

**RESPONSE TO  
REGULATORY REVIEW –  
SMART METERS ISSUES  
PAPER**

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## INTRODUCTION

Smart meters are a part of, and a key starting point for, the next quantum step for the electricity industry, called smart grid. SilverSpring Networks (SSN) has significant experience as a leading global provider of smart grid solutions, both in Australia and in other parts of the world.

SSN believes that the success of the Victorian smart meter program will be measured not by the effectiveness of the technology, but by how consumers adopt the technology and reduce their electricity costs. To this end, SSN believes that:

- the introduction and implementation of complementary technologies such as in-home displays (IHD), web portals, smart phone applications, etc need to be accelerated so that customers have, as soon as possible, the tools to allow them to understand and manage their electricity consumption;
- while it is necessary that all customers are exposed to cost reflective tariffs in the medium to longer term, the transition to ToU tariffs as the default tariff for domestic and small commercial and industrial customers should occur over a period of time; and
- a broad and comprehensive education program on smart meters, ToU tariffs and the management of a customer's electricity consumption to reduce costs, needs to be implemented as part of the Victorian smart meter roll-out.

SSN welcomes the opportunity to provide its views and experience to the 'Regulatory Review – Smart Meters' being conducted by the Essential Services Commission (ESC).

### About SilverSpring Networks

SSN is a leading global provider of smart grid solutions, including:

- 'last mile' communications to smart grid devices, including smart meters;
- back-office systems to manage smart meters and other devices on smart grid networks; and
- systems to interface between the network, customers, retailers and distributors.

Four of the five Victorian distributors have selected SSN as the provider of smart grid infrastructure to meet their AMI obligations. Further, SSN is the technology provider to many other smart grid and smart meter projects around Australia, including a number of the consortia for the Smart Grid Smart City initiative, as well as projects in New South Wales, Western Australia and Queensland.

Internationally, SSN has:

- engagements underway with utilities that serve 1 in 5 US households;
- cooperation with investor-owned, municipally-owned, and cooperatively-owned utilities; and

- worked with utilities as large as 5 million customers and as small as under 100,000 customers.

### **The benefits of smart meters**

Smart meters represent a key starting point for smart grid deployments and provide very significant benefits to customers, including:

- the ability to reduce their energy costs in both the immediate future and in the long-run by managing the time in which they consume energy;
- immediate or scheduled connection and disconnection when moving into a property or vacating a property;
- provision of information to understand their energy consumption and the appliances that contribute the most to their energy costs;
- understanding the amount of Green House Gases (GHG) their electricity consumption is producing;
- the ability to obtain information from their retailer, for example, about other energy offers, high market prices, etc
- the ability to obtain information from their distributor, for example, about planned and unplanned outages in their area;
- improved reliability as distributors are able to better locate and respond more rapidly to faults; and
- reduced requirement for physical access to their meter.

However, in order for customers to obtain the full range of these benefits, it is necessary that not only the meters are rolled-out but also a number of complementary applications and technologies are provided, including IHD, web portals and home area networks. The current plan for the roll-out of smart meters in Victoria (the AIMRO program) does not provide for these complementary services to be enabled for a number of years. It is SSN's view that the provision of these services need to be accelerated in order for customers to obtain the full spectrum of possible benefits from AIMRO and to reduce the risk and impact on customers.

Another key element for empowering customers to get the maximum benefit from their smart meter is education. The management by a customer of their electricity consumption in an environment of ToU pricing, in conjunction with a smart meter and associated functionality, is very different to the current arrangements, involving a flat tariff and an accumulation meter. The key to customers accepting and exploiting this new environment is education. SSN believes that part of the AIMRO should be a structured, detailed and comprehensive education program for all customers and stakeholders. This will go a long way to removing the fear around smart meters and empowering customers to manage their consumption and electricity costs.

### **Smart grid and smart meters**

Smart metering is a part of a much bigger technological leap forward for the electricity industry called "smart grid". Smart grid refers to the overlay of ubiquitous network communications to provide connectivity for traditional utility distribution assets (e.g., meters, transformers, etc.) and innovative devices (e.g., sensors, smart appliances, etc.). It will provide the ability to route electricity to where it is needed. Smart grid enables distributors to

monitor the operation of utility assets in real-time, manage these assets with hard data, plan rationally for future generation and delivery infrastructure and to control and optimise their operation. Smart grid will also enable retailers to interact with their customers in real-time, providing incentives to adjust their energy consumption to meet the demands of the market, providing improved and expanded products and services and assisting customers to reduce their energy costs.

