The Costs to Australia of Renewable Energy:

Submission to the Senate on the proposed 20 per cent energy requirement

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The Costs to Australia of Renewable Energy

Key Points

The proposed renewable requirement would markedly raise the price of electricity:

- imposing a direct cost on the economy of $1.8 billion annually;
- increasing consumers' costs and reducing industry competitiveness;
- causing far more jobs to be lost than the subsidised jobs created.

Introduction and Summary

The Commonwealth Government's proposal to require 20 per cent of electricity to be derived from renewable sources offers Australia no advantage to while crippling the competitiveness of its energy supply. It raises the average cost of generated electricity by 10 per cent, imposing a deadweight loss on the economy of $1.8 billion per year.

If the proposed Emission Trading Scheme (ETS) is also introduced, the 20 per cent renewable requirement will not even bring a net reduction in carbon emissions. It would merely change the composition of that reduction, making it more expensive.

Ten years ago, with the National Electricity Market Australia had developed the world's lowest cost electricity supply industry. This stemmed from deregulation and privatization combined with Australia's natural advantages in energy sources. The outcome was of immense value to the nation's economic competitiveness. We are progressively dismantling this asset. Instead of facilitating the use of low cost energy, government regulations are increasingly subsidising high cost energy sources.

The proposed ETS tax would compound these adverse effects. But, at least revenues from the ETS are to be directed back to people and institutions the government deems to be most needy or meritorious. By contrast, the mandatory renewable requirements impose a hidden tax on the consumer, the revenues from which are given to the suppliers of intrinsically uncompetitive renewable energy sources.

Evidence from overseas shows that any jobs created from a forced requirement to use mandatory renewables come at a cost in excess of $200,000 each. Moreover, Spain's experience indicates for each subsidised job created, there are 2.2 jobs lost.

Mandatory renewables are promoted by a classic combination of "Baptists and bootleggers". The bootleggers, those with commercial interests in wind farms and other high cost renewables, like the protectionist lobby before them, point to visible developments in facilities built on the back of the economic distortions they seek.

But the damage from imposing high cost electricity is much greater than was the case with external tariff protection because of electricity's ubiquitous presence throughout the economy. Moreover, unlike manufacturing facilities previously made possible by restraining import competition, wind farms and other renewable technologies can make no credible claims of being nurseries for infant industries that will mature into productive activities.

Australia's Proposed 20 per cent Renewable Target in Context

Types of Australian Emission Reduction Measures

The renewable target is being addressed at the same time as other measures which focus upon emission reductions. Chief among these is the cap-and-trade scheme incorporating a carbon tax, and a range of budgetary expenditures by the Commonwealth and State Governments. In all, there are five classes of programs designed to reduce Australian emission levels:

- direct funding from the budget for incentives to reduce emissions;
- the regulatory price based cap-and-trade proposal;
- requirements for specific amounts of renewable energy to be incorporated in the electricity that retailers supply to the consumer;
- funding promotional measures designed to encourage consumers voluntarily to reduce their emission levels; and
- requiring businesses to incur expenditures through energy audits with a view to their discovering new means of saving energy or justifying reasons why such savings are not being made.

The last two classes are not further addressed in this paper.

Government Budgetary Expenditure

The Commonwealth Government is spending considerable public funds on measures to foster lower energy use. As there is no shortage of energy per se that normal price developments do not signal, these sums can be designated as focussed upon the objective of reducing greenhouse gas emissions.

During the current financial year some $2.6 billion is identified in the Department of the Environment (DoE) budget. Among these are the "Clean Energy Initiative" and the "Climate Change Action Fund".

The Department of Climate Change (DCC) elects not to include some of the DoE measures as directed at climate change and therefore publishes a lower costing (just over $1 billion). Excluded from the DCC summation is important expenditures on home insulation and low emission assistance for renters which have over $1.4 billion budgeted in the current year and 2010/11. These formed part of the fiscal package designed to avert the effects of the global financial crisis on Australia.

Aside from their emission abating functions, a rationale for these expenditures is "market failure" to produce the goods and services that consumers generally want. While it is possible that all classes of the $2.6 billion of expenditures undertaken by government on our individual behalves represent our best interests, such spending choices have seldom proven to be optimal in the past. Governments have long histories of promoting particular industry sectors through tariffs and subsidies but such "winner picking" is now generally considered to have been misplaced.

