THE ROAD TO SMART METERING IN AUSTRALIA

By Phil James

Australia's electricity sector has been the subject of ongoing micro-economic reform since the mid-1990s, progressing from individual state-based regulatory regimes to a largely integrated national structure.

The National Electricity Market (NEM) formally commenced in 1998 and operates across the world's largest interconnected power system, continually meeting the demand of more than 8 million electricity consumers. The NEM is an "energy only" wholesale market, with weather-driven needle peaks in demand and relatively low forecast reserve plant margins. These features are especially relevant in the Victorian and South Australian regions of the NEM, which experience some of the world's worst load duration curves. For these reasons, structural and policy improvements in wholesale market efficiency are of particular importance.

In this second of three articles broadly covering smart metering in Australia, the focus is on the Victorian advanced metering infrastructure (AMI) programme. The AMI programme is the first large-scale rollout of smart meters to occur in Australia.

VICTORIA – TAKING THE LEAD

In the last year of the twentieth century, the Victorian energy regulator foreshadowed a decision that would have far-reaching consequences for the electricity sector across Australia.

When it published the 2001-2005 Electricity Distribution Price Review (EDPR), the Office of the Regulator General (ORG) indicated that it was prepared to consider requiring interval meters for domestic and small business customers if the benefits of interval metering justified the additional cost.

While it would be July 2004 before the ORG's successor organization, the Essential Services Commission (ESC) of Victoria, issued a final decision mandating their installation, Victoria had, once again, taken a lead position in regulatory reform.

The ESC concluded that a targeted rollout of interval meters would improve the competitiveness and efficiency of the electricity market in Victoria and thereby contribute future net economic benefits to electricity customers and to the economy generally. It also decided to mandate a phased installation programme, commencing in 2006, which would mean that:

- In the seven years to 2013, up to a million large customers and customers with electric water heating would have their accumulation meters upgraded to interval meters, and
- Over an extended period, when a new or replacement meter was required, the around 1.3 million remaining meters would be upgraded.

Of critical importance to its final decision, the ESC determined that price signals that reflect the costs of electricity use patterns were an essential prerequisite for electricity consumers and the economy as a whole to realize the potential benefits of electricity industry structural and policy reforms. It considered that the responses of electricity users to cost-reflective prices should contribute to reducing the volatility of energy prices by smoothing peaks in the electricity load profile, improving the supply and demand balance in the wholesale market, and lowering the cost of energy by delaying investments in new demand-satisfying infrastructure.

In its earlier draft report, the ESC had canvassed the question of whether it should play an active role in fostering or mandating the rollout because, in its view, "the market does not necessarily deliver improved economic, social or environmental outcomes in all situations."

Finally, the ESC concluded that an interval meter rollout (IMRO) was required to achieve both cost-reflective pricing and the technological platform needed to deliver the potential economic and social benefits. It also determined that no individual decision maker (retailer, distributor or consumer) would have the necessary incentive to undertake the programme on its own.

On that basis, the ESC decided that regulatory intervention was appropriate and set about implementing its decision, through the 2006 EDPR, so that Victoria's electricity distributors could commence the IMRO programme, as scheduled, in 2006.

IMRO GIVES WAY TO AMI

Under the IMRO programme, the ESC did not require the use of interval meters with communications capability. This did not prevent the inclusion of communications-enabled devices and may simply have been a pragmatic approach to implementation. At the time, a derogation from the National Electricity Rules only maintained the distribution companies' monopoly on meter provision and meter data services in relation to meters that did not have remote communications capability. Although it is speculative, it is likely that the ESC saw benefit in being able to give effect to the IMRO programme more quickly and efficiently if distributors maintained their monopoly over meter provision. The ESC already possessed all the necessary regulatory powers to mandate a distributor-led IMRO.

What is clear is that energy retailers showed little interest in any type of large-scale IMRO programme.

While there was significant market interest in the IMRO design there was also a level of concern that the lack of mandatory communications capability could result in the loss of substantial potential future benefits if not addressed. In 2005, in response to these concerns, the Victorian state government commissioned CRA International to review the IMRO programme to determine if it would be cost-effective either to add communications capabilities to meters that continued to be rolled out according to the existing IMRO schedule, or to add communications capabilities and accelerate the programme so that all meters would be converted to IMRO meters plus communications within four years from 2009 to 2012 inclusive.

This CRA review was quite comprehensive and recommended a number of variations to the IMRO programme, the first of which was the addition of two-way communications capability utilizing private, rather than public, networks. It also recommended greater harmonization of standards across the different distribution areas and a deferral of the scheduled IMRO commencement, both to facilitate the extra work required and to avoid the "rework" needed if meters were rolled out early without communications capability. Finally, it

recommended accelerating the programme schedule in order to reduce implementation costs and enhance programme benefits.

