Submission to COAG Energy Council Stand-Alone Energy Systems consultation paper

October 2016

The Alternative Technology Association (ATA) welcomes the opportunity to respond to the COAG Energy Council's consultation paper on stand-alone energy systems in the electricity market..

Founded 36 years ago, the ATA is a national, not-for-profit organisation whose 6,000 members are (mostly residential) energy consumers. About 2,500 of our members are Victorian.

Our extensive experience in energy policy and markets informs our advocacy and research which, amplified by our close collaboration with fellow members of the National Consumer Roundtable on Energy, makes the ATA an important voice for energy consumers Australia-wide.

ATA has a uniquely twofold perspective as a consumer advocate. With the continuing support of the Energy Consumers Australia (and formerly the Consumer Advocacy Panel) we represent all small energy consumers in advocacy that seeks to improve energy affordability and the structure and operation of the National Energy Market (NEM). Additionally, we speak with authority on behalf of the growing portion of the consumer base that has an interest in demand-side participation.

We thank the Energy Market Transformation Project Team for preparing a comprehensive and thoughtful consultation paper, and for your excellent participatory workshop that helped inform stakeholder submissions.

Overview

Microgrids becoming a more prominent feature of the energy supply system could lead to growing numbers of people outside the energy regulatory framework unless the framework encompasses microgrids and other small networks that may be separate in one way or another from the conventional regulated network. In the ATA's view, appropriate regulation of microgrids – whether with or without a grid connection – is necessary to ensure good customer outcomes; and to ensure consistency and predictability, the national framework is the most appropriate one.

The form of regulation may vary according to the ownership and governance models, as well as the rationale. Where established as the most efficient way to deliver network services, microgrids should be considered part of network infrastructure and regulated under the existing regulatory framework for networks. Where established by other parties, for other reasons, an appropriately tailored exemptions framework seems the most suitable approach in the near term, with a flexible small-scale authorisations framework becoming necessary over

time as there is growth in both the number and size of microgrid and embedded network management businesses.

Special consideration should be given to consumer-driven microgrids, part of the growing movement of community energy projects (CEPs). Regulation of CEPs can be lighter and more flexible to allow for the types of trade-offs consumers may consciously make to pursue their objectives, while still providing for basic consumer protections.

In this submission we comment on the differences between energy systems established by networks as part of their regulated services, those established by commercial entities, and those established by communities, with respect to a number of issues including pricing, reliability, hardship provisions, dispute resolution, customer information, contracting, and so on.

Developing appropriate regulatory responses to emerging energy products and services is essential to ensure that the transforming energy market continues to put the interests of consumers front and centre.

Defining stand-alone systems

We recognise that this paper is concerned with small stand-alone networks rather than individual customer-owned systems. Nevertheless there are a number of customer protection issues with individual customer-owned stand-alone systems that also need to be addressed. We comment on these in our submission to the consultation paper on consumer protections for behind the meter electricity supply.

Terminology

There are many different types of stand-alone power supply systems, and using the term 'stand-alone systems' has the potential to cause confusion, especially when the alternative energy industry has largely settled on more specific terminology:

Individual systems

Stand Alone Power System (SAPS): this is a well-recognised term in both the solar industry and among DNSPs, referring to an individual system (typically solar with battery storage and a backup generator) serving one customer load (typically a single house) and completely disconnected from the grid.

Hybrid system: an individual generation and storage system installed at a single connection point. It is connected to the mains grid but can operate independently of it during power outages or peak demand events. Hybrid systems can be designed or optimised to minimise reliance on grid supply (potentially to less than 10 per cent of annual load).

Group systems

Embedded network: a network "embedded" in the main electricity grid. The embedded network is connected to the mains grid through one grid connection point, where a revenue-grade meter exists and retail billing and contractual arrangements occur. All sites within the embedded network are sub-metered.

Microgrid: a small network with its own generation and storage that can operate independently as a whole system. A microgrid may be connected to the mains grid – and thus be

an embedded network – but it must be capable of disconnecting from it and operating in island mode.

Fully independent microgrids and household SAPS are rare and are likely to remain so in the foreseeable future, as they are not cost-effective in most situations (with some remote locations being the exception). However the economic case for embedded microgrids and household-scale hybrid systems is improving and these will be the systems that are likely to proliferate.

