Silver Spring Networks Pty Ltd
Level 25
360 Collins Street
Melbourne VIC 3000

15 October 2012

Eamonn Corrigan
Project Leader
Australian Energy Market Commission
Level 5
201 Elizabeth Street
Sydney NSW 2000

RE: Silver Spring Networks' Response to AEMC Power of Choice Draft Report

Dear Eamonn:

Silver Spring Networks appreciates the opportunity to make this submission to the AEMC in response to the Power of Choice Draft Report.

In Australia, Silver Spring Networks leads the industry with over 1.1M homes and businesses connected to Advanced Metering Infrastructure. Silver Spring is also the market leader globally, connecting over 12M homes and businesses to date with contractual commitments for 10M more across five continents. By partnering with Silver Spring Networks, our utility customers have been able to leverage their existing Advanced Metering Infrastructure to enable Demand Side Participation to more efficiently manage their distribution networks and empower consumers. As a result, consumers have been able to shrink their peak energy use and reduce their energy bills.

We look forward to contributing further to the work of the AEMC and its commitment to expanding energy choices for the people of Australia.

Regards,

John Garner
Regional Manager, Australia and New Zealand
Silver Spring Networks

Silver Spring Networks Response to AEMC Power of Choice Draft Report

15th October 2012

Silver Spring Networks Pty Ltd
Level 25, 360 Collins Street, Melbourne Vic 3000 Australia
ABN: 65 132 628 258
O +61 3 9236 5222 | F +61 3 9236 5299
silverspringnet.com

1. Executive Summary

Silver Spring Networks applauds the general direction of the AEMC's to empower energy consumers with timely information and meaningful choices. This submission seeks to refine AEMC's recommendations in a manner that is consistent with fulfilling Australia's needs for affordable, reliable, and sustainable energy.

This submission consists of three core topics, as follows:

1. The merit of **competition in metering services** is a complex topic that the AEMC acknowledges and Silver Spring Networks agrees, requires further analysis and consultation. We encourage the AEMC to consider that a decision regarding competitive metering services will inadvertently influence the underlying communications network infrastructure, likely leading to point-to-point technologies. Today, point-to-point technologies have been adopted for only 0.1% of all Smart Meters deployed globally today and will increase infrastructure costs by an estimated 93% relative to the radio frequency mesh technologies that have successfully connected nearly half of the smart meters.
2. The AEMC's proposed **timing of meter installation** will ultimately result in full deployment. It is, therefore, prudent for the AEMC to consider policies, rules and specifications that are geared towards this long-term outcome. This will guide the industry to proactively adopt proven technologies and processes designed to scale to full deployment in the most cost-effective manner possible.
3. The AEMC suggests a **minimum meter functionality** of interval reads with remote communications to support efficient Demand Side Participation. The Smart Meter Infrastructure minimum functionality specification, which has been subjected to extensive industry participation and consultation, sets out functions beyond remote interval reads. These functions are necessary to realise an estimated 59% of total Smart Meter benefits. Should meter functionality be restricted to only interval reads, these benefits could be foregone resulting in higher consumer electricity costs than they could have otherwise been.

In the following sections we describe important considerations of Advanced Metering Infrastructure and offer our views and recommendations on the Draft Report, for the AEMC's consideration in producing the Final Report.

Silver Spring Networks Pty Ltd
Level 25, 360 Collins Street, Melbourne Vic 3000 Australia
ABN: 65 132 628 258
O +61 3 9236 5222 | F +61 3 9236 5299
silverspringnet.com

2. Advanced Metering Infrastructure

Advanced Metering Infrastructure (AMI) refers to the full system that connects network endpoints (such as smart meters) deployed at consumer premises to back-office management systems in a utility's head-end location. AMI is comprised of hardware and software components which, essentially, combine data collection with continuously available remote two-way communications.

Figure 1 shows the building blocks of AMI. The consumer is equipped with smart meters that collect time-based data. Meters can include three types—electricity, gas, and water meters. Communication modules within these meters have the ability to transmit the collected data through privately owned networks such as RF Mesh or Power Line Communications (PLC) or public networks (e.g., GPRS, 3G). The meter data is received by the AMI host system and sent to the Meter Data Management System (MDMS) that manages data storage and analysis to provide the information in useful form to the utility.

