Competition Benefits from Electricity Interconnectors

An IPA Submission to the ACCC's Review of the Regulatory Test for Network Augmentation

By Alan Moran

April 2004

Energy Issues Paper Number 30

Institute of
Public Affairs Ltd
Lvl 2, 410 Collins Street
Melbourne Vic 3000
Tel: (03) 9600 4744
Fax: (03) 9602 4989
Website: www.ipa.com.au

Competition Benefits from Electricity Interconnectors

Institute of Public Affairs Submission to the ACCC's Review of the Regulatory Test for Network Augmentation

1. Introduction and Summary

A private investment in a transmission facility gains its revenues from arbitraging prices (including via contracts) between two areas. Such an investment offers no compensation to consumers in exporting areas if they face higher prices as a result of its trade facilitation. Nor would it obtain all the gain from its transport capacity. Consumers in the importing area would obtain at least some of the benefits of lower prices from the supply actually sourced through the investment, while its owners would be unable to obtain any of the benefits of lower prices its presence might force on existing sources.

Under many circumstances, the collective supply characteristics of electricity transmission networks are thought to rule out standard market provision. Hence a proposal is assessed on the basis of its estimated costs and benefits, compared with those of alternative investments. A proposal passing these tests is authorised by a regulator and funded by mandatory charges.

In addition to its conventionally measured costs and benefits, where the investment causes prices to fall there is a further "competition benefit". This is equivalent to an increase in real net income or "welfare" that the investment expenditure brings about. In principle this comprises the combination of lower prices and consequent increased consumption in the importing region, less the real income losses (if any) of higher prices and lower consumption in the exporting region and on other goods.

In fact, competition benefits are typically very small – even if a new investment caused a 20 per cent price reduction, competition benefits would be unlikely to exceed one per cent of costs. Moreover, uncertainties in demand and price outcomes mean that these competition benefits are difficult to estimate and can easily be confused with income transfers, which are already accounted for in the conventional cost/benefit framework. Furthermore, it is not likely that a commercial venture would be able to obtain the competition benefits. Hence, their inclusion brings potential bias against commercial investments.

Market intervention that favours regulated investment will deter new commercial investment and should be avoided. Offering preferred treatment to regulated transmission investments is of considerable importance in the electricity industry where there are alternatives means of achieving outcomes similar to those of such facilities. As well as merchant transmission links, these include gas pipelines, generators and demand saving strategies. If a policy favours a regulated supply approach the consequent distortions to competition will prevent the gains from lower commercial supply costs and their subsequent pass-on to consumers.

2. *The Efficiency of the Electricity Supply System*

2.1 Price Outcomes in the Australian National Market

Increased efficiency encompasses the reliability and security of the system and sustainably low prices.

Since wholesale markets commenced operation in 1996, competition has driven down ex-generator prices, (which make up about half of the costs of electricity to the consumer). Wholesale prices had been expected to average of the order of $40 per MWh, the level that notionally prevailed under the centrally controlled system that markets replaced. For most of the period of the National Market, however, average prices have been only three quarters of this, and even less in real terms.

Table 1 shows average prices in the regions comprising the National Market.

Table 1. Average Prices in the National Market Regions ($/MWh)

Year	NSW	VIC	QLD	SA	SNOWY
1999 - 2000	28.88	26.11	45.25	60.61	27.79
2000 - 2001	38.36	45.39	42.19	57.33	37.72
2001 - 2002	34.76	30.97	35.34	31.61	31.59
2002 - 2003	32.9	27.54	37.77	30.1	29.82

Source: NEMMCO

Beyond the generators, electricity supply has natural monopoly characteristics. Where this requires regulation, the industry is likely to be less conducive to increased efficiency than in competitive markets where suppliers need to beat rivals for the consumer's dollar. Nonetheless, over the past decade enormous efficiency gains have been made in the regulated parts of the Australian electricity supply as well as in those parts disciplined by competition. This greater efficiency has entailed improved levels of reliability and has, broadly speaking, been translated into lower prices.

2.2 Timely Commissioning of New Generation

A relatively free market has proved to offer adequate incentives for new capacity. Since the late 1990s in the eastern connected system, this has amounted to over 4,000 MW - about a ten per cent increase in a system that was largely over-supplied. This has been broadly of the type that might have been expected to be built: a mixture of intermediate and peak in increasingly peaky South Australia and Victoria, mainly baseload in Queensland, where demand is growing more rapidly. Table 2 indicates the particular capacity commissioned. In addition to this, construction of over 700 MW of capacity is committed and considerably more at various stages of evaluation.

Table 2

	Year	Max capacity (MW)
Oakey Creek	1999	344
Roma	1999	84
Callide C	2001	1000
Millmerran	2002	900
Swanbank E	2002	410
Total Qld		**2738**
NSW Redbank	**2001**	**150**
Bairnsdale	2001	94
Somerton	2002	160
Valley Power	2002	390
Total Vic		**644**
Ladbroke Grove	2000	100
Pelican Point	2001	510
Quarantine	2001	100
Hallett	2002	220
Total SA		**930**
NEM Total		**4462**

This investment outcome is a vindication of the "energy only" market approach adopted in Australia. Supplier bids that are free to incorporate all costs provide the same incentives for entrepreneurs to build new capacity in electricity as they do in all other industries. As long as there is workable competition, prices that are free to fluctuate will give the appropriate signals. Such market structures are superior to other options like a two part tariff with a "supply" charge and a "capacity" charge. They avoid regulatory guessing to set prices for capacity payments and consequent restraints on each plant manager's price strategy to ensure that market bids reflect marginal costs.