In this submission we will use the term *microgrids* to refer to small networks that are either fully separate from the grid, or with a grid connection but that can operate independently of the grid.

What is an appropriate definition for our purposes?

A suitable definition should encompass both fully independent microgrids that are not connected to the grid), and microgrids that can connect and disconnect as required. Since it is feasible that network businesses may in rare cases install individual stand-alone power systems (SAPS) for individual edge-of-grid customers as part of their regulated provision of network services in the interests of more efficient expenditure, the definition in this consultation process should also encompass utility-owned systems that supply even just one customer.

What different regulatory issues arise from grid-connected versus grid-independent systems?

The most fundamental difference is that a grid-connected system has the grid to back it up if it cannot meet demand, has quality or reliability problems, and so on; while a fully independent system must supply 100 per cent of the need 100 per cent of the time. On the other hand, a grid-connected system will interact with the grid when it is connected, drawing power at some times and injecting at other times. These qualities suggest that grid-connected systems may need specific regulations concerning their connection and interaction with the wider grid; while fully independent systems may need more stringent regulations concerning quality and reliability.

Ownership models

In exploring the regulatory implications of different types of microgrids, it is useful to consider governance and purpose in addition to ownership. Different governance structures and purposes lead to different priorities and different customer and regulatory issues. For example:

- A co-operative whose purpose is to minimise reliance on the grid and provide a sustainable, emissions-free local energy supply will have a very different regard for price than one established to provide lowest-cost power using a combination of local generation and strategic use of the grid.
- A grid operated by a third party contracted by an owners' association that has a complete hands-off approach will respond differently to regulatory incentives than one where the owners' association works collaboratively with the third party.
- A DNSP establishing a micro-grid (either stand-alone or grid connected) or a series of SAPS or hybrid systems as a regulated service because it is the most efficient way to serve that community faces different regulatory pressures than if it establishes these as a contestable service in response to customer demand.

Other possible business models

The business models identified in the consultation paper may take very different forms – to the extent that the definitions of the models could overlap considerably. Co-operative models may be self owned and/or managed, or contracted from third party providers – which could be not-for-profits, social enterprises, or more conventional for-profit businesses. Municipal systems may be governed by municipalities or via a community representative body more akin to a community co-operative model. Landlord, district, or DNSP models may look very different but all be contracted to third party operators and be run very similarly.

Unique regulatory challenges of different ownership models

DNSP model: microgrids established as the most cost-effective way to deliver regulated network services would still be covered under the existing national framework. However some aspects of this (such as reliability and service standards) might need to be further specified with regard to how they apply in a microgrid environment. This model remans closely aligned to the National Electricity Objective (NEO).

Landlord model: as outlined in the consultation paper, this seems most like an embedded network, and should be regulated under the exemptions frameworks as other embedded networks are – if not also a small-scale authorisations framework. Split incentives between the microgrid operator and the end-users are a regulatory challenge. Because the end-user customers are not driving the decision to leave the conventional grid, the regulatory framework that encompasses this model's should align it with the NEO.

District model: as a commercial proposition, this has similar requirements and issues to those applying to the landlord model.

Co-op model: as a community benefit endeavour, a lighter or more flexible form of regulation is suggested. However there are still a number of fundamental consumer protection issues. Balancing these end-users' goals (which may include trading off price or reliability for other objectives) with those fundamental consumer protections is a regulatory challenge. This is discussed later in our submission. Additionally, most of these types of microgrids are likely to contract management of the system out to a specialist energy services company, so many of the regulatory issues with other models that relate to split incentives between operators and end-users may still apply. Because the end-user customers are explicitly choosing an alternative from of energy supply, some diversion from the NEO is implied. However it must also be considered that in a diversifying energy market, the NEO needs to be reinterpreted and perhaps reframed to better meet customers' long-term interests with regard to responding to the threat of climate change, and being more engaged with energy supply and use.

Municipal model: depending on its rationale and how it is structured and governed, these may be more like either the district model or the co-op model with regard to regulatory needs and challenges.

