public interest
ADVOCACY CENTRE

PIAC submission to AEMC Alternatives to grid-supplied network services rule change consultation paper

28 July 2017

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1. Introduction

1.1 The Public Interest Advocacy Centre

The Public Interest Advocacy Centre (PIAC) is an independent, non-profit law and policy organisation that works for a fair, just and democratic society, empowering citizens, consumers and communities by taking strategic action on public interest issues.

PIAC identifies public interest issues and, where possible and appropriate, works co-operatively with other organisations to advocate for individuals and groups affected.

Established in July 1982 as an initiative of the (then) Law Foundation of New South Wales, with support from the NSW Legal Aid Commission, PIAC was the first, and remains the only broadly based public interest legal centre in Australia.

1.2 Energy and Water Consumers' Advocacy Program

The Energy + Water Consumers' Advocacy Program (EWCAP) represents the interests of low-income and other residential consumers of electricity, gas and water in New South Wales. The program develops policy and advocates in the interests of low-income and other residential consumers in the NSW energy and water markets. PIAC receives policy input to the program from a community-based reference group whose members include:

- Council of Social Service of NSW (NCOSS);
- Combined Pensioners and Superannuants Association of NSW;
- Ethnic Communities Council NSW;
- Salvation Army;
- Physical Disability Council NSW;
- Anglicare;
- Good Shepherd Microfinance;
- Financial Rights Legal Centre;
- Affiliated Residential Park Residents Association; and
- Tenants Union.

2. PIAC's position on the rule change proposal

PIAC is supportive of distribution network service providers (DNSPs) pursuing the least-cost option to provide regulated network services. In the same way that DNSPs should consider non-network in addressing a need, PIAC considers that DNSPs should also consider off-grid, or Stand-alone Power Supply (SAPS), solutions where they provide a cost-effective alternative to traditional network solutions.

As such PIAC supports the intent of the rule change proposal. However, PIAC raises a number of issues for the AEMC to consider in making its determination which cover aspects of potential configurations for providing off-grid supply and the necessary consumer protections for customers who are transitioned to off-grid supply.

PIAC understands that the rule change proposal is to clarify that DNSPs can provide off-grid solutions to its customers who are currently grid-connected and receiving regulated network services only where it is a more efficient alternative to a continued grid-connection.

PIAC agrees that there may be uncertainty around whether SAPS could be considered as a means of providing a distribution service under the current arrangements. While PIAC considers that the current Rules do not explicitly prevent DNSPs from pursuing off-grid systems in these cases, we would welcome clarity to encourage SAPSs being deployed instead of traditional network augmentation where they are the most efficient means of providing regulated network services.

Therefore, the key factor behind the DNSP proposing a Stand-Alone Power System (SAPS) solution would be to reduce costs in either network augmentation or replacement expenditure. The DNSP is best placed to see the true costs of providing network services to a customer (or group of customers) and, in the absence of locational network pricing, or another incentive for the consumer (for example as part of an agreement for any customer/s to forego their entitlement to receive energy from the grid) the customers themselves will have insufficient price signal to install a SAPS.

In considering this rule change, it is important to note there are two general cases where a customer might be supplied by a SAPS. One is where the customer has not sought a change to their method of electricity supply and any change is done "behind the scenes" by the DNSP as the most cost-effective way of providing regulated network services. In this case, the arrangements should seek to retain as many aspects as possible of a grid-connected customer's relationships, interactions and protections, irrespective of the source of supply.

The second case is where a consumer nominates to receive their power supply from a SAPS that they themselves own or lease of their own volition, potentially as part of an agreement for that consumer to forego their entitlement to receive energy from the grid in return for a payment. PIAC supports consumers having this option where appropriate. These consumers will require additional protections to those currently afforded to off-grid customers, similar to protections that exist currently under retail and distribution frameworks but reflect the greater risk to the customer should the SAPS fail to operate as expected. These protections are as discussed in more detail in 5.2 Specific protections for consumers going off-grid.

2.1 Extent of the rule change proposal

PIAC supports the intent to the rule change to clarify that a DNSP can provide off-grid solutions where they provide a cost-effective alternative to traditional network solutions. PIAC also supports the limitations proposed by Western Power on the situations where the DNSP can provide an off-grid solution as a regulated service.

PIAC understands that the proposal will only extend to customers who are currently grid-connected and the DNSP identifies that an off-grid solution is a more cost-efficient alternative to continuing their grid supply. PIAC also understands that the proposal will not extend to customers who are currently off-grid, in a microgrid or are seeking to go off-grid of their own volition. Further, it will not prevent such customers choosing for themselves to disconnect from the grid and purchase an off-grid solution through the competitive market.

2.2 Appropriate trigger for evaluation of network options

It is likely that projects to transition customers to SAPS supply will be driven by a replacement or other investment needs of the DNSP's network.

The recent Replacement Expenditure Planning Arrangements rule change made by the AEMC enhances transparency on DNSPs' replacement expenditure in both their Annual Planning Reports and Regulatory Investment Test for Distribution (RIT-D). Further, the AER has ex post powers as part of a DNSP's revenue determination process to review and remove inefficient expenditure and capitalisation.

PIAC considers that the above arrangements, along with a DNSP's ring-fencing requirements, provide transparency about their options evaluation process to ensure that customers are transitioned to off-grid supply only where it is found to be the most cost-effective option for projects that are above the $5 Million RIT-D threshold.

PIAC expects, however, that due to the nature of smaller distribution upgrades that effect supply to a limited number of consumers at the fringe of the grid[1], many of the potential projects where consumers might be more effectively supplied by SAPS will be less than the cost threshold for conducting a RIT-D, currently $5 million.

PIAC notes that a SAPS system with a capital outlay of around $50,000 would supply a typical regional or remote residential user, with a level of reliability at least as high as what they receive from the grid, for a lower operating cost.

In the interest of identifying the most cost-effective measures to supply existing consumers, in PIAC's view, a less detailed investment test than a RIT-D (i.e.: a "RIT-D lite") should be applied for any projects of less than $5 million that only supply a small number of customers. Noting the SAPS cost of $50,000, an appropriate threshold for this might be $100,000 per customer served.

[1] Such as reconductoring, pole replacement, upgrading distribution transformers, installing switchgear and so on.

2.3 Definition of a grid-connected customer

PIAC understands that the AEMC has interpreted the National Energy Retail Law to mean that a distributor moving a customer from grid supply to off-grid supply would constitute disconnection and hence would be subject to various limitations under the Law.

However, PIAC questions this interpretation and points out that it is problematic in this context.

PIAC agrees that disconnection is defined as the electrical separation of a premises from the distribution system. However, if the distributor is providing the SAPS as a regulated service in lieu of a traditional grid connection, as proposed in this rule change, then PIAC contends that the network assets should be considered as being part of the distribution system.

This will make clear that the customer is still subject to the protections under the National Energy Retail Law as they were while still grid-supplied, and that the network business can recover the efficient costs of providing this service. This also makes clear under the Retail Law that the distributor and/or retailer must obtain the explicit informed consent of the customer.

This does not, however, limit the need for any additional protections specifically for customers who choose to provide their own SAPS, as discussed in 5.2 Specific protections for consumers going off-grid.

2.4 Understanding of regulated network services

PIAC acknowledges concern regarding regulated distribution businesses potentially providing 'behind the meter services' and the overlap between this rule change and other reforms, in particular, the contestability of energy services rule change. PIAC agrees that there are risks to competition and ultimately to consumer outcomes from regulated distribution businesses unfairly being able to edge out otherwise efficient competitors.

However, this should not prevent the AEMC from considering this rule change proposal. So long as appropriate ring-fencing and other protections are in place, DNSPs should be able to pursue the least cost solution to provide network services. Limitations such as the limbs in Western Power's proposed rule can effectively restrict the situations where the DNSP can provide an SPS as a regulated service to only those where it is clearly the least cost solution to meeting its obligation to provide distribution services, as opposed to providing contestable behind the meter or off-grid systems, ensuring that the benefit of the least-cost solution being chosen is socialised among all consumers.

3. Stand-alone power systems

3.1 A typical stand-alone power system

Currently, customers who choose a SAPS mostly do so because they are too far from existing grid infrastructure to make a cost-effective grid connection. Increasingly, as the cost of SAPS continue to drop and energy from the grid becomes more expensive, consumers choose SAPS for other reasons. While there may be financing options available, the customer typically procures the physical assets either from one of a number of suppliers each offering markedly different

products. This is in contrast to a grid-connected supply where the customer is procuring a more or less identical service from a retailer via the single interface of “the grid”.

As shown in Figure 1, a typical stand-alone power system will consist of a number of components including:

- a primary source of generation, typically solar PV but can also include wind;
- an energy storage device such as a battery;
- a backup generation source (typically a diesel genset) for emergency power; and
- an inverter, which may incorporate other power electronics such as battery chargers and system controllers.

It is important to note that while there are multiple assets which make up an SPS, and these may be physically housed on, or integrated with, the site, there is still typically effectively still a single electrical connection from the SPS to the customer’s premises.

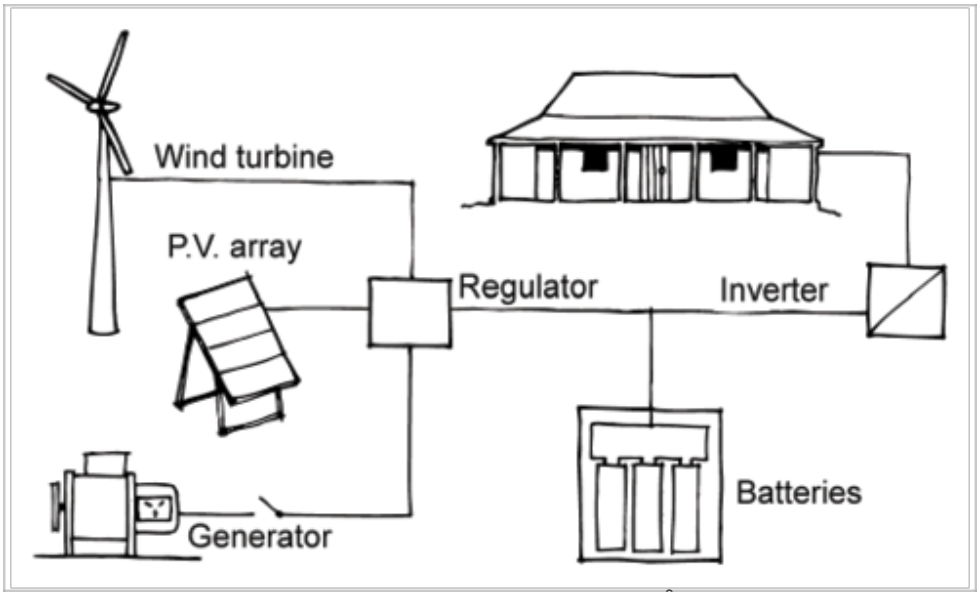


Figure 1 Typical configuration of a Stand-alone Power System[2]

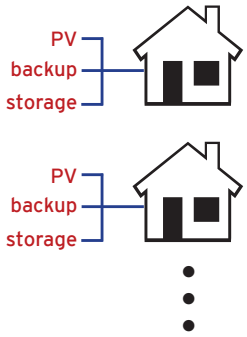
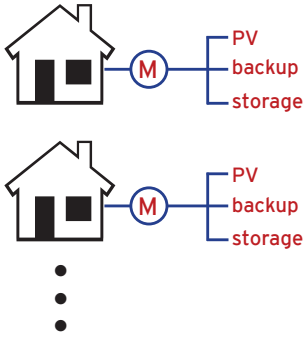
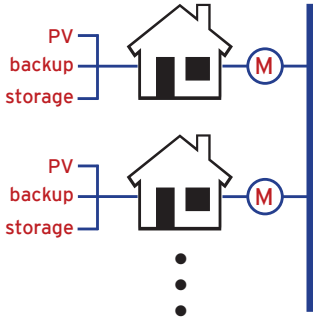
When off-grid customers are procuring the assets and not a service, they are not charged based on their usage (notwithstanding ongoing costs for maintenance, repairs and replacements and fuel costs for any use of a backup generator) but instead effectively charged for the capacity of their system. Therefore, they will often not have a revenue meter in the same way that a grid-connected customer will and be charged based on their usage (in kWh and/or kW).

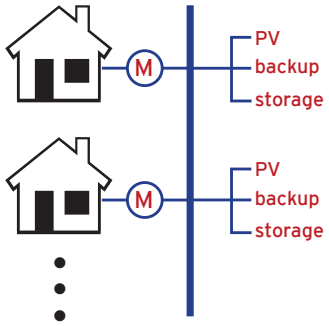
However, PIAC contends it is possible for SAPS to retain aspects of a grid-supplied system, most notably a metered connection with access to retail competition and consumer protections. These are outlined in the following section. In PIAC’s view, this should be able to be done, in the context of this rule change proposal, where the customer is not necessarily choosing to transition to off-grid themselves, but is being transitioned by the DNSP as a more cost-effective alternative to providing network services.

2 http://www.yourhome.gov.au/energy/batteries-and-inverters

3.2 Possible configurations for stand-alone power systems

There are a range of different configurations that may prove the most cost-effective solution to providing off-grid supply to customers. These are summarised in Figure 2. Where SAPS are being considered, the most efficient solution will often be a SAPS with no connection to the local grid. In some cases, particularly local microgrids, it may be a hybrid of these configurations. Which of these is more efficient and acceptable depends on a range of factors, including the number and size of customers to be supplied, their distribution relative to each other and exiting infrastructure, the relative costs of small-scale vs large-scale SAPS equipment, and consumer preferences.

