

Submission to the Australian Energy Management Commission's Draft Report, *Power of Choice – giving consumers options in the way they use electricity*

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ATTN: Eamonn Corrigan, Director, Power of Choice Review

Dear Mr Corrigan,

Thank you for the opportunity to provide a submission to the Power of Choice draft report. This submission is informed by my ongoing qualitative social research with Australian residential electricity consumers, both independently and in conjunction with colleagues at RMIT University and electricity industry research partners. This submission represents my personal views in my professional capacity as a social scientist. It does not represent the views any particular company or research institute.

This submission does not specifically address or comment on the questions raised in the draft report. Rather, it draws attention to recent social research and alternative disciplinary perspectives relevant to the demand-side management (DSM) changes proposed in the Power of Choice review. The issues raised have broader implications for the assumptions on which the review is founded.

As the AEMC is already aware, the provision of information through website portals, smart phone applications and in home displays consistently demonstrates reductions in energy usage of between 5-20 per cent (Darby 2006; Faruqui *et al.* 2009). Further savings have been achieved where these tools are provided in combination with other DSM strategies, such as cost reflective pricing (Faruqui & Palmer 2011). These figures have been widely cited as the basis for the commonly held assertion that consumers require better information about their electricity consumption in order to manage their demand. This is a key assumption on which the Power of Choice review is founded.

However, the repeated assertion made in the Power of Choice review that 'consumers can make informed choices about the way they use electricity through the provision of appropriate information, education programs, incentives and technology' (p.1) is also subject to widespread international criticism in the social sciences and the field of human-computer interaction. Criticisms are leveled at claims that: (i) individual consumers make their own choices about their consumption; (ii) individual consumers make rational or cost-reflective decisions about their consumption; (iii) householders primarily interact with electricity through their role as 'consumers'; and (iv) the provision of information *about electricity* leads to desired and sustained behavioural change in electricity use. These criticisms extend beyond the electricity sector to the environment, water, transport and health sectors (see, for example, Burgess *et al.* 2003; Lindsay 2010; Shove 2010).

In previous work I have outlined the current disconnection between the language and tools of energy management and the ways in which energy is consumed in the course of ordinary, everyday life (Strengers 2011a, 2011b). This work draws attention to the social practices householders participate in, such as laundering, heating, cooling, bathing, entertaining and cooking, which are responsible for all energy consumption and peak electricity demand in the home. This and other social research indicates that these practices are unlikely to substantially change as a result of improved or real-time information to consumers about their electricity usage. Further, this work highlights that household practices are already continuing to change in ways that may serve to both hinder to assist with the challenges the AEMC seeks to address through the initiatives proposed in the Power of Choice review.

A large body of social research is now focused on these issues. A central contention of this work is that the social change we have witnessed (and are still witnessing) during the 20th and 21st centuries, in relation to electricity use and many other facets of everyday life, is not a process of many individual choices, but of the changing dynamics of social practices and services, such as how we eat, bathe, heat, cool, cook, clean, entertain and launder (Shove 2010; Shove 2003; Wilhite *et al.* 2000). Rather than being independent from energy demand and the choices of individuals, the supply-side has played a significant role in making possible, and in many cases directly promoting, many of these new forms of practice (Healy & MacGill 2012). This raises a number of important implications for the Power of Choice review.

Firstly, it reframes the problems the AEMC is seeking to address (*e.g.* peak electricity demand and climate change) as ones of changing social practices, particularly ways of cooling the body and home and the historically recent emergence of residential air-conditioning (Strengers 2010, 2012). Rather than viewing the increasing penetration and changing usage of air-conditioning as one of individual decisions and choices, historians and sociologists of technology have long argued that the increasing proliferation of this device is due to a complex process of socio-technical change characterised by changing housing formats; regulations and building codes; aggressive advertising and marketing campaigns; the decline of other cooling techniques; and new associated meanings of modernity and status attributed to this device (Ackermann 2002; Brager & de Dear 2003; Cooper 1998; Shove 2003). Substantial changes in air-conditioning penetration and usage in Australian households (DEWHA 2008) demonstrates that the practices of household cooling are still undergoing significant change that is unlikely to be substantially affected by the provision of household-specific electricity information or consumer choices. In particular, air-conditioning penetration is growing and usage patterns are changing.