Issues

Consumer protection

The types of microgrids within the scope of this review are utility-owned or utility-like systems that in essence are more akin to various types of embedded networks or other exempt selling arrangements rather than customer product choices. Thus it is appropriate that consumer protections reflect what is experienced in the energy market more broadly. This suggests a combination of regular consumer protections as determined by the national and state energy consumer frameworks, and the more limited protections found in the national and state exemptions frameworks. The nature of microgrids may determine some differences from mainstream protections; as may the particular implications of different ownership structures.

In particular, if network businesses establish microgrids for edge-of-grid communities because it represents more efficient expenditure – and these systems are part of their regulated services and regulated asset base – customers should be protected on the same basis as grid-connected customers of that network business. The implications of this for retail services are unclear. Networks might serve as regulated retailers, or procure retail services from authorised retailers or third parties. The absence of competition suggests some form of price and service regulation will be necessary.

This approach reflects the underlying principle that the need for, and level of, regulatory intervention in the interest of providing consumer protection should be based not on the mode of delivery of energy, but on:

- the extent to which the service or product in question is being relied on by the consumer to deliver the essential service of the continuous supply of energy; and
- the impact on the consumer of experiencing payment difficulties and hardship.

Overall, the rising significance of microgrids as a part of the energy market, along with growing numbers of other off-market and behind-the-meter services and products, raises the question as to whether a model of regulation based on the elements of the old monolithic system – retail rules, distribution rules, embedded network rules, and so on – is still appropriate. A principles-based customer-centric model framed around consumer outcomes and entitlements would be applicable to all energy supply scenarios, with some variation in methodology where necessary according to limitations, scope, or peculiarities of specific scenarios. (For example: achieving the consumer outcome of efficient price will require rules to facilitate effective competition where contestable retailing exists, and good price regulation where it doesn't.)

Types of consumer protections

Energy consumer protections vary from state to state; but for the most part, customers of traditional energy retail businesses enjoy the same types of consumer protections wherever they are. Among other things, they can be confident that:

- They will be able to connect to an energy supply
- Their energy supply will meet minimum reliability, quality, and safety standards, and they will be compensated if it doesn't

- Sufficient notice will be given for any planned interruptions to supply, and special consideration given to people reliant on life-support systems
- They will be given clear information about the service they are purchasing, a cooling-off period for any contract they sign, and in some circumstances (for more novel supply arrangements) a limited right to exit a contract and revert to their previous contract
- The basis of all charges is clear and subject to regulatory oversight
- They have access to historical billing data
- They have access to government-funded discounts on their energy costs if they are eligible for concessions
- If they come into payment difficulties, they will be given support and flexibility and only disconnected as a last resort and according to a regulated process
- They have access to an external dispute resolution service if they are unable to resolve a dispute with their energy supplier
- During billing disputes they can stay on supply and not have to pay the disputed amount
- If their supplier ceases trading, their supply is uninterrupted

These are all energy-specific protections that reflect electricity's unique status as an essential service with no practical substitutes – and that Australian Consumer Law cannot deliver.[1] And while it could be argued that a household making an informed choice to procure a portion of their energy supply from a third party may trade off some consumer protections for other price or service outcomes, the same cannot be said with respect to microgrids that will provide the entirety of energy supply. This is especially significant where the establishment of an off-grid system has been a decision by a network business, municipal body, landlord or developer, rather than the end-customers themselves.

Price and service outcomes

If customers are unable to access the contestable retail market, price and service outcomes will need to be regulated. Contestability is not, after all, an end in itself, but the means by which efficient customer outcomes are achieved. The rationale for removing price and service regulation from jurisdictional energy markets in the first place was to have these outcomes more efficiently delivered by retail competition.

Regulation of retail service provision still exists to a large extent in the NEM and jurisdictional markets, especially with regard to default or standing offers. These could be extended to microgrids as appropriate.