3 Transmission and its Development

3.1 Maintaining Pressure on Improving Efficiency

While market signals have delivered adequate supplies of new generation, many see little scope for these signals to operate effectively for transmission and distribution. An absence of competition weakens suppliers' efficiency drivers, even where suppliers have been placed on a commercial footing. On-going improvements in costs and reliability are, therefore, driven by market mechanisms only in the form of cost-paring to improve profits – and even this may be weak under government ownership or tight regulatory control.

A regulatory substitute to markets is also likely to fail to ensure cost-reflective pricing. Regulation is far less potent in promoting the dynamic gains that are fostered by the threat of competition. Of particular importance to a country like Australia with vast distances is that the cost of transmission will always be likely to be relatively higher than in other countries. Leaving new development to regulatory decisions which do not have the disciplines of profit and losses without competition is therefore especially risky.

Taking sectors out of the regulated umbrella and into the market sphere whenever possible is therefore a means of promoting increased efficiency. Parts of transmission are candidates for such a shift out of the regulated sector.

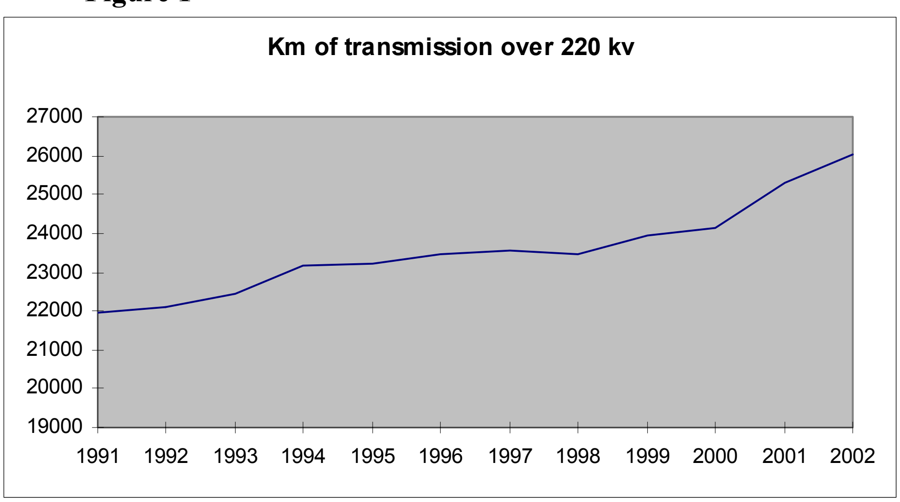
3.2 Recent Transmission Developments

Lack of transmission capacity has not to date been a major issue for system reliability in most of Australia's electricity industry. This reflects an overbuilding of electricity transmission (as well as base load power plants) under the integrated government systems that prevailed prior to the mid 1990s.

Transmission investments that have proven to be grossly premature include the lines from the brown coal district of the La Trobe Valley to Melbourne. Twenty years on and having experienced a 40 per cent increase in capacity demand these remain underutilised. It seldom makes economic sense to build so far ahead of demand.

The Australian transmission grid has continued to expand as shown in Figure 1 below. Even so, the means of bringing new transmission capacity on stream and at the right time continues to be an area of considerable discord. In particular, issues are arising about how to bring incentives for increased capacity in those areas that were over-supplied but are likely to see capacity strains emerging. These revolve around features of many regulated markets, namely how to ensure timely provision of capacity without gold-plating investments.

Figure 1

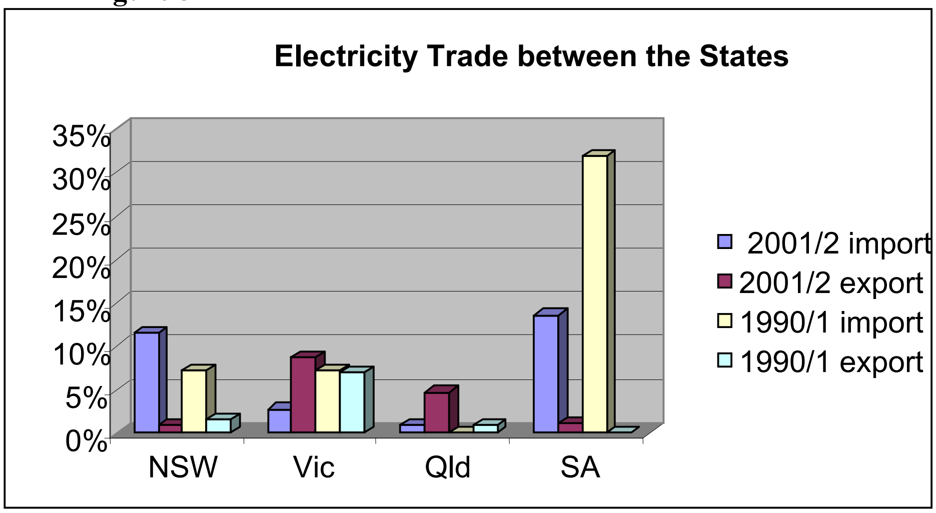


Source ESAA

The nature of electricity trade between the states has changed over the past decade. Additional generation capacity in South Australia has reduced exports from Victoria, while the NSW-Queensland link has brought increased energy flows into NSW and the National Market has brought an expansion of exports from Victoria to NSW through the Snowy link.

Figure 5 shows snapshots of interstate trade over the past decade.

Figure 5



Source ESAA (Percentages are of "energy sent out" based on each jurisdiction's electricity generated).

The need for transmission expansion may be less pressing where load growth is peak rather than base demand. Where there is a shift of requirements to greater peaking capacity, this may be best supplied by stations that are gas fired and located closer to loads than coal or hydro power stations. Where the gas is supplied to a plant through a pipeline that is built on a different basis than gas-derived electricity delivered along a transmission line, there is potential for inefficiency.