	**1) Unmetered individual SAPS** • All SAPS equipment is integrated into the premises • Billing to customer for payback of capital cost and not necessarily related to electricity usage • Similar to many current off-grid systems • No role for any energy retailer or DNSP
	**2) In front of the meter individual SPS** • Similar to (1) except SPS equipment is separated by a revenue meter – similar to meter used in grid supply • Customer is charged for energy usage, as per normal grid connection • Role for retailer and/or DNSP
	**3) Microgrid with behind the meter generation** • Similar to (1) except customers are connected in a microgrid to allow sharing between premises • Revenue meter for use of the microgrid • Some customers may have larger or smaller capacity of generation and storage onsite. Some customers may be net importers and others net exporters • Role for retailers and DNSP



4) Microgrid with in front of the meter generation

- Similar to (2) except customers are connected in a microgrid to allow sharing between premises
- SPS equipment can be a mix of distributed and centralised
- Customer charged using revenue meter similar to grid supply
- Role for retailers and DNSP

Figure 2 Potential configurations for Stand-alone Power Systems (SPS)

Importantly, there are configurations possible which, from the customer's perspective, retain many aspects of their grid-supply arrangements including a role for a retailer as in grid-connected supply and the use of a revenue meter as a line of demarcation between the customer's premises and the DNSP's network assets and infrastructure. This has the benefit of clearly apportioning responsibility for the ownership, maintenance and repair of assets between the customer and other parties including the DNSP. As noted previously, PIAC recommends that the AEMC consider options that seek to retain as many aspects as possible of a grid-connected customer's relationships, interactions and protections to these off-grid customers.

In the event that a microgrid is deployed, a mix of centralised and decentralised generation is possible. For example, it may be more cost effective to deploy distributed PV and storage devices throughout the microgrid, potentially at or near each customer's premises, solar systems installed on rooftops and/or in public space, and a single large backup generator to supply the entire microgrid with power in the event of sustained generation shortfall or equipment failure.

3.3 Treatment and recovery of generation costs

Regardless of the configuration, the issue of the DNSP's cost recovery for generation will need to be considered.

PIAC supports the DNSP owning and operating the generation assets in a SAPS where it is the most cost-effective solution to providing network services, provided any operating expenditure, such as for fuel for the backup generator or maintenance, is subject to appropriate regulatory oversight. Importantly, opex may change year to year depending on many factors including how often the backup generator is used due to weather, customer usage patterns and breakdowns.

Where energy is still delivered to the customer as a metered service (configurations 2 and 4 above) PIAC considers there are a number of potential options for this that allow the customer to still access retail competition:

- allow cost recovery through the retailer at a price linked to and/or capped by the regional spot price for energy. This option may support retail competition by providing consistency between on and off grid arrangements.
- allow cost-recovery through a retailer using a regulated price for the efficient operation of off-grid systems. This provides an incentive for DNSPs to provide the service at or below the regulated prices, but would impose additional obligations on the AER or jurisdictional regulators to set and monitor these benchmark efficient operating costs. This may require a range of prices to be set depending on the configuration and scale of the off-grid systems.

This option may encourage retail competition by allowing a higher gross retail margin than for a grid connected customer.

- in the case where this operating expenditure is relatively small, it may be appropriate for the DNSP to not recover these costs directly from the customer or retailer. In this case, the DNSP's operating costs may be included in the DNSP's total operating expenditure allowance in its revenue proposal and hence recovered from all customers. This would further reduce costs for the off-grid customer's retailer and more strongly encourage retail competition for such off-grid customers. This would likely need to be reviewed in the case where DNSP-supplied off-grid systems become more common such that the revenue associated became a material part of the overall network revenue.

4. Retention of retail arrangements for off-grid customers

As noted in the above section, there are opportunities for off-grid supply to be arranged in a way that retains the current customer interfaces with their authorised retailer and distributor and the customer may remain covered by the Retail Law and Retail Rules. In these arrangements, the customer has the benefit of continuity of experience where they continue to pay their bills to a retailer, access competitive retail offers and the same consumer protections.

4.1 Access to retail competition

While PIAC has concerns about the effectiveness of retail competition for consumers in the current retail market, retail competition has the potential to provide considerable benefit. Competitive tension between retailers ought to drive lower costs for consumers and encourage innovation in their offers. Further, allowing customers choice in their retailer and retail offer may allow them to select a retail offer which best suits their particular needs. For these reasons, retaining access to retail competition is important.

4.2 Existing consumer protections

Retaining retail arrangements will allow off-grid consumers to continue to be covered by the same consumer protections they have while grid-connected. These include:

- access to a retailer's hardship programs and repayment plans where customers cannot pay their energy bills. These plans help prevent low-income and vulnerable customers from falling unnecessarily deep into debt and other financial stress in order to receive essential energy services and an important safety net to prevent the need for disconnection of supply
- access to rebates and vouchers such as the Energy Accounts Payment Assistance (EAPA) Scheme in NSW
- strict limitations on retailers and distributors around the conditions under which the customer may be disconnected
- stringent protections around disconnection for customers with life support equipment
- access to binding dispute resolution processes through the ombudsman's schemes. These dispute resolution processes allow consumers to have free and independent dispute resolution with their retailer or distributor which they may otherwise not have.

5. Consumer protections for off-grid customers

PIAC considers that the current consumer protection frameworks are in need of significant changes to reflect that access to energy is essential in a modern society while acknowledging that not all energy services are inherently essential.

With this in mind, PIAC recommends moving to a harm-cognizant, impact-based approach to consumer protections, where the level of protection for a given service is commensurate with the potential impact to the consumer from something going wrong, and is irrespective of the method and technology involved in delivering the service.

5.1 The risks for consumers in going off-grid

The risks for off-grid consumers are different to those who retain a grid connection and specific consumer protections are required which reflect these.

If a customer has behind the meter generation and storage on their premises but has retained their grid-connection, the consequences of a failure of their system will not involve losing access to essential electricity services. It will likely involve higher electricity bills for a period as a greater portion of their energy usage is supplied through their network connection rather than from their behind the meter system.

By contrast, in the case where a customer has gone completely off-grid and foregone their connection to the network, the consequences of the SPS failing are considerably more severe. If there is no backup generator as part of the SPS, it may mean losing access to essential electricity services for a week or more while awaiting repair or replacement. Even if there is a backup generator which will allow for some electricity services to be provided, it can involve hundreds of dollars in fuel costs per week and may be limited in operation by the capacity of the generator or its noisy and polluting nature.

In either case, the failure of the SPS results in a significant impact to the customer through the loss of an essential service. This may result in the customer losing heating and cooling in remote areas which with more extreme weather or losing refrigeration of food and medicine. Of greatest concern would be if it meant losing power supply to life support services.

There is also potential for the customer's load to change in excess of the off-grid system's capacity to provide. This may be due to growth in demand and/or energy, changes in the time of usage or changes in the required level of security and/or reliability of supply such as the need for life support. Upgrading an off-grid system to meet this higher load requirement may require considerable capital investment, unlike the case if the same customer were to have retained their grid-connection. Therefore, it is important that customers who are transitioned to off-grid supply are made aware of such implications so they are able to make a fully-informed choice or are appropriately protected from these costs.

5.2 Specific protections for consumers going off-grid

Given these specific risks for customers who to own or lease a SAPS of their own volition, particularly where they are be used to the nature of supply from the grid, additional consumer protections are required above those received by consumers who remain grid-connected.

It is important to remember that, currently, SAPS are typically provided by small businesses (often sole traders) who, because they are not selling energy, have no obligations to comply with retail licencing or exemption arrangements or any other aspects of the National Electricity Rules. The only redress consumers have with SAPS providers is under Australian Consumer Law (ACL), which has no energy specific consumer protections. Work undertaken by PIAC suggests that the warranties for many residential batteries, which form a crucial part of any SAPS, may not fully comply with the ACL.

PIAC considers that SAPS systems, where they are purchased outright or leased by the consumer to replace an existing grid connection, should include:

- Performance guarantees regarding the frequency and duration of system outages
- Educating the customer about the differences between living with a grid connection and living with a SAPS
- Clearly demonstrating the Explicit Informed Consent of the customer, with particular emphasis on the customer's understanding of the differences between living with a grid connection and living with a SAPS
- Clear and fair contract terms with a cooling off period
- A transition period for customers where the premises is electrically isolated but not yet physically disconnected from the grid. This will allow the customer to trial the SAPS for a period and, if they opt out of using the SAPS and instead decide to retain the grid connection, the customer will not need to establish new grid connection infrastructure from scratch
- Full disclosure of detailed product information to allow for straightforward repairs and identification of the correct replacement parts
- Independent dispute resolution and recording and reporting of disputes to the AER
- A prudential fund or insurance against the failure of the system.

6. Consultation questions

Responses to the AEMC's consultation questions and other issues for the AEMC to consider are provided in Attachment A.

7. Further engagement

PIAC would welcome the opportunity to discuss the issues considered herein in more depth. For any queries please contact Energy Team Leader, Craig Memery at cmemery@piac.asn.au or on (02) 8898 6522.

Attachment A: Responses to consultation questions

Question 1 Nature of issues

a) Do Western Power's concerns, as described in section 2.2, accurately identify the nature of any problems associated with distributor-led transitions from grid supply to off-grid supply in the jurisdictions that are part of the national electricity market?

PIAC supports network businesses pursuing the least-cost options to provide regulated services. In the same way that DNSPs should consider non-network options in addressing a need, PIAC considers that DNSPs should also consider off-grid solutions where they provide a cost-effective alternative to traditional network solutions.

PIAC agrees that there is uncertainty around whether a SAPS would be considered a distribution service under current arrangements. While PIAC does not consider this uncertainty expressly prevents DNSPs from pursuing off-grid systems in all cases, we welcome clarity to allow network businesses to pursue SAPS and other alternatives to traditional network options wherever it is the most efficient solution.

b) In relation to customers who currently have a grid connection, is there workable competition for off-grid supply systems, or are there barriers that significantly impede businesses that are not economically regulated (non-distribution businesses) from providing off-grid supply to these customers?

Currently there are some consumers who have made decisions to go off-grid of their own accord for a range of reasons such as being too remote to make a grid connection a viable option or for personal preference.

PIAC understands that this rule change proposal is not targeting these customers. Instead, it is intended to capture customers who currently have a grid-connected supply but the DNSP has identified that an off-grid supply would be a more cost-effective option. For these consumers, there is currently no incentive for them to go off-grid even though it would be a lower cost option overall as these customers are not exposed to the full cost of supplying their grid connection (in the absence of locational network pricing).

As noted above, due to the nature of smaller distribution upgrades that effect supply a limited number of consumers at the fringe of the grid[3], many of the potential projects where consumers might be more effectively supplied by SAPS will be less than the cost threshold for conducting a RIT-D, currently $5 million.

PIAC notes that a SAPS system with a capital outlay of around $50,000 would supply a typical regional or remote residential user, with a level of reliability at least as high as what they receive from the grid, for a lower operating cost.

In the interest of identifying the most cost-effective measures to supply existing consumers, in PIAC's view, a less detailed investment test than a RIT-D (i.e.: a "RIT-D lite") should be applied

[3] Such as reconductoring, pole replacement, upgrading distribution transformers, installing switchgear and so on.

for any projects of less than $5 million that only supply a small number of customers. Noting the SAPS cost of $50,000, an appropriate threshold for this might be $100,000 per customer served.

c) *Does the issue identified by Western Power, and any barriers from (b), indicate that it may be appropriate to allow distributors to provide off-grid supply as a regulated service, in certain circumstances?*

It may be favourable for DNSPs to provide off-grid systems in cases where it is a more efficient solution to provide network services because they may be better able to provide continuity of service to the customer.

As noted earlier, SAPS are typically provided by small businesses (often sole traders) who, because they are not selling energy, have no obligations to comply with retail licencing or exemption arrangements or any other aspects of the National Electricity Rules. The only redress consumers have with SAPS providers is under Australian Consumer Law (ACL), which has no energy specific consumer protections.

PIAC notes the submission by ATA and CUAC in their 2015 New Products and Services in the Electricity Market Consultation Paper:

> Currently, the protections afforded to consumers who choose to go 'off the grid' are mostly limited to:
> - Electrical safety provisions, such as the wiring rules. These are mandatory for the standard household voltages (Low voltage, eg 240 VAC), however an electrical licence is not required to work on elements of a SAPS that operate at Extra Low Voltage (up to 48VAC and 110VDC). This means that battery systems and components can legally be installed and maintained by someone without a full electrical licence.
> - Clean Energy Council's SAPS installer accreditation. Importantly, a SAPS installer does not legally require this accreditation, and providers of cheaper poor quality SAPS can easily undercut more reputable providers that do have accreditation. In any case, this accreditation caters to traditional SAPS applications so does not specifically address the unique risks and needs of grid-connected consumers moving off-grid.
> - The ACL, which carries little in the way of energy-specific protections.[4]

Classification as a regulated service also provides a number of customer protections including regulatory oversight of expenditure, similar consumer experience to a grid-supplied customer and additional consumer protections specific to an off-grid system (see above Sections 2.2, 4 and 5.2, respectively).

Considering these protections, the provision of SAPS by a DNSP and as a regulated service under the National Electricity Rules may carry markedly less risk for consumers than provision by a small business as a contestable service outside of the Rules.

[4] ATA and CUAC, *Submission to COAG Energy Council Energy Market Reform Working Group on New Products and Services in the Electricity Market Consultation Paper*, 2015, pg. 10.

d) Other than concerns as to whether off-grid supply would constitute a distribution service, what barriers (such as other regulatory barriers or licence requirements) prevent distributors from seeking customers' agreement to move off-grid where it would be cost effective?

No response.