Price regulation (in the form of a price cap) is used in the national and Victorian exemptions frameworks to prevent price-gouging by exempt sellers. This could also be extended to microgrids – however if the intent is to ensure customers in these systems face similar prices to what they would if they were in the contestable market, a weighted average of market offers should be used as a benchmark, rather than the relevant standing offer. This is because in contestable markets, standing offers have become the 'price to beat' from which market offers

[1] *e.g.* Consumer Action Law Centre, *Consumer Protections In The National Energy Market – The Need For Comprehensive Energy-Specific Consumer Protections*, Consumer Action Law Centre, 2006; https://scer.govspace.gov.au/files/2015/03/5.-Department-of-Industry-and-Science-NECF.pdf, 2016

are discounted; so the prices delivered by market competition – i.e. those faced by typical consumers on market offers – are considerable lower than published standing offer prices.[2]

Variations in both price and service standards may be appropriate for some types of microgrids – where establishment of or participation in the system is clearly an informed customer choice, and where the rationale for participation is to achieve specific non-price or service outcomes. For example, in a microgrid established by a co-operative to achieve preferred environmental or reliability outcomes, a higher price or a lower level of customer service may be acceptable to end-users.

Safety outcomes

Health and safety protections in the mainstream energy market are underpinned by strong regulation. These same regulations should be extended to microgrids, whether they are owned by regulated networks, their ring-fenced or structurally separated subsidiaries, developers, third party energy services companies, municipal bodies or community-owned co-operatives. (In many cases they will already apply to varying degrees: asset management standards for network-owned equipment, electrical safety regulations, design and installation standards for equipment typically used in microgrids or SAPS, and so on. Any gaps should be addressed.) The adverse impacts of health and safety failures are so severe – on both people within the microgrid and those outside it – that this is non-negotiable.

Regulation of contractual relationships

In the traditional energy market, contracts between end-use customers and retailers (and those between customers and distributors) are required to be compliant with the relevant regulation. In embedded networks, contracts between customers and the embedded network managers or onsellers must comply with the regulatory conditions delivered via the exemptions framework.

Using this as a template, customers in microgrids should have contracts with the system operator, and these contracts should be required to comply with the regulations governing that relationship, as delivered by whatever regulatory mechanism applies to these types for systems. (In our view, the conceptual similarity of microgrids to embedded networks suggests that at the very least, a regulatory framework similar to that which applies to embedded networks should apply.)

Dealing with split incentives

The risk that split incentives may lead to end-use customers facing unreasonable costs would be largely addressed by a pricing rule capping prices at typical on-market rates (as discussed above). The risk of poor service outcomes can be addressed by service-oriented customer protections.

Protecting customers from service provider insolvency

Because energy is an essential service, some form of protection against microgrid operator insolvency is necessary. The two main contingencies required are another operator available to step in, and funds to adequately compensate that operator for its preparedness to step in if necessary, and the costs incurred in doing so. A system operator of last resort scheme would

[2] This is well documented in the St. Vincent de Paul Society's regular *Energy Prices* reports for each NEM state (https://www.vinnies.org.au/page/Our_Impact/Incomes_Support_Cost_of_Living/Energy/). This issue of the increasing divergence of standing prices from typical prices has led the Victorian Government to consider basing the pricing rule for exempt sellers on commercial market data rather than standing prices.

thus require some form of insurance to offset those costs, and a register of accredited network operators with pre-determined responsibility for specific sites. At this point in time, DNSPs and some dedicated embedded network operators may be the appropriate accredited entities.

The requirements for such contingencies would differ between grid-connected and grid-independent systems, because grid-connected systems can more readily be operated as embedded networks or in some circumstances be subsumed into the grid. (Where a grid-connected system may feasibly be subsumed into the grid and customers served by the retail market, this is probably the simplest solution.)

Dispute resolution

Access to a dispute resolution framework is a fundamental consumer protection. Microgrid operators should be required to have internal dispute resolution processes commensurate with their scale – with defined minimum criteria for the smaller operators and more comprehensive requirements (including reporting) for those operating across multiple sites.

External dispute resolution is a more complex problem. While Australian Consumer Law allows for consumer disputes to be taken to state-based consumer regulators, these bodies have limited (and varied) capacity to actually resolve disputes (focusing more on information provision and advice) and their complaint processes can be complex and, if complaints need to be taken to tribunals, costly.[3] State-based Energy Ombudsmen handle disputes in the mainstream market but their jurisdiction doesn't extend even to embedded networks (apart from in NSW). The Victorian Government is currently exploring the practicalities of extending the reach of the Energy and Water Ombudsman to exempt retailers and network operators in embedded networks;[4] and the Victorian, NSW, and South Australian Energy and Water Ombudsmen are currently exploring the feasibility of extending their membership to alternative energy providers.[5] Implementing this change would require, among other things, developing new fee structures and membership categories for Ombudsmen that are appropriate for smaller-scale businesses without needing unjustifiable cross-subsidies from other Ombudsman members. This is not simple, but it's a solvable problem: and if it is done (as looks likely), then extending membership and jurisdiction of Ombudsman schemes to operators of microgrids will be rudimentary. If customer protection in microgrids is to be delivered similarly to the way it is in embedded networks (as we are suggesting), then including external dispute resolution in this way will be obvious.

