

Impacts of Kyoto on Australian Power Costs

By Alan Moran

Energy Prices and Effects on Income

In 1973/4 when the first energy crisis was underway, there were many risks perceived to result from the quadrupling of oil prices that OPEC engineered. One of these stemmed from a long standing relationship between energy and GDP. At that time each percentage point increase in GDP was considered to require a 1.5% increase in energy.

Hence, aside from the fears over how petro-dollars were to be recycled, there was real concern that the reduced energy demand from higher energy prices would mean a sharp contraction in growth rates.

Among OECD countries such a contraction did take place. But it was not as a result of any automatic relationship between energy prices and GDP growth. Had that been the case, we would not have witnessed the growth of many developing countries from then onwards - growth rates that remain astonishing even though events last year have taken the froth off them.

The energy crises of the 1970s did have one permanent effect. They brought a marked increase in effort on behalf of business to reduce energy inputs. We saw such phenomenon as steel making being converted to ensure that the coking coal it used was employed for heat as well as a carbon input. Motor car design placed a new accent on fuel economy. These economies broke the 1.5:1 relationship between energy and overall GDP. At present the ratio stands at a little over 0.8:1 for Australia.

Economies in energy use are continuing. This is not a matter that should cause much surprise to business since half the driving force of the profit motive is based on the benefits that accrue from saving inputs. Firms out to preserve their market positions and to gain increased margins are constantly seeking to reduce inputs. We can see the outcome of this in outputs as diverse as the thickness of cans and other containers, to the layout of supermarkets. In the latter case, over the past few years, Coles has managed to operate its stores without increasing its energy usage, in spite of having increased the floorspace of the main energy user – frozen and cooled areas – from 15% to 35%.

A major recent catalyst for change has been the deregulation of the electricity market, the prominence this has received and the increased gains to be made from focusing on energy savings.

These remarks underline just how flexible the economy is. Adding cost to one factor of production will rapidly see substitutes being found for it and economies in its usage. This accounts for the fact that government regulation of production and high

and distortionary taxes will rarely have the massive economy-wide adverse impacts that a static analysis of the effects of the measures would indicate. And this is reflected in the economy-wide estimates of the effects of emission restrictions undertaken by respected bodies like ABARE. ABARE's scenario based on emissions 10% below 1990 levels by the year 2020 brought an output decline in Australia of only 1.5%. The corollary is that an 8% increase in emissions allowed by 2012 would have an even smaller overall effect.

Economic Consequences of Kyoto

For the vast number of countries in the world, the consequences of international agreements on greenhouse emissions will be trivial¹. But for some, including Australia, adverse outcomes are possible as a result of costs involved in transferring resources to uses involving lower energy inputs or different forms of energy input.

For the European Union, achieving its targeted 8% reduction in emissions by 2010 will not be difficult. Europe is shifting its electricity fuel source from coal to gas. It is doing so for perfectly sound reasons unrelated to greenhouse. But, as a by-product, the shift reduces carbon dioxide emissions by one third. Closing down East Germany's massively inefficient power industry added a further bonus. This also allowed Europe to adopt differentiation whereby Greece and Spain were allocated very large increases in emissions. European enthusiasm for lower emission levels also contains a self-serving element – saddling others with a real burden confers a competitive advantage to their own energy-intensive industries.

The US is a different matter. The US is one country where the Government's actions require ratification in the legislature. Congress voted 95-0 against an agreement that does not include the developing nations. China and India are also adamantly opposed to any sort of greenhouse gas reduction strategy that impacts upon them. Congressional ratification is made all the more unlikely by forecasts that implementing the agreement would double energy prices and bring annual costs of \$2,000 per household². Following an early stumble where it played to an Enron inspired agenda seeking ratification with tradeable emission rights, the Bush Administration has now set its sails firmly against Kyoto.

Specific Australian Consequences

Australia has been allocated an 8% increase in emissions over the 1990 baseline. It is now clear that this will not be enough for a nation with a far more resource intensive profile than others. But the result could have been a lot worse.

¹ Under the Kyoto Agreement, countries other than the developed nations are not obliged to reduce their emission levels. Moreover the former Soviet Bloc used energy very inefficiently and easily able to achieve higher living standards while scrapping much of its previous coal based plant. Within the EU, some nations also are able readily able to meet greenhouse gas emission targets due to Germany's absorption of East Germany and the UK's switch from coal to lower carbon dioxide emitting gas

² The Energy Information Administration, US Department of Energy, Washington, December 2000.

Prime Minister Howard's statements back in 1997³ encapsulated the most recent estimates of where Australia stands. They also point to various market interventions in pursuit of the greenhouse Holy Grail.

The measures announced are designed to reduce emission growth, excluding land clearance, to 18 per cent by 2010. This leaves a gap of 10 per cent to be filled on the 2010 business-as-usual estimates. By 2012 this is equivalent to a 12 per cent shortfall on the Pledge.

