SUBMISSION TO SELECT COMMITTEE ON ELECTRICITY PRICING

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SUMMARY AND RECOMMENDATIONS

Over an extended period, energy market reform has departed from good public policy principles. We now face a situation where the National Electricity Market encourages behaviour that not only conflicts with broader policy, but drives business decisions that place the future of the electricity industry at risk. This is reflected in the recent rapid electricity price increases. There has been serious and ongoing policy failure in this sector, which must be addressed as a matter of urgency. The National Electricity Market (NEM) has four main components. Generators compete to sell electricity on the wholesale market. This model has worked reasonably well, but faces new challenges as growth in demand falls and many emerging nimble competitors attempt to enter a market that was not designed to respond to their characteristics.

Transmission and distribution (T&D) are treated as 'natural monopolies' under NEM: this is no longer realistic: they compete with energy efficiency, demand management, energy storage and distributed energy generation. Yet these emerging options are paid only what they save the incumbent industry: unlike other emerging business models in on-line media, telecommunications and water. This model is seriously undermining progress of these emerging, more flexible and sustainable solutions, while placing at risk the financial viability of the existing industry and driving up consumer costs. The network component of the NEM needs a major overhaul if 'least cost' sustainable outcomes are to be achieved.

Electricity retailing is also in need of review. Some retailers are now vertically integrated with generation capacity: this was not supposed to happen in the original market model. It potentially distorts the behaviour of retailers in favour of their own generators. The Victorian competitive model has been proposed as the way forward. Yet a significant component of recent price increases has been the increase in 'customer acquisition costs'. Aggressive sales activity has led to a 28 percent annual 'churn' rate and increasing levels of complaints. This can hardly be described as a successful model for other jurisdictions.

The history of energy market reform shows that what began as a broadly based policy agenda has been subverted into a public policy disaster. Energy policy makers have separated energy from the broader policy objectives of governments and society, and have been allowed to get away with it by governments. Today, the signals sent to NEM participants compete with and conflict with those being sent by other elements of public policy including climate policy, social justice, innovation and industry development. Energy policy makers have repeatedly failed to deliver effective outcomes to address the failures. They have had their opportunity: government must step in to ensure society's aims are met. The problem is reflected in the wording of the NEM Objective: it requires revision.

The importance of energy efficiency in particular has been seriously undervalued in Australian energy policy. Around the world it is recognised as the top priority to manage energy costs, limit peak demand and cut greenhouse gas emissions. Yet in Australia it lacks effective governance frameworks and present energy market culture and financial signals work against it. The NEM must encourage energy efficiency, and encourage cooperation with policy makers in areas that influence energy costs such as building, appliance, social welfare, innovation and industry policy.

We are at a critical point. If we cannot bring the NEM into line with broader policy, we will waste money and time, while losing a window of opportunity to reposition our economy for the 21st century.

Recommendations

1. Change the NEM objective to refer to 'societal cost' instead of 'price' of electricity and require consideration of social and environmental factors. Provide clear guidance as to how the 'long term benefit of energy users' is defined, to ensure that 'price' is not used as a proxy. Require energy policy agencies and regulators to engage with policy makers from other areas so that they incorporate mechanisms that help to reduce energy costs and energy-related greenhouse gas emissions.
2. Require policy makers in areas that impact on energy use to incorporate mechanisms that help to reduce societal energy costs and related emissions, such as reducing peak electricity demand, improving energy efficiency, etc. These include, for example, building energy regulation and policies, appliance efficiency policies, business innovation policies, social welfare policies, education and training to mention a few.
3. Revise NEM rules to ensure its participants are provided incentives or penalties, or regulated to ensure they act in ways consistent with societal goals, and that they have clear timelines to deliver specific outcomes. Contingency measures that would increase pressure to perform should be automatically triggered if they miss annual milestones. A number of specific changes are discussed in this submission.
4. Establish an interdepartmental working group of senior officials to maintain an ongoing overview of the interaction between energy policy and other aspects of public policy, including independent research. This group should provide recommendations for improvements (including timelines and contingency responses).
5. Establish an independent consumer representative organisation with its own funding, so that it can set its own priorities. This organisation should report to CoAG regularly on the performance of the NEM against societal objectives and should have a formal right to intervene in energy market policy development and implementation.
6. Ensure policy decisions in situations of uncertainty err in the direction of sustainable energy options. For example, if the network benefits of PV are uncertain, a 'best estimate' should be used, rather than setting it to zero, as regulators have done recently. The value of emerging options should not be determined based on how much they save the existing industry, but on what they could charge in a free and fair market.

My background

I have worked in the energy sector since the late 1970s in community groups, government, with the private sector and as a consultant. My main focus has been sustainable energy, with emphasis on energy efficiency and demand management. I have received numerous awards from the sustainable energy industry, and a Centenary medal, as well as being made a Member of the Order of Australia for my work in sustainable energy and climate policy. I have taken an interest in the evolution of the electricity market since 1990, although lack of resources for independent work and the powerful 'group think' of the energy sector have meant that I have not played a high profile role in the electricity industry itself.

Overview

The electricity market has evolved significantly since the early 1990s, when reform was driven by National Competition Policy, the desire of some states (especially Victoria) to sell off public assets, and a strong neoclassical economic agenda driven by powerful 'think tanks', econocrats and vested interests.

Through the 1990s, the energy market reform process moved progressively further away from a focus on societal outcomes towards an 'economic' (I would say narrow ideological and accounting) focus. This has led to the present situation, where key elements of the electricity market are completely out of step with other major policies and the wishes of the vast majority of the community, who repeatedly respond to surveys by saying they want a sustainable energy future, not a fossil fuel one . This submission documents some key steps in this process, from the reframing of objectives to the rejection of climate issues as a relevant factor and the formation of a 'club' that has avoided much scrutiny from broader policy agencies, political leaders and the community.

So the problems of the electricity market have been visible to some observers for many years. It has just taken a while for them to become visible to our wider society. They rest on fundamental institutional, structural and cultural flaws. Indeed, the 2002 Parer Review and other processes have identified some of the problems, yet many still exist.

The shortcomings of electricity market design have become visible through substantial increases in prices over the past few years. These price increases are an indicator of the existence of underlying problems. It is important to address these fundamentals, rather than just focusing on limiting price rises, which are a symptom. This submission looks at the fundamentals in order to recommend actions that will address the pricing problem and put us on a path to a sustainable energy future.

What is the NEM?

The National Electricity Market has four elements. Generation and retailing are competitive markets. Transmission and distribution networks are largely regulated, and treated under the market model as 'natural monopolies'.

Generation

The generation market is a large scale market in which participants are large, well-resourced and expert businesses. This market seems to have broadly met the criteria required for an effective

market to work: participants are well-informed, empowered, similar in size and influence, and subject to overall market regulation. Indeed, this market does seem to have worked reasonably well to date. However, some aspects of it are now showing cracks.

