Scaling the Peaks: Demand Management in Network Infrastructure Planning

Mark Lister
8 June 2011
Key questions for the Stage 3 Review

1. How much are power bills rising – and what’s driving this increase?
2. Beyond ‘giving them options’ - what can be done to reduce pressure on consumer electricity bills?
3. Can DSP make a difference or will cutting carbon emissions drive bills even higher under current regulatory settings?
NOTE:
- NSW, Qld, VIC prices now at similar levels; SA, WA higher as not based on coal-fired generation
- NSW, Qld, WA, SA similar growth pattern; VIC with earlier price rises

Steep recent rises; often back to inflation adjusted levels close to those of 25 years ago

Prices risen ~30% 2006/07 – 2010/11

Source: Rod Sims, ‘Energy market outlook’ (Presentation to the Multi-Party Climate Change Committee, 10 November 2010)
What’s driving these electricity price increases?

> Government gouging of dividends?
> Carbon Tax?
> Green Schemes / Solar Bonus?

> Network charges driven by network infrastructure investment is by far the dominant factor.
> This review has an important role in creating affordable energy in Australia.
Components of electricity prices - NSW

Components of residential Sydney electricity prices in 2009-10 and 2012-13

Source: Derived from Independent Pricing and Regulatory Tribunal, Review of regulated retail tariffs and charges for electricity 2010-2013 (Final Report, March 2010)
Rising Network Prices

Energy Australia Indicative Proposed Network Charges

The ‘under-investment’ issue...

**Energy Australia:**
Reliability

<table>
<thead>
<tr>
<th>Year</th>
<th>Customer minutes without supply</th>
<th>Capital expenditure</th>
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<tbody>
<tr>
<td>05/06</td>
<td>90</td>
<td>604</td>
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<tr>
<td>06/07</td>
<td>102</td>
<td>784</td>
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<tr>
<td>07/08</td>
<td>100</td>
<td>951</td>
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<tr>
<td>08/09</td>
<td>109</td>
<td>1,291</td>
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<tr>
<td>09/10</td>
<td>79</td>
<td>1,319</td>
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</tbody>
</table>

Average performance – 96 minutes

Average capital expenditure – $990 million

Source: Energy Australia Annual Report 2009/10
http://www.ausgrid.com.au/Common/About-us/Corporate-reports/~/media/Files/About%20Us/Annual%20reports/EAAR1011.ashx
Network Investment: >$45 Billion by 2015
- Bigger (and sooner) than National Broadband Network

Network Capital Expenditure (>9b p.a.)

- NSW
- Qld (draft)
- Vic (prop.)
- WA
- SA (draft)
What drives network investment?

> Peak demand growth
> Replacing aged networks
> Higher reliability standards

*Each factor can be addressed with Demand Management (to varying degrees)*
Reducing network pressure on electricity bills

“It is the Tribunal’s strong view that there is significant untapped potential for efficient demand management. To a large extent, one of the major obstacles continues to be a culture which favours traditional 'build' engineering solutions and which pays little more than lip service to alternative options.

The Tribunal is very concerned about the potential for substantial increases in capital expenditure ..., with adverse consequences for costs faced by end-users. ...

Potentially massive increases in network expenditure to meet demand growth highlight the importance of getting demand management right.”

Prof Tom Parry, Chairman IPART, 2002
US Utility Demand Management (DM) - Actual Peak Load Reductions

Total Aust. NEM Summer Peak Demand = 4.4% of US Peak Demand

(Sources: US Energy Information Administration & AEMO)
A²SE Survey of Network DM

> To understand current practice:
  – What is it delivering, what does it cost?
> To share experience and lessons
> To raise awareness of potential, barriers and solutions
  – among policy makers, utilities and community
> To establish a baseline and test an approach

“You can’t manage what you don’t measure”
Energy Savings (and Distributed Generation)

By technology

= 0.01% of Energy Use

By state

Note that energy generation was reported for 2 NSW DG projects in 08/09, but not in subsequent years.