There are therefore three elements of the Australian approach. These comprise land clearance measures, which are not addressed in this piece, and:

- Regulatory and tax based measures designed to redirect output or energy inputs so that 10 per cent of the estimated net 31 per cent emissions growth is staunched;
- Any residual measures that would ensure the target is met.

Others are addressing the land clearance matters.

Regulatory and Tax-Based Measures

There are several elements involved here. One rather pernicious measure that was slipped in was the specialist renewable energy innovation investment fund. As well as a well resourced Internet site, this entails loans and grants totalling some \$64 million for the subsidy of greenhouse gas free electricity generation. Conspicuously absent from mention were the two best sources of greenhouse free energy production: nuclear and hydro.

Not costed in this respect is a requirement that 2 per cent additional energy from electricity is to come from renewable energy sources by 2010. It may be that such supplies will be forthcoming as a result of improvements in technology by then. But such dividends from technology have long been promised and have failed to materialise. Moreover, it would appear that the Commonwealth does not expect them to materialise without some industry planning sticks and carrots, since the Prime Minister's statement says that the proposal will stimulate a new industry that will export its technology to the world. The prospects from such capital seeding has rarely lived up to potential in the past.

At present costs requiring politically correct renewable energy sources would more than double the price of the electricity supplied⁴. At 2 percent of electricity, it would require these doubled costs to be incurred for some 4,000 GWhs of electricity. If the premium is only 5 cents per KWh, this entails additional costs of some \$20 million per annum.

³ The Prime Minister's *Safeguarding the Future Statement*, 20 November 1997

⁴ Others put the relative costs higher, see "Extracting one kilowatt/hour of energy from the wind costs four times as much as using fossil fuels", *Germany: Tilting At Windmills*, Hartmut Wewetzer, UNESCO Courier, March 2000

Other costs will emerge from the increased use of regulatory Codes for housing and commercial building insulation including the minimum energy performance for new houses and minimum energy performance for a range of appliances. In addition we have an assured bureaucratic presence with the Commonwealth Greenhouse Office and an extension of the Greenhouse Challenge program.

These measures are not entirely new. In NSW, a retail electricity licensee is required to prepare annual reports on:

- the implementation of its demand management strategies;
- carbon dioxide emissions arising from electricity supplied by it as measured by a methodology approved by the Environment Protection Authority;
- the proportions supplied by each of its sources of electricity;
- strategies to achieve reduced greenhouse emissions “from electricity supplied to customers in NSW” and developed in negotiation with the Minister and independently verified.

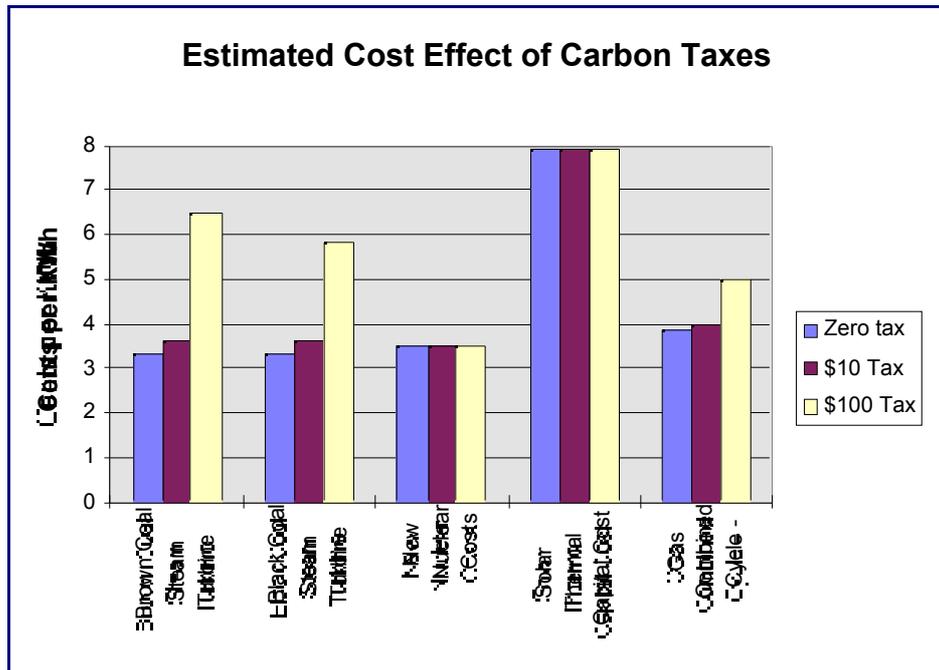
The penalty for non-compliance is a fine of up to \$100,000 and/or cancellation of the licence. To reinforce these provisions, the Government has established a watchdog Licence Compliance Advisory Board comprising two members appointed by the Minister of Energy and one each by the Nature Conservation Council and the Australian Consumers Association. Clearly the latter two members will be strongly agenda driven and will seek to pressure retailers into sourcing their contracts from suppliers which they consider most appropriate. Brown coal, with its intrinsically higher greenhouse gas emissions would be especially targeted.

