IoTAA response to Promoting innovation for NSW energy discussion paper

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NSW Department of Planning, Industry and Environment

By email lodgement: energy.consumerpolicy@dpie.nsw.gov.au

To whom it may concern:

Subject: IoT Alliance Australia – Enabling the Transformation of the Energy Sector Paper Submission

IoT Alliance Australia (IoTAA), https://iot.org.au/ welcomes this opportunity to respond to the Enabling the Transformation of the Energy Sector Paper.

IoTAA is the peak Australian IoT industry body, with over 500 participating organisations and 1000 individual participants. We grow the Australian IoT eco-system, help build capability and good practice, advocate for policies that help accelerate adoption and "IoT for good" that is safe and secure IoT deployment and uses of Internet of Things (IoT) devices and services in Australia. Our mission is to accelerate the adoption of IoT to improve competitive advantage of Australia and benefit Australian society.

IoTAA plays an active role in issues relating to all aspects of IoT this includes suitable architectures, security considerations, technology, industries and most importantly impact on the public. IoTAA maintains an Energy Utility workstream and this input takes into consideration the advice of the membership.

Internet of Energy

IoTAA recognises that the current energy market is based on a long-standing successful engineering model that has delivered very reliable energy to the people of NSW accompanied by operating rules to ensure a commercially viable system while maintaining customer protection.

This existing model is based on a 'one way' scenario with Generators providing energy to customers via a distribution network. The rapid expansion of renewable/distributed generation over the past decade have a huge impact on the Energy System. Importantly reducing emissions – but at the same time introducing complexity in to the 'Grid' with 2-way flow of energy. The main contributors in this space are:

- Deployment of Smart Meters – enabling the detection measurement of significant data that can be harvested for more than simple billing.
- Solar Panels (Photovoltaic – or PV) related assets (inverters etc) – allowing reduced reliance on centralised Generators
- Batteries enabling delayed consumption of renewables
- EV charging

- Advances in LV network grid solutions
- New energy and carbon trading businesses and models
- Over the Top plays of digital innovation like Virtual Power Plants, DER controls etc.

The key context for future innovation in the energy sector is the transition from the legacy one-way energy model to a new 2-way model – **the Internet of Energy**. To maximise the consumer and business benefits of this inexorable shift support for open participation by new and old players, a willingness to supporting flexible business models and a determination remove barriers to entry will be required.

With reference to the transition to new models for a reliable, affordable, clean energy transition IoTAA also participated in the RACEfor2030 CRC as is NSW DPIE. We would commend RACEfor2030 as a credible, highly skilled, independent source for investigation, market proving and research into options and pathways for managing the transition.

Our responses to the discussion paper questions are attached, in the appendix.

We are available to discuss our comments and to provide any clarifications that you may require.

Yours Sincerely,

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Appendix – IoTAA answers to discussion paper questions

Issue 8. DER in New South Wales. With this evolution of the electricity system comes opportunities to provide customers with greater choice and access to additional value streams such as innovative new market offers that value flexibility by incentivising demand side participation.

8a. Are the suggested guiding principles appropriate and adequate to guide government strategy for enabling high levels of active DER in New South Wales?

IoTAA is aligned to the Principles. For IoTAA the key factor is that DER rules should be national, and must take an 'Outcomes Based' approach that applies 'system level' options/decisions. Decisions should also align with overall industry initiatives at the national level to avoid the introduction of narrow use 'stove pipe' solutions that increase cost/complexity and consumer confusion.

8b. What practical measures should the government consider to support DER and the suggested guiding principles?

Measures should ensure that DER implementations can be readily monitored using an Open Architecture that simplifies the ability to share data to relevant players like AEMO, DNSPs, Aggregators, Energy traders and consumers.

To support the above practical and essential measures in the new Internet of Energy is management of the associated data collection, management, processing and sharing, including:

- clear definition of scope and responsibilities of data collectors and custodians in the LV network must be articulated.
- a well-designed framework for authenticated data sharing.
- Security mechanisms to protect privacy, hacking and that provide resilience

The IoTAA IoT reference framework, https://iot.org.au/resources/, provide a useful framework to unpack the data, security, application etc paths to help discuss and address the above issues. This framework has been adapted by WSAA (Water Services Association of Australia) as it's Digital Water reference Framework.

8c. How can the government support greater demand side participation and flexibility for customers and market participants?

It's critical that customer understanding, education and trust are built and maintained during the implementation of these innovations. To achieve this requires transparency of information for participants, building a strong understanding of the services, accessibility and controllability levels, and providing sufficient protections such as customer override or opt-out capabilities. Solutions require contribution from other bodies like Energy Consumers engagement.

8d. What material concerns and barriers will need to be mitigated to support DER?

Successful DER will require the widespread deployment of IOT assets for collection and monitoring and eventual pedagogic presentation to customers. A focus must be maintained on using Open Standards as opposed to proprietary. For example Victoria has a grid wide mesh network – this network cannot be accessed for more general collection and reporting not shared for any other task. Effectively creating a 'walled garden' excluding innovation.

8e. What could be done to ensure vulnerable, low-income and other 'locked out' households are not disadvantaged by the energy transition?