Hardship provisions

In any situation where the essential continuous energy supply is delivered in such a way as to require periodic payment by the customer to a provider with whom they have an ongoing relationship, payment difficulties threaten their ongoing supply. This is why conventional retail energy customers are entitled to payment flexibility and a degree of support from their retailer if they fall into payment difficulties – and why the retail exemptions framework also contains hardship provisions for customers in embedded networks.

End-users in microgrids should be given the same considerations and support with regard to payment difficulties, de-energisation and re-energisation, and concessions and rebates as

[3] Jo Benvenuti & Caitlin Whiteman, Consumer access to external dispute resolution in a changing energy market, EWOV/EWON/EWOSA, 2016.
[4] Department of Environment, Land, Water and Planning, *General Exemption Order: Draft Position Paper*, DELWP, 2016
[5] Jo Benvenuti & Caitlin Whiteman *op. cit.*

provided for in the AER Retail Exempt Selling Guideline (conditions 9 through 12, with some applying only to residential customers as specified in the Guideline). In summary, this provides for:

- The customer being advised of available energy efficiency advice, and of concessions they may be eligible for, when they disclose payment difficulty
- The provider not hindering the customer applying for a concession or rebate, and applying on the customer's behalf if this is necessary
- The customer not being liable for a late payment fee if they have advised payment difficulty
- A customer who fails to pay by the due date being given a reminder notice with an extended pay-by date, and (if a residential customer) offered flexible payment terms
- A customer who fails to pay by the reminder notice due-date being given a disconnection notice with a new pay-by date
- The provider attempting to contact a customer who has not contacted them after the disconnection notice is issued, before disconnection
- Disconnection not proceeding if the customer
    - requires life support equipment
    - is in the process of applying for a concession or rebate
    - has made a complaint to the provider or a relevant external dispute resolution body relating to the reason for disconnection
- Disconnection not occurring on or at certain specified days or times

Where jurisdictions have specific hardship provisions that apply over and above the AER's, the jurisdictional provisions should prevail as applicable.

Opting out of hardship provisions

Fulfilling hardship obligations does impose some costs on energy retailers and embedded network operators, and would do the same for microgrid operators. It has been argued that end-users establishing a microgrid for their own reasons (such as a small community, via a co-op, to achieve energy independence or emissions reductions) should have the option of 'opting out' of needing to have hardship provisions. However, as much as people may honestly believe that they will never need hardship provisions, households can fall into financial difficulties for many reasons or due to a range of one-off events or other circumstances, often unpredictably. It is our strong view that all microgrids should have to meet a minimum standard with regard to dealings with customers in payment difficulties; and the hardship provisions in the AER's Retail Exempt Selling Guideline constitute a tried and tested minimum standard.

Reliability and service standards

Reliability and service standards in microgrids may vary depending on the type of system, its ownership or governance structure, and its rationale. For example, an edge-of-grid system established by a DNSP as part of its regulated service provision would be expected to have similar reliability and service standards to the rest of its network. However if the served community previously experienced very poor reliability – and improving reliability is part of the rationale for setting it up as a microgrid – it might be reasonable to deliver a reliability standard that significantly improves on the previous standard while still not aligning with the network as

a whole. Systems set up by co-operatives for environmental or price outcomes may choose to trade off reliability levels.

Determining the level of reliability required by a specific group of customers (or customers in general) is difficult, as noted by the Australian Energy Market Operator (AEMO) in its determination of the customer value of reliability.[6] It is also clear that reliability requirements for residential customers are very different than those for industry, and that with the right equipment and knowledge, residential customers can adapt to lower levels of reliability by some measures and in some circumstances – especially if manifested as reduced capacity on a discrete number of occasions rather than total cessation of supply.[7] Nevertheless, the prevailing reliability and service standards should be seen as the default, with any variation from the standard acceptable only when unavoidable, or explicitly agreed to by informed end-users.