3.3 Transmission's Role in Trade Facilitation and Reliability

3.3.1 Transmission as a Trading Link

Like virtually all grids, Australia developed transmission interconnections first within individual jurisdictions and later, on a gradual basis, between jurisdictions.

As with any other trading medium, transmission involves creating value by moving a product from a lower to a higher valued location. To be viable, these links must take into account not only the difference in price but the costs of transmitting the electricity, including operating costs, amortisation and line losses.

The conventional gains from trade - using lower cost energy sources to supply loads across different regions – are one of two considerations in establishing the case for high voltage links. The second consideration is an option value for increased reliability brought about by an additional link (an additional power station would offer comparable levels of comfort).

Improving reliability by sharing power in emergencies was normally the key motive for Australian inter-State transmission developments[1]. Aside from the Snowy Mountains hydro development, high voltage transmission links for inter-state trade that takes advantage of low cost energy at its source have really only been seen over the past 15 years. Other than for short term operational stability, it is not clear that improved reliability and greater capacity are different products rather than simply different facets of the same product.

3.3.2 The Effects of the Collective Nature of Transmission on Electricity Markets

The case for subsidisation of electricity reserve capacity provision is ostensibly strong because of its nature as a "collective good". Users simultaneously benefit from increased reliability and free-rider issues appear since the beneficiaries will attempt to avoid paying.

One aspect of this, system stability, is maintained by using ancillary services to ensure that the system stays in balance. This balancing function must be administered centrally and its costs, which typically entail less than one per cent of total costs, recovered from users. In the Australian National Market attempts are made to recover these costs from the users who actually cause them.

In contrast to this, system adequacy does not require subsidised provision or making payments mandatory. Over the longer term retailers contract or plan for the power they need in line with their marketing goals and obligations. Nor is regulated provision required in the shorter term; retailers operate under strict credit controls to ensure they have supplies in place on the day.

Different suppliers' electricity is delivered along the same transmission system to different customers, but as with goods that move along highways this does not mean suppliers and purchasers losing control of these transactions. Buyers and sellers make their own future supply arrangements, as with other goods and services, without government intercession. Clear property rights and contracts mean all the electricity has buyers and sellers that can be identified and free-riding is thereby prevented.

3.4 Transmission's Role in Facilitating Greater Competition

3.4.1 Competition Benefits

Trade is a clear benefit when it allows lower cost goods or services to be moved to places where supply is otherwise more expensive.

As with other economic improvements, the drivers for such efficiencies may constitute huge gains for success to the individual firm but such success are likely to be modest in an aggregate economic framework. A worked example is offered below.

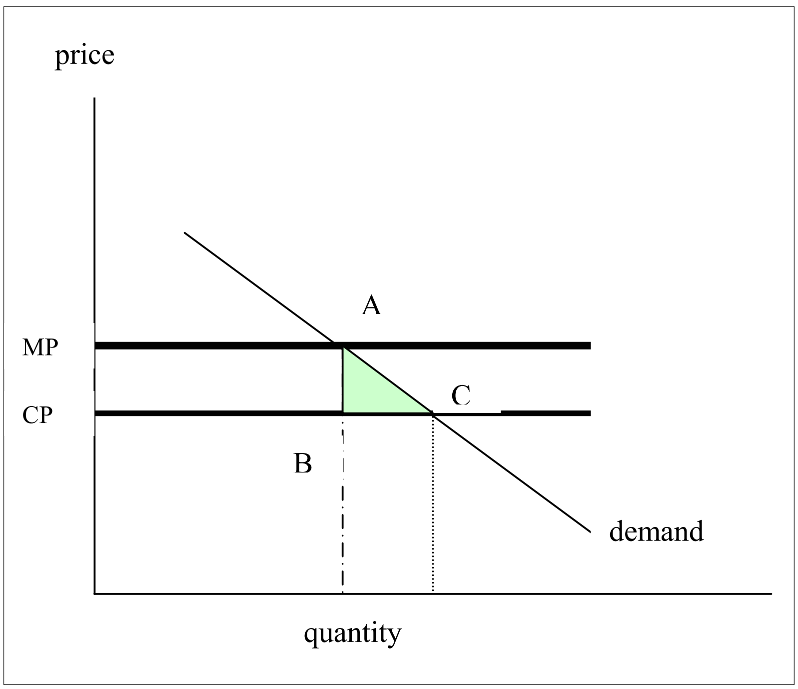
1 Linking a large region with multiple suppliers to a small region is likely to bring greater system reliability benefits to the latter since its chances of readily covering an outage by imports are greater.

Traditionally the gains from easing a monopoly price situation are drawn as in the Figure below. The gain from reducing the price from the Monopoly Price (MP) to the Competitive Price (CP) is as shown in the triangle ABC. This represents a "welfare" or real income gain representing higher levels of real consumption net of transfers between different consumers and between consumers and producers. The size of the gain can be visualised by applying some numbers to the NEM. Thus:

- if increased competition in South Australia from a NSW interconnect reduced SA's prices to the average of those of NSW were to bring a price reduction in South Australia of 8 per cent (NSW prices were actually 8.5 per cent above those of South Australia in 2002/3); and
- if the price elasticity of demand is 0.5,
- this will bring a demand increase in SA of 4 per cent (0.08*0.5).

The size of the welfare triangle gain is usually expressed as one half of the product of the two percentages, or 0.16 per cent (0.08*0.04*0.5).

