St Vincent de Paul Society
NATIONAL COUNCIL
good works

Direct Load Control and Smart Grid

Customer issues for South Australia

January 2010

May Mauseth Johnston

Direct Load Control and Smart Grid - Customer issues for South Australia
May Mauseth Johnston
St Vincent de Paul Society National Council, January 2010

National Council Office:
PO Box 243, Deakin West, ACT 2600
www.vinnies.org.au

Contact: Gavin Dufty
Manager Social Policy Unit
St Vincent de Paul Society Victoria
Locked Bag 4800, Box Hill, VIC 3128

Table of Content

List of Abbreviations

ABS	Australian Bureau of Statistics
AGL SA	Australian Gas Light Company South Australia
ACT	Australian Capital Territory
AEMA	Australian Energy Market Agreement
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
CPI	Consumer Price Index
CPP	Critical Peak Pricing
CRA	Charles River Associates
CSO	Community Service Obligation
CUAC	Consumer Utilities Advocacy Centre
DLC	Direct Load Control
EDPD	Electricity Distribution Price Determination
EIOSA	Energy Industry Ombudsman South Australia
EMCa	Energy Market Consulting Associates
ESCOSA	Essential Services Commission of South Australia
ETF	Early Termination Fee
GSL	Guaranteed Service Level
GST	Goods and Services Tax
GWh	Giga Watt hour
HAN	Home Area Network
IHD	In-home display
kWh	Kilo Watt hour
LCU	Load control units
MCE	Ministerial Council on Energy
MWh	Mega Watt hour
NECF	National Energy Customer Framework
NEL	National Electricity Law
NEM	National Electricity Market
NEMR	National Energy Marketing Rules
NER	National Electricity Rules
NERL	National Energy Retail Law
NERR	National Energy Retail Rules
NPV	Net Positive Value
NSW	New South Wales
REES	Residential Energy Efficiency Scheme
RPWG	Retail Policy Working Group
SCO	Standing Committee of Officials
SACOSS	South Australian Council of Social Service
SG	Smart Grid
SMI	Smart Meter Infrastructure
SMWG	Smart Meter Working Group
SASES	South Australian State Emergency Service
SVDP	St Vincent de Paul
TOU	Time of Use
WA	Western Australia
WDP	Wrongful disconnection payment

Acknowledgements

The Society of St Vincent de Paul National Council is grateful for the funding provided by the **National Advocacy Panel** to undertake this project, and wishes to thank and acknowledge the following organisations for supporting the project idea and the funding application: Centacare Catholic Family Services, Good Sheppard Youth and Family Services, Jesuit Social Services, MacKillop Family Services, Mission Australia, Queensland Council of Social Service, The Brotherhood of St Laurence, Uniting Care Victoria and Tasmania, Victorian Council of Social Service and Welfare Rights Unit Inc.

The society and the author of this report are particularly grateful to Catholic Social Services for supporting this project with the provision of an office space.

Finally, I wish to thank Gavin Dufty, Manager for Policy and Research at the St Vincent de Paul Society, Victoria, Tom Stead at SACOSS and Mark Henley at United Care Wesley Adelaide for their input to the report.

May Mauseth Johnston
January 2010

Introduction

This report, Direct Load Control and Smart Grid – Customer issues for South Australia, is the fourth of a series of five reports investigating jurisdictional and National Energy Market (NEM) issues pertaining to customer protections, Community Service Obligations and regulation in light of smart meter infrastructure, or in the case of South Australia, Direct Load Control and Smart Grid technology.

Attached to this report is an extensive **Background Paper** discussing smart meters and associated consumer issues more broadly. This Background Paper was also attached and referenced in the three first reports of this project, looking at issues pertaining to Victoria and NSW (*Customer Protections and Smart Meters – Issues for Victoria*, August 2009, *Customer Protections and Smart Meters – Issues for NSW*, October 2009 and *Customer Protections and Smart Meters – Issues for Queensland*, November 2009). The project will produce a fifth and final report aimed to inform the MCE, Federal Government and regulators about smart meter related consumer issues. This final report will collate recommendations and advocacy positions as they arise from consultations on the jurisdictional reports.

Structure of the report

Section 1 provides a brief outline of key energy market characteristics in South Australia, ranging from consumption levels to price trends to disconnection levels.

Section 2 provides an overview of Direct Load Control (DLC) trials in South Australia and discusses some of the important lessons and findings to date. This section also highlights some issues that may arise if there is a rollout of DLC technology on a broader scale in South Australia or in other states.

Section 3 discusses potential DLC related customer impact issues, including equitable access to DLC products and customer information about DLC contracts and integrated appliances.

Section 4 presents some of the economic regulation aspects of DLC and smart grid rollouts. Focusing on cost allocation issues and the pass through of benefits to consumers.

Section 5 examines the current South Australian customer protections in comparison to the proposed National Energy Customer Framework (NECF) in light of DLC and smart grid technology.

Section 6 provides concluding remarks in relation to the NECF and DLC/smart grid technology, and the adequateness of the proposed protections for future energy markets.

This report contains 16 recommendations. The majority of the recommendations are in relation to the NECF but other recommendations are directed at the South Australian Government, the Essential Services Commission of South Australia, the Australian Energy Regulator and the Australian Energy Market Commission.

1. The South Australian Market

1.1 Smart meters and Direct Load Control in South Australia

The South Australian Government has firmly expressed its opposition to rolling out smart meters for the purpose of introducing time of use (TOU) pricing in South Australia.[1]

In 2001 the South Australian Government established the Electricity Demand Side Measures Task Force to identify measures to help reduce the peak demand for electricity. Being the state with the peakiest demand profile in Australia, reducing peak demand was identified as a fundamental energy challenge for the state. In a response to the Task Force's final report, the Government stated its support for processes that ensure ETSA Utilities consider demand side management options as alternatives to network upgrade and augmentation.[2]

In 2005, the Essential Services Commission of South Australia (ESCOSA) approved $20.4 million in funding for ETSA Utilities to conduct a range of pilot demand management programs between 2005 and 2010. The objective of the pilot programs was to explore what the most effective demand management strategies for South Australia would be. The pilot programs were primarily tasked with investigating the use of available and emerging technologies, as well as taking note of regulatory and economic impacts.[3] Direct Load Control (DLC) technology has been extensively trialled as part of these pilot programs. DLC allows electricity suppliers to remotely control electric devices in a home (or a business) and thus to 'cycle' electric devices at peak times. That is, to turn on and off appliances such as air-conditioners and pool pumps, at short intervals. Smart meter infrastructure can incorporate the DLC functionality or DLC can be rolled out independently of smart meters. The trial findings are discussed in section 2 below.

1.2 Key market characteristics

1.2.1 Recent energy market reform

- The South Australian electricity industry was privatised in 1999.
- Full retail competition for electricity was introduced in January 2003.
- In 2008 the Australian Energy Market Commission (AEMC) reviewed the effectiveness of competition in South Australia and recommended the deregulation of standing contract prices. The South Australian Government decided not to act on this recommendation. The retention of direct price control for standing contract customers was viewed by the Government as an important mechanism to maintain public confidence, and as a means to

[1] South Australia's Minister for Energy, Pat Conlon, has on several occasions expressed his views on smart meters and time of use pricing in particular. One illustrative comment made to The 7.30 Report in 2007 was: "If you want a policy outcome where we kill the elderly in droves during heat waves, this is what you do" (ABC, The 7.30 Report, Smart meters: blessing or curse? 23 August 2007).

[2] The Government of South Australia, *Electricity Demand Side Measures Task Force Final Report – Government Response Report*, April 2003.