Facilitating informed customer decisions about reliability and service quality

As AEMO has noted, it is difficult to engage customers around the issue of reliability, and difficult for engaged customers to make decisions about the level of reliability they require and how much it is worth to them.[8] The value of reliability is a hypothetical concept, and in fact "most residential customers … are unwilling to pay more to avoid outages … [because] their electricity bills are already high and … existing reliability levels are acceptable."[9] This makes it difficult to facilitate informed customer decisions about reliability and cost trade-offs. In the context of transitioning a household or small community from a grid connection to a stand-alone network, this may be simpler if more accurate cost differentials and more concrete reliability outcomes can be given. For example, if a stand-alone network is being established because of existing reliability issues, a specific reliability improvement (say, reduced average number and duration of outages per year) may be reasonable foreseen, and a specific cost increase (in terms of average or even specific annual bills) given. Customers with tangible experience of poor reliability can thus better envisage the improved outcomes, and more readily decide if the cost is worth it. These decisions are probably better facilitated in participatory workshops than via simple surveys – this will be feasible when it relates to a geographically defined microgrid with a discrete number of affected households.

This process is more difficult in a greenfield development, where cost and reliability trade-offs could be made by the developer with no input from future residents. This is why we recommend above that applying the existing standards be the default, with lower standards being allowable only where necessary due to circumstances (such as remoteness) or where explicitly agreed to by informed end-users. Importantly, where a DNSP seeks to take an edge-of-grid community off-grid because it results in more efficient expenditure, the existing reliability standard of that node should at least be maintained.

All of this must also be understood in the context that, for the foreseeable future, fully grid-independent microgrids are likely to remain very rare, and grid-connected microgrids much more likely. Grid-connected microgrids will have the reliability of the larger network as a backup

[6] AEMO, Value Of Customer Reliability Review: Final Report, Australian Energy Market Operator, 2014

[7] For more discussion of this, please refer to the ATA's submission to the *AEMC Draft Report - National Workstream: Review of Distribution Reliability Outcomes and Standards* (aemc.gov.au/getattachment/e338a045-6c0b-4936-bd17-848ac6088977/Alternative-Technology-Association-received-31-Jan.aspx)

[8] AEMO 2014, *op. cit.*

[9] *Ibid.* p. 35

Changes in demand affecting reliability

In a grid-independent microgrid, significant changes in one or a few customers' demand or consumption could exceed the capacity of the system to provide the agreed reliability standard. This is a risk in any grid-independent system, irrespective of the ownership or governance structure. Customer engagement in the ongoing operation of the network may help moderate this risk, but it is difficult to envisage a generic solution, especially in systems that are established for reasons not related to specific end-user preferences (such as DNSPs seeking the most efficient expenditure for an edge-of-grid node, or developers of greenfield sites). This risk should be thoroughly canvassed during any customer consultation on the desired level of reliability.

However in our understanding, it is almost impossible to predict future changes in an individual connection point's demand or consumption with anything close to absolute certainty – and the smaller a microgrid, the less likely that changes in demand and consumption by end-users will average out to a predictable range. This is one of the reasons that fully independent microgrids are expected to remain rare for some time.

Obligation to supply

As noted in the consultation paper, microgrids will ultimately be small monopolies comprising a single, vertically integrated energy service provider. End-use customers will have no choice of retailer. An obligation to supply must be imposed on system operators.

Network regulation

Independently of considerations of ownership and governance, we envisage three different approaches establishing microgrids:

- an existing network provider establishing it as an alternative to servicing the area via their network (to reduce costs or to increase reliability)
- a developer, landowner, or local authority establishing a new development or existing area as a microgrid for their own reasons
- a community electing to retrofit as a microgrid for their own reasons.

For a DNSP-led system, where establishment of the system is to achieve lowest efficient cost of service at the required standard and is allowable under the Regulatory Investment Test for Distribution (RIT-D) (keeping in mind that the current rule change may make this more likely) it is appropriate that the system is both included in the Regulatory Asset Base (RAB) and subject to the same regulation as the remainder of the network (noting though that where access to retail competition cannot be given, regulation of price and customer protections via the appropriate instrument is required, as discussed above).