In money terms this amounts to an annual gain in South Australia, based on sales of electricity at $400 million, of $640,000. Even if the estimates were to be conducted on the basis of the values at the retail level, the annual gains would still be under $1.5 million.



Even the small level of gain estimated above is likely to be an over-estimate, not only because price differences are often counter to expectations (as observed in 2002-03 SA had lower prices than NSW, the main source of the projected energy imports; similarly, NSW had lower prices than Queensland, the main source of projected energy transfers from a reinforced QNI). In addition:

- Line losses also figure, and
- the negative effect of higher prices in the exporting region need to be factored-in (A comprehensive formulation would also include a deduction for the real income effects of the reduced expenditure on "all other goods").

It is however the case that links between markets create an additional dynamic to that stemming from high cost areas having access to low cost supplies. The effects of increased competition in driving down prices can be seen in markets like the European Union where the weight of additional producers has forced cost savings and greater consumer-orientation. Much of the Australian and North American pressure for additional transmission seeks to tap those same sources of benefit. But it is likely to be counter-productive to seek them through subsidisation.

Trade facilitation allowing goods to be moved from low cost to high cost areas is often a stimulus for commercial investments. Such investments involve benefit transfers with the investment's owners taking a share of the two areas' price differential. This share would only be obtained for the goods transferred and the investment facility would rarely be able to extract any of the consumer benefit brought about by lower prices from the receiving market's incumbent suppliers. Nor would the facility need to indemnify the consumers in the exporting areas.

Commercial facilities are developed outside the social cost/benefit framework of welfare economics on which public capital investment decisions rest. It is difficult to develop a basis for public financed or regulated facilities to be developed within that commercial framework.

New trade links should be market driven and where possible represent the full costs to the beneficiaries. It is seemingly beneficial for the government to subsidise a means by which low priced goods could be moved to areas where prices are higher. However, whether in the form of a trade-facilitating transmission line or a price-suppressing new power station, such outcomes are likely to be self-defeating. If private investors consider that a profitable opportunity they spot will be undermined by government action, this will prevent the search for and subsequent action on such opportunities. Ultimately, it will be left to the government to build or guarantee all facilities with a reversion to high cost, highly regulated systems. The benefits of lower prices and appropriately increased capacity that emerge from the interplay of demand and competitive market provision will be lost.

3.4.2 Transmission Expansion

At issue with transmission in Australia and elsewhere is devising the appropriate incentives to build the correct amount of new capacity. Although augmenting transmission for reliability reasons is high on the political agenda, it is seldom possible to make an economic case for a regulated link on such grounds. Placing a value on reliability improvements is just too complex, and in any case is not totally divorced from the more pedestrian cost-saving case. Instead, the case must largely be made on cost savings through the availability of cheaper power. Cook[2] assembled the estimates of regulatory test benefits of four proposals as follows.

---

[2] Cook, A, Maintaining the Security of Supply to South Australia through Interconnections, Address to South Australian Power Conference February 2004.

Table 3

The Calculation of the Regulatory Test Benefits

Benefit ($M)	Riverlink[1]	QNI[2]	Murraylink[3]	SNI[4]
Energy	4	90	82	25
Reliability	-	-	62	-
Deferred generation	158	571	54	154
Deferred network	15	-	24	18
TOTAL	177	661	222	197

1 Report on Technical Issues, Costs and Benefits Associated with the Riverlink Interconnection – Between the Electricity Networks of South Australia and New South Wales, undated, Schedule 2

2 London Economics, 1997

3 Murraylink Transmission Company Application for Conversion and Maximum Allowed Revenue, Decision 1 October 2003, ACCC, page 75

4 Economic Evaluation of the Proposed SNI Interconnector, Roam Consulting Pty Ltd, October 2001, Results for Simulation 1-S-M

Note: SNOVIC400 Regulatory Test benefits unavailable

Following the estimates of the deferred benefits of these facilities, new generation came on stream attracted by the same profit opportunities identified by those estimates.

Thus, in the case of the proposed regulated Riverlink line between NSW and South Australia, the estimated value of deferred investment was $158 million. This was largely predicated on reserve capacity estimates being a relatively low 12.5 per cent. However in the three years following the proposal over 1000 MW of new capacity was commissioned on top of the pre-existing South Australia capacity of 2980 MW bringing the reserve capacity margin to 32.8 per cent.

Similarly, QNI (between NSW and Queensland) was estimated to bring $571 million of deferred generation benefits included $351 million for Queensland where supplies were tight at that time. In the event, in the subsequent two years, Queensland's pre-existing capacity of 8,400 MW was augmented by 2,500 MW of additional capacity.

In these and other cases, the estimates of value of the proposal were based on a static situation in which other suppliers are assumed not to react to the same opportunities.

Yet, though market forces did in fact respond by increasing investment to meet the same opportunities that a regulated transmission development meets, there is considerable pressure to relax the criteria under which a regulated link is assessed. The ACCC's recent Draft Decision[3], expressed an inclination to expand the

[3] Australian Competition and Consumer Commission, *Draft Decision Review of the Regulatory Test for network augmentations*, Canberra, 10 March 2004

benefits it includes within a proposal to incorporate "competition benefits". As well as the welfare triangles addressed earlier, as presently defined the price benefits appear also to include price benefits to consumers.

This is a departure from the outcome obtainable by a private entrepreneur. A private entrepreneur would be most unlikely to be able to capture all the value from arbitraging prices between two areas in the way the ACCC's analysis proposes. The entrepreneur could not arrange for the price discrimination necessary to obtain the consumer surplus that is represented. Still less would the entrepreneur be able to capture the consumer surplus value that stems from the price reductions forced on incumbent suppliers. Hence a regulated investment justified on the basis of such benefits is overvalued vis-à-vis a private investment.

