ACCC Review of the Regulatory Test
Submission by Peter Garlick
P M Garlick & Associates Pty Ltd (PMGA)
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Introduction

On 10 May 2002, the ACCC released an Issues Paper, which highlighted a number of concerns raised by interested parties with the operation of the current Regulatory Test. (RT). The Commission subsequently received 19 submissions from Market Participants and others.

On 5 February 2003, the Commission issued a Discussion Paper that identifies three options for the development of the RT. These are:

"1. maintaining the current test with minor modifications to ensure consistency between the regulatory test and the code following the NDR code changes;

2. define and clarify elements of the regulatory test to ensure a consistent application of the test across the NEM; and

3. outline possible methods for assessing competition benefits."

However, between the Issues Paper and the Discussion Paper, on 31 October 2002, the National Electricity Tribunal (NET) announced their decision in respect to the Appeal by TransÉnergie against the decision by NEMMCO to approve the SNI Interconnector between NSW and South Australia. In a split decision, the two lawyers on the Tribunal considered that the project satisfied the RT, but the economist on the Tribunal (Prof Gavan McDonell) disagreed. In his dissenting judgement McDonell examined in some detail the historical background to Cost Benefit Analysis (CBA), of which the RT is an example. In his view the RT as defined is "foundationally flawed" for a number of reasons. The NET decision is now to be tested in the Supreme Court, as TransÉnergie has lodged an Appeal, which should be heard later in the year.

McDonell supported his judgement with a number of Annexures, which are available on the NET website. These make interesting reading, and it is disappointing that the ACCC has not made reference to this body of economic theory in its Discussion Paper. However, the points raised by McDonell must go to the heart any redefinition of the RT by the ACCC.

This submission is based on my 28 years of experience in performing economic evaluations of electricity projects, 7 years as a generation planner with the SEAQ/QEGB in Queensland, and the subsequent years as a consulting power engineer. I have also drawn on McDonell's Annexures where appropriate.

The Regulatory Test - "A House Built on Shifting Sand?"

Costs and benefits

The RT as defined by the ACCC is as follows:

*"A new interconnector or an augmentation option satisfies this test if it maximises the net present value of the **market benefit** having regard to a number of alternative projects, timings and market development scenarios;"*

where,

*"**Market benefit** means the total net benefits of the proposed augmentation to all those who produce, distribute and consume electricity in the National Electricity Market."*

Basically this means that the reduction in market wide costs (the benefits) should be greater than the transmission augmentation costs (capital and O&M[1]) when assessed on a present value basis. However the costs and benefits are subject to different levels of uncertainty.

Economies of scale for transmission usually mean that the capital cost of the project must be fully expended at the start of the project life, and can be estimated to a reasonable level of accuracy. The ongoing O&M costs are small by comparison. The benefits are usually delivered much later, and this means that a much higher level of uncertainty must be attached to the quantification of benefits.

Some consumers are therefore faced with an immediate increase in TUOS charges, with the *hope* that at some point in the future lower wholesale prices (due to a filtering through of lower costs) will more than compensate for the increased TUOS.

Benefits are quantified by computer simulation models, which hope to simulate, to a reasonable degree of accuracy, the possible future physical operation of the NEM. Costs are derived by the application of a Participant cost database to the physical outcomes of each model run. The various recent analyses of the SNI project have used a cost and plant performance database promulgated by the Inter-Regional Planning Committee (IRPC), and this is based to a large degree on a report prepared for NEMMCO and the IRPC by PMGA[2].

Cost analysis of the NEM participants is complex because of the lack of publicly available information. The cost analyses presented in my report were based on extrapolation of an historical cost database that I have maintained for many years, supported by detailed analysis of what public information there is, and combined with estimations based on my years of experience in the analysis of electricity systems.[3]

So how good is the data? I would say not bad, given the shortage of information, and the general opacity of the NEM. However its main limitation is that it presents a current picture of costs and performance, and these must become less certain over time.

For example, what will happen to the future price of natural gas? Will a tightening of gas supplies lead to higher gas prices for power generation, or will new field developments serve to hold prices down? Perhaps more importantly, will increased competition from additional gas producers serve to force existing producers to reduce gas prices? Will the future imposition of greenhouse measures such as a carbon tax serve to change the relative costs between gas and coal? Will new generation technology change current cost relativities?

