

AEMC Power of Choice – Stage 3 DSP Review
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

30 April, 2012

Dear Commissioners,

As the peak body for the community services in South Australia, the South Australian Council of Social Service (SACOSS) welcomes the opportunity to comment on the AEMC Power of Choice – Stage 3 DSP Review.

As part of our concern and advocacy for vulnerable and disadvantaged South Australians, SACOSS considers the increasing cost of peak demand through the lens of the impacts on low income households. In the current context, there is no doubt that low income households are facing increasing cost of living pressures and many are struggling financially. Energy prices are a significant part of these cost pressures and so every effort should be made to ensure essential services are affordable and that price increases are kept to the minimum necessary. However, rising peak demand and stagnant or falling annual consumption means a deteriorating load factor and we can be sure that deteriorating load factors will only result in higher prices.

As you have stated, demand side participation (DSP) “refers to the ability of consumers to make informed choices about how much electricity they use at different times”. SACOSS certainly support the view that greater DSP should lead to lower prices than would otherwise be the case. While we broadly support DSP efforts in general, SACOSS is strongly supportive of a specific DSP measure that offers even greater opportunities to lower costs specifically for those at risk of disconnection: namely, the unwinding of the cross subsidies inherent in residential pricing related to the cost of peak demand. The other key issue for SACOSS is the establishment of a national energy consumer peak body. These two points are addressed in more detail below.

1. The unwinding of cross subsidies inherent in residential pricing

SACOSS has engaged Andrew Nance to detail the proposed DSP measure. The report prepared for SACOSS by Mr Nance is attached to this submission and we draw your attention to its contents. SACOSS fully endorse all of the comments contained therein.

In line with the above report, SACOSS submits that further consideration be given to using load profiling as a way of segmenting the residential sector by load factor as an alternative to a roll out of Advanced Metering Infrastructure in SA. As a means for assessing market performance, load factor of the Net System Load Profile is a key parameter.

SACOSS submits that the South Australian context is dominated by residential space cooling in summer. However, while public housing tenants have less capacity to generate cooling demand than the average household (due to having dwellings with

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smaller than average floor areas, lower penetration of air-conditioning and smaller air-conditioners when they do), they are assumed to have consumed according to the Net System Load Profile (NSLP).

As detailed on page 11 of Mr Nance's report, "This group of some 50,000 households are likely to have an aggregate load factor in the 45-50% range implying that their load profile may be materially cheaper to supply than the NSLP (noting that *some* households in this cohort may in fact have poor load factors but that the aggregate, diversified patterns of consumption is materially different to the NSLP)."

SACOSS concur with Mr Nance's view that the establishment of cost reflective tariffs for a buying group of households with good load profiles is a sound proposition. We strongly propose that this load profile should be established by a representative sample of dwellings rather than the expense of individual smart meters. The most prospective cohort is the tenants of public and social housing as this cohort should have a good and stable load factor – representing a lower risk load profile to a prospective retailer than the NSLP.

2. Support for a national energy advocacy body

SACOSS strongly believes that the capacity of consumers to make informed choices about how and when they use electricity is improved by well-resourced consumer advocacy. Consumer advocates have a role to play in improving the quality, quantity and coordination of existing energy management programs and messages as well as ensuring that consumers are sufficiently engaged in decision making about the energy market.

A current gap in energy consumer advocacy exists at national peak level. SACOSS reiterates the importance of strong support for a national energy advocacy body, with continued funding of jurisdiction specific advocacy bodies, to enhance the capacity of consumers to fully experience the benefits of DSP measures.

In closing, SACOSS strongly supports the establishment of cost reflective tariffs for the public and social housing buying group cohort and support for a national energy advocacy body as priority considerations for the Power of Choice Review.

Yours sincerely,



Ross Womersley
Executive Director

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AEMC POWER OF CHOICE REVIEW

DIRECTIONS PAPER

SOUTH AUSTRALIAN COUNCIL OF SOCIAL SERVICE

A report on:

- The AEMC's Directions Paper of its Market Review: *Power of Choice – giving consumers options in the way they use electricity.*
- Key issues for SACOSS
- Recommendations

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April 30th, 2012

PREFACE

SACOSS has commissioned St Kitts Associates to provide advice with respect to the Directions Paper published by the AEMC as part of its Power of choice Market Review.

SACOSS has sought a brief report in order to identify key issues of relevance to the SACOSS work in advancing the interests of the market's most vulnerable consumers.

BACKGROUND

The Directions Paper represents a further step in the Commission's inquiry into demand-side participation (DSP) in the National Electricity Market.