In the case of energy industries, the widespread belief 30 years ago that there was a looming energy supply crisis brought government subsidies and regulations that were designed to pressure decision takers into making energy savings they would not have willingly made. Though there are benefits in energy savings, these are rarely costless and usually have a negative worth when they involve capital expenditures with a zero or very low payback.

The Emission Trading System (ETS)

The ETS incorporated within the *Carbon Pollution Reduction Scheme* is the only one of listed classes of abatement policy that is an "economic instrument" in the accepted definition of the term. Economic instruments are almost universally considered to be more efficient than deterministic command-and-control measures which mandate specific solutions. Regulations that specify particular technologies or types of technologies fail to make use of the power of markets to discover the lowest cost ways of meeting the goal.

Economic instruments use taxes or quantitative goals to allow the objectives to be met most cheaply.

Taxes and quantitative limits both bring additional costs. These are passed on in prices and cause consumers to reduce their demand for the product incorporating the targeted constituent. This effect on gross demand is complemented by further abatement resulting from supply switching; with the ETS, that means from the fuels that are high in carbon emissions relative to the energy they produce, to those that are lower in carbon emissions.

The supply switching effect is transmitted differently by a tax as opposed to a quantitative limit. With a tax, supply switching is achieved by the charge's greater direct cost on the supplies that use the taxed component most intensively.

With a tradeable rights approach, owners of the outputs that use the taxed component most intensively have an incentive to switch their production profiles or sell the emission rights to others who have a more favourable input profile. This indirectly increases the cost of the products that use the targeted input most intensively, causing it to be substituted by products where the targeted input is less intensively present. In both cases the switching between product classes reduces the average rate of tax per unit of product.

The switching process is readily seen with electricity generated by gas rather than coal. The former has only half of the latter's rate of carbon dioxide emissions per unit of electricity. As a result, the impost on electricity generated by gas is only half of that on coal based electricity and gas will improve its competitiveness because it faces a lesser impost and will increase its market share, thereby reducing aggregate emissions for a specific level of electricity generated.

The degree to which the price increase brings a demand reduction rather than a switch in types of supply depends on a number of factors. Importantly, these include the relative ease by which carbon intensive energy supplies can be substituted and the responsiveness of consumers to higher prices.

Economic instruments therefore pursue the goals by one of two routes. The first involves setting a rate of tax per unit of emission and allowing the quantity to be determined by the market. The second sets a quantity and allows the market to set the price. Normally, whether a tax or a quantity is the parameter that is set, the government will have in mind a likely outcome that is acceptable in terms of the reciprocal factor.

Like other countries, Australia has opted to introduce an Emissions Trading System. Emission rights are to be sold with some given away to particular users who are judged likely to suffer excessive costs from the higher impost they would be required to bear. As evidenced by the Queensland Premier's call on 15 July for special treatment for the State's "gassy" mines, should the scheme become operational, there are likely to be considerable refinements to it.

As with most ETS schemes, that of Australia incorporates a fall back price at which the government will make unlimited permits available. That price for Australia is proposed to be $10 per tonne of CO2-e in the first year and an indexed $40 per tonne of CO2-e in subsequent years ($57 in after-tax terms).

Mandatory Requirements on Electricity Usage

Advice Offered on Mandatory Requirements

The Productivity Commission (PC) in its submission to Garnaut[1] expressed its strong reservations about the merits of mandatory incorporation of specific technologies in its usual understated and measured manner. It did so in referring to the MRET scheme for promoting renewables. The PC's conclusions were

"with an effective ETS in place, the MRET would:

- not achieve any additional abatement but impose additional costs
- most likely lead to higher electricity prices
- provide a signal that lobbying for government support for certain technologies and industries over others could be successful."

The PC examined many claims where a measure other than a price mechanism like the ETS might be supplemented by other regulatory arrangements and concluded that none of these were persuasive. For example it might be argued that there is an asymmetry of information between the market and those more knowledgeable of future trends in government. However, such claims have seldom in the past been born out and considerable costs have been incurred by taxpayers or through regulatory measures in supporting particular industries or technologies that turned out to be blind alleys or inappropriate for Australia.