There has been evidence over many years that some generators have 'gamed' the system by limiting generation capacity at times, to push up prices. ABARE (2002), drew attention to this and estimated the cost to the economy of this practice at between $81 and $412 million per annum. Recently media reports have raised more alleged examples (see Robins, 2012). The structure of the market, in which all bidders on the spot market are paid the price bid by the highest successful bidder, creates an incentive to 'game'. It could be argued that the recent threats by coal power stations to shut down or cut maintenance if a carbon price undermined their profitability is another example of gaming. Indeed, these threats led the Australian government to offer generous assistance in exchange for commitments to maintain output. This reflects a widely held view that major power stations are 'too important to fail' – a bit like banks.

The reliance on bidding based on marginal generation costs has favoured low running cost high capital cost plant such as brown coal. The divergence between increasing peak demand and average demand has raised concerns that the present market may not provide sufficient incentive to build additional generation capacity or take other steps to manage peaks.

Demand side participation in the wholesale market has been limited, due to lack of appropriate market design and management. This is slowly being rectified. But progress has been agonisingly slow, even though it could dramatically reduce peak prices.

Vertical integration, where energy retailers invest in large scale generation, was originally not allowed. However, it has gradually evolved, as regulators have chosen not to block it. This is a convenient way for retailers to manage their risk. But it creates incentives for retailers to change behaviour in ways that support their generation assets.

The emergence of a range of competitors, including energy efficiency, distributed generation and non-dispatchable renewable such as wind, has added further complexities to market operation. For example, demand for grid-sourced electricity has declined for several years. This reduces revenue for existing generators, especially those with high debt, creating pressures that undermine their financial viability. Indeed, Sandiford (2012) has shown that recent wholesale electricity prices have been under $30/MWh, well below the long term average of $47/MWh. Some energy policy makers see this low price as a problem, yet it should be good for consumers and society.

When many industry participants and commentators refer to 'the NEM', they focus on this wholesale market. However, this is only part of the NEM. Indeed, it can be said that this element of the NEM has worked reasonably well. But, given the above issues, there is more work to be done.

Transmission and Distribution (T & D)

These elements of the NEM deliver electricity from generators to consumers. They are capital intensive assets with low running costs. They are (apart from some transmission lines) regional power line monopolies. This has led many policy makers and industry participants to see them as 'natural monopolies' and almost a 'public good'. So they are managed as regulated regional

monopolies. This approach also includes an assumption that their financial viability and profitability must be maintained at any cost. Regulators have limited powers (Coorey, 2012), and network owners have routinely won appeals against regulatory decisions.

The reality is that T & D assets are not natural monopolies in the modern electricity system – at least at the margin. Energy efficiency, demand management, energy storage, on-site generation, distributed generation, regional generation and even switching to other fuels such as gas all reduce dependence on T & D. Indeed, as these options develop, they are providing increasingly financially attractive alternatives that could allow complete disconnection from T & D networks unless T&D operators make it attractive for hosts of these competing solutions to remain connected.

Further, the shift towards more variable demand, renewable energy, including non-dispatchable sources, is complicating the operating situation for T&D owners and operators. Traditionally, the aim of the electricity supply industry has been to encourage ongoing growth in demand while also trying to achieve a demand profile that is as flat as possible. This approach supports high utilisation of T&D assets, and has complemented our traditional high dependence on relatively inflexible coal-fired generation capacity. But that has irrevocably changed.

Now, some renewable energy sources are much more plentiful during the daytime in summer – such as solar electricity. Some, such as hydro-electricity, are very flexible. Some, such as biomass, are well suited to base load operation. Consumer trends are also making the dream of the flat demand profile less attainable – and less important. The reality is that consumers value electricity most when it provides high value services such as entertainment, comfort, communication and electronic equipment, etc.

At the same time, traditional loads that have helped to maintain overnight demand are declining. Use of resistive off-peak electric water heating is declining: this is a thermodynamically poor way to use electricity, so this is a good thing. Policies driving reduction in energy waste and greenhouse gas emissions are driving a reduction in the tendency to simply leave equipment on in offices and industry outside working hours. For example, one of the cheapest and easiest ways to improve an office building's NABERS rating is to switch everything off outside business hours. Many traditional 24-hour industries are changing. Some are shifting offshore. Others are closing. And some are shifting to cogeneration (on-site generation of heat and electricity at high efficiency). Even street-lighting is finally becoming more efficient, despite fifteen years of blocking by electricity network owners, who own and maintain them.

T&D system owners now confront a rapidly changing situation. They face increasingly cheap and effective nimble competitors that are driven by fundamentally different agendas. Yet their capital intensive assets and their strong 'growth' culture limit their capacity to respond. For example, one network operator plans to invest in just one local battery storage system over the next few years to explore its potential. This is a tiny investment in an increasingly profitable activity.

The political pressure on distribution companies in particular is increasing. Network investment is the main driver of recent increases in electricity prices. The public and business outcry has led to actions such as the establishment of this Inquiry.

It is also increasingly clear that electricity network operators have been using the weakness of regulatory frameworks and their market power to increase profits and block or delay development of competitors such as distributed generation (see VCEC, 2012).

While the main focus of concern has been networks, some issues have been identified regarding transmission. In particular, the present planning and regulatory approach seems to work against expansion of interstate links, as well as failing to respond to the needs of emerging renewable energy generators such as wind farms.

The evidence is mounting (see for example the VCEC, 2012) that the network element of the NEM is seriously broken, and needs a major overhaul.

One key issue, raised by this author in submissions to the recent VCEC Inquiry in feed-in Tariffs (submissions at www.vcec.vic.gov.au), is the need to challenge the assumption that electricity networks are natural monopolies, and that competitors such as distributed generation should be paid only the costs they save the electricity retailer through reduced purchase of power, as several regulators have now proposed.

First, these decisions ignore the potentially large but variable reduction in network costs, although VCEC, for one, accepts that these benefits are real. Second, and more important, competitors to networks are being treated differently from many other industries across the economy.

On-line media and retailers are not paid the amount they save traditional print media or physical retailers. Mobile phone operators are not paid what they save Telstra's land line operations. They compete on retail prices, service quality and convenience with the traditional industries. If distributed generation and other demand side activities were treated fairly, they would be able to sell electricity to, or manage demand of, neighbours and other customers against a benchmark price that the conventional electricity industry can provide similar services to retail customers.

So a fair price for solar electricity and other distributed energy systems would be the real time retail price of 'green' (or equivalent emission intensity) electricity minus the cost of running a separate power line or paying a fair price for use of the local network at that time, whichever is cheaper and easier for the distributed generator.

A further complication in T&D is that several state governments still own these assets. There are suggestions that this has led to strategies that siphon revenue from networks to state governments. This is sometimes used as evidence of a 'conflict of interest' that justifies privatisation. In reality, it simply reflects failure to establish appropriate governance structures and mechanisms. This failure could be addressed by privatisation, or by better governance. It is not as if state governments have no experience in dealing with potential conflicts of interest in many other areas.