Tackling Further Reductions

Normally, the best way to estimate what will be the outcome of a regulatory action is to measure its effects as a tax. Where a specific level of reduction is to be put in place, the tax is set at a rate to encourage consumers and businesses to find ways to meet this. The tax chokes off the least economical inputs and encourages substitution of other inputs.

Estimating the effects of tax changes on price and then output is difficult enough one year hence and it is well nigh impossible a dozen years into the future. But to reduce greenhouse emissions would require some sort of tax or assignment of tradeable rights. The effects of these on prices are best modelled in the form of a tax and the table below indicates the effects of a tax at \$10 and \$100 per tonne of carbon on sources of power for electricity. Broadly speaking, the more carbon per unit of energy a fuel source contains the higher the tax and price. Based on present estimates of costs of different fuel sources, even a \$10 carbon tax tilts the competitive advantage away from brown coal. A \$100 tax makes gas a cheaper option than black or brown coal providing the increased demand does not result in a scarcity driven price increase for gas. For renewables to be competitive, a carbon tax of at least \$215 would be required. This would apply to a solar based system and even with such a tax advantage, the

value of the renewable energy is likely to be discounted because of its dependence on weather conditions.



In the case of most naturally occurring materials and capital goods, a change in demand allows them to be shifted to other uses. However, this is not the case with brown coal. When brown coal is priced out of energy competitiveness, it cannot be diverted to other uses. Nor is there scope to concentrate only on the lowest cost brown coal mines. All areas are mined and supplied to generators at comparable cost. Beyond a point, imposing a cost penalty on brown coal supplied stations means they cease to be viable and the power source becomes redefined as dirt. There is therefore a wealth effect with brown coal.

It will doubtless be said that the knock on effect to electricity users of a tax even if it were \$100 per tonne would be minor. After all, some will say, a 3 cents increase in price would translate into less than a 25% increase in fuel bills once transmission and distribution costs are included. And a tax increase on electricity is more neutral than some of the other taxes it could replace.

Such views miss the point. We have a comparative advantage in low power costs just as California has a comparative advantage in the IT industries. We have just emerged from a period when State ownership of electricity had allowed the assets to fall way behind those overseas in terms of their productivity. Australia's future development is critically dependent on low cost power. Power intensive industries focus heavily on the price of electricity in their location decisions.

Victoria is especially vulnerable to measures that force reduced greenhouse gas emissions. Brown coal, on which the State's low cost electricity is based, emits more carbon dioxide per unit of energy than other fuel sources.

Tough greenhouse emission targets would have been the death knell of Latrobe Valley. We would have been forced to write off both the Valley's national asset of limitless (proven reserves amount to over 1,000 years of current usage) supply of coal, and the power stations themselves. Recent privatisations place a worth of over \$11 billion on Victoria's five coal-fuelled power stations. Funds would have had to be found to replace these assets. And even then, households and industry would have faced skyrocketing electricity bills. Many industries would simply re-locate, further adding to costs and reducing jobs in the State.

A tight target would also mean the eventual closure of coal-based power stations in other States. This would mean increased quantities of Australian black coal would be diverted to exports and burned in those developing countries that were sensible enough to reject a target. The net effect on greenhouse would have been trivial.

The Australian Government's costs from reduced emissions would have been far greater than those of other nations and those costs would have been borne most harshly in Victoria. Australia's negotiators deserve credit for refusing to blink in the light of the chorus from other developed countries and the publicity-seeking antics of some non-government organisations.

Concluding Comments

The Kyoto conference allowed world leaders to introduce feel-good measures and pontificate about saving the environment. This has a positive side to it. Cooperation rather than conflict is in stark contrast to the era of international relations which characterised the last century.

But nations have made unwise agreements in the past. The developing country exemption means that any restraints agreed to by the industrial world will be negated - perhaps more than offset if less efficient energy industries replace existing ones. There are considerable uncertainties about global warming and low penalties that would follow from deferring action. Given these factors and the certain costs of forcing emission restrictions, it is to be hoped that the feelgood measures are not translated into regulations with a price bite that would bring serious dislocation to energy intensive economies like Australia.

These comments are against the backdrop that:

- Global warming remains a *theory* and the most accurate measure we have to validate it, satellite measurements have shown no temperature increase since measurements began in 1979.

- The sort of warming that is predicted by global climate models, 0.5-3.3 degrees Centigrade, is well within the range that has been common throughout human history without causing distress
- The steps painstakingly agreed to at international conventions have yet to be implemented. And even if they are fully implemented they will have only a trivial on the build up of greenhouse gases and a possible consequent warming effect.