The simple answer is that we don't know how these factors will affect the future development and operation of the electricity system. Future costs and benefits in any economic evaluation should therefore be **heavily** discounted to reflect this uncertainty, particularly those beyond say ten years.

I am aware that the RT requires the use of sensitivity analysis where data is uncertain, and this is entirely appropriate. However, even the use of sensitivity analysis may not fully reflect the impact of changes in circumstance, and this is issue is discussed further in a later section.

[1] Operating & Maintenance.
[2] See "Short and Long Run Costs of NEM Generators", PMGA, August 2000.
[3] I am somewhat bemused that IRPC endorsement seems to have conferred a high degree of legitimacy on the accuracy of the data, and it has since been widely referenced. At least the database has had the benefit of independent analysis.

Big vs Small

The existing RT only focuses on the highest nett benefit. However this takes no account of schemes of different sizes. Consider the simple example below. Scheme A has the highest nett benefit of 9, and therefore is the preferred scheme under the RT. However, Scheme B would deliver almost the benefits of A, but at a much lower cost, and of course has a much higher benefit/cost ratio. Given the inherent uncertainty attached to the benefits, clearly Scheme B would be superior to Scheme A, and would be the scheme of preference for any commercial enterprise operating under market conditions.

Project	Costs	Benefits	Nett Benefit	B/C Ratio
Scheme A	100	109	9	1.09
Scheme B	20	28	8	1.40

This is one of the foundational flaws identified by McDonell in his dissenting judgement in the recent Tribunal assessment of SNI. A preference for big schemes leads to "gold plating" of regulated assets, and this issue is well understood by those countries with longer regulatory histories than Australia. A further complication with the above, is that under the RT, the low cost option may not even be identified by the transmission augmentation proponent. Information asymmetry then means that it is difficult for other parties to identify more cost effective options than the scheme being presented.

A useful modification to the RT would therefore be to require the presentation of benefit/cost ratios as part of the evaluation of alternative options.

Alternatives and Unbundling

One thing that Is not well defined in the RT is how to deal with projects that comprise a number of components, some of which are part of, or impact on, other augmentation schemes. An example was the recent Tribunal hearings into SNI, where there was much discussion of bundled and unbundled SNI, and where SNI can be seen to comprise certain upstream assets, and other downstream assets. In this case the upstream assets are also of benefit to the Snowy to Victoria (SNOVIC) augmentation, and to the Murraylink DC connection between Victoria and South Australia.

McDonell presented the following table in his assessment of SNI[4].

Project	Capital Cost ($M)	Transfer Capacity Relative to Base Case	Range of Benefits ($M)
SNI	110	250 MW	33.6-134.9
SNOVIC	44	410 MW	159.9-233.3
SNI+SNOVIC	146	600 MW	159.8-310.8

This is interesting if SNI is considered as an incremental project to SNOVIC. The table shows incremental costs of SNI of $102 million (146 minus 44), and incremental benefits of between zero and $77.5 million (310.8-233.3). This analysis suggests that the downstream assets are well short of being economically justified.

This example indicates that the unbundling of schemes is important. It follows that the RT should be modified to specifically require the separate identification of scheme components, and that incremental scheme costs are justified by the associated incremental benefits.

[4] Page 29, "Reasons for Decision: Appendix 1", Prof G D McDonell, NET, October 2002.

Change in Circumstance

The uncertainty of the quantification of the future benefits of transmission augmentations was discussed earlier. However, a much greater source of uncertainty is change of circumstance, particularly under market conditions. Such changes of circumstance are usually unable to be captured by modelling processes. Indeed one of the benefits of the wholesale market is that the risks of circumstance change must be understood and managed by market participants, and not simply passed through to consumers as increased prices when things go wrong.

A useful case study is the SNI project, which was originally proposed by Transgrid in 1997[5]. London Economics (LE) performed an economic evaluation of the project on behalf of Transgrid, which was conducted in accordance with Code provisions, although at the time the Code was not yet operating. The LE study concluded that the project was justified, but in reaching this conclusion the following assumptions were made.

