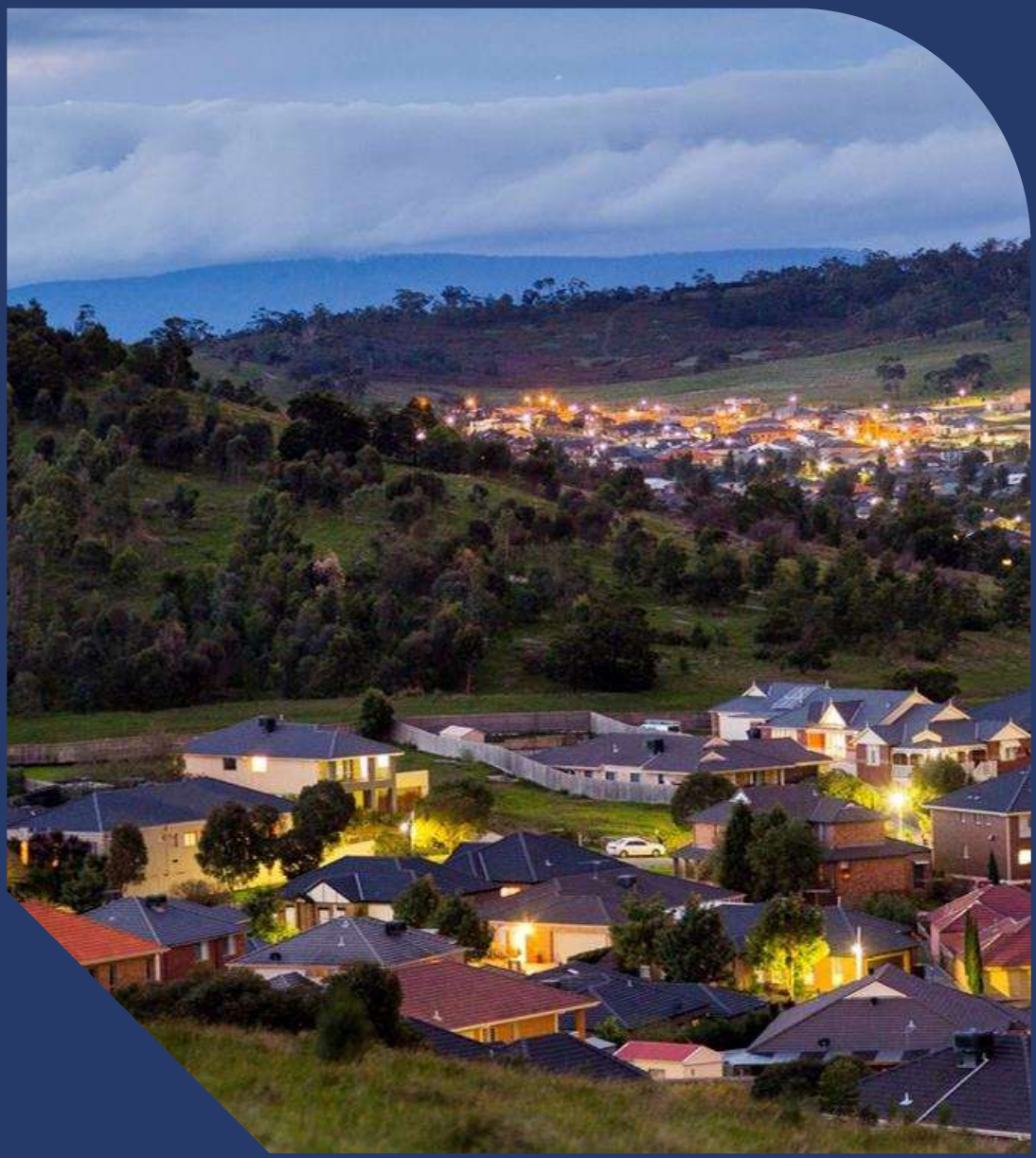
AusNet

Demand Side Engagement Strategy

31 January 2025



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1. Executive Summary

In October 2012, the Australian Energy Market Commission (AEMC) made a final rule establishing the Distribution Network Planning and Expansion Framework in response to a proposal by the Ministerial Council on Energy (MCE).

Under the Framework, the National Electricity Rules (NER) placed demand side obligations on the distribution businesses with the aim of encouraging efficient investment in network infrastructure for the long-term interests of electricity consumers as required by the National Electricity Objective.