The Directions Paper states that

“... DSP refers to the ability of consumers to make informed choices about how much electricity they use at different time. These choices should efficiently reflect the value they obtain from using electricity services. Examples of DSP can include, but are not limited to, such measures as electricity conservation, peak demand shifting, fuel switching, utilisation of distributed generation and energy efficiency.”

Appendix D of the Paper is dedicated to *Issues related to vulnerable consumers*.

SUMMARY

1. The motivation for the Power of Choice Review lies in the increasing cost of ‘peak demand’ – the fact that when we, collectively, consume electricity affects the price. Rising peak demand and stagnant or falling annual consumption means a deteriorating load factor (in essence the ratio of the maximum demand at any one time to the average demand throughout the year). Deteriorating load factors can only result in higher prices.
2. A key factor for the residential sector in South Australia is the close correlation between electricity demand and temperature. South Australia has a ‘peaky’ climate and the small customer load profile very closely follows the need for cooling in summer. The cost of this cooling capacity is borne, in part, by all small consumers whether or not they directly contribute to the demand.
3. In terms of appropriate actions, there is an efficiency dividend for the market and consumers overall in a more optimal mix of supply and demand. That is, greater Demand Side Participation (DSP) should lead to lower prices than would otherwise be the case. This benefit should reach all consumers including those of most interest to SACOSS – those at risk of disconnection for an inability to pay. SACOSS should therefore broadly support efforts in this regard.
4. However, a DSP measure that may offer a much greater opportunity to lower costs specifically for those at risk of disconnection is the unwinding of the cross subsidies inherent in residential pricing related to the cost of peak demand.
5. Market settlement is based on the notion that all small customers have the same load profile. Preliminary analysis¹ suggests that customers with significantly flatter load profiles than the average might be 10-20% cheaper to supply.
6. This benefit is likely to apply to those households at greatest risk of disconnection. However, the cost of accessing this benefit (that is; demonstrating a flatter load profile) could reduce the net benefit significantly. The initial costs of Advanced Metering Infrastructure (AMI) in Victoria are in the order of \$100 per customer per annum² - a cost greater than half of the estimated benefit.
7. As an example of an alternative approach to allocating this benefit to vulnerable consumers, I have provided an outline of part of my doctoral thesis. This describes the potential for public housing tenants to act as a cohort of 50,000 consumers with a diversified load profile statistically different to the standard Net System Load Profile that applies to the state’s over 800,000 small customers. These customers should be able to be access a market offer that reflects the fact they are cheaper to supply than the average customer.
8. More broadly, in terms of the peak demand phenomenon in South Australia, it is clear that summer cooling is the principal causal factor. Market interventions such as energy efficiency schemes should therefore target summer cooling and also ensure that other supported measures do not result in the deterioration of the residential load factor.

¹ This analysis is being performed as part of Andrew Nance’s doctoral thesis at the University College London School of Energy and Resources Australia (UCL SERAus). In turn, this has been contrasted with similar work undertaken by AGL Applied Economics and Research Working Paper No. 24 (Dynamic Pricing, February 2011) using Queensland as a case study

² Based on the Australian Energy Regulator (AER) Final Determination Victorian AMI budget and charges 2012-15 available at www.aer.gov.au/content/index.phtml/itemId/743595

RECOMMENDATIONS

9. It is recommended that SACOSS submit to the AEMC that further consideration be given to using load profiling as a way of segmenting the residential sector by load factor as an alternative to a roll out of AMI in SA.
10. It is recommended that SACOSS submit to the AEMC that the *load factor* of the Net System Load Profile is a key parameter for assessing market performance. It is a measure of energy productivity (the term advanced in the Australian Government's recent Draft Energy White Paper) and that the effect on this parameter should be used when assessing the efficacy of market interventions.
11. It is recommended that SACOSS submit to the AEMC that the South Australian situation is dominated by residential space cooling in summer and that interventions should focus on this as a way of:
 - a. Reducing the costs of individual households
 - b. Recognising the risks that summer heatwaves pose for vulnerable consumers, especially the aged and households with small children
 - c. Slowing the growth in peak demand and the deterioration of the load factor, for the benefits of all small consumers
 - d. Acknowledging the interaction between energy policy (and energy market policy in particular) and housing policy.