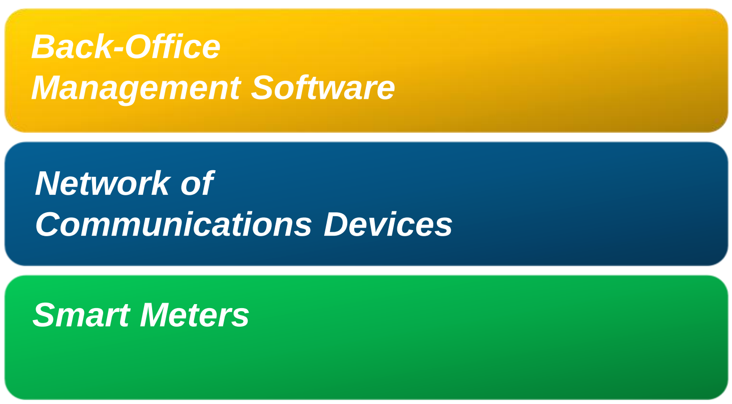

Figure 1: The major Advanced Metering Infrastructure building blocks

Deployment of AMI is often the first smart grid application deployed by a utility, not only because it enables a utility to remotely collect granular meter data, but also because it can be the foundation for implementation of additional smart grid applications. One of the most common applications deployed by utilities once AMI is in place is Demand-side Participation (DSP). DSP programs encourage and incentivize customers to reduce demand during peak periods by providing them with more insight into how they consume electricity, along with the ability to act on those insights.

Today, there are many different types of communications technologies that have been applied to AMI for mass market purposes. The Smart Grid network is unlike any other networking technology and is characterized by:

- **Geographic reach** where utilities must provision and manage network coverage over tens of thousands of square kilometres;
- **Varied terrain** requires Smart Grid networks to operate across dense urban, suburban, rural and subterranean environments;

- **Difficult physical access** of Smart Grid network devices requires extremely high reliability;
- **Longevity** of Smart Grid devices is expected by utilities of 20 years or longer;
- **Changing environment** caused by unpredictable interference, obstructions and other impediments require the network to be able to adjust without manual intervention;
- **Massive scale** is required to support millions of endpoints;
- **Unparalleled uptime** is critical for the Smart Grid network;

Utilities around the globe are adopting sub-GHz RF Mesh as the technology that best meets these characteristics. As Figure 2 shows, of the estimated 97M Smart Meters deployed worldwide almost half (46%) use sub-GHz RF Mesh. By comparison, only 0.1% of Smart Meters use point-to-point mobile technology such as 3G. With only 0.1% market, point-to-point mobile technologies are risky because they have not truly been proven in large deployments and do not have enough economies of scale to achieve competitive pricing.

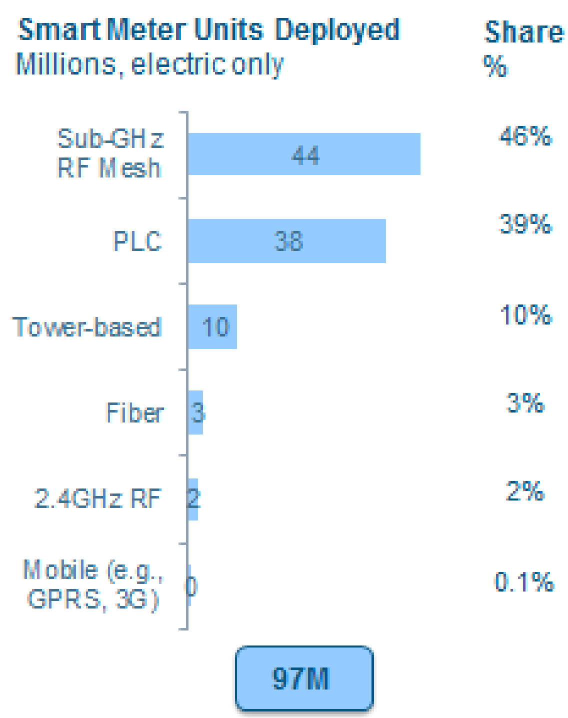

Figure 2: A comparison of different communications technologies being used in Smart Meter deployments. (Sourced from publically available Smart Grid deployments worldwide to 30 June 2012.)

3. Silver Spring Response to Certain AEMC Recommendations

In this section, we provide responses to five sections of the AEMC Draft Report by setting out important considerations and recommendations.

3.1 Role of Retailers and Distribution Network Businesses (AEMC Draft Report Section 3.3.2)

The recommendation in the Commission's Draft Report is that the National Electricity Rules (NER) and National Energy Customer Framework (NECF) are clarified to outline the conditions when a distribution network business can engage directly with consumers to offer DSP network management services. This may involve establishing appropriate guidelines/processes for the Australian Energy Regulator (AER) to apply and outlining which elements of the NECF apply[1].