Secondly, this body of research indicates that the split between the 'demand-side' and the 'supply-side' is an artificial one that potentially masks important ways in which the electricity industry and its associated technologies inadvertently shape demand. The ways in which resources are provided to householders, and the roles and relationships embedded into that system, have a significant impact on demand, in many ways mediating and co-shaping what makes sense for people to do in regards to how they use electricity (Southerton *et al.* 2004; Van Vliet *et al.* 2005). For example, one UK study found that the provision of renewable distributed generation meant that householders 'developed a distinctive approach to demand management, arranging a variety of routines around the availability of resources that most of us take for granted' (Chappells & Shove 2004: 139). More specifically, they shifted their use of electricity to times when it was available, a finding reported in other studies of distributed generation on residential properties (Bahaj & James 2007; Dobbyn & Thomas 2005; Keirstead 2007). Building on this and other work, recent research conducted by myself and my RMIT colleague Dr Cecily Maller found that 'energy and water systems that are materially present, exhibit traits of scarcity, and encourage diversity through innovation, may engage householders as co-managers of their everyday practices'

(Strengers & Maller 2012: 770). In short, the characteristics of electricity supply systems play a critical role in co-shaping electricity demand.

Thirdly, the AEMC's focus on electricity consumers or bill payers as the target of DSM initiatives potentially overlooks much of the electricity consumption and peak demand in the home. Many electricity consumers, particularly children, teenagers and even pets, do not readily identify as 'consumers', nor do they have any relationship with an electricity provider or an electricity bill. Women, for example, are likely to be more responsible for cleanliness in the home (and therefore hot water usage) (ABS 2009; Martens 2007), and have been found to be more sensitive to thermal temperatures (Karjalainen 2007). However, consumer research suggests that they are less likely to be interested in energy management data of the type provided by IHDs and website portals (Accenture 2011)—a finding supported by my research.

A fourth related point is that many everyday practices are not subject to regular, if any, cost-benefit analyses. In qualitative social research conducted by myself (Strengers 2011a, 2011b), and American (Pierce *et al.* 2010a; Pierce *et al.* 2010b), UK (Hargreaves 2010; Hargreaves *et al.* 2010; Hazas *et al.* 2012), and other Australian researchers (Maller *et al.* 2011), there is little evidence to suggest that householders weigh up the costs and benefits of performing many taken-for-granted practices, such as taking a shower, washing the dishes, doing the laundry, cooking dinner, heating the house or carrying out 'green' renovations. While cost-benefit analyses may be conducted on some actions (such as when deciding which television to buy) significant swings in what is considered 'normal' or 'necessary' practices that require or depend on electricity consumption tend to fall outside these processes (Shove 2003). For this reason, Sarah Darby notes that there are reasons to be cautious with the electricity savings achieved through the provision of information feedback, 'which so often turn out to be steps taken down an upward-moving escalator' (Darby 2008: 502). The risk of overlooking changes in taken-for-granted practices is that new peaks may emerge, or become exacerbated, that undermine DSM initiatives. The increase in electricity consumption occurring in the household ICT sector is one example that may have (further) significant implications for the electricity sector (EST 2007).

A fifth point is that many householders do not always understand, or relate to, the provision of energy-related information, such as resource units (kilowatt hours), costs, and impacts (greenhouse gas emissions). Social research in this area has found that there is often significant confusion associated with this terminology, and a disconnection between technical terms and their meaning and relevance to everyday practices, many of which are considered non-negotiable or non-discretionary (although this is always provisional and subject to change) (Hargreaves 2010; Hargreaves *et al.* 2010; Pierce *et al.* 2010a; Pierce *et al.* 2010b; Strengers 2011a). While many consumers are asking for this information and expect it to be part of smart metering and grid deployments, it is important not to overstate its benefits or likely impacts on the practices that are contributing to demand management problems, many of which are likely to continue to change in isolation from the provision of information. Other initiatives will also be required that directly address the changing dynamics of social practices integral to the problems the electricity industry is currently facing (*e.g.* changing expectations of household cooling).

Finally, research conducted by myself and colleagues on cost-reflective pricing in the residential electricity sector indicates that there is significant scope for engaging householders in demand management issues beyond their role as price-responsive consumers. In particular, the internationally consistent finding that householders substantially shift their electricity demand on very hot days in response to critical peak pricing (CPP), critical peak rebates and non-monetary based requests (information-only trials), challenges the commonly held assumption that air-conditioning is non-

discretionary on hot days. Our research on this topic has found that a substantial proportion of this response may be due to householders being engaged as co-managers of their cooling (and other domestic) practices on hot days, rather than (or as well as) making cost-benefit decisions and rational choices (Strengers 2010; Strengers & Maller 2011).

