

AEMC Project: Review of Regulatory Frameworks for Stand-alone Power Systems

Organisation: Horizon Power

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About Horizon Power

Operating Context & Experience with SAPS

Horizon Power is Australia's only fully vertically integrated utility. Providing electricity across regional Western Australia, this is the world's largest and most sparsely populated utility service territory with only one customer per 50km². Historically the only feasible way to electrify such large regional areas at scale involved traditional 'poles and wires' networks therefore Horizon Power has expansive sections of aging and lightly utilised network that are approaching replacement. Since 2015 Horizon Power has been exploring and trialling 'stand-alone power systems' (SAPS) as viable alternatives for such applications.

Following the catastrophic Esperance bushfires in 2016, Horizon Power purchased and adapted five vendor-supplied SAPS as an alternative to rebuilding some feeders that had been destroyed. Following significant upgrades of the vendor solutions to utility-grade safety and engineering standards, these units have now successfully operated for almost two years. Further Horizon Power trial deployments have tested different SAPS technology combinations in other locations including Exmouth and Hopetoun during 2017 and 2018 and numerous technical and supply chain lessons have been learned.

Key Learnings re: SAPS Supply Chain

The above series of Horizon Power trials have demonstrated that the existing supply chain for traditional SAPS lacks significant depth and maturity. Only now emerging from cottage industry status, much of the supply chain has focused on 'consumer-grade' SAPS units sold to and maintained by individual purchasers. In some cases, very high quality solutions have been developed for extreme industrial and mining applications and supplied at an elevated price point.

In all cases, while several market actors are producing elements of the solution, no single public or private entity has developed a whole-of-system SAPS solution that is ready to integrate across utility control centre systems and operational processes. While this is less of an issue for trials of 1 – 5 SAPS, it is a critical gap if long-run economies of scale and operational efficiencies are to be achieved by utilities transitioning hundreds or thousands of sites off-grid.

In other words, Horizon Power has found that creating a fully-integrated, utility-grade SAPS solution to be far more complex than simply purchasing and deploying individual retail SAPS units. Given the complexity and strict safety obligations of utility operations, and the need to seamlessly manage very large fleets of SAPS, it is a serious miscalculation to underestimate the difficulty of bringing together all of the core elements required for such a utility-grade solution.

Beyond Trials: Creating a New Utility Asset Class

Horizon Power has now concluded further technology trials. Together with its commercial partners, Horizon Power is presently developing and embedding an off-grid offering across its business as a new utility asset class. Known as 'Micro Power Systems' (MPS) to differentiate from traditional retail-grade SAPS, the solution provides customers with a full electric utility service offering but without the need for 'poles and wires'. Fully compliant with all utility obligations for safety, service quality, maintenance, fault response and long-run economic efficiency, MPS is particularly differentiated by the following characteristics:

- Designed for multi-decade longevity and lifecycle efficiencies (>25 year operational life);
- Supported by a fully scalable 'Android' fleet-management platform that can remotely manage thousands of systems from different suppliers;
- Fully compliant with critical infrastructure cyber-security requirements; and,
- Fully integrated 'end-to-end' across utility back-office systems and processes.

This holistic solution will drive significant economic efficiencies by enabling the transition of circa 1,000 customers to a safer, more efficient off-grid alternative and the decommissioning of hundreds of kilometres of aging network. In time, MPS may also be made available to DNSPs operating in the NEM or SWIS.

Questions		Feedback
Question 1 – Jurisdictional opt-in provisions		
(a)	Should the arrangements supporting the transition to off-grid supply include an explicit mechanism to enable jurisdictions to determine when the national framework for SAPS would come into effect for DNSPs in their jurisdiction?	No comment
(b)	Should this mechanism provide jurisdictions with the flexibility to opt-in to the national framework on a more bespoke basis e.g. on a regional or distribution area basis, rather than state or territory wide?	No comment
Question 2 – Efficiency pre-condition		
(a)	Is the RIT-D and supporting consultation process appropriate in the context of SAPS, including in respect of the different models of SAPS supply (that is, microgrids and IPS)?	<p>The RIT-D threshold may be too high at \$5M for network segments that are not bundled in with other segments (i.e. zone based asset management or similar) for investment appraisal. Individual network segments may not exceed the threshold for assessment.</p> <p>Additionally, where an unforeseen event occurs (i.e. a bushfire destroying existing assets), the requirement for RIT-D assessment appears to fall away. In such cases, whilst the prospect of moving to a SAPS following a bushfire event is somewhat sensitive, the lack of a RIT-D requirement may drive replacement of network infrastructure like for like and as such inefficiently.</p>
(b)	<p>To ensure they remain fit-for-purpose in the context of SAPS, what (if any) amendments may be required to:</p> <ul style="list-style-type: none"> the RIT-D test (including to the classes of market benefits and costs) the RIT-D consultation process and information requirements (including in relation to the non-networks options report), and the AER's application guidelines? 	As per above response (Q2a)
(c)	Is there a need to develop a light handed, targeted test to apply where the RIT-D is either not applicable or not proportionate? What might this test and/or assessment process look like?	A light-handed test would be appropriate, or as an alternative, more explicit requirements in the Distribution Annual Planning Report process could be created. For example, network businesses are increasingly using geospatial mapping overlayed with asset information to truly understand the true cost to serve/replace (and risk profile) of individual customers and network segments. As these forecast and systems mature, DNSPs should be able to forecast SAPS candidate sites a number of years prior to investment being required (and readily updated in the event of a bushfire or similar event that brings forward investment).