Question 2 Costs and benefits of moving to off-grid supply

a) Do you agree with Western Power's description of the costs and benefits of transitioning from grid supply to off-grid supply? What other costs and benefits should be considered?

Transitioning a customer from grid supply to off-grid supply may provide benefits in network costs in terms of reduced assets costs for the network infrastructure used directly to supply the customer(s), reduced asset costs for assets elsewhere in the network which are used to supply multiple customers, reduced operating costs in maintenance of remote distribution assets, potentially improved reliability and security, reduced network losses. In addition, there may be benefits of reduced carbon emissions from a greater reliance on local renewable generation than if supplied through a centralised grid. PIAC expects these benefits to be passed on to consumers through lower overall network costs.

The exact quantum of these costs and benefits will vary based on numerous factors.

b) What credible estimates are there of the current costs to procure, install and maintain (i) microgrids and (ii) individual power systems in fringe of grid areas of Australia? How are those costs broken down between electricity generation, network provision and retail costs/billing? How do these costs compare to the costs of providing electricity to such customers through the national grid?

- There are multiple possible configurations for an off-grid system for the situations considered in this rule change proposal, such as distributed generation behind the meter, distributed generation in front of the meter or centralised generation in front of the meter.
- Each of these will have different costs but most of these will have common factors including: requiring a lumpy capital investment to install, relatively cheap marginal cost to run once installed and requiring (smaller) lumpy capital investment for refurbishment after about 10 and 20 years.
- Today, a SAPS system with a capital outlay of around $50,000 would supply a typical regional or remote residential household, with a level of reliability at least as high as what they receive from the grid, for a lower ongoing operating cost than the wholesale component of energy sent from the grid.

c) Distributors, please provide information (to the extent you have any) on the number of your customers who are currently grid-connected but who you consider may be more cost-effectively served by (i) microgrids and (ii) individual power systems. Consider current and projected costs of those systems.

As noted above a SAPS system with a capital outlay of around $50,000 would supply a typical regional or remote residential household, with a level of reliability at least as high as what they receive from the grid, for a much lower ongoing and operating cost. The same system would

have cost approximately $78,000 in 2011. A Consumer Advocacy Panel-funded study by SKM MMA in 2011 found that, due to the higher upfront cost but lower ongoing costs associated with SAPS compared to energy supplied from the grid, it was more cost effective to

> spend approximately $78,000 up-front on a high quality, automated SAPS than to upgrade the grid at a cost of $50,000. To put that in perspective, $50,000 broadly equates to the cost of undergrounding 100 metres of existing powerline to a single home.[5]

d) *What are the key factors that make customers candidates for off-grid supply? For example, upcoming line replacements, local reliability or congestion issues, safety standards, line undergrounding requirements, declining costs of off-grid supply, presence of existing distributed generation?*

PIAC expects that key factors, as the rule change has proposed, would be cases where the DNSP is obligated to undertake significant network (capital) expenditure.

This may be where a consumer or group of consumers in a remote area are supplied by a long, stringy line which is due for replacement. There are many potential drivers for replacement including the asset(s) reaching the end of their useful life, the need for expensive refurbishment or repair, or jurisdictional obligations on issues such as bush fire risk.

Requirements to improve reliability or quality of supply may also be an important driver, especially in remote areas which are often characterised by a weak network and long time to restore power due to the remoteness of the area.

However, PIAC considers there are other opportunities where off-grid supply may be a lower cost option but is not highlighted because there is currently no need for the DNSP to replace or augment the existing grid connection.

Another factor is the level of energy use of the consumer. The lower the energy consumption of the customer, the more cost-effective an off-grid system will be as an alternative to grid-connected supply. Indeed, some very low energy use customers may be more efficiently supplied through an SAPS than grid-supply even in the absence of the need for a network augmentation or replacement project.

e) *Distributors, if you were permitted to supply the customers identified in question (c) through off-grid supply, please provide an estimate of your annual savings (if any). Please state any critical assumptions such as pricing approaches to be applied to off-grid customers.*

In addition to cost estimates for savings for avoided network replacement and maintenance costs sourced from DNSPs, PIAC recommends the AEMC consider other sources. For instance the Victorian Powerline Bushfire Safety Taskforce suggests that the capital cost of replacing a Single Wire Earth Return (SWER) line with covered wire would be between $112,490 and $221,910 per

[5] ATA, *Stand Alone Power Systems as an Alternative to Grid Connection at the Fringe of the Grid – Summary for Policy Makers*, 2012, pg. 4.

km and replacement with an aerial bundled conductor would be between $221,720 and $320,100 per km (2011 dollars).[6]

f) Other than the costs of the off-grid supply itself, what costs and benefits are likely to arise from moving certain customers off-grid, for the customer, the distributor, the customers remaining on the grid, retailers, local generators, or any other parties? How could any costs be mitigated?

Moving remote customers to off-grid supply will likely lead to lower operating expenses for the DNSP in terms of reduced maintenance of long, remote lines. These savings will then pass on to consumers through lower network charges. In addition, off-grid systems typically have shorter asset lives than the 40- or 50-year asset lives of many network assets, hence SAPS may in some cases be a better approach to dealing with uncertainty such as the energy sector is currently experiencing in terms of changing usage patterns and new technologies enabling alternatives to traditional supply options.

Question 3 Potential alternatives to the proposed rule

a) If a rule change is considered necessary, are there alternatives to the proposed rule which relate to the issues raised in the request and:
- *i) are consistent with the Law;*
- *ii) would allow all customers to benefit from lower costs by enabling electricity to be supplied in the most efficient way in each area; and*
- *iii) would result in customers who move to off-grid supply receiving electricity supply with appropriate reliability, quality, safety and other relevant consumer protections?*

PIAC recommends that the AEMC seek to retain as many aspects as possible of a grid-connected customer's relationships, interactions and protections for customers who are transitioned to off-grid supply as a more cost-effective alternative.

In addition, PIAC contends there is potential to clarify when the assets used in providing a SAPS as a more cost-effective alternative to continuing grid-connected supply are part of the distribution system. PIAC considers that this would provide additional certainty to consumers in terms of continuing the customer's relationships, interactions and protections. These are discussed further in Sections 3 and 4 above.

The issue of cost recovery for generation will also need to be considered. PIAC supports the DNSP owning and operating the generation assets in a SAPS where it is the most cost-effective solution to providing network services, provided any operating expenditure, such as for fuel for the backup generator or maintenance, is subject to appropriate regulatory oversight. Importantly, opex may change year to year depending on many factors including how often the backup generator is used due to weather, customer usage patterns and breakdowns.

PIAC considers there are a number of potential options including linking the generation charge to the wholesale spot market price, through a separate regulated price, and in the case where this operating expenditure is relatively small, it may be appropriate for the DNSP to not recover these

[6] Powerline Bushfire Safety Taskforce, *Powerline Bushfire Safety Taskforce Final Report*, 2011, pg. 66.

costs directly from the off-grid customer or retailer. These are discussed further in Section 3.3 above.

b) *Would the alternatives in (a) be able to be achieved through changes to the Rules alone, or would changes to other instruments, such as the Retail Rules or other laws, regulations or licences (jurisdictional or national) be required or desirable?*

Whatever rules are put in place to address this issue, the laws, regulations and licenses governing off-grid supply – in particular, those relating to consumer protections – will need to be reviewed and potentially revised.

Question 4 Assessment framework

Do you agree with the approach set out in section 3.3 to assessing whether the rule change request will, or is likely to, contribute to the achievement of the national electricity objective? If not, how should it be assessed?

In considering this rule change, it is important to note where that the impetus for taking the customer off-grid is from the DNSP and where it is from the customer themselves.

In the first case, the customer has not sought a change to their method of electricity supply and any change is done "behind the scenes" by the DNSP as the most cost-effective way of providing regulated network services. Therefore, the AEMC should seek to retain as many aspects as possible of a grid-connected customer's relationships, interactions and protections to these off-grid customers.

In the second case a customer nominates to receive their power supply from a SAPS that they themselves own or lease of their own volition, potentially as part of an agreement for that consumer to forgo their entitlement to receive energy from the grid in return for a payment. For those customers, additional protections specifically for off-grid customers are required as discussed above in 5.2 Specific protections for consumers going off-grid.

In either of these cases, the NEO can be supported by more cost efficient SAPS supply options that do not compromise reliability of supply, or require any consumer to pay more than they otherwise would, when compared to the grid.

Question 5 Competition issues relating to moving from grid supply to off-grid supply

a) *To what extent do you consider that distributors' ability to average the costs of grid-connected distribution services across their customer base inhibits the development of competition in off-grid supply as an alternative to grid connection?*

PIAC understands that the proposal will only extend to customers who are currently grid-connected and the DNSP identifies that an off-grid solution is a more cost-efficient alternative to continuing their grid supply. As the AEMC has noted, these customers do not currently have an incentive to pursue an off-grid supply.

PIAC also understands that the proposal will not extend to customers who are currently off-grid, in a microgrid or are seeking to go off-grid of their own volition. Further, it will not prevent such customers choosing for themselves to disconnect from the grid and purchase an off-grid solution through the competitive market.

Therefore, in the cases targeted by this proposal, PIAC does not consider that it will inhibit competition in off-grid supply.

Therefore, PIAC does not consider that this proposal will inhibit competition in off-grid supply in other cases.

PIAC reiterates that a customer's retention of any extant retailer choice is essential where the customer is taken off-grid by the DNSP as a more efficient way of providing its regulated services.

In the other case where a customer forgoes their entitlement to receive energy from the grid either of their own volition or in exchange for a payment from the DNSP, the customer should retain the ability to choose the provider of the SAPS.

b) *If the proposed rule (or a more preferable rule) is made, and the AER classifies off-grid supply as a standard control service, would distributors' ability to offer below-cost off-grid supply hamper the development of competition in the off-grid supply market, as costs of off-grid supply fall in the future?*

No. See answer to Question 5 a), above.

c) *In addition to the issues discussed in chapter 4, what other factors affect competition for providing off-grid supply in place of grid supply?*

No response.

d) *Would the AER's process for classifying distribution services, including considering the potential for the development of competition, provide an adequate way in which to address these competition issues in practice?*

No response.

Question 6 Competition issues arising after moving to off-grid supply

a) *Should a monopoly provider of a service in one area of the supply chain for off-grid services be able to provide an integrated service whereby it provides all the services forming part of off-grid supply, in circumstances where competition is limited?*

PIAC does not oppose an appropriately ring-fenced and regulated entity providing a vertically integrated off-grid service in the cases where the off-grid supply is the cost-effective alternative to continued grid-connected supply.

There is potential benefit in having an appropriately ring-fenced DNSP, at the very least, having long-term responsibility to maintain and replace the physical assets of an off-grid system. The DNSP can, for instance, provide greater assurance that they will honour warranties and manage the long-term costs of the assets.

PIAC also highlights that there are alternative configurations of off-grid supply than a completely vertically-integrated model as suggested by the rule change proposal. Some configurations that are outlined above in Section 3.2 retain many aspects of their grid-supply arrangements including a role for a retailer as in grid-connected supply and the use of a revenue meter as a line of demarcation between the customer's premises and the DNSP's network assets and infrastructure.

b) *If a customer moves to off-grid supply where one entity is the monopoly off-grid retailer, generator and distributor, what disadvantages are they likely to face due to the lack of ability to change retailers?*

While PIAC has many concerns about the effectiveness of retail competition for consumers in the current retail market, retail competition has the potential to provide benefit. Competitive tension between retailers ought to drive lower costs for consumers and encourage innovation in their offers.

As noted in Section 3.2, there are opportunities for off-grid supply to be arranged in a way that retains the current customer interfaces with their retailer and distributor. In these arrangements, the customer has the benefit of continuity of experience where they continue to pay their bills to a retailer, potential to access competitive retail offers and have access to the same consumer protections. These consumer protections include access to retailer hardship programs, access to rebates and vouchers, strict limitations on disconnection of supply, stringent protections for customers with life support equipment and access to binding dispute resolution processes – see Section 4.

This would also retain the obligation for Explicit Informed Consent (EIC) which ensures customers are provided with detailed, accurate, standardised and easy to understand information including the anticipated risks and benefits which may arise. PIAC holds broader concerns around shortcomings of the current information obligations, for instance that it does not address the need to disclose information in plain English and to ensure it is provided by someone competent to do so, but considers that obligations around EIC are essential to ensure that customers are given sufficient information and understand their rights, obligations and terms of energy service contracts they enter into.

PIAC also considers that EIC should apply to all contracts, whether short or long term, but understand that the implications will be different depending on the nature of the service.

As discussed by ATA and CUAC

> consumers should be able to readily change energy retailers to access better priced energy from the grid, or break a contract when their circumstances change, with little or no penalty. However, some innovative products and services for consumers inherently require a longer

term contractual commitment, as material up-front investment is made in providing and installing equipment.

In these cases, a consumer should not be restricted from accessing innovative products and services by protections that are intended to preserve access to competition in the retail market, however, a service provider must be able to demonstrate EIC such that the consumer is made aware that:

- They may be foregoing access to competition for some or all of their energy needs for some period of time ...
- They may be subject to some sort of additional charge to recoup some of a provider's cost outlay if their circumstances change - for example, if they move house and equipment has to be removed or relocated.[7]

Therefore, the AEMC should seek to retain as many aspects as possible of a grid-connected customer's relationships, interactions and protections to customers whose supply is changing from grid-connected to SAPS.

c) *Do the extent of any disadvantages under (b) depend on which entity provides the monopoly services (e.g. a licensed, regulated distributor, compared to an entity that is exempt from registration and licensing provisions under the Rules and state laws)?*

No response.

d) *How can any disadvantages under (b) be mitigated?*

As noted above, there are opportunities to retain access to retail competition for customers who are transitioned to off-grid supply. This would alleviate some of the disadvantages noted in (b).

