TOTAL ENVIRONMENT CENTRE INC.
National Electricity Market Campaign
Suite 2, 89-97 Jones Street, Ultimo, NSW 2007
Ph: 02 9211 5022 | Fax: 02 9211 5033
www.tec.org.au

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Mark Byrne
Energy Market Advocate

Glen Wright
Energy Market Researcher

Total Environment Centre's National Electricity Market Advocacy

Established in 1972 by pioneers of the Australian environmental movement, Total Environment Centre (TEC) is a veteran of more than 100 successful campaigns. For nearly 40 years, we have been working to protect this country's natural and urban environment, flagging the issues, driving debate, supporting community activism and pushing for better environmental policy and practice.

TEC has been involved in National Electricity Market (NEM) advocacy for eight years, arguing above all for greater utilisation of demand side participation (DSP) — energy conservation and efficiency, demand management and decentralised generation — to meet Australia's electricity needs. By reforming the NEM we are working to contribute to climate change mitigation and improve other environmental outcomes of Australia's energy sector, while also constraining retail prices and improving the economic efficiency of the NEM — all in the long term interest of consumers, pursuant to the National Electricity Objective (NEO).

TEC's vision is of an electricity system that is both clean and affordable. This can best happen via:

- The rapid replacement of polluting coal and gas fired power stations with large-scale renewable energy generation and related infrastructure.
- Greater demand –side participation – that is, increased energy efficiency, demand management and local generation (TEC's primary area of expertise).
- Smarter, more interactive grids with more consumer empowerment.
- Better regulation to implement these changes.

TEC's ultimate objective is for Australia to play role in creating safe global climate. In this respect reform has been lagging behind not only government policy, such as the Clean Energy Futures (CEF) package and the Renewable Energy Target (RET), but also scientific observations of a rapidly deteriorating climate. There is therefore a pressing need to transition to a low carbon energy system and economy. This will entail some short term costs, but will ultimately be cheaper that delaying action, as shown by the Stern report, and, in the Australian context, the Garnaut Review, and is therefore in the long term interest of consumers.

TEC thanks the Senate for the opportunity to make this submission. In it, we respond to the Inquiry's Terms of Reference and set out a suite of recommendations based on our experience of 8 years of working with the NEM and related energy issues. We hope that the Committee will understand that the brevity of our submission reflects our limited resources in the context of multiple regulatory processes occurring simultaneously. We have therefore concentrated in the bulk of our submission on the issue of network charges, but have flagged other issues and made related recommendations, which we could expand on if called before the Committee at a hearing.

(a) Key causes of electricity price increases

Several factors have contributed to recent rapid price rises in electricity prices across Australia,[1] which are now substantially higher than other OECD nations.[2] But transmission and distribution **network charges**, which together constitute around half of retail bills,[3] have been the single largest source of price rises. In his 2011 update to the 2007 Garnaut Review, Garnaut calculated that "increased investment in electricity networks" constituted two-thirds of price rises.[4]

[1] Australian Energy Regulator. (2011). State of the Energy Market 2011. Energy. Canberra: Australian Competition and Consumer Commission. Garnaut, R. (2011). Transforming the electricity sector. Update. Canberra.

[2] Garnaut, R. (2011). Transforming the electricity sector. Update. Canberra.

[3] See, eg, Fact Sheet: Electricity Prices, DRET, August 2012: http://www.ret.gov.au/Department/Documents/clean-energy-future/ELECTRICITY-PRICES-FACTSHEET.pdf.

[4] Garnaut, R. (2011). Transforming the electricity sector. Update. Canberra.

Garnaut's calculations were made before the carbon price was introduced this year. While it added around another 9 per cent to bills from 1 July 2012,[5] network charges will continue to put upward pressure on bills for years to come, because of investment already approved by the AER over the 5 yearly revenue determination periods for networks. In the case of transmission networks, approved revenue increases for the current revenue period have been up to more than double (Ausgrid), and in the case of transmission networks, nearly three-quarters (TransGrid).[6]

As the AER puts it, "Energy network investment in the current five year regulatory cycle is running at historically high levels".[7] Transmission network companies are spending $7 billion and distribution companies $35 billion on network infrastructure over the 5 years 2010-2015. Network investment is projected to increase by $240 billion by 2030 – all of it eventually paid for by consumers.[8] This is an investment larger than the National Broadband Network, but with far less political or media scrutiny.

There are several causes of this massive investment (some avoidable), including the need for networks to replace aging assets due to earlier underinvestment, to meet increasing reliability standards (especially in NSW), and to respond to increasing overall demand (due to population increases) and peak demand (especially due to the increased use of home air conditioners on summer afternoons and evenings).

Overall demand is now falling,[9] again due to a combination of factors: in particular; lower economic growth; energy efficiency measures; voluntary energy conservation in response to higher prices; milder weather related to the 2010-12 La Nina event; and the boom in rooftop PV systems. This should prevent networks from claiming this as a generalised reason for cost increases, although they will still need to build more infrastructure where there is pressure on supply from local population growth or new mining projects.[10] However, AEMO cannot help but predict that, in spite of the recent trend, total demand will increase by an average of 1.7 per cent per each over the next decade, even though this is down substantially from its 2011 forecast of 2.3 per cent per year.[11]

On the issue of **peak demand**, according to a 2011 consultant's report for the AEMC's Power of Choice review, nearly half of the $46 billion referred to above – $22 billion[12] – is being invested in infrastructure to meet increasing demand. Peak demand has grown at a much higher rate than average demand and is met with expensive infrastructure that is utilised for very short periods. It is often stated that some 20 per cent of investment is needed for only about 40 hours per year; or that a $1500 air conditioner effectively requires $7000 in increased infrastructure costs.[13]

While peak demand is still rising, growth is now much less than it was for much of the previous decade, and is now estimated by AEMO to be about 1.5 per cent per year for the next decade.[14] Approved network spending is yet to reflect this trend towards lower peak as well as total demand. However, we note that at

[5] See, eg, Fact Sheet: Electricity Prices, DRET, August 2012:

[6] Australian Energy Regulator. (2011). State of the Energy Market 2011. Energy. Canberra: Australian Competition and Consumer Commission.