ANALYSIS

12. In considering the key issues for SACOSS, it is useful to dissect the problem that the DSP Review is addressing. The principal area of interest for SACOSS is the issues related to residential consumers. The South Australian residential electricity market comprises 737,367 customers (as at 30 June 2011), around 4,400 GWh of sales, worth just of \$1bn per annum (ESCOSA 2011 Annual Performance Report).
13. The residential electricity market is settled as the residual of the wholesale market based on what is referred to as the Net System Load Profile (NSLP). In the absence of individual time of use metering, all small customers (residential plus around 90,000 small businesses) with a simple accumulation meter, are assumed to have consumed at times of the day represented by the NSLP.
14. The South Australian region of the market exhibits the most 'peaky' demand profile in the NEM and given that this is a significant contributor to historically higher costs in SA compared to other regions, has been an area of ongoing interest and activity by SACOSS. SACOSS has long acknowledged that how we collectively use electricity, effects the price we all pay for it.
15. However, not all consumers contribute to the cause equally. The Australian Government's DRAFT Energy White Paper (DRET, 2011) makes reference to the apparent cross-subsidy that exists within the 'small customer' cohort. The Energy White Paper makes an assertion that a key factor behind the growth in peak demand is inefficient pricing structures that are not cost reflective and that this³:

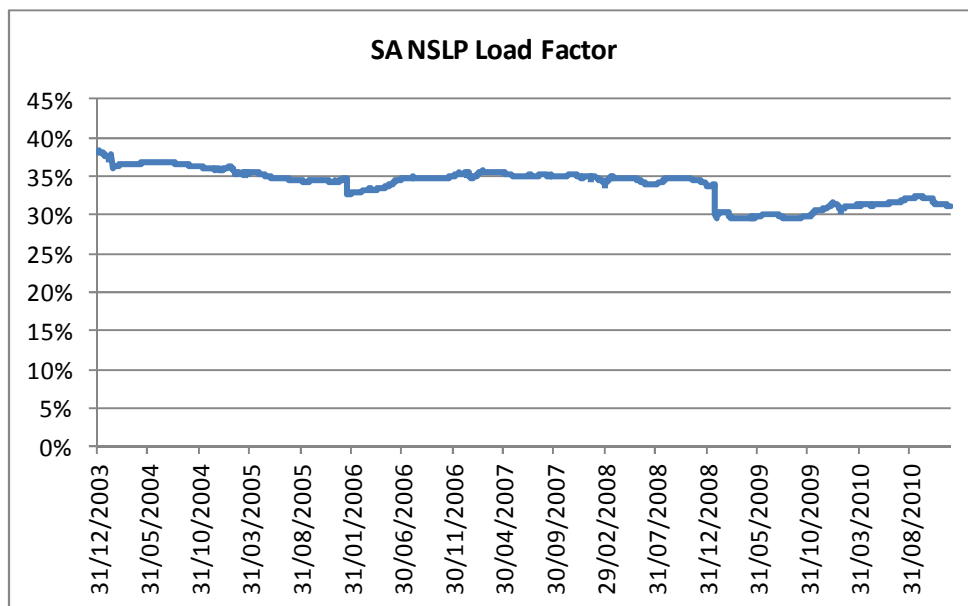
"... results in some consumers paying more than they should, and effectively cross subsidising those who are driving the growth in peak demand."
16. The document expands on this somewhat when it states:

"This means that the less well off, who generally do not run multiple air conditioners and television sets, are cross subsidising those consumers who do."
17. When considering a way of prioritising the relevant issues for SACOSS, the basis has been to consider the matters raised in the Directions paper related to appropriate protections for vulnerable consumers.
18. It is my view that the consumer cohort of most interest to SACOSS is those at genuine risk of disconnection through an inability to pay. SACOSS should be interested to the extent that DSP can enhance affordability for these households, and, conversely, should be interested to the extent that actions or inaction could make affordability deteriorate further.
19. The following section characterises the peak demand phenomenon in SA.