- The South Australian region was approaching a period of capacity shortage due to the increase in summer air conditioning load.
- The 240 MW Playford Power Station would have to retire in 2000 with the expiration of its environmental licence. This would create a capacity shortfall.
- Riverlink would allow the deferment of new peaking capacity in SA, which was estimated to cost $692/kW.
- No allowance was made for demand management through load curtailment under high pool price conditions.
- The NSW system was winter peaking, and therefore surplus capacity would always be available from that state during the SA summer peaking periods.
- The SA region was importing some 40% of its energy requirements from Victoria, and the link from Victoria was constrained for a high percentage of time. This would translate into high SA pool prices once the NEM commenced.
- Lower cost coal based generation in NSW would allow a significant trading benefit against gas based generation in SA.

Over the last five years much has changed, and most of the above assumptions are no longer valid. For example:

- The 487MW gas fired Pelican Point Power was commissioned in 2000/2001 supplying base and shoulder energy. This has largely unconstrained the Vic/SA link, and resulted in a substantial fall in SA pool prices. The average time weighted pool prices for 2002 were $35.26/MWh for SA, $33.08/MWh for Victoria, and $39.92/MWh for NSW. So much for trading benefits from NSW imports.
- A second source of natural gas is to be introduced to SA with the completion of the Seagas pipeline from the Otway Basin at the end of 2003, and will provide some much need competition to gas supply from the Cooper Basin.
- Playford Power Station has been refurbished and is not about to retire any time soon.
- A substantial block of new peaking capacity has been installed in SA and Victoria, using in some cases second hand plant, and at lower costs than that assumed in the LE study.
- High SA pool prices under summer peak conditions has brought forward some demand management, although the quantity is unclear.

[5] The project at that time was called Riverlink.

- The NSW has just become summer peaking, with the 2003 summer peak demand exceeding the 2002 winter peak demand for the first time. The extent of load diversity between the summer peak half-hours of NSW, Victoria and SA remains to be seen.

The above example shows the fundamental weakness of the RT, in that market developments will result in unstable assumptions for any economic evaluation.

Optimisation

No doubt TNSP's will point to the risk of optimisation[6] if projects do not work out as planned. However the critical condition for dynamic efficiency is that uneconomic projects should not be committed in the first place.

Optimisation is closing the gate after the horse has bolted. Optimisation simply reallocates the cost of poor investment decisions from consumers to network owners (taxpayers or shareholders as the case may be). Surely economic efficiency objectives should seek to create some consistency in the investment environment between generators and inter-regional network augmentations.

Conclusions

My basic conclusion is that the Regulatory Test is a nonsense. The test is based on economic theory, but has too many practical limitations under market conditions. Central planning has been criticised in the past, and its shortcomings are one of the reasons for the introduction of markets, but at least some control was possible over future developments. Under market conditions, changes in circumstance, and uncertainty in cost and performance assumptions, have the potential to render any economic evaluation as invalid within a short period of time (hence the shifting sands).

Unfortunately, so long as the model we have allows for regulated interconnectors, then we are stuck with the RT, despite its many limitations. In this respect, the ACCC should adopt their Option 2 and ensure that the test is strengthened wherever possible. The following suggestions are offered for consideration by the ACCC:

- Define the Regulatory Test as an example of Cost Benefit Analysis.
- Ensure that the test includes acceptance criteria additional to the maximum nett benefit, such as benefit cost ratios, and break-even discount rates.
- Ensure that discount rates fully reflect uncertainties in assumptions.
- Ensure that projects are unbundled so that incremental costs can be compared with incremental benefits.
- Ensure that where unbundled asset components are common to other alternative schemes that benefits are correctly apportioned between the schemes and are not double accounted.

My strong preference is for market based solutions for transmission wherever possible. In this I believe that for inter-regional interconnector augmentation there should be a strong preference for Market Network Service Provider (MNSP) solutions, with regulated status only given when market failure can be demonstrated. However this will only be achieved if some form of property right can be granted to those Market Participants prepared to underwrite network augmentations. These and other issues are discussed in the recent report prepared by Intelligent Energy Systems (IES) on the coexistence of entrepreneurial and regulated transmission[7].

[6] The devaluation of asset values by a Regulator to reflect market outcomes.
[7] See "Economics And Co-Existence Of Regulated And Nonregulated Transmission" a report prepared by IES for the ACCC, September 2002.