A key component of the Framework is the development of a Demand Side Engagement Strategy.

AusNet Services' Demand Side Engagement Strategy forms a key component of AusNet Services' network planning and decision-making, and describes the processes used to identify opportunities for potential non-network solutions and to engage with non-network providers. The Strategy also works in conjunction with AusNet Services' Distribution Annual Planning Report (DAPR) and Regulatory Investment Test (RIT-D) analyses to effectively assess non-network alternatives to find the most efficient and effective solutions to address network constraints.

1.1. Objectives of the demand side engagement strategy

The Demand Side Engagement Strategy provides one of the principal mechanisms for:

- Developing opportunities for proactive engagement between AusNet Services and non-network service providers in developing solutions to network capacity augmentations.
- Providing transparency and clarity around the AusNet Services' network system planning and development processes; and
- Facilitating positive engagement and interaction between AusNet Services and non-network proponents (and other interested parties and stakeholders).

1.2. Purpose of this document

The National Framework for Distribution Planning and Expansion contains fourteen specific elements that the Demand Side Engagement Strategy is to address, noting that there is flexibility to allow DNSPs to develop bespoke processes in their consideration of these requirements.

AusNet Electricity Services Pty Ltd.'s response to each of these obligations is presented in this document, including a description of the key processes and procedures used by AusNet Services to:

- Develop, evaluate, and report on potential non-network solutions.
- Engage, consult, and negotiate with proponents of non-network solutions.
- Inform non-network service providers about the documentation to be provided in a proposed solution to a network capacity constraint, and the criteria used to evaluate such proposals.
- Make payments for non-network solutions, and stand-alone schemes.
- Negotiate connection agreements with embedded generation proponents, set charges for such connections, and set the terms and conditions of connection agreements.
- Enable an embedded generation proponent to lodge a connection application, and the factors considered when evaluating such applications; and
- Direct non-network service providers to sources of relevant information in the public domain, contact the business for additional information, or enrol in a Demand Side Engagement Register.

2. Introduction

In October 2012, the Australian Energy Market Commission amended Chapter 5 of the NER in support of a national Distribution Network Planning and Expansion Framework. The Framework recognises the importance of proactive engagement by the distribution businesses and non-network service providers to develop efficient solutions to address limitations and constraints on their electricity networks. Efficient investment decisions will, in turn, facilitate the provision of a reliable and cost-effective electricity supply for consumers.

The Framework comprises three interrelated components: a Distribution Annual Planning Report (DAPR); a Demand Side Engagement Strategy; and a Regulatory Investment Test for Distribution (RIT-D) process.

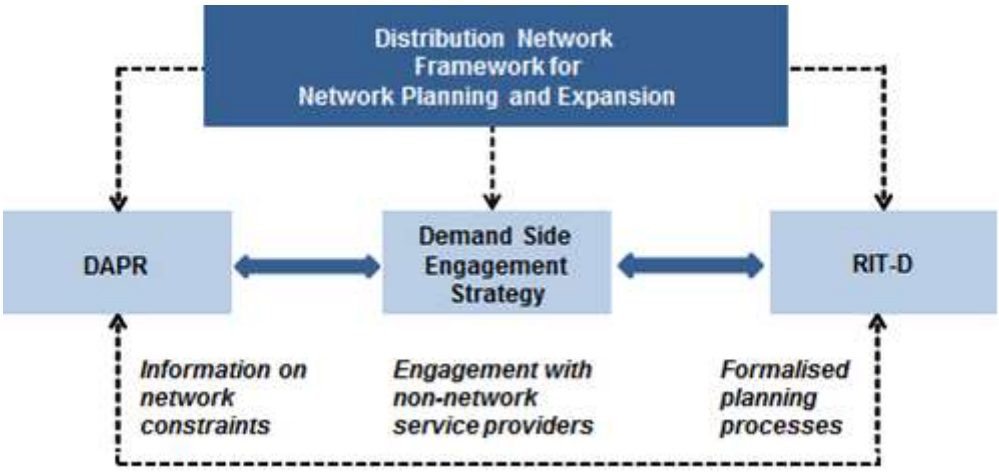

Figure 1 - Distribution Network Framework for Network Planning and Expansion

The *DAPR* aims to provide timely advice to non-network proponents on future network limitations or constraints, and proposed investments to manage them, thereby ensuring that supply-side and non-network options are investigated fairly and equally.