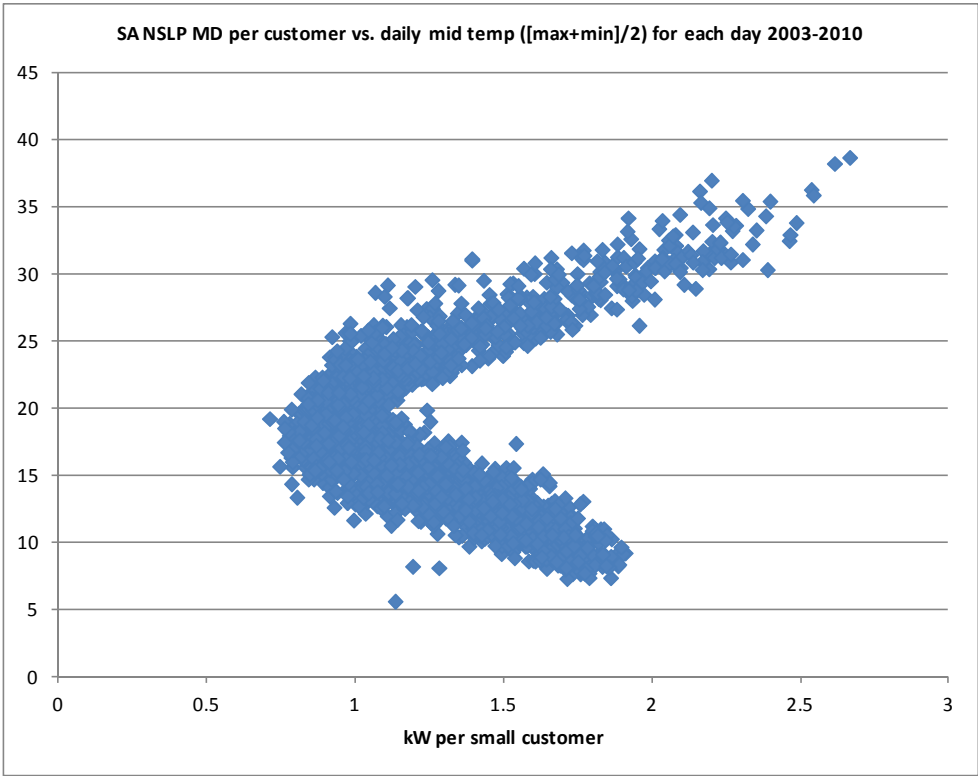
³ DRET 2011 Overview page xxii

PEAK DEMAND IN SOUTH AUSTRALIA

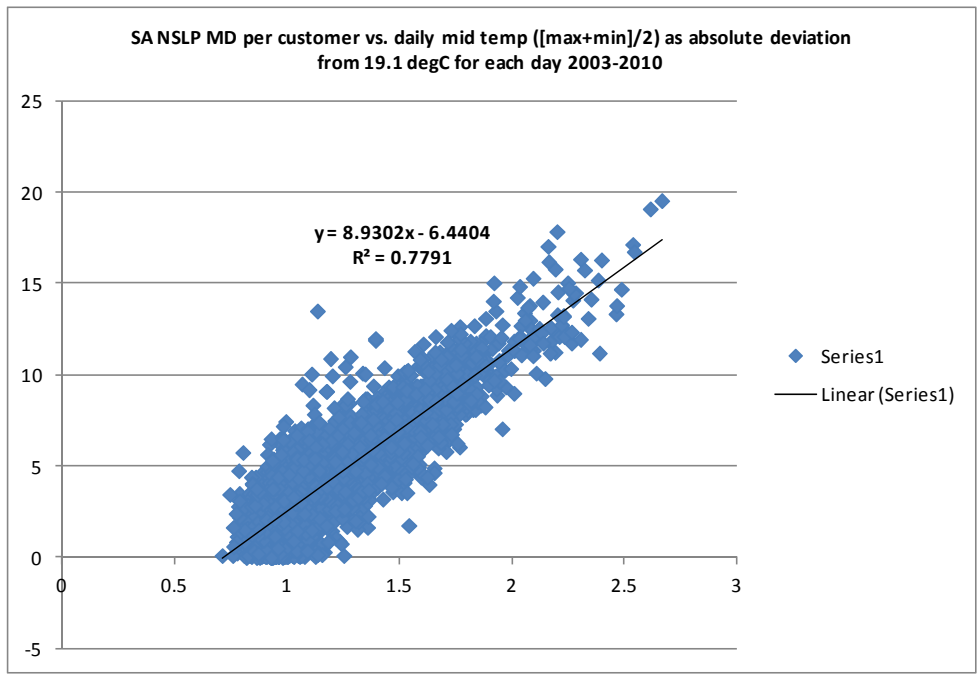
20. It is possible to illustrate the relationship between small customer peak demand and temperature. The following plots have been compiled from data published by the Australian Energy Market Operator (NSLP and market price data) and the Bureau of Meteorology (Temperature data). The data covers the years 2003 to 2010 – 8 years of market data since the introduction of Full Retail Contestability (FRC) in SA.
21. The extent of the peak demand phenomenon is usually illustrated by a region's Load Factor – the ratio between actual energy consumed and what could have been consumed if the peak demand had been sustained all year. For the SA NSLP, the 12month rolling average is around 32% although it has been below 30%.