By sector
Peak Demand Reduction

**By technology**

= 0.1% of Peak Demand

**By sector**

**By state**
Figures shown here are without estimated NSW FIT expenditure estimates for 10/11.
Projects Summary

Number of projects by state

- NSW: 51
- QLD: 15
- VIC: 5
- WA: 7
- NT: 2
- SA: 27
- ACT: 0

Expenditure vs. savings

- $M per annum

08/09:
- Expenditure: 35
- Savings: 0

09/10:
- Expenditure: 10
- Savings: 5

10/11:
- Expenditure: 5
- Savings: 0
Why so little DM in Australia?

A²SE Survey of Perceived Barriers to DM

> To assess perceived relative importance of barriers.
> To improve understanding of different stakeholder’s perspectives
## Survey Respondents

<table>
<thead>
<tr>
<th>Category</th>
<th>Respondents</th>
<th># Respondents</th>
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</thead>
<tbody>
<tr>
<td><strong>Utilities</strong></td>
<td>Energy Utility – Network</td>
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<tr>
<td></td>
<td>Energy Utility – Retailer</td>
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<tr>
<td></td>
<td>Energy Utility – Generator</td>
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<td><strong>Government</strong></td>
<td>Government Agency – Federal</td>
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<tr>
<td></td>
<td>Government Agency – State</td>
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<tr>
<td></td>
<td>Government Agency – Local</td>
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<tr>
<td><strong>End User</strong></td>
<td>Energy Consumer – Commercial</td>
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<tr>
<td></td>
<td>Energy Consumer – Industrial</td>
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<tr>
<td><strong>DM Provider</strong></td>
<td>Demand Management Provider</td>
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<td>Demand Management Consultancy</td>
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<td>Energy Supply Consultancy</td>
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<td><strong>Other</strong></td>
<td>Environmental organisation</td>
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<tr>
<td></td>
<td>Consumer organisation</td>
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<td>Industry organisation</td>
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<td>Research Institution</td>
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<td></td>
<td>Other</td>
<td>28</td>
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</table>
Institutional barriers

- Cultural barriers
- Regulatory barriers
- Externalities and price structures
- Confusion
- Lack of information
- Split incentives: landlord/tenant etc

The Policy Palette (‘PERFICT’)

- Information
- Coordination
- Enticement
- Regulation
- Payback gap
<table>
<thead>
<tr>
<th>I1</th>
<th>Limited experienced / skilled DM service providers</th>
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</thead>
<tbody>
<tr>
<td>I2</td>
<td>Lack of data on costs, reliability, potential from DM precedents</td>
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<tr>
<td>I3</td>
<td>Lack of information about network constraints</td>
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<tr>
<td>S4</td>
<td>Competing priorities in utilities limit consideration of DM</td>
</tr>
<tr>
<td>S5</td>
<td>Disaggregated electricity market - DM benefits hard to capture</td>
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<tr>
<td>S6</td>
<td>Landlord-tenant relationship</td>
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<tr>
<td>G7</td>
<td>Lack of capital, financiers, funds for DM project proponents</td>
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<tr>
<td>G8</td>
<td>Consumers / utilities want shorter DM payback than for supply</td>
</tr>
<tr>
<td>G9</td>
<td>Utilities have easier access to finance than DM providers</td>
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<tr>
<td>P10</td>
<td>Lack of carbon price</td>
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<tr>
<td>P11</td>
<td>Local peak / network constraints not reflected in power prices</td>
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<tr>
<td>P12</td>
<td>ToU tariffs don't represent time / location cost of energy</td>
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<tr>
<td>R13</td>
<td>Electricity suppliers profit from electricity sold, DM cuts profits</td>
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<tr>
<td>R14</td>
<td>Networks don't invest in DM unless constraint is imminent</td>
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<td>R15</td>
<td>Regulatory processes (security, reliability) don't consider DM</td>
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<td>R16</td>
<td>Regulatory Test (RIT) limits assessment of DM</td>
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<td>R17</td>
<td>High $ threshold of Regulatory Investment Test restricts DM</td>
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<tr>
<td>B18</td>
<td>Lack of state / national government consideration for DM</td>
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<td>B19</td>
<td>Utility bias towards centralised supply</td>
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<tr>
<td>B20</td>
<td>Electricity suppliers lack expertise / experience with DM</td>
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<tr>
<td>B21</td>
<td>Absence of DM / environmental objective in National Electricity Law</td>
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<td>B22</td>
<td>Electricity consumers lack interest in saving energy</td>
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<tr>
<td>B23</td>
<td>Consumers want to use power when &amp; how they choose</td>
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<tr>
<td>B24</td>
<td>Electricity suppliers prefer CAPEX to OPEX, DM is OPEX</td>
</tr>
<tr>
<td>C25</td>
<td>Coordinated approach lacking at state / national level</td>
</tr>
</tbody>
</table>
Extent of Agreement
C25. Lack of coordination at state/national level

