28th January 2014

To Australian Energy Market Commission
   PO Box A2449
   Sydney South NSW 1235

**Itron Response to AEMC DRAFT REPORT, Framework for Open Access
and Common Communication Standards Review, dated 19 December
2013
Reference No. EMO0028**

Dear Australian Energy Market Commissioner

Thank you for the opportunity and I am pleased to provide an Itron response to
the above AEMC Draft Report.

Itron is the world's leading AMI and Smart Grid technologies provider, with over
15 Million AMI meters deployed using RF, PLC, and Cellular technologies. We
offer intelligent metering, start-of-the-art data collection, utility software
solutions, project consultation and deliveries, with nearly 8,000 utilities
worldwide relying on our technology to optimize the delivery and use of energy
and water.   Itron is also the leading provider of commercial off the shelf meter
data management to the Australian market.

Itron's approach to AMI and the Smart Grid is built on industry leading standards
and strategic partnerships, such as Cisco and SAP, to ensure we are offering best
in class solutions. Together with our partners and customers, Itron's
commitment is to deploy solutions that enable scalability, security,
interoperability, and streamlined operations to support a continually increasing
array of Smart Grid innovation and applications for both energy providers and
consumers. Our leadership and experience continues to move the industry to a
game changing platform that innovates the Smart Grid and provides our
customers with flexibility and peace of mind.

Itron understands the purpose of this Report and its review process is to
recommend a communication and access framework that supports smart
meters, and contestability in demand side participation (DSP) and related
services which are enabled by these meters. The findings shall clarify the
communication architecture under the National Electricity Rules (NER) and the
adoption of common market communication standards. This work is crucial to
the advancement of the Australian electricity industry; therefore Itron has
reviewed the Draft Report and herein present our response to the Commission.

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Itron Response Summary:

1. Itron strongly supports establishing a standard metering protocol for the market.
    a. DLMS/COSEM is an excellent choice for a metering protocol; however it is not optimized for business transactions, between market participants.
    b. The AEMO should also consider other interoperability specification such as IDIS to form the basis of the standard metering protocol.
2. Itron does not believe that a metering protocol shall form the basis of an effective market protocol, and further it will create additional cost for participants and consumers. Instead, Itron recommends extending the existing market protocols to support the new use case requirements at the business level, and allowing service providers (be they new SMP's, or existing players such as MDP's) to provide services at a business level

Itron is keen to further participate and contribute to the discussion and is seeking representation in this Workgroup if possible.

Thank you once more for the opportunity to participate the review, and we shall look forward to your comment and response

Sincerely yours,

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Itron Draft Report Review

Page iv (PDF 8) of the AEMC's Framework for Open Access and Communication Standards Review states that, "We have identified specific issues on which we are seeking comments and require further development. In addition, we welcome submissions on any other aspect of this draft report."

[Itron comment] Itron has thoroughly reviewed the report. We have comments in response to requests for input, as well as unsolicited comments on selected portions of the review. For convenience we reference both the section number and the PDF page number we are commenting on. The PDF page number does not match the printed page number, but will allow a reader working with the electronic version of the report to navigate directly to the appropriate page. For clarity, each comment will begin with a quote from the report which provides context.

§2.2 (PDF 15): For consumers to obtain services enabled by smart meters, such as flexible pricing or load management, parties offering these services would need to have access to the smart meter.

[Itron comment] Itron agrees that in some circumstances access to the meter would facilitate services enabled by smart meters. However, the key to obtaining these services is not access to the meter itself, but to the services enabled by that meter.

There are a rich variety of mechanisms for reaching the consumer. In some markets data is obtained locally via a Home Area Network interface, such as ZigBee. In other markets data is obtained via the internet from a distribution company, retailer, market operator, or 3rd party data aggregator. In most cases this data exchange is not done using a metering protocol. Instead it is achieved using a data exchange mechanism suitable for the medium and the business objectives.

§ 4.1 (PDF 20): The smart meter infrastructure deployed in the NEM, including in any given distribution network, may be deployed by several different smart meter service providers offering different technology solutions. This could have the potential to reduce the ability for some accredited parties to communicate with some meters if no standards are applied.