As the PC argued, an MRET scheme in conjunction with renewable targets would have no effect on the aggregate level of emissions since these are set by the ETS scheme. At best, it could lead to a zero net cost but only if the approach to emission reductions were

[1] What Role for Policies to Supplement an Emissions Trading Scheme? May 2008 http://www.pc.gov.au/__data/assets/pdf_file/0003/79716/garnaut.pdf

to follow the renewable route completely on the basis that other reduction approaches, like substituting gas for coal as a generation fuel, were higher cost.

Other rationales for an MRET scheme have included the greater degree of self sufficiency it offers and that it supports an infant industry.

The self sufficiency case is seldom of merit in an inter-dependent world and, in any event, is irrelevant to Australia which is a net energy exporter and certainly has no shortage of local low cost coal and gas supplies suitable for electricity generation.

Support for an infant industry is often the refuge of the politico-economic scoundrel. In Victoria the state scheme was promoted as the harbinger and catalyst of a whole raft of new industries particularly involving the manufacture of high technology blades. The outcome is discussed below.

Current Australian Schemes

The Mandatory Renewable Energy Target (MRET)

From relatively modest beginnings there has been a considerable escalation in subsidies to renewable energy. When Prime Minister John Howard announced the proposal to introduce a scheme in 1997 he said it was for an additional 2 per cent of electricity that was to come from "renewable or specified waste energy". Although an additional 2 per cent by 2010, on the basis of the consumption that year of some 250,000 GWH would have been 5,000 MWh, the MRET target was reinterpreted and almost doubled to be 9,500 GWH.

A review of the scheme in 2004 (the Tambling Review) recommended it be increased to 20,000 GWh by 2020. In June 2004 the Commonwealth announced that it did not believe expanding the target was economically justified and that it did not intend to increase the requirement.

NSW NGAC

The NSW Government introduced its NSW Greenhouse Gas Abatement Certificates (NGAC) scheme in 2003 which set a benchmark for emission standards of 7.27 tonnes of CO2 per head. On top of the Commonwealth MRET scheme, based on business-as-usual estimates of market growth and carbon intensity of electricity generation, an additional 19% of electricity in NSW must be derived from low carbon emitting sources.

Queensland GEC

Queensland has its 13 per cent GEC scheme under which 13 per cent of the non-exempt load must be derived from gas based electricity generation. The exempt load is 9,000 GWh hence, after also deducting for loss factors in transmission and distribution, the requirement covered 75 per cent of the 2005 load.

Victoria's VRET

Victorian Premier Bracks in November 2005 argued that there was a, "lack of national leadership" by the Federal Government in not increasing the MRET scheme from the 9500 GWh target set for 2010 and said this, "is costing Victoria – economically and environmentally - and cannot be allowed to continue." Mr Bracks argued, "*Victoria's aim to facilitate the development of up to 1000 megawatts of wind energy by 2006 represents $2 billion worth of capital investment. Then there are the jobs and the other economic spinoffs that accompany such a significant outlay".* The VRET scheme requires an additional 3,274 GWh of eligible renewable electricity by 2016. It was expected to create "up to 2,000 new jobs, most of them in regional Victoria". An indexed $43 penalty is imposed on shortfalls in a regulated entity's obligations.

At the time of the initial discussions of mandatory requirements for renewables, many among the wind farm lobby were confident that eventually wind would prove competitive with fossil fuels even without a subsidy. That view was even shared by many climate sceptics for example in 1995 in *The Skeptical Environmentalist*, Bjorn Lomborg noted how windmills' productivity had improved, and "In the long run they will undoubtedly become competitive and even cheaper (than fossil fuel plants)".[2] No reputable authority would claim that today. Indeed, anticipating a continued lack of competitiveness in the economics of renewable energy, the 20 per cent renewable proposal increases the after tax fall-back price from the MRET's $57 to $93 per MWh.

The Victorian scheme's hopes for new cutting edge businesses manufacturing blades and other components have been highly disappointing. Thus the Pacific Hydro wind farms were to be the springboard for a Vestas blade factory in Portland, and were expected to generate 400 direct and indirect positions according to the sponsor, by mid 2006. In spite of extensive State and Federal subsidies the project folded.