Please see also the commentary on Explicit Informed Consent in (b).

However, if there is no ability to change retailer or retail offer, then an appropriate regulatory oversight is needed to ensure the customer is paying an efficient price. This may take the form of price regulation for the entire off-grid supply to the customer. Or it may take the form of a regulated price for the generation and retail components of the off-grid supply, while the network component is regulated as under a normal grid-connection.

e) *Is it desirable (in light of the long-term interests of consumers) that customers being moved to off-grid supply would be offered, or would be able to access, competitive offers for each component of off-grid supply (for example, provision of generating plant, maintenance of the plant, billing)? If so, what circumstances or policies would encourage this?*

Full contestability and choice in each disaggregated component of off-grid supply as described in the question would increase complexity for the customer for no apparent benefit, and at high risk given the integrated operation of SAPS.

[7] ATA and CUAC submission to COAG Energy Council Energy Market Reform Working Group on New Products and Services in the Electricity Market Consultation Paper, 2015, pg. 3-4.

This may be a poor outcome for customers because it would likely require multiple contractual relationships, potentially unclear responsibility if things go wrong, which may mean customers are left without a clear means of recourse and a significant departure from arrangements from a traditional grid-connection.

Nonetheless, as discussed earlier herein, when energy is supplied from a metered SAPS, retail competition can be preserved.

Question 7 Appropriate regulation of reliability of off-grid supply

In light of the varying reliability requirements that may apply to off-grid supply under the current arrangements, are specific consumer protections regarding the reliability of off-grid supply required before the Rules should allow distributor-led transition to off-grid supply?

Yes - the risks for off-grid consumers are different to those who retain a grid connection and additional consumer protections are required above those received by consumers who remain grid-connected.

PIAC considers that SAPS systems purchased outright by the consumer, including if incentivised by a DNSP to forego a grid connection, as an alternative way of providing network services should include:

- Performance guarantees regarding the frequency and duration of system outages
- Educating the customer about any differences between living with a grid connection and living with a SAPS (bearing in mind that for many customers a quality SAPS will improve reliability over a regional grid connection)
- Clearly demonstrating the Explicit Informed Consent of the customer, with particular emphasis on the customer's understanding of the differences between living with a grid connection and living with a SAPS
- Clear and fair contract terms with an appropriate cooling off period
- A transition period for customers where the premises is electrically isolated but not yet physically disconnected from the grid. This will allow the customer to trial the SPS for a period and, if they opt out of using the SPS and instead decide to retain the grid connection, the customer will not need to establish new grid connection infrastructure from scratch
- Full disclosure of detailed product information to allow for straightforward repairs and identification of the correct replacement parts
- Recording and reporting of disputes to the AER
- A prudential fund or insurance against the failure of the system.

If the move to off-grid supply is done as the most efficient way to provide network services, then it would be expected that the customer would not experience any reduction in service reliability and quality than under its previous grid-connection. But it should be noted that such off-grid options are most likely to occur, at least initially, in remote areas and an off-grid solution may provide a marked increase in service reliability and quality for these customers.

Further consideration may be required for how network service to off-grid customers is captured in DNSP reliability and service metrics such as the AER's benchmarking and the Service Target Performance Incentive Scheme (STPIS).

Question 8 Impacts on consumers of moving to off-grid supply – general questions

a) *Chapter 5 discusses various regulatory issues and considers the potential impacts of moving to off-grid supply under the current regulations. If you have further information on, or a different analysis of, any of these issues, please provide details.*

No response.

b) *What are the impacts on off-grid customers of ceasing to be covered by the protections in the Retail Law and Retail Rules, bearing in mind the protections provided by the Australian Consumer Law and by state laws?*

The Australian Consumer Law and state laws do not necessarily provide the types of electricity-specific protections necessary for customers as these are instead intended to be provided under the Retail Law and Retail Rules. These protections include:

- access to a retailer's hardship programs and repayment plans
- access to rebates and vouchers such as the Energy Accounts Payment Assistance (EAPA) Scheme in NSW
- strict limitations on retailers and distributors around the conditions under which the customer may be disconnected
- more stringent protections around disconnection for customers with life support equipment
- access to binding dispute resolution processes through the ombudsman's schemes.

PIAC considers there are there are opportunities for off-grid supply to be arranged in a way that retains the current customer interfaces with their authorised retailer and distributor and the customer may remain covered by the Retail Law and Retail Rules (see Section 3.2). PIAC considers this would be a more preferable outcome than a customer ceasing to be covered by the protections in the Retail Law and Retail Rules.

c) *To what extent are customers who move to off-grid supply likely to face additional risks relating to electricity supply not faced by grid supplied customers? If additional risks arise, what is the nature of these risks and how material are they?*

If a customer has behind the meter generation and storage on their premises but has retained their grid-connection, the consequences of a failure of their system will not involve losing access to essential electricity services.

By contrast, where a customer has a SAPS and forgone the connection to the network, the consequences of the SPS failing are considerably more severe. If there is no backup generator as part of the SAPS, it may mean completely losing access to essential electricity services for up to a week. Even if there is a backup generator which will allow for some electricity services to be provided, it can involve hundreds of dollars in fuel costs per week and may be limited in operation by the capacity of the generator or its noisy and polluting nature.

There is also potential for the customer's load to change in excess of the off-grid system's capacity to provide without increased generator run time. This may be due to growth in demand

and/or energy, changes in the time of usage or changes in the required level of security and/or reliability of supply such as the need for life support.

If generation charges for the metered SAPS system is unregulated, there is the risk that the off-grid customers may end up paying more than they were whilst still grid-connected. In this case, taking the customer(s) off-grid may be the most efficient option from the perspective of network service costs, however losing access to competitive centralised generation through the grid may drive up generation cost and cancel out the potential benefit to the customer if the business operating the generation source for the off-grid system is inefficient or sees this as an opportunity for windfall profits.

Stand Alone Power Systems as an alternative to Grid Connection at the Fringe of the Grid

Summary for Policy Makers

A report by the

Alternative Technology Association

May 2012

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Fringe of Grid SAPS Research – Summary for Policy Makers – Draft 300512 v1.0	30/05/2012	Damien Moyse – Energy Projects & Policy Manager		Final Version

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Executive Summary

With funding from the Consumer Advocacy Panel, the Alternative Technology Association (ATA) commissioned SKM MMA to undertake economic modelling of the costs and benefits of installing stand alone power systems (SAPS) for customers on the fringe of the electricity grid, as an alternative to distribution network replacement or augmentation.

Approximately $40 billion is to be invested in electricity distribution networks across the National Energy Market (NEM) during the current five year regulatory period – the costs of which are ultimately borne by all electricity consumers.

Given the distances involved and low density of customer connection points in fringe of grid areas, in many cases it will be more cost effective to meet customer energy requirements with a SAPS, rather than by network augmentation.

This research sought to quantify the long run energy costs (expressed as both 'levellised' and 'net present' costs) from a variety of SAPS designs as compared with the long run costs of upgrading the electricity grid in fringe of grid locations. More specifically, the research sought to identify the level of network capex at which it becomes more economically efficient to install a SAPS, rather than upgrade the electricity network.

The key finding of the research was the fact that it does not take large amounts of network capital investment to make SAPS a more economically attractive alternative.

Whilst ATA was not surprised to see that even the most costly off-grid option cost less in the long term than a $100,000 network upgrade, the research shows that it is more cost effective to:

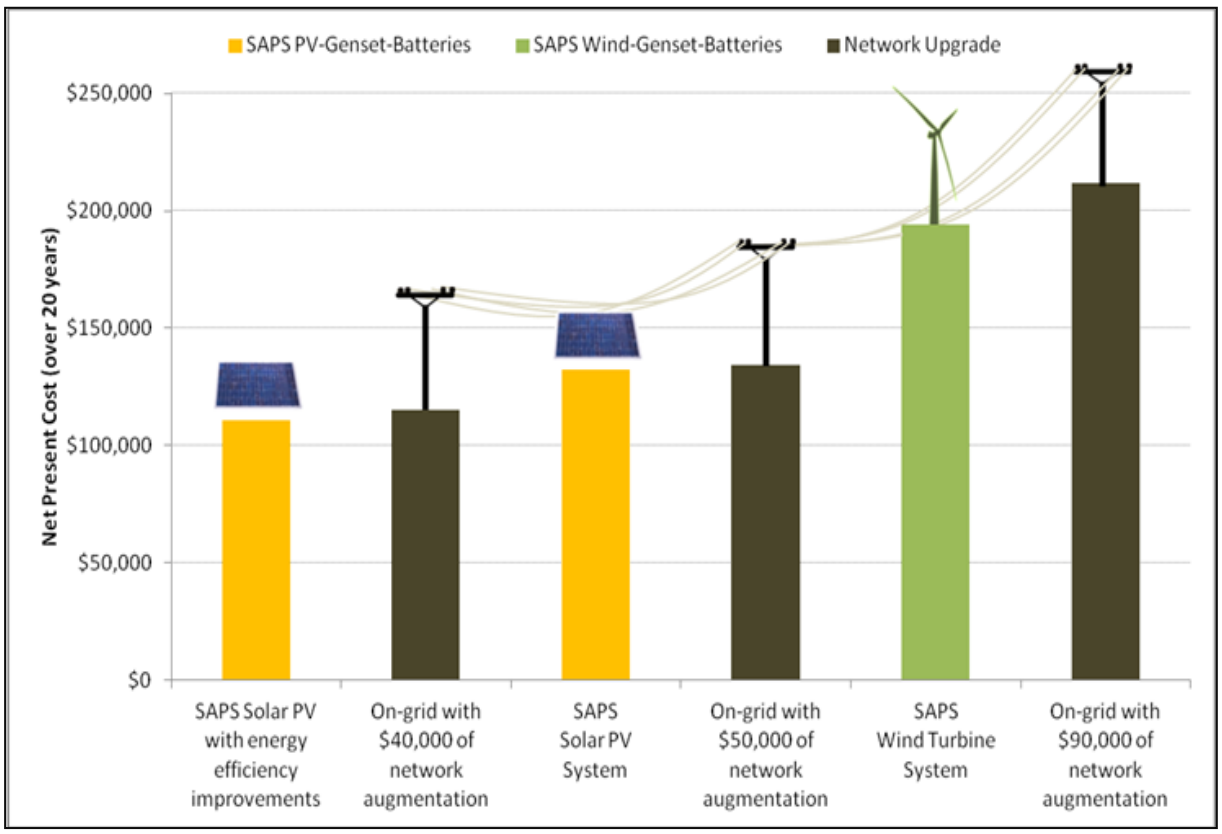
- spend approximately $78,000 up-front on a high quality, automated SAPS than to upgrade the grid at a cost of $50,000. To put that in perspective, $50,000 broadly equates to the cost of undergrounding 100 metres of existing powerline to a single home; or
- spend about $65,000 up-front on a high quality, automated SAPS and some basic home energy efficiency measures than upgrade the grid at a cost of $40,000.

Importantly, the SAPS considered in the modelling provide power of better reliability, quality and security than rural electricity networks. Expenditure on existing networks is a cost borne by all electricity consumers on that network. It is therefore clearly in keeping with the National Electricity Objective (NEO) to consider SAPS in place of extant network connections wherever it is more cost effective in the longer term than network upgrades.

ATA are of the view that these findings should be taken into account by governments and regulators across Australia when considering matters relating to energy supply in rural and remote areas.

The figure below compares the net present cost for the different SAPS scenarios modelled with those of grid augmentation.

Net Present Cost Comparison – SAPS versus Grid Augmentation



1.0 Introduction

With funding from the Consumer Advocacy Panel, the Alternative Technology Association (ATA) commissioned SKM MMA[1] to undertake economic modelling of the costs and benefits of installing stand alone power systems (SAPS) for customers on the fringe of the electricity grid, as an alternative to distribution network replacement or augmentation.

Stand Alone Power Systems as an alternative to Grid Connection at the Fringe of the Grid: Summary for Policy Makers provides an overview of the process undertaken and the outcomes of the modelling undertaken for the project.

For further details regarding the process, a price sensitivity survey and the assumptions and structure of the economic modelling, please refer to the background documents prepared by SKM MMA:

- *Preliminary assessment of stand alone power systems as an alternative to grid connections at the fringe of the grid*; and
- *Supplementary modelling on stand alone power systems as an alternative to grid connection at the fringe of the grid*.

1.1 Project Context

Approximately $40 billion is to be invested in electricity distribution networks across the National Energy Market (NEM) during the current five year regulatory period[2] – the costs of which are ultimately borne by all electricity consumers.

Given the distances involved and low density of customer connection points in fringe of grid areas, in many cases it will be more cost effective to meet customer energy requirements with a SAPS rather than by network augmentation. Importantly, this will likely be the case irrespective of whether the policy rationale is to meet increasing demand on a constrained network; improving power quality; replacing aging or damaged assets; or for policy objectives such as for bushfire start risk mitigation.

Commenced in mid 2010, this piece of research was initiated in response to the 2009 'Black Saturday' bushfires in Victoria. After the bushfires, the Victorian Government sought to understand what the costs would be to mitigate the bushfire risk of uninsulated powerlines, including 'single wire earth return' (SWER) lines[3], by replacing them with insulated conductors, relocating them underground or by improved operation and maintenance.

This research sought to quantify the long run energy costs (expressed as both 'levellised' and 'net present' costs) from a variety of SAPS designs as compared with the long run costs of upgrading the electricity grid in fringe of grid locations. More specifically, the research sought to identify the level of network capex at which it becomes more economically efficient to install a SAPS, rather than upgrade the electricity network.