Lastly, evidence has been mounting that, especially government-owned, networks have been 'gold-plating' and are reluctant to invest in demand side action. A recent Australian Energy Regulator Paper (AER, 2012 p.9) showed that network owners had spent only 5 percent of the funds allocated to them under the DMIA rebate mechanism. It seems their cultural barriers are so strong that they cannot even spend money that will be completely rebated to them for demand side measures!

So a major review of the network market model is required, to take into account its competitive nature. Failure to do this will lead to ongoing over-investment in network infrastructure and delay in adoption of more cost-effective, lower emission energy solutions. It will also drive consumers to pursue more extreme and less cost-effective solutions, such as disconnecting from the grid. The networks do not have a 'right to be profitable': hard copy media, land line telecommunications, traditional retailers of goods and services have no such right.

Electricity Retailing

Electricity retailers are effectively brokers and an interface between the rest of the electricity industry and consumers. They may also sell appliances, energy management services, other non-energy products and services. They may also own a variety of electricity generation assets, both small and large. Electricity retailing outside Victoria, particularly for residential and small business consumers, is still regulated and even owned by some state governments. This can distort pricing structures.

Some retailers are introducing a wider range of services to assist customers in their management of energy and energy costs.

Victoria is the only jurisdiction in which retailing has been privatised and deregulated. Electricity industry and policy studies have argued that the Victorian market is a success, and that this model should be followed by other jurisdictions as quickly as possible.

In reality, the Victorian retail electricity market is seriously deficient. So how could it be called a success? It all depends on the criteria. According to policy studies, the Victorian retail market is the most competitive in the world. This is 'proved' by the very high rate of consumers changing retailers – around 28 percent in 2010-11 (ESC, 2011 p.4). Energy policy makers argue that this high rate of churn shows that consumers are actively making choices, and that retailers are competing effectively. Unfortunately, a number of other criteria, conveniently ignored by policy makers, tell a very different story.

First, retailing costs for Victorian consumers are very high in comparison with other jurisdictions. The AEMC (2011) estimated that the Victorian retailing component of residential electricity prices was higher, and increasing faster, than those in other jurisdictions, as shown in Table 1, from AEMC data.

TABLE 1. Comparison between Victorian and average national retail electricity costs, 2010-11 and 2013-14. (Source: various Tables in AEMC (2011) *Possible Future Retail Electricity Price movements: 1 July 2011 to 30 June 2014, Final Report, Sydney*). AEMC notes that values for Victoria are based on published tariffs, not contract prices offered to individual customers, which are not public. So actual retail costs are probably lower.

	Total (cents/kWh)		Retail (cents/kWh)		Retail (% of total)	
	2010-11	2013-14	2010-11	2013-14	2010-11	2013-14
National	22.41	30.75	3.36	4.37	15.0	14.2
Vic	22.86	30.32	5.88	8.23	25.7	27.1

This reflects the reality that much of the claimed 'competition' is simply customer churn, driven by a number of factors, including:

Aggressive and dubious door-to-door and call centre sales tactics documented by the Victorian Energy and Water Ombudsman and the Essential Services Commission (ESC, 2011 pp. 1-2). Also see Wells, 2012.

Costs of marketing, advertising, paying sales staff, administration and provision of incentives to customers to change retailers: given AGL's NSW data (below), AEMC's estimates of higher retail charges in Victoria and the 28 percent rate of churn, the cost of retailers gaining new customers seems to be adding well over $50 annually to an average Victorian household electricity bill.

As AGL Energy managing director Michael Fraser recently commented when interviewed by commentator Giles Parkinson (RenewEconomy 22 August 2012 *Ten Things We Learned from AGL's Michael Fraser*):

> "There is a massive battle for customers in the retail electricity industry, a complex and fiercely competitive business. AGL says it added a whopping 152,000 retail electricity customers in NSW alone during the year, although it experienced slight falls in Victoria and South Australia. But the cost of obtaining those new customers, finding them, advertising and offering discounts, jumped sharply to $192.43 in NSW, from $162.93. Those costs are passed on to all consumers – and given that the "churn" rate in the industry is 20 per cent – that is one-in-five customers changing retailers every year – it seems that electricity customers are paying more for the cost of signing up their neighbours than they are for green energy schemes."

Numerous anecdotes suggest that many customers who change retailers have either been confused by aggressive sales people (who are often on commission) or have changed because of dissatisfaction with their present retailer: customer complaints increased to 111,047 in 2010-2011, more than double the previous year (ESC 2011 p.1). Often they are no more satisfied with their new retailer, and change again.... Confusion about the roles of retailers and networks have added to consumer dissatisfaction, for example with regard to the roll-out of smart meters and management of installation and billing for solar PV systems (see VCEC, 2012).

This can hardly be described as a 'successful' market. Yet energy policy makers seem to have convinced themselves that it is. There is a risk that, if the Victorian model is rolled out more widely, electricity prices could be driven even higher.

As noted earlier, major energy retailers are investing heavily in electricity generation assets, despite the original policy intent to keep retail and generation separate. The impact of this behaviour must be assessed and, if it is a problem, addressed.

So there is a clear need for a lot more work on the design and operation of energy retailing.

Summary

Overall, it can be seen that only the wholesale market and possibly transmission elements of the NEM have worked anywhere near satisfactorily. Networks, retailing, and ownership of generation and retailing by single (or closely related) businesses, all need a lot of work to address existing

problems. All elements of the present model need even more work if they are to facilitate viable business models for the emerging future of declining demand, innovative competitors and declining greenhouse gas emissions while meeting consumer expectations and societal objectives.

Some History of Energy Market Reform

This submission discusses only a few key aspects of the evolution of the NEM. An excellent paper by McLennan Magasanik Associates for the Total Environment Centre (MMA 2009) as well as a review by Gavan McDonnell (2005) provide much more detail.

Consideration of the history is important, because it shows how the energy sector has progressively distorted the objectives of National Competition Policy and ignored policy directions set by CoAG and Australian Governments. The history of energy market reform is a story of serious policy failure under successive governments since the early 1990s.

