Locked Bag 14051
Melbourne City Mail Centre
Victoria 8001 Australia
T: 1300 360 795
www.ausnetservices.com.au

18 July 2017

John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Via website: www.aemc.gov.au

Dear John

Consultation paper: National Electricity Amendment (Alternatives to grid-supplied network services) Rule 2017

AusNet Services is pleased to have the opportunity to make this submission on the Australian Energy Market Commission's (the Commission's) consultation paper on the rule change proposal by Western Power titled 'Alternatives to grid-supplied network services'.

AusNet Services strongly supports the objective of the proposed rule change to allow distribution networks to deploy off-grid solutions where more efficient for existing network customers. AusNet Services sees its purpose as empowering communities and their energy future, and is actively engaged in projects that will help deliver better customer outcomes. The rule change has the potential to deliver improved customer outcomes by reducing costs and improving service quality and reliability. It would also support the efficient achievement of our bushfire mitigation obligations.

AusNet Services has previously supported regulatory arrangements that would allow distribution networks to deploy efficient off-grid solutions, including in the context of the COAG Energy Council review of stand-alone energy systems.

Our attached submission provides information on:

- circumstances where off-grid solutions may be more efficient;
- potential network cost savings associated with off-grid solutions; and
- competition and consumer protection impacts.

Importantly, our submission outlines arrangements for the provision of network services via off-grid assets that allows customers to preserve the same electricity supply services as those that are conventionally grid-connected. The arrangements maintain customers' access to retail competition, reliability standards and consumer protections.

We look forward to engaging further with the Commission during the course of the rule change process, including at public forums associated with the review. Please contact Deirdre Rose, Principal Regulatory Economist with any inquiries related to this submission.

Yours sincerely,

C. Eddy

Charlotte Eddy
Manager Economic Regulation

AusNet Service Submission: Alternatives to grid-supplied network services rule change consultation paper

Introduction

Customers will be the ultimate beneficiaries if network businesses are able to adopt a range of technologies to provide network services ranging from traditional network assets through to off-grid solutions.[1] The ability to utilise alternative, off-grid technologies can provide significant cost savings.

AusNet Services strongly supports the objective of the rule change as proposed by Western Power, which is designed to remove unnecessary barriers to achieving these cost savings. The rule change limits the deployment of alternative off-grid solutions to existing grid customers, meaning that developing markets for off-grid supply would be unaffected.

The key messages of our submission in support of the rule change are that:

- ***The cost of network services will be lower than under the current rules***
  - the cost savings at identified customer sites could be significant, particularly in areas of highest bushfire risk where AusNet Services is required to replace bare-wire powerlines with insulated overhead powerlines, undergrounded powerlines or other technologies;
  - cost savings achieved in supplying network services will benefit all customers of our distribution network.

- ***Competition in the market for off-grid supply is unaffected***
  - the proposed rule change would not reduce the incentives or opportunity for privately-led off-grid supply relative to the status quo;
  - customers with an existing connection (to which the rule change applies) would continue to have a choice between receiving a network service and paying a network charge or investing in their own energy supply systems (and potentially disconnection from the grid);
  - the rule change will not result in distributors dominating the consumer and market-led adoption of alternative energy technologies which is underway;
  - the market for the supply of off-grid technologies would benefit from increased systems procurement by electricity networks.

- ***Consumer services and protections can remain***
  - the off-grid systems are likely to improve the reliability and quality of network services to customers in edge of grid areas;
  - the off-grid systems could improve safety in bushfire prone areas in AusNet Services' network;
  - a network service can be provided with an off-grid solution while retaining existing customer choice, services and protections available to conventionally grid-connected customers.

[1] Off-grid solutions or supply in this context refers to stand alone power systems (SAPS) or islanded microgrids.