To demonstrate the extent to which Victoria was then leading the national reform effort, it would be two more years (April 2007) before the Council of Australian Governments committed to a national rollout of smart meters and a further year (June 2008) before the Ministerial Council on Energy (MCE) determined that an accelerated national smart meter rollout would maximize economic and social benefits.

There were further changes during this period. Late in 2007, the MCE established a national minimum functionality standard for smart meters that Victoria adopted. With the additional changes recommended by the CRA review then approved by the state government, the AMI programme was born and IMRO was superseded.

In its 2008 Smart Meter Decision Paper the MCE noted that, "Victoria already has a legislative commitment to rollout smart meters and this programme is well underway. MCE supports this initiative within the national rollout and notes the benefits of a lead jurisdiction. Victoria agrees to work with other jurisdictions on the development of the national framework to support a consistent agreed business model for NEM arrangements and retailers. MCE notes that Victoria may proceed with meter procurement based upon existing specifications."

By the end of 2008, Victoria looked likely to be the first jurisdiction in the world to undertake a large-scale smart meter programme utilizing full communications capability and a home area network.

But, as is becoming customary, more change was coming, this time in the form of the Victorian Auditor-General.

TROUBLED BEGINNINGS

Victoria is segmented into five separate electricity distribution regions but due to the cooperation of related parties there are only three "smart meter zones". Two of the three are utilizing a proprietary mesh radio network communications technology developed by Silver Spring Networks and the third is using WiMax. The Silver Spring equipped distributors commenced their respective rollouts earlier and by late 2009 had installed some 10,000 meters across the greater Melbourne area.

Around 2.5 million smart meters will be installed by the time the programme is completed in 2013 and the schedule is demanding. The targets required to be met in each project year are:

- 5% (125,00) by June 2010
- 25% (625,000) by June 2011
- 60% (1.5 million) by June 2012
- 95% (2.375 million) by June 2013, and
- 100% (2.5 million) by December 2013.

In November 2009, the Victorian Auditor-General (VA-G) released a report called "Towards a 'smart grid' – the roll-out of Advanced Metering Infrastructure," which was highly critical of programme governance and management. The key findings related to governance, programme management and the lack of consumer information.

While the government initially rejected the criticism, in March 2010 the energy minister announced a review of the programme and placed an indefinite moratorium on the introduction of cost-reflective tariffs, following lobbying by a number of consumer organizations.

Both the Auditor-General's report and the subsequent actions of the minister cast a shadow over the programme which, by that time, was ramping up to full capacity. When the minister made his announcement, in March 2010, nearly 100,000 meters were already installed and operating Victoria.

A state election was scheduled for November 2010. The incumbent government had been in power for 11 years in Victoria and, by the beginning of 2010, was dealing with poor public perceptions of a number of major infrastructure projects. Among these were two high profile projects; a desalination plant to address drought conditions in the state, and a replacement for Victoria's ageing public transport ticketing system.

Both projects were contentious and were plagued by cost and time overruns. Driven by the Auditor-General's report and a very active opposition, the AMI programme became the third "challenged project" in the public's mind.

Then Victorians changed their government.

WHERE TO FROM HERE?

The new premier has promised a comprehensive review of all the contentious projects, including the AMI programme. At the time of writing, the moratorium on time-of-use (TOU) tariffs is still in place and the programme faces an uncertain future while a new minister considers his options. However, despite these challenges, installation of new meters continues unabated and distributors are broadly on or ahead of schedule.

Given the criticism of the programme in a number of quarters, particularly in respect to benefits, it is puzzling, to say the least, that more effort is not being made to develop and deliver tangible benefits for early adopter consumers. The most obvious of these are tariffs that reward consumers who can shift load and devices that take advantage of the richness of consumption information available from the interval meter.

The very basis of the programme relies on the provision of cost-reflective pricing that will drive behaviour change. A moratorium on distributor-imposed TOU tariffs may have placated consumer activists in the run-up to the state election but as long as it remains in place consumers will be denied the achievement of the programme's broader objectives.

On the second matter, there are already a number of high quality, inexpensive in-home display devices available in the Australian market that are suitably enabled to communicate with AMI meters. These devices can provide consumption, cost and carbon information, almost in real time, and are an ideal way for consumers to derive tangible benefits from the AMI programme from soon after they have a meter installed.

While in time there will be more sophisticated appliance control systems available that function seamlessly within the home area network, the in-home display is the easy place to start and a demonstrable way for consumers to benefit.

It is understandable that for all its ten-year history to date the focus has been on regulatory, technical and, now, operational matters but it really is time the focus shifted to the consumer.

And, with that in mind, despite their apparent lack of engagement to this point, it's an opportune time for the energy retailers to get involved.

After all, they "own" the consumer, don't they? MI

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