22. The following chart illustrates the relationship between NSLP Maximum Demand (MD) and temperature. There is a relatively strong relationship between MD and the daily 'mid temp' – the simple mean of the maximum and minimum temps recorded for each day (ie $\text{Max} + \text{Min} / 2$). The chart has been normalised for the growth in customer numbers and is displayed as a MD (kW) per customer.
23. As can be seen, the MD increases when temperature either increases or decreases from, what appears to represent, a *comfortable* temperature. Such an approach also acknowledges the impact of higher overnight temperatures on the cooling load.



24. The same data re-cast was found to provide a strong relationship to a ‘comfortable’ middle temperature of 19.1°C. The data suggests that around three-quarters of the variation in the SA NSLP MD can be accounted for by the daily deviation from this temperature.



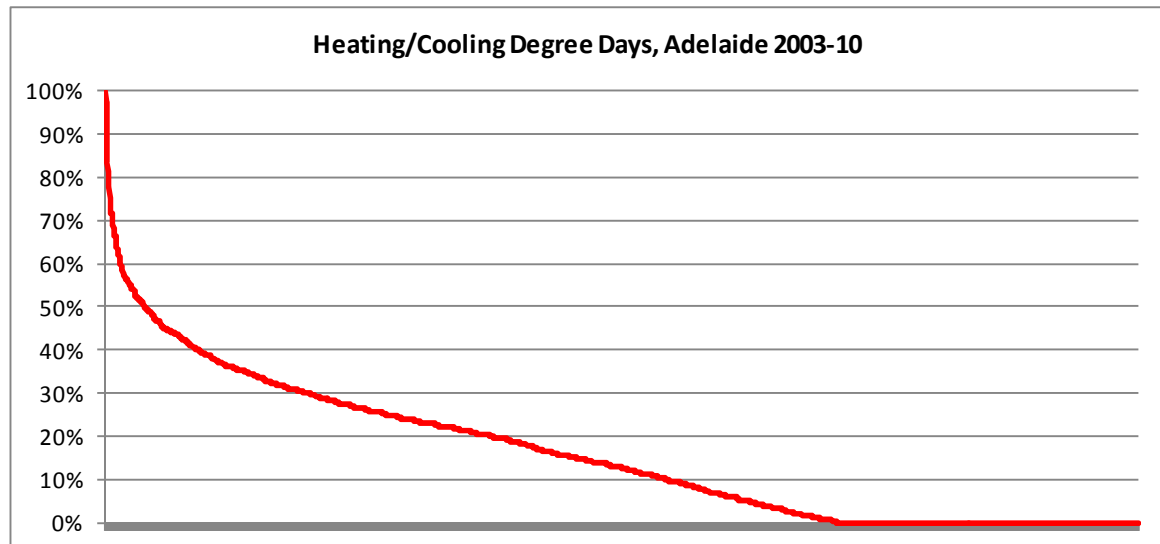
25. It is quite clear that the extremes of demand are driven by high temperatures. In the South Australian case, the prevalence of protracted heat waves in recent summers has resulted in higher MD levels being recorded.

26. To illustrate the relationship between electricity demand ‘peakiness’ and temperature, the following is an analysis of the ‘peakiness’ of heating and cooling ‘degree days’. The Australian Bureau of Meteorology (BoM) provides information on the degree days concept⁴.

Heating and cooling degree days are based on the average daily temperature. The average daily temperature is calculated as follows: [maximum daily temperature + minimum daily temperature] / 2. If the average daily temperature falls below comfort levels, heating is required; and if it is above comfort levels, cooling is required.