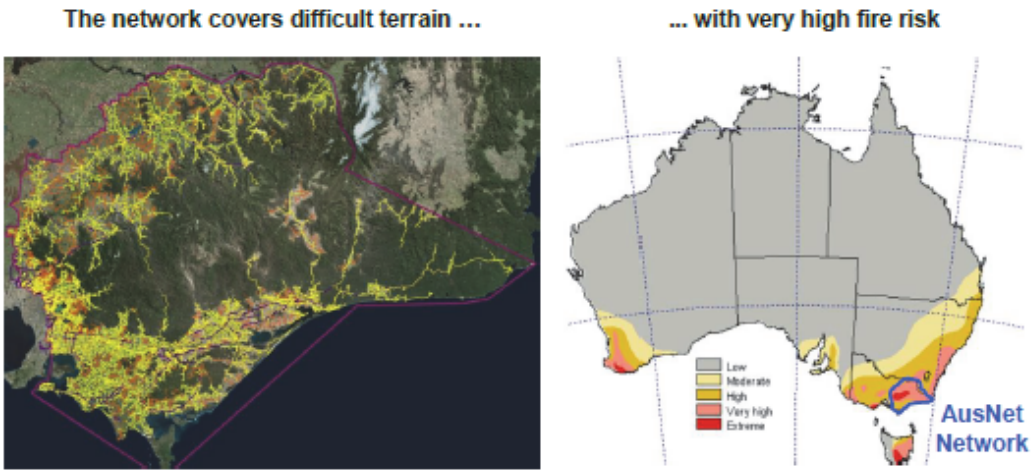
AusNet Services' submission provides the following information to address key questions raised by the Commission in the consultation paper:

- circumstances where off-grid solutions may be more efficient;
- potential network cost savings associated with off-grid supply;
- competition impacts of the proposed rule change; and
- how the proposed rule change could be implemented while maintaining consumer protections.

Potential for efficient off-grid solutions

AusNet Services' distribution network extends from the northern and eastern suburbs of Melbourne eastward to Mallacoota, and north to the Murray River, covering heavily forested and mountainous areas, as well as the low lying and coastal regions of Gippsland (as shown in Figure 1). Over 90 per cent of AusNet Services' network (by line length km) is located in rural areas. More than 80 per cent of this is located in high bushfire risk areas (HBRA).[2]

Figure 1: AusNet Services' network



In this context, there are circumstances in which it is likely that an off-grid system could have a lower lifecycle cost than maintaining or replacing grid assets. These circumstances include:

- providing a network service to existing edge of grid customers in remote areas; and
- customers in bushfire areas, including those defined in the Victorian Electricity Safety (Bushfire Mitigation) Amendment Regulations 2016[3].

AusNet Services obligations in relation to bushfire mitigation areas is explained in further detail below.

Bushfire safety

AusNet Services has key responsibilities for delivering the Victorian Government's Powerline Bushfire Safety Program aimed at reducing the risk of Victorian powerlines causing bushfires. The objective and elements of the program are described below.

The Victorian Government is assisting to fund powerline replacement in the highest bushfire risk areas through its $200 million Powerline Replacement Fund (PRF). AusNet Services is receiving a share of funds from the program to replace bare-wire powerlines in areas of highest

[2] As determined by the Country Fire Authority in accordance with Section 80 of the Electricity Safety Act 1998 which require the assigning of a fire hazard rating for an area of 'high' or 'low'.

[3] Under the Regulation, the defined areas are referred to as an *electric line construction area*.

bushfire risk with insulated overhead powerlines, undergrounded powerlines or other technologies. This program is due for completion by July 2019. In the event that the proposed rule change was made, AusNet Services may offer off-grid solutions, such as stand alone power systems (SAPS), under this program where this would be more cost efficient than the required powerline replacement. At the closure of the fund, approximately 15% of AusNet Services' bare overhead powerlines that now have a prescribed requirement to be replaced with insulated powerlines will have been replaced.

Victorian Powerline Bushfire Safety Program

Victorian Bushfires Royal Commission recommendations

The Powerline Bushfire Safety Program is responsible for the delivery of two of the Victorian Bushfires Royal Commission's recommendations, Recommendations 27 and 32.

Recommendation 27

- Progressive replacement of all single-wire earth return (SWER) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives.

- Progressive replacement of all 22-kilovolt (kV) distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.

Recommendation 32

- Disable the reclose function on the automatic circuit reclosers on all SWER lines for the six weeks of greatest risk in every fire season.

- Adjust the reclose function on the automatic circuit reclosers on all 22 kV feeders on all total fire ban days to permit only one reclose attempt before lockout.