3.4.3 Removing Excessive Market Power

In facilitating regulated augmentation to reduce market power, the authorities need to be clear that such power actually exists. In aggregate terms, it is implausible that Australian generators have been able to exercise market power to boost their profits. These profits have remained low, as have wholesale prices.

Most generators do, however, have market power at some time, in the sense that they are able to hold back supply or increase their prices above marginal costs, thereby setting or benefiting from a higher pool price. But they are constrained from this by their being uncertain when such strategies might be successful, because rival generators are seeking the same opportunities and can maroon their bids above the pool price.

Cramton[4] uses probability analysis to present a model of when and by how much a profit maximising firm should bid above its marginal cost. He shows that this is normal market behaviour which customers can counter by forward contracting (as they do in most electricity markets). If forward contracts incorporate excessive costs due to market power, this will attract new supplies.

Cramton correctly points out that perfect competition cannot operate in most markets since the marginal unit cannot recover its capital cost and will not enter. Under these circumstances, if the regulatory authorities seek to force an outcome equivalent to perfect competition, too little new investment will be built and supply shortages are likely to emerge. The outcome may be a spiralling down in available capacity and increasing levels of regulatory intervention impairing the efficiency of the industry and its commercial viability.

3.4.4 The Relative Importance of Distortion Caused by Regulated Transmission

Expanding transmission coverage and capacity for trade or competition augmenting reasons is a relatively uncontroversial issue when transmission is a tiny part of aggregate costs. However, when it comprises a relatively large share of total electricity costs, unwise decisions impact on costs *per se,* as well as crowding out alternative investment, particularly generation. And Australia's distances mean that transmission tends to be more costly than in other countries.

[4] Cramton M, *Competitive Bidding Behaviour in Uniform-Price Auction Markets*, Proceedings of the Hawaii International Conference on System Social Sciences, January 2004. http://www.cramton.umd.edu/papers2000-2004/cramton-bidding-behavior-in-electricity-markets-hawaii.pdf

This is especially so with regard to the marginal expansion costs represented by new connections. SNI from NSW to South Australia, for example, has a capital cost of $110 million for a capacity of 250 MW, a price that compares to the capital cost of $300 million for building a new 250 MW gas generator[5].

Where transmission involves considerable costs and is sanctioned by a regulator and financed through mandatory payments and generation is market-provided, the former can undermine market approaches and create inefficiencies. The introduction of new transmission that passes an easier hurdle than the commercial test that generators must face can pre-empt a more efficient solution involving constructing new generation, possibly fuelled by gas delivered to a power station close to the load.

3.5 Australian Transmission Issues

3.4.1 Transmission Expansion Proposals

NEMMCO's Annual Interconnector Review identifies the following options which, if completed, would result in little price separation between the different regions.

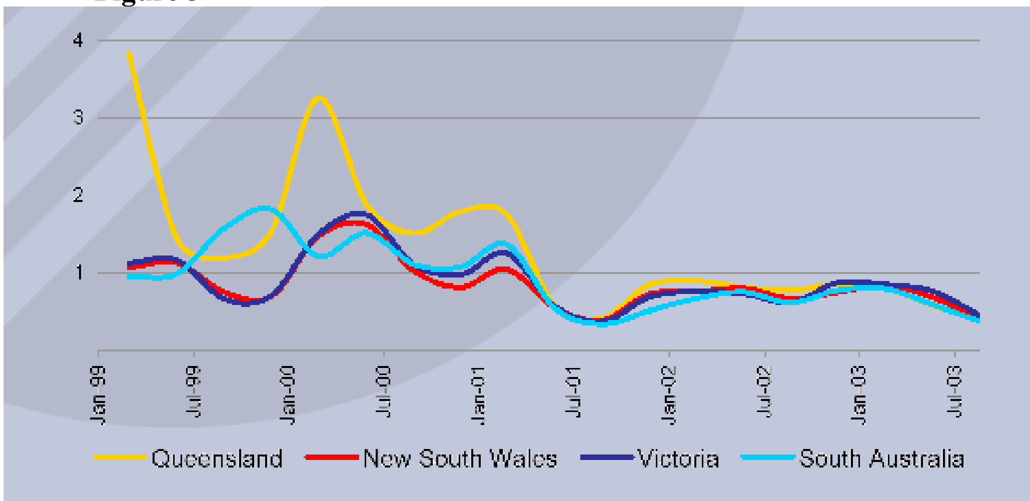
Table 4

Interconnector	Project	Additional Capacity (forward/reverse) MW	Timing
Tasmania to Victoria	Basslink undersea cable	630/300	2005 (committed)
New South Wales to South Australia	SNI	250/250	2004 (advanced proposal)
	High voltage DC interconnection	800/800	5 years (from approval)
New South Wales to Queensland	Upgrade QNI	200/200	2 – 3 years (from approval)
	High voltage AC interconnection	800/800	5 – 7 years (from approval)
	High voltage DC interconnection	2000/2000	5 years (from approval)
New South Wales to Snowy & Victoria	NEWVIC 2500	400	2006/07
	NEWVIC 3500	1400	2006/07
	NEWVIC HVDC	1400/1400	2006/07
	Moama HVAC	N/A	5 years
Victoria to South Australia	Heywood interconnection series compensation upgrade	150	18 months

The greater price convergence which these proposals would bring has already been experienced as a result of new generation and transmission capacity. NECA has commissioned work, reproduced in Figures 3 and 4 below, that demonstrates this.

