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Dear Ms Collyer,

Ausgrid Response to Interoperability Policy [Directions Paper] – Consultation Paper

Ausgrid is pleased to provide this submission to the Energy Security Board in response to its Interoperability Policy Consultation Paper, published in October 2022.

Ausgrid operates a shared electricity network that powers the homes and businesses of more than 4 million Australians living and working in an area that covers over 22,000 square kilometres from the Sydney CBD to the Upper Hunter.

A national 'flexible export ready' mandate unnecessarily brings forward costs

Subject to the definition of 'flexible export ready' discussed in the next section, Ausgrid does not support a national mandate for new and upgraded consumer energy resource (**CER**) installations to be 'flexible export ready'. Mandating the introduction of Flexible Export Limits across the country at the same time, such as July 2024 suggested in the consultation paper, would add costs to consumers for CER installations and distribution system operator (**DSO**) back-end systems earlier than necessary in some network areas. DSOs are affected to different levels by high CER penetration. For example, SA Power Networks and Energy Queensland are significantly more affected than Ausgrid.

Mandating that installations are 'Flexible Export Ready' prior to a customer taking up a dynamic connection agreement will result in additional cost for equipment on the customer's site and potentially costs to test the flexible exports from the DSO to the site.

DSOs can be obliged to support CSIP-Aus when implementation of DOEs occurs

Ausgrid supports an obligation on DSOs to ensure that when implementing Dynamic Operating Envelopes (**DOEs**), their server-side communications are consistent with CSIP-Aus, without prematurely requiring the implementation of Flexible Export Limits.

Ausgrid plans to introduce flexible connection agreements in FY28; investment to support this will be included in Ausgrid's regulatory proposal to the AER for 2024-29. Although Ausgrid is testing the interaction of dynamic network pricing and DOEs in **Project Edith** in 2022-23, the introduction of a mandate for Flexible Export Limits will require higher levels of ICT systems investment earlier than planned.

A clearer definition of 'flexible export ready' is required

It is unclear from the paper how an installation is defined as 'flexible export ready'. The following aspects will affect whether an installation is 'flexible export ready' and need to be defined in any mandate:

- If the CER end device can support external control natively using CSIP-Aus

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- If the CER end device can support external control through a gateway device using another common interoperability protocol such as Modbus, Open Charge Point Protocol (**OCPP**), AS/NZS 4755 demand response modes (DRM)
- If the CER end device can support external control using proprietary communications to a cloud platform
- If an active internet connection to the CER device and/or gateway is required at time of installation and this needs to be maintained
- If the customer needs to maintain an active account with a cloud platform provider when they are not using services from the provider other than flexible exports
- If configuration for flexible exports is carried out in the customer's equipment, CER technology provider and DSO's systems
- If functional testing of flexible exports is carried out from the DSO through to the CER

Ausgrid suggests that CER end devices such as inverters, batteries and permanently installed electric vehicle supply equipment (**EVSE** or "smart chargers") for sale in Australia be required to support at least one of the commonly used interoperability protocols for future use in a CSIP-Aus communication model without reliance on proprietary vendor communications. Ausgrid believes an implementation date such as from July 2024 would be adequate for product suppliers to comply with this more flexible suggestion.

Ausgrid supports the focus on the CER-DSO interoperability domain and using CSIP-Aus for CER systems up to and including 30 kW. At this point, Ausgrid believes CSIP-Aus should not be mandated as a single standard for CER-CER interoperability due to the current lack of native support for CSIP-Aus by these devices which are predominantly designed overseas and support international standards for communications.

An implementation model can adapt existing roles

DSOs are already responsible for enforcing requirements for connections to their networks and specific requirements for connection of embedded generation. The National Electricity Rules (**the Rules**) require compliance with AS/NZS 4777.2 to be part of a networks Model Standing Offers and Negotiated Agreements. Ausgrid considers it acceptable for the Rules to refer CSIP-Aus in either its current form or as a Standards Australia Handbook. While DSOs can be a vehicle for specifying a requirement for an installation to be 'flexible export ready' in a similar way to specifying requirements for existing technical requirements for the connection of embedded generation such as inverter settings within AS/NZS 4777.2 or our own network standards, there is likely to be similar enforcement challenges as are currently occurring with AS/NZS 4777.2. These issues are highlighted in our joint submission with Endeavour Energy and Essential Energy to the related Australian Energy Market Commission (**AEMC**) Consultation Paper, Review into Consumer Energy Resources Technical Standards. The AEMC's work in this space should be taken into account, as should the related work the ESB is taking on the implementation of its data strategy.