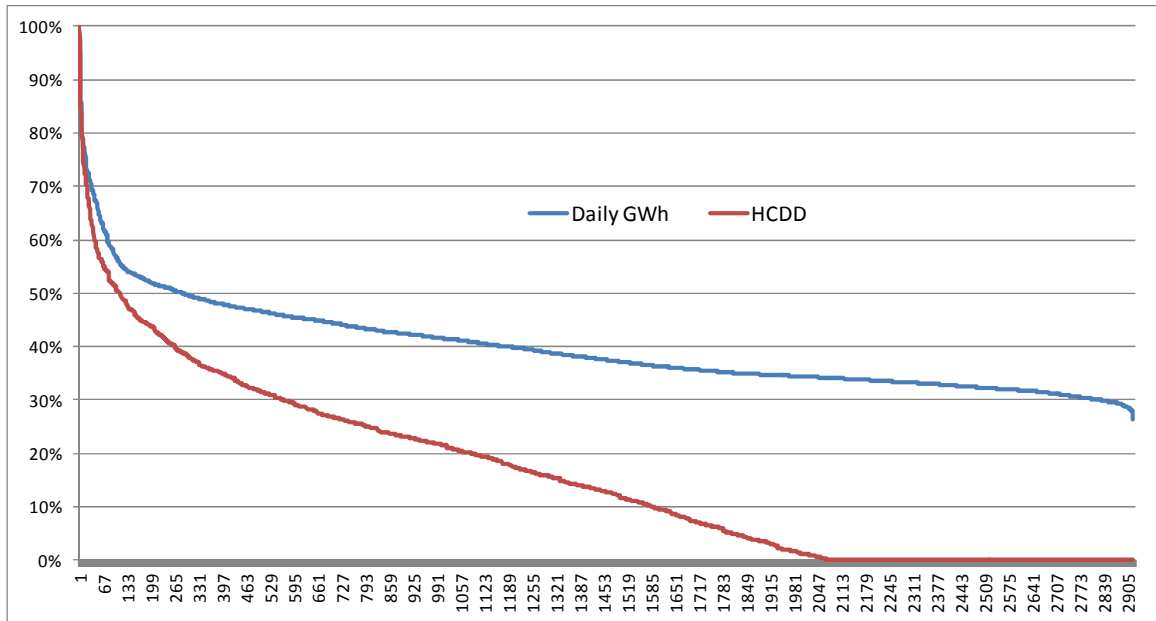
The heating degree days or cooling degree days are determined by the difference between the average daily temperature and the comfort level temperature.

27. For the purposes of this analysis, Summer Cooling Degree Days (SCDD) and Winter Heating (WHDD) were not separated out. A ‘comfort band’ around the observed midpoint (19.1°C) of +/- 2.5°C has been used to separate out a measure referred to as Heating and Cooling Degree Days (HCDD). The purpose of this is to illustrate that the ‘peakiness’ of electricity consumption is no more pronounced than the ‘peakiness’ of the Adelaide climate (acknowledging that consumers in the South Australian region of the NEM live in a range of climates from Port Augusta to Mount Gambier but that Adelaide not only contains the majority of residential consumers but represents somewhat of a middle ground of climates as well).
28. In the chart, 100% relates to a day where the difference between the mean temp (ie the simple mean of the daily maximum and overnight minimum) and the upper end of the range (19.1 + 2.5 = 21.6) was at its maximum of 17.05°C (January 29th, 2009 and coincided with the maximum value recorded for the NSLP of 2132MW).