To the outside observer, the typical response of energy policy makers to critiques of the NEM model over the past two decades could be described as:

- Denial that there is a problem
- Reluctant acceptance that there is an issue
- Re-interpretation of broad policy directives from government, CoAG, and/orMCE into narrow terms of reference and objectives that fail to recognise the fundamental nature of the directives: the NEM objective (see below) and the framing of the approach in its *Power of Choice* process (see Appendix 1) are examples of this
- Lengthy, complex processes to analyse the issue: these processes have effectively frozen out much independent input by producing very long and technical reports, and lack of provision of funding for community input and independent analysis (although this has improved over time)
- Recommendation of minor adjustments that, it is claimed, will address the problem while maintaining the integrity of the NEM and its objectives
- Lengthy efforts to implement these minor adjustments,
- Eventual evaluation of progress that finds there are still problems
- Build-up of community concern that the solutions have failed to deliver the claimed outcomes
- Iteration of this process

The present *Power of Choice* process, while being an improvement on past processes, still reflects most of these steps. The process started in 2007. MCE has intervened to expand terms of reference in response to AEMC's narrow interpretation of the original ones – see Appendix 1. A final draft report has recently been published, with many worthwhile proposals in it. But how many of these will remain in the final report? How long will it take to implement them? Will they deliver the desired outcomes? Can we trust the electricity industry to deliver, given its past record? We will not know for several years unless clear interim milestones and contingency responses where they are not met are locked in.

Hopefully this Inquiry will change this approach and introduce more accountability and more consideration of societal goals. This is long overdue.

The First Fifteen years of Reform: steps towards policy failure

A Special Premiers' Conference in November 1990 made formal commitments to develop a National Electricity Market. A further meeting in mid 1991 finalised these arrangements. The Council of Australian Governments (CoAG) has continued to pursue this agenda. The development of National Competition Policy in the early 1990s created a comprehensive national policy framework that supported pursuit of electricity industry restructuring. As part of this process, commitments to offer up to $4.2 billion to states in return for their participation in development of the competitive electricity market were made.

The National Grid Management Council was established to oversee the detailed development of the market framework. It was comprised of five representatives from the existing electricity generation industry and two government representatives (Tasman Institute, 1991). No effective provision for broader community or business involvement seems to have been made. Indeed, the NGMC did not even include its contact details in a number of its discussion papers.

The framework of competition policy proposed by the National Competition Policy Review chaired by Professor Fred Hilmer included recognition of the possibility that some public interest issues, such as environment, may not be adequately dealt with via pure market solutions. The Independent Committee of Inquiry chaired by Hilmer (1993) pointed out:

> "Competition policy is not about the pursuit of competition *per se*. Rather, it seeks to facilitate effective competition to promote efficiency and economic growth while accommodating situations where competition does not achieve efficiency or conflicts with other social objectives. These accommodations are reflected in the content and breadth of application of pro-competitive policies, as well as the sanctioning of anti-competitive arrangements on public benefit grounds."

This statement indicates that the structures of competitive market frameworks developed under national competition policy - that is the market rules and price signals themselves, were intended to pro-actively support social objectives (which can be interpreted to include environmental objectives that have broad community support), not just rely on regulatory controls to limit impacts and provide 'safety nets'.

Consistent with the view put by Hilmer, the Commonwealth and State governments specifically recognised the need to address environmental issues in restructuring of the electricity sector when they included as the first objective of the National Grid Management Protocol (NGMC, 1992):

> "to encourage the most efficient, economical and environmentally sound development of the electricity industry consistent with key National and State policies and objectives"

Other relevant NGMC objectives were:

> "to provide a framework for long-term least cost solutions to meet future power supply demands including appropriate use of demand management" and
>
> "to maintain and develop the technical, economic and environmental performance and/or utilisation of the power system"

Governments failed to incorporate the consideration of social and environmental issues into the energy reform charter given to the National Competition Council, which supervises progress on energy market reform. In contrast, environmental considerations were part of its mandate on water reform (NCC in evidence to Senate Inquiry into Global Warming, 2000). This failure has had clear consequences for the structure of the reformed energy markets, particularly exclusion of criteria beyond 'economic' factors.

Major CoAG policies such as climate policy (including both the 1992 National Greenhouse Response Strategy and the 1998 National Greenhouse Strategy, as well as the Ecologically Sustainable Development process) included clear guidance for energy market reform. These were also ignored.

In 1993-94, the NGMC considered options for incorporating demand management in the electricity market model, and rejected them all, despite the NGMC Objective's clear inclusion of DM.

State regulators, such as Victoria's Office of the Regulator General and, later, Essential Services Commission also had terms of reference that limited consideration of environmental and social issues. Further, the ESC was (and is) required to "facilitate the financial viability of the regulated industries" (Govt of Victoria, 2001). This undermines fair treatment of emerging competitors and creates a serious risk of a welfare scheme that protects the existing electricity industry. For example, the author put a question on the interpretation of this sentence to a senior Victorian energy policy officer in a public forum some years ago. I asked how the ESC might respond if the adoption of measures such as energy efficiency (which is not regulated by ESC) threatened the financial viability of the existing electricity industry that is regulated by the ESC. My concern was that the ESC might be bound to oppose energy efficiency measures. I did not receive a meaningful reply.

In 2001, CoAG proposed a review of progress on energy market reform. Former Howard government energy minister Warwick Parer led this review, which reported to CoAG in December 2002 (IREMD 2002). The review found that "there are many impediments to the demand side playing its true role in the market" (p.9). It also noted (p.9) that "there are some barriers to embedded generation, which limit the benefits that could be gained in this area." The review also recommended introduction of a greenhouse emissions trading scheme so that electricity prices would incorporate appropriate signals (p.40).

This brief history of the early evolution of the NEM shows a serious policy failure. CoAG and energy ministers failed to ensure that energy reform policy reflected broader policy issues, as originally intended. This failure has undermined progress towards a sustainable energy market model, and has strongly favoured the existing electricity industry. It has led to creation of a flawed market model that is now driving up consumer costs.

The consequence of this is that energy market rules, as developed, conflict and 'compete' with other major policies, increasing costs, creating confusion and undermining progress in other important policy areas.

Recent Developments

Ongoing development of the NEM has continued to this day, and a number of processes are in train at present. These are documented in other places, such as MMA (2009) and documents from AEMC,

AER and AEMO. The AEMC's recent draft *Power of Choice* report proposes further changes but, as noted in Appendix 1, this still falls far short of what is needed. These ongoing changes should be considered when the Select Committee is formulating recommendations. However, the limitations of the AEMC process scope and the lack of firm timelines, clear accountability and contingency measures means there is still great uncertainty about if, when and how the draft proposals will be delivered, and the extent to which they will solve the underlying problems.

It is important to address some overarching issues that have increased electricity costs and slowed adoption of measures that reduce consumer costs and help to achieve other policy objectives.

First, the NEM Objective is inappropriate. Table 2 states some aspects of the NEM Objective and explains why they are problematic.

Table 2. Excerpts from NEM Objective (www.aemc.gov.au) and explanations of why they are inappropriate.