Ausgrid does not believe that a new national body is required to oversee the requirements for DSOs to be consistent with their implementation of CSIP-Aus given the high level of collaboration within the industry on the DER Integration API Technical Working Group as well as the Standards Australia committee overseeing the drafting of a Standards Australia handbook based on the CSIP-Aus implementation guide. Members of the industry are collaborating on test procedures for the implementation of CSIP-Aus. There could be benefit in

specifying that a common test procedure needs to be produced by a certain date, such as July 2024.

Existing bodies and processes can be adapted for product certification and listing

The Clean Energy Council's role in listing CER devices as AS/NZS 4777.2 compliant could be expanded to include listing/delisting CER devices/solutions for conformance to CSIP-Aus. Alternatively, the Commonwealth Department of Climate Change, Energy, the Environment and Water (**DCCEEW**)'s role in listing particular consumer appliances for the Greenhouse and Energy Minimum Standards (**GEMS**) could also be adapted to list/delist CER devices/solutions for conformance to CSIP-Aus.

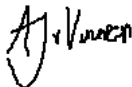
However, neither of these would necessarily be a complete solution. This is because at present there are few, if any, CER end devices which natively support CSIP-Aus and, as noted by the consultation paper, there are multiple technology models to implement CSIP-Aus for CER-DSO interoperability. Where it is built into the CER devices themselves once conformance test procedures are developed, it will be possible for manufacturers and third-party test houses to test and certify CER devices as natively supporting CSIP-Aus. However, where technology models use gateway devices or cloud platforms, these solutions will need to be conformance tested against CSIP-Aus as an alternative to the end device supporting CSIP-Aus.

Consultation questions

Attachment A contains Ausgrid's detailed responses to the consultation questions presented in the Interoperability Policy Consultation Paper.

We would be happy to discuss this submission with the ESB. Please contact me at alida.jansenvanvuuren@ausgrid.com.au.

Kind regards,



Alida Jansen van Vuuren

Head of DSO

Attachment A: Response to consultation questions

| # | Consultation question | Response |
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| 1 | Are the five identified domains correctly summarised? Are there gaps or major limitations in this framing? | <p>The paper provides a reasonable summary of the interoperability domains.</p> <p>A major gap in the descriptions of the domains is the ability of the various domains to convey pricing information. This information could be dynamic network prices as being demonstrated by Ausgrid's Project Edith, static time of use network prices, retail prices and/or wholesale prices. Conveying this information to CER Technology Providers will improve the ability of CER to respond to varying prices prior to requiring Dynamic Operating Envelopes to "force" the behaviour of CER.</p> <p>The paper correctly describes that IEEE 2030.5 is capable of exchanging pricing information however this has not been adopted in CSIP nor CSIP-Aus.</p> <p>Figure 5 shows domain 1 being between CER technology providers and traders, but this is labelled as "CER-market interoperability". This should be relabelled as "CER-trader interoperability" to better match the description on p.21. Also, p.20 states "[Figure 5] does not show all communication relationships, such as Trader-AEMO links for bidding".</p> |