[7] Australian Energy Regulator. (2011). State of the Energy Market 2011. Energy. Canberra: Australian Competition and Consumer Commission.

[8] Australian Energy Market Commission, Fact Sheet 2: demand side participation and prices.

[9] See, e.g., AEMO, 2012 National Electricity Forecasting Report, Chapter 3, Summary.

[10] See AEMO, 2012 Electricity Statement of Opportunities.

[11] See AEMO 2011 and 2012 Electricity Statement of Opportunities.

[12] Ernst & Young. (2011). Choice Rationale and drivers for DSP in the electricity market – demand and supply of electricity, page 47.

[13] The Hon Martin Ferguson AM MP, Minister for Resources and Energy, 'Strengthening the foundations for Australia's energy future', Speech to the Committee for the Economic Development of Australia. Melbourne. 13 December 2011.

[14] See AEMO 2012 National Electricity Forecasting Report (estimate based on Figure 2-3).

least one distribution network, Endeavour Energy, has reportedly promised to keep network price increases to less than CPI for the next seven years[15] – a step in the right direction.

Finally, networks pay substantial **profits or dividends** to their owners. These usually rise with increasing revenue, and are ultimately paid for by consumers. For instance, the four NSW networks are reportedly paying the state government about $1 billion this financial year in dividends and income tax equivalent payments, an increase of more than 50 per cent over 2010-11.[16] Like the privately owned networks, state and territory governments could choose to take less money from the networks in order to keep prices down. For instance, $500 million in dividends returned to 3 million households equates to a saving of $167 per household – far more than impact of the carbon price, even before related compensation.

(b) Legislative and regulatory arrangements and drivers in relation to networks

The protected monopoly companies take the opportunity to overinvest or "gold plate" their networks because the regulatory regime has encouraged them to do so. Here we focus on three aspects of this phenomenon: the calculation of network revenue to incentivise capital infrastructure (capex); the issue of revenue versus price caps as "control mechanisms" for network revenue determinations; and the lack of adequate incentives and/or obligations for networks to engage in demand side participation (DSP) activities that might constrain costs but also reduce revenue.

Capex bias

The building block approach to determining the level of revenue that networks are allowed to make over a 5 year period takes into account likely capex and opex (operating expenditure) needs (based, among other things, on total and peak demand forecasts), the cost of borrowing money (weighted average cost of capital or WACC), depreciation and income tax payments. In short, the higher the capex, the higher the revenue. Because capex becomes part of the asset base, capex expenditure in one regulatory period is built into the following period. Thus, networks have a natural incentive to increase their capex, and in some cases overinvest, rather than utilise demand side measures as an alternative.[17]

TEC has first-hand experience of this practice, discussed below.

Powerlink

TEC engaged with the AER to shed light on Powerlink's expenditure proposal for the 2012-17 regulatory period.[18] TEC, along with a number of large energy users, argued that Powerlink overestimated electricity demand and requested excessive increases in expenditure and revenue. Powerlink's proposal represented a doubling of its previous revenue cap, using creative accounting throughout its revenue proposal to justify profligate increases in expenditure and obscure the impacts on consumers, whilst exaggerating its efficiency and the need for expenditure.

[15] See Simon Benson, *Daily Telegraph*, Big savings flow from freeze on power price, 24 August 2012: http://www.news.com.au/national/big-savings-flow-from-freeze-on-power-price/story-fndo4bst-1226457019735.

[16] Louise Hall, Carbon tax not dividends behind rising power bills, says Treasurer, *SMH*, 12 August 2012: http://www.smh.com.au/nsw/carbon-tax-not-dividends-behind-rising-power-bills-says-treasurer-20120812-242e8.html. Read more: http://www.smh.com.au/nsw/carbon-tax-not-dividends-behind-rising-power-bills-says-treasurer-20120812-242e8.html#ixzz26PYvgbLn.

[17] Chin, L., Gawler, R. and Gerardi, W., 'NEM Market Failures and Governance Barriers for New Technologies: Final Report to Garnaut Climate Change Review' (McLennan Magasanik Associates 2008) 24.

[18] See http://www.aer.gov.au/node/7945.

A group of big companies, including Visy, BOC, Orica and Incitec Pivot, argued that Powerlink's proposal was "highly questionable, with an over-claim estimated to be some $220 million a year".[19] The AER agreed that Powerlink's demand forecasts were too high, driving over-expenditure. Analysis commissioned by the Regulator calculated Powerlink could have deferred at least $700 million of investment in the last regulatory period, almost 25 per cent of its budget, if it had forecast demand more accurately. In its draft determination the Regulator stated that it was "concerned about Powerlink's recent history of consistently over-forecasting demand" and decided to cut Powerlink's $5.9 billion revenue plan by 23 per cent.

Ultimately, the AER allowed Powerlink $4994.5 million revenue for the period. While this is a reduction of 6 per cent on Powerlink's revised revenue proposal, it still represents an increase of about 49 per cent over its current allowance, and makes the company's original revenue proposal look like an ambit claim.