We agree with the AEMC that further clarity is required, especially with regard to the roles and processes of retailers and network businesses when engaging with consumers to offer DSP services.

NECF has established a triangular relationship involving the consumer, their retailer and network business. This relationship acknowledges that both retailers and network businesses have an important role when engaging and serving consumers.

The Draft Report suggests that the triangular relationship may not be appropriate to enable efficient DSP and that the role of the network business may need to be constrained. Restricting the role of the network business to offer and engage directly on DSP may have an adverse impact on programs aimed at reducing electricity costs in the future compared to what they would have otherwise been.

As DSP can benefit both the retailer and the network business, an alternative approach would be to provide appropriate incentives on both retailers and network businesses to offer DSP as an alternative to investment in network infrastructure. Today, network businesses are obligated and incentivized to invest in infrastructure necessary to provide sufficient capacity to meet forecast peak demand, with reserve.

> We recommend that the final report consider incentives based mechanism for network businesses to investment in DSP at a rate equal to or greater than their investment in distribution network infrastructure. We also recommend against constraining the role of network businesses in DSP programs.

3.2 Functional Specifications of Meters in the NER (AEMC Draft Report Section 4.3.1)

The recommendation in the Commission's Draft Report is that a new minimum functionality specification is included into the NER for all future new meters installed for residential and small business consumers. That specification should include interval read capability and remote communications[2].

---

1 Page 38 of Draft Report Power of Choice by AEMC dated 6 Sep 2012

2 Page 47 of Draft Report Power of Choice by AEMC dated 6 Sep 2012

Silver Spring Networks Pty Ltd
Level 25, 360 Collins Street, Melbourne Vic 3000 Australia
ABN: 65 132 628 258
O +61 3 9236 5222 | F +61 3 9236 5299
silverspringnet.com

In 2009, the National Smart Meter Program (NSMP) began what would be a two-year effort to determine the minimum functionality specification for Smart Metering Infrastructure (SMI). This specification sets out 405 functionality requirements and 23 performance requirements that are necessary to deliver an open, standards based infrastructure capable of realizing all of the benefits of Smart Meters.

The Draft Report suggests that this comprehensive exercise has produced an outcome that does not support efficient DSP and is, therefore, seeking input on whether a remotely read interval consumption meter is sufficient.

The correlation between functionality of SMI and the benefits that functionality delivers is an important consideration when setting minimum functionality, as benefits cannot be realized if the required functionality is not available. As the scope of Draft Report is DSP, we suggest the AEMC not discount the importance of non-DSP functionality within the meter, which would be required to realize identified non-DSP benefits.

Many jurisdictions around the globe have conducted deep analysis of the costs and benefits of a smart meter deployment and the required minimum functionality to realize the benefits. To provide the AEMC with an example of this correlation, we have analysed the benefits published in 26 publically available AMI business case filings in the United States. This analysis shows that, if the minimum functionality specification was to be restricted to remotely read interval consumption that the benefits would be reduced by an estimated 59%. This goes against the intent of this Draft Report to ensure that consumer electricity costs in the future are less than what they would have otherwise been.