NEM Objective	Comments
Promote efficient investment in and efficient use of electricity and natural gas services for the long-term interests of consumers of electricity and natural gas with respect to:	The word 'efficient' has been interpreted by energy policy makers to mean 'econonomically' efficient from a narrow perspective (see below)
Price [not total cost], quality, reliability and security of supply of electricity and natural gas [not energy-related services] and	The 'long-term interests of consumers' seems to have been interpreted as being addressed through low energy prices, quality, reliability and security of supply of electricity and gas via traditional centralised solutions. As discussed later in this submission, it is the total cost (consumer bills, including factors such as fixed charges, and societal costs) that affect the long-term interests of consumers. For example, if a consumer needs to use only half as much electricity to provide a useful service, a doubling of the unit price of electricity would lead to no overall increase in energy bills. Further, the interests of consumers are improved by delivery of the services they want, not provision of energy (or electricity) per se. While many services now involve use of certain amounts of grid-sourced electricity and gas, this may not be the case in future.
	The NEM Objective includes no reference to consistency with and proactive support for other aspects of government policy such as environment, pricing of CO2, , equity, etc. This fails Hilmer's Competition Policy guidelines, discussed earlier.

In a discussion with a senior Victorian energy policy adviser, it was explained to me that, by focusing only on 'economic' regulation, the intent was to avoid placing the regulator in a situation where it had to balance multiple policy issues. It was considered that this broader picture was a role for government. This lack of faith in the capacity of energy policy agencies, regulators and market participants to cope with more than one dimension is surprising to the author. Further, the reality is that other policy areas have failed to 'take up the slack' and adequately consider energy market

related issues while developing policy. For example, neither building regulations nor appliance efficiency standards include appropriate consideration of impacts of building and appliance performance on peak electricity demand. So there is a policy gap.

In some cases, other policy measures 'compete' with energy market policies, effectively driving conflict and undermining outcomes. For example, the response of an electricity generator to carbon pricing will also incorporate its response to energy market rules and other policies and market factors. Generators gain more revenue by selling more electricity or higher-priced electricity. So their response to the combination of carbon pricing policy and electricity market policy is likely to be a focus on reducing the greenhouse intensity per unit of electricity, but selling more at a higher price. This means they will not encourage investment in the societal 'least cost' solutions such as energy efficiency, demand management and distributed generation. Instead, they will invest in what are, according to ClimateWorks (2009) among the highest cost emission abatement measures: investment in supply side abatement such as lower emission power stations. Clearly the overall outcome of carbon pricing and electricity markets will not deliver the intended societal 'least cost' outcome unless the NEM signals to participants are changed.

This situation is reflected in the submission by International Power to the Prime Minister's Energy Efficiency Task Group (2010):

> "IPRA rejects any proposal to introduce climate change policy, *under the guise of energy efficiency measures*, which has the potential to destroy the value of existing investments in the generator sector." (International Power submission to PM's EE Task Group, 2010)

Clearly the most cost-effective abatement response option from a societal perspective, energy efficiency, conflicts with the way the electricity market works at present. This is a serious problem with the electricity market.

There is also a (hopefully largely unconscious) distortion of energy policy debate towards defining issues in ways that best suit the existing industry, and often undermine adoption of competing emerging alternatives. An obvious example of this problem is the attitudes to demand management and energy efficiency (for example, as documented in AER 2012, p.9).

While, in principle, demand management is recognised as a way of limiting the costs and risks of peak electricity demand, the industry has conspicuously failed to capture most of its potential. While regulators have introduced various ways of rebating DM implementation costs, this incentive seems to be outweighed by the loss of profit from less expansion of their capital assets.

There is a widely held view in the industry that energy efficiency improvement is not an effective or desirable means of managing peak demand. In reality, well-designed and targeted energy efficiency measures can very effectively reduce peak demand (see later in this submission). However, they may also reduce demand at other times as well, undermining the revenue of the existing electricity industry but reducing overall consumer costs.

Since energy policy makers seem to pay much more attention to the existing industry than to 'outsiders', it seems that neither energy market rules, nor other elements of government policy have been used to encourage application of energy efficiency to peak management. I noted earlier that neither the building code, nor appliance efficiency programs include requirements to manage peaks,

nor do their cost-benefit studies in Regulatory Impact Statements place much emphasis on the economic benefits of reduction of peak demand.

Similarly, as pointed out earlier in this submission, distributed generation is especially discriminated against in energy market policy by being paid only what it saves the existing electricity industry, rather than what it could reasonably be paid in the retail market if it were free to negotiate with nearby neighbours to sell them electricity. This reflects a (hopefully unconscious) tendency to protect the welfare of the existing industry at the cost of competitors and consumer, and improved policy outcomes in other areas such as climate abatement costs, social justice and development of new industries.

The cultural dimension of energy policy towards supporting the incumbent industry can be illustrated by the recent VCEC Feed-in tariff Inquiry (VCEC, 2012). This inquiry proposed a minimum feed-in price of 8 cents/kWh for exports from small distributed generation such as photovoltaics. This was based on the avoided energy costs for retailers. However, VCEC noted that PV provided an additional, potentially large, saving through deferral of network infrastructure. Yet it chose to exclude this factor from the recommended feed-in price.

This is typical of decision-making in the energy sector: if there is a clear benefit but it is uncertain, the approach is to set the value of the benefit to zero until an 'accurate' value can be determined – but no formal process is put in place to achieve this. Indeed, this is the approach that climate modellers have traditionally taken in Australia. In a round-table the author attended as part of the Senate Inquiry into Climate Change (2001), ABARE representatives were asked why they looked only at the costs of response to climate change, and ignored the costs of failure to manage it. Their response was that the latter costs were very uncertain, and they did not have the resources to make a credible estimate: so they set the cost of allowing climate change to zero.

A more sensible approach would be to consider a range of values for poorly defined benefits or costs, so that policy makers could make an informed judgement. Alternatively, in the example of the FiT inquiry, VCEC could have proposed a 'reasonable' default value for avoided network costs as a way of applying pressure to network operators to conduct analysis to confirm or refute it. But VCEC preferred to prolong a recognised market distortion rather than to risk criticism that its estimate was wrong. This approach rests on a value judgement that it is better to leave a distortion in place, with adverse consequences for emerging industries and climate, than to adopt an approach based on 'best existing knowledge' and create an incentive for the electricity industry to produce higher quality data. This is not good policy making.

VCEC also justified its decision to ignore the network benefits in other ways. First, it pointed out that network benefits were related to peak demand rather than consumption. The Commission then argued that allocating network savings through a feed-in tariff was inappropriate. But VCEC could have proposed a reduction in fixed charges for PV owners, or looked at NEM data to estimate the impact of a typical PV system on peak demand and hence network peak load. Alternatively since Victorian PV owners are mostly on time of use tariffs, they could have proposed a revised TOU pricing structure that emphasised the benefits of reducing peak demand. But it chose not to.

Second, VCEC pointed out that the network benefits of PV systems vary, depending on how tightly constrained the local network capacity is, and even the orientation of PV systems. This is correct. But

the electricity rules allow for broad smearing of many other costs on a regional and time basis. So this could have been done for distributed generation. Or VCEC could have proposed regional pricing, as is being trialled in Western Australia. Instead, it was easier to set the benefit to zero.