[Itron comment] Itron has a great deal of experience deploying a wide variety of communications for metering, including RF-Mesh, RF-Star, Cellular, and PLC solutions; Head-end and MDM software; and specifically market interfaces for the Australian market. With the exception of cellular, most communications solutions are optimized for saturation deployment. Selecting an application protocol, while very important, does not provide device level interoperability. SECR needs to consider whether true device level interoperability is required, in which case a standard MAC/PHY and network layer should also be specified.

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The proposed approach will only support interoperability at the application level and above. For some physical networks this will either result in sub-optimal deployments (for example, mixing two incompatible mesh networks in the same location) or force deployments to be regional (for example, deploying one network type on the east side of a city and the other on the west).

This is a key reason why Itron recommends that a market protocol be maintained, independent of the meter protocol, to enable access at a business level, and to enable innovation and competition at the communications network level.

Itron also recommends that the SECR look closely at network profiles, such as the in-progress IEC Technical Committee 13/Working Group 14 project to elaborate a new standard (62056-8-20), which describes how DLMS/COSEM can be optimally used in a RF-Mesh environment. Designing and deploying a network that can reliability support millions of devices is not trivial. The industry has found that optimizations are still required at the application level to allow these systems to run well.

§ 4.2.2 (PDF 22-23): interchangeable - where one meter could be swapped for another without any protocol impacts for all accredited parties seeking access to the meter.

[Itron comment] The frame work does not seem to adequately consider the implications of layers on interoperability. Application layer interoperability does not automatically enable into interchangeable devices unless they share common network and physical layers as well.

§ 4.3.4 (PDF 27-28): The security of the smart meter infrastructure is managed at the point of entry. If the point of entry is at the meter then security must be managed with a system of passwords. If the point of entry is remote from the meter then security will be managed by the SMP.

[Itron comment] The security of the smart meter infrastructure must be measured at all levels within the system:

- Point of Entry
- Network Access
- Device Access
- Encryption at the network layer
- Encryption at the Application Layer

While passwords are indeed the most common mechanism for authenticating access to meters, they are not the only means. The current DLMS/COSEM specification already allows the use of symmetric keys for managing access to devices. Forthcoming updates to the DLMS/COSEM protocol will allow the use

of digital signatures. The sheer numbers of devices involved in metering make managing passwords difficult and error prone. A system that uses unique passwords for every device is hard to keep up to date. A system that shares passwords is prone to catastrophic failure if a password is leaked. A strong key management mechanism can allow direct (application level) access to meters without the requirement for password management. This approach is planned for the UK. Generally, direct access to the meter by multiple parties is ill advised without a strong security mechanism. Meters lack the deep security protections that server environments provide, such as intrusion detection, firewalls, and security event mangers. Privacy and safety issues can arise if smart meters are not secured properly. Itron strongly recommends that any direct meter access program uses digital signatures instead of passwords to authenticate such access. If desired, Itron welcomes the opportunity to present further on meter security to the SECR.

§ 4.3.8 (PDF 31): Therefore, the smart meter communications network needs a congestion management system to allow some accredited parties to have priority access to the smart meter's functionality during times of system emergency.

[Itron comment] Itron agrees that congestion management can be very important in a Smart Meter Network Environment. Whether this is a problem in practice will depend on how highly loaded the Smart Meter Network is, and most importantly how access to that network is managed. If multiple parties are allowed direct access to the Smart Meter Network, congestion issues are likely. One of the challenges that the SECR must manage in this case is providing clear guidance on which traffic should receive the highest priority. Is a demand response message more important than a meter reading?   What if the meter reading is related to a move-in/move-out or a change in retailer? What if competing retailers all want to issue demand respond requests simultaneously? Will there be any coordination between them? Which retailer's request gets priority?

Given that the parties attempting to access the Smart Meter Network are likely to be competitors, Itron believes the most appropriate technical solution would be to use a single head end to manage access to the smart meters, and resolve priority issues at the business level through the Market Protocol.   Quality of service technology can allow multiple competing messages to share a limited bandwidth network, and Itron offers such technology, but network management tools cannot address issues of business fairness. A properly design head-end system can arbitrate between requests, taking into account the impact on the network, and ensuring that all parties have fair access to the meter's services, if not the meter itself.