The *Demand Side Engagement Strategy* aims to facilitate co-operative engagement in network planning between distribution network service providers (DNSPs) and proponents of non-network solutions.

The *RIT-D* stipulates formal planning and consultation processes that DNSPs must follow when considering large scale investment to meet identified limitations or constraints on the network.

This document presents AusNet Services' Demand Side Engagement Strategy. It forms a key component of AusNet Services' network planning and decision-making, and describes the processes used to identify opportunities for potential non-network solutions and to engage with non-network providers. The Strategy also works in conjunction with AusNet Services' annual DAPR and RIT-D analyses to effectively assess non-network alternatives to find the most efficient and effective solutions to address network constraints.

It is intended that this Demand Side Engagement Strategy builds and improves upon, current practice, and promotes a constructive working relationship between AusNet Services and non-network providers. The overall outcome will be a more economically efficient network with the expected flow-on effect of reduced costs to electricity consumers.

3. Rule Requirements for Demand Side Engagement

Clause 5.13.1 of the NER sets out the following obligations in relation to demand side engagement:

> (e) Each *Distribution Network Service Provider* must develop a strategy for:
>
> (1) engaging with non-network providers; and
>
> (2) considering non-network options.
>
> (f) A *Distribution Network Service Provider* must engage with non-network providers and consider non-network options for addressing system limitations in accordance with its demand side engagement strategy.
>
> (g) A *Distribution Network Service Provider* must document its demand side engagement strategy in a demand side engagement document which must be *published* by no later than 31 August 2013.
>
> (h) A *Distribution Network Service Provider* must include the information specified in schedule 5.9 in its demand side engagement document.
>
> A *Distribution Network Service Provider* must review and *publish* a revised demand side engagement document at least once every three years.
>
> (j) A *Distribution Network Service Provider* must establish and maintain a facility by which parties can register their interest in being notified of developments relating to *distribution network* planning and expansion. A *Distribution Network Service Provider* must have in place a facility under this paragraph (j) no later than the date of publication of the *Distribution Network Service Provider's* demand side engagement document under paragraph (g).

Rule 5.13 (h) requires a demand side engagement strategy to include the information (set out in Schedule 5.9 of the NER) as reproduced in Appendix A.

4. Current Operating Context

Peak demand is typically 130% of the average demand but is only present for 20 to 50 hours of the year. The higher the peak demand relative to average demand, the more infrastructure capacity will be required to deliver electricity to consumers. However, this capacity is not required to meet demand for most of the time and a non-network option may provide a more economical solution to peak demand driven augmentation. Where growth in network demand is slow, non-network demand management options may be able to defer network augmentation for several years. A non-network solution may also provide an economic solution to further reduce the risk from network constraints even when a network augmentation is not viable.

Peak demand is expected to grow driving network expansion. Non-network demand management may provide cost-effective alternatives to this expansion by reducing demand or increasing generation close to the source of demand to defer or avoid the building of new infrastructure.

4.1. AusNet Services' history of non-network demand management

For more than two decades AusNet Services has actively pursued non-network demand management and embedded generation options as economically efficient alternatives to network augmentation to manage or meet expected demand for electricity. Some examples of these projects are presented below.

AusNet Services will continue to develop its network in the most economic manner and non-network alternatives (embedded generation or demand management) will continue to be employed wherever they present the most economic and reliable option.

Fixed Embedded Generation

The 40 MVA Bairnsdale gas-fired power station located in East Gippsland was one of AusNet Services' first demand management (DM) projects, provided an alternative to constructing a planned 220 kV transmission line and terminal station to supply the region.

AusNet Services, in 2012, successfully negotiated with a non-network provider to install 10 MW of gas-fired embedded generation at Traralgon, deferring the augmentation of a new 220/33 MVA Zone Substation transformer for at least 5 years.

AusNet Services has also actively explored the viability of embedded generation as an alternative to supply-side augmentation at Wodonga, Traralgon, Seymour, Euroa, Wonthaggi, Cranbourne, and Pakenham, and continues to do so as capacity constraints emerge across its distribution network.

Mobile Embedded Generation

AusNet Services has established a mobile embedded generation team who operate a small fleet of rapid deployment generator units for short term peak demand management, until expansion of regional loads reaches a level and DM is no longer a viable option. Temporary generation was installed to manage residential summer peak demand in Euroa and Kalkallo. Outside of the summer months, generators were deployed to reduce the impact of planned outages to customers during asset replacement and augmentation works.