[3] For more background information on the demand management and research project, see ETSA Utilities, *Demand Management - The Way Forward*, 2005/06 – 2009/10.

safeguard consumer interests during the current period of energy sector uncertainty.[4]

1.2.2 Load and consumption issues

- Domestic electricity accounts for approximately 39% of the state's total annual electricity consumption.[5]
- Domestic electricity consumption increased by 5% in 2008-09.[6]
- Approximately 85% of households have air conditioning.[7]

1.2.3 Domestic consumers

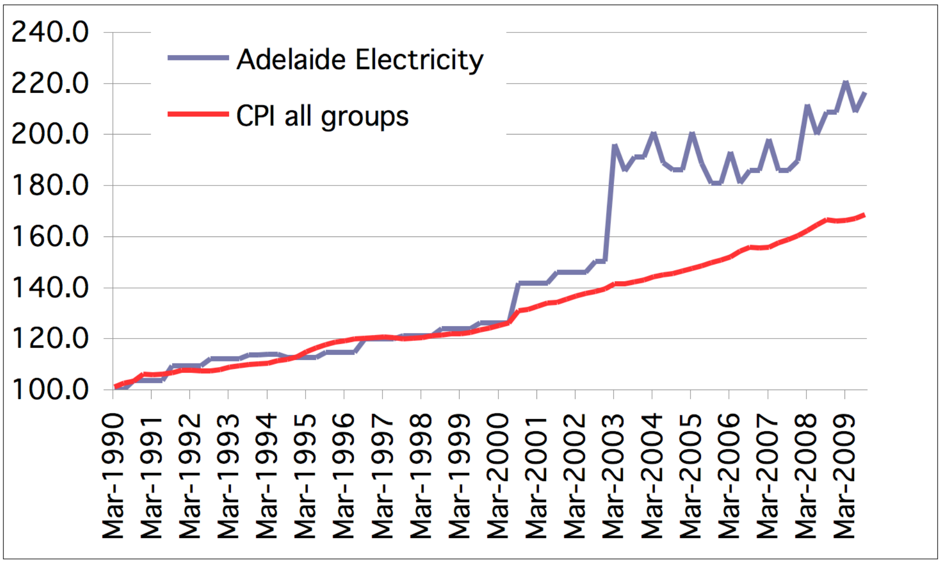
- There are approximately 687,000 residential electricity connections in South Australia.[8]
- Average electricity consumption per household is just over 6000 kWh per annum.[9]
- Household access to reticulated gas is relatively high. Almost 27% of households use natural gas for heating purposes and 46% use gas for hot water services.[10]
- In December 2008, a household using 5000 kWh per annum had an annual electricity bill of just over $1,500 (standing contract price).[11]
- As of June 2009, 72% of domestic customers were on a market contract.[12]
- Since 2007 there has been a continued reduction in active marketing to small customers in South Australia.[13]
- In 2007/08, there were approximately 2000 prepayment customers in South Australia.[14]

---

[4] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry*, November 2009, p 23.
[5] NERA Economic Consulting, *Cost Benefit Analysis of Smart Metering and Direct Load Control*, Report for the Ministerial Council on Energy Smart Meter Working Group (Phase 2, Stream 4), February 2008, p 74.
[6] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry*, November 2009, p 52.
[7] Energy Market Consulting Associates (EMCa) report to the Ministerial Council on Energy Standing Committee of Officials, *Smart Meter Consumer Impact: Initial Analysis*, Consultation Draft, February 2009.
[8] ESCOSA, *2007/08 Annual Performance Report, Energy Retail Market*, November 2008.
[9] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry,* November 2009, p 58.
[10] Energy Market Consulting Associates (EMCa) report to the Ministerial Council on Energy Standing Committee of Officials, *Smart Meter Consumer Impact: Initial Analysis*, Consultation Draft, February 2009.
[11] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry, November 2009, p 54.*
[12] Ibid p 24.
[13] Ibid p 30.
[14] ESCOSA, *2007/08 Annual Performance Report, Energy Retail Market*, November 2008.

1.2.4 Price trends

Graph 1
Cost of electricity and CPI, Adelaide March 1990-September 2009[15]



1.2.5 Energy affordability and disconnections

- In 2008-09, the standing contract price for a typical residential customer increased by 4.1%.[16]
- In 2008-09 electricity retailers disconnected just under 1% of customers (6,086 households) due to non-payment of bills.[17]
- 2.5% of customers were offered an instalment plan due to financial difficulties. AGL SA reduced its number of instalment plans drastically in 2008-09 by only offering 2,093 instalment plans (down from 9,089 in the previous year)[18]
- Approximately 219,000 customers (31%) receive electricity concession.[19]
- The South Australian Government's Energy Concessions provides an annual discount of up to $120 on energy bills (electricity and gas combined) to eligible pensioners and healthcare card holders.
- In 2008, the South Australian Government announced the Residential Energy Efficiency Scheme (REES). The scheme requires retailers to assist households in adopting energy efficiency improvements and 35% of the households assisted must be low-income or 'priority groups'.
- The majority of customers' complaints to retailers in 2007-08 related to billing issues (i.e. overcharging, prices, payment terms and methods and debt recovery practices).[20]

---

[15] Graph shows cost of electricity in Adelaide and CPI (for Australia). ABS Ref 6401.0 - Consumer Price Index, Australia, September 2009 updated version of graph presented in Dufty G, *Winners and losers - the Relative Price Index. The CPI and the implications of changing cost pressures on various households types and income groups*, December 2008.
[16] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry*, November 2009, p 4.
[17] Ibid p 132.
[18] Ibid p 132.
[19] Ibid p 137.
[20] ESCOSA, *2007/08 Annual Performance Report, Energy Retail Market*, November 2008.

- In 2008-09 ESCOSA dealt with significant retailer non-compliance issues in relation to billing (code breaches regarding retailers issuing bills and information provided on bills) and the use of security deposits.[21]

Table 1 - Comparison of Domestic Electricity Disconnections across Jurisdictions, per 100 Domestic Electricity Customers[22]

Jurisdiction	2003-04	2004-05	2005-06	2006-07	2007-08	2007-08
Victoria	0.84	0.54	0.22	0.33	0.29	0.43
NSW	0.80	1.00	0.90	0.70	n/a	n/a
ACT	0.32	0.36	0.40	0.30	0.43	0.27
South Australia	2.12	1.20	1.14	0.76	0.85	0.87
Queensland	1.30	1.57	n/a	n/a	1.13	n/a
Tasmania	0.55	0.53	0.59	0.47	0.39	0.45
Western Australia	n/a	n/a	1.16	0.97	0.77	0.55

1.2.6 Dispute resolution

- The South Australian Energy Ombudsman scheme (EIOSA) was established in July 2007 and is the external dispute resolution scheme for South Australian energy consumers.
- In 2008-09 EIOSA handled 6700 electricity cases, an increase of 63% from the previous year.[23]

1.2.7 Market participants and regulators

- In June 2009 there were 11 electricity retailers selling to small customers in South Australia.[24]
- AGL SA is obliged to offer small customers standing contracts with a regulated price. As of June 2009, 28% of small electricity customers were on a standing contract with AGL SA.[25]
- In terms of market share for residential electricity consumers, 55% of households are with AGL (including standing and market contracts), 17% with Origin, 13% with TRUenergy and 8% with Simply Energy.[26]
- ETSA Utilities is South Australia's distribution business.
- ESCOSA determines the regulated electricity retail prices that are applied to AGL South Australia's standing offers.
- On 30 June 2010 the AER will assume responsibility for the economic regulation of South Australia's electricity distributor, ETSA Utilities.
- ESCOSA will continue to regulate the service standards applicable to ETSA until June 2015.

---

[21] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry,* November 2009.

[22] Source: Essential Services Commission, *Energy Retailers Comparative Performance Report 2008-09*, Summary of Findings, December 2009, Table 5, p 13. Note: Data unavailable for WA prior to 2005-06. WA combined residential and business data for 2005-06 only.

[23] Energy Industry Ombudsman South Australia, *2009 Annual Report*.

[24] ESCOSA, *2008-09 Annual Performance Report, South Australian Energy Supply Industry,* November 2009, p 23.

[25] Ibid p 24.

[26] Ibid p.25.