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§ 5 (PDF 32): Our initial recommendations do not consider what communications technologies should be deployed, allowing the selection of the communications media to be determined by the provider of the smart metering infrastructure. Rather the initial recommendations address specific communication interfaces in the end-to-end connection between an accredited party and the smart meter.

[Itron comment] Itron believes that DLMS/COSEM makes an excellent common metering protocol. It is widely adopted throughout the world and is supported by most major device manufacturers. By adopting the Interoperable Device Interface Specification, SECR can optimize further.[1] IDIS provides a core interoperable profile supported by Elster, Itron, Landis+Gyr, and others. This profile is supported by a formal testing and certification regime, to ensure that IDIS certified devices are genuinely interoperable. Adopting IDIS avoids investing time and energy into creating yet another market specific profile, which then has to be supported by metering vendors, adding costs which must eventually be borne by Australian consumers.

Itron does not believe that DMLS/COSEM is an appropriate common market protocol. Australia already has a well-defined common market protocol with ASEXML. It will be far more efficient with respect to both time and money to extend the existing market protocol to support some new market transactions related to metering, than it will be to add market support into DLMS/COSEM.

We strongly agree with the discussion in §5.3.3 (PDF 36). A good metering protocol is not necessarily a good market protocol. The needs are different. Accredited parties need to work at a business transaction level. Meters are technical details that market participants, as business users of meter data, should not have to worry about.

§ 5.3.4 (PDF 36): We are seeking stakeholder views on the appropriate selections of a common market protocol. In particular:
- *Should an internationally accepted meter protocol form the foundation of the NEM common market protocol?*

[Itron comment] No. Itron is a strong proponent of international open standards, including DLMS/COSEM. Our products widely support DLMS/COSEM, and we actively participate in its development. That having been said, meter protocols are designed for device communications. Accredited parties do not have responsibility for the device, but they are responsible for the relationship with the market participants. Fundamentally APs have a need to complete data driven business transactions with the MDP, not technical transactions with the meter itself.

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[1] See http://www.idis-association.com/ for details.

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Using a metering protocol as a market protocol is a bit like using a spanner (wrench) as a hammer. In many cases it will work, (especially if the spanner is large enough), but it will not perform nearly as well as a proper hammer will.

Itron recommends using a protocol suited for the job. For example, the AEMO could define a set of web services transactions, using either SOAP or REST to be used between APs and MDPs or SMP's. Itron believes the most efficient and cost-effective approach will be to extend the existing market protocol to support these new market transactions.

- *Is DLMS/COSEM sufficiently well developed to be used as the foundation for a market protocol, given the potentially synergies that exist with smart grid interoperability and other meter standards?*

[Itron comment] DLMS/COSEM is a strong protocol and sufficiently well developed to form the basis of a common metering protocol. As discussed above, it is not designed to serve as a market protocol.

Within a smart metering architecture, the head-end and MDM serve as translation points by exposing technical meter functions as business services. While an application protocol is a requirement for interoperability, it does not guarantee good performance or security end-to-end.   The system communicating with the meter must also take into account the routing protocol of the individual network and, for lower bandwidth networks like RF-MESH and PLC, the packet sizes and other constraints of the physical layer. The business reason for the evolution of these systems in this manner is that it is impractical to require business systems at all levels to understand the technical details of the metering communication.

- *Would the costs of developing an Australian specific services based common market protocol be likely to deliver sufficient benefits compared to using an internationally accepted metering protocol?*

[Itron comment] First, the two are not mutually exclusive. A market protocol typically solves problems that a metering protocol will not. For example, while a metering protocol will enforce security rules, it is not designed to facilitate non-repudiation, nor do meters typically have the resources to maintain comprehensive audit logs indefinitely. Servers can easily provide these sorts of services. A well designed market protocol can ensure non-repudiation and full auditability.

Separating the meter protocol from the market protocol allows the two protocols to evolve independently. For example, new metering technology may allow data to be collected more often, or allow more nuanced load control

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through interaction between the meter and local renewable resources. Similarly, innovative retailers may choose to offer incentive rates in which groups are given a lower overall rate if their collective peak stays below a certain threshold. Such an approach could be very valuable to industries with complementary load shapes. Allowing separate forums for innovation in market and metering will enable the market to find the best solution for each, and will not cause business level services to be constrained by technical implementation and vice-versa.