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[1] ATA originally commissioned McLennan Magasanik Associates (MMA) to undertake this assignment. During the course of the project, the business of MMA was acquired by Sinclair Knight Merz (SKM) and the assignment was transferred to SKM MMA.

[2] AER, 2011. *State of the Energy Market*. ACCC, Canberra.

[3] Typically found in rural locations and were found to be the catalyst for a number of the Victorian fires.

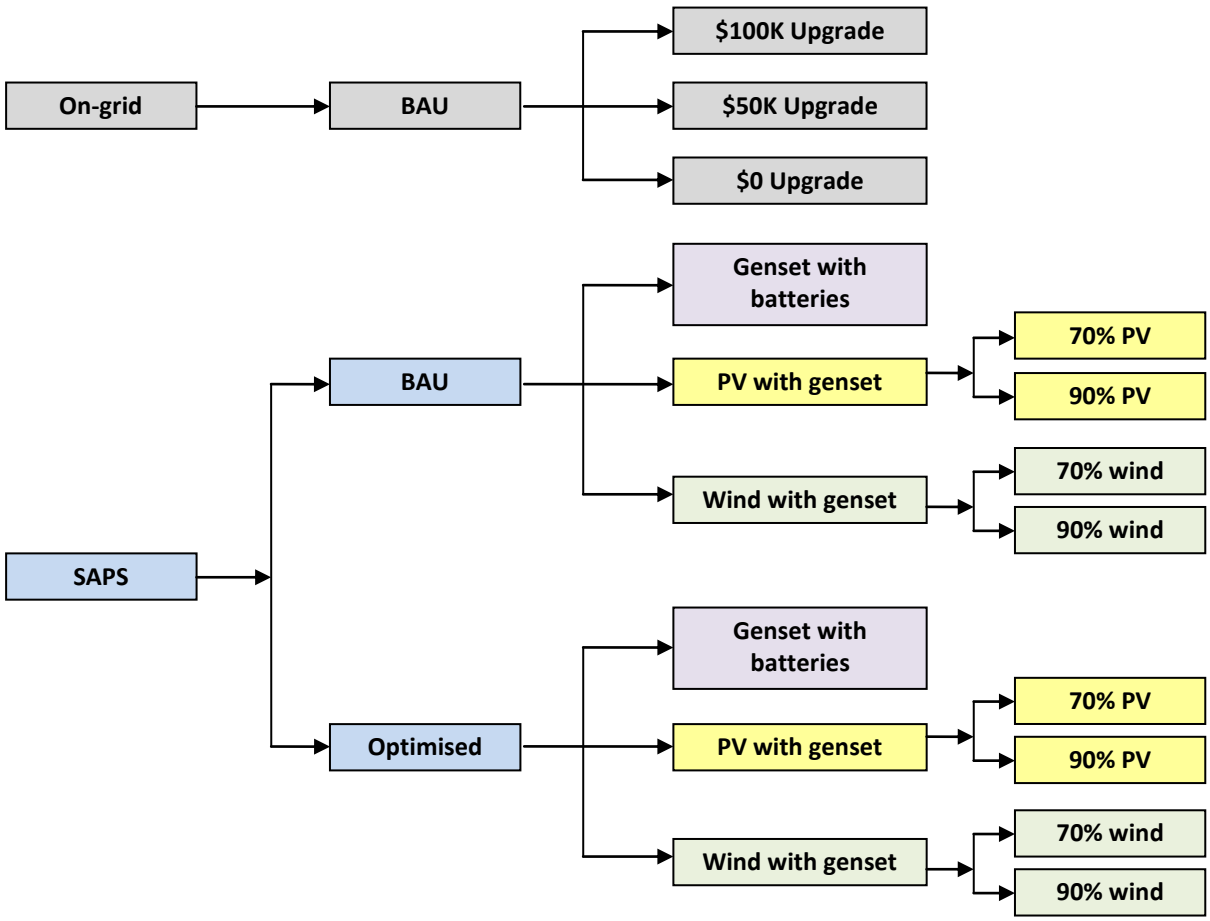
2.0 Project Methodology

Four approaches were utilised to determine the costs and benefits of SAPS at the fringe of the grid:

1. A survey of a reasonably energy literate cross-section of the rural population (based on members of the ATA) in order to:
   - obtain real data on electricity consumption and appliance type and use; and
   - understand the potential for end use energy efficiency improvements to reduce the capital cost of SAPS;
2. SAPS specifications and costs for high quality, fully automated SAPS provided by an independent SAPS installer, who specialises in SAPS design, installation and maintenance;
3. Modelling of the levellised and net present energy cost of various 'off-grid' scenarios with different SAPS systems; and
4. Modelling of the levellised and net present energy cost of three 'on-grid' scenarios – two reflecting the costs of distribution network upgrades that would continue to provide grid supplied electricity to fringe of grid customers and one reflecting the cost of no upgrade at all.

There were two primary options – that is, to remain grid connected ('on-grid'), or to move to a SAPS. Thirteen scenarios were then modelled that encapsulated a variety of on-grid and SAPS configurations and energy requirements. **Figure 1** outlines the thirteen scenarios modeled.

Figure 1: Relationship between the Scenarios



2.1 Model Scenarios

Within the on-grid scenarios, households continued to use their existing appliances in a business as usual (BAU) manner – meaning there was no change to the household appliances or use thereof. The electricity would be delivered via existing conductors; or by upgrades to the network[4]. The capital cost of upgrades to the network were valued at $50,000 and $100,000 respectively[5].

For the purposes of this project, the capital cost of network upgrades has been considered as any expenditure incurred for works between the customer and point of common coupling with other customers on the network. However, there may be cases where the avoided costs attributable to an individual SAPS occur elsewhere in the network (for example, through avoiding the need to upgrade the thermal capacity of a shared network component) and these values apply equally in that situation to any avoided costs.

Within the SAPS option, households could continue as business as usual (with respect to appliance or load requirements) or the household and SAPS could be 'optimised' by:

- replacing some appliances (e.g. fridges) with more efficient technology; or
- fuel switching (e.g. replacing electric hot water with electric boosted solar hot water).

Undertaking either of these investments would obviously reduce daily load requirements and therefore the cost of the SAPS. Importantly, the costs of all these improvements are incorporated into the levellised and net present energy costs for these optimised scenarios.

Based on the survey data, the average daily electricity use was assumed to be 13.7 kWh per day for the 'BAU' case; and 12.1 kWh per day for the 'Optimised' case.

ATA note that far greater cost effective efficiency gains would be achievable in reality than those within the 'optimitised' scenarios. This of course would lead to SAPS with lower capital, and net present energy costs.

Within the SAPS option, there were three potential SAPS designs. The electricity could be generated by:

- a diesel generator (genset) alone;
- a solar photovoltaic (PV) system with genset backup; or
- A small wind turbine with genset backup.

All of these options included batteries. Within the solar PV and wind based systems, there were two levels of renewable contribution modelled – those being either 70% or 90%.

[4] For example, by new insulated unscreened conductors (IUC) or underground conductors, or modifications to the control or operation of the network – such as the use of smart re-closers or earth fault neutralisers.

[5] While the cost of upgrades to supply some homes may extend well beyond that range, it was unnecessary to consider more expensive network upgrades to capture the point at which SAPS become more cost effective.

2.2 Modelling Parameters

With respect to the modelled scenarios, the following parameters were fixed for each sensitivity, with the values shown in **Table 1** being for the base sensitivity.

Table 1: Parameters for the Modelling

Parameter	Values for base sensitivity
Diesel price	$1.50/L
Generator operating cost, excluding fuel	$1.50/hour
Inverter cost	$9,290
Inverter operating cost	$100/year
Battery operating cost	$0/year
Wind turbine maintenance cost	$200/year
PV maintenance cost	$0/year
STC price	$35

No residual values were assumed for the gensets, inverters, batteries, wind turbines or PV panels, however it is fair to assume that the salvage value of these items would further reduce the levellised and net present costs under the SAPS scenarios.

The basic SAPS parameters for each of the scenarios are shown in **Table 2** below.

Table 2: SAPS Scenario Parameters

Scenario	Daily electricity use	Generator size (kVA)	Generator use (h/year)	Size of PV unit (kW)	Size of wind generator (kW)
On grid BAU	13.7	N/A	N/A	N/A	N/A
SAPS BAU Genset w Batteries	13.7	13	1,004	N/A	N/A
SAPS BAU PV 70%	13.7	13	302	2.63	N/A
SAPS BAU PV 90%	13.7	13	57	3.6	N/A
SAPS BAU Wind 70%	13.7	13	300	N/A	5
SAPS BAU Wind 90%	13.7	13	75	N/A	5
SAPS Optimised Genset with Batteries	12.1	13	877	N/A	N/A
SAPS Optimised PV 70%	12.1	13	252	2.63	N/A
SAPS Optimised PV 90%	12.1	13	77	3.15	N/A
SAPS Optimised Wind 70%	12.1	13	220	N/A	5
SAPS Optimised Wind 90%	12.1	13	100	N/A	5

2.2.1 Cost Methodology for PV

PV units were specified by the SAPS installer, assumed to have a life of 25 years and to require no maintenance beyond the unskilled labour required to clean the surface periodically. **Table 3** outlines the installed capacities and capex of the PV systems.

Table 3: PV Installed Capacity & Capex

Scenario	Installed Capacity	PV Capex ($)
SAPS BAU PV 70%	2.63	$14,700
SAPS BAU PV 90%	3.60	$20,160
SAPS Optimised PV 70%	2.63	$14,700
SAPS Optimised PV 90%	3.15	$17,640

2.2.2 Cost Methodology for Wind

A 5.0 kW Westwind generator was specified for all wind scenarios, as this turbine would always exceed the minimum energy requirements. Capex on a 22 metre tower was $45,620, with the major components being the tower, the turbine, and installation costs.

Opex was based on several hours of skilled maintenance per year (not necessarily required each year, but averaged at $200 per year over the generator life); and a major overhaul costing 50% of the original generator cost every 10 years. The overhaul allowed for replacing major components, such as blades or controllers.

2.2.3 Cost Methodology for Diesel Gensets

A 13 kVA JCB generator was used for all scenarios, with mean fuel consumption of 3.5L per hour. The gensets were assumed to require a major overhaul after 20,000 hours, but they did not reach this number of hours in any of the scenarios during the 20 year system life.

Genset opex was based on fuel, consumables such as filters and lubricants and routine maintenance costed for a typical year and then converted to a cost per hour of operation for use in the scenarios.

To ensure high reliability of supply through full redundancy, the generator was sized to be able to supply the full electrical load of the house if needed. This is important, as it meant that the systems in all scenarios would provide better reliability than the grid connections they were to replace.

2.2.4 Cost Methodology for Inverters & Batteries

All of the scenarios used a Selectronic 7kW fully automatic interactive inverter. As with the generator, to ensure high reliability of supply through full redundancy, the inverter was sized to be able to supply the full electrical load of the house if needed.

Hoppecke Gel batteries were specified operating to a 50% depth of discharge. One day of autonomy was specified for gensets with batteries; two days for the 70% renewables scenarios and three days for the 90% renewables scenarios.

No maintenance was required as the batteries were sealed gel batteries and the expected life of the inverter and batteries was 15 years. **Table 4** outlines the capacities and capex for batteries:

Table 4: Battery Capacities & Capital Cost

Scenario	Capacity (Amp hours)	Capex ($)
On-grid BAU	N/A	N/A
SAPS BAU Genset w Batteries	1,000	$21,120
SAPS BAU PV 70%	1,250	$22,440
SAPS BAU PV 90%	1,700	$33,792
SAPS BAU Wind 70%	1,250	$22,440
SAPS BAU Wind 90%	1,700	$33,792
SAPS Optimised Genset w Batteries	750	$15,312
SAPS Optimised PV 70%	1,000	$21,120
SAPS Optimised PV 90%	1,250	$22,440
SAPS Optimised Wind 70%	1,000	$21,120
SAPS Optimised Wind 90%	1,250	$22,440

3.0 Modelling Outputs

3.1 Capex

Table 5 summarises the capital costs in the first year of the various scenarios and their energy sources.

Table 5: First Year Capital Costs

Scenario	Capital Cost ($)	Daily Electricity Load (kWh)
BAU On grid	$0	13.7
BAU On grid - $50K Upgrade	$50,000	13.7
BAU On grid - $100K Upgrade	$100,000	13.7
SAPS BAU genset with batteries	$49,242	13.7
SAPS BAU PV 70%	$60,744	13.7
SAPS BAU PV 90%	$78,557	13.7
SAPS BAU Wind 70%	$96,716	13.7
SAPS BAU Wind 90%	$109,203	13.7
SAPS Optimised genset with batteries	$45,061	12.1
SAPS Optimised PV 70%	$61,500	12.1
SAPS Optimised PV 90%	$65,826	12.1
SAPS Optimised Wind 70%	$97,472	12.1
SAPS Optimised Wind 90%	$98,924	12.1

3.2 Levellised Energy Cost & Net Present Cost

The model then estimated the levellised energy cost of all scenarios – i.e. the lifetime cost per kWh, where both costs and generation are calculated as net present costs by applying a discount rate.

For the SAPS scenarios, a discount rate of 5% was used, this being reflective of the value of money in the pocket of a household or private individual. This would be indicative of the life cycle cost of a system where, for example, a one-off payment has been made to the household to go off grid.

For the on-grid scenarios, a discount rate of 10% was selected, as this is close to the long term Weighted Average Cost of Capital (WACC) used by distribution businesses in Australia when funding network operational and capital expenditure. A 15% discount rate was also tested across all scenarios as part of the sensitivity analysis.