Victorian Industry Minister Theo Theophanous blamed the Commonwealth for failing to invest in renewable energy, "The reason why Vestas has been unable to continue its operations in Portland is very squarely and directly as a result of the Federal Government's refusal to extend its renewable energy scheme to allow the industry to expand," he said on the ABC.[3]

This was rejected by then Commonwealth Minister Ian Macfarlane who argued, "Our Government has provided through the MRET scheme some $5.5 to $6 billion in terms of assistance to the renewable energy sector". Mr Macfarlane added, "In particular with Vestas, [we] have provided them with tax relief over the last two years of around $10 million to ensure they are able to be competitive with the turbines they do produce."[4]

Victorian Energy Minister Theophanous also announced the Victorian Wind Energy Network central to which was to be a blade manufacturing facility by Bolwell Corporation at Ararat. This too folded in spite of extensive government support.

[2] *The Skeptical Environmentalist*, by Bjørn Lomborg, Cambridge University Press, p. 134.
[3] http://www.news.com.au/heraldsun/story/0,21985,22287835-662,00.html
[4] http://www.abc.net.au/news/newsitems/200608/s1723948.htm

The Spanish Experiment with Renewables

The Spanish experience with solar and wind power subsidies has been more far-reaching in relation to the market's size than that seen anywhere else.[5] Spain embarked upon a vigorous subsidy program which was intensified following the election of a new Socialist Government under Prime Minister Zapatero in 2004. By 2008, electricity production was as shown in Table 1.

Table 1 Spain electricity generation share

Energy Source	Per cent
Combustible	64
Nuclear	20
Hydro	7
Wind and solar	9

Source OECD; http://www.swivel.com/data_columns/show/10362480?value=Spain

Wind and other exotic renewables had shown a rapid increase in market share and claimed to be at 11 per cent in the first half of 2009.

However, as demonstrated by the work of Gabriel Calzada Alvarez and his researchers, the outcome has contributed to an economic disaster in Spain. At 18.1 per cent Spain's unemployment rate is currently the highest in the OECD area, whereas previously it was close to the average. That regrettable outcome is not solely related to the Spanish Government's aggressive pursuit of wind power investment but this was most certainly a significant factor.

Installed renewable power was targeted at 20,155 MW in 2010 – threefold Victoria's brown coal generation capacity and similar to Australia's entire black coal generation capacity. At the end of 2008 over 15,000 MW of wind and 4,000 MW of solar photovoltaic capacity had been installed.

A second objective was to have 20 per cent of electricity consumption from renewable sources. Including hydro-electricity, renewable energy was close to that figure in 2008.

The issue that Alvarez addresses is the cost and consequences of that seemingly successful performance.

In the case of wind power there is a complex remuneration system (which actually encourages the installation of under-sized units). In 2008 the average cost of wind exceeded the pool price by 59 per cent. In the case of solar the increase was far greater at sixfold.

Alvarez models the effect of these cost increases on jobs throughout the economy. He concludes that though the stimulus to renewables has resulted in increased jobs, especially in construction, the increased cost of electricity has resulted in 2.2 jobs being

[5] Denmark has a considerable amount of wind installed but is fully electrically integrated with the rest of Europe

lost for every job created. He also estimates the cost of each "green" job was €571,000 and the cost of each wind industry job €1 million.

In terms of industry, Alvarez points to several high profile relocations of firms from Spain in response to the higher costs of energy. These include Hoeschst, Sidenor, Ferroatlantica and the stainless steel company Acerinox (which relocated its production to the USA and South Africa).

Spain's experience, though involving higher costs than others, has not been unique. Indeed, according to the Rhine-Westphalia Institute for Economic Research, "Each of the 35,000 solar jobs in Germany, for instance, is subsidized to the tune of €130,000."[6]