Elements of the program

The Victorian Powerline Bushfire Safety Program consists of 5 projects:

- Powerline Replacement Fund ($200 million): this program contributes funds to replace powerlines in the highest risk bushfire areas with insulated overhead, underground powerlines or new conductor technologies. Under this program Victorian distributors are replacing Single Wire Earth Return (SWER) powerlines and 22 kV powerlines with insulated and underground cabling, and other technologies.

- Network Assets Project ($500 million): requires distribution businesses including AusNet Services to install new network technologies to better control faults such as remotely controlled Automatic Circuit Reclosers and Rapid Earth Fault Current Limiters (REFCLs).

- Network Operations Project: rules for each bushfire season that informs how electricity distributors control their networks on Total Fire Ban days.

- Research and Development Project ($10 million): allocates funds to priority research and development such as bushfire mapping and modelling and improved powerline technology.

- Local Infrastructure Assistance Fund ($40 million): provides for back-up generators to be installed in residential care facilities throughout rural and regional Victoria.

As part of the response to the Victorian Bushfires Royal Commission, the Electricity Safety (Bushfire Mitigation) Regulations 2013 were also amended effective 1 May 2016 to require any new or replacement of existing powerline (4 spans or more) within defined geographical areas to be constructed with insulated technology (covered overhead or underground powerline).

AusNet Services is also subject to the f-factor Incentive Scheme which places reporting obligations and economic incentives on our regulated network business to improve bushfire safety associated with the operation of our network and to optimise new enhanced protection technology.

In areas where AusNet Services is required to replace existing network with lower fire risk technologies, AusNet services is actively considering whether installation of SAPS in edge of grid areas would be a more cost effective solution. Of our high voltage (HV) powerlines, 1,600km (route length) are in the *electric line construction area* defined in the Victorian Electricity Safety (Bushfire Mitigation) Amendment Regulations 2016. This accounts for approximately 5% of AusNet Services total HV powerlines (31,800km route length) or 6% of rural HV powerlines (28,200km route length).

Potential network cost savings

At this stage AusNet Services has not undertaken the analysis to determine the number of grid connected customers in our service area that may be more cost-effectively served by off-grid systems (e.g. in bushfire and edge of grid areas).

We note that the average cost to build replacement powerlines under the Powerline Replacement Fund has been approximately $400,000/km. The economics of off-grid solutions and whether they are more cost effective will depend on the amount of network replacement that is avoided.

AusNet Services has compared the lowest forecast costs of powerline replacement (using Lo Sag network currently under development[4]) to SAPS (consisting of solar PV, battery and back up diesel generation) in the Chiltern Area[5]. Based on 2016 cost estimates, the NPV cost of the stand alone systems (inclusive of maintenance and fuel) were lower at 35 customer sites out of a total of 93 customer sites considered. The SAPS were between 4% and 54% lower cost (in NPV terms) than the Lo Sag network option.

Given the characteristics of our rural network, we expect that several other areas of opportunity will emerge for the cost effective application of off-grid solutions as an alternative to network solutions. These opportunities may be driven by a range of factors such as condition-based asset replacement decisions.

Western Power has identified that the National Electricity Rules (the Rules) do not permit distribution network service providers (DNSPs) to deploy the most efficient service solutions to maintain service to customers in particular circumstances. These are the circumstances where a part of the network serves a low density of customers, the local network requires investment, and a standalone solution serving the individual customer is the cost-effective solution.

Competition issues

The Commission's Consultation Paper seeks comment on the competition issues relating to off-grid solutions.

In terms of competitive impacts, if implemented, the proposed rule change will not materially impact on the level of competition in the market for off-grid supply relative to the circumstances under the current Rules. This is because the existing distribution network customers to whom this rule change applies would continue to receive network and electricity supply services determined under the same price and service standard frameworks as under the current Rules. This would be the case regardless of whether the network service is provided by conventional network assets or off-grid systems.

The position of existing grid customers in terms of the relative economics of network supply versus investing in their own off-grid supply systems will not be materially changed by the rule

[4] Lo Sag is covered conductor which is currently under development.
[5] Chiltern is in northeast Victoria between Wangaratta and Wodonga.

change proposal (even with the reduction in network costs over time shared among all the network customers).