B21. No DM/environmental objective in National Electricity Law

P12. Time based prices poorly reflect time & location cost of energy

B19. Utility bias towards centralised supply

S4. Competing priorities in utilities limit consideration of DM

S6. Landlord-tenant relationship

S5. Disaggregated electricity market - DM benefits hard to capture

R15. Regulatory processes (security, reliability) don't consider DM

P11. Local peak/network constraints not reflected in power prices

I3. Lack of information about network constraints

B18. Lack of state/national government consideration for DM

G9. Utilities have easier access to finance than DM providers

R14. Networks don't invest in DM unless constraint is imminent

R16. Regulatory Test (R1T) limits assessment of DM

I2. Lack of data on costs, reliability, potential from DM precedents

R17. High $ threshold of Regulatory Investment Test restricts DM

G8. Consumers/utilities want shorter DM payback than for supply

P10. Lack of carbon price

B20. Electricity suppliers lack expertise/experience with DM

B24. Electricity suppliers prefer CAPEX to OPEX, DM is OPEX

H1. Limited experienced/skilled DM service providers

G7. Lack of capital, financiers, funds for DM project proponents

R13. Electricity suppliers profit from electricity sold, DM cuts profits

B23. Consumers want to use power when & how they choose

B22. Electricity consumers lack interest in saving energy

Average Utility Govt End User DM Provider Other
20 Policy Tools for DSP

1: Decouple electricity sales from network profits
2: Reform National Electricity Rules
3: Streamline DG Licensing
4: Carbon Price
5: Cost reflective pricing
6: Network support payments
7: Distributed Energy Fund
8: Reform feed-in tariffs
9: Public recognition & awards
10: Streamline network negotiation process
11: DE Ombudsman
12: Annual DE Review
13: Training & skills development
14: Energy audits & technical support
15: Network planning info
16: DSP handbook and advisory service
17: Resource assessments and case studies
18: Extend retailer EE targets
19: DE targets & reporting
20: DE Coordination Agency
Towards an effective policy package

An Energy Savings Partnership:
> Focus on reducing peak demand and reducing consumption
> Set ambitious collaborative targets with electricity networks
  – e.g. $1 billion p.a. in avoided capex and consumer savings
> Regular performance reporting by each network
> Savings Partnership Fund to drive actions (say, $300m p.a.)
> Any unallocated funds offered to other savings providers
> Build into business as usual through economic regulation

• cf UK £500m Low Carbon Networks Fund
Conclusions

• Network investment is driving rapid rising power prices

• Energy Efficiency and Demand Management are the best real prospect for reining in increasing bills

• Giving consumers ‘options’ may not be sufficient - solution must be strategic, coordinated and collaborative

• Electricity network businesses have a key role to play in DSP

• Addressing affordability is crucial to implementing DSP

... and vice versa
Thank you

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Australian Alliance to Save Energy
Creating an Energy-Efficient Australia