5 The case for the building of that particular new regulated transmission line between NSW and South Australia has been largely overtaken by events. It was originally planned when there was no 500 MW Pelican Point (nor its proposed expansion), when the 180 MW Playford Power Station was scheduled for early retirement and when the line from Victoria was carrying up to 40 per cent of Victoria's electricity supply and frequently constraining. The case for SNI has been clearly undermined by these developments and the building of the Transenergie merchant link, all of which are alternatives to regulated solutions.

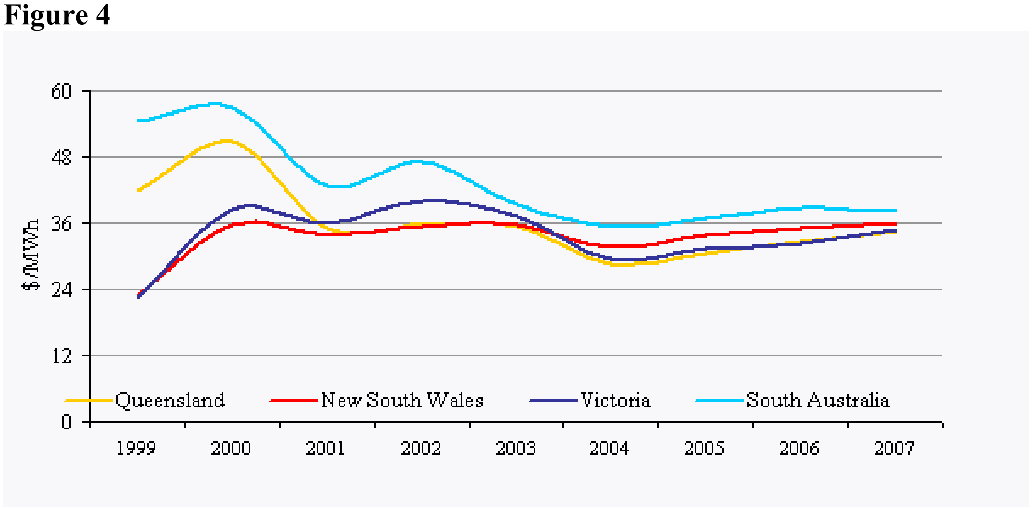
Figure 3



Source: Dr John Field, http://www.neca.com.au/What'snew.asp?CategoryID=32&ItemID=1328

The analysis underpinning Figure 6 also indicates a pattern of reduced volatility of demand has emerged over the past few years. Figure 7 analyses the forward price curve and finds the volatility and price dispersion continue to be low.

Figure 4



Source NECA

3.5.2 Price Convergence as a Benefit

Many would regard the outcome of the combination of new capacity and transmission illustrated in Figures 3 and 4 above as positive. However, price equalisation ought not be the goal if such equalisation doesn't represent an underlying similarity of costs. If prices are equalised across regions but costs are dissimilar, this means that high cost load areas are being subsidised and low cost load areas are being taxed.

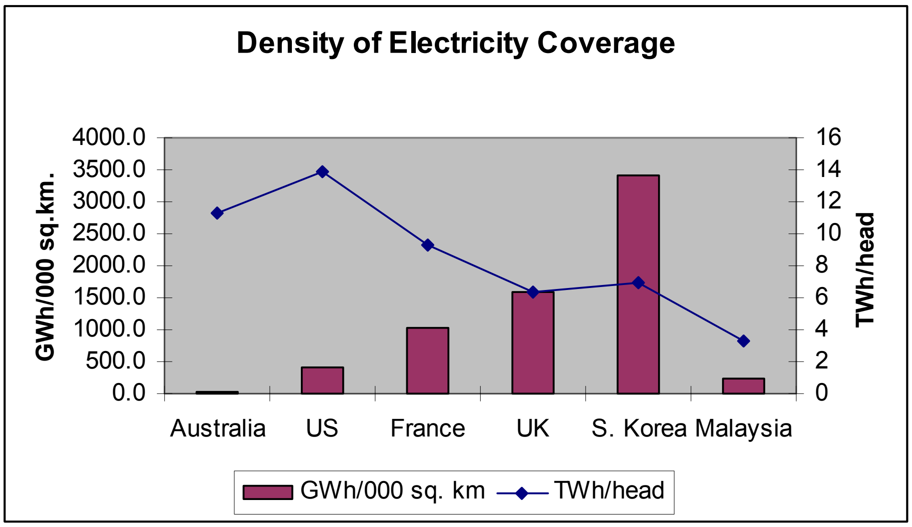
Subsidies are a transfer tax, one result of which is a diminution in overall income. Cost-smearing also blunts the incentives to locate new energy using industries in the areas which are favoured by the lowest cost supply. Hence, the appropriate location signals are tempered if costs of transmission (those over and above the shallow connections from generators and line losses during transmission) are paid for by a general charge on customers.

3.5.3 Transmission and Australia's Economic Geography

Australia's long distances between different markets and between areas of potential supply and loads add a unique dimension to its electricity supply industry. In terms of TWh per thousand square kilometre, Australia comes in at 29 compared to 418 in the US and 1,575 in the UK. It might be argued that this measure exaggerates the extent of Australia's distance because much of its acreage comprises highly remote areas. But even if Western Australia and the Northern Territory were excluded, Australia would still have only one eighth of the US density of coverage.

Figure 5 below illustrates the density of electricity coverage among selected countries by geographical spread and consumer usage.

Figure 5



Farrier Swier graphically introduce some implications of Australia's size by pointing out,

"In comparison to one of the world's largest integrated electricity markets, PJM, the NEM covers an area around 23 times greater.. and serves around half as many final consumers and meets a co-incident peak demand of around 1/3 that of PJM. However the transmission network within the NEM is around 30% longer than that in PJM[6]."