Question 3 – Consumer consent provisions		
(a)	Is a requirement for customer consent necessary? If existing consumer protections can be maintained for SAPS customers, is consent necessary? If so, should this be based on a unanimous or majority consent model? What are the implications and issues associated with each model?	<p>Requiring consent will jeopardise the ability to realise cost to serve efficiencies identified (i.e. the last customer in a network segment issue). However, proactive engagement including demonstration of reliability benefits will typically (and increasingly) overcome perception and information barriers.</p> <p>Rules around obligation to serve (typically contained within jurisdictional instruments) once a SAPS is installed should be explicitly clarified. This includes scenarios such as future sub-divisions etc, or where a non-connected customer may have previously had a right to supply by virtue of being within a set distance of the distribution network, that right may fall away with the removal of the distribution network.</p> <p>Rights could be grandfathered and then extinguished after a suitable period (e.g. 3 years) – this provides customers with a long lead-time for their own decision making processes, whilst provides certainty to DNSP planning processes. It should be noted that administration of the grandfathering will add complexity and cost. Grandfathering could potentially include customers outside the 100m limit, but may face higher connection costs under a SAPS model.</p>
(b)	Are customers equipped to make informed decisions, particularly with respect to understanding what they are agreeing to in terms of reliability and security, and potentially price, outcomes? Should explicit informed consent be required before DNSPs transition customers to supply via a SAPS?	Horizon Power's experience is that customers are well placed to make informed decisions when: 1) proactively and respectfully engaged; 2) over a reasonable period of time; and, 3) provided with straight-forward and quality information (see examples of our website and brochure).
(c)	Where consent is considered appropriate, could incentives be offered by DNSPs to secure the consent of affected customers? What might these be (and could the benefits of a SAPS be shared)?	No comment
Question 4 – Regulatory oversight role		
(a)	Is there a need to incorporate a formal oversight and/or approval role by the AER (or other appropriate body) in relation to the transition arrangements for DNSP-led SAPS?	No comment
(b)	Who would be best placed to perform such a role?	No comment
(c)	If the AER is the appropriate body, what additional benefits might be provided by giving the AER additional powers in relation to SAPS, given it is already responsible for monitoring, investigating and enforcing compliance with various aspects of the energy laws and rules?	No comment
Question 5 – Grid-connection pre-condition		

(a)	Should new customers or developments without an existing grid-connection be eligible for SAPS provision facilitated by a DNSP? Why or why not?	<p>New remote customers will need to comply with the relevant Connections Policy. Typically this may involve them paying the full cost up-front for SAPS as the more cost-effective alternative to paying for a new network connection.</p> <p>A key issue however is the fact that, under uniform tariff policies, at some point these customers may still not contribute to the full cost to serve them via a SAPS and as such may end up being cross-subsidised by other customers.</p>
(b)	Would new customers always have a financial incentive to obtain SAPS from the competitive market? Could implementation of a SAPS for a new customer or group of customers by a DNSP result in network savings?	New customers have to balance the upfront costs (applicable under DNSP and private market options) with the ongoing costs and liabilities. With regulated pricing structure and regulated service obligations, the ongoing cost obligations on the customer may still be outweighed by the benefits of not being solely responsible for their own electricity supply. This will be particularly relevant later in asset lives as components (batteries, inverters etc) require replacement.
(c)	Would enabling DNSPs to consider and potentially implement a SAPS solution as an efficient alternative to grid connection for new customers damage the competitive market for SAPS? In answering this question, consider new customers located in remote areas where a competitive market for SAPS may not be established.	DNSPs operating in a vertically-disaggregated context will typically be compelled to procure individual SAPS units, or holistic MPS-type solutions, from the competitive market. As such, it is likely to stimulate rather than damage the market and drive greater maturity of the solutions being provided commensurate to the needs of utilities as managers of large asset fleets.
(d)	What are the potential issues associated with DNSP obligations to connect where SAPS are regulated under the national framework?	No comment
Question 6 – Right of reconnection		
(a)	Should existing reconnection rights apply unchanged to DNSP-SAPS customers wishing to seek reconnection to the grid? Alternatively, should the SAPS arrangements include special rights for DNSP-SAPS customers seeking to reconnect/revert?	No comment
(b)	Should the reconnection rights of DNSP-SAPS customers who have provided consent (where applicable), or new customers, differ from the rights of customers who have not provided their consent to be moved?	No comment
(c)	What might a “return to grid process”, including charges, look like for DNSP-SAPS customers	Customers seeking to reconnect would need to abide by the relevant Connections Policy – and would likely be required to pay for the full cost of network installation (at least for non-shared assets). This would present a significant cost implication of seeking reconnection and limit the occurrence.
(d)	Would a mechanism need to be designed to avoid any potential to burden other customers with the costs of reconnection?	No comment