- The AER is currently undertaking a distribution price review for South Australia to determine ETSA Utilities' prices for the next regulatory period (1 July 2010 to 30 June 2015).
- The AER's functions and powers are set out in the National Electricity Law (NEL) and the National Electricity Rules (NER).

2. DLC Trial vs. Rollout

2.1 The ETSA Utilities DLC trials

In 2004 ESCOSA responded to a study undertaken by Charles River Associates (CRA) by approving funding for ETSA Utilities to undertake a DLC pilot programme.[27] ESCOSA's Electricity Distribution Price Determination (EDPD) stated:

> The need for such a pilot program (DLC) is underscored by the major contribution to peak electricity demand made by residential air-conditioners. Important issues to be addressed in this pilot will include an assessment of:
> - the cost-effectiveness of different DLC control technologies;
> - customer receptivity and take-up at various types and levels of initiative;
> - load reduction impacts (as compared to projections);
> - impact of cycling on air-conditioning operation;
> - customer comfort;
> - customer satisfaction; and
> - the willingness of customers to stay on the program.[28]

ETSA Utilities demand management team developed five DLC projects involving domestic consumers to assess the various criteria established by ESCOSA. The 5 projects are:

- Direct Load Control Phase I
- Direct Load Control Phase II
- Direct Load Control Phase II(a)
- Direct Load Control Phase II(b)
- Direct Load Control Phase III

ESCOSA requires ETSA Utilities to publish annual demand management compliance reports and the most recent report, released in August 2009, includes findings and updates on the above trials.[29]

The objective of the DLC pilot is to determine whether DLC technology is viable as a demand management strategy for ETSA Utilities as well as other Australian network businesses. ETSA Utilities therefore needed to develop an understanding of the DLC technology and associated control strategies for maximum load reduction without creating adverse customer impacts. To do this, ETSA Utilities also needed to obtain knowledge about customers' air conditioners and their usage patterns. The trials

---

[27] See CRA, *Peak Demand on the ETSA Utilities System*, Discussion Paper, February 2004 and CRA, *Assessment of Demand Management and Metering Strategy Options*, Final Report August 2004.

[28] Reference to the Electricity Distribution Price Determination in ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 58.

[29] The Electricity Industry Guideline No. 12 - Demand Management for Electricity Distribution Networks, requires ETSA Utilities to publish annual demand management compliance reports. The reports describe progress to date on the various demand management initiatives being undertaken by ETSA Utilities and summarise any reasonableness tests and evaluations completed in the previous 12 months. The 2009 report is available at www.etsautilities.com.au/centric/our_network/annual_network_plans.jsp

measure customer participation rates and monitor customers' response to the various load control strategies applied.[30]
Of the DLC trials, phase 1 included 20 domestic sites in the Adelaide metropolitan area, phase 2 had 4000 residential and commercial sites in the suburb of Glenelg, and phase 3 included 1000 domestic customers and the majority of the sites were in the new northern Adelaide suburb of Mawson Lakes. All customers participating in the phase 2 and 3 trials received $100 in incentive payments. The small phase 1 trial had a customer acceptance rate of 100% while the phase 2 trial in Glenelg has an acceptance rate of only 32%. The customer acceptance rate for the phase 3 trial in Mawson Lakes is yet to be advised.

In terms of the equipment tested, phase 1 installed 'converge' load control units (LCUs), more simply referred to as controllers, to external air conditioner compressors. The Glenelg trial involved a 'Beat the Peak' information and awareness campaign as well as the installation of three different controllers due to different types of, and "new generation", air conditioners. The phase 3 trial also includes the installation of all three controllers.[31]

2.1.1 Key findings

The ETSA Utilities DLC trials have found that:

- There is a discernible decrease in load when DLC is activated.
- The load reduction from a DLC event is highly dependent on location.
- The load reduction is highly variable.[32]

The trials established that DLC has a demand response rate ranging from 18 to 35% and that extensive heat waves are not a barrier to demand response.

Importantly, the switching (cycling) levels trialled did not negatively impact on customers' comfort levels. The trials included switching levels of 25% (i.e. switching the air conditioner off for 7.5 minutes for each 30 minute interval). For older type properties (see section 2.2.3 in regards to dwelling types), some customers were able to sustain switching levels of 50%.[33]

ETSA Utilities did however find it somewhat problematic to recruit trial participants and participation rates varied substantially between suburbs and regions.

Phase 1 (small trial in Adelaide metropolitan area)

The trial demonstrated a reduced aggregated demand in the sample group in the order of 17% from a peak of approximately 30 kW through the use of forced cycling of air-conditioner compressors.[34] This trial was completed in March 2006.

Phase 2 (Glenelg area)

An extensive "Beat the Peak" campaign was run in the media in order to source trial volunteers in the Glenelg area. The campaign resulted in 4,000 customers expressing

[30] ETSA Utilities, *Progress Report for Pilot/Trial – Load Management*, Presentation to the National Smart Meter Project's Pilot and Trials Working Group, October 2009.
[31] The different types of controllers (LCUs) are also commonly referred to as P1, P2 and P3.
[32] ETSA Utilities, *Demand Management Program, Interim Report No. 2*, September 2008, p 41.
[33] ETSA Utilities, *Progress Report for Pilot/Trial – Load Management*, Presentation to the National Smart Meter Project's Pilot and Trials Working Group, October 2009.
[34] ETSA Utilities, *Demand Management Program, Interim Report No. 2*, September 2008.

their interest in participating in the trial. Just over half of the respondents (2,392) had air conditioners suited to DLC. The trial found that 1,158 of the air conditioners (approximately 50%) were "new generation" units. These air conditioners have advanced diagnostics that require the installation of a more sophisticated controller. The high market penetration of "new generation" air conditioners was unexpected and will have a significant impact on the cost of a potential rollout. While controllers attached to external compressors took on average 30 minutes to install, the more sophisticated controllers for the "new generation" units took an hour to install and required access to inside the home and its roof space.[35]

Box 1 – Types of controllers[36]

Trials using Type 1 controllers
"Type 1" or "P1" controllers were attached to external compressors and took on average 30 minutes to install.

Trials using Type 2 controllers
"Type 2" or "P2" controllers were installed on "new generation" Daikin ducted air conditioners which required an additional component to the "P1s". This was an interface card to be installed at the same time as the Peakbreaker. "P2" installations required access to the ducted air conditioning system's head unit situated in the home's roof space and typically took an average of 60 minutes to install.

An important development was that the interface card could be installed on the outdoor unit of new Daikin ducted air conditioners supplied since late 2007, thus reducing the installation time.

Trials using Type 3 controllers
"Type 3" or "P3" controllers for "new generation" air conditioners require an additional device known as an "emulator" to be made an integral component of the Peakbreaker installation. The installation is different for different air conditioning systems.

For ducted systems a "P3" installation required entry into the home and access to the head unit for air conditioners inside the roof space. This installation could take up to two hours to perform.

For split systems, the installation required entry into the home by a two person installation team and access to the main unit fitted on a room's wall as well as simultaneous access to the external compressor. This installation took a minimum of one hour with access to the home's living area being necessary.

"P3" installations took significantly longer and were considerably more complex than the "P1" installations. Additionally, for split systems, installation was further complicated by the head unit's location and the possibility of damage to external covers.

Taken together, these findings pointed towards trialling only a small sample of 30 volunteers. For these volunteers, it was decided to modify relatively few split systems because they: (i) were generally of low load value, (ii) required considerable time and effort to modify, and (iii) the location of the internal head unit and easily broken head unit covers could lead to claims for damages.

[35] ETSA Utilities, *Demand Management Program, Interim Report No. 2*, September 2008.
[36] From ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 69-71.

Phase 3 (Mawson Lakes)

As of June 2009 phase 3 was still active and whilst it drew on the findings from the Glenelg trials it also targeted new areas, which included sites in Mawson Lakes, Northgate and the regional centre of Murray Bridge.