The next section of this submission outlines an alternative approach to energy policy that reflects the emerging realities of increasing uncertainty and volatility, and the need for energy policy to complement other aspects of government policy.

Electricity System Design to Reflect Emerging Realities

Things are changing quickly in the energy world. After growing almost continuously since the emergence of the electricity industry, NEM consumption has declined for several years. Indeed, according to analyst Hugh Saddler, we are back to the 2003 consumption level. This impacts on the business models of the capital intensive electricity supply industry designed to operate in an environment of growing sales. There is increasing competition from diverse alternatives, including energy efficiency, distributed generation, natural gas, smarter management of consumption, and so on.

Many of these competitors are far more nimble than the existing industry. They can roll out fast, and can rapidly capture large economies of scale and cost reductions through 'learning'. Many of them compete with increasingly expensive retail electricity, and decisions to adopt them can be driven by many factors unrelated to electricity usage and cost.

So any business considering investment in large, lumpy projects faces increasing uncertainty and risk of building stranded assets – assets that won't be fully used, and won't recover their costs. T&D owners can pressure regulators to pay them more, to offset losses. But generators and retailers are vulnerable. As discussed earlier, this raises the question of whether the existing industry should be protected and compensated as change sweeps through. The answer in telecommunications, media and other industries has been 'No': this is innovation at work. The existing electricity businesses carried out due diligence studies when they bought assets and invested in new ones. They are big enough to cope with the consequences of their actions, including paying the price for their poor decisions. That is how markets are meant to work.

The big fear of policy makers and politicians seems to be that the industry will create crises such as black-outs if it is not 'looked after' via what is effectively an electricity industry welfare scheme. As noted earlier, some brown coal power stations successfully bullied government into offering substantial compensation for carbon pricing, even though their due diligence processes should have considered this risk. In other industries, things are very different.

This fear is reinforced by the belief among energy policy makers and many in the electricity industry that electricity consumers do not have alternatives. But they do, especially if they have some time to develop and implement them, and institutional support to drive progress. We can manage and reduce electricity demand (and usually save money). We can now invest in distributed renewable or low emission energy sources and energy storage if we are not blocked by market power, market rules and institutional barriers.

Energy Fundamentals

No-one needs electricity for its own sake. Energy is just one input to complex technological and social systems that deliver needed or desired 'useful services'. The amount and form of energy needed to provide a useful service can vary enormously. For example, to provide comfort in a home in winter, some of the options include:

- Designing the home to need little or no heating energy, through insulation and solar input
- Using natural gas or wood to provide heat
- Using a fuel cell or cogeneration unit to provide heat, and electricity as a useful by-product
- Using a resistive electric heating system or an electric reverse cycle air conditioner
- Putting on a jumper
- Heating part or all of the home
- Setting the thermostat higher or lower

Some of these options involve little or no use of electricity (and may even generate an excess of electricity). Others (such as the reverse cycle air conditioner) involve much less electricity usage than traditional resistive electric heating technologies.

So the present electricity market focus on unit price of electricity as an indicator of success is flawed. Indeed, there is no such thing as an 'electricity service' either: this is a service that *must* be provided by (grid sourced) electricity. An efficient TV can use very little energy, and could be run using on-site electricity generation and storage. In practice, there are 'useful services' (which themselves are culturally defined) provided by technology and influenced by user behaviour. They may involve consumption of more or less, or no grid-sourced electricity.

Fundamentally, it is our demand for 'useful services' mediated by our technologies and behaviour that drive demand for energy, including electricity. Australian energy policy has put the cart before the horse: we build energy supply capacity based on forecasts of ever-growing demand for electricity.

In the past, this made some sense, as electricity supply infrastructure took a long time to build, had high capital costs, and was 'lumpy' in that large modules of capacity were added by each project. But we now live in a different world. We can reduce grid sourced electricity consumption in small increments by rolling out energy efficiency programs at varying rates, or installing on-site generation (which reduces metered electricity consumption).

We can now increase electricity supply in small increments by varying the rate at which wind generators, solar generation capacity or micro-hydro plants are installed. These approaches are fundamentally less risky, do not require long planning and construction timeframes (as long as legislation or regulations do not block them) and provide more stable employment than traditional electricity supply projects.

We can shift the timing of demand for electricity in many ways, by encouraging behaviour change, energy efficiency, demand management and energy storage. Many of these options are already cheaper than new large-scale electricity supply infrastructure, and costs continue to decline while performance improves.

Yet the present electricity market model slows and blocks these options.

The myth that energy efficiency does not reduce peak demand

This is a critical issue. If energy efficiency does not help to manage peak electricity demand, we are left with demand management through load shifting, energy storage and increased generation capacity to deal with peaks. Reducing peaks is critical to limiting electricity price increases due to investment in rarely used energy supply infrastructure.

However, the electricity industry's perception of the peak demand problem is different from society's. The industry is concerned to maintain profits. Within the present market framework, this leads to a mixture of motives:

Since generators are paid based on the maximum accepted bid price in each bidding interval, they have a vested interest in increasing the threshold bid price accepted by AEMO, as all generators operating at that time can gain windfall profits. This can swamp losses from selling less electricity, as the price can reach up to $12,500/MWh compared with an average of $30-50/MWh. Indeed, AEMO data have shown that generators gain a disproportionate amount of their annual revenue in relatively few hours of high wholesale prices.

Networks can justify additional capital investment to the regulator if peak demand increases. If the regulator accepts the need for the investment, the network owner can earn a guaranteed rate of return on the investment. Further, this 'grows the business' so it allows costs to be spread over a bigger capital base.

However, if generators and networks capture the above benefits, retail electricity prices and charges must increase, and consumers face higher electricity bills. This means competing options such as distributed generation, gas and energy efficiency become more attractive. Further, it can create political problems and adversely impact on the industry's reputation.

Where pressure is applied to adopt alternatives to increasing network capacity, the preferred option is to shift load to times of lower demand, and to do this by investing more within networks rather than on the consumer side of the meter. This increases regulated returns for networks. Networks also gain more revenue if their assets are better utilised, while less flexible power stations (such as coal-fired units) can provide a larger proportion of total electricity because the demand is less variable.

Managing peak demand by driving energy efficiency is widely perceived as being a negative for the existing electricity industry. Some EE measures may not reduce peak demand, but may cut electricity sales much of the rest of the time (for example, switching off equipment outside working hours). In other cases, it may reduce peak demand but also cut demand at other times (for example, an efficient refrigerator cuts demand at all times, while an energy-efficient building fabric reduces both peak demand and heating and cooling energy requirements at all other times). So many energy efficiency measures disproportionately reduce electricity industry revenue, even when they do reduce peak demand.