3.6 Determining Priorities for New Transmission

The natural monopoly features, said to be inherent in electricity transmission, present a fundamental challenge as a result of the interplay between the alternative means of meeting load growth through transmission and generation.

[6] Transmission Issues Scoping Report, Farrier Swier Consulting, May 2003, page 25.

The geographic setting of Australia's electricity supply industry, in particular the long distances and relative absence of loop-flow, offer some potential advantages in setting policies for transmission. In most jurisdictions, the meshed nature of transmission means contract paths are not easily determined but Australia's long, stringy system does not have that complexity.

The greater certainty of Australia's electricity path flowlines allows the application of more simplified hedging arrangements. Whereas highly meshed systems generally need to specify rights between different points without identifying the energy path, the Australian system can identify the path along which energy will flow. Other systems which allow pricing for transmission do so on the basis of financial transmission rights (FTRs). In Australia, the settlement residues (SRs) capture some of the difference at a particular juncture when prices diverge but some supply transfer occurs. Future SRs are auctioned to give a partial price hedge for transfers (the auction does not offer a comprehensive hedge where the line constrains and prices separate).

The settlement residues also offer indications about the need for augmentation of interconnects. Where residues are accruing to supplies in the "to" region this indicates the lines might justify augmentation from the exporting region. The justification hangs on a mixture of the value of the additional capacity, its reliability, the cost of the addition/augmentation, the costs of alternative means of supply and the availability of supply from the sending region.

Though there are often guides like this as to where the most appropriate investment should be undertaken, the nature of the political process tends to contaminate these guidelines. Australia's electricity transmission decision framework was developed conscious of the distortions that political interference can bring. Even so, political override of commercial and even neutral technology based decisions is evident. Strong political pressure to build SNA as a regulated link between New South Wales and South Australia is an example of this.

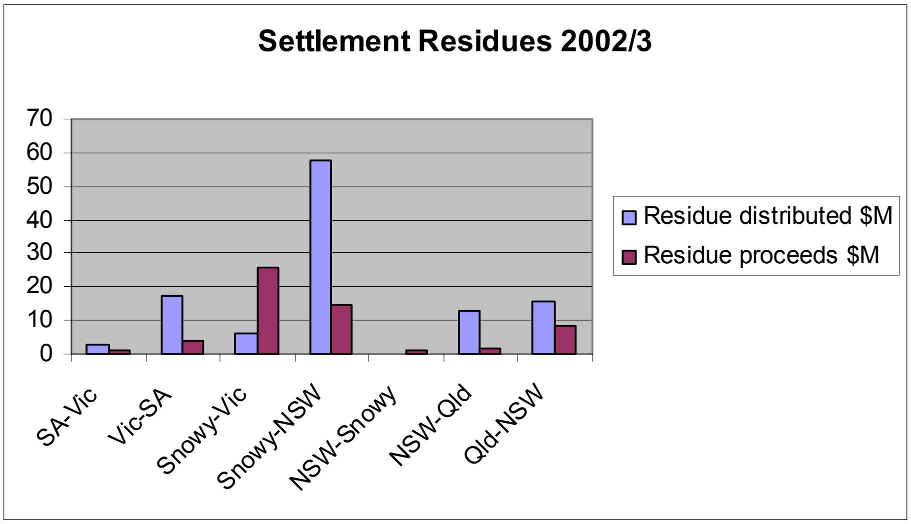
Other politically motivated decisions may also be inferred from investments that have been made. Thus, based on value, as measured by settlement residues, the line most in need of additional capacity is Snowy to NSW. (Though all of this SR in 2002/3 was associated with a single event[7].) The others are Victoria to South Australia and the Queensland NSW link, especially that coming south. In fact the most important augmentation has been south into Victoria, which has added 400 MW to a 1,700 MW transmission line, though the cost of this was, at only $40 million, quite modest.

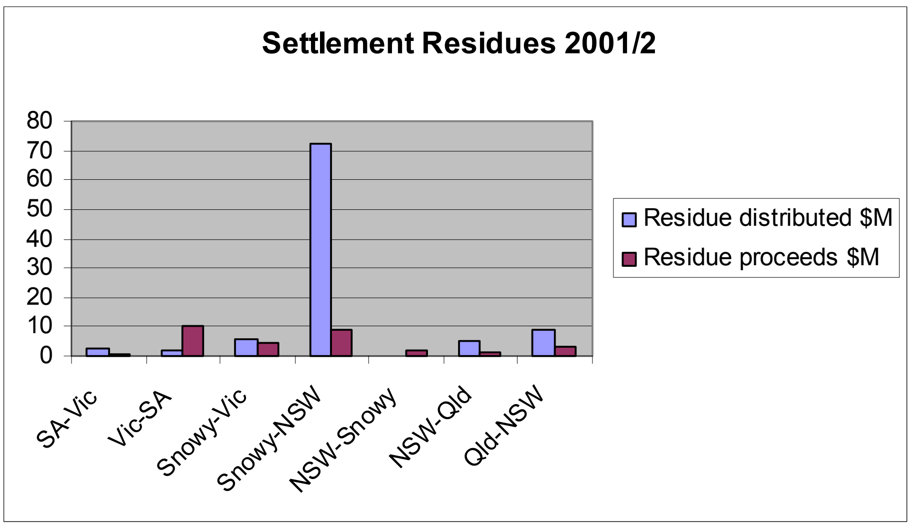
Figure 6 indicates the SRs accruing across the regions.