Specifically the phase 3 trial aims to:

- Gain more information on the cost benefit of DLC for large ducted air-conditioners.
- Gain further information on the effect of DLC on distribution networks.
- Gather information on the possible maximum customer participation in DLC programs.
- Compare the impact of DLC relative to other trial areas. [37]

These trials, combined with sourcing and developing the necessary technology, have allowed ETSA to undertake a cost benefit study for the deployment of DLC.

2.1.2 DLC and Smart Grid Infrastructure

As DLC is envisaged as a voluntary product, it is highly unlikely that the 'volunteering customers' would be clustered around the substations that face constraints (and therefore result in deferred network augmentation).[38] The cost-benefit analysis undertaken by ETSA Utilities and KEMA International based on new mathematical modelling for predicting demand reductions, resulted in a negative business case for DLC. However, modelling based on rolling out an enhanced Peakbreaker with two-way communications (within a Home Area Network) points to a positive societal business case.

Table 2 - KEMA/ETSA Utilities Cost-benefit analysis, NPV for South Australia[39]

Alternative (at 2007/08 Price Points)	Societal NPV ($ million)	NPV of the Capital Cost of Roll-out ($ million)	Initial 5 year Capital Spend ($ million)	Rank by NPV
Peakbreaker+	$36	$108	$44	1
Direct Load Control	- $6	- $8	- $5	2
Smart meters	- $27	$313	$221	3
Smart meters and DLC	- $32	$320	$226	4

ETSA Utilities commenced trials of the enhanced Peakbreaker in metropolitan Adelaide and some regional areas during the 2008-09 summer in order to prove the technology and firm up the cost-benefit analysis.[40] The most recent developments in ETSA's demand management trials have been to focus on DLC of residential air conditioning within a smart grid system. ETSA's trials of a smart grid device that adds low cost automation and supply control functions for a residential customer have been extended into 2010.[41]

[37] ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 71.
[38] The ETSA Utilities modeling assumed a 10% take-up rate of DLC.
[39] KEMA Limited/ETSA Utilities, *Socio Economic Assessment of Smart Metering and DLC for South Australia*, Rev 1.0, 17 August 2008 in ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 74.
[40] ETSA Utilities, *Demand Management Program, Interim Report No. 2*, September 2008, p 55.
[41] ETSA Utilities, 2nd Annual Smart Grids, *Case Study – Integrating DLC infrastructure and the Smart Grid*, 29 September 2009.

This new DLC device includes duplex communications and because it is placed in association with the electricity meter it provides the following functions in addition to the cycling of appliances:[42]

Remote connects and disconnect	⇒	Customers can be connected and disconnected remotely.
Supply capacity control	⇒	Provides the ability to limit power to individual households.
Quality of supply recording	⇒	Enables meters to record information in relation to quality of supply events or other events (eg: outage, undervoltage, disconnection, meter loss of supply, change of settings).
Meter loss of supply and detection	⇒	Regular communication with the meters at customer premises would enable a loss of supply to a meter to be promptly detected. The metering systems would also enable system outages to be detected, either at meters or at distribution transformers.
Remote configuration	⇒	Enables meter settings to be remotely changed. Settings would include, for example: ▪ times for controlled load switching; ▪ thresholds for quality of supply events; and ▪ supply capacity control settings.
Remote software upgrades	⇒	The software in the meter can be upgraded remotely by the person responsible over the communications link, without the need for a site visit or action from the customer.

Furthermore, this device allows for communications via a Home Area Network (HAN) to a demand response enabling device located at the customer's air conditioner. The inclusion of a HAN will therefore have the potential to further increase demand response rates.

Some of these additional functionalities may require a strengthening of the protections embedded in the National Energy Customer Framework (NECF). The specific NECF protections are discussed in section 5 below.

2.1.3 Critical peak pricing

ETSA has also sought to explore demand response from Critical Peak Pricing but the lack of interest amongst households in signing up for such tariff offers (even though participants were offered $100 in incentive payments) resulted in the initial trial being cancelled. The 2nd interim report on the demand management program concluded:

> ETSA Utilities has reviewed the body of knowledge on CPP and ToU and concluded that more research is needed into consumer behaviour to electricity

[42] ETSA Utilities, *Progress Report for Pilot/Trial – Load Management*, Presentation to the National Smart Meter Project's Pilot and Trials Working Group, October 2009.

> price signals. To this end a trial targeting approximately 100 volunteers was designed for deployment in the Adelaide suburb of Novar Gardens during the summer of 2007/08. The small (14%) volunteer take up rate attained from residents resulted in the trial being brought to a halt for this area.[43]

Subsequently, ETSA Utilities decided to move the trial to the suburbs of Prospect and Blackwood.

The purpose of the CPP trial is to:

- Determine customer acceptance of CPP tariffs amongst residential consumers.
- Develop ETSA Utilities' expertise in the design of CPP tariffs.
- Develop systems and processes for signalling CPP periods.
- Collect data on price elasticity, response persistence and overall efficacy of CPP tariffs.
- Assess the potential of CPP tariffs for widespread deployment amongst residential consumers.[44]

The trial uses in-home displays (IHDs) to signal CPP periods to households and as of 30 June 2009 only 25 IHDs had been deployed in the two suburbs.

ETSA Utilities summarised the main trial parameters as:

- Volunteers are offered $100 to participate.
- To receive the $100 volunteers are asked to respond positively to 10 peak events.
- For each event to which they chose not to respond, the $100 reduces by $10.
- A positive response is a reduction in household demand during a nominated period by an amount communicated to the volunteer.
- Volunteers are to receive information, education and support so that they can judge what appliances must be turned off.
- Volunteers are to receive event information by 'sms' to a mobile phone and via a sound and light display unit attached temporarily to a kitchen wall.[45]

2.2 From trial to rollout

2.2.1 Incentives

DLC trials in South Australia have been based on customers voluntarily agreeing to an arrangement where the distributor, ETSA Utilities, can cycle households' air conditioners and thus reduce peak demand. In exchange, customers participating in the trials have received incentive payments from ETSA Utilities. If, however, this were an on-going energy product, rather than a trial, customers would in all likelihood receive lower electricity tariffs (instead of incentive payments) in exchange for allowing the distributor to control some of their load.

---

[43] ETSA Utilities, *Demand Management Program, Interim Report No. 2*, September 2008, p 2.
[44] ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 84.
[45] ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 84-85.

2.2.2 Company legacy

ETSA Utilities is the sole distribution business in the state and many South Australians associate ETSA Utilities, rather than the retail companies, with the sale and supply of electricity. It can be assumed that this legacy aspect of ETSA Utilities has helped the company in terms of recruiting DLC participants and establishing direct distributor-customer contracts. Other states, Victoria for example, have several distribution businesses, and with recent company name changes many customers do not know the name of their electricity distributor. Furthermore, in jurisdictions where a triangular retailer-distributor-customer relationship arrangement exists (as is the case in South Australia and as proposed in the new NECF), there is likely to be more customer awareness of distribution businesses. These jurisdictions would therefore have an advantage in terms of recruiting customers for distributor delivered DLC products.[46]

2.2.3 Dwelling types

An important issue identified during the DLC trials was the role building structure played in achieving demand response without reducing customers' comfort levels. The trials indicate that older houses respond better to the activation of DLC (cycling the air conditioner compressors) and with fewer impacts upon household amenity. A key design factor being that older houses generally consist of smaller rooms, which allows for quicker cooling and, conversely, a slower heating rate when the DLC application is switched on.

Trial participants residing in newer homes experienced a change in amenity at the switching rates applied to the older homes. Typical design characteristics of the newer homes were larger rooms (open plan living) and frequent use of glass windows and doors to provide views to gardens and other outdoor features. These designs resulted in the rooms heating up more quickly when the DLC application was applied. ETSA Utilities noted:

> The housing mix in Mawson Lakes tends to be of larger indoor open plan area that is reliant on air conditioning to maintain comfort levels during temperature peaks of either heat or cold. Also, temperatures in Mawson Lakes during the summer tend to be two to three degrees higher than those in the coastal Glenelg area and importantly Mawson Lakes tends not to have the cooling effects of an afternoon sea breeze.[47]

The impact the building structure itself has on the switching levels for air conditioners, and hence the demand response achieved, is an important finding that other jurisdictions and/or energy companies with access to DLC devices need to be mindful of.