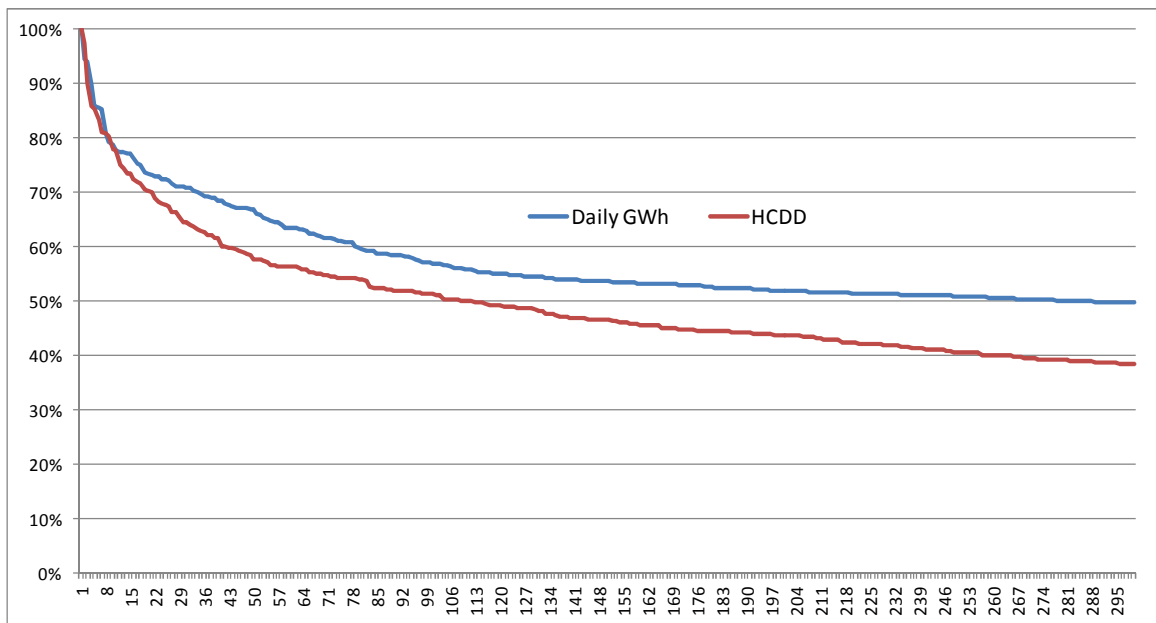


29. For comparison, the following includes the NSLP daily electricity volumes for the same 8 year period of 2003-10:

⁴ www.bom.gov.au/jsp/hcc/climate_averages/degree-days/index.jsp



30. The following chart zooms in on the top 10% of values (ie the top 300 of the 2922 samples)



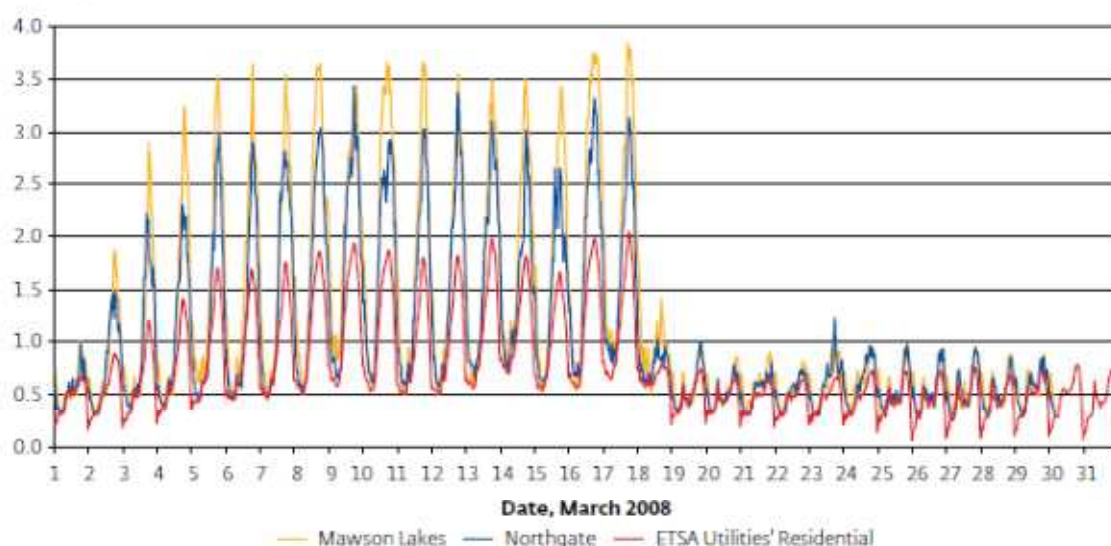
31. The above indicates that the demand profile of SA small electricity customers is closely correlated to the average SA climate which produces quite peaky cooling demands itself. An implication being that the energy service of space cooling is the primary causal factor behind the peak demand phenomenon and the efficiency of the market can be assessed in terms of how it allocates the cost of meeting this end-use. It is not clear if *space cooling*, for example, is what the National Electricity Objective refers to as an electricity service.
32. It is clear that the cost of providing electricity for the space cooling load is relatively high since it requires significant capital intensive capacity (MW) but consumes relatively small amounts of energy (and therefore small sales volume). The real cost of this electricity is then spread across all customers in the class.

33. The role of pricing in DSP is worth considering in the context of this particular subset of demand. The demand for space cooling, particularly at the extremes, is likely to be highly inelastic and to be accompanied by a significant willingness to pay by consumers.
34. It is then worth distinguishing the objectives of DSP and/or more cost reflective pricing between trying to drive changes in consumption or to provide for more efficient allocations of costs.

CROSS SUBSIDIES AND THE CONSUMER INTEREST

35. From a SACOSS perspective, the key issue is whether or not the market results to date are helping or hindering those at risk of disconnection. To the extent that poor load factors drive up costs, it is considered likely that the predominant effect is that these households may be paying higher than the efficient costs of supplying them.
36. The extent of this cross-subsidy is largely a function of the difference between the load factor of this cohort and the load factor of the average small consumer – that is; the NSLP. My preliminary analysis of the South Australian situation suggests that savings in the order of 10-20% are plausible if the cohort has a load factor in the range 45%-50% compared to the balance of households around the 30-35% range. ETSA Utilities are currently collecting data in order to better understand the diversity of load profiles of residential customers. SACOSS is represented on the ETSA Utilities Reference Group for this work.
37. The ETSA Utilities work builds on their observations from the Adelaide Heat Wave of January 2008 (15 days above 35°C). As shown on the following chart from the ETSA Utilities Regulatory Proposal 2010-15 to the AER (released in 2009), the electrical demands vary significantly from one suburb to the next.