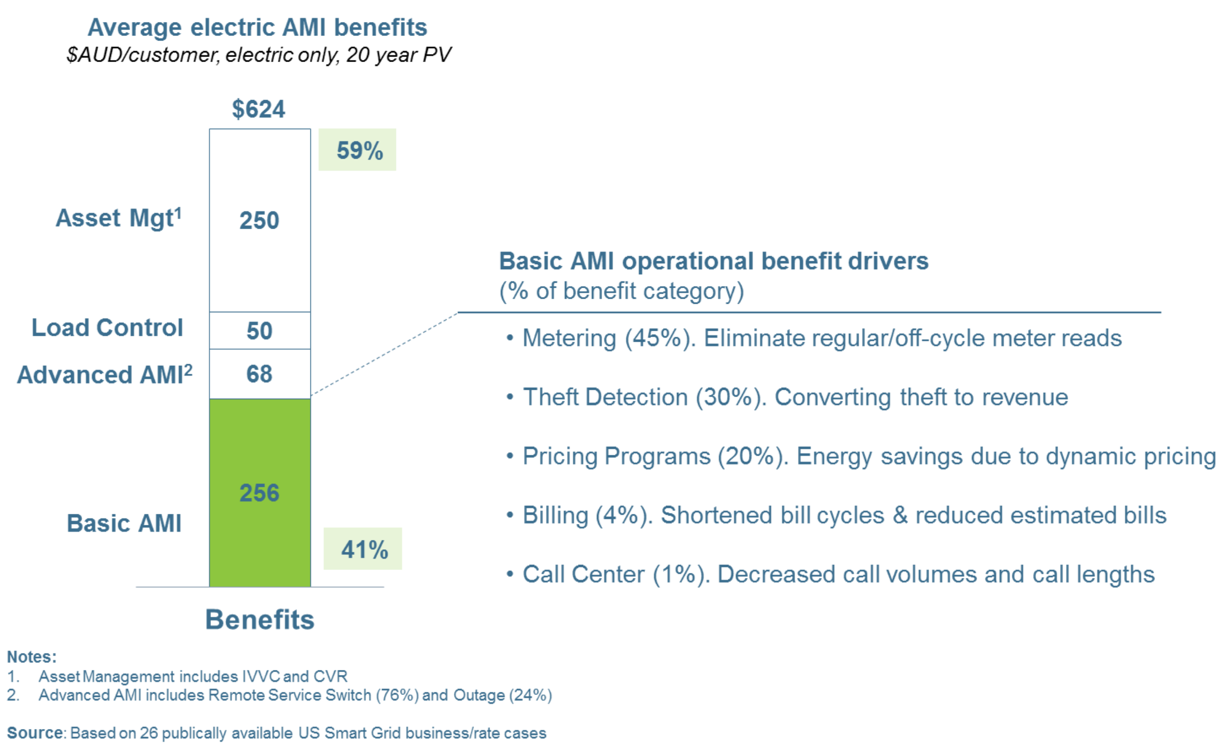

Figure 3: Analysis of Smart Grid benefits attributable to Smart Meters with Interval Read functionality only.

It is also important for the AEMC to consider that adding functionality to SMI after an initial deployment of remote read interval meters would require a meter hardware replacement to realise to the incremental 59% of the total Smart Meter benefits defined above. This is likely to lead to significant duplication of costs and the risk of stranding the remote read interval meters. This would have a negative impact on the costs of electricity for the consumer.

> We recommend that the AEMC adopt the SMI Minimum Functionality Specification in full and to the extent that each functional requirement is supported by standards set out in that specification. For example, Home Area Network (HAN) requirements must be supported by the Zigbee Smart Energy Profile (SEP) such that standards based solutions can be implemented.

3.3 Timing of Metering Infrastructure Installation (AEMC Draft Report Section 4.3.2)

The recommendation in the Commission's Draft Report is that the installation of meters consistent with the proposed minimum functionality specification to be required in certain situations (e.g. refurbishment, new connections, replacements) and that such metering must also be installed on an accelerated basis for large residential and small business consumers whose annual consumption a defined threshold[3].

The criterion that has been considered by the AEMC in this recommendation would result in a full deployment of AMI over the next 10 to 15 years for all consumers in the NEM, except for Victoria, which has an existing mandate for full deployment. Consequently, economic decisions regarding infrastructure investment must be strategic and be made with a longer term vision in mind. The most cost effective method for the deployment of AMI infrastructure is a networks business lead deployment as economies of scale are realised through the deployment of infrastructure to all consumers within a service territory.

In making its recommendations the AEMC has given consideration to customer segments that may contribute the biggest benefit, however, the extent of this contribution is not quantified. Further, the Draft Report does not appear to consider the costs of adopting this deployment approach against alternative deployment approaches, such as a networks business lead deployment, to ascertain which deployment approach would deliver the best value to the consumer.

> We recommend that the AEMC Analyze the different deployment approaches (Networking type, meter technology, deployment speed & scope) to ensure that consumers are receiving the best value for money.

3.4 Arrangements to Foster Competition in Metering Technology (AEMC Draft Report Section 4.3.3)

The Commission's Draft Report recommends reforms to the current metering arrangements to promote investment in better meter technology and promote consumer choice. AEMC puts forward a model where metering services are open to competition and can be provided to residential and small

[3] Page 49 of Draft Report Power of Choice by AEMC dated 6 Sep 2012

business consumers by any approved metering service provider. If new arrangements are implemented, then AEMC advises that governments should consider removing the possibility of a mandated roll-out of Smart Meters[4].

Giving consideration to the merits of competition of metering services requires significant and separate analysis and consultation, than this review of enabling efficient DSP. Notwithstanding, the Draft Report does not appear to contain analysis that quantifies the contribution of metering services on consumer electricity costs and the impact on these costs if metering services were competitive. In this regard, we agree with the AEMC that further work is required to assess the details and practicalities of this approach.

An important view for the AEMC's consideration is the adverse effect that competition in metering services will introduce regarding AMI communications technology. Competitive metering services will result in dispersed customers across the NEM, which as a consequence, is likely to promote point-to-point mobile communication technologies.