TransGrid

In 2009 TransGrid, the monopoly transmission line builder and operator in NSW, submitted its final notice to the AER for the proposed $227 million Dumaresq-Lismore 330 kV transmission line. Even at the time, its peak (46% over 10 years) and total demand forecasts appeared questionable. In spite of evidence of falling total demand in the interim, the company persisted with the same projections in its 2010 application for NSW planning approval.

In 2010, following complaints from a group of affected farmers in the Tenterfield area, the AER conducted an investigation into the regulatory test followed by TransGrid, and found a series of shortcomings.[20] There was, for instance, no serious effort made to investigate alternatives to a new transmission line such as local generation and demand management. Nevertheless, the project remains on TransGrid's books, despite the company announcing a 1-10 year deferral in its 2012 Transmission Planning Report – a vague and open-ended delay that does no favours for affected landholders, whose incomes and quality of life remain in the balance.

In 2011 this project was also the subject of a scathing report commissioned by the same group of landholders by the Institute for Sustainable Futures at UTS.[21] It found, inter alia, that peak summer demand on the NSW North Coast had not increased over the past five years; that the proposed transmission line would be the most expensive way to meet increased peak demand in any case; and that there was no serious consideration of non-network alternatives to meet any increase in peak demand.

Revenue versus price caps

As monopoly businesses, NSPs' revenues are independently regulated by the AER. The AER takes a 'building block' approach to calculating revenue needs over five year regulatory periods. The building blocks primarily comprise forecast capex and opex needs, based *inter alia* on: total and peak demand forecasts;[22]

[19] An Energy Consumers Group operating in Queensland (the GROUP), Queensland Electricity Transmission Revenue Reset Powerlink Application, Submission, August 2011. http://www.aer.gov.au/sites/default/files/Energy%20Consumers%20Group%20operating%20in%20Queensland%20%2816%20August%202011%29.pdf

[20] See http://www.aer.gov.au/node/2395.

[21] Rutovitz, J et al. 2011.TransGrid proposal for a new Dumaresq to Lismore transmission line: commentary on project need. Institute for Sustainable Futures, UTS.

[22] The demand forecasting in AER determinations is developed in a similar process to the rest of the AER determinations. That is, the business puts forward a proposed demand forecast and the AER then assesses the forecast and can either approve the forecast or make changes to it (subject to appeal to the tribunal). In the AER's assessment it will typically hire a specialist consultant and in areas where AEMO demand forecasts are relevant it liaises with AEMO (AEMO forecasts tend to be at a higher level than the specifics included in a determination): AER, pers. comm.

the cost of borrowing money (weighted average cost of capital or WACC); depreciation; and income tax payments.

The AER can then utilise two main 'control mechanisms' to allow for revenue generation. It can either cap the total revenue to be earned by each NSP (maximum allowable revenue or MAR), or cap the average price paid by customers for its services for each year in the period (via a weighted average price cap or WAPC).[23]

With revenue caps the revenue requirement is locked in annually for five years.: *24* If a network makes more revenue than the cap one year, it must forfeit the additional revenue in future years, and vice versa. Revenue caps are therefore difficult for networks to game.[25] Under a price cap the AER divides revenue requirements each year by the projected units of sales to determine a price. A price cap requires a 5 year forecast of demand. The price is set on an annual basis; but unlike a revenue cap, once it is set it cannot be compensated for the following year, so the networks get to either keep the profit they have made when demand is higher than anticipated, or are forced to bear the losses when the reverse occurs. A price cap therefore provides networks with a significant opportunity to game the market. The AER notes that in Victoria (which has a price cap), in the period 2006-10

> *…the Victorian DNSPs recovered revenue substantially above forecast throughout the period, averaging a recovery of 8.28 per cent above forecast annually (a total over recovery of $568 million (real $2010) over the period). This demonstrates the large fluctuations in revenue that can occur under a WAPC as a result of variations from forecast demand and prices.*
>
> *The AER considers that during the regulatory control period DNSPs were able to make windfall gains by increasing the price (above the general increase specified in the WAPC) of components of particular services experiencing sales growth above its forecast.*[26]

The main issue for consumers is which control mechanism is most likely to act as a constraint on retail prices. The building block approach ensures that, in the long run, regardless of the control mechanism, networks have a strong incentive to encourage higher peak and/or total energy consumption, in order to maximise revenue.

In the short run, under a revenue cap when demand is increasing, revenue remains constant. Networks therefore have an incentive to encourage energy saving measures (energy conservation, demand management and energy efficiency) in order to reduce costs, thereby increasing profits. Where a price cap is in place, on the other hand, when demand is increasing networks will increase their revenue by encouraging more consumption. This is the case in Queensland, where Ergon and Energex have conducted significantly more DM demand management activity under a revenue cap than DNSPs in jurisdictions with price caps, such as NSW and Victoria.

Where peak and/or total demand are flat or falling, under a revenue cap, network revenue remains constant, so networks have an incentive to encourage more energy saving measures, as any further decreases in costs result in increases in profits. The downside for consumers is that if demand proves to be lower than forecast for much of the 5 year determination period, the networks get a windfall profit, since their revenue was determined by the original forecast.[27] Where demand is flat or falling, price caps do not

[23] This is aside from control mechanisms for particular services such as public lighting, and options such as hybrid mechanisms.

[24] Ibid.

[25] "…under a revenue cap, a DNSP has little incentive to set prices in a manner that aims to maximise revenue recovery"; ibid, p. 6.