Figure 5.6: Residential loading in summer 2008^(1,2)



Notes:

(1) Residential demand per customer (kW)— March 2008.

(2) Mawson Lakes requires 3.8kW; Northgate 3.4kW; and ETSA Utilities' residential (average) requires 2.0kW capacity.

38. The above profile (ETSA Utilities Figure 5.6) shows the diversified electrical demand from a sample of houses from two of Adelaide's newer residential developments (Mawson Lakes and Northgate) compared to the state-wide residential average during an extended heatwave (15 days above 35°C) in March 2008. The figure illustrates the almost 2:1 contribution from newer housing compared to the

older housing stock during the heat wave and the almost indistinguishable average consumption during milder weather (the rest of the month).

39. In summary, I believe the key issues for SACOSS in this review are in relation to the prices faced by residential consumers at risk of disconnection. Any efforts to promote demand-side initiatives and moderate prices for all consumers will have some trickle-down benefits to this consumer cohort. However, the more direct and material prospect is the extent to which these consumers may be paying more than the efficient cost of supplying them.
40. As SACOSS is aware, it is my view that a cohort such as public housing tenants have less capacity to generate cooling demand than the average household due to having dwellings with smaller than average floor areas, lower penetration of air-conditioning and smaller air-conditioners when they do.
41. This group of some 50,000 households are likely to have an aggregate load factor in the 45-50% range implying that their load profile may be materially cheaper to supply than the NSLP (noting that *some* households in this cohort may in fact have poor load factors but that the aggregate, diversified patterns of consumption is materially different to the NSLP).
42. The average public housing tenant spends around 20% less than the average household⁵ but still has electricity bills in excess of \$1200 per annum. They often receive the energy concession of \$157.50 which covers around 13% of the average bill.
43. If cost reflective retail and network pricing meant a further 10-20% cost reduction could be realised it would have an impact akin to a doubling of the concession for those that have it, and giving it to those that currently don't receive it. This implies that it is an opportunity worth pursuing.
44. However, if the price to access this new settlement profile was a smart meter *as per* the Victorian AMI Rollout, where the cost of meter provision and data handling is in the order of \$100 per annum and rising, the potential net benefit to the vulnerable consumer is eroded back to something providing a much less convincing case for change.
45. It is my view that such a customer cohort does not need to be individually smart-metered in order to establish a bespoke load profile for market settlement. The application is a corollary of the current arrangement for off-peak controlled load supply (off-peak hot water) where a sample of some 200 meters in representative locations is used to determine a separate controlled load profile for the SA Region.
46. The Discussion Paper makes a brief reference to such an opportunity at page 152:

"Given the limitations in the metering platform, there may be a case for trying to develop consumption profiles which more accurately reflect the consumption patterns of different types of consumers"
47. It is my view that a case is emerging for the establishment of cost reflective tariffs for a buying group of households with good load profiles and with this load profile established by a representative sample of dwellings rather than the expense of individual smart meters. If the load profile is established with an accompanying network tariff, then the retail supply to the group could be competitively tendered.

⁵ For example, see ABS 4618.4 October 2004 Domestic Use of Water and Energy South Australia and ABS Household Expenditure Survey Cat No 6530 Table 15: TENURE AND LANDLORD TYPE, Household expenditure, South Australia

48. It is also my view that the most prospective cohort is the tenants of public and social housing. The reasons for this are the combination of having, as a group, established their limited capacity to pay and, by the nature of their housing arrangements, have limited capacity to consume. The small number of landlords and their asset management practices mean it can be assured that this cooling capacity will not change significantly over time. This group is likely to be quite price inelastic due to the likely absence of much discretionary consumption. In short, this cohort should have a good and stable load factor – representing a lower risk load profile to a retailer than the NSLP.
49. The connection to the small number of landlords should also minimise Customer Acquisition and Retention (CAR) costs for retailers. Likewise, the high proportion of benefit recipients means that Centrepay is likely to have high uptake, lowering the risks to a prospective retailer. Similarly, the higher probability of receiving the energy concession (which is paid directly to retailers by the South Australian Government) should mean a stable baseline cashflow for a retailer as well.
50. The Directions Paper states (at 10.3 Way Forward page 159):

“We are seeking stakeholder views on whether further consideration on developing load profiles which could better support DSP is warranted. However, the issue of load profiling appears to only be fully resolvable if interval meters are available for all consumers.”

I would argue that there is merit in pursuing load profiling using a representative sample of meters as a more cost effective way of enhancing economic efficiency than a roll-out of interval meters.