Efficiency of Different Electricity Sources

Costs Based on Australian Experience and Estimates

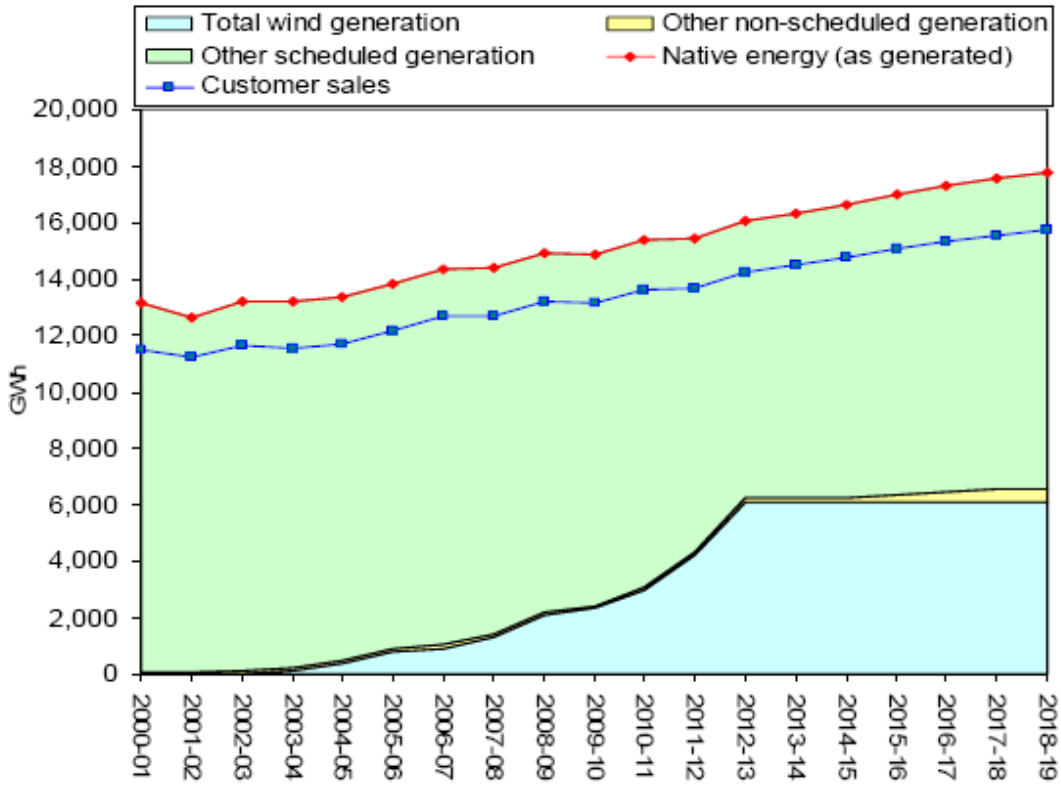
In Australia, South Australia is home to most of the wind generation installed and under consideration. This is due to the state having the most advantageous wind conditions and because its pool prices tend to be a little higher than those of most other states (as a result of its reduced availability of coal).

Some 326 MW of wind generation is installed or planned around Lake Bonney in the state's south west and much of the rest is planned near existing transmission lines north of Adelaide. Capacity factors average around 27 per cent.

South Australia's Electricity Supply Industry Planning Council (ESIPC), now incorporated within the Australian Energy Market Operator (AEMO), estimated that the state has 880 MW of wind generation projects "advanced" with 295 MW considered close to commitment.[7] That approaches one third of the state's capacity and though, because of wind's unreliability, it would never supply that share of electricity, in 2008/9 it contributed 14 per cent of supply.

Work conducted for ESIPC by KPMG estimated future supplies as follows.

[6] http://online.wsj.com/article/SB122937766062908297.html
[7] http://www.esipc.sa.gov.au/webdata/resources/files/Public_Forum_presentation_Final.pdf



KPMG's forecasts show SA's wind capacity rising from 740 MW in 2008-09 to 2,162 MW in 2012-13, without any allowance being made for an extension of the RET target to 45,000 GWh by 2030.

ESIPC also demonstrates one of the outcomes of Australia's National Electricity Market's "energy only" approach to pricing. The pool price received closely approximates the worth of the energy. Because of the unreliability of wind energy, it tends not to be available at the highest priced occasions – sometimes because it is at full capacity already, often because high price events coincide with no or excessive wind. As a result, wind tends to attract a lower average price than more flexible forms of generation. In the first half of this year wind's average price was $48.56 per MWh, some 53 per cent below the $74.26 per MWh received by other South Australian generators.

Table 2 below illustrates the different prices over recent years.