2.2.4 Distributor vs. retailer products

The trials in South Australia have not involved retailers as a provider of DLC contracts. However, theoretically retailers could end up having access to DLC devices (for example through the HAN) and it is important to realise that distribution

---

[46] In Victoria, for example, small customers do not have a direct contractual relationship with their distribution businesses. This relationship is managed through the retailers.

[47] ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009, p 72.

businesses and retailers may have different motivations for cycling appliances. A distribution business would seek to reduce demand relating to specific parts of their network while a retailer would seek to reduce its exposure to high prices in the wholesale market.

2.2.5 Multiple DLC contracts

In a non-trial environment customers could be on more than one DLC contract, i.e. one with their distribution business and one with their retailer. The triangular customer – distributor – retailer relationship arrangements currently in place in South Australia, and proposed in the draft NECF, will allow for this to occur as long as retailers have access to DLC devices. Although the smart grid envisaged for South Australia is a network driven smart grid, the development of Home Area Networks (HAN) may enable retailers to control customers' appliances. It is therefore necessary that arrangements be in place to regulate distributor and retailer access to DLC.

3. DLC and Customer Issues

3.1 DLC and price impacts

The DLC functionality alone has minimal impact on individual customers' bills. Whilst DLC can reduce the need for costly network augmentations in the medium to long term, DLC itself does not notably lower the electricity bills for participating households.[48] In a September 2009 presentation, ETSA Utilities stated that its vision for DLC in a smart grid environment is a system that reduces customers' peak load by 15% or more and electricity bills by 10%.[49] However, this estimate is based on the assumption that the smart grid provides the customers with information via an in-home display and that customers use this information to lower their overall demand. Therefore it must not be regarded as an estimate for DLC and cycling of appliances alone.

As the cycling of appliances does not create a notable bill reduction in itself, households are offered incentives to take-up DLC contracts. At a trial stage this incentive takes the form of payments but if DLC were widely rolled out it would more likely be in form of lower tariff rates. As such, customers on DLC contracts may expect lower electricity bills.

3.2 Equitable access to DLC contracts

Theoretically, ETSA Utilities allowed all households (within the trial area) to participate in their DLC trials but they ultimately refused many individual households due to inappropriate appliance holdings. If DLC is extensively rolled out and those households who are on a DLC distribution contract receive lower electricity tariffs than other households, DLC rollouts can create inequitable results.

As with energy efficiency measures, low-income households often lack the up-front capital to make changes that will result in lower electricity bills due to reduced consumption. It is therefore foreseeable that low-income households will be over represented amongst households unable to be on a DLC contract due to their appliance holdings, and hence excluded from lower tariff rates. Such access and equity implications in relation to DLC contracts would also become increasingly important as the cost of electricity rises.

The South Australian Government should therefore ensure that ETSA Utilities collects data on DLC access and exclusion with the aim of informing the Government whether certain classes of consumers are more likely to be excluded from such products, and consequently the possibility of access to lower electricity tariffs. The DLC access/exclusion data should identify whether certain households, such as concession card holders, private renters, public housing tenants and those with low-consumption, are over represented amongst the non-access group. Furthermore, if it finds that certain classes of consumers are more likely to be excluded from DLC contracts and lower electricity tariffs, the Government must develop or enhance Community Service Obligations (CSOs) that assist low-income and other vulnerable groups to access these contracts. The design of these CSOs could be based on

---

[48] If DLC was utilised in combination with a high critical peak price, for example, the savings to households with DLC could potentially become noticeable compared to households without DLC.

[49] ETSA Utilities, 2nd Annual Smart Grids, Case Study – Integrating DLC infrastructure and the Smart Grid, 29 September 2009.

schemes such as the Victorian ‘Home Wise Appliance and Infrastructure Grants’ or the Federal Government’s ‘Energy Efficient Homes’ package.

> Recommendation 1:
> The South Australian Government should request ESCOSA to monitor access to DLC contracts and investigate options to mitigate the risk of exclusion and/or directly assist disadvantaged consumers by introducing new and enhanced Community Service Obligations.

3.3 Guaranteed service standards

From a customer perspective, the key attraction of DLC products is that the cycling of appliances has no perceived impact on comfort levels or appliance amenities. It is therefore important that DLC contracts include guaranteed service standards that the distributor or retailer will meet. These service standards are crucial to promote consumer confidence in DLC products and they should be used to ensure that DLC contracts do not cause detriment to appliances, and that public health and safety standards are met. This would include issues such as careful consideration prior to placing customers with medical cooling needs on contracts with DLC of air conditioners.

3.4 Consumer information about DLC

DLC technology enables new and relatively complex energy products, and a distributor or retailer marketing these products to domestic customers must be obliged to fully inform the customers about the product offerings. However, information should not be limited to households signing up for DLC products, distributors and/or retailers should also adequately inform households with appliances unsuited for DLC, yet who have expressed an interest in the product, why they cannot access DLC contracts and what they would potentially need to change in order to do so. As discussed in relation to equitable access above, this is important because households unable to be on a DLC contract due to their appliance holdings may effectively be excluded from lower tariff rates.

NECF requirements in relation to information provision and marketing of DLC products are discussed in section 5.

3.5 Information about the appliances

As DLC solutions directly involve household appliances in order to achieve the intended outcome, a distributor (or retailer) offering DLC products should be responsible for informing customers about the DLC controllers as well as the appliances involved. During their DLC trials, ETSA Utilities found that many consumers have limited understanding of basic air conditioner operations and maintenance needs, such as the need for cleaning air conditioner filters to ensure optimal operation of the units. This resulted in ETSA Utilities being required to provide additional information to trial participants in order to ensure that the cycling of the units could occur while maintaining customer comfort and satisfaction levels.

Clearly this need for additional customer information is more manageable in a trial situation than under a broad rollout scenario. However, distributors or retailers offering DLC products must have an obligation to inform customers about appliance related issues, as the appliance itself is an integral part of the energy product being offered.

Recommendation 2:
Distributors and retailers offering DLC contracts should be obliged to provide customers with information and assistance in relation to the operation and maintenance of the household appliances that are being controlled.

4. *Economic Regulation*

4.1 Cost allocation

As ETSA Utilities would be the 'responsible party' for rolling out DLC and building smart grids in South Australia, the Australian Energy Regulator (AER) would be responsible for determining costs and charges to consumers as part of the cost recovery process. The National Electricity Rules stipulate the regulatory approach the AER must apply to such a determination.[50] The AER will also have the mandate to ensure that benefits accrued are passed through to consumers.

On the basis of a request from the MCE, the AEMC has recently commenced a review in relation to cost recovery issues associated with rolling out smart meters.[51] The AEMC should ensure that this review is relevant to jurisdictions deciding to build smart grids and rolling out DLC devices as well. As such, the issues discussed and the recommendations directed at the AER in this section of the report are therefore relevant recommendations for the AEMC and the MCE as well.

4.1.1 Pricing principles

Although it is believed that the cost of rolling out DLC and building smart grids is expected to be significantly lower than a smart meter rollout, households will nonetheless experience cost increases as a result of a rollout, and low-volume energy consumers will encounter a proportionally higher increase. In addition to proportionally higher price increases, low-volume energy consumers will also have the least ability to respond to information about their electricity consumption (due to low discretionary consumption) that may otherwise allow them to offset these costs. This raises important equity issues as low-income households represent a large proportion of low-volume consumption households.