For these opportunities to be realised, there needs to be much greater reflection on the changing relationship between providers and consumers of electricity and the ways in which the electricity industry involves and relates to its consumers. As is now recognised internationally, a paternalistic relationship in which the electricity industry's role is to provide electricity, and the consumer's role is to consume it, is no longer appropriate given the challenges posed by climate change, peak electricity demand, and the integration of ICTs into the electricity system (Wimberly 2011). The challenge will be to relate to and engage with householders in a two-way conversation, rather than (only) providing householders with highly simplified information, which can be viewed as patronising and disengaging.

I would like to stress that the implications of the research discussed above are not that current DSM strategies do not or cannot work, but rather that they may work for different reasons than those put forward in the economic or psychological analyses that currently dominate DSM policy, practice and research. While savings are achieved through the provision of information feedback via a website portal or IHD, the implications of the social research I refer to above is that these savings may be negated as more carbon-intensive or peaky forms of practice take hold. Further, social research on cost-reflective pricing suggests that responses to CPP, CPR and 'information-only' pricing trials may be the result of the changing relationship between providers and consumers during participation in these programs, rather than purely rational responses. This opens up new opportunities and potential areas of foci currently unexplored in the AEMC Power of Choice review.

In conclusion, I encourage the AEMC to engage more broadly with the social sciences, beyond those disciplines that currently dominate DSM. New disciplinary perspectives provide alternative problem definitions, starting points and opportunities which are required to achieve the significant transformations currently taking place and required for Australia's electricity industry.

I wish you well with your review and future work in this area.

Yours faithfully



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For further information on my research and publications in this area visit:
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References

- ABS 2009, 'Australian Social Trends (4102.0): Trends in household work', viewed 2 April 2009.
- Accenture 2011, *Revealing the values of the new energy consumer: Accenture end-consumer observatory on electricity management 2011*, Accenture.
- Ackermann, M 2002, *Cool comfort: America's romance with air-conditioning*, Smithsonian Institution Press, Washington, USA.
- Bahaj, AS & James, PAB 2007, 'Urban energy generation: The added value of photovoltaics in social housing', *Renewable and Sustainable Energy Reviews*, vol. 11, no. 9: 2121-36.
- Brager, G, S & de Dear, RJ 2003, 'Historical and cultural influences on comfort expectations', in R Cole & R Lorch (eds), *Buildings, culture and environment: informing local and global practices*, Blackwell Publishing, Oxford [UK], 177-201.
- Burgess, J, Bedford, T, Hobson, K, Davies, G & Harrison, C 2003, '(Un)sustainable consumption', in F Berkhout, M Leach & I Scoones (eds), *Negotiating Environmental Change: New Perspectives from Social Science*, Edward Elgar, Cheltenham, UK, 261-92.
- Chappells, H & Shove, E 2004, 'Infrastructures, crises and the orchestration of demand', in D Southerton, B Van Vliet & H Chappells (eds), *Sustainable Consumption: the Implications of Changing Infrastructures of Provision*, Edward Elgar, Cheltenham, UK, 130-43.
- Cooper, G 1998, *Air-conditioning America: Engineers and the Controlled Environment, 1900-1960*, The Johns Hopkins University Press, Baltimore, USA.
- Darby, S 2006, *The effectiveness of feedback on energy consumption: A review for DEFRA of the literature on metering, billing and direct displays*, Environmental Change Institute, University of Oxford, Oxford, UK.
- Darby, S 2008, 'Energy feedback in buildings: improving the infrastructure for demand reduction', *Building Research & Information*, vol. 36, no. 5: 499-508.
- DEWHA 2008, *Energy Use in the Australian Residential Sector 1986-2020*, Australian Government: Department of the Environment, Water, Heritage and the Arts (DEWHA), Canberra, Australia.
- Dobbyn, J & Thomas, G 2005, *Seeing the light: The impact of micro-generation on our use of energy*, The Hub Research Consultants on behalf of the Sustainable Consumption Roundtable, London, UK.
- EST 2007, *The ampere strikes back: How consumer electronics are taking over the world*, Energy Savings Trust (EST), London, UK.
- Faruqui, A & Palmer, J 2011, 'Dynamic pricing and its discontents', *Regulation*, vol. 16, no. Fall.
- Faruqui, A, Sergici, S & Sharif, A 2009, 'The impact of information feedback on energy consumption - a survey of the experimental evidence', *Energy*, vol. 35, 1598-608.
- Hargreaves, T 2010, *Working paper 141: the visible energy trial: insights from qualitative interviews*, Tyndall Centre for Climate Change Research, Norwich, UK.
- Hargreaves, T, Nye, M & Burgess, J 2010, 'Making energy visible: a qualitative field study of how householders interact with feedback from smart energy monitors', *Energy Policy*, vol. 38, 6111-9.
- Hazas, M, Brush, AJB & Scott, J 2012, 'Sustainability does not begin with the individual', *interactions*, vol. 19, no. 5: 14-7.
- Healy, S & MacGill, I 2012, 'Chapter 2 - From Smart Grid to Smart Energy Use', in FP Sioshansi (ed.), *Smart Grid*, Academic Press, Boston, 29-59.
- Karjalainen, S 2007, 'Gender differences in thermal comfort and use of thermostats in everyday thermal environments', *Building and Environment*, vol. 42, 1594-603.
- Keirstead, J 2007, 'Behavioural responses to photovoltaic systems in the UK domestic sector', *Energy Policy*, vol. 35, no. 8: 4128-41.