The on-grid scenarios used a conservative forecast of the average price of electricity (taken from mid 2010) for the next 20 years, that being $0.38/kWh. This figure was derived from SKM MMA's energy market cost model. It refers to the long term average price paid by customers for the service charge and the energy charge and is indicative both of the long term cost of supplying the customer, and also what the customer may be reasonably expected to contribute towards their energy consumption if a SAPS is installed.

The overall purpose of the modelling was to attempt to ascertain at what point it would be more cost effective to install a SAPS for a grid connected customer instead of upgrading the electricity grid. Due to the differing energy use profiles of the BAU and optimised loads used in the SKM MMA modelling, the levellised cost calculated has been identified as a sub-optimal metric upon which to compare the different scenarios modelled.

For this reason the cost for each scenario (presented as a net-present-value over 20 years) has been chosen to compare the scenarios and identify the point at which choosing a SAPS becomes more economic than choosing to augment the grid.

3.3 SAPS v Grid Augmentation

Table 6 summarises the results of the modeling and presents both the levellised energy cost, and the net present cost of each scenario over 20 years.

Table 6: Levellised Energy Costs and Net Present Cost for each Scenario

Scenario	Levellised Energy Cost ($/kWh)	Net Present Cost ($) over 20 years
BAU On grid[6] (no augmentation)	$0.38	$38,004
SAPS Optimised PV 90%[7]	$1.25	$110,413
SAPS Optimised PV 70%[7]	$1.36	$120,129
SAPS BAU PV 70%[7]	$1.24	$124,012
SAPS BAU PV 90%[7]	$1.32	$132,013
On grid at $50,000 network upgrade[6]	$1.34	$134,013
SAPS Optimised Genset with Batteries[7]	$1.79	$158,111
SAPS BAU Genset with batteries[7]	$1.71	$171,017
SAPS Optimised Wind 70%[7]	$2.00	$176,660
SAPS BAU Wind 70%[7]	$1.92	$192,019
SAPS BAU Wind 90%[7]	$1.94	$194,019
SAPS Optimised Wind 90%[7]	$2.20	$194,326
On grid at $100,000 network upgrade[6]	$2.31	$231,023

[6] With 10% discount rate, for distribution network businesses, reflective of long term WACC settings.
[7] With 5% discount rate, for private individual / household investment.

Table 6 demonstrates that a number of the SAPS scenarios were more cost effective than even a $50,000 network upgrade.

ATA therefore sought to demonstrate at what point the economic 'cross-over' would occur where the cheapest SAPS scenario, as modelled under the research, was more cost effective than a network upgrade.

The modelling allows the calculation of the required capex of a network upgrade for any equivalent value of net present cost. For ease, a formula is presented here for this relationship:

$$\textit{Equivalent CAPEX of Grid Augmentation (\$)} = 0.518 \times NPC - 19590$$

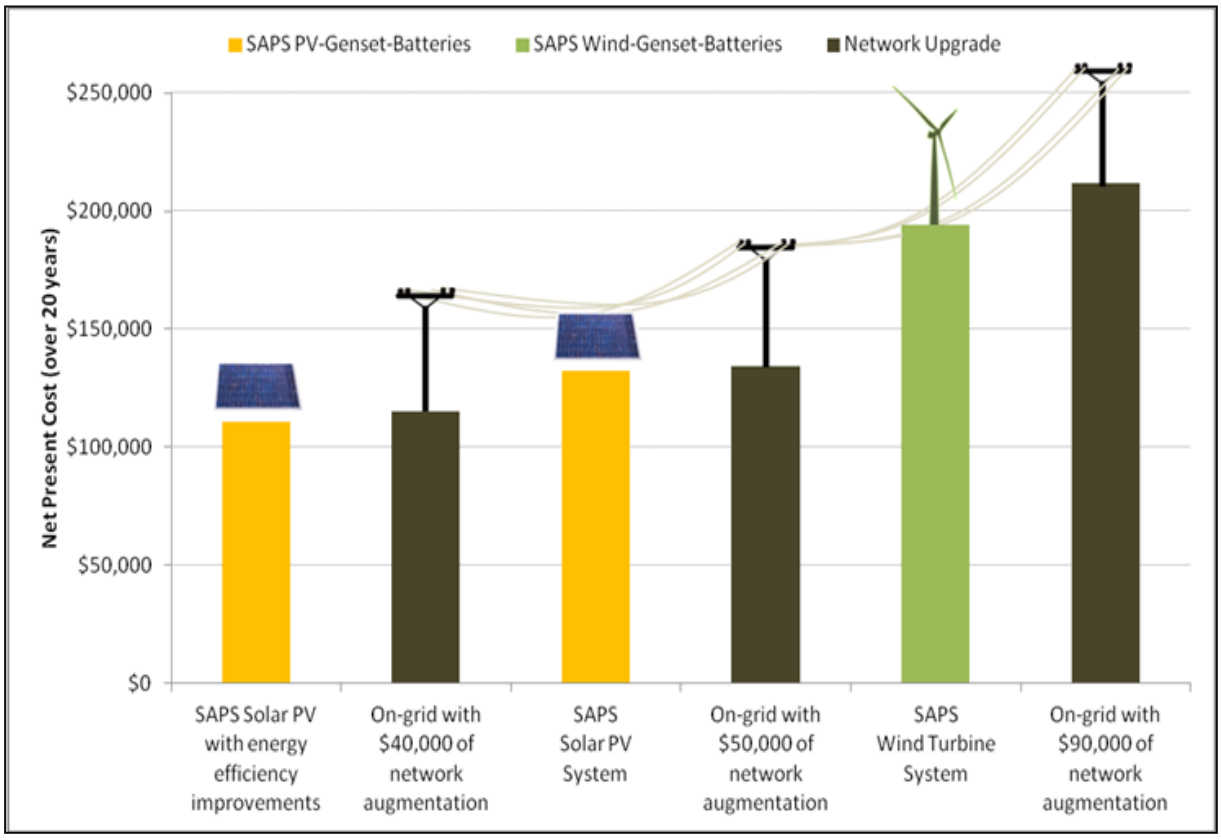
Where:

NPC is the Net Present Cost of a grid augmentation alternative

Using this formula, ATA calculated the required capex of network augmentation to be **$37,600** for the equivalent net present cost for the cheapest SAPS scenario. It is above this level of network capex that SAPS (with some basic home energy efficiency improvements) are more cost effective under the scenarios presented by this modelling.

In line with the above, **Figure 2** compares the Net Present Costs for a number of the SAPS scenarios with those of grid augmentation.

Figure 2: Net Present Cost Comparison – SAPS versus Grid Augmentation



4.0 Discussion of Findings

A number of assumptions have been made in order to build this model. The realities driving these assumptions are constantly changing, and for the most part, these changes continue to reduce the cost of SAPS and increase the costs of network augmentation.

One of the most significant of these variables is the installed costs for SAPS – and in particular, the solar based systems. With the project commencing in 2010, relevant installed costs had to be used at that point in time. Since mid 2010, the cost of solar panels has dropped in the order of 30%.

Electricity prices are also difficult to predict, with the model using conservative figures with respect to the levellised cost of energy from the grid for the next 20 years (based on 2010 input values).

At the time of publication of this *Summary* document (May, 2012), recent increases in electricity prices in excess of earlier forecasts have been experienced in most states. With the amount of distribution investment expected nationally over the next five to ten years, it is possible that the average levellised cost of energy from the grid over the next 20 years will be higher than the $0.38/kWh reported in this study.

The key finding however is the fact that it does not take significant amounts of network capital investment to make SAPS a more attractive economic proposition.

Whilst ATA was not surprised to see that even the most costly off-grid option was cheaper in the long term than a $100,000 network upgrade, the report shows that it is more cost effective to:

- spend approximately $78,000 up-front on a high quality, automated SAPS than to upgrade the grid at a cost of $50,000. To put that in perspective, $50,000 broadly equates to the cost of undergrounding 100 metres of existing powerline to a single home; or

- spend about $65,000 up-front on a high quality, automated SAPS and some basic home energy efficiency measures than upgrade the grid at a cost of $40,000.

ATA are of the view that these findings should be taken into account by governments and regulators across Australia when considering matters relating to energy supply in rural and remote areas.

Best practice-designed, standards-compliant, SAPS provide power of better reliability, quality and security than rural electricity networks. Expenditure on existing networks is a cost borne by all electricity consumers on that network. It is therefore clearly in keeping with the National Electricity Objective to consider SAPS in place of extant network connections wherever it is more cost effective in the longer term than network upgrades.

For further project details, including all of the detailed analysis and assumptions underpinning the modeling, the following two additional documents can be obtained from ATA's Melbourne office:

- *'Preliminary assessment of stand alone power systems as an alternative to grid connections at the fringe of the grid'*; and
- *'Supplementary modelling on stand alone power systems as an alternative to grid connection at the fringe of the grid'*.

ATA and CUAC Submission:
New Products and Services in the Electricity Market Consultation Paper

Energy Market Reform Working Group

COAG Energy Council Secretariat

GPO Box 9839

Canberra ACT 2601

Submitted by email to: energycouncil@industry.gov.au

30th March 2015

Dear Energy Market Reform Working Group,

The Alternative Technology Association (ATA) and the Consumer Utilities Advocacy Centre (CUAC) welcome the opportunity to provide feedback to the Council of Australian Governments Energy Council (COAGEC) regarding the regulation for new energy products and services in the energy market. We thank the Energy Market Reform Working Group (EMRWG) for preparing a very useful consultation paper and for their endeavours to include consumer advocates in this important and timely discussion.

Founded 35 years ago, the ATA is a National, not-for-profit organisation whose 5,500 members are residential energy consumers.

Through the application of our experience in energy policy and markets to our advocacy and research, and close collaboration with fellow members of the National Energy Consumer Roundtable, the ATA is an important voice for energy consumers Australia-wide.

ATA presents a uniquely two-fold perspective as a consumer advocate: with the continuing support of the Consumer Advocacy Panel (now Energy Consumers Australia) we represent all small energy consumers in with respect to the promotion energy affordability and improvements to the NEM, and speak with authority on behalf of the growing portion of the consumer base who have an active interest in demand side participation.

CUAC is a specialist consumer organisation established in 2002 to represent Victorian energy and water consumers in policy and regulatory processes. As Australia's only consumer organisation

focused specifically on the energy and water sectors, CUAC has developed an in-depth knowledge of the interests, experiences, and needs of energy and water consumers.

Our work is guided by strong principles. Energy and water services are essential for health, wellbeing, and social participation. Therefore, we believe that consumer interests – particularly those of low-income, disadvantaged, and rural and regional consumers – must be a primary consideration in the development and implementation of energy and water policy and in service provision. CUAC's advocacy maintains a focus on the principles of affordability, accessibility, fairness, and empowerment through information and education. CUAC supports informed consumer participation in energy and water markets.

We have endeavoured to respond directly herein to the questions posed in the consultation paper, as well as exploring some related matters

1. ***Do these three markets cover all new products and services that could be offered to small electricity customers?***

Yes.

2. ***Are these principles useful for identifying whether a product or service should be drawn into the National Electricity Law and Rules?***

For the most part, yes.

We are of the view that it is also important to specifically consider 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 electricity; and the impact on the consumer of experiencing payment difficulties and hardship.

Explicit informed consent

We note that **explicit informed consent** (EIC) is essential. EIC ensures that customers are given sufficient information and understand their rights, obligations and the terms of their energy or energy management services contract, whenever they enter into an agreement with the energy business.

Customers should be provided with detailed, accurate, standardised and easy to understand information about the product or service that is on offer, and the anticipated risks and benefits that may arise from their use before they sign up to the product/service. The National Energy Customer Framework (NECF)[1] however does not address the need to disclose information in plain English and

[1] s39 National Energy Retail Law

to ensure that consent is provided by someone who is competent to do so. This is a concern in view of the poor practices that are often employed in marketing to vulnerable consumers from non-English backgrounds and those with poor literacy.

In a recent judgement against retailer Energy Australia, Justice Gordon said EIC *"goes to the very core of stability and transparency of the energy market when considered from the perspective of consumer confidence. All participants in the industry must not only understand the central importance of the need to obtain the explicit informed consent of consumers but ensure that they have procedures in place which ensure that this is achieved."* In our view, this applies equally to emerging energy services.

In our experience, it is not necessarily in a business' interest for consumers to understand, for example, the nuances of retail price offerings as businesses benefit from the 'confusopoly' that leads to consumers making sub optimal choices. Some of the new products and services have the potential to be more confusing than existing retail and energy service products due to added complexity.

It is therefore incumbent on government and regulators to ensure that, in addition to robust consumer protections, consumers have basic information tools to help them fully understand the new product and service. All contract terms and conditions and product information sheets must be easy to understand and accurate. In addition, full disclosure of information about product or service attributes and use is important.

We note that the Australian Energy Market Commission (AEMC) had, in the Power of Choice Review, recommended a comprehensive consumer awareness program prior to the implementation of pricing and metering reforms to assist consumers make informed choices about their electricity consumption and realise the benefits and opportunities of taking up demand side participation (DSP) products and services. We view the AEMC's recommendation on consumer awareness as relevant to the new products and services contemplated in this consultation paper. We note that a continuing education program is more appropriate than a once-off campaign, and government and industry may both have a role in such a program.

We are of the view that EIC should apply to all contracts, whether short or long term. The implications of the longer term contracts to with respect to EIC will be different to short term. For example, with traditional energy retail services, consumers should be able to readily change energy retailers to access better priced energy from the grid, or break a contract when their circumstances change, with little or no penalty. However, some innovative products and services for consumers inherently require a longer term contractual commitment, as material up-front investment is made in providing and installing equipment.