Curtailable Loads

Where a network constraint has been identified, AusNet Services carries out an analysis to determine the contribution of the Commercial & Industrial (C&I) sector customers for their contributions to the peak demand on the element. Selected C&I customers are then approached to provide temporary curtailment of industrial processes or the use of standby generators during peak demand periods in return for network support payments.

AusNet Services has also trialled demand management using controlled electric vehicle charging, completing a pilot project in 2020 investigating smart vehicle charging via software platforms and a current trial in 2022 involving hardware smart chargers, live network sensors and a software platform to assess network operation and dynamically adjust charge rates in real time.

Energy Storage Systems

AusNet distribution network is experiencing strong growth in residential solar uptake which resulted in increasing challenges such limited solar hosting capacity and maintaining voltage compliance. In the meantime, maximum demand is expected to continue to grow due to electric vehicle and electrification. The network is facing the challenge of balancing the grid, when solar energy production is high and demand is low during the day and then drops off as demand peaks in the evening, i.e., the duck curve.

Several Battery Energy Storage Systems (BESS) are being installed and are expected to be commissioned in 2025 to evaluate their effectiveness in increasing solar hosting capacity, improving supply quality and deferring network augmentation.

Community battery energy storage systems are being deployed as an alternative solution to traditional network augmentation. LV batteries are being installed at high solar penetration areas of the network, with the purpose of managing excess solar export, reducing peak demand and regulating voltage on the LV network. It will also deliver direct benefits to customers, such as removing export limits and enabling more solar connections.

In 2014 AusNet Services commissioned a grid energy storage project at Thomastown to trial the use of a large battery storage system (1 MW capacity and 1 MWh storage) to manage peak demand on a distribution feeder and explore other potential benefits such as demand levelling and voltage support services to defer investment and improve the quality of supply to customers. In 2021, this grid energy storage system was relocated and commissioned in Mallacoota as MAGS (Mallacoota Area Grid Storage) to reduce the impact of supply outages on the township, which has been historically susceptible to power outages caused by storms, vegetation and animals, and has also suffered the impact of restoration delays as crews travel long distances to undertake repairs in the area.

In early 2021, AusNet evaluated proposals from service providers for a Phillip Island Non-Network Solution. The 5MW/10MWh battery facility was commissioned in 2023 and the Network Support Agreement has been executed. The battery has been supporting the network's peak demand since the 2023/24 summer, eliminating the need for temporary diesel generators.

Due to the bushfires in the 2019/2020 summer and the drive to reduce network operational costs, AusNet investigated opportunities for Stand Alone Power Systems (SAPS) to improve network resilience. A first tranche of SAPS was commissioned in May 2023 and provided an evidence base for further SAPS programs.

Grid-connected microgrids are also being assessed for suitability across the network, similar to the MAGS system at Mallacoota. SAPS, BESS and Grid-Connected Microgrids will be a feature of future planning opportunities and assessed based on suitability, safety, reliability, resiliency and economics in-line with any regulatory changes.

Tariff Strategies

In the 1990s AusNet Services introduced a kVA demand tariff to encourage commercial and industrial consumers to correct the power factor of their loads and hence reduce peak demand on the network.

Over the last decade, AusNet Services has optimised the control strategies for the time-switched water heating tariff in the South Gippsland area, to defer the need for augmentation of the sub-transmission and distribution networks in the area, reducing the overall costs borne by network customers.

In 2010 AusNet Services introduced a Critical Peak Demand tariff that provides a financial incentive to businesses to cut their consumption on five days of high network demand over the summer period to

secure a reduced electricity demand charge for the next 12 months. The tariff has successfully contributed to a total annual peak demand reduction of 5.45% across AusNet Services' electricity distribution network and provided significant cost savings to participants. This program has continued operating and is now known as GoodGrid – Business.

In 2011 AusNet Services undertook a project to manage network capacity constraints at Mallacoota, in East Gippsland using measures to improve reliability of supply, improve information flows to customers in the event of loss of supply, and shifting hot water peak demand.

In 2020-2021 AusNet launched the GoodGrid program where 1000 residential customers participated in voluntary demand response and were rewarded financially for up to 5 events if they were able to reduce their power usage to below their baseline.