It is acknowledged that the averaged prices these customers pay for network services do not reflect the cost of supply, such that in the absence of distributor led initiatives, there is a strong financial incentive for these customers to remain grid-connected. Ultimately, if locational network pricing became more cost reflective and granular (including reflecting locational costs), then this will be the driver for a more accurate comparison of network versus off-grid supply costs for individual customers. Whilst DNSPs have sought to advance cost reflectivity of network prices, this end of the continuum remains a long way off. In this circumstance, ensuring that network supply costs remain higher than a more efficient alternative, solely to limit adoption of off-grid supply to private or market-led circumstances, would not be a desirable outcome.

Under the proposed rule change existing network customers are still free to install stand-alone systems should they choose to do so of their own accord.

The rule change will not result in a distributor-led transition to off-grid supply that dominates the consumer and market-led transition which is underway. This is because the rule change is limited to customers that are already connected to the grid and to circumstances where these network services could be more efficiently supplied by off-grid systems (such as edge of grid and bushfire prone areas).

In the event that the rule change was made to allow distributors to install off-grid systems for existing customers where more cost efficient, the market for the supply of off-grid technologies would benefit from increased procurement and maintenance of systems by the electricity networks.

Consumer protection and service quality impacts

AusNet Services considers that the proposed rule change would not have adverse impacts in terms of customer protections or the reliability and quality of service. Rather, the rule change is more likely to offer benefits in terms of lower costs of network services, improved reliability and quality of network services and reduced fire risks.

Maintenance of consumer protections and high standards of service are provided where the off-grid solution is only implemented where the cost is lower than the network solution. This is generally in fringe of grid area, plus in the defined bushfire areas where the existing network must be undergrounded or insulated.

As previous outlined by AusNet Services in our submission to the COAG Energy Council review of stand alone energy systems, a network service can be provided with an off-grid solution while retaining existing customer choice, services and protections available to conventionally grid-connected customers. Our submission is available at:
http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/AusNet%20Services%20-%20Resposne%20to%20consultation%20on%20standalone%20systems.pdf

Further information in support of these points is provided below.

Improved reliability and power quality

Off-grid systems are likely to offer reliability and quality levels that are equal to or better than those received by powerline-connected customers. This may include:

- improved reliability in extreme weather events or bushfires; and
- standalone system supply quality not impacted by network disturbances.

AusNet Services has recently conducted islanding tests as part of its Mooroolbark Mini Grid trial to test power quality outcomes. The tests are designed to discover how the participating homes will perform off-grid (home islanded mode), including in terms of system functionality and performance. As shown in Figure 2, during the home islanded tests voltage stability improved relative to grid-connected supply, as well as achieving uninterrupted supply.

Figure 2: Voltages traces for a single customer within the Mooroolbark Mini Grid trial

Note: Green voltage trace shows the grid supply. Yellow voltage trace shows off-grid supply. The customer supply transitions from grid-connected to off-grid at approximately 7:00am, half-way across the chart.

Bushfire safety

Off-grid power systems have the potential to contribute to better community safety through removal of powerlines in fire-prone areas. Advanced safety and fire monitoring systems are typically included within quality stand alone power systems to provide high standards of system and site safety.

Retaining customer services and experience

AusNet Services considers that arrangements can be made for the provision of network services via off-grid assets that allows customers to preserve the same electricity supply services as those that are conventionally grid-connected. This includes access to retail competition, reliability standards and consumer protections.

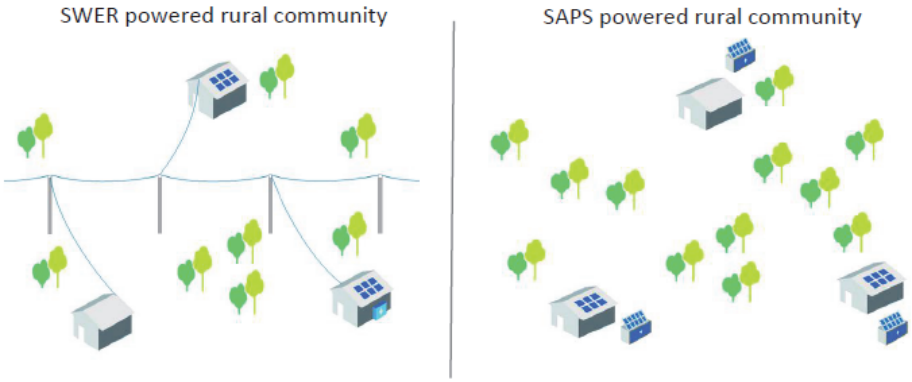
This is shown at a high level in Figure 3, which shows that customers that receive a network service delivered by an off-grid solution (SAPS) can continue to:

- purchase energy via their chosen retailer;
- choose to purchase solar, batteries or other behind-the-meter energy assets; and
- receive a high level of reliability, including as a result of distributor's design and maintenance expertise.