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| 2 | <p>What priority should each domain be assigned, considering the interest of all electricity consumers within the consumer energy resource interoperability landscape?</p> | <p>Priority highest to lowest:</p> <ul style="list-style-type: none"> - CER-network interoperability (3) is the highest priority - CER-CER interoperability (2) - CER-trader interoperability (1) - Network-AEMO interoperability (5) - Network-X interoperability (4) <p>Domain 3 is of the highest priority to address network constraints that are appearing due to high CER penetration across the country. Addressing interoperability in this domain will generally allow more CER generation and less curtailment.</p> <p>Building on domain 3, addressing interoperability on domain 2 is of the next priority where there are multiple CER devices within a connection point. We do not believe any one standard should be mandated for domain 2. These methods appear to be the most commonly supported:</p> <ul style="list-style-type: none"> - Modbus TCP - Modbus Serial RS232/RS485 - Open Charge Point Protocol (OCPP) for electric vehicle supply equipment (EVSEs) and - Hard-wired AS/NZS 4755 Demand Response Enabling Device (DRED) demand response mode (DRM). <p>If any mandate was to be adopted, we suggest that CER devices be required to support at least one of the above. The result will be that HEMS on the market will likely evolve to support all of the above.</p> <p>Domain 1 is of next priority to allow traders to easily operate CER on customers' behalf. This may be possible at the moment where a trader has a proprietary communications protocol/method, but does not easily allow customers to change to different traders. For example, a customer may need an installer to change the HEMS on site.</p> <p>Domain 5 interoperability will allow networks to provide visibility to AEMO of conditions within a network area. This domain will also allow networks to assist in addressing system-wide conditions such as Lack of Reserve (LOR), Minimum System Load (MSL) through mechanisms such as Reliability and Emergency Reserve Trader (RERT) and the Operational Strength Mechanism (OSM).</p> |
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| 3 | <p>What are the likely costs and benefits for consumers associated with a national 'flexible export ready' mandate including in relation to future readiness of customer installations and installation costs?</p> | <p>Costs</p> <p>Applying a national 'flexible export ready' mandate can directly (e.g. installation of HEMS) and indirectly (e.g. installers needing to be trained and increasing their labour rates to account for this) add cost to installations in network areas which are not as greatly affected by high CER penetration.</p> <p>The introduction of SA Smarter Homes Regulation and Energy Queensland Dynamic Connections is resulting in 'flexible export ready' products and solutions being available first in SA and Qld, and we see these solutions will gradually become available across the rest of Australia.</p> <p>A mandate introduced too early in other states may result in missed opportunities to incorporate learnings and updated technology/standards from use in SA and Qld.</p> <p>Benefits</p> <p>Consumers adopting 'flexible export ready' installations will better enable consumers to participate in Virtual Power Plants providing value for the consumers, their traders.</p> <p>Adopting 'flexible export ready' installations will be able to support the local network and system as a whole as a "backstop" measure.</p> |
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| 4 | <p>Do stakeholders agree that DNSPs are best placed to enforce a 'flexible export ready' mandate at the time of installation? If not, what alternative models should be considered?</p> | <p>Ausgrid believes that the most feasible option for a national mandate is Option 1 as described on p.28. "An obligation on DNSPs to ensure that ... their server-side communications are consistent with CSIP-Aus".</p> <p>Ausgrid does not believe that Option 2 is feasible at this point in time ("require that new installations are 'flexible export ready' by reference to a CSIP-Aus product certification.") This is because there are multiple technology models as illustrated in Figure 6. Only "one part of the model needs a compliant CSIP-Aus client" and this is not always the inverter. There are few, if any, inverters which natively support CSIP-Aus at this time so mandating an installation to be 'flexible export ready' would be forcing customers to install a CSIP-Aus gateway or have a relationship with a cloud platform when they may not otherwise need these.</p> <p>At the point in time at which a DNSP implements DOEs, Ausgrid agrees that the DSO is best placed to enforce that an installation is 'flexible export ready'. This is similar to existing embedded generation connection/model standing offer processes where there is an obligation on a customer, and by extension their installer, to ensure that the customer's connection is compliant otherwise a defect is issued by the DSO and the customer's generation is not permitted to be switched on.</p> |
| 5 | <p>What requirements should a 'flexible export ready' installation have with regard to internet connectivity (e.g. embedded mobile communication versus LAN connectivity)?</p> | <p>Ausgrid does not believe that there should not be a detailed technology requirement for a 'flexible export ready' installation (e.g. embedded mobile vs LAN) other than to specify that an internet connection is required from the installation. Specifying a detailed requirement may lock in inferior technology and stifle innovation. One example is that smart meters already have a network connection on site and this could be used as a method for the internet connection for interoperability with an appropriate security architecture. Ausgrid acknowledges that changes in a customer's Wi-Fi network/password or a new customer could result in an installation losing flexible export communications, however the impact of this can be mitigated through detailing how installations should behave on loss of communications, and robust processes to inform customers of a loss of flexible export communications.</p> |