Battery Tariff Trial

The Battery Tariff Trial focuses on developing and implementing new tariff structures to optimize the integration and operation of Community Batteries and Battery Energy Storage Systems. These tariffs include two for Neighbourhood Batteries and two for BESS, designed as two-way time-of-use (ToU) tariffs with specific pricing mechanisms for import/export and demand charges. The tariff enables customers to interact with the market, allowing retailers to request and transition customers onto these tariffs while ensuring accurate data aggregation and billing. The key objective is to gather insights into peak loads and excess solar generation during midday for effective battery charging and discharging, paving the way for new tariff structures. This initiative supports managing future peak demand growth, addressing minimum demand voltage and thermal issues, and minimizing or deferring network augmentation, aligning with AusNet's commitment to innovation and demand management in the EDPR framework.

EV Tariff Trial

The EV Tariff Event Management Trial is designed to explore direct incentives as a mechanism for managing maximum and minimum demand on the network. The trial enables AusNet to call upon EV customers during high-demand days to curtail charging or on low-demand days to increase charging within predefined periods. Participants are rewarded based on their response from their baseline during these events, fostering engagement while helping to manage network load. Insights from the trial will support the development of future tariff structures, helping to manage future demand, minimize network augmentation, reduce costs for customers, and enhance grid reliability, particularly during minimum and maximum system load periods. This initiative aligns with AusNet's broader commitment to innovation in demand management and the energy transition.

5. Engagement Strategy and Response Plans

5.1. Processes to investigate, develop, assess, and report on potential non-network options

Opportunities to investigate and report on potential non-network options are identified through the annual planning reports published by AusNet Services. These are outlined below.

In line with the requirements of the NER Chapter 5 and Clause 3.5 of the Electricity Distribution Code, AusNet Services prepares, implements, and publishes a DAPR annually (in December of each year). The DAPR sets out the outcomes of AusNet Services' annual planning review and includes information on capacity and load forecasts for the distribution network 5 years into the future, information on emerging system limitations, and capital costs for future network augmentation. The DAPR is available on AusNet Services' website.

AusNet Services also participates in the annual Victorian joint distribution/transmission planning review and publishes the Transmission Connection Planning Report (TCPR), in accordance with the requirements of Chapter 5 and Clause 3.4 of the Electricity Distribution Code. The TCPR presents a high-level indication of the expected balance between capacity and demand at each terminal station over a 10-year forecast period and is available on AusNet Services' website.

Together the DAPR and the TCPR identify and report on emerging constraints on AusNet Services' distribution network and connections with the transmission network. These reports provide a means of identifying network locations where load is at risk and further detailed analyses of supply-side limitations may be warranted. These reports also provide preliminary information on potential opportunities to prospective proponents of alternatives to network augmentations at stations where remedial action may be required. Providing this information to interested parties in the marketplace aims to facilitate better informed and more efficient investment decisions.

Identified constraints are categorised into two groups according to the level of capital works required to alleviate the limitation.

Regulatory Investment Test for Distribution (RIT-D)

For each distribution network constraint with a network augmentation solution cost greater than $5m, the Regulatory Investment Test for Distribution (RIT-D) applies, as specified in Clause 5.17 of the NER.

The RIT-D establishes the processes and criteria to be applied by distribution businesses to identify the most efficient network investment options for large projects. In overview the RIT-D process that will be followed by AusNet Services from the commencement date will be:

- Upon identification of a network limitation AusNet Services will determine its eligibility for the RIT-D process (ie. the most expensive credible augmentation option is $5m or more).
- AusNet Services will then identify 'credible options' which may include network and non-network projects with the potential to alleviate the identified constraint or 'need'.
- An economic analysis is carried out from an asset lifetime NPV view to compare and rank all options, and to determine an optimum level of network support payment.
- Potential options are also compared from a consumer benefit view, a risk assessment view, and a regulatory/cost recovery point of view.
- Where the screening process reveals that a viable non-network project (or set of projects) exists, AusNet Services will draft a non-network options report and expression of interest for public release and consultation.

- If AusNet Services decides to proceed with the business' proposed investment a draft project assessment report will be prepared which summarises the key pieces of information for all options considered and presents a description AusNet Services' final preferred option for the investment.
- Finally, following a second formal consultation period on the draft project assessment report AusNet Services will publish a final project assessment report that summarises any submissions received on the draft project assessment report along with a response to each submission.