One approach to address these equity issues is to apply pricing principles that allocate the cost of the rollout (or a higher proportion thereof) to higher consumption households. This can be achieved by only allowing the pass through of these costs once a certain consumption threshold has been reached and hence ensure that costs are more equitably allocated.[52]

> Recommendation 3:
> That the MCE directs the AER to investigate the potential for using pricing principles to allocate costs in an equitable manner – meaning that those most likely to benefit from the rollout pay a proportionately higher cost.

Furthermore, the distribution businesses may be allowed to allocate the rollout costs to the prescribed metering charge. If so, the retailers are likely to argue that they can pass through the cost to consumers in whatever way they wish. This could have

[50] Chapter 6 of the National Electricity Rules covers 'economic regulation of distribution service' and Chapter 7 covers 'metering'.
[51] The AEMC has issued a Draft statement of approach to this review and submissions in response to this paper are due in early February 2010. See www.aemc.gov.au/Media/docs/Draft%20Statement%20of%20Approach-d96045a0-e3f9-4f31-8e56-f9cffaf331b8-0.PDF
[52] See Dufty G, *Electricity pricing – delivering social justice and environmental equity,* in CUAC Expert Forum on Electricity Pricing, Forum Papers, August 2007.

significant equity implications and result in the obfuscation of the cost of the rollout to consumers.

Recommendation 4: The AER should undertake a review of the impacts of how and where costs are allocated with the aim of identifying an equitable, fair and transparent approach for allocating smart grid and DLC costs to consumers.

4.2 Pass through of benefits

The majority of the cost of rolling out DLC and smart grid infrastructure will occur up-front which imposes some risk to consumers in relation to the pass through of benefits.

There is no guarantee that all the estimated benefits will be accrued and therefore produce the savings anticipated. As households pay for the infrastructure up-front they could end up short-changed if the benefits do not materialise.

There is also a risk that benefits are not accurately and/or timely passed through to consumers. The distribution businesses have an incentive to maximise return to their shareholders and this raises challenges for the regulatory framework as the networks may seek to underestimate the benefits accrued from a DLC/smart grid rollout in order to retain as much of the savings as possible – arguing that it is a result of business efficiencies rather than the rollout. To mitigate this risk the regulatory framework can be restructured to ensure that operational benefits are accounted for and passed through on an annual basis. The typical 5 year regulatory period would not deliver satisfactory outcomes and most likely allow the network businesses to gather windfall gains.

Recommendation 5: That the regulatory framework for large scale demand response projects (such as DLC and smart grids) be adjusted to ensure that the operational benefits are accounted for and passed through to consumers on an annual basis.

5. The Regulatory Framework in light of Direct Load Control and Smart Grid

The South Australian trials of DLC and smart grid technology have been entirely network driven. However, if there is a positive business case to build smart grids with DLC capabilities in South Australia, the technology may be accessed by retailers who wish to develop products utilising the new functionalities.[53] This section therefore discusses regulation pertaining to both the distributor-customer relationship and the retailer-customer relationship.

5.1 Regulation of the sale and supply of energy to customers

There are two types of energy retail contracts available to residential customers in South Australia: Standing Contracts and Market Contracts. ESCOSA determines the price of the Standing Contract and its terms and conditions are set out in the Energy Retail Code. AGL SA is obliged to offer a Standing Contract to all new and existing households. AGL SA and other retailers operating in South Australia can also offer customers a Market Contract. Market Contract prices are not regulated and the terms and conditions can to some extent be varied from the Energy Retail Code.

Customers also have a contract with the distributor, ETSA Utilities, and the standard connection and supply contract is specified in the Electricity Distribution Code.

ESCOSA is the key agency in relation to monitoring and administering the South Australian energy customer protection framework.[54] Important consumer protections are embedded in the following codes administered by ESCOSA:

- Energy Retail Code
- Electricity Distribution Code
- Energy Marketing Code
- Energy Price Disclosure Code
- The Energy Prepayment Meter System Code
- Electricity Metering Code

The *Energy Retail Code* establishes minimum terms and conditions for contracts with small customers and delivers provisions for billing and payment conditions, information to be included in bills, overcharging and undercharging, disconnection and reconnection, and the handling of enquiries, complaints and dispute resolution.[55]

The *Electricity Distribution Code* regulates the terms on which ETSA Utilities may connect customers to its network and supply electricity, including service standards to be met by ETSA Utilities. It contains a service incentive scheme for ETSA Utilities based on targets set out in the Code. It specifies the standard connection and supply contract between ETSA Utilities and its customers. It also sets out the details of a guaranteed service level (GSL) scheme.[56]

---

[53] Issues relating to distributor vs. retailer products are discussed in section 2.
[54] ESCOSA was established under the Essential Services Commission Act 2002, which came into effect on 12 September 2002.
[55] The Energy Retail Code is available at www.escosa.sa.gov.au/library/091221-EnergyRetailCode_V2.pdf
[56] The Electricity Distribution Code is available at www.escosa.sa.gov.au/library/091221-ElectricityDistributionCode_V7_0.pdf

The *Energy Marketing Code* aims to ensure that customers make informed choices without unreasonable pressure. It therefore regulates:

- The time during which telephone and door-to-door selling can occur.
- The identification to be worn by door-to-door sellers.
- The provision of information about contract terms and conditions.
- Cooling-off periods.[57]

Another code specific to market contracts only is the *Energy Price Disclosure Code.* This code stipulates that the retailer must set out a price factsheet on its website, and include it with any written disclosure statement provided to residential customers for each market contract. Furthermore, it requires retailers to provide ESCOSA with various pricing details, such as price and price structures, loyalty and entry rebates, exit fees and loyalty schemes.

5.2 The National Energy Customer Framework

The Ministerial Council on Energy (MCE) has been tasked with creating a national framework for the regulation of sale and supply of energy to retail customers. This framework is known as the National Energy Customer Framework (NECF).[58] In April 2009, the MCE Standing Committee of Officials (SCO) released a First Exposure Draft for the NECF, comprising National Energy Retail Law (NERL), National Energy Retail Regulations (the Regulations) and National Energy Retail Rules (NERR). A Second Exposure Draft was released on 30 November 2009.

The MCE has also committed to review consumer protection arrangements and ensure appropriate protections exist for customers with smart meters. The Smart Meter Working Group (SMWG) is currently examining the proposed NECF to assess its ability to accommodate the pricing and operational implications of smart metering.[59] The SMWG will propose additional or alternative arrangements where appropriate to ensure that the NECF is flexible enough to apply in both jurisdictions with smart meters and those without.[60] As Smart Meter Infrastructure can enable both DLC and the other functionalities associated with smart grids, the work to be undertaken by the SMWG should also be relevant to South Australia.

The majority of the recommendations set out below are therefore recommendations for the MCE, through its Retail Policy Working Group (RPWG), tasked with drafting the NECF, and its SMWG, which advices the RPWG on smart meter related NECF issues.

[57] The Energy Marketing Code is available at www.escosa.sa.gov.au/library/040227-EnergyMarketingCode.pdf
[58] The NECF forms part of ongoing national energy market reforms set out in the Australian Energy Market Agreement (AEMA), as amended in 2006. Note that under the AEMA, the States and Territories maintain responsibility for certain regulatory functions including: community service obligations and measures to maintain distribution tariff equalisation schemes.
[59] The first draft policy paper of the Smart Meter Customer Protection and Safety Review was released by MCE SCO in August 2009 and is available at www.ret.gov.au/Documents/mce/_documents/smart_meters/Smart%20meter%20customer%20protection%20and%20safety%20issues%20-%20draft%20policy%20paper%201.pdf
[60] MCE SCO, *Explanatory Material, First Exposure Draft*, April 2009.

5.3 Approach

This section analyses customer protections embedded in regulation and guidelines in light of DLC and smart grid (SG) technology. A comparative framework has been applied to this analysis, discussing particular clauses or rules from both the current South Australian framework and the proposed NECF in relation to DLC and SG technology.