In these cases, a consumer should not be restricted from accessing innovative products and services by protections that are intended to preserve access to competition in the retail market, however, a service provider must be able to demonstrate EIC such that the consumer is made aware that:

- They may be foregoing access to competition for some or all of their energy needs for some period of time. Cases exist today where consumers have been disadvantaged by a lack of awareness that they are foregoing competition when making long-term decisions to use LPG (bottled gas) appliances.
- They may be subject to some sort of additional change to recoup some of a provider's cost outlay if their circumstances change - for example, if they move house and equipment has to be removed or relocated.

Where the customer is disconnecting from the grid, even if the consumer is purchasing a Stand Alone Power Supply (SAPS) outright, the SAPS provider should be required to comply with EIC conditions that extend well beyond those required under the Australian Consumer Law (ACL). These should include:

- Providing a performance guarantee with respect to the frequency and duration of system outages
- Educating the customer about the difference between living with a grid connection and living with a SAPS
- Demonstrating that they have the EIC of the consumer, with particular emphasis on the customer understanding the above matters.

Triggers for including new consumer protection regulations under NECF

Appropriate consumer protections will, ideally, be in place prior to any new products and services becoming available in the market.

We note however that not all of these new products and services have actually been envisaged yet. Where it is impossible to predict the market for new products and services far in advance, COAGEC should have a process in place for an adequate policy response when a new product or service is introduced, with a view towards enhancing and strengthening consumer protections where this is appropriate, and responding to risk.

This process should be complemented by a robust and proactive approach to monitoring each new product and service as they emerge which would also allow risk assessments to be made. The policy response process may also more easily facilitate the entry of a new product or service where it is found that a new product or service does not warrant such strong consumer protections

ATA and CUAC have contemplated whether it might be appropriate to effectively restrict access to all new services until new regulations are implemented. With the exception of high risk services[2], we do not support banning new services outright, as:

[2] For example, consumers with medical needs should be protected from signing up to new products and services that would potentially cause or exacerbate any detriment to their health, wellbeing or

- it's simply impractical to restrict new services altogether;
- banning could drive the services underground, giving rise to dodgy operators, to the detriment of consumers;
- access to beneficial new products or services might be delayed some years while waiting for new protections to be implemented;
- overcoming a general ban is a significant barrier for new entrants to any market, potentially stifling innovation; and
- in any case it is still possible to ban individual products and services if and when needed[3]

3. ***Is this principle useful for identifying whether a product or service should be drawn into the NECF?***

We are of the view that it is also important to specifically consider 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 electricity; and the impact on the consumer of experiencing payment difficulties and hardship.

4. ***Are there other products and services emerging in the electricity supply market (beyond distributed generation and storage) that we should consider in our advice to Ministers?***

In our view, appropriate energy-specific consumer protections should apply to all or most current and future energy related services for households, such as

- Energy trading arrangements:
  - Buying from and selling to the grid
  - Buying and selling 'behind the meter'
  - Multiple Trading Relationships
  - Residential demand response

- Energy services involving the leasing or operation of household-scale energy generation, consumption and management, such as
  - Energy generation systems
  - Energy storage systems
  - Electric vehicles.
  - Operation of smart appliances

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safety. We do not support the use of supply capacity control for credit management services. (See our response to Q4.)

[3] As has already occurred in Victoria with the ban on using Supply Capacity Limiting

  - Direct load control
  - Optimisation services across multiple loads and energy sources

- Energy services may be provided by
  - Retailers
  - Networks service providers
  - Demand Response businesses
  - Electric vehicle providers
  - Community energy groups
  - Stand Alone Power System or microgrid operators

There are some products and services that we object to outright, and for which no level of protections is appropriate beyond outright prohibition; in particular, the use of supply capacity control as a credit management tool. In Victoria, energy retailers are prohibited from offering a supply capacity control product to customers for any credit management purposes.[4]

Care must be taken to ensure that vulnerable consumers do not sign up to new products and services (in particular supply capacity products) that would potentially cause or exacerbate any detriment to their health, wellbeing or safety; for example, consumers on fixed incomes, the elderly, those with disabilities, those who are on life support, or have medical cooling and heating needs.

5. ***Do you agree that the National Electricity Law and Rules can accommodate new products and services in this market, through the framework for authorising and exempting generators and network operators?***

As they stand, no.

The energy market has been undergoing a considerable amount of change, including greater numbers of consumers moving to market contracts and taking up new products and services as a result of smart metering and other technological advancements. These new products, services and innovative business models were not contemplated at the time when the NECF was drafted.

Importantly, the requirement for retail authorisations and exemptions needs to be based on the provision of energy services, rather than solely on the sale of energy.

ATA and CUAC are of the view that the need for, and level of, regulatory intervention in the interest of providing consumer protection should be based not on the transaction of energy (ie on metered energy flows), but on:

[4] Clause 76A, (Harmonised) Energy Retail Code (version 11, 1 January 2015)

- 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 electricity; and
- the impact on the consumer of experiencing payment difficulties and hardship

6. ***Is the NECF flexible enough to allow the AER to ensure customers of alternative energy sellers have appropriate consumer protections?***

As it stands, no.

Importantly, the requirement for retail authorisations and exemptions needs to be based on the provision of energy services, rather than solely on the sale of energy.

The NECF only gives the Australian Energy Regulator (AER) jurisdiction to regulate for sale of energy, hence retail authorisation and exempt selling arrangements apply today only where there is a financial transaction relating to the volumes of energy.

This means that providers of many energy related services, that are in other respects – including the impact on consumers - similar to those where energy is transacted, will not be regulated beyond the ACL with respect to consumer protections.

Until now, this approach has been suitable given the nature of exemptions, but now this needs to be brought up to date, as it leaves current and future energy consumers vulnerable to a lack of energy specific protections.

The below diagram illustrates 20 possible relationships arising from potential new services in the energy market. All of the new services and relationships noted currently sit, in whole or part, outside of current NECF arrangements and therefore outside energy specific consumer protections. more than a half of which involve consumers directly

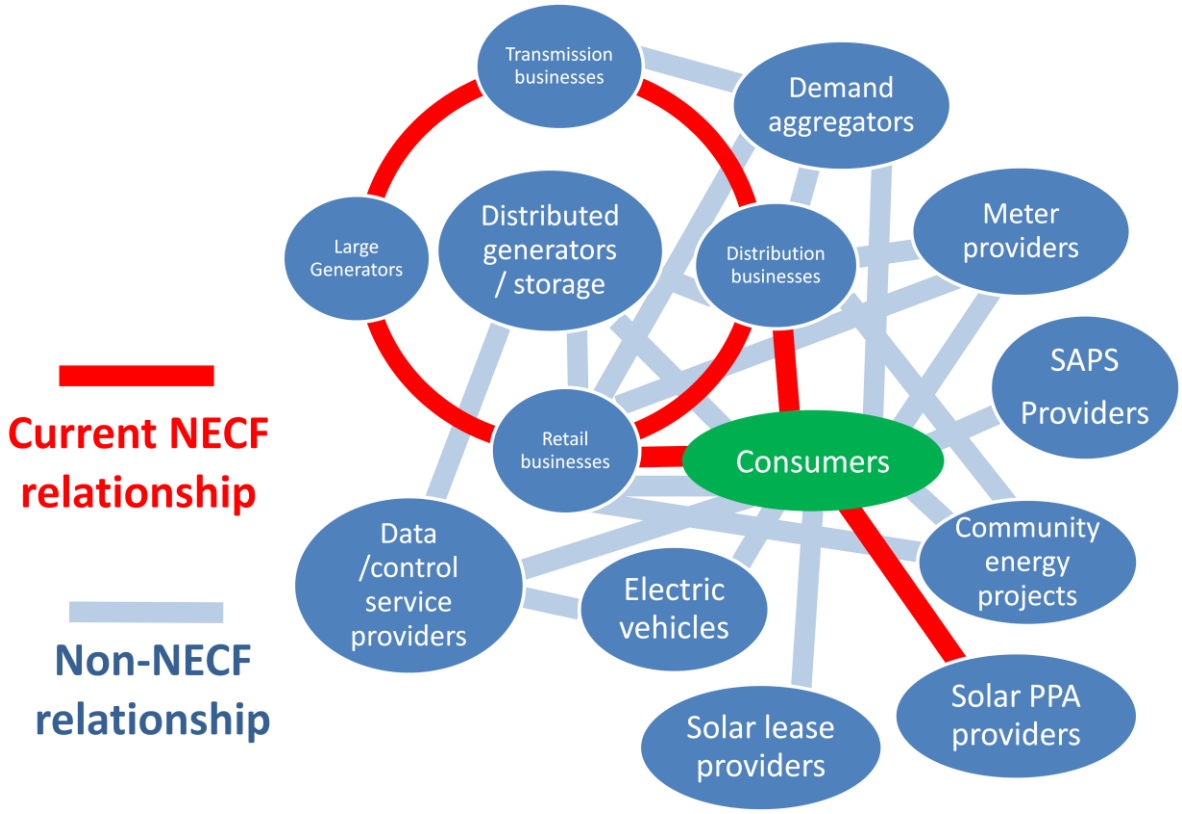

Figure 1 – The connecting bars represent current and potential future energy relationships. Those in red are covered by NECF today; those in blue are not.

Consumer impacts arising from lack of regulations

Limiting regulations only to where energy is metered and traded runs the risk of creating loopholes, whereby the provider of the product or service can avoid complying with some consumer protections and other requirements simply by and not selling energy on a per kWh basis thus avoiding the need for an exemption. This is not a mere theoretical risk: it is happening today.

One example of this today is solar leasing products. Under a typical solar leasing arrangement, a consumer makes a regular payment for a solar array that remains the property of the provider until fully paid for. In this case the consumer actually takes on markedly more risk than they do under Solar Power Purchase Agreements (SPPA), as they (the consumer) carry most of the volume risk[5] Perversely, the consumers are afforded lower levels of protection under the (usually higher risk) solar leasing arrangement than under the (usually lower risk) SPPA arrangement.

[5] The volume risk relates to the production of energy over the life of the system. It is very common for solar arrays to generate less – in some cases, as less than half over the long term – of the energy that the provider has predicted at the time of sale, due to the impact of many factors including component performance, breakdown, and shading. Under an SPPA arrangement, where payments are based on the metered output, the provider carries this volume risk, however under a financing arrangement, where repayments are fixed regardless of performance, the consumer carries the risk

One example (out of many) situations that may arise in the future is where the electric vehicle (EV) charge business providing an intermediary service to a consumer makes a common mistake - like adjusting for daylight savings - when the retailer does not, or misses a critical peak pricing (CPP) message, thus failing to switch off the battery charger on or off at the right time. This could have material cost implications for their customers.

Without options for dispute resolution, a consumer may lack a means of recourse. If there is no complaint reporting requirement, systemic issues will not be documented and potentially left unresolved.

Amending the retail exemptions framework.

In our view, the AER's jurisdiction should be expanded to cover the provision of all energy services and not only where there is a sale of energy.

While the ACL is historically the more appropriate avenue for consumer protections where a consumer is buying a product outright and assuming full ownership and responsibility for day-to-day operations, in some cases, the ongoing energy services provided are of a nature where the ACL may be deficient and the retail exemptions obligations should be extended.

This is not to suggest that all energy services providers should be required to carry full retail authorisations – this would be excessive, inefficient, and create a compliance burden that would restrict offerings to consumers.

A significant problem with the exemptions framework today is that customers of exempt sellers do not have access to the services of the jurisdictional energy ombudsman for dispute resolution. Access to a free, independent and an impartial dispute resolution scheme is a basic consumer right.

An additional problem is that it is also unclear whether the jurisdictional energy ombudsman's jurisdiction extends to cover the provision of energy services by even the current members of the scheme.

We are concerned that the exemptions framework can, in some instances be used to circumvent the obligation to consumer protections that are required under a retail authorisation. Some energy retailers have set up subsidiary companies to provide solar and other energy management services, and have obtained exemptions for these companies.

Customers of these exempt companies might not have access to the jurisdictional energy ombudsman for services provided by the exempt subsidiary company, and different consumer protections apply to them. In such cases were a consumer is contracted with an exempt subsidiary company they are unlikely to be aware of the implications with respect to the lesser protections.

7. ***Will off-grid energy supply arrangements create specific consumer protection issues if this becomes a mass-market option?***

Key points

- **Consumers should be free to replace their mains grid energy supply with a SAPS (Stand Alone Power Supply) if they wish to do so.**
- **The protections for consumers replacing a mains grid connection and retail contract should reflect the greater risks that are particular to their situation.**
- **In some respects, protections for consumers seeking to disconnect from the grid should be similar to those that exist today under retail and distribution frameworks.**
- **These protections are equally important when a consumer is purchasing a SAPs outright with no intention of a continuing relationship with the provider.**
- **For the purpose of consumer protection, providers of systems and services to take consumers permanently 'offgrid' need to be subject to stronger regulation than they are today.**

What level of protections is needed for consumers going off-grid?

Currently, the protections afforded to consumers who choose to go 'off the grid' is mostly limited to

- Electrical safety provisions, such as the wiring rules. These are mandatory for the standard household voltages (Low voltage, eg 240 VAC), however an electrical licence is not required to work on elements of a SAPS that operate at Extra Low Voltage (up to 48VAC and 110VDC). This means that battery systems and components can legally be installed and maintained by someone without a full electrical licence.
- Clean Energy Council's SAPS installer accreditation. Importantly, A SAPS installer does not legally require this accreditation, and providers of cheaper poor quality SAPS can easily undercut more reputable providers that do have accreditation. In any case, this accreditation caters to traditional SAPS applications so does not specifically address the unique risks and needs of grid-connected consumers moving off-grid.
- The ACL, which carries little in the way of energy-specific protections.