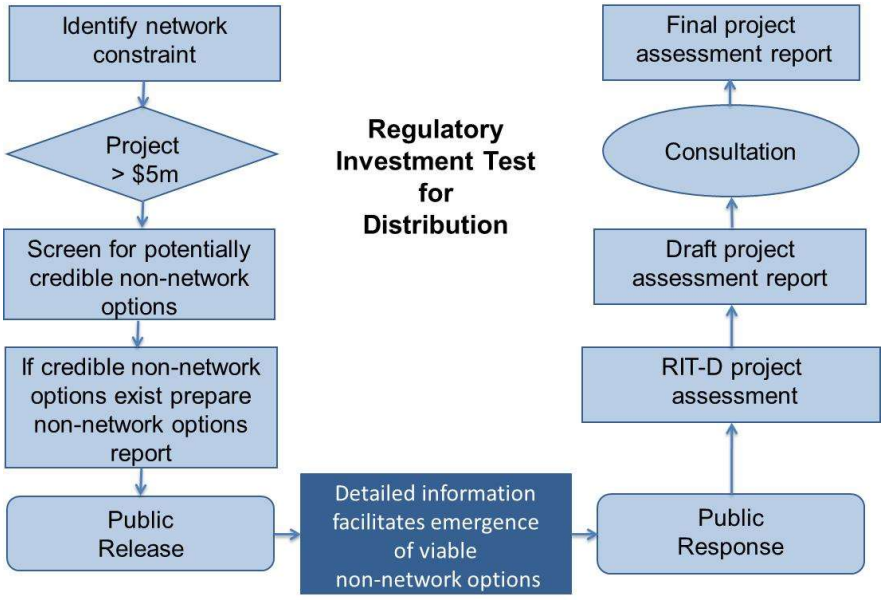

Figure 2 - Application of the Regulatory Investment Test for Distribution

The AER has published application guidelines for the operation and application of the RIT-D. The guidelines are designed to provide guidance to RIT-D and enhance transparency and consistency in investment decision making.

Details of the RIT-D process and guidelines can be found on the AER website.

Projects less than $5 million

For augmentation projects with a cost of less than $5M a similar, but simplified, approach is used such that the level of effort and cost of the evaluation and consultation processes are commensurate with the level of network investment and likely benefits. The general process used is as follows:

- A screening evaluation to identify options is the first step.
- This evaluation determines whether it would be 'reasonable' to expect that cost effective demand management or embedded generation strategies could be used to avoid or defer the expansion of AusNet Services' distribution network.
- If the conclusion from the screening test is 'yes' a more detailed evaluation follows.
- Based on the operational requirements identified in the screening test, a more detailed investigation identifies possible demand management or embedded generation options that might exist in the area under consideration based on existing knowledge of the customer base.
- Depending on the size of the DM requirement a public consultation, through an Expression of Interest request with interested parties and non-network service providers will be initiated.
- Alternatively, selected C&I customers are approached directly for curtailable load control during peak demand periods in return for network support payments.
- Any feasible demand management and/or embedded generation options are considered for development and compared with network augmentation option.
- Where a demand management or embedded generation option is determined to be the most economical solution, it is implemented.

5.2. Process to engage and consult with potential non-network providers

As noted in 5.1, as part of its ongoing network planning process AusNet Services identifies specific locations where there is existing, or emerging, limitations, and publishes them as opportunities for network support in the business' annual TCPR and the DAPR. At any time, non-network service providers (or other interested parties) may approach AusNet Services with demand management or embedded generation proposals based on the information in the latest TCPR and DAPR.

Non-network providers can proactively approach AusNet Services to become listed on the business' Demand Side Engagement Register in response to an open invitation to be registered, or to a targeted invitation from AusNet Services.

AusNet Services currently engages with registrants to determine their specific capabilities and capacities to provide non-network solutions that mitigate network limitations and constraints.

Details of qualified service providers are managed in a database and ongoing contact is maintained with Registered Parties, so that they are advised of any DAPR and TCPR releases in which RIT-D processes have been initiated. The release of DM public consultation papers or any other DM-related reports and case studies are also communicated to service providers registered in the database.

More formalised engagement and consultation processes (Expressions of Interest etc.) are also used when a specific need is identified.