This approach has been chosen in order to identify potential gaps and discrepancies between the South Australian consumer protection framework and the NECF. As the jurisdictional regulations have developed over time, and in many instances compliment or address other jurisdictional protections embedded in legislation or Community Service Obligations (CSOs), a comparative framework can more easily highlight any interdependencies.

5.3.1 Draft NECF and DLC/smart grid

Neither the First nor the Second Exposure Draft of the NECF address smart grid or smart meter related issues in regards to the retailer-customer relationship, the distributor-customer relationship or the distributor-retailer relationship. This section identifies several DLC and SG issues for the NECF. Most of these issues also arise for customers connected to Smart Meter Infrastructure (SMI), and previous reports produced by this project have argued that many SMI related provisions should be captured under a separate Part of the NERR. As with customers connected to prepayment meter systems, customers connected to SG or SMI will require specific provisions in the Rules. A new and separate Part of the NERR is therefore required.[61] This separate Part of the NERR has in previous reports been referred to as the SMI Part of the NERR. The recommendations in this report refer to the new and separate Part of the NERR as the 'SG/SMI Part of the NERR' for the purpose of simplicity and similarity with the other jurisdictional reports.[62]

Recommendation 6: That the Retail Policy Working Group develops a separate SG/SMI Part to be inserted into the NERR and incorporate the many DLC and Smart Grid provisions recommended below.

5.3.2 Load control

There are two distinct approaches that can be utilised in regards to limiting a customer's load. One approach is incentive based, where customers' contracts would include a DLC component that the customer would be financially rewarded for. DLC is hence about providing a service. Clearly, this is the approach ETSA Utilities has been trialling in South Australia. The second approach is punitive, where customers' contracts stipulate that supply will be limited to a certain threshold – effectively putting a choker on a household's energy supply. If retailers are allowed to utilise the supply capacity control functionality for small customers, they could potentially use load limiting as a debt management tool. This approach is about denying a service

[61] Our focus is on the NERR rather than the NERL as we aim to discuss the specific arrangements. However, a new Part 'X' of the NERR would require a corresponding new Division 'X' in the NERL.
[62] See *Customer Protections and Smart Meters – Issues for Victoria*, August 2009, *Customer Protections and Smart Meters – Issues for NSW*, October 2009 and *Customer Protections and Smart Meters – Issues for Queensland*, November 2009.

and households with payment difficulties would be the obvious target group for such a product.

As the supply capacity control and load management via the meter are functionalities that enable load limiting options, the NERL and the NERR should specify that supply capacity control and load limiting via the meter can only be used by the distribution businesses for the purpose of system management.[63] Retailers, on the other hand, may obtain access to the load control via the Home Area Network (HAN) in order to develop new retail products that utilise the direct load control of appliances.

Recommendation 7:
To ensure that domestic customers are protected from the introduction of punitive, demand limiting tariffs, the NERL and the SG/SMI Part of the NERR must express that:

Supply capacity control and load management via the meter are system management tools and only distributors should be able to load restrict households in order to manage demand on their system for the purpose of ensuring security of supply. System management and load management via the meter are thus not retail products.

5.3.3 Billing for other goods and services

Retailers may find new opportunities to supply customers with other goods and services in relation to SG. In-home displays and appliances that can be linked to DLC are some obvious examples.

Recommendation 8:
That the SG/SMI Part of the NERR include a *billing provision* similar to Rule 818 in relation to prepayment systems, requiring retailers to separately bill for other goods and services and recover those payments separately from the cost of supplying energy.

5.3.4 Product requirements

Distributors and retailers offering DLC contracts should be subject to specific regulatory requirements. These requirements should specify maximum thresholds in relation to duration, frequency and scope.

- The duration threshold would specify a limit for how long a distributor/retailer can cycle or control an appliance at the time.
- The frequency threshold would specify a limit for how often a distributor/retailer can cycle or control an appliance.
- The scope threshold would specify a limit for how much load the distributor/retailer can control within a household (e.g. maximum number of appliances that can be controlled).

[63] Exemptions may be made for negotiated retail contracts between large users and retailers.

Recommendation 9:
The AER should be requested to review DLC product requirements and its decision should be reflected in the SG/SMI Part of the NERR *product requirement provisions.*

5.3.5 Special needs

The Energy Retail Code (Clause 11.1.1) and NER Rules 703 and 704 stipulate actions retailers and distributors must take when notified about customers using life support equipment. By using the term 'life support equipment' to define which households should be included in the special register the framework uses a narrow, appliance oriented definition. The term 'special needs', on the other hand, is less narrowly defined as it is linked to the household's circumstances. Customers with specific reliance on electricity for health and medical purposes can be included in the register based on criteria such as medical certificates and/or access to particular concessions (e.g. the medical cooling rebates).

By using a broader definition than 'life support equipment' a special needs register can ensure that households with health issues which make them especially dependent on energy supply are included in the register. Such a register would be valuable in terms of distribution businesses and retailers' ability to deliver duty of care in relation to suitability of energy products (such as DLC and CPP) and prior to conducting remote disconnections for non-payment. This approach would hence mitigate some of the health and safety risks associated with remote disconnection (discussed below).

Recommendation 10:
That the relevant definitions and rules in the NERR are amended to broaden the definition of households with 'life support equipment' to households with 'special needs' (due to health and medical conditions).

5.3.6 Customer enquiries and complaints

Due to the increased complexity and the technical aspects of DLC, retailers and distributors offering DLC contracts should have a specialist customer support team that handle enquiries and complaints relating to these products.

Recommendation 11:
That the SG/SMI Part of the NERR should include *an enquiries and complaints* provision stipulating that retailers and distributors offering DLC contracts are required to establish a specialist customer support team to handle customer queries and complaints.

5.3.7 Marketing and information provision

It is important that customers are protected from misleading and predatory marketing practices in order for a competitive energy market to work. As consumers have limited experience and understanding of DLC contracts, it is crucial that the marketing provisions allow them the right to assess the offer in a timely manner and that they have the ability to change their mind if they find the offer unsuitable.

The National Energy Marketing Rules (NEMR) should apply to all energy retailers and include marketing of products, tariffs and services to both existing and new customers. Currently neither the NEMR nor the South Australian Energy Marketing Code include marketing provisions for distribution businesses and minimum standards for marketing and information provision for DLC contracts offered by distributors should therefore be captured in other parts of the regulation. The NER Rules 404 and 410, for example, stipulate the nature of the information distributors must provide a customer upon request and should be amended to ensure that customers on a network DLC contract can access the information they require.

> Recommendation 12:
> That NERR 404 and 410 are amended to ensure that customers on a network DLC contract can access the information they require.

5.3.8 Remote disconnection

South Australia recently introduced a ban on disconnections for non-payment of bills during heat waves in order to protect households from the potential detrimental health and wellbeing impacts associated with such disconnections.[64] The Energy Retail Code (Clause 9.7 (h)) and the Electricity Distribution Code (Clause 1.9.2 (e)) have been amended to prevent retailers and distributors disconnecting customers for non-payment on an extreme heat day.[65] These changes to the codes came into effect on 1 January 2010. This important code amendment also implicitly acknowledges the detrimental impacts disconnection from electricity supply has on peoples' lives.

SG technology allows for remote disconnection and reconnection of properties. Remote disconnection means that the timeframe between a retailer requesting a disconnection and a distribution business performing one will be significantly shorter. It is expected that distribution businesses will disconnect no later than the day after receiving the request but often on the same day. This expediency means that retailers must have robust processes in place to ensure that the disconnection is lawful.

Similarly, as a house visit will not occur, there is no possibility of detecting last minute mistakes or raising health and safety concerns by the distribution company's representative. Improved processes should therefore be in place to minimise the risk of consumer detriment. Firstly, a wrongful disconnection payment should be in place to ensure that retailers have an incentive to improve their processes and minimise disconnection errors. Secondly, retailers should be required to make two notification attempts during the 24 hours leading up to a disconnection (using two different notification processes). Thirdly, the idea of a life support register should be broadened to include households with medical and health issues that increase their dependency on energy, as a way of minimising health and safety risks associated with remote disconnection.