SECR must also consider the costs of changing existing, functioning, market systems to use the metering protocol rather than the market protocol, and the effects that will have in delaying implementation, or re-doing work which has already been done.

Getting data from SMPs to APs is a business / data problem, not a metering problem. Meter protocols are optimized to address the limits and intricacies of meter communications. Forcing these details to APs will result in unnecessary work. Implementing a market protocol makes substantially more sense. While the AEMO could consider work done within OASIS,[2] as well as some of the EDI standards[3] that were created for this purpose, Itron believes the extending the existing ASEXML will be the most straight-forward, cost effective approach.

- *Would extensions to the B2B gateway present a viable option for the development of a services based common market protocol?*

Yes. Itron believes that this is the most efficient, speedy, and cost-effective way to enable competition and innovation in the smart metering and DSM space.

[Itron comment] The AEMO and accredited parties have already made substantial investments in the current B2B gateway systems and their integration. The lowest risk, most cost effective approach for all parties involved will be to review, extend and evolve the existing solution.

Moving to a new solution will require reimplementation and retesting of current core functionality, in addition to building to the new requirements. It's usually much more cost effective to build an extension than to level and rebuild the entire house.

§ 5.4.1 (PDF 37): We are seeking stakeholder views on the appropriate entity to maintain the documentation for a common market protocol. In particular:
- *Would AEMO be the most appropriate entity to develop and maintain the common market protocol?*

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[2] https://www.oasis-open.org/
[3] http://www.uig.org/

[Itron comment] Itron believes AEMO is ideally placed to take the leadership in the common market protocol development; provided that mechanisms to engage and facilitate the discussion, innovations, new technologies adoption, and standards/implementation evolvement are established and maintained in good working order with all relevant market participants.

- *Is there the potential for the responsible entity to adversely impact on the competitive provision of DSP and related services?*

[Itron comment] While this potential exists, an open and transparent process among competitive stakeholders should prevent it. Fundamentally, the AEMO needs to create a forum in which new functions can be created and implemented on a bilateral basis between participants, as new functionalities evolve. Later these bilateral transactions can be properly adopted as market standards. Premature standardization will likely result in wasting effort on ideas that don't bear fruit in the market, but not providing a structured way to experiment will result in chaos.

- *Would AEMO be regarded as sufficiently neutral, should the common market protocol be based on the existing B2B arrangements, as the B2B procedures are maintained by the Information Exchange Committee, established by AEMO?*

[Itron comment] Itron believes the current B2B procedures are well established and serve the purpose for customers' information exchanges and market metering data management and settlement. It is required to be extended and support challenges for Demand Side Participation, Distribution Operation optimization as well as customer engagement and services. Provided that the process for expanding the functionality allow for open exchange of ideas, and bilateral agreements between participants until standards are fully defined and adopted.

The AEMO and accredited parties have already made substantial investments in the current B2B gateway systems and their integration. The lowest risk, most cost effective approach for all parties involved will be to review, extend and evolve the existing solution. Moving to a new solution will require reimplementation and retesting of current core functionality, in addition to building to the new requirements. It's usually much more cost effective to build an extension than to level and rebuild the entire house.

§ 5.4.2 (PDF 38): We are seeking stakeholder's views on whether the accredited parties and MPs should be required to define new functions in the smart meter functionality specification before they can be implemented. In particular:

- *Would requiring new functions to be fully documented before they are used stifle innovation and reduce competition in the provision of DSP and related services?*

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[Itron comment] Yes. Providers need the ability to create new offerings and experiment with them before making them more widely available. That said, tying market innovations to device innovations is problematic. If a market innovation must be implemented at the device level it may take months or years before it can be rolled out. These concerns should be kept separate.

- *Would not requiring new function to be documented be likely to lead to reduced levels of interoperability, and hence reduce competition in the provision of DSP and related services in the longer term?*

[Itron comment] Documentation by a single provider does not result in interoperability. It is a very rare occurrence when competitors will simply adopt each other's designs. Interoperability requires well-defined standard, certification processes, and a well-defined intellectual property regime. Itron recommends the AEMO consider adopting IDIS to provide a metering protocol baseline.