We have modelled the costs of AMI deployed by network businesses adopting mesh technology compared with competitive metering services businesses adopting 3G point-to-point, and we estimate this will result in an additional 93% costs to the deployment of this infrastructure. Please refer to following section of this document for further details on this analysis.

Importantly, as set out in Section 2 of this document, point-to-point mobile technology has been adopted for about 0.1% of the 97M Smart Meters deployed to date globally, with a very small number deployed in Australia. Consequently, there is less industry competition for point-to-point technologies, than the more widely adopted technologies, such as RF Mesh. This is likely to have an adverse effect on the costs of metering services and, consequently, consumer electricity costs.

If the AEMC is to give further consideration to competitive metering services, we would encourage the AEMC to acknowledge that AMI communications infrastructure generally exhibits the characteristics of natural monopolies, in which the capital-intensive nature of particular industries leads to economies of scale, often associated with regulated public utilities that provide essential services across broad geographies with greater availability and affordability than multiform competition would allow. Standardising this communications infrastructure, such as the United Kingdom is pursuing, allows for reduced infrastructure costs and enables uses of the infrastructure beyond smart grid, such as smart water meters.

> We recommend that the AEMC conduct a separate, comprehensive review of competitive metering including all of the costs/benefits of smart metering and smart grid for distributors, retailers and 3rd party DSP providers.
>
> We recommend that the option for governments to mandate a full roll out of smart meters be maintained since Monopoly smart meter deployments are the most cost effective method.

4 Page 52 of Draft Report Power of Choice by AEMC dated 6 Sep 2012

3.5 Phasing in Time Varying Pricing (AEMC Draft Report Section 6.3.5)

The recommendation in the Commission's Draft Report is to transition to better price signals in the NEM in a gradual phased approach. It is proposed that this can be achieved through focusing only on introducing time varying prices for the network tariff component of consumer bills and segmenting residential and small business consumers into three different consumption bands and applying time varying network tariffs in different ways[5].

We welcome the AEMC's acknowledgment of the important role that cost reflective tariffs play in increasing consumer awareness of the costs of supplying electricity during peak periods. In our experience, jurisdictions that make the early correlation between Smart Meters enabling the adoption of cost reflective tariffs have reduced peak demand with success. For example, Oklahoma Gas and Electric (OGE) continues to deploy a DSP program utilizing Time-of-Use (TOU) and Variable Peak Pricing (VPP) tariffs, which in the first year reduced peak demand by 70MW and by the third year forecast to reduce peak demand by 176MW, deferring investment in two peaker generation plants at a cost of $330M.

The Draft Report recommends banding all consumers into one of three bands. These proposed banding arrangements will introduce significant complexity on industry participants to identify, manage and transition customers into the appropriate band, which may lead to increased costs being passed to consumers unnecessarily. Recently, the Victorian State Government announced the introduction of TOU tariffs to commence in July 2013 and for a two year period consumers who elect to adopt this tariff can revert to their previous tariff at no cost. This is a much simpler approach to phasing in time varying pricing, which we would encourage the AEMC to give consideration to.

High income households generally consume more electricity and contribute more heavily to peak demand than low income households who generally have more flat load profiles. Consequently, the proposed banding will generally target high income households. However, low income and vulnerable households have been shown to benefit greatly from more cost reflective tariffs. As illustrated below, analysis by The Brattle Group[6] shows that more low income households obtain a benefit than higher income households. Low income households should be given the same opportunity to choose how they consume electricity as other higher income households. This would include the industry being given the same incentive to offer innovative cost reflective tariffs irrespective of household income.

5 Page 99 of Draft Report Power of Choice by AEMC dated 6 Sep 2012

6 2010 Edison Foundation report "The Impact of Dynamic Pricing on Low Income Customers" (prepared by The Brattle Group), http://www.edisonfoundation.net/IEE/Documents/IEE_LowIncomeDynamicPricing_0910.pdf