RIT-D

Under the RIT-D, Clause 5.17.4 of the NER specifies the nature and timing of the consultation processes that are to occur. In overview:

- AusNet Services will publish on its DM Website and email persons on its Demand Side Engagement Register a non-network options report and expression of interest for distribution augmentation projects over $5M in value where a demand management or embedded generation solution may be a viable option.
- AusNet Services will consult more broadly with *Registered Participants,* Australian Energy Market Operator (AEMO) and other stakeholders, as required.
- Calls for submissions are on the non-network options report will be made and stakeholders given at minimum three months to make submissions in support of viable non-network options along with information to enable AusNet Services to assess the option's technical and commercial feasibility.
- A minimum six-week public consultation period will be held on the draft project assessment report requesting submissions on the business' stated preferred investment to meet the identified limitation on its network.
- To conclude the RIT-D consultation process, AusNet Services will notify persons on its Demand Side Engagement Register when it publishes its final project assessment report.

Details of the RIT-D consultation process can be found on the AER website.

5.3. Process when negotiating the further development of a potential non-network option

When a viable non network option is identified (embedded generation or demand management) AusNet Services will enter negotiations with the selected non-network provider to agree a Network Support Contract for a period. The Network Support Contract will agree:

- The size and timing of the network support provision.
- The requirements for a separate Network Connection Agreement if embedded generation is to be used and any other prerequisites.
- The communications and despatch procedures for network support events.
- The amount and timing of payments for network support events.
- The duration of the agreement and review process for termination or extension; and
- Any other commercial and legal requirements.

5.4. Information a non-network provider is to include in a non-network proposal

AusNet Services has provided below a nominal list of the data that should be considered for inclusion in a demand management or embedded generation (excluding micro-generators) proposal. The intent of this list is to provide guidance to facilitate information exchange, and to provide a more efficient process for all parties involved in developing such a proposal.

The list is not intended to replace or supersede any requirement published in a consultation paper, EOI, or a non-network options report. Rather, the intent is to provide advance indications of the types of information that AusNet Services would need in the assessment of non-network options:

1. Proponent name and contact details.
2. A detailed description of the proposal, and a brief explanation of the relevance of the proposal in relation to the need for investment in the distribution network.
3. Operational parameters including:
    - Capacity in MW or MVA of load reduction or generation to be provided and number of units, if generation,
    - The period of notice required before loads can be interrupted or generators started,
    - Availability of the DM resource and any restriction on load reduction capacity or generator output at any times of the year,
    - Availability and reliability performance benchmarks.
4. Proposed operational and contractual arrangements that the proponent would be prepared to enter with AusNet Services.
5. Any special conditions to be included in a contract with AusNet Services.

Additional information that may be needed for embedded generation projects includes:

- Fault level contribution, load flows, and stability studies.
- Electrical layout schematics.
- A firm nominated site.
- A commissioning date with contingency specified.
- Network interface requirements as agreed with AusNet Services (e.g., SCADA, dispatch)

- The economic life of the proposal.
- Banker/financier commitment; and
- Evidence of a planning application having been lodged, where appropriate.

5.5. Criteria that will be applied by AusNet Services in evaluating non-network proposals

As noted in earlier sections AusNet Services' evaluation of non-network proposals will be conducted in accordance with the evaluation criteria set out in the AER's RIT-D. The RIT-D requires DNSPs to consider and assess all credible options – network and non-network alternatives - before choosing the best investment option to meet the network need.

Under the RIT-D, the preferred option is the credible option that maximises the net economic benefit to all those who produce, consume and transport electricity in the NEM, compared to all other credible options. The net economic benefit considers the market benefits versus the economic costs of each option. A credible option is a project, or set of projects, established to meet an *identified need*.

In assessing each credible option that has been identified to satisfy an *identified need*, such as the alleviation of forecast network constraint, the following broad criteria are considered during the option assessment stage, as per the RIT-D guidelines:

- Addresses the identified need.
- Commercially feasible.
- Technically feasible; and
- Can be implemented in a sufficient time to meet the identified need.

An option is commercially and technically feasible where its estimated costs are comparable to (or less than) other credible options that address the *identified need*.

The following table sets out the above criteria and how they would be applied in assessing a suite of network and non-network options.

Example Options	Meets identified need	Technically feasible	Economically feasible	Sufficient time to implement
Network option 1	✅	✅	❌	uncertain
Network option 2	✅	✅	❌	❌
Network option 3	✅	✅	✅	✅
Non-network option 1	✅	✅	✅	✅
Non-network option 2	✅	✅	uncertain	uncertain

Table 1 – Criteria applied to non-network proposals

In addition to the above criteria, there will also be a risk assessment that looks at the "firmness" or reliability of the non-network option compared with the augmentation option i.e., its ability to deliver the network support requested on time.