Question 7 – Defining the SAPS system service(s)		
(a)	Should the national framework be designed around one model of SAPS service provision which could accommodate various circumstances? What might this model look like?	No comment
(b)	If the answer to the previous question is no, should this review focus on establishing a framework that allows DNSPs to pursue a variety of approaches to SAPS service provision, depending on the circumstances at hand? Why or why not?	No comment
(c)	In what circumstances (if any) might it be appropriate for a DNSP to own/operate a vertically integrated SAPS solution?	No comment
(d)	When (that is, at what stage point in the process) would contestability in the provision of SAPS be tested and by who?	No comment
Question 8 - Role of the distributor		
(a)	Are the issues identified in the contestability of energy services rule change applicable in the context of SAPS?	Yes. The SAPS should be considered a distribution service and the assets considered front of the meter network assets. Whilst restrictions on procurement may be applied, the assets should be treated the same as distribution assets to prevent any undesirable outcomes (i.e. the selection of inefficient poles and wires due to the rate of return that can applied).
(b)	Is it necessary and appropriate to restrict the ability for DNSPs to earn a regulated return on behind-the-meter and/or in-front-of-the-meter assets specifically associated with the provision of SAPS? Why or why not?	No comment
(c)	In what circumstances (if any) might it be appropriate for a DNSP to own/operate a vertically integrated SAPS solution (that is, to seek an exemption (where relevant) from restrictions on asset ownership)?	No comment

Question 9 – Provision of retail services

(a)	Is it likely to be feasible to design arrangements to provide SAPS customers with access to retail competition? What might these arrangements look like?	<p>Clarification of the role of retailer is a significant issue in the context of SAPS. Retailers are no longer required to provide many of the retail functions they provide grid-connected customers as they effectively come in-situ with the provision of an SPS (these retail services include procurement of generation, ancillary services etc). Generation and other services are provided in-situ with the network supply.</p> <p>This also raises the issue of how the portions of the retail cost-stack are allocated in a SAPS scenario. A customer on a flat-rate regulated tariff may pay varying costs for generation, capacity, network services, retail margins and other charges (green schemes etc). In a SAPS scenario, the network tariff absorbs the generation and capacity related charges. As such a new tariff class would be required in order to more adequately represent how service costs are provided – and avoid any windfall gain potential for retailers who as a result of a customer taking on a SAPS are no longer required to procure generation from the market to serve that customer. At a scale of 1000 customers, this avoided cost could be in the millions of dollars annually.</p> <p>A SAPS tariff with a higher portion flowing to the DNSP servicing the customer would also help to reduce inherent cross-subsidies within the network tariff that exist for such customers.</p> <p>It should be noted that whilst a new tariff class is likely required as per the above, the requirement for a SAPS customer to transfer to an alternative tariff structure, whilst likely desirable from an efficient price signal perspective, may potentially undermine the opt-in consent model (should it prevail) and as such any mandatory tariff change should be carefully considered.</p>
(b)	What specific retail services would need to be provided to customers supplied via a SAPS model of supply?	No comment
(c)	Is there a need for a separate retailer role (distinct from the provision of other services) within the SAPS model of supply? Why/why not?	No comment
(d)	Should retail services be managed by an authorised retailer?	No comment