[26] AER, Framework and approach paper, Ausgrid, Endeavour Energy and Essential Energy, Regulatory control period commencing 1 July 2014, June 2012, p 128.

[27] The AER argues that differences between forecast and actual demand should not greatly affect network revenue as most of their costs are fixed (pers. corr.).

encourage more energy saving measures, since the networks have an incentive to encourage more consumption so that their revenue falls as little as possible.

TEC currently favours the application of revenue caps, as the "least worst" option for increasing network DM, with significant reservations. [28] The AER[29] and AEMC[30] appear to have contrary views. While the recommendations in the Power of Choice draft report go some way to this end, they are unlikely to be enough to effectively decouple volume from revenue In the long term it is important for regulators to give greater consideration to how networks and retailers can become energy service providers that can profit from encouraging lower rather than higher consumption.

Inadequate incentives for DSP

DSP is a collective term that includes demand management (DM), energy efficiency (EE) and decentralised or embedded energy (DE). Substantial benefits could accrue from the implementation of a range of DSP and related options for meeting demand, including:

- Energy conservation.
- Decentralised electricity generation.
- Demand response.
- Decentralised energy storage.
- Improvements in the efficiency of buildings, appliances and equipment.
- More responsive, 2-way networks utilising smart grid technologies.

The NEM was originally intended to be a two-sided market where both supply and demand side measures would be on an equal footing in meeting Australia's electricity needs. The first outline design of the NEM included a strong statement about the demand side.[31] Unfortunately, this even-handed approach was not subsequently implemented in the Rules: when the NEM commenced operation, there were no provisions that ensured equal opportunities for DSP,[32] resulting in a bias toward the supply side.[33] Some provisions were subsequently implemented which refer to consideration of DSP options in network planning; however, these still do not require anything beyond nominal consideration of DSP measures.[34]

To date, the NEM has not facilitated the use of DSP by Networks. DSP capacity represents about 1% of peak demand in the NEM, compared to approximately 4% in the Western Australia electricity market, and 6% in California, which has a lengthy history of innovative DSP initiatives and incentives.[35]

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[28] Headberry and Partners & Bob Lim, & Co, 2008. Does Current Electricity Network Regulation Actively Minimise Demand Side Responsiveness in the NEM? TEC, Sydney: Total Environment Centre. Available at: http://www.advocacypanel.com.au/documents/Applic280.pdf.

[29] See AER, Framework and approach paper, Ausgrid, Endeavour Energy and Essential Energy, Regulatory control period commencing 1 July 2014, June 2012, e.g. p ix.

[30] In the Power of Choice draft report, at 7.3.2.

[31] National Grid Management Council, National Grid Protocol (First Issue 1992) iii.

[32] Crossley, D., 'Demand-Side Participation in the Australian National Electricity Market: A Brief Annotated History' (Regulatory Assistance Project 2011) 8.

[33] The Prime Minister's Task Group on Energy Efficiency noted that a quarter of the submissions it received argued that the NEM is "excessively supply-side focused", and that it "fails to effectively balance the incentives and obligations for supply and demand solutions". Prime Minister's Task Group on Energy Efficiency, *Report of the Prime Minister's Task Group on Energy Efficiency* (Canberra 2010) 166.

[34] The current provisions regarding DSP in the NER are contained in the following rules: 5.6.2(a) and (b)(4); 5.6.2A(4)(vi) and (6)(iv); 5.6.5A(c)(3)(v); 5.6.6(c)(5); 5.6A.3(3)(ii); 6A.6.6(e)(12); and 11.27.4(c)(7).

[35] See Futura Consulting, 2011. Power of choice – giving consumers options in the way they use electricity,

A survey of Network DM in the NEM conducted by the Institute for Sustainable Futures found that in 2010/11 Network DM saved 51.3 gigawatt hours of electricity during the summer peak, just 0.02% of energy used in that year. The equivalent percentage in the US was 4.4%.[36]

There are numerous barriers to increased Network DM in the NEM. These have been expounded in various reports produced over the last decade,[37] and include:

- A regulatory framework that is weighted in favour of Networks making excessive profits through increasing supply. The AER has recently detailed its concerns as a regulator with this framework.[38]
- Reduced profits due to the displacement of capex, which earns a regulated return investment, in contrast to DSP activities which have generally been treated as opex, which does not earn a regulated return.[39]
- A lack of developed capability within Networks to develop and implement DM initiatives. For example, Networks may lack the necessary institutional knowledge or experienced staff.
- Poor coordination between government departments and regulatory bodies, and between state and federal level. Different agencies have differing responsibilities and priorities in relation to DSP, and a lack of coordination is perceived to hamper DM policy efforts.[40]
- Cultural barriers and resistance to change. In 2002, IPART, the NSW regulator stated: "To a large extent, one of the major obstacles continues to be a culture which favours traditional 'build' engineering solutions and which pays little more than lip service to alternative options".[41]
- The lack of social and environmental criteria in the NEO, which make consideration of the environmental costs and benefits of greater DM more difficult to assess and include in policy and regulatory processes.[42]

[36] Dunstan, C., Ghiotto, N. and Ross, K, 2010. Report of the 2010 Survey of Electricity Network Demand Management in Australia, Sydney: Australian Alliance to Save Energy and the Institute for Sustainable Futures, University of Technology, Sydney vi. Note though that the US figure includes contributions by retailers and integrated utilities.