- Lindsay, J 2010, 'Healthy living guidelines and the disconnect with everyday life', *Critical Public Health*, vol. 20, no. 4: 475-87.
- Maller, C, Horne, R & Dalton, T 2011, 'Green Renovations: Intersections of Daily Routines, Housing Aspirations and Narratives of Environmental Sustainability', *Housing, Theory and Society*, 1-21.
- Martens, L 2007, 'The visible and the invisible: (de)regulation in contemporary cleaning practices', in B Campkin & R Cox (eds), *Dirt: New Geographies of Cleanliness and Contamination*, I.B. Tauris & Co Ltd, London, UK.
- Pierce, J, Fan, C, Lomas, D, Marcu, G & Paulos, E 2010a, 'Some considerations of the (in)effectiveness of residential energy feedback systems', paper presented to DIS 2010, Aarhus, Denmark, 16-20 August.
- Pierce, J, Schiano, DJ & Paulos, E 2010b, 'Home, habits, and energy: examining domestic interactions and energy consumption', paper presented to CHI 2010, Atlanta, Georgia, USA, 10-15 April
- Shove 2010, 'Beyond the ABC: climate change policy and theories of social change', *Environment and Planning A*, vol. 42, 1273-85.
- Shove, E 2003, *Comfort, Cleanliness and Convenience: the Social Organisation of Normality*, Berg Publishers, Oxford, UK.
- Southerton, D, Chappells, H & Van Vliet, B (eds) 2004, *Sustainable Consumption: the Implications of Changing Infrastructures of Provision*, Edward Elgar, Cheltenham, UK.
- Strengers, Y 2010, 'Air-conditioning Australian households: a trial of Dynamic Peak Pricing', *Energy Policy*, vol. 38, no. 11: 7312-22.
- Strengers, Y 2011a, 'Designing eco-feedback systems for everyday life', paper presented to Proceedings of the 2011 annual conference on Human factors in computing systems, Vancouver, Canada.
- Strengers, Y 2011b, 'Negotiating everyday life: the role of energy and water consumption feedback', *Journal of Consumer Culture*, vol. 11, no. 19: 319-38.
- Strengers, Y 2012, 'Peak electricity demand and social practice theories: Reframing the role of change agents in the energy sector', *Energy Policy*, vol. 44, 226-34.
- Strengers, Y & Maller, C 2011, 'Integrating health, housing and energy policies: the social practices of cooling', *Building Research & Information*, vol. 39, no. 2: 154-68.
- Strengers, Y & Maller, C 2012, 'Materialising energy and water resources in everyday practices: Insights for securing supply systems', *Global Environmental Change*, vol. 22, 754-63.
- Van Vliet, B, Chappells, H & Shove, E 2005, *Infrastructures of Consumption: Environmental Innovation in the Utilities Industries*, Earthscan, London, UK.
- Wilhite, H, Shove, E, Lutzenhiser, L & Kempton, W 2000, 'The legacy of twenty years of energy demand management: we know more about individual behaviour but next to nothing about demand', in E Jochem, J Sathaya & D Bouille (eds), *Society, Behaviour and Climate Change Mitigation*, Kluwer Academic Publishers, The Netherlands, 109-26.
- Wimberly, J 2011, *EcoPinion Consumer Cents for Smart Grid Survey Report, Issue 12*, EcoAlign, USA, May.