§ 5.5 (PDF 39): We are seeking stakeholder's views on whether a common meter protocol should be adopted, or whether SMPs should be able to use protocol translators. In particular:
- *Should there be a common meter protocol?*

[Itron comment] Yes. A common meter protocol allows the specification of common functionality with the expectation of similar implementations across vendors. Even if this protocol is not explicitly used by the APs, requiring the use of well-established international protocols increases the likelihood of high quality smart metering implementations on the part of the SMPs/MDPs.

A Common meter protocol provides a good basis for a base level of functionality within the market.   Mechanisms should also be provided for experimentation with new services and technologies within this protocol. IE: The common meter protocol should form the lower limits of functionality, not the upper ones. Modern AMI systems and Meters, with firmware upgrade capabilities, will allow for changes of protocol over time, as unique functions evolve into standard ones.

- *If a common meter protocol is required, should it use the internationally accepted DLMS/COSEM protocol as its foundation?*

[Itron comment] Yes. DLMS/COSEM is an excellent choice with a strong history and a vibrant community.

- *If a common meter protocol is required, should existing Victorian smart meter operators be required to offer a protocol translation to the new common meter protocol?*

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[Itron comment] No. Use of a common meter protocol has many advantages for device level interoperability, but integration and interoperability for business purposes is provided at the common market protocol, not the metering protocol. There is no need to force protocol translation of the metering protocol in legacy installations.

- *Without a common meter protocol do proprietary meter protocols (and protocol translations) be more likely to support competition in DSP and related services?*

[Itron comment] No. Providers can innovate within DLMS/COSEM. There is no need for proprietary protocols to facilitate innovation. If anything proprietary protocols decrease innovation, as providers are redesigning and reinventing established capabilities, rather than building new features.

Mechanisms should also be provided for experimentation with new services and technologies within this protocol. IE: The common meter protocol should form the lower limits of functionality, not the upper ones.   Modern AMI systems and Meters, with firmware upgrade capabilities, will allow for changes of protocol over time, as unique functions evolve into standard ones.

§ 5.6.3 (PDF 42): We are seeking stakeholder's views on whether the protocols at the meter point of entry and the market point of entry support access to new functionality without the need to make any modifications to the SMP software.

[Itron comment] Direct access to the meters by accredited parties through a common meter protocol fails to recognize the role of the communications network in providing reliable consistent access to data. Meters do not have the resources of IT servers, and meter networks do not provide the robust, high-bandwidth access that we have become accustomed to with modern IT networks and the Internet.
The bandwidth of these networks is limited (even on cellular networks), and the capabilities of these devices are limited as well. It would be unwise to allow general uncoordinated access by multiple parties to these devices and networks. Multiple APs attempting to access the same device simultaneously or both trying to perform bandwidth intensive requests could take down devices or entire segments of the network. This will serve no one's business interests. The SMP must serve as the custodian of the smart meter network, ensuring that all APs have fair and equitable access. The only way to consistently achieve this is for the entry point to be at the market level rather than the device level.

§ 5.6.4 (PDF 43): We are seeking stakeholder's views on the proposed architectures above. In particular, should the proposed architecture of:
- *A protocol translation at the point of entry (Figure 5.1) be supported in the NEM?*

[Itron comment] Itron believes the most appropriate point of entry to be the common market protocol, not the common metering protocol. With this in mind, a protocol translation mechanism is inherently required between the

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market protocol and the metering protocol, but this will be responsibility of the smart meter provider.

- *A common meter and market protocol (Figure 5.2) be supported in the NEM?*

[Itron comment] Yes. Itron believes that there is value in having both a common meter protocol and a common market protocol.

- *The proposed protocol that allows communication via either the meter protocol or the market protocol (Figure 5.3) be supported in the NEM?*

[Itron comment] While Itron strongly supports a common metering protocol, accredited parties should only access meter functions through the common market protocol.

- *In addition, we are seeking stakeholder's views on whether changes to the NER would be required to allow the SMP to manage access, security, congestion and message validation required for smart meter deployments?*

[Itron comment] The smart meter system operator must be able to manage access, security, congestion, and message validation, and must have the necessary regulatory support to do so.