[37] E.g. Roy, R., Nemztow, D. & Mawer, G., 2004. Demand Management and the National Electricity Market, Sydney: Total Environment Centre. Dunstan, C., Ghiotto, N. & Ross, K., Report on the 2010 Survey of Electricity Network Demand Management in Australia, Australian Alliance to Save Energy. Chin, L., 2008. Final Report to Garnaut Climate Change Review: NEM Market Failures and Governance Barriers for New Technologies. Stockton, J., 2009. Role of the NEM in responding to climate change policies, Melbourne: MMA Associates.

[38] See Australian Energy Regulator, 2011. State of the Energy Market 2011, Canberra: Australian Competition and Consumer Commission. For a comparative assessment, see Mountain, B. & Littlechild, S., 2010. Comparing electricity distribution network revenues and costs in New South Wales, Great Britain and Victoria. Energy Policy, 38(10), pp.5770-5782.

[39] This issue has been widely accepted in the submissions to the Power of Choice Directions Paper and in numerous reports. See, e.g., Headberry Partners & Bob Lim & Co, 2008.Does Current Electricity Network Regulation Actively Minimise Demand Side Responsiveness in the NEM?, Sydney: Total Environment Centre. Available at: http://www.advocacypanel.com.au/documents/Applic280.pdf.

[40] In a stakeholder survey, the lack of coordination was the most identified barrier to improved DSP. See Dunstan, C., Ross, K. & Ghiotto, N., Barriers to Demand Management: A Survey of Stakeholder Perceptions, Australian Alliance to Save Energy.

[41] IPART, 2002. Inquiry into the Role of Demand Management and Other Options in the Provision of Energy Services, Final Report.

[42] Castle, J., 2006. How Should Environmental and Social Policies be Catered for as the Regulatory Framework for Electricity Becomes Increasingly National? Sydney: Total Environment Centre. Wright, G., 2012. Systemic Biases in the NEM: Barriers to Demand-side Participation. Australian Energy Efficiency Summer Study. Sydney: Australian Alliance to Save Energy. This issue was also prominent in the Australian Alliance to Save Energy's stakeholder survey: see Dunstan, C., Ross, K. & Ghiotto, N., Barriers to Demand Management: A Survey of Stakeholder Perceptions, Australian Alliance to Save Energy.

- The disaggregated nature of the NEM means that Networks may not reap the benefits of their DSP expenditure, i.e. the electricity market consists of a number of different participants, so the NETWORK itself only receives part of the benefit of its Network DM activities.
- The small-scale and localised nature of many existing DM schemes.

(c) Options to reduce peak demand

The Australian Decentralised Energy Roadmap found that decentralised energy (or DSP) sources could deliver 22,608 MW of peak capacity (> 50% of total peak demand) and 86 GWh of total energy generation capacity (40% of energy demand);[43] and that approximately $15 billion of approved network investment could potentially be avoided if demand growth was met through demand-side measures.[44]

There are potentially three ways to reduce peak demand by encouraging more DSP. One is to reduce the drivers of demand, by reducing overall energy consumption. This can be done by encouraging households and businesses to use either less energy, or to use it more efficiently – for instance, by using more efficient appliances and plant, and by increasing the thermal efficiency of buildings.

A second way is to "load shift" – shifting some of the peak load to other times, for instance by encouraging the use of discretionary appliances like dishwashers and washing machines or industrial machinery and chillers outside peak periods. This would eliminate the need for about one quarter of current investment. For instance, the AEMC's commissioned studies find that in Victoria, between $3.4 billion and $11.1 billion in network costs could be avoided in the NEM over the period 2011-2030 if demand in the top 1 per cent of peak demand periods could be reduced to the level of the next highest demand period. This is a modest reduction, and we believe that further reductions are possible.

The third way is to increase the use of local (or distributed, embedded or decentralised) energy, which would place less burden on the networks, especially at peak times. This is effectively what has happened with the boom in rooftop PV systems, which have a load curve that, while not identical with typical periods of maximum demand, does overlap with it in afternoons.

The Decentralised Energy Roadmap found that almost half of the savings quoted above could come from greater use of energy efficiency measures, while another quarter would be provided by measures to reduce peak demand. (The remainder would come from cogen and trigeneration – 19 per cent; local bioenergy – 5 per cent; local renewables – 4 per cent; and storage units – 2 per cent.)

However, significant regulatory reforms are required to encourage more DM and other forms of DSP in the NEM. If most of the proposals canvassed in the draft report of the AEMC's *Power of choice* review are implemented, they will eventually produce this result. Nevertheless, we have doubts about some of the report's findings. For instance, the AEMC, which appears to have an ideological opposition to targets and obligations, is critical of the proposed National Energy Savings Initiative (NESI), which is effectively a national version of the energy efficiency scheme that has been highly effective in recent years in NSW and Victoria.

Customers

The NEM does not provide direct pricing signals for consumers that could encourage greater DSP. Retail price regulation and the lack of interval metering means that there is little use of time differentiated retail

[43] Dunstan, C., Boronyak, L., Langham, E., Ison, N., Usher, J., Cooper, C., & White, S. (2011). The Australian Decentralised Energy Roadmap. Energy. Sydney.

[44] Dunstan, C., Boronyak, L., Langham, E., Ison, N., Usher, J., Cooper, C., & White, S. (2011). The Australian Decentralised Energy Roadmap. Energy. Sydney.

prices.[45] This means that the price of electricity for consumers does not reflect the true cost of producing that electricity and therefore provides little incentive for demand reduction at times when the cost of producing electricity is at its highest. For instance, only 12 per cent of small customers, the major drivers of peak demand, have meters in place that can support cost-reflective pricing. The AEMC recently recognised this in its Power of Choice draft report, and proposes moving towards more cost-reflective tariffs.