---

[7] See Statement of Opportunities, NEMMCO 2003, page 9-13 Table 9-4; http://www.nemmco.com.au/publications/soo/soo2003.htm

Figure 6





3.7 Merchant Transmission

3.7.1 The Potential for Market Failure

The step beyond separating transmission decisions from political control is leaving a role for entrepreneurial or merchant transmission. The larger that role the less likely it is that non-market based transmission decisions will corrupt market based decisions in other parts of the system.

Entrepreneurial electricity transmission lines are seen to have shortcomings stemming from:

- The difficulty of overcoming Kirchoff's Law with AC power lines, which makes it difficult to fully define the capacity of an individual line within a meshed system
- The evidence that cost recovery (strictly network variable charges) on transmission lines is low – less than 25 per cent in the half dozen

jurisdictions reviewed by London Economics in 1999 and less than 30 per cent in any study that they cite[8]
- The fact that revenue is likely to be earned with a DC line only with the constriction of the line to create a price differential (or threatened constriction of the line if it is contracted forward).

One troubling feature about the first two of these assertions is that the difficulty they alert us to in determining the merits of a new investment is equally applicable to regulated investments. If it is impossible or at least very difficult to define the added capacity that a new private investment brings, it is equally difficult to decide whether expenditure on a regulated investment is viable. How then is the case for this investment to be determined? Moreover, it is possible that if transmission can only earn 30 per cent of its costs that too much of it is being built.

The third point addresses concerns about "gaming" of a transmission line by bidding it in to take advantage of its scarcity value. These concerns are equally applicable to generators and have given rise to a considerable body of review which, at least in Australia, has found bidding behaviour to be benign. As previously addressed, a commercially viable electricity system is not possible if firms are required to accept prices based on marginal costs. In electricity, the most marginal generating unit is likely to require a very high price for only a few hours per year if the unit is to be commercially viable. Yet once built, such a unit is likely to be able to operate for far more hours and still cover its marginal costs. Of course, if it were to be required to operate whenever its marginal costs are covered, it would be unviable and not be built in the first place[9]. This applies equally to transmission.

Joskow and Tirole[10], however, argue that applying market principles is unlikely to work with transmission. They take this view from their assessment that merchant transmission would be jeopardised by loop flows adding to a variety of more conventional market failure reasons. One of these is that thin markets will lead to withdrawal of capacity and create artificially high prices.

Such analyses are based on a misplaced presumption that only atomistic markets can work. In fact, much of the electricity market in generation is "thin" in so far as in certain periods there are few realistic supply options. Buyers respond to market power, as with other goods, by adopting contractual arrangements. Firms subject to market power from suppliers lock in contracts to prevent this being used. This allows market determined prices to prevail. In most markets, suppliers have some capacity to influence price and where buyers consider this creates too many uncertainties or excessive volatility, they will lock in a price through contracts. Commonly, though not invariably, this "insurance" price will be above the average spot price.

---

8 Review of Australian Transmission Pricing, A report for the Australian Competition and Consumer Commission, London Economics, 1999.

9 Attempting to reward fixed costs through capacity payments is commonly used in the US and was a feature of the original England and Wales design. The two part form of remuneration suffers from deficiencies vis-à-vis obtaining all the reward from a single bid but this goes beyond the present paper's scope.

10 Joskow, P. and J. Tirole (2003). Merchant Transmission Investment. mimeo.

3.7.2 Future Augmentations and Additions

The vast amount of power-distance the energy travels from generator to load is along the regulated system. Regulated lines are rewarded by Transmission Use of System (TUoS) charges, offering a far greater return than those likely to be received in the form of short run marginal cost savings.

Options for future developments have to be assessed in the context of the system that is presently in place. The existing system has created expectations, even forms of implicit property or contractual rights that cannot be dismissed. Unscrambling that system is impracticable and probably not desirable. Irrespective of the role of merchant transmission, most transmission that is in place and arguably some new transmission will, under any conceivable rules, continue to be remunerated by a government imposed charge.

While it is not easy to arrange for market provision where parts of the system are regulated, we do this with other infrastructure like roads, schools and hospitals. In the case of roads, we are in fact, seeing an increasing co-existence of socialised road developments and those financed by tolls. Though, in the main, the private provision is a form of government out-sourcing, this is not always so and is clearly not the case with schools and hospitals.

The entrepreneurial solution that could be grafted onto the present system might comprise long links like Basslink, the undersea link being developed between Tasmania and Victoria, and very short links like Heywood between Victoria and South Australia. It is best to think of both of these as bridges between extensive transmission systems rather than new lines.

4 Concluding Comments

Creating market-driven arrangements for new transmission is perhaps the most formidable challenge facing the Australian electricity supply industry. Ill-advised investments resulting from political/bureaucratic decisions are costly and may:

- prevent efficient new investment in generation where a consumer subsidy to transmission has reduced the cost penalties of transporting electricity from distant sources;
- bring about additional costs through blunting the real market signals to the locational decisions of industry and households; and
- distort signals for energy sources, especially gas and renewables; for example, the current arrangements place disincentives to the locating of gas fuelled power stations close to loads and are likely to favour over-investment in remote wind farms.

Provision of transmission facilities will tend to equalise the price in the linked areas. Where this is undertaken by a risk-taking entrepreneur, some of the price (and volume) rearrangements from the parties benefiting are obtained by the transmission entrepreneur. In such a market, no compensation is paid to those losing from the wealth transfer since requiring such compensation would amount to trade restriction.

Policies should not deter the creation of merchant links or other market responsive activities. In addition, we need some means of activating the individual rights to existing transmission capacity that is in principle already present. With those rights being made tradeable, new providers, (or loads in some cases) would need to finance the increased capacity they seek, perhaps by displacing high cost pre-existing supply sources.