The drivers for smart grid include:

- reducing and/or deferring the need for future power generation and energy delivery infrastructure by utilising customer demand response (through smart meters) to reduce peak demand and improve system load factor;
- identification, management and locating of faults;
- reducing the impact of faults by remotely switching the network to restore supply to as many customers as possible before the fault is rectified as well as improving the locating of the fault and ensuring the supply is restored to all customer before the field crew leaves the site of the fault;
- customer engagement;
- using demand response to offset inherently intermittent renewable generation from wind and solar resources, reducing the need for costly, redundant, fossil fuel-based back-up generation;
- extending the life and optimising the replacement of aging assets;
- assisting the existing electricity network, which was designed to carry energy from a central point to distributed load, to work with distributed generation; and
- to meet the significant demands that will be placed on the electricity grid by future technologies such as Plug-in Electric Vehicles.

Any serious effort to reduce greenhouse emissions depends on the deployment of smart grid technologies. Customer energy reduction, grid optimisation, the integration of distributed and large scale renewable generation, and vehicle electrification are examples of key GHG-reducing technologies that can be greatly accelerated and enhanced by the implementation of open, interoperable, and unified smart grid communications networks.

## **RESPONSE TO ESC ISSUES**

### **Vulnerable customers**

SSN supports the position that 'disconnection from supply should always be a last resort option.' The smart meter technology being installed in Victoria has the capability to 'choke' or restrict the amount of power going through the meter. This would allow, for example, sufficient power to be provided at a premise to run a few lights and the fridge only. This functionality could be utilised either as an alternative to disconnection or as an additional step prior to disconnection.

SSN recognises that pre-payment meters are prohibited in Victoria. Notwithstanding, the smart meters being installed in Victoria are capable of operating as prepayment meters using the back office systems to manage the amount of credit remaining and the amount of

energy used. However, smart meters used this way have a number of advantages over conventional pre-payment meters, including:

- the threshold at which action is taken can be varied without visiting the meter. This means that, for example, as a customer's payment record changes, the threshold at which notification or action is initiated can also be changed;
- multiple thresholds can be set. For example, at a certain level of debt or credit, a message may be sent, at a different level, the customer's power could be choked, while at an even greater level of debt the customer may be disconnected;
- it would be possible for the customer, in conjunction with their retailer, to determine the thresholds and actions;
- all of the communication facilities of the smart meter can be utilised, including the IHD, web access, etc; and
- utilising the facilities to monitor their consumption, the customer can see their level of consumption and their available credit at any time.

SSN believes that smart meters provide overall benefits to vulnerable customers, including:

- the ability to reduce their energy bills by managing their load,
- the ability to monitor their consumption and anticipate what their bill will be;
- the use of smart meters as pre-payment meters (where permitted) with better facilities than current pre-payment meter technologies; and
- to move to a monthly billing cycle so that the size of each bill is smaller.

Work by Ahmed Faruqi of the Brattle Group has demonstrated that as a result of the combination of the response of customers to cost reflective prices (such as ToU tariffs) and the savings in hedging costs for retailers being passed to customers, as much as 90% of customers could see reduced electricity costs<sup>1</sup>.

### Reviewing the bill

SSN believes that it is necessary for the customer to be able, in a simple way, to gain a reasonable level of comfort that their meter and bill are accurate. As a minimum, the accumulation reads (adjusted if required) should continue to be provided on the bill.

In addition to the simplistic approaches currently available, smart meters will provide many more opportunities for the customer to gain comfort about the accuracy of their meter and their bill, including:

- downloading their half-hourly energy consumption and reviewing it to make sure it 'makes sense' (eg low consumption for periods when there was no one at home, higher consumption for periods when the whole family was at home);
- by monitoring their energy consumption in real time (ie utilising the Zigbee link in the meter) the customer will be able to 'test' the response of the meter to switching appliances on and off; and

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<sup>1</sup> Faruqi, Ahmad and Ryan Hledik, "The Power of Dynamic Pricing," *The Electricity Journal*, April 2009.

- comparing their energy consumption, either by price periods or in total, with the download of their meter reads.

### **Estimated and substituted data on bills**

SSN supports the ESC's position that, even in a smart meter environment, estimated and substituted reads will still be needed. However, the frequency and value of estimated and substituted data will be significantly reduced.