Table 2: South Australian pool prices for wind and other generated electricity

Year	Volume Weighted Price for Wind Generators		Volume Weighted Price for Other SA Generators	
	Full Year ($/MWh)	Summer ($/MWh)	Full Year ($/MWh)	Summer ($/MWh)
2004–05	NA	NA	39.25	32.62
2005-06	32.57	39.59	43.91	67.50
2006-07	49.69	51.55	58.71	67.21
2007-08	63.31	63.94	102.01	149.92
2008-09*	48.56	91.80	74.26	165.28

Source ESIPC

In addition to this, the priority in scheduling of most wind generation tends to distort the costs of other generators by forcing them to back off at periods when they would otherwise be operating, thus increasing the average costs of supply for these units.

The increased wind generation availability also has a cost in terms of networks, which need to be upgraded to carry the increased wind based electricity output that is available at times that are propitious for its generation. This essentially means designing a network to carry less average power than is the case with a network carrying output solely from conventional fossil fuelled power stations. Those costs are likely to be carried by consumers in general under the "regulatory test" applied for new transmission investment.

Based on data prepared by Carbon Market Economics for AEMO, the costs of wind are currently around $93 per MWh[8].

AEMO also has considerable detail prepared annually by ACIL Tasman on the costs of other generators. Excluding carbon costs, in real 2009/10 dollars, these vary from around $47 per MWh for conventional black and brown coal generators to a little over $50 per MWh for gas, $70-80 for black and brown coal incorporating carbon capture and storage,[9] and around $100 for nuclear. These costs for the coal based generators are inflated by the high world demand for new power stations on the back of very rapid growth in China and appear to have declined somewhat in 2009.

The carbon capture and storage costs (incorporated in the "IGCC black CCS_SWNSW" row below) are speculative and are likely to be in excess of those incorporated into the modelling.

Table 3 illustrates comparative costs.

[8] See http://www.aemo.com.au/planning/419-0032.pdf
[9] The stated costs for this are highly speculative and at the present juncture optimistic.

Table 3: Comparative generation costs

	2010	2012	2014	2016	2018	2020
CCGT (WC)_SWQ	55.63	50.41	50.55	50.66	52.14	52.57
SC BLACK (AC)_CQ	52.78	50.71	49.35	48.78	48.35	47.94
SC BLACK (AC)_NCEN	51.85	49.86	48.62	48.13	47.78	47.43
SC BROWN (WC)_LV	50.22	48.33	47.33	47.04	46.88	46.72
IGCC BLACK CCS_SWNSW	97.24	89.65	84.12	79.96	76.09	72.87
USC CCS BROWN (WC)_LV	82.94	77.35	74.59	73.16	71.8	70.87
Nuclear_NSA	101.41	100.62	99.85	99.09	98.33	97.58

Source: AEMO/ACIL Tasman

Wind costs with the proposed $65 per MWh government penalty (an after tax penalty of $93) are below fossil fuel generated electricity costs and assure the use of wind to the degree stipulated. This would remain true even though wind generators' inflexibilities mean they earn less on the spot market than controllable generators.

Unlike nuclear, where future efficiency improvements are likely, wind is now a mature technology, which has shown asymptotically lower costs which are now close to the their maximum.

A popular model, the Vestas V80, uses a rotor 80 meters in diameter and has a generator rating at 1.8 MW. Set at a wind design point rating of 7 metres per second, on a site that averages this wind speed, it delivers a capacity factor of just under 30 per cent. This approaches the practical maximum achievable which several authorities suggest is around 35 per cent and indicates that there are few technological improvements to be had with the design of wind turbines that will lower their costs. [10]

The Costs of the 20 per cent Renewable Proposal

Using wind as the least cost renewable option, additional costs fall within three components:

- The premium required for wind over the least cost energy supply of $46 per MWh ($93 less $47 for coal)
- The costs of the additional back-up for wind supply. Wind's reliability according to AEMO is only 7 per cent. In order to ensure the system is maintained, fast start (gas) back-up plant is required. The most market-oriented means of establishing the cost of this is to use the $300 base cap traded through the over-the-counter market, which gives traders the certainty that they can avoid losses in the event of their supply not performing. The price

[10] Under Betz Law, a wind turbine can never convert more than 59 per cent of the wind flowing past it into energy. This is further reduced by mechanical losses and the fact that the turbine only reaches its 59 per cent maximum at a specific "design point". The Betz limit is not directly factored into the turbine rating.

of the $300 cap varies between $11 and $15 per MWh, with the average at $12.[11]

- Additional costs stemming from the increased transmission likely to be required as a result of the lower average flow of electricity from wind sites. In marginal cost terms this is likely to be low since the wind farms locate in areas where transmission is amply available. Where new lines need to be built or existing lines reinforced, the costs do become significant. However for the purpose of this analysis these costs are not included.