Question 10 – Other roles/responsibilities specific to stand-alone power system provision		
	Who are the key stakeholders within a SAPS model of supply (other than the DNSP and the retailer) and, specifically, what would be their key roles and responsibilities?	No comment
Question 11 – Treatment of existing market participants		
(a)	Which existing market participants (if any) may be impacted by a DNSP's decision to transition a customer (or group of customers) to a SAPS model of supply?	Energy retailers and centralised generators are likely to be marginally affected over time. However the scale of SAPS deployment is unlikely to expose these entities to significant revenue loss in the short or medium term.
(b)	Should DNSPs be required to consider the impact of transitioning a customer (or group of customers) to a SAPS on these participants? Why or why not? Via what mechanism?	No comment
(c)	Is it necessary to put in place special arrangements for market participants, including embedded generators or retailers, who may be affected by a DNSP's decision to transition customers to a SAPS model of supply? What might these arrangements involve?	No comment
Question 12 – Roles of AEMO and the AER		
(a)	What role could/should the AEMO play within the framework for SAPS provision by a DNSP?	No comment
(b)	What role could/should the AER play within the framework for SAPS provision by a DNSP?	No comment
Question 13 – Retail price protections		
(a)	If retail competition is not possible in SAPS, what alternative protections may be appropriate (e.g. retail price controls) for customers receiving supply via SAPS?	No comment
(b)	Would applying the pricing condition from the AER's retail exempt selling guideline to not charge more than the standing offer price that would be charged by the local retailer be appropriate for SAPS, if retail competition does not apply? Is there an alternative price control that would be more appropriate?	No comment
(c)	In the areas that currently have price regulation, is extending that price regulation to customers in SAPS an appropriate approach?	No comment

Question 14 – Other national energy-specific consumer protections

(a)	The Commission has suggested a general principle that energy-specific consumer protections for customers being supplied via a DNSP-led SAPS should be equivalent to those for grid-connected customers. Are there any significant provisions that wouldn't apply, or would require amendment for customers under a DNSP-led SAPS model of supply?	No comment
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Question 15 – Consumer protections specific to SAPS customers

(a)	Are there any additional consumer protections that may be necessary for SAPS customers?	No comment
(b)	In relation to detailed product information for the SAPS, what are the minimum provisions that should apply (if any)?	No comment

Question 16 – Options for providing electricity-specific consumer protections

	To provide equivalent protections for consumers receiving electricity supply via SAPS is the most efficient approach to amend the jurisdictional Acts adopting the NERL, as well as amending the NERL and NERR? Is there an alternative approach which may be more effective?	No comment
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Question 17 – Reliability, security and quality

(a)	What reliability, security and quality standards are appropriate for DNSP-led SAPS? Should the same reliability and service quality levels apply as for grid-connected customers?	No comment
(b)	Are there any existing network reliability, security and quality standards that would be difficult to comply with for SAPS? For example SAIDI and SAIFI requirements may have equivalent principles, but the practice for determining them may be different in SAPS.	No comment
(c)	Should GSLs be determined for DNSP-led SAPS? If so, should the same standards apply as for grid-connected customers (why/why not)?	No comment

Question 18 – Other jurisdictional consumer protection considerations

(a)	Are the other jurisdictional issues presented in section 5.6 less likely to be a concern for DNSP-led SAPS (why/why not)?	No comment
(b)	Should any of these issues be examined in greater detail in relation to DNSP-led SAPS?	No comment

Question 19 – Third party stand-alone power systems – decision making framework

(a)	Which party should make the decision to transition customers to a SAPS and which party/ies should approve the decision	As the entity primarily responsible for the safety, service quality and economic efficiency of the distribution network, the DNSP should be the decision maker in conjunction with the customer (under whichever consent model is agreed).
(b)	What should be the grounds for deciding to transition customers to a third party SAPS?	No comment
(c)	Which mechanisms should be employed to seek approval and/or consent?	No comment
(d)	If the consent of transitioned customers is sought, what is the proportion of customers that should provide their consent? Should consent factors be defined, and what should they be?	No comment
(e)	Should transitioned customers, either individually or collectively (in the case of a microgrid), retain the right to reconnect to the grid?	No comment

Question 20 – Third party stand-alone power systems –asset transfer and stranded assets

(a)	Is there a role for the AER, jurisdictional regulator or other body in setting or approving asset values and pricing methodologies as a result of the transfer?	No comment
(b)	How should asset transfers be treated in the DNSP RAB?	No comment
(c)	How should stranded assets be treated in the DNSP RAB?	No comment

(d)	Should corresponding fees be charged to the transitioned customers and customers left behind on the grid?	No comment
(e)	Is a dispute resolution framework design required for asset transfer and stranded assets? What are the key elements of the design?	No comment
Other comments on the review or consultation paper		
	Do you have any other comments on the rule change request or the consultation paper?	No further comments at this time.