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| 6 | <p>What are the pros and cons of a flexible export ready mandate set in the Rules, via a subordinate instrument, or under a separate head of power (e.g. jurisdictional technical regulation)?</p> | <p>It would be acceptable for the Option 1 mandate to be established in the Rules as the existing regulatory bodies would be able to enforce this upon DSOs.</p> <p>If the Option 2 mandate were established, this should allow for different implementation dates between states (and possibly between DSOs) based on the impact of varying CER penetration levels in network areas. Establishing them through a jurisdictional technical regulation (e.g. the NSW Service and Installation Rules) allows the existing compliance process for embedded generation to be kept with minimal change and not requiring new bodies to be established or enforcement capabilities to be built within existing bodies.</p> |
| 7 | <p>If implemented under the Rules, which market body is best placed to establish and oversee the proposed requirement on DNSPs?</p> | <p>If the Option 1 mandate was written into the Rules, Ausgrid believes that the AER will be able to oversee the requirement for DSOs to ensure that "server-side communications are consistent with CSIP-Aus" through a self-declaration.</p> <p>Ausgrid does not believe that a detailed technical capability needs to be built up within a market body due to strong collaboration between industry members (DSOs, CER technology providers, traders) on CSIP-Aus through the DER Integration API Technical WG and Standards Australia committee. This is similar to the way that there is no market body which oversees the requirement for inverters to be compliant with AS/NZS 4777.2. (This should not be confused with the Clean Energy Council's role in listing inverters which are compliant.)</p> |
| 8 | <p>What are the pros and cons of a flexible export ready mandate referring to CSIP-Aus in Standards Australia Handbook form?</p> | <p>Ausgrid supports a mandate referring to CSIP-Aus in Standards Australia Handbook (SAHB) form as this is likely to be a more rigorously tested version of CSIP-Aus. Ausgrid believes this should not preclude DSOs and other industry members using CSIP-Aus with more features added in a preliminary/beta/testing format, provided that existing features are backwards compatible with the SAHB version. An example of this would be the addition of pricing information as being tested in Ausgrid's Project Edith.</p> |
| 9 | <p>Would there be value in agreeing a national approach to public key infrastructure for consumer energy resources?</p> | <p>Ausgrid supports a national approach to public key infrastructure for CER provided this is consistent with CER standards used internationally particularly IEEE 2030.5 and CSIP upon which CSIP-Aus is based.</p> |

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| 10 | Are there existing examples that could be used as a model for the consumer energy resources ecosystem? | If key management is used within the Australian energy industry already, this could be used a model for CER (e.g. AEMO wholesale market systems, AEMO metering data systems, Meter data provider systems). |
| 11 | What are the pros and cons of establishing a national certificate authority? | <p>Ausgrid believes that DSOs should retain some level of control for certificates related to their network area, rather than full control being handed to the national certificate authority.</p> <p>Pros of National Certificate Authority May reduce the number of trusted root certificates which need to be managed by client devices, thus reducing number of firmware updates to add trusted roots.</p> <p>Cons of National Certificate Authority - Entire chain of trust sits at national level. If national certificates are compromised there is a risk of spoofing at a national level rather than for individual DSOs. - If there is a failure or compromise of a DSO's certificate, this adds to the certificate lifecycle by having to go back to the national CA. - An alternative could be using a public root CA rather than having the root CA being a national CA.</p> |
| 12 | Do stakeholders have a view as to who should perform the role of national certificate authority, if it were created? | A national body with experience working with PKI and certificates should perform this role. The Australian Cyber Security Centre could be a good candidate with experience managing cyber security issues and existing relationships with the energy industry. |
| 13 | What views do stakeholders have about the adaptability of existing industry-led product certification and compliance processes for future use? | <p>Existing industry-led product certification and compliance processes should be adaptable for a broader category of products.</p> <p>Compliance solutions will be more difficult to adapt as interoperability is dependent on multiple parties, communication links and device configurations. The SA Smarter Homes regulation and Energy Queensland Dynamic Connections will demonstrate to other parts of the country how compliance processes will develop.</p> |

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| 14 | What views do stakeholders have about the most appropriate body to have oversight of the product certification and listing/delisting processes? | CER products and technology solutions should be conformance tested by accredited third party test organisations to an approved test procedure attached to an Australian or international standard. A register of tested products should be maintained by a national body such as the Clean Energy Council, Clean Energy Regulator or DCCEEW. The Clean Energy Council listing process is the most easily adaptable given their listing of AS/NZS 4777.2 conforming devices. |
| 15 | What role could DNSPs have in the product certification/decertification process in the context of improving outcomes for industry and consumers? | There is a role for DSOs to improve outcomes for industry and consumers by listing on the DSO's website the technology solutions which have been successfully integrated with a DSO's systems for interoperability. |