In a smart meter environment, there will still be circumstances when a meter is unable to be read remotely. This may be due to a failure of the communications network or the communication chip in the meter. In these circumstances, the consumption data will remain in the meter and will be retrieved at the next successful download. However, until this data is retrieved, it will be necessary to provide an estimate for the missing intervals and if a bill is issued before the next successful read, the bill will include this estimated data. Because the meters are being read regularly, both the occurrence of a bill with estimated data and the amount of data that is estimated on a bill will be significantly reduced from that which occurs with manually read meters. Pacific Gas and Electric (PG&E) have found that the occurrence of a bill containing estimated data where a smart meter is installed is about one eighth of that where a manually read accumulation meter is installed<sup>2</sup>.

Although the failure rate for smart meters is significantly less than that of meters currently used, when a meter or the memory storage device in the meter fails, substituted data must be developed. However, not only is a failure that results in a loss of data less likely with a smart meter, generally these failures will be detected very soon after they occur. Consequently, the time period of the data that is substituted is generally also less.

### **Customer billing cycle**

In order for customers to gain benefits from smart meters it is necessary for them to be getting information about their consumption on a regular and timely basis. Many customers will actively obtain this information through devices such as IHD, the internet, smart phones, etc. However, customers who are less technologically sophisticated will continue to rely on their bill for this information. Thus it is imperative that in order for the maximum number of customers to benefit from smart meters, a monthly billing cycle becomes the norm. In Australian society today, monthly billing is the norm for most services. Credit cards, fixed line and mobile phones and internet, home mortgages and store accounts are among the many services that utilise monthly billing.

SSN believes that, whatever the hurdles to changing to monthly billing are, it is important that these be overcome in order for the majority of customers to benefit from smart meters.

### **Graphical information on the bill**

SSN agrees with the ESC's view of requiring graphical information, similar to the Energy Australia and Ontario examples, to be provided on the bill. This should be sufficient for most customers to be informed about their energy consumption sufficiently to be able to take

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<sup>2</sup> PG&E April 2006 "Senate Appearance PG&E Senior Vice President and Chief Customer Officer Helen Burt" – 26 April 2010

steps to reduce their energy costs, if they wish to. Should a customer desire more information or more timely information, this will be available through other means.

#### **Notification of variations to tariffs**

SSN strongly believes that the issue of transitioning customers from the flat tariffs supported by accumulation meters to more cost reflective tariffs that are enabled by smart meters is a critical issue in customers' acceptance of smart meters and the success of AMI.

Ultimately all customers should be exposed to the cost impacts of the time at which they use energy in order for the societal benefits of smart meters to be obtained. On the other hand, there is no benefit in customers receiving 'bill shock' by being exposed to inflated peak energy prices without them understanding the implications of ToU pricing nor being able to manage their consumption to reduce their peak time energy usage.

For these reasons, SSN believe that a transition period should be declared during which:

- customers will have the choice and will be encouraged to move to ToU tariffs;
- customer education will occur;
- retailers will be required to offer a choice of tariffs, including a flat tariff, each of which will be cost reflective in their own right;
- the impacts of ToU pricing on low income and other disadvantaged customers will be analysed and steps put in place to assist them to benefit from smart meters and ToU pricing; and
- more of the functionality of smart meters, including IHD's and web portals, will be developed and implements.

Following this transition period, ToU tariffs should be the norm.

SSN is not aware of any jurisdictions in the world that have moved to ToU or similar tariffs as the default tariff for domestic customer. Where this type of tariff is offered as an option, the take-up rate is generally slow, largely due to the absence of enabling technologies and the lack of customer education and engagement. However, in the case of Oklahoma, a high level of customer satisfaction is being seen from customers who have taken up more cost reflective tariffs, in conjunction with an IHD. Significant savings in electricity costs are being reported by many customers representing a very broad demographic.

#### **Shopping around for a better offer**

SSN supports the ESC's aim of ensuring that customers are able to compare and make informed choices between competing offers. However, this is not a straightforward matter as it is not only the retailer's prices and time periods that are relevant, but also how the customer is able to take advantage of these prices. For example, a retailer offer that has extremely high prices at some times (say peak times) but low prices at other times (say off-peak times) may be more attractive to some customers than an offer with much lower peak prices and only slightly higher off peak rates if those customers can move a lot of load away from peak times. Additionally, different offering that use different time periods for peak and off-peak will appeal to different customers.