8f. What can the government do to improve equity of access to the benefits of clean energy solutions?

8g. How can the government help to unlock the full value of DER and load flexibility on the distribution network, and ensure asset owners are properly protected and compensated?

8h. What are the most promising clean energy solutions for delivering material private, network and market benefits?

Issue 9. Enabling flexibility and dynamic operating envelopes.

Essential for providing a workable demand flexibility and dynamic operating envelopes are:

- Appropriately shared, near-real-time data on generation, consumption and "ability to consume" e.g for energy load sinks
- Entities that can aggregate and process such information and enact near-real time trading decisions – consistent with understood envelopes

A key requirement is for a long-term view of the overall grid that encompasses SAPS/DER/Community Batteries etc.

9a. How can customers be encouraged to only install solar systems that suit their current consumption needs? What would be the most effective measure to achieve this aim?

9b. Will changing usage and system demand profiles likely disrupt grid security and reliability in New South Wales, and if so when and how?

This is a possibility. Mechanisms for minimising this risk are many and include –

- Load balancing and flexibility supported by business models that encourage and facilitate relevant contracts
- Ensuring generation capacity is balanced through investment cycles in the transition from legacy power generation to new forms including DER sources, green hydrogen, etc

RACEfor2030 is doing good research in this area, which may be directly relevant or could be commissioned appropriately.

9c. What can the NSW Government do to mitigate the potential problem of breaching lack of load thresholds?

9d. How can the NSW Government best enable dynamic operating envelopes?

9e. What issues or barriers, including around consumer protections, need to be considered if implementation of dynamic export limits is pursued?

9f. Are there NSW-specific customer, grid infrastructure and/or technological issues that should be considered in enabling dynamic operating envelopes?

Issue 11. Improving the visibility of residential DER and data management.

11a. Is the AEMO DER register the best way to improve the visibility of DER in New South Wales? What better approaches should be considered?

The DER register is prone to error as it relies on the correct process being followed by installers including notification as well as the accurate completion of the notification. A 'Register' does not enable dynamic monitoring of the network performance that would support DNSPs in the execution of their management role. Need to migrate to a solution that automates the data entry/collection. The next generation grid will be built on data as the underlying essential component for decision making/operation. Manual processes can only cause bottlenecks in such a scenario.

11b. What should the NSW Government do to help improve the visibility of changing operating conditions across the distribution network? Are behind the meter DER assets a viable and cost-effective solution?

Behind the meter DER can be cost effective. This requires a low-cost monitoring standard (enabling use of low priced behind the meter assets) and system enablement.

In the long-term behind the meter consumption visibility will be essential to manage a true Internet of Energy network.

11c. What would an ideal system, data collection and notification process look like to have the best oversight of these assets?

Who should be responsible for this system?

This will likely require a secure distributed system that involves multiple parties, including DNSPs, Aggregators, energy traders, DER operators, installers and managers and big users.

An ideal system provides a 'system level' design that can be supported by multiple suppliers. Data collection would ideally be automated as much as possible, including at point of installation.

Data transparency and visibility at appropriate levels is essential to enable the most equitable, responsible, competitive and responsive system.

The responsibilities would be assigned accordingly across Internet of Enerfy value chain from installers (using an automated collection tool) to DNSPs (interworking with the DER to ensure grid performance), aggregators, users and appropriate governance levels.

11d. Should there be different notification requirements based on the size or capacity of the EV charging or other DER infrastructure not already captured by the DER register (i.e. 7 kW or 50 kW chargers)?

11e. How can installers of DER be supported to ensure robust reporting of DER data to networks and AEMO? How should compliance be enforced?

Easy to use reporting tools to a central repository. Enforcement should be distributed as much as possible to ensure flexibility.

11f. What should the NSW Government consider in working with AEMO to expand the DER register to incorporate new controllable loads not already captured by the register?

Issue 12. Community batteries and emerging technologies.

As we migrate to a more distributed, 2-way internet of energy models there is likely to be considerable opportunity for new business models including aggregation through community batteries and the like. Emerging technologies across DER network will likely play a much greater role in such areas as management of load, energy productivity, energy trading and arbitrage, carbon trading, battery storage etc. It is important that appropriate reliability, security, privacy etc standards underpin the introduction of such innovation to minimise consumer confusion and service resilience – while remaining open to innovation.

12a. Are there any concerns about community batteries (or other similar DER innovations) from a system or customer perspective that should be considered as part of any future strategy or reform?

12b. What technical and regulatory changes that have not already been addressed, should be considered to enable the full value of community batteries and other DER solutions to be unlocked?

12c. Are there any technical requirements or standards that should be developed to support the safe and efficient rollout of these kinds of emerging solutions?

12d. Are community batteries an economically effective solution to managing increasing amounts of generation from rooftop PV on the distribution network? If not, what other solutions should be considered?

12e. What are the barriers for developing and implementing a community battery project, and then connecting and operating the battery?

12f. What other emerging solutions could enable locked out demographics to participate in the energy transition and benefit from clean energy solutions?

12g. Are there any other ways the NSW Government can support broader rollout of community batteries and other promising DER solutions that can enable locked out demographics to access the benefits of clean energy solutions?