The premium costs per MWh for wind are therefore estimated at $58 ($58,000 per GWh). In order to reach 45,000 GWh, this premium would need to be applied to the non-commercial (mainly hydro) part of renewable energy supply stipulated in the Bill. The commercial component is about 14,000 GWh, hence the cost would apply to 31,000 GWh and amount to $1,800 million per annum in 2020,[12] with this rising in subsequent years in line with the 20 per cent target. The cost of the renewable option is not greatly dissimilar from substituting nuclear for coal of $1,580 million, though nuclear might show considerable cost reductions, perhaps amounting to 40 per cent.[13]

In addition to these costs there would be consequential magnification effects.

Offsetting this, in the context of an ETS, the expanded MRET would entail some reductions in the cost of the ETS (100 per cent in the unlikely event that the renewables were the lowest cost option). The PC reported that the cost of specifying renewables was double that of a more market-oriented approach, findings the PC noted were similar to those by consultancy projects conducted by Access Economics and CRA.

Concluding Comments

There can be few other cases in the history of modern economies where governments have taken action deliberately to increase the costs of production in their economies on the scale being contemplated with the Renewable Energy proposal. In the past, those societies that have rejected lower costs have been condemned to economic decline and in many cases a loss of sovereignty. Historically, such was the fate of the Ottoman Empire and a looming repetition of this in the case of China was observed by key nineteenth century Japanese politicians. This led to the Meiji Restoration with the recognition that Japan needed to aggressively accept the least costly production methods of the western world or become a backward, foreign controlled state.

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[11] Personal communications with electricity traders, though a price can be estimated from the d-cypha site http://www.d-cyphatrade.com.au/market_options

[12] This cost may be reduced by renewables featuring less uncompetitive sources like bagasse (which have limited availability) and, if the practice is allowed to continue, by Snowy and Hydro Tasmania manipulating the scheme by oscillating their production from year to year so that every second year they produce above baseline. It would be increased to the degree that solar panels (with a cost over fourfold that of wind) fulfil part of the 20 per cent quota.

[13] *The Economic Future of Nuclear Power*, a study conducted at the University of Chicago, August 2004

The issue of renewable certificates under the Carbon Pollution Reduction Scheme Bill (2009) introduces a variable tax on generators, with the rate dependent on their emissions per unit of energy supplied. An indexed emission cost of $40 per unit - $57 in after tax terms - (following $10 per unit in the first year) would increase the costs for a brown coal generator by 150 per cent and more than double those of a black coal generator.

Specifying a particular form of technology rather than leaving the market to select the lowest cost option will invariably result in additional costs. The proposed 20 per cent renewable target for electricity would impose a considerable burden on the Australian consumer and on the nation's industry. As a stand-alone policy, a 20 per cent renewable target means substituting existing sources of electricity by others that are far more expensive. Windmills are the least cost means of supplying renewable energy in the absence of the availability of large scale hydro. These entail a premium that is roughly double the cost of commercially available coal based electricity.

In those respects, a 20 per cent renewable requirement would mean the equivalent of a tax on non-renewable electricity supplies to raise the sums necessary to allow wind to be viable. That amounts to a tax of $1,800 million on the consumer with the sums raised hypothecated back to the builders and owners of windmills. In terms of the impost on energy consumers, as renewables are over twice the costs of conventional sources and apply to a fifth of total supply, the tax is equivalent to something in excess of 10 per cent of the total generation costs.

The 20 per cent renewable proposal in the Renewable Energy Bills involves intentionally increasing consumers' expenditures and deliberately reducing the competitiveness of productive activities by raising their input costs. In doing so, because the ETS proposal is to control total Australian emissions, the 20 per cent proposal will contribute nothing to the goal of emission reductions that it ostensibly pursues. It would simply re-arrange the aggregate nature of emission reductions, while imposing additional costs.