil production capacity will be unable to meet demand. Demand is expected to increase in line with global economic recovery and the more rapid the recovery, the more significant the production shortfall. The IEA believes that because of these factors, there is a serious danger of another oil price spike in several years time.

The oil price spike of 2007-08 provides some insight into the price impact of global demand for oil. The proportional Petrol price increases experienced in Australia were far in excess of price falls attributable to energy market reforms of different types. As in the case of electricity prices, the main benefit of energy market reforms is to maintain competitive pressure to ensure that any price rises are justifiable.

4. Emissions Trading

The CPRS is the Federal Governments primary mechanism to address climate change mitigation. The scheme is intended to increase relative prices in the energy market so as to increase the price of emission intensive energy sources and so favour less emission intensive or zero emissions energy sources. All modelling of CPRS impacts show that the prices of electricity, gas and liquid fuels will increase in proportion to their emission intensity. These price impacts are unavoidable. Greenhouse emissions are increasing because the discharge of emissions into the atmosphere is costless. The structural changes needed to reduce emissions require an end to this situation.

Following on from the NSW example provided above; IPART has indicated that the 20 to 42% increase in retail electricity prices necessary to cover the costs of transmission and distribution infrastructure would become 46 to 64% when CPRS costs are added as well. This is comparatively

[7] Commonwealth of Australia, Australia's Low Pollution Future, The economics of Climate Change Mitigation, p166, www.treasury.gov.au

[8] International Energy Agency, the Impact of the Financial and Economic Crisis on Global Energy Investment, May 2009, www.iea.org

large but should be compared to increases in incomes that are likely and to the relatively small proportion of expenditure devoted to energy. Engineers Australia believes that the best strategy for consumers and businesses to cope with rising energy prices is to become more energy efficient.

4. Energy Efficiency

Australia has a National Framework for Energy Efficiency (NFEE) that is comprehensive and has been agreed by all Governments. Yet progress has been slow and not in keeping with the potential of energy efficiency to mitigate the rising demand for energy. Engineers Australia strongly supports aggressive energy efficiency policies. Just as economic policy emphasizes the importance of productivity policy, energy policy should support energy efficiency. The cheapest energy is energy that is not used.

Research by the International Energy Association for the G8 into how the world can reduce its greenhouse emissions to avoid the worst climate changes showed that 45 % of the reduction can be achieved through end user energy efficiency[9]. One reason for the slow progress in Australia is that the potential of energy efficiency is not managed through an energy efficiency target. An energy efficiency target is necessary because:

- Energy efficiency options arise in many and diverse circumstances including insulation in residential, commercial and industrial buildings, appliances, lighting and motors used by householders, businesses and industry, the fuel efficiency of transport vehicles generally and optimization of transport modes. An energy efficiency target can provide a mechanism to bring the potential of this diversity together into a consolidated effort.
- Many energy efficiency options can be realized with existing technologies at low, or no cost now[10]. By harnessing the potential of energy efficiency inexpensive greenhouse gas reduction can be quickly achieved. This takes the pressure off more costly new technology solutions and ensure that the overall reduction is achieved as cheaply as possible.
- Energy efficiency policies and programs now in existence are widely dispersed between jurisdictions, operate at the margin and are highly variable in effectiveness and progress achieved. There are minimum efficiency standards for appliances, not best practice standards; there is action to address energy efficiency in new buildings but few plans and programs to address buildings already in existence and most programs are voluntary. Furthermore, existing programs are often directed at one energy source rather than all energy sources. Efforts to enforce energy efficiency standards are disjointed and need significant improvement.
- Some energy efficient options are influenced by market forces and their take-up will be assisted by the carbon price established by emissions trading. However, a large number of energy efficiency options are not responsive to market forces because the impediments are non-market issues, including high first up costs driving purchasing decisions, even when life-cycle costs are economic, options where gains to individuals are small but aggregate to significant gains for society as a whole, poor consumer information and institutional

[9] International Energy Agency, Energy Technology Perspectives 2006, Scenarios and Strategies to 2050, OECD 2006 and an updated version in Energy Technology Perspectives 2008, both available from www.iea.org

[10] McKinsey and Company, An Australian Cost Curve for Greenhouse Gas Reduction, 2008, www.mckinsey.com

arrangements oriented in favor of existing arrangements and planning and servicing infrastructures geared to the present and resistant to change, are frequently not taken up.

- The argument used to substantiate the expanded Renewable Energy Target aimed at increasing the share of renewable energy to 20% by 2020 is also applicable to an energy efficiency target.
- Energy efficiency is not independent of emissions trading and, if the interaction between the two is not managed, can undermine the impact of emissions trading. Every tonne of greenhouse gas avoided through energy efficiency (or for that matter through the use of renewable energy) means one less emissions permit is necessary in Australia's carbon market. Unless the gains from energy efficiency are factored into the number of permits released into the carbon market from the outset, there may well be too many emissions permits in the market causing the carbon price to remain at levels too low to drive effective change. An energy efficiency target is an effective way to drive management of the interaction between energy efficiency and emissions trading.

Engineers Australia is not convinced these matters have received serious consideration in the design of energy strategies and policies. The discussion in earlier Sections suggested that the interdependence of global and domestic energy markets and climate change mitigation would drive up energy prices above historical levels. Leaders frequently express concern about the impact of such changes on the energy bills faced by households and businesses alike. Engineers Australia believes that the most practical approach is an energy efficiency target to focus energy efficiency policies and programs so that households and businesses use less energy and use what energy is required in the most efficient way.