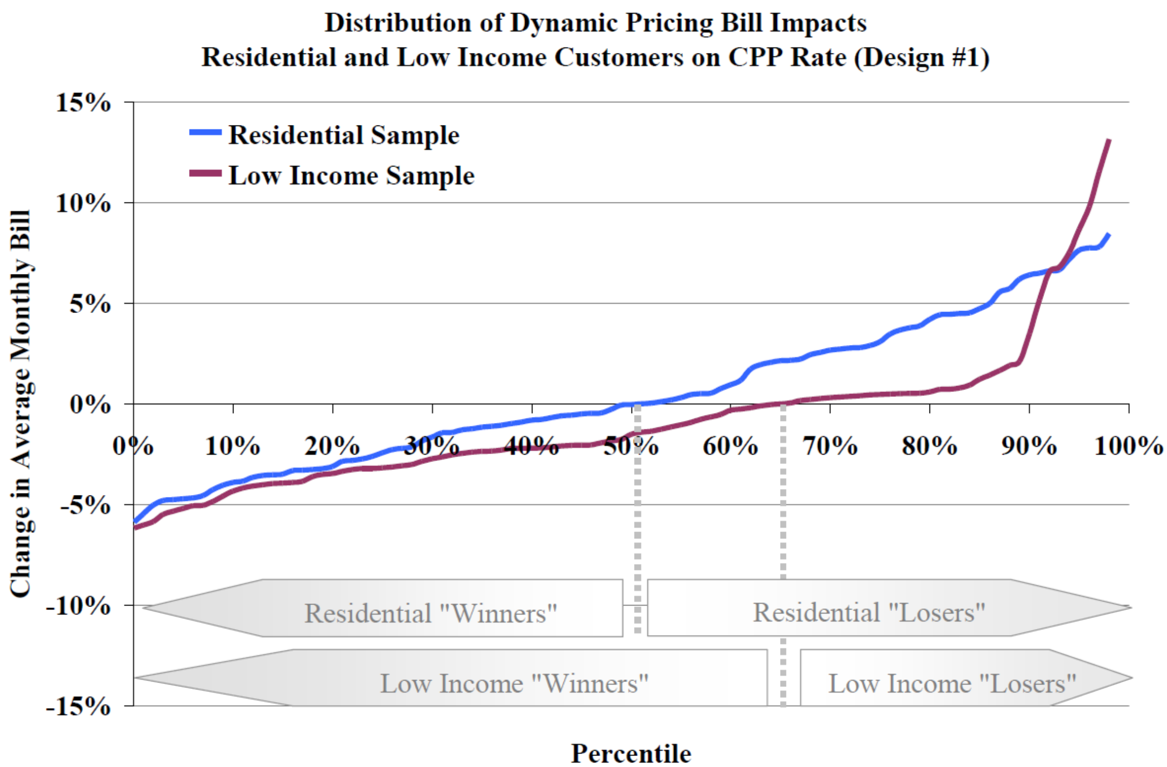

Figure 4: A comparison of changes in monthly electricity bills for low income households versus higher income households

The Draft Report appears to give consideration only to time vary pricing and does not make recommendations on other tariffs, such as Critical Peak Pricing (CPP) and Variable Peak Pricing (VPP) that are likely to be more attractive to certain customers and have a greater impact on peak demand.

We recommend that the AEMC reduce unnecessary complexity that banding of customers may introduce and to consider phasing in of cost reflective tariffs adopting a similar approach to Victoria. Should banding be required, we recommend reducing the number of bands to two. Further, we would recommend the AEMC not limit the types of cost reflective tariffs to time of use. Lastly, retailers should have greater flexibility to offer various cost reflective tariffs that provide incentives to all consumers with differing “risk and reward” appetites.

4. Silver Spring Analysis

Silver Spring Networks has analysed the comparative costs of metering infrastructure under a monopoly and competitive metering services market, including the technology consequences of these two scenarios. This analysis shows that a monopoly based market leads to a 93% less expensive total cost of ownership for AMI in the NEM, excluding Victoria.

The two modelled scenarios are:

1. **Monopoly Metering Services deploying RF Mesh** – Network businesses deploy and maintain canopy RF mesh networks in their geographic service territories, with 99% coverage starting in the first year. As the criteria proposed in the AEMC Draft Report for smart meters are met (e.g. new construction, refurbishment, large residential and industrial customers), individual customers are added to this network. Each network business owns and manages the back-office software and operations to manage their respective communications networks. The total cost of ownership (TCO) of the AMI network covering the NEM, excluding Victoria, is estimated to be $298 per metering end point.
2. **Competitive Metering Services deploying 3G Point-to-Point** – Competitive Metering Services businesses adopt 3G cellular AMI communications. Each entity owns and manages the back-office software and operations to manage their respective communications networks. The TCO of the AMI network covering the NEM, excluding Victoria, is estimated to be $574 per metering end point.