§ 5.7 (PDF 43): We are seeking comment on whether the SMP's responsibilities should be retained in a separate role, or whether these responsibilities should be assigned to an existing entity.

[Itron comment] In the history of the NEM, there are several roles split between meter provider, meter data provider, etc. In practice these entities have successfully been integrated within a single market participant. While SMP's responsibility will be crucial to the market, Itron believes it is more a commercial decision rather than a regulatory ruling. Provided sufficient "ring-fencing" and accreditation processes, it can be efficiently incorporated into existing market entities. However Itron also believes innovative entrepreneurs can take the initiative and offers competitive services in this field.

§ 6.1 (PDF 44-45): We welcome comments on:
- *whether the right of access to smart meters should be enforced under the NER and, if so, to what degree (e.g. should right of access apply to all smart meter functions or in relation to providing certain services);*
- *what are the contractual arrangements that are expected to be in place and to what extent these contractual relationships are to be supported by rights under the NER;*
- *how the market (the NEM as a whole or the retail energy market) would be impacted if participants are denied access to smart meters; how would different participants be impacted; and*

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- *how the existing rights and obligations relating to the use of metering infrastructure and metering data would impacted by smart meters.*

[Itron comment] Itron welcomes the regulatory discussion and is committed to participating in the consultation process. Itron will continue to offer its feedback from a technological, operational and implementation perspective. Itron reiterates the importance for the market protocol to be separated from meter protocols.

Itron would also like to request the Workgroup to consider and review the legal, social and policy impact. For example, providing too many "rights" of access will drive up overall costs for all consumers, even those who do not use the services. Therefore efficiency in the market would best be served by making the access to these functions priced, and open to competition between SMP's/MDP's where they are not directly related to public health and/or Safety, or disadvantage any specific group.

Itron would encourage the Workgroup to define rights of access to the services and data of the smart meter, rather than to the meter itself, as it is the services and data which provide business value.   If one SMP can make that data available as a business level service, while another SMP requires it's customers to directly access the meter and to manage the complexities of meter communication, the uptake of such services will ultimately determine what is the best solution.

§ 6.2 (PDF 45): We welcome comments on:
- *how the services that could be enabled by smart meters be defined and should these services be subject to regulation;*
- *whether there would there be alternative means of providing these services other than through a smart meter.*

[Itron comment] Itron believes smart meters and AMI will introduce significant benefit to all participants in the market, it will further bridge the gap between consumers and energy service providers. Light-handed regulation provides the most freedom for consumers and their service providers to innovate and take full advantage of the services enabled by smart meters.

There will be in-coming new and innovative technologies and services tailored for specific customer groups: Some of these may be encased within new smart-meters, and others will be represented by non-meter offerings in home energy management, appliance control, and home security.

Itron believes AEMO shall establish a long term view and take the leadership in engaging and facilitating this development. AEMO needs to create a forum in which new functions, services, and alternative means of providing these services can be presented, discussed and encouraged on a multilateral basis between participants, as new functionalities evolve.

§ 6.4 (PDF 46): If new risks could be introduced, we will assess whether the existing consumer protection mechanisms would provide sufficient protection or whether new measures may be required. We welcome comments on these issues.

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[Itron comment] Security and data access are key risks which must be properly implemented and designed to ensure consumers are protected.

Smart meters bring higher levels of functionality to distribution companies and retailers. They provide much more granular data about energy consumption, a direct consumer touch point through the Home Area Network interface, and the ability to remotely connect and disconnect consumers. With this greater functionality there is also greater risk. Should these systems be hacked, consumers could suffer anything from a loss of privacy to a loss of power. Given these concerns it is absolutely vital that security of all aspects of the system be treated as a first class concern, rather than an afterthought. Legacy approaches to security such as shared keys and shared passwords are not sufficient.

The AEMO must consider security by design at the device level, the network level, the common metering protocol, the common market protocol, and the associated business-to-business exchange. A compromise at any of these points could be used to facilitate a broader system compromise. While the AEMO should certainly consider consumer protections to prevent unscrupulous use of consumer data and the like, it must start by ensuring that there are clear reliable protection mechanisms in place to ensure that unauthorized access is never allowed.

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