> Recommendation 13:
> That the SG/SMI Part of the NERR includes a *disconnection provision* stipulating that a retailer must make two notification attempts during the 24 hour period prior to requesting the distributor to remotely disconnect the customer's premises.

---

[64] See ESCOSA, *Energy Retail Code – Disconnections during heatwaves*, Discussion paper, October 2009.

[65] An extreme heat day is defined as any period when the South Australian State Emergency Service (SASES) or some other body authorised by the State Government of South Australia has issued such an extreme heat warning.

5.3.9 Disconnection/reconnection charges

The Energy Retail Code (Clause 10.1 (d)) states that a retailer can request the customer to pay the retailer as well as the distributor's "reasonable" reconnection charge before reconnecting a customer. Similarly, NER Rule 616 refers to charges that may apply to reconnection services. However, as the remote connection/disconnection functionality will significantly reduce the cost of disconnecting and reconnecting customers, these charges should not apply to customers connected to SG.

Clearly an exemption would have to be made if a jurisdiction decides to roll out SG but that jurisdiction's electricity safety regulator does not allow for remote disconnection/reconnection.

> Recommendation 14:
> That the SG/SMI Part of the NERR should include a *disconnection provision* stating that SG/SMI customers cannot incur an additional charge for disconnections and reconnections.

5.3.10 Remote reads and undercharging

SG technology will allow the distributor to read the meter remotely. However, as a smart meter (interval meter) is not being installed, the reads will contain accumulation data rather than interval data.

When a meter can be read remotely a retailer should always base a customer's bill on a reading of the meter. Currently the Energy Retail Code (Clause 6.4.1 (b)) and the NER Rule 209 only require retailers to use the best endeavour to read the meter at least once every 12 months. The remote read functionality delivers one of the most significant customer service improvements associated with SG technology as it abolishes the need for estimates and associated problems with over- and undercharging. The practice of issuing bills based on estimates should therefore be abolished where this technology is installed.

> Recommendation 15:
> That the SG/SMI Part of the NERR includes a *meter reading provision* stipulating that a bill cannot be based on estimates.

Large and unexpected bills often cause significant financial hardship for customers on low or fixed income. It is therefore crucial that the retailers have solid billing systems in place to avoid the occurrence of undercharging.

The Energy Retail Code (Clause 6.5.2 (a)) and the proposed NER Rule 218 allow retailers to recover undercharged amounts for 12 months before the date on which the retailer notifies the customer. As SG technology has the potential to significantly reduce undercharging due to retailer billing errors, and as this is a key customer service improvement that SG can deliver, retailers should only be allowed to recover undercharged amounts for up to 3 months prior to notifying the customer about the occurrence where SG technology is in place.

In addition to improving customer service and reducing the number of hardship cases created due to billing errors and undercharging, a 3 month limit will provide the retailers with an incentive to ensure that reliable and accurate billing processes are in place.

> Recommendation 16:
> That the SG/SMI Part of the NERR includes an *undercharging provision* stating that a retailer cannot recover undercharged amounts for longer than 3 months prior to notifying the customer.

6. Concluding remarks

Although South Australia is continuously exploring new technologies and products that can achieve demand response, the current South Australian Government is adamant that households will not be subject to TOU pricing. South Australian households are therefore not facing an imminent risk of TOU related price increases and price volatility, as is currently the case for consumers in Victoria and NSW. That said, the quest for other demand response solutions to address the state's summer peak load problem, may necessitate new and enhanced customer protections.

The various functionalities enabled through smart grid technology discussed in this report do require new customer protections. Smart grid technology will, for example, enable remote connection/disconnection of supply and a capacity control functionality that can limit households' supply of electricity. These functionalities raise significant consumer concern and demand additional regulations, especially in relation to the customer-retailer relationship. DLC, if widely rolled out, also raises important customer issues in relation to information provision, guaranteed service standards and product requirements (i.e. maximum thresholds in relation to duration, frequency and scope of the cycling of appliances).

Many of the functionalities associated with DLC and smart grid technology are the same as those associated with smart meter infrastructure. The draft NECF, however, does not encompass regulations in relation to either of these technologies. As it currently stands, the NECF is out of sync with developments in South Australia and the NEM. It is a customer protection framework for yesterday's energy markets. The South Australian Minister for Energy should therefore carefully consider the repercussions an outdated and inadequate national customer protection framework may have on South Australian households before signing them on to it.

Bibliography

Australian Bureau of Statistics (ABS), Ref 6401.0 - Consumer Price Index, Australia

Charles River Associates (CRA), *Peak Demand on the ETSA Utilities System*, Discussion Paper, February 2004.

Charles River Associates (CRA), *Assessment of Demand Management and Metering Strategy Options*, Final Report August 2004.

Dufty G, *Winners and losers - the Relative Price Index. The CPI and the implications of changing cost pressures on various households types and income groups*, December 2008.

Dufty G, *Electricity pricing – delivering social justice and environmental equity,* in CUAC Expert Forum on Electricity Pricing, Forum Papers, August 2007.

Energy Industry Ombudsman South Australia (EIOSA), *2009 Annual Report.*

Energy Market Consulting Associates (EMCa) report to the Ministerial Council on Energy Standing Committee of Officials, *Smart Meter Consumer Impact: Initial Analysis*, Consultation Draft, February 2009.

Essential Services Commission Victoria (ESCV), *Energy Retailers Comparative Performance Report 2008-09*, Summary of Findings, December 2009.

Essential Services Commission South Australia (ESCOSA), *2007/08 Annual Performance Report, Energy Retail Market*, November 2008.

Essential Services Commission South Australia (ESCOSA), *2008-09 Annual Performance Report, South Australian Energy Supply Industry*, November 2009.

Essential Services Commission South Australia (ESCOSA), *Energy Retail Code – Disconnections during heatwaves*, Discussion paper, October 2009.

ETSA Utilities, *Demand Management - The Way Forward*, 2005/06 – 2009/10.

ETSA Utilities, *Annual Demand Management Compliance Report*, Issue 1.0, August 2009.

ETSA Utilities, *Progress Report for Pilot/Trial – Load Management*, Presentation to the National Smart Meter Project's Pilot and Trials Working Group, October 2009.

ETSA Utilities, *Demand Management Program, Interim Report No. 2*, September 2008.

ETSA Utilities, 2nd Annual Smart Grids, *Case Study – Integrating DLC infrastructure and the Smart Grid*, 29 September 2009.

Johnston, May M., *Background Paper – Customer Protections and Smart Meters*, St Vincent de Paul Society National Council, August 2009.

Johnston, May M., *Customer Protections and Smart Meters – Issues for Victoria (Amended)*, St Vincent de Paul Society National Council, August 2009.

Johnston, May M., *Customer Protections and Smart Meters – Issues for NSW*, St Vincent de Paul Society National Council, October 2009.

Johnston, May M., *Customer Protections and Smart Meters – Issues for Queensland*, St Vincent de Paul Society National Council, November 2009.

KEMA Limited/ETSA Utilities, *Socio Economic Assessment of Smart Metering and DLC for South Australia*, Rev 1.0, 17 August 2008.

Ministerial Council on Energy Standing Committee of Officials (MCE SCO), *Explanatory Material, First Exposure Draft*, April 2009.

Ministerial Council on Energy Standing Committee of Officials (MCE SCO), *Smart Meter Customer Protection and Safety Review - Draft Policy Paper One*, August 2009.

NERA Economic Consulting, *Cost Benefit Analysis of Smart Metering and Direct Load Control*, Report for the Ministerial Council on Energy Smart Meter Working Group (Phase 2, Stream 4), February 2008.

The Australian Broadcasting Cooperation (ABC), The 7.30 Report, *Smart meters: blessing or curse?* 23 August 2007.

The Government of South Australia, *Electricity Demand Side Measures Task Force Final Report – Government Response Report*, April 2003.