The figure below highlights the key rationale for the differences in costs. The higher cost in the competitive scenario is largely driven by greater duplication of fixed costs associated with AMI communications. These are systems integration costs, project management office costs, and head-end system setup costs. The analysis assumes the deployment of single phase meters and excludes the cost of transition and meter swap-outs as the logistics are unknown. We therefore, believe that these estimates are conservative and that the monopoly scenario's cost advantage is actually greater than 93%. One of the AEMC's principal concerns is the pass through of costs to consumers. Our analysis shows a significant cost difference between the monopoly and competitive scenarios.

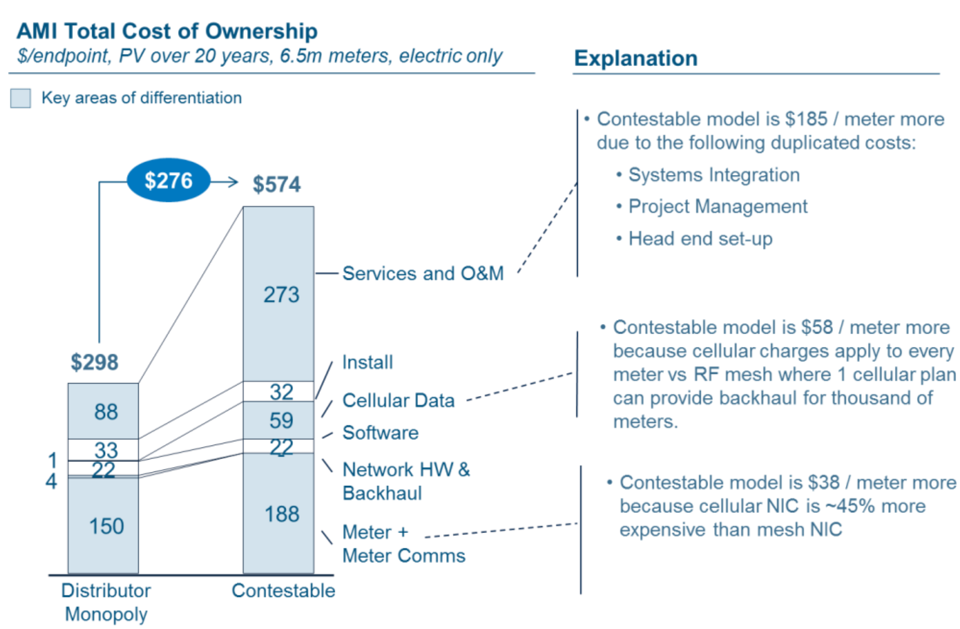

Figure 5: Comparative analysis of AMI Infrastructure costs of competitive and monopoly Metering Services

5. Conclusions

In conclusion, we thank the AEMC for the opportunity to make this submission on efficient DSP. We agree with and encourage the AEMC to undertake more detailed analysis and consultation on important topics such as competition in metering services, metering functionality and the timeline for implementation. We suggest that in doing so, the AEMC give consideration to these topics with a broader perspective than efficient DSP, so that outcomes are not to the detriment on non-DSP factors. We look forward to participating in these further discussions to provide consumers with greater choice on how they consume electricity in the future.

Silver Spring Networks Pty Ltd
Level 25, 360 Collins Street, Melbourne Vic 3000 Australia
ABN: 65 132 628 258
O +61 3 9236 5222 | F +61 3 9236 5299
silverspringnet.com

Appendix

Silver Spring Networks Overview

Silver Spring Networks enables rapid and cost-effective implementation of a broad array of smart grid applications. Whether beginning with Advanced Metering or Distribution Automation, or focusing on consumers through Demand Side Participation or Electric Vehicles, Silver Spring Networks delivers the standards-based smart grid platform necessary for success. The breadth and depth of our hardware and software solutions account for Silver Spring's worldwide adoption as the smart grid platform of choice.

Silver Spring Smart Energy Platform

The Silver Spring Smart Energy Platform incorporates standards-based network infrastructure, software, and services–all tailored to a utility's particular project goals, service territory and terrain requirements, regulatory model and operational structure.

The smart grid includes metering devices, in-home devices, DA devices and network infrastructure that collect and relay information to a utility's back office. These smart devices, powered by Silver Spring firmware, work in concert to create a self-configuring, highly redundant network with ubiquitous coverage, strong security, and the scale and performance needed to deliver a broad set of smart grid initiatives across millions of intelligent endpoints.