As noted we are of the view that the need for, and level of, regulatory intervention in the interest of providing consumer protection should be based not on the transaction of energy (ie on metered energy flows), 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 electricity; and
- The impact on the consumer of experiencing payment difficulties and hardship

Considering this, more stringent conditions - some matching retailer and DNSP conditions - might be required wherever:

- The provider of the product or service has the ability to entirely restrict a consumer's access to continuous energy supply for non-payment, or
- When the consequence of failure of the business, product or service is that a consumer's access to the essential service of the continuous supply of energy is compromised,

such that a consumer is unable to access energy from another cost effective and immediately available source.

What are the risks for consumers going off-grid?

High quality, properly designed SAPS are usually automated and will provide better levels of reliability and security than remote electricity networks. On the other hand, cheaper SAPS, that often aren't correctly designed to provide energy through high demand or cloudy periods, and/or that use poorer quality components, may be much less reliable and require more manual day to day operation.

As a high quality, properly designed SAPS usually costs tens of thousands of dollars more than cheaper systems, we expect that more consumers will be drawn to cheaper SAPS. In the experience of ATA and its members, providers of poor quality SAPS are generally:

- Less likely to fully understand, or have regard for, the shorter and longer term energy needs of their customers
- Less likely to provide adequate after sales service
- Less likely to remain solvent, and therefore
- Less likely to be in a position to honour warranties

While many consumers in remote areas are used to living with SAPS and have a relationship with a trusted SAPS installer and provider, in coming years it is very likely that consumers who are used to receiving reliable energy from urban grids will choose to disconnect from the grid with systems acquired from less experienced suppliers that are aiming to compete on price. These customers will generally be unused to living with a SAPS, less aware of the relative complexity of living with a SAPS, and may not appreciate the nature of outages associated with - particularly cheaper, poorer quality – SAPS.

By way of comparison, consumers who have purchased the cheapest available grid connected solar systems have generally found the equipment to be of poor quality and performance, and a number of providers have ceased to trade, leaving many of consumers with faulty systems and useless warranties. We are concerned that if a similar market emerges for cheap, poor quality SAPS, the consequence for consumers will be much more serious.

While the equipment installed for a grid connect battery and PV system is in many respects similar to a SAPS, the consequences of the failure of those components is far more serious. Consider the

following example of the complete failure of a battery, battery charge controller or inverter that results in an energy storage system being out of action for a week.

Where the failed battery is part of a grid connected energy generation and storage system, the consumer can still access energy from the grid, so the consequence will be:

1. The consumer pays - perhaps a few dollars - more for energy that week
2. The consumer's retailer sells some more energy to the consumer at their agreed price
3. No loss of access to an essential service for the consumer

Where the failed battery is part of a SAPS, a consumer's grid connection will typically have been decommissioned or disconnected such that mains supply cannot be promptly restored, so the consequence of the outage will be:

1. If there is no backup generator present: a complete lack of access to the essential service of continuous energy supply for a week
2. If a back-up generator is present: continuous energy supply is available, but typically
    a. costs the consumer hundreds of dollars in diesel fuel over the course of a week
    b. is constrained in capacity and operation
    c. is noisy and polluting
3. Even with a moderate level mass-market uptake of SAPS, any of the following are likely if protections aren't extended beyond their current level.
    a. the situation occurs at multiple sites due to poor quality equipment, or
    b. a provider ceases to trade, or
    c. there is a serious consequence such as injury or loss of life from loss of supply.

What specific protections are required for consumers going offgrid?

Noting the previous points, our view is that where the customer is purchasing a SAPS and disconnecting from the grid, even if they are purchasing a SAPS outright, the SAPS provider should be required to provide energy-specific consumer protections. These should include

- Providing a performance guarantee with respect to the frequency and duration of system outages
- Educating the customer about the difference between living with a grid connection and living with a SAPS
- Clearly demonstrating that they have the EIC of the consumer, with particular emphasis on the customer understanding the above matters.
- Contract terms that are clear and fair
- A cooling off period
- Full disclosure of detailed product information to allow for straight forward repairs and identification of correct replacement parts
- Recording and reporting disputes to the AER

- A prudential fund or insurance against failure of the system

Currently, there is no requirement in the ACL, NECF, or the Clean Energy Council's voluntary SAPS installer accreditation for the above conditions. Due to the nature of electricity being an essential service and the fact that these customers are initially connected to the grid, it is appropriate for more robust exemption arrangements administered by the AER, to be extended to these SAPS providers in the interest of consumer protection.

8. ***Are specific consumer protections required to help consumers make informed decisions about going off-grid?***

Yes. In this case an obligation to disclose critical information is not sufficient and EIC is required. Please refer to the earlier responses on EIC and off-grid for details.

9. ***Are there other consumer protection issues we should consider in this market? If so, how could these be addressed?***

As we have previously mentioned, care needs to be taken with regard to vulnerable consumers, that they are not exposed to certain new products and services that would potentially result in detriment. We are also opposed to the use of supply capacity control as a credit management tool.

10. ***Are there other products and services emerging in the demand management market that we should consider in our advice to Ministers?***

Refer to our previous answer to "Are there other products and services emerging in the electricity supply market (beyond distributed generation and storage) that we should consider in our advice to Ministers?"

11. ***Could direct load control products create material risks for power system operations? If so, how could these risks be managed within the regulatory framework?***

12. ***Are there similar implications for power system operations where distributed generation and storage are being controlled remotely?***

In the longer term, some risk may be posed to power system operations. For example, high penetration of controlled loads and/or batteries may cause or exacerbate voltage control issues at a local level when they switch off simultaneously, or capacity issues deeper in the network (or wholesale price impacts) if all loads are on concurrently, as has happened before in South Australia with off-peak water loads, requiring the operation of offpeak time switches to be altered by the NSP.

One key tool for mitigating these risks to the network, particularly when the direct load control (DLC) is operated by parties other than the LNSP, is through randomisation or staggering of switching. Randomisation is not always an option for DLC services - for example, switching off aggregated loads in response to spot market price signals will typically leave a window of less than 5 minutes for switching - so its use should not be mandated, however it should be included in relevant specifications (such as metering specifications) as an option and its use should be encouraged.

On the other hand, DLC offers opportunities that may materially benefit power system operation. Voluntary load shedding can help to alleviate undervoltage conditions and capacity constraints on heavily loaded lines. The ability to switch off discretionary loads can assist the stable restoration of power after and outage, and may even help prevent outages during high demand events and constraints brought about by system faults. Some battery systems will be capable of operating in an islanded manner and isolating energy consumers from the network, offering greater load reduction benefits.

Bearing in mind the above, appropriate responses to the risk of power system operations include

- Require DLC operators to disclose to DNSPs the nature and capacity of their DLC operations in a given network. It would be inappropriate to require this for low levels of DLC that are inconsequential in terms of their network impact, so a minimum threshold – express for example as a MW or number of customer threshold – should be reached before this disclosure becomes mandatory
- Require network businesses to publish information for consumers DLC operators, including
    - contact details for appropriate contacts at the DNSP
    - identifying parts of the network that may benefit from DLC opportunities, or where constraints exist or are emerging that may be worsened by DLC. This could be done as part of the current DNSP's annual planning reporting requirements.
- Encourage DLC providers and/or consumers to use equipment and systems that minimise negative impacts and offer opportunities to aid power system operations.

13. ***Should parties offering direct load control products to customers have similar obligations to retailers and distributors regarding informed consent?***

14. ***If so, how could these obligations be created for parties not covered by the National Electricity Retail Law?***

(Our response to this questions extends beyond IEC and DLC to other protections and services.)

We are of the view that the need for, and level of, regulatory intervention in the interest of providing consumer protections should be based not on whether batteries or any other specific technology is present, 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 electricity; and
- The impact on the consumer of experiencing payment difficulties and hardship

If third parties are to be involved in the provision of DLC it is appropriate for there to be consumer protections including a requirement for EIC. The absence of basic protections from Thirds parties may lead to a perverse outcome where a customer with a DLC product from a retailer or DNSP has a higher standard of customer protection than a customer with the same product obtained from a third party.

We strongly support DLC and other emerging products and services, as tools to better coordinate the supply and demand of electricity, in the interests of consumers. This entails ensuring that consumers are fully informed about and understand the pros and cons of any DLC product before they provide their explicit informed consent.

There is a critical need to ensure that vulnerable customers including those on life/medical support or medical cooling needs do not place essential equipment on DLC.

Emerging and likely future examples - where providers of energy services may, under current arrangements, choose not to provide protections such as DLC – include providing a service to consumers for the operation of appliances and devices within the home. These products and services may include:

- Demand aggregator control of household cooling (or heating) for the purposes of demand response;
- Battery charging systems to balance offpeak energy consumption with peak demand (without solar), to reduce consumer's price exposure; and
- Other emerging services to operate home appliances at certain times or under certain conditions.

As noted previously, the level and type of regulation and consumer protections should be based not on what technology is used, but on the nature of service provided. For example, the inclusion of storage should not, in and of itself, become a trigger for further regulation, although an associated service may be a trigger.

There are different energy services that use similar technologies where the consequence of major failure of the service provider or product, and hence the impact on either a consumer, or the consumer's traditional energy retailer, are materially very different from one case to the next. (Refer for example to the case shown herein in relation to grid connect and SAPS batteries) EIC must reflect understanding of the risks specific to the application of a given product.

We suggest common language to describe the basic functions of DLC products and for information to be presented in simple English. Issues of timing, frequency etc need to be clearly communicated

to consumers. Without common definitions or minimum standards on the technical aspects of the product, consumers are unlikely to be able to provide their EIC.

As previously mentioned, EIC should apply to all contracts whether short or long term, but the implications of the long term contracts to the consumer would be different (see section on EIC).

15. ***Do the National Electricity Rules protect metering data sufficiently where it is held by market participants?***

16. ***Is the Privacy Act sufficient to protect metering data where it is used by parties outside the electricity market?***

17. ***How can the privacy expectations of customers and the need for market participants to access data best be managed concurrently?***

We support the comments and recommendations made concerning privacy in Consumer Action Law Centre's report 'Smart Moves for a Smart Market'.[6]

18. ***Other matters - Impacts of consumer protection obligations on incumbent retailers***

Retailers have raised the issue that they will carry the risk of consumer protection provisions such as CSOs, while the other energy providers will not. Some aspects of this concern do not appear legitimate, and in any case this appears to be an entirely manageable risk. These matters were productively discussed an AER's forum on February 5th and the points following reflect our understanding of some of these issues as discussed.

1. In the case of a consumer accessing a grid connected generation and/or storage related service, if a third party service provider ceases to trade or the technology stops working, there is no negative implication for the retailer – the outcome for them is that the consumer purchases more energy from the grid, at a price determined by the retailer. By all accounts this is a positive result for the retailer.

2. Any retailer is able to make a price offering to consumers to recover any additional risk or cost. The advent of customers getting most of their energy from sources other than the grid does not present a fundamentally new problem for energy retailers, it simply means some of their customers will use less energy.

[6] Consumer Action Law Centre, *Smart Moves for a Smart Market: Simple Steps to ensure Consumer Protections Keep Pace with Innovation in a High-Tech Energy Market, July 201,*. Chapter 4, found at: http://consumeraction.org.au/wp-content/uploads/2014/08/Smart-Moves-for-a-Smart-Market-eVersion.pdf

For example, a 30kWh/day all-electric home that meets 80% of its energy needs from a generation and storage system will import about 6 kWh/day from the grid. There are many efficient dual fuel consumers today without solar or batteries that already import less than 6 kWh/day.

At least one retailer that is active in Victoria today already readjusts the unit price of energy that is charged to their customers on a month to month basis, according to the customer's historical average kWh energy use. They do this to account for - among other things - fixed network charges and other fixed costs that they smear across the volume charge.

There is nothing preventing a retailer of any customer with low energy usagefrom taking a similar approach, or applying other tools such as higher fixed charges and declining blocks tariffs, today.

3. Compared to average consumers, those accessing innovative energy services are generally less likely to enter into hardship, as they will tend to
    a. Have access to capital to make a material up-front payment; and/or
    b. Have satisfied the provider of those services / products that they are a low credit risk (few innovative energy service providers will enter into a PPA or leasing arrangement with a consumer that is likely to have difficulty paying); and/or
    c. Be an owner occupier, as restrictions on building modifications and the longer term nature of some contracts with make generation and/or storage products and services unfeasible for renters

4. In the event that the consumer has difficulty paying, the retailer will not be exposed to any more unpaid credit than for their own portion of the energy supplied for that consumer in any case.

    This actually reduces the retailer's cost burden for that customer. As the retailer ultimately has the ability to disconnect a consumer from the grid in the event of not payment – a measure the other service provider can't do - the consumer will generally opt to pay the retailer ahead of the generation / storage provider.

Some retailers are of the view that the innovative energy sellers have an advantage in an unlevel playing field, however in our view this is neither accurate, nor a valid reason for imposing higher conditions on providers of innovative services, as

- retailers are equally able to enter the market for innovative products and services (with or without retail authorisation) and, in fact, a few larger retailers have actually set up their own subsidiary companies with retail exemptions to do so; and

- retailers and innovative sellers offer fundamentally different services, such that the extent to which they are in direct competition is questionable. For example, retailers offer connection to continuous supply of energy from the grid (which SPPA providers cannot), whereas a provider of innovative services may provide, for example, optimisation of energy use in a home, (which retailers do not)

For the above reasons it is hard to accept the argument raised by retailers about the lack of a level playing field.

Some retailers have also argued for relaxed authorisation requirements because they perceive the requirements on innovative sellers are lesser than their own. However, the solution must never be lowering the authorisation requirements for any entity controlling access to an essential service.

Thank you again for the opportunity to provide this submission, and please feel free to contact myself (craig@ata.org.au), or Deanna Foong (deanna.foong@cuac.org.au) with any queries.

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