However, even with the right technologies in place, there are additional barriers to more efficient energy use. Firstly, consumers have traditionally not viewed electricity as a discretionary part of household expenditure, and are unlikely to act in the way that purely economic models predict. The AEMC has acknowledged this, stating:

> *"Current consumer understanding of energy use and what they need to know for smarter energy consumption decisions is quite low.... [They] Have a low level of interest as electricity is not necessarily considered as a priority "product" to manage in the context of household/business expenditure."*[46]

Secondly, there are auxiliary issues, including a potential lack of clear information available to consumers, high transaction costs involved in managing energy use, insufficient access to capital to invest in efficient consumption, and split incentives.

Thus, while TEC supports greater use of cost-reflective tariffs an important piece of the bigger puzzle, it does have its limitations and "an economically efficient level of DSP would not automatically occur as other issues will persist in the market".[47]

Networks

International experience with network DM suggests that it can be a significant contributor to the overall DSP effort, and many jurisdictions have implemented appropriate regulatory reform to facilitate this contribution. The International Energy Agency (IEA) undertook a worldwide survey, identifying 64 Network DM projects from 13 different countries[48] from the past 15 years. The IEA survey identifies a wide range of activities that are taking place, including: direct load control, demand response, interruptible load agreements, load shifting, power factor correction and smart metering. It concluded that Network DM can effectively reduce load on electricity networks that can be targeted to relieve specific network constraints; and provide a range of additional services, such as reactive supply and voltage control, regulation and frequency response and reserve capacity.

TEC advocates for the following reforms in order to encourage more DM activity by networks:

- DM targets. These are both simple to implement and would allow Networks flexibility in meeting the needed increase in DM utilisation, in the absence of more comprehensive and fundamental regulatory reform. A reasonable target would be for Networks to be required to meet 1 per cent per annum of their energy throughput with Network DM measures, with this subsequently increasing by a further 1 per cent per annum, subject to periodic review.
- A Peak Demand Performance Incentive that rewards networks for improvements in managing peak demand on their networks. Such a scheme could be applied as a factor in the revenue

[45] Chin, L., Gawler, R. and Gerardi, W., 'NEM Market Failures and Governance Barriers for New Technologies: Final Report to Garnaut Climate Change Review' (McLennan Magasanik Associates 2008) 24. Electricity companies generally provide a flat tariff, or a usage or time of use tariff that does not accurately reflect the true cost of electricity on the wholesale market at a given time.

[46] AEMC, 2012. Power of Choice Review, Draft Report, page 40-43.

[47] Ibid 109.

[48] Crossley, D., 2008. Worldwide Survey of Network-driven Demand-side Management Projects, Sydney: IEA DSM Programme. See also Crossley, D., 2010. International Best Practice in Using Energy Efficiency and Demand Management to Support Electricity Networks, Sydney: Australian Alliance to Save Energy.

determination process, in much the same way the D-factor and other incentive mechanisms currently apply.

- The reform of reliability standards. These are currently jurisdictional and are potentially set too high, encouraging overspending to meet the required standard.[49]
- Increased and formalised use of the approach taken by Energex in Queensland, whereby Networks are able to calculate the value of upstream benefits resulting from their DM programs and apply for the regulator to allow for the costs of these programs.
- Provide a share of the deemed upstream benefits of DM programs to the network in the form of an incentive payment.
- Extend the AER's proposed Demand Management and Embedded Generation Connection Incentive Scheme to ensure high quality research and trials are carried out in relation to network-led DSP programs.

(d) Assisting households and business to reduce their energy costs

Low cost energy efficiency opportunities to assist low income households

The government is currently consulting on a National Energy Savings Initiative (NESI). It is essential that the resultant program places obligations on retailers to assist consumers. Energy efficiency has huge potential in Australia, but voluntary measures, ineffective in the past, will not overcome apathy on the part of retailers.

Improved customer advocacy and representation

In November 2010, a group of four consumer advocacy organisations[50] released a detailed report into the structure of energy consumer advocacy in Australia.[51] There is currently a formal process taking place as a result of this report, with the assistance of the CAP and the Standing Council on Energy and Resources (SCER), to create a national peak body (tentatively called Energy Consumers Australia) for consumer advocacy on energy issues.

At present there is a clear preference for creating a national organisation with the capacity to respond to energy issues on a national basis and improve advocacy capacity at state levels, while maintaining funding for jurisdictional organisations/projects (the 'augmentation model'). This option requires additional funding required so as not to diminish present essential advocacy efforts which are linked to the federal nature of the NEM. A $2 million investment in a national advocacy body, for example, equates to about 10 cents per capita per annum. Yet Minister Ferguson flagged in a letter to the groups involved that he expected funding for the new body to come from existing sources, which would obliterate the advocacy done by specialist and jurisdictional groups such as TEC.

On the subject of funding, there is a clear need for increased funding for consumer organisations across the board. Last year, the CAP's budget did not increase, and many organisations were left under- or unfunded. Every year consumer advocates engage with the CAP's budget process, stating that its budget (approximately $1.6 million) is insufficient for funding effective and comprehensive consumer advocacy. Meanwhile, networks, retailers and centralised generators have billions of dollars of revenue, generated from consumers, to engage lawyers and consultants to defend and consolidate their positions.

[49] Garnaut, R. (2011). Transforming the electricity sector. Update. Canberra.

[50] The NEM body responsible for funding consumer advocacy organisations.