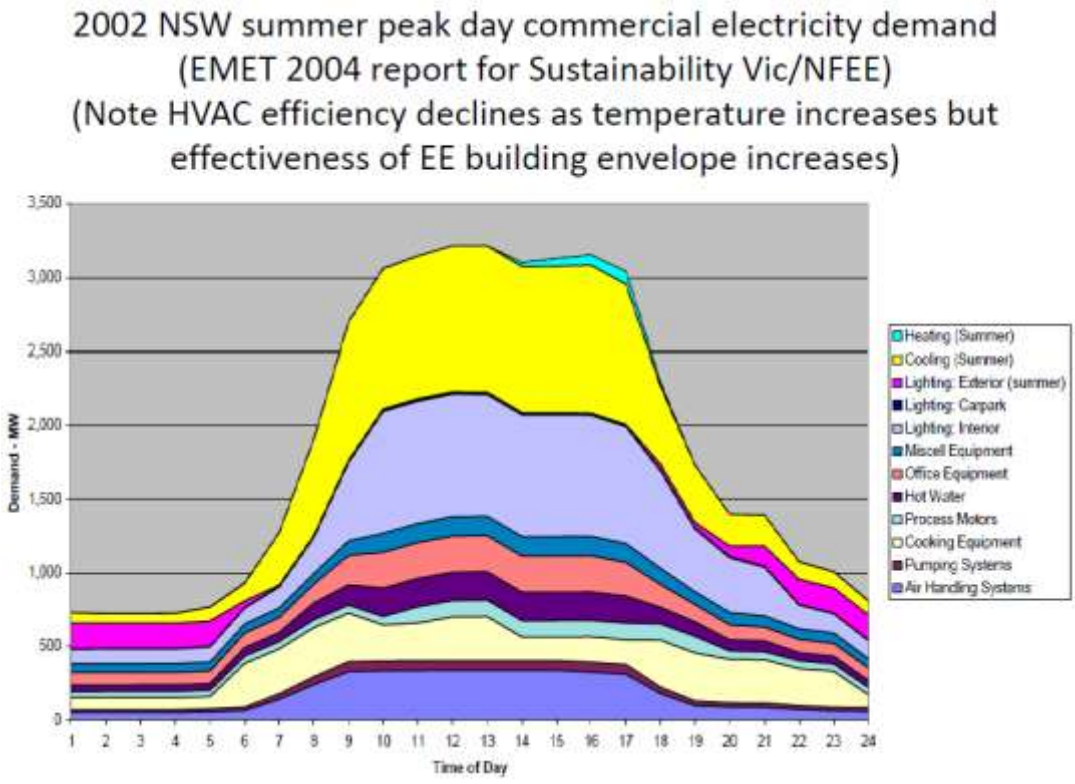
So the electricity industry is conflicted over how it responds to peak demand. In particular, energy efficiency measures are the least preferred solution. Yet energy efficiency measures can reduce peak

demand if applied appropriately while also reducing consumer energy costs and greenhouse gas emissions. While this does reduce electricity industry revenue, it is a positive benefit for society, as it saves consumers money, cuts greenhouse gas emissions and helps to defer or avoid investment in high capital cost electricity supply infrastructure.

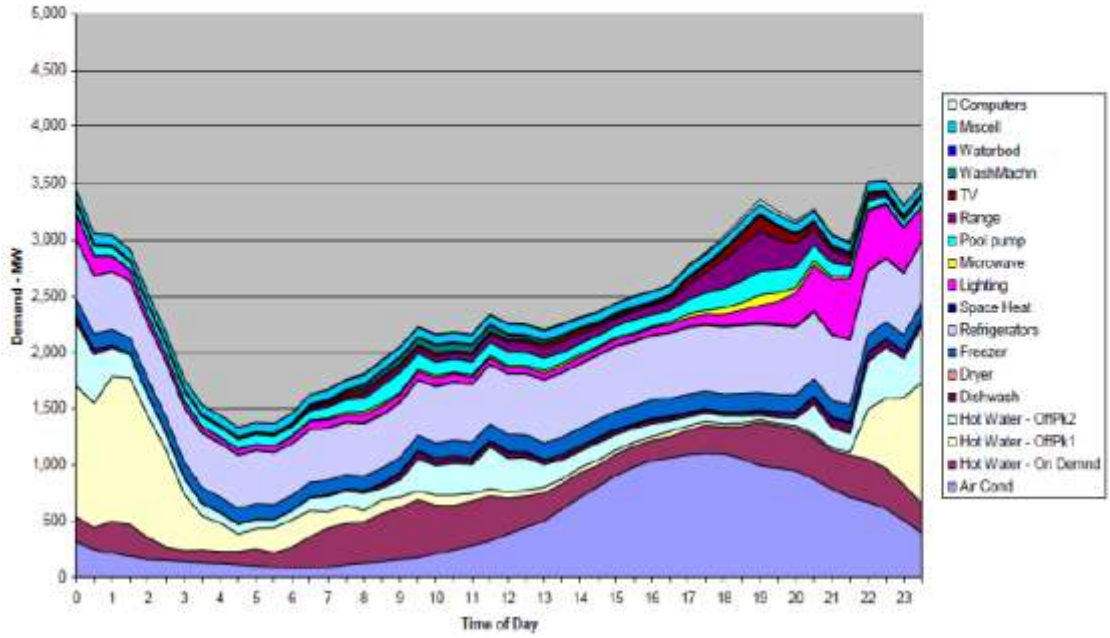
As can be seen from the Figures below, which show electricity demand profiles for the peak NSW summer day in 2002, energy efficiency measures can be targeted towards the equipment that is running at times of peak demand, to reduce that demand. This is not rocket science.

But it is important that energy efficiency measures are pursued in parallel with reduction in peak demand. If not, both the electricity industry and consumers can potentially suffer. This scenario would mean that the electricity industry could spread its costs over a smaller amount of electricity sales, while it would still have to keep investing in expansion of electricity supply infrastructure to cope with the growing peaks. Indeed, AGL recently described this scenario as the 'death spiral' which would adversely impact low income households while encouraging others to invest in alternatives to consuming electricity. This would lead to ongoing increases in electricity prices that would drive lower and lower consumption.

Figure 1. NSW 2002 peak summer day demand for commercial and residential sectors (EMET, 2004)



2002 NSW summer peak day residential electricity demand (EMET 2004 report for Sustainability Vic/NFEE)



A positive vision

Many studies show that there is very large potential to improve energy efficiency. Indeed, the International Energy Agency sees energy efficiency as the major mechanism to cut global energy-related greenhouse gas emissions over the next few decades. Locally, ClimateWorks (2010) and others have published extensive analysis to show that there is large cost-effective energy efficiency potential in all sectors of the economy. The mix of smart controls and monitoring to drive demand management, 'smart' short term forecasting, an increasing variety of low and zero emission energy sources, energy storage and energy efficiency potential offer us a powerful toolkit to provide the 'useful services' Australian households and businesses need and want at affordable costs and much reduced environmental impact.