Figure 3: Distribution service delivered via network vs SAPS

Low customer density rural community:

SWER powerlines vs Stand-Alone Power Systems (SAPS)



Common factors

Customer purchases energy via chosen retailer.

Customer can choose to purchase solar, batteries or other behind-the-meter energy assets.

Distributor owns and maintains energy delivery infrastructure.

High level of reliability a result of distributor's design and maintenance expertise.

Differences

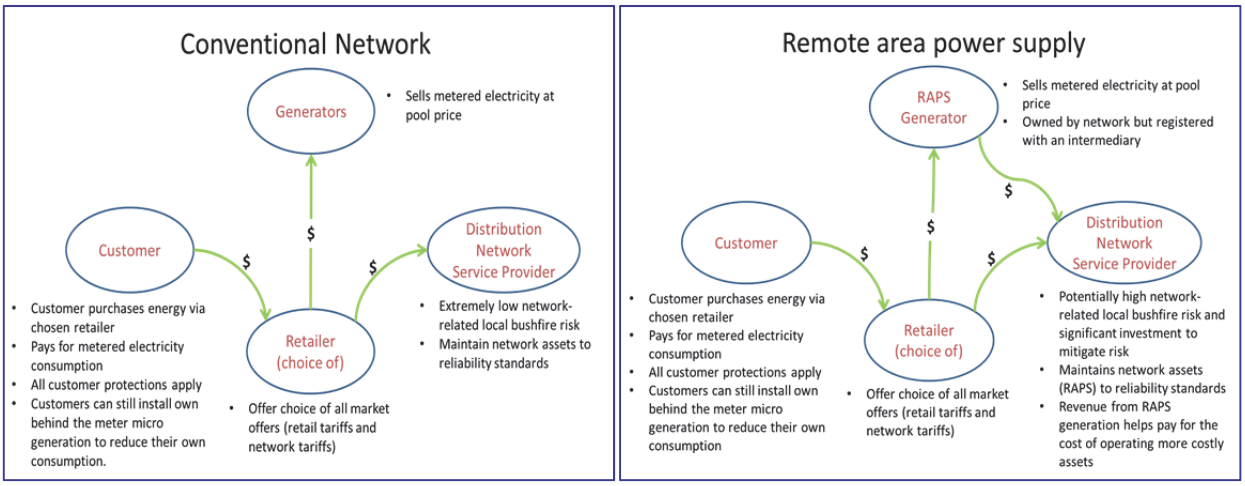
SWER Community	SAPS Community
Potentially high network-related local bushfire risk.	Lower network-related bushfire risk.
Significant investment required to mitigate this risk i.e. vegetation management, SWER network upgrades and application of new technology	Vegetation management not essential to safety and reliability.
Higher CO2 footprint.	Investment focussed on SAPS infrastructure.
	CO2 footprint reduced by an estimated 90 per cent.

Market Arrangements

AusNet Services considers that an alteration to the definition of *distribution system* may allow customers on network supplied standalone systems to be treated in the same way as other customers connected to the conventional *distribution system*. Where qualifying conditions are met, all relevant provisions in the National Electricity Rules could be extended to include network supplied stand alone power systems.

Under this arrangement, customers moving to network supplied stand alone power systems would remain on their existing market offers and continue to access the full range of retail offers. Both the customer's premises and network supplied generation asset would have National Metering Identifies (NMIs) assigned and have metering registered to account for all generation and consumption. The Australian Energy Market Operator (AEMO) manages the market settlement process and makes payments to the Market Participant for the generation. Figure 4 compares the market arrangements that would achieve equivalent electricity supply service provision to customers receiving their distribution network service via an off-grid solution.

Figure 4: Market arrangement to deliver equivalent services to customer under off-grid supply arrangements



Further detail of these arrangements is provided in Attachment 1 to this submission.