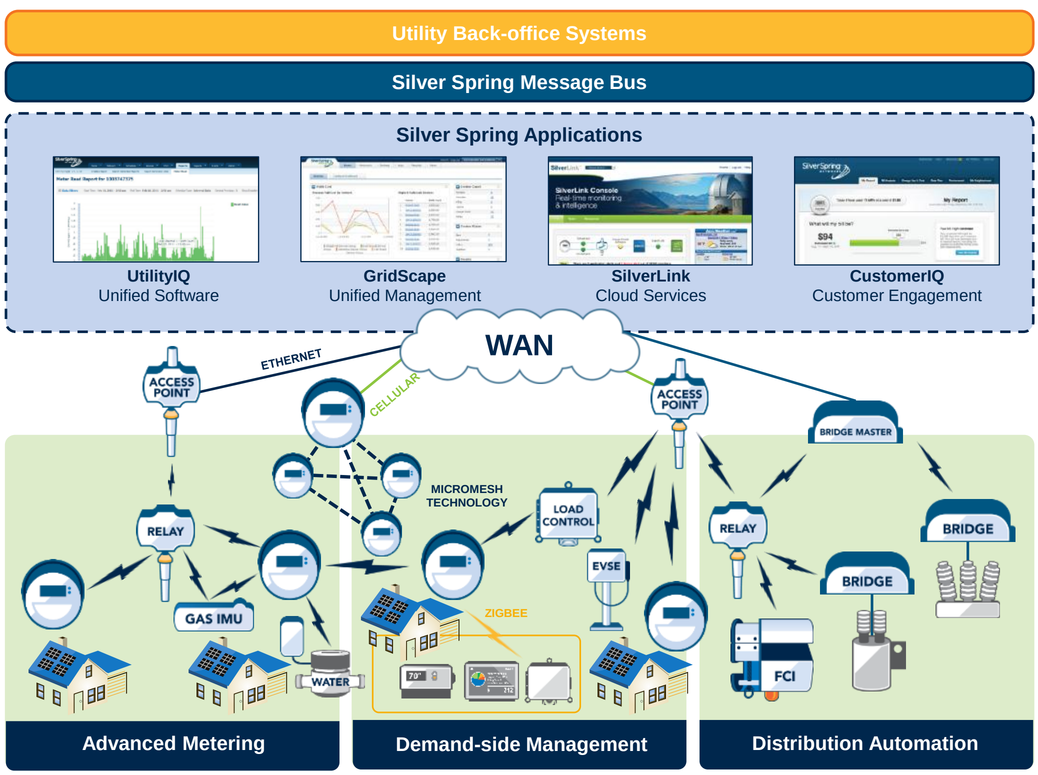

Figure 6: A Smart Grid capable of supporting multiple applications.

The Silver Spring UtilityIQ application suite includes advanced metering, outage detection, voltage monitoring, demand response and network management applications, and it supports standard web services for integration into a utility's back-office applications. Silver Spring software also includes the CustomerIQ consumer engagement platform helping utilities relay consumption and pricing information and manage energy efficiency programs.

Figure 3 shows how multiple smart grid application, including AMI, DSM and ore can be supported by the Silver Spring Smart Energy Platform.

Silver Spring provides a versatile Demand Response software platform in its UtilityIQ Demand Response Manager application. The application enables utilities to define and manage Demand Response programs, manage both customer devices and the network linking to customers' homes, define device groups at which to target Demand Response activities, and send Demand Response events and messages.

The Communications Modules within Silver Spring-equipped meters deliver connectivity into the home, enabling the two-way communications essential for effective Demand Response. Silver Spring supports the ZigBee Smart Energy Profile specification for Home Area Network (HAN) devices. The company also supports a HAN device qualification program to ensure end-to-end interoperability with in-home devices and the utilities' Demand Response programs.

For areas that have not yet received smart meters, Silver Spring offers Direct-to-Grid™ communications solutions for Demand Response. Direct-to-Grid communications leverage Silver Spring's IPv6 Communications Modules integrated into third-party devices such as load control switches and Electric Vehicle charging stations. In addition to supporting Demand Response ahead of a smart meter deployment, the Direct-to-Grid communications option also delivers robust communications, leveraging the coverage and redundancy inherent in the Silver Spring network to provide utilities the assurance they can reach high-value Demand Response assets and shed load.

Utilities initiate pricing events or load control message from within UtilityIQ Demand Response Manager, which manages communications over the smart grid network to both grid- and ZigBee-connected devices.

With this full two-way solution, utilities can view real-time and historical information about the success of various Demand Response programs. The CustomerIQ customer engagement platform offers Demand Response participants advance notice of upcoming Demand Response events and an immediate view into their usage patterns.

With Silver Spring's end-to-end Demand Response solution, utilities can leverage their investment in the Advanced Metering network and extend it to DSM applications to reduce cost, improve the reliability of the smart grid and provide consumers with more choice.