But we need a coherent policy framework that supports the ongoing adoption of these options, rather than the ad hoc, often perverse and conflicting approaches we now use. It is therefore critically important to align the signals sent by the electricity market to other major societal objectives rather than let them conflict. It is also critical to ensure that both energy policy makers and the electricity industry itself are held accountable for delivering the outcomes society wants, not what is good for the existing electricity industry.

It is also critical that policy makers in other areas that interact with electricity incorporate mechanisms to support reduction of peak electricity demand and electricity consumption from high emission options. These include, for example, building energy regulation and policies, appliance efficiency policies, business innovation policies, social welfare policies, education and training to mention a few.

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APPENDIX 1: COMMENTS ON MCE TOR VS AEMC INTERPRETATION of AEMC Power of Choice PROCESS

Comments: Adjunct Prof Alan Pears AM July 2012

The following extracts from a number energy policy documents demonstrate how the terms of reference for the *Power of Choice* process were 'redefined' by AEMC in ways that limited the scope and undermined the effectiveness of the policy recommendations.

The MCE proposed Terms of Reference for the AEMC *Power of Choice* Review as follows:

> As reflected in the policy response, the MCE supports the AEMC proposal for a third stage of the DSP Review (Stage 3 DSP Review) to consider the implications of smart grid and smart meter technologies in the National Electricity Market (NEM). In addition, the MCE also agreed that the Stage 3 DSP Review should have a broader focus to incorporate the ability of electricity market frameworks to facilitate efficient investment in, and use of, DSP[1] in the NEM.

This suggests a lack of satisfaction with the Stage 2 review's scope. Note also that this does not limit the review to 'efficient investment' only by participants in the electricity market. It could be seen as a broader brief to include investment by others, such as firms like Samsung, who are developing home energy management systems, IT firms, appliance manufacturers or builders.

> Consistent with the National Electricity Objective (NEO), the Stage 3 DSP Review should seek to identify market and regulatory arrangements that enable the participation of both supply and demand side options in achieving an economically efficient demand/supply balance in the electricity market.

This is a broad TOR. Presumably 'economic efficiency' is meant to be seen from a societal perspective, not that of the individual market participants. But the focus of AEMC is on market participant financial aspects.

In the March Directions Paper, the AEMC redefines the TOR to be:

> We consider that the objective of this review is to identify opportunities for consumers to make informed choices about the way they use electricity, and provide incentives for network operators, retailers and other parties to invest efficiently so that there is increased confidence that demand and supply side options are given equal weight in satisfying the community's demand for energy services.

This focuses on 'informed choice' by consumers, which is a very small subset of the TOR. While 'other parties' are mentioned by AEMC, the focus of response is on networks and retailers. For example, appropriately designed building regulations could focus on limiting peak electricity demand of new and refurbished buildings. Incentives could be provided to appliance retailers to encourage adoption of high efficiency air conditioners. And MEPS could be strengthened. Incentives could be offered to households to include some energy storage in their PV systems. While these are beyond the powers of AEMC, they are legitimate responses to the TOR to the extent that AEMC could recommend that they be considered by MCE (now SCER).

Later in the Directions Paper, the AEMC notes:

> **Terms of Reference**
>
> The Terms of Reference (ToRs) specifically require the AEMC to consider the following key areas:
>
> - the efficient operation of price signals, which includes the tariff setting process and incentives for operating and capital expenditure;
> - the market frameworks required to maximise value to consumers from services enabled by new technologies (such as smart grid/smart meter and load control capability); and
> - the effectiveness of regulatory arrangements for energy efficiency measures and policies that impact on or seek to integrate with the NEM (such as retailer obligation schemes).[6]
>
> The AEMC will also consider other matters relevant to the objectives of the review.

This also reflects AEMC's focus on market participants rather than the broader agenda proposed by MCE.

So the process is flawed from the start.

MCE also notes:

> The MCE recognises that the Stage 2 DSP Review was undertaken with an explicit focus on the Rules to determine whether there were material barriers to the efficient and effective use of DSP in the NEM. The AEMC Stage 3 DSP Review should have a broader focus covering electricity market frameworks for facilitating efficient investment in, and use of, DSP in the NEM. The review of electricity market frameworks would include all electricity market arrangements and transactions that impact on the electricity supply chain, the Rules, other national and jurisdictional rules and regulations and market behaviours.

Clearly MCE tried to get AEMC to broaden its perspective, but AEMC seems to have limited its scope.

MCE listed the following specific issues to be considered (note I have not included the full text in these areas from the MCE document but selected key excerpts to make my points):

> *Efficient operation of price signals*
>
> The AEMC should assess the technical and administrative restrictions and barriers to the efficient operation of price signals[4] in the NEM and their potential to promote efficient consumer DSP through enhancing consumers' ability to make informed choices concerning their use of electricity services, including the quantity and timing of their electricity consumption. Considerations should include, but not be limited to:

At present, network price signals are very 'smeared' and my understanding is that retailers are charged at least some TUOS and DUOS for PV output, even though the broader networks and transmission systems are not used.

Effectiveness of regulatory arrangements for energy efficiency

The AEMC should assess the potential for energy efficiency measures and policies to promote efficient use of, and investment in, DSP in the stationary energy sector, and undertake a stocktake and analysis of regulatory arrangements for energy efficiency measures and policies that impact on or seek to integrate with the NEM, such as retailer obligation schemes. Considerations should include, but not be limited to, the potential:

This clearly asks AEMC to consider policies beyond the energy market that might facilitate effective action.

Market frameworks to maximise value to consumers from services enabled by new technologies, such as smart grids.

The AEMC should assess the market frameworks that would be necessary to maximise the economic value to consumers of services enabled by new technologies, including smart grid/smart meter and other load control technologies. Considerations should include, but not be limited to, measures for:

This point emphasises that the focus should be on maximising economic value to consumers of services, not individual businesses in the energy market.

A fundamental issue affecting the Review is its focus on 'electricity services', that is, services involving use of electricity. This is a flawed framework. In practice, people want services that may be satisfied by many options including electricity, gas, renewable energy and efficient technologies. They may also reframe their needs for services in response to cultural change.

Even within the limits of 'electricity services' there is a tendency to assume that demand must be satisfied when it occurs, and that electricity networks and transmission systems are 'natural monopolies' when they actually compete with many other alternatives.

Electricity networks should be required to compete, not supported by a welfare scheme. For comparison:

Mobile phone operators are not paid based on the amount they save Telstra's landline operations

On-line media and retailers are not paid based on the amount they save suppliers of hard copy newspapers or shops

The water industry seems able to encourage alternative sources of supply such as rain water tanks and water efficiency that reduce dependence on their water supply networks

At a minimum, regulated arrangements with alternative energy service solution providers should be linked to the actual prices at the points and times when they provide those alternatives. For example, rooftop PV competes with retail 'green' electricity prices, not with wholesale electricity.