[51] Renouf, G., & Porteous, P. (2012). Making Energy Markets Work for Consumers: The Role of Consumer Advocacy.

An order of magnitude increase in funding is essential, to even slightly level the playing field, although this seems unlikely to overcome the David and Goliath position in which consumer advocates find themselves. What is needed is fundamental reform and restructuring of the NEM, couple with a substantial increase in consumer advocacy funding, taken from reductions in network, retailer and generator revenues.

Wider adoption of technologies to provide greater information

TEC favours a national smart meter rollout with a high level of in home display (IHD) functionality. This necessitates quicker implementation of smart grid technologies, which are fledgling and piecemeal at present. Experience in Victoria suggests that such rollouts should be conducted carefully, taking into account the needs of vulnerable consumers.; and communication issues involved in the more accurate measurements being contrary to existing inaccurate meters.

Adequacy of current consumer information, choice, and protection measures

TEC is critical of the state governments that took part in developing the National Electricity Customer Framework (NECF), but failed to implement it for spurious reasons. For example, in NSW the government did not implement the NECF so that it could retain control of licences in order to force retailers to include so-called 'red text' regarding the carbon price and other "green schemes" on consumers' energy bills. This political sniping has no place in an energy market that is struggling to maintain its social licence to operate as it fails to deliver on its objectives.

Improved reporting by electricity businesses

We believe that there is a range of additional annual reporting requirements that would be helpful in the ongoing NEM reform process:

- From retailers to consumers on their total and peak demand statistics for the previous financial year (as an incentive to improve their performance).
- From retailers to consumers on the fuel mix and emissions intensity of their generation assets and investments (so that consumers
- From networks to consumers on the capacity of DM measures that they have in place, as a percentage of total energy volume.
- From networks to potential generators on current and potential (looking 5 years ahead) localised network constraints.

(e) Opportunities and barriers to the wider deployment of new and innovative technologies

Direct load control and pricing incentives

While common practice in places like California, we are unaware of any large-scale direct load control (DLC) programs in Australia. DLC has the potential to provide significant demand reductions at peak periods and reduce consumers' energy bills. However, DLC can be seen as 'invasive' and would need to be explained to consumers very carefully and then implemented on a voluntary basis.

Similarly, progress in shifting customers off flat pricing tariffs in some jurisdictions has been slow. We would recommend that a single, simple, standardised time-of-use tariff be introduced in each jurisdiction.

Storage technology

Battery prices are falling rapidly, though they are still not cost-competitive where grid connections are available.[52] Once batteries become cost competitive, the importance of the grid is likely to diminish. Some have spoken of it going the way of Telstra's fixed line network.

However, there are significant environmental implications to be managed regarding the production and disposal of batteries. Thus we do not suggest that batteries will replace the grid entirely, but rather that they can play a part in localising electricity supply and reducing transmission losses in certain strategic locations.

Local and renewable energy generation

Local generation, community renewable energy (CRE) projects and co/trigeneration projects have huge potential to reduce energy prices as well as reduce emissions, but they currently face a number of technical, regulatory, cultural and legal barriers in Australia, as regulatory frameworks were designed to meet the needs of the out-dated centralised model of electricity supply. The barriers include:

- Lack of government support for feasibility studies and governance establishment.
- Uncertain timelines for connection enquiry and application.
- Uncertainty and prohibitive costs in relation to assessing network constraints at any given location.
- Lack of clarity regarding the information required by networks to achieve connection.
- The onerous technical requirements imposed on small and medium scale generators as a condition of connection.
- The costs and terms of connection.

In addition, a proposed change to the NABERS rules would result in the environmental and energy efficiency benefits of precinct systems not being recognised by NABERS and the Commercial Building Disclosure scheme and its Mandatory Disclosure program.[53] This would significantly reduce the benefit a commercial building owner may receive from investing in a precinct scheme. We understand that such owners place a very high value on NABERS as it allows them to attract large high-profile tenants. Thus this proposed change threatens to further derail co/trigeneration projects by large commercial property developers and owners.

There is a current AEMC Rule change proposal ("Connecting embedded generators") which is intended to address many of these barriers, but it is not yet clear how much support it will receive from the AEMC, especially as the networks have already indicated in their submissions that they are not generally in favour of it.

[52] ATA (2012), Stand Alone Power Systems as an Alternative to Grid Connection at the Fringe of the Grid. http://www.ata.org.au/wp-content/uploads/Fringe-of-Grid-SAPS-Research-Summary-for-Policy-Makers-Final-160812-v4.0.pdf

[53] See http://www.nabers.com.au/page.aspx?cid=705&site=1.

(f) Any related matter

Improved network regulation

If implemented by the AEMC, the current joint AER-Energy Users Association Economic Regulation Rule change proposal would result in more realistic rates of return for networks' costs of capital. However, the AEMC rejects the idea that government-owned networks should be forced to accept a lower cost of capital than private networks, even though the former typically borrow at discounted rates.

There are also additional procedural issues that are needed to mediate the power of networks in the current framework, including an appeals process for revenue determinations that is heavily weighted in favour of networks (they regularly appeal, with a very high success rate);[54] and complex revenue determination and investment test processes that preclude full participation from consumer groups, especially given the disparity in resources available to the parties.[55]

While these procedural changes are likely to make an important contribution to the effort to contain price rises, they are unlikely to change the fundamental drivers of network spending, so the other reforms discussed above remain critical.