Where not allowable in this way, or where microgrids are established by developers, end-users, local authorities, or other bodies, provision of such systems should be contestable and if DNSPs wish to be involved it should be through appropriately ring-fenced or structurally separated entities.

Retail regulation

Microgrids by their nature are vertically integrated and not in constant connection with the wholesale or retail markets. Even where a microgrid has a grid connection, its ability to be

islanded means any retail or wholesale relationships cannot be presumed to be ongoing. These systems will probably operate more like an embedded network, where the network as a whole is the retail customer when on-grid. It is conceivable that end-use customers within such a system could purchase energy from retailers when grid-connected, and revert to the system's own generation when islanded; but this seems overly complex from a metering and contractual point of view – as well as in terms of customer billing and, ultimately, customer engagement with their energy supply.

Separation from the mainstream market and grid is a key feature of microgrids, whether by design or by necessity – so their vertical integration underpins their rationale for existing in most circumstances. This suggests that, like other systems separated in one way or another from the mainstream market (such as embedded networks) that comprise small end-user customers, some form of regulation to substitute for the efficiency incentives inherent in an effective contestable energy market is required.

The most satisfactory approach with regard to price regulation seems to be:

- by default (primarily in systems established by DNSPs or developers for commercial reasons), price regulation in the form of a pricing rule enforcing a cap on the retail price so it is no more than the typical price paid by equivalent customers in the mainstream market (as discussed above)
- where a system is established for non-price outcomes (such as environmental goals or end-users' desire for grid-independence), pricing should be determined on the basis of the costs of the system in a transparent manner with the active involvement of end-users. This would be part of the development process for co-operatives and local authorities retrofitting existing communities into microgrids, and part of the disclosure requirements for developers of greenfield sites. The requirements to undertake this participatory consultation and for the relevant disclosure should be a part of the regulatory framework that covers these types of systems.

Again, consideration of the nature of microgrids suggests a regulatory approach akin to that taken with more traditional embedded networks and other exempt selling arrangements.

Regulating the decision to establish microgrids

Where a DNSP converts an edge-of-grid node to a microgrid because it represents the most efficient cost in delivering network services at the required standard, it should:

- demonstrate that the proposed system can deliver network services at the required standard (including an allowance for potential changes in future demand)
- consult with affected customers and educate them about the change, what it will mean for them, and how their new service will compare to their existing service.

If these requirements – for demonstrating capacity to meet service standards, and transparency and customer consultation with regard to network planning in general and large augmentation and repair projects specifically – are not sufficiently provided for in the current regulatory system, this should be remedied.

In other situations where a community may be retrofitted to a microgrid, requirements for the explicit informed consent of end-users should be enforced. As customers in a microgrid are

giving up key benefits of the mainstream energy market (such as retailer choice, and – where there is no grid connection – the security of the grid as a backup or to accommodate growth in consumption or demand), this consent must be predicated on a comprehensive information and consultation program spelling out the risks and benefits in detail. This requirement needs to be incorporated into the regulations governing microgrids.

Anything less than the explicit informed consent of *all* end-users raises the risk of some households leaving the retail market or the conventional network against their will. On the other hand, requiring unanimous consent raises the risk of a single customer with an effective veto over a project that meets the wider community's needs – which seems a perverse outcome in large communities. We note that similar issues are already evident with regard to retrofitting embedded networks into apartment complexes and shopping centres, and that in those situations, an individual rather than class exemption must be applied for when consent is not unanimous. This may suggest a way forward for dealing with such a situation with regard to retrofitted microgrids.

Consistency versus tailoring

The form of regulation

As discussed in the consultation paper, "the NER and NERL currently recognise a tripartite arrangement comprising retailers, distributors, and customers."[10] With a grid-connected microgrid, the system operator is the customer. This is little different from a more traditional embedded network, for which the regulatory system contains a framework[11] to extend customer protection provisions to end-users within the system. There seems to be no rationale to not extend these same provisions to grid-connected microgrids.