Attachment 1: Customer experience under RAPS delivered network services

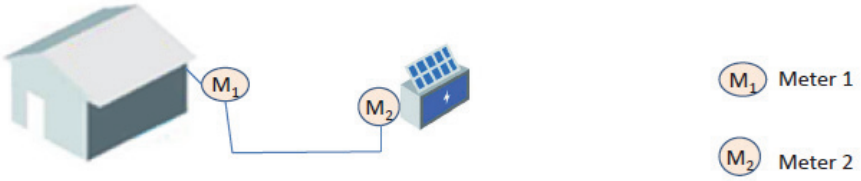
Scenario

DNSP provides a stand alone energy system, such as a remote area power supply (RAPS), after determining it is the most efficient option to supply a remote on edge of grid area.

Objective

Objective is to preserve the benefits and protections enjoyed by the customers, via being a customer of the National Electricity Market (NEM)

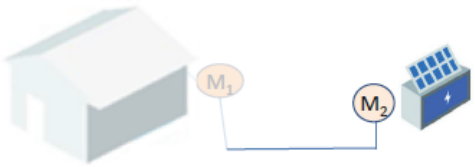
RAPS in a DNSP led scenario



High level Summary

1. RAPS generated energy is metered generation
   - a National Metering Identifier (NMI) is established to register and account for the energy flowing into the NEM.
2. The customer's consumption would also be metered (this is identical to the generation) and form the basis for the customer's retail billing.
3. The DNSP's obligations and customers' rights would not change i.e.:
   - the customer receives the same reliability standards, access to retailer of choice and customer protections as other customers in the network

Generation

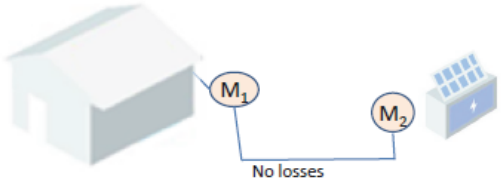


1. Generator revenue from NEM settlement offsetting the higher costs of operating the RAPS.
2. The RAPS generator is registered in the Market Settlements and Transfer System (MSATS);
   - the DNSP would procure the revenue collection service from a third party (competitive market participant);
   - the Market Participant would administer and receive revenue from the energy generated;
   - the Market Participant would then compensate the DNSP for the value of the energy (less their fee for administering the energy sale); and
   - any revenues received by the DNSP for the energy would be netted out of regulated revenue as negative opex.
3. Australian Energy Market Operator (AEMO) manages the market settlement process and makes payments to the Market Participant for the generation.
   - Paying the regional spot price for each measured unit of energy in 30 minute blocks; and
   - RAPS generation is not dispatched by AEMO.

Consumption and Regulation

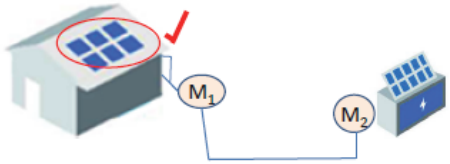
4. Consumer protections and reliability of supply still apply:
   - outage notifications;
   - GSL payments;
   - life support registration; and
   - retail billing conditions
5. Pricing
   - Customers have the same easy access to Retailer of Choice as any other customer
   - The sites supplied by RAPS generation would have any Network Tariff or Retail Tariff available to residential customers.
6. Asset classification and regulatory treatment
   - RAPS assets would be included in the RAB and the costs of operating and maintaining the generation assets included in DNSP opex - all funded by regulated revenues (Network Tariff); and
   - classified to be providing distribution services (e.g. Western Power rule change proposal)

Metering



7. Metering:
   - Generation and consumption must be metered
   - A logical meter or a second physical meter is required.
   - Contestable Metering arrangements can still apply
8. Marginal Loss Factors (MLFs) and Distribution Loss Factors (DLFs)
   - The RAPS generator provided would be assigned the same DLF and MLF as the consumption; and
   - does not appear to be different to any other site physically connected to the distribution system

Alterations and Introduction of New Sites



9. Consumer installs additional micro embedded generation:
    - Customers may still deploy additional solar micro embedded generation behind the meter; and
    - RAPS equipment would need to be robust enough to manage this scenario.
10. Increased load
    - RAPS designed to meet customer agreed demand
    - Distributor to provide customer cost to upgrade RAPS for increased demand
11. New customer connections
    - Where the cost to customer for a grid connection is high and a competitively provided RAPS could be the economic solution.