The National Electricity Objective

The NEO is the guiding principle of the NEM: all NEM rules must be made in accordance with the NEO, which is part of the National Electricity Law. The NEO, as it currently stands, is to ensure:

> *efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to— (a) price, quality, safety, reliability and security of supply of electricity; and (b) the reliability, safety and security of the national electricity system.*

Although precursors to the NEO included consideration of the environment, the existing NEO does not explicitly include any such reference. It could be implied by the phrase "the long term interests of consumers", were it not for the fact that the criteria to be assessed under this aegis are spelt out. The Australian Energy Market Agreement (2006) has "address[ing] greenhouse emissions from the energy sector" as one of its objectives, but does not allocate responsibility for this to any of the NEM's governing bodies. Thus the current NEO was promulgated in 2005 without an environmental component. Although a range of actors has called for the NEO to be reformed,[56] no serious effort has been made to date by SCER or its predecessor, the MCE, to address the merits of this issue.

Why reform the NEO? One of the great deficiencies of the NEM is that it is focused only on delivering the energy with the cheapest short-term marginal cost of production. The NEM is ill-suited to recognise the long term economic as well as environmental benefits of energy storage, local generation, and even energy efficiency.

Further, the current NEO does not support climate and renewable energy policies, and struggles when their implementation appears to conflict with the overarching objective of the NEM – ie, economic efficiency (as interpreted by the regulators). This disconnect is apparent, inter alia, in relation to the costs and connection times often associated with renewable energy projects at all scales, from humble suburban rooftops PVs to the largest wind farms. It is also apparent in the current push by some retailers to attempt

[54] Garnaut, R. (2011). Transforming the electricity sector. Update. Canberra.

[55] May Mauseth Johnston. (2011). Barriers to fair network prices: an analysis of consumer participation in the merits review of AER EDPR determinations. Consumer Action Law Centre and Consumer Action Law Centre.

[56] This is often called for in submissions to regulatory processes, especially by wind farm proponents; but see also Ison, N., et al., (2011). The NEM Report Card: How well does the National Electricity Market serve Australia?

to restore revenue lost via the boom in PV systems by increasing fixed charges, making new PV systems less financially attractive.

Regulators and energy ministers often complain that introducing an environmental criterion to the NEO would make their work difficult, if not impossible. This knee-jerk reaction flies in the face of evidence both from other OECD countries where environmental objectives feature in electricity network regulatory regimes without catastrophic impacts on price, reliability, etc.,[57] and from other regulatory regimes in Australian jurisdictions which have multiple objectives, frequently including ecologically sustainable development (ESD) – again without the sky falling down.

TEC does not propose anything so radical as the implementation in 2012 in the NEM of the 1992 National Strategy for ESD, which, as far as we are aware, remains in place. Instead we merely ask that in addition to the current 5 criteria, "greenhouse gas emissions and intensity" is added. This would require all stages of the supply chain to factor in current government climate and renewable energy policies alongside the other multiple – and sometimes internally conflicting – criteria by which the NEO is to be assessed by regulators and market participants.

Summary and recommendations

The following proposals for reform are 'win-wins' as they target price constraints for consumers and the environmental outcomes of the NEM:

Energy efficiency

- A national energy efficiency target, e.g. as part of the proposed National Energy Savings Initiative (NESI), building on the successful existing schemes in place in NSW and Victoria.

Demand management

- A Rule change to allow demand aggregators to sell consumers' demand reductions during periods of peak demand.
- Mandatory targets for network DM.
- The introduction of a scheme to enable the sharing of DM benefits across the supply chain.
- The AER to be given additional resources so it can assume responsibility for a tendering process wherever impending network constraints are identified, instead of existing networks being the default providers of additional capacity.

Renewable energy generation

- Easier, quicker and cheaper connection of renewable energy generation at all scales, especially for community renewable energy projects (CRE) and precinct-scale co- and tri-generation projects.

Gold plating

- More powers to the AER to regulate networks and ensure efficiency and cost-effectiveness in the provision of electricity.

[57] For instance, since 2008 Ofgem, the UK energy regulator, has had its "duty to contribute to the achievement of sustainable development… on an equal footing with [its] duties to meet reasonable demand and financing authorised activities": http://www.ofgem.gov.uk/Sustainability/Pages/Sustain.aspx.

- Application by the AER of revenue rather than price caps in 5-yearly revenue determinations.
- Reform of reliability standards to make gold plating less attractive to networks.
- DSP options should be the default solution where there are network constraints, instead of being a box to be ticked before proceeding with new infrastructure projects.

Reporting

- Increased transparency and improved reporting on consumer and environmental outcomes in the NEM, especially via integrated annual reporting in relation to how well the market is meeting the NEO.

Consumer empowerment

- Greater opportunities for consumers to play an active role in the electricity system through being given better information to enable them to control their energy use and through distributed generation.
- More opportunities for affected communities to be involved in approval processes for major new infrastructure projects.
- Support for a national energy consumers' peak body, including via a very small additional levy on consumers' bills, in addition to maintaining existing funding for jurisdictional and specialist consumer groups.

The NEO

- The inclusion of quantifiable environmental criteria in the NEO.

Complementary measures

- Progress on reforms related to energy but outside the NEM framework, including a national building energy efficiency rating system with mandatory standards for new residential and commercial buildings and retrofits.

TEC has a large repository of reports and other documents related to all areas of the NEM. We would be happy to provide copies of research to the Senate Inquiry. TEC staff would also be happy to present or answer questions at any public hearing related to this inquiry.

Yours sincerely,

Jeff Angel
Executive Director

Contact:

Mark Byrne
Energy Market Advocate