When the grid-connected microgrid disconnects from the grid, those other parties are no longer involved. But the same contracts between end-users and the system operator – with conditions that comply with the relevant regulation – will still exist. There is no clear rationale for why the end-users should periodically and temporarily lose their regulated customer protections. Yet if the answer to this conundrum is to excise grid-connected microgrids from the embedded network framework entirely, it increases the horizontal inequity (with respect to customer protections) across the end-use customer base (which already exists between on-market customers and those in embedded networks). In our view, this makes a clear case for extending the same framework that covers embedded networks to grid-connected microgrids. And – because there is also no clear rationale for horizontal inequity between grid-connected and grid-independent microgrids – it should also be extended to the latter. Significantly, the framework that applies to embedded networks is flexible enough to allow some variation of specific customer protections and other requirements where required.

We also note that in the current reviews of the exemptions framework and licensing system in Victoria, the issue of the disconnect between exempt entities and the businesses that operate embedded networks has been raised. The exemptions framework is premised on the idea that embedded networks are operated by entities that should not be required to hold a license or authorisation because energy selling is not their primary business. However in many situations

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[11] Currently an exemptions framework that allows entities to manage networks and sell energy without an authorisation or licence – though Victoria is considering introducing a small-scale licence for some embedded network operators.

– especially apartment complexes, shopping centres, and residential parks – the exempt entities are merely the titular operators of the embedded networks, contracting their actual operation to companies whose core business is in fact selling energy in embedded networks. These businesses operate numerous networks across multiple sites, and at least some have more customers than some of the smallest authorised energy retailers.[12] Fundamentally, this constitutes provision of a public utility service (albeit on a smaller scale); it is difficult to argue that this does not warrant appropriately scaled authorisations framework. The approach Victoria seems to be taking is to develop a small-scale licensing framework that will include licensing requirements for these types of businesses.

It is likely that most microgrids – especially those established by developers, and quite possibly DNSP-owned systems also – will be operated by similar types of entities: companies whose primary business is managing microgrids or embedded networks, and who do so to hundreds or thousands of customers across numerous sites. Again, this constitutes provision of a public utility service. A small-scale authorisations framework thus seems the most appropriate way to regulate.

It could be argued that requiring microgrid management businesses to be authorised, but not embedded network management businesses, represents a horizontal inequity. On one level, this is true – and we contend that embedded network management businesses should also be appropriately authorised, especially considering the similarity in scale between the larger embedded network businesses and the smaller energy retailers. On another level: because microgrids can be taken off grid (or be permanently off-grid), the system operator has a more profound responsibility for safe and sufficient service provision to end-users than more conventional embedded network operators do. This makes a stronger case for an authorisations framework for commercial microgrid operators.

For systems owned and operated by co-operatives or site-specific entities, coverage under the existing exemptions framework is probably most appropriate (though again, it is likely that many of these will be contracted out to microgrid management companies to operate, in which case the above still applies). Specific classes would need to be established to account for the additional requirements, as discussed above (for example, contingencies against insolvency, reliability and system security, and so on). A significant advantage of leveraging from the existing exemptions framework is that consumer protections and other key conditions are already stipulated.

Victoria's General Exemptions Order review is exploring having a specific exemption category for 'community energy projects' (CEPs) – energy provision for community benefit under community governance. This approach may well be appropriate for microgrids established by community co-ops or, in some cases, municipal bodies; and may be the most transparent way to provide for different approaches to reliability, service standards, price, and hardship provisions for co-op-led and other community-benefit driven microgrids. These could apply even if microgrid operation is contracted out to microgrid management companies (who may be subject to their own regulation, perhaps through a small-scale authorisations framework as discussed above)so long as the requisite conditions for treatment as a CEP (such as active community governance are met.

[12] For example, according to Benvenuti & Whiteman 2016 (*op. cit.*) both WINenergy and Network Energy Services have more than 15,000 customers each.

Conclusion

Thank you for the opportunity to respond to the consultation paper on stand-alone energy systems. We also thank the Energy Market Transformation Project Team for the excellent participatory workshop that helped inform stakeholder submissions, and for allowing us to lodge a late submission.

If you wish to discuss anything raised in this submission further, please contact Dean Lombard. Senior Energy Analyst, at dean@ata.org.au or on (03) 9631 5418.