5.6. Principles considered in developing the payment levels for non-network options

The fundamental principle that AusNet Services applies in determining whether to proceed with any network investment, whether it is a network augmentation or a non-network solution, is that there is a net economic benefit to proceeding; notably, benefits outweigh costs over the life of the project.

A network augmentation is justified on several benefits, such as capacity, quality of supply, reliability, safety, environmental risks, NER and code compliances, infrastructure security, reduced expected

unserved energy valued at the Value of Customer Reliability (VCR) and reduced network losses. A network augmentation project is considered viable if these benefits exceed the cost of capital and ongoing operational costs for that project.

For non-network solutions it is also necessary for the value of benefits to exceed the cost of non-network support provision. The benefits will be calculated both with and without the network support proposal to value the economic benefits of the non-network option. The determination of network support payments will be based on an appropriate portion of the avoided costs mentioned in the preceding paragraph and will be assessed based upon the most competitively priced effective non-network option available.

Under the regulatory framework, distribution businesses are required to provide network support payments for non-network projects which maximises the net economic benefit associated with mitigating a network constraint. Broadly, payment levels for such non-network solutions should support the objective of the National Electricity Objective and the NER in relation to promoting efficient provision of services by the distribution network service provider.

In practical terms, application of the above principles to the development of payment levels for network support services are generally based on an appropriate portion of the Avoided Distribution Cost (ADC) usually from reduced expected unserved energy valued at the Value of Customer Reliability (VCR). The ADC establishes a 'cap' for recovery of the costs for non-network projects (and hence network support payments). In principle:

- The ADC represents the expected change in the net present value of future capital and operating costs affected by a non-network option.
- The expected change in the present value is calculated by comparing the present values of expected capital expenditure and operating cost cash flows with and without the non-network project (all other things being equal) over an appropriate time period.
- Estimates of future capital expenditure and operating costs for calculating present values should be based on the state of knowledge that existed at the time a formal business decision was made to commit to the relevant network augmentation investment across a range of reasonable future development scenarios.

In addition to network support payments, embedded generators are entitled to additional payments, under the NER in the form of Avoided Transmission Use of System Charges (TUoS). These network support arrangements can be applicable to demand management projects in certain circumstances.

The methodology used by AusNet Services for calculating the Avoided TUoS payment is presented Section 5.8.

5.7. Applicable incentive payment schemes for the implementation of non-network options

Non-network providers receive network support payments based upon the avoided distribution costs (as per the preceding section) and avoided TUoS (as per the following section). If a particular solution is fully or partially funded by an incentive scheme such as DMIS (Demand Side Incentive Scheme), its eligibility criterion will be applied in developing and implementing the non-network options.

There may be non-network solutions which may not be funded by any incentive scheme or fully or partially funded under a different incentive scheme other than DMIS. Any applicable incentives and associated specific criteria will be factored into the assessment and implementation of a non-network proposal to achieve intended objectives of the scheme.

The DMIS is designed to support DNSP's investigation and implementation of broad-based and location-specific DM solutions, to improve their non-network planning capabilities, and to provide benefits to consumers in the longer term.

To ensure optimal allocation of its funding AusNet Services has developed three key criteria for assessing potential DMIS projects:

- *Reproducibility* – projects should address characteristics that exist in multiple locations in AusNet Services' network and can be applied in multiple situations.
- *Applicability* – projects should be able to address issues and limitations at the level of a Zone Substation footprint; and
- *Economic efficiency* – projects should be potentially cost effective compared with probable network alternatives

AusNet Services submits annual reports to the AER on the outcomes and expenditure of programs and projects implemented under the DMIS. Copies of these reports can be found at the AER website.

5.8. The methodology to be used for determining avoided TUOS charges

Clause 5.5 (h) of the National Electricity Rules (NER) requires that distributors make payments to embedded generators for avoided Transmission Use of System Charges (TUoS).

The avoided TUoS charges that are paid to embedded generator proponents are calculated based on the difference in prescribed TUoS charges resulting from the change in load due to the embedded generator on the relevant transmission connection point. An overview of how avoided TUoS costs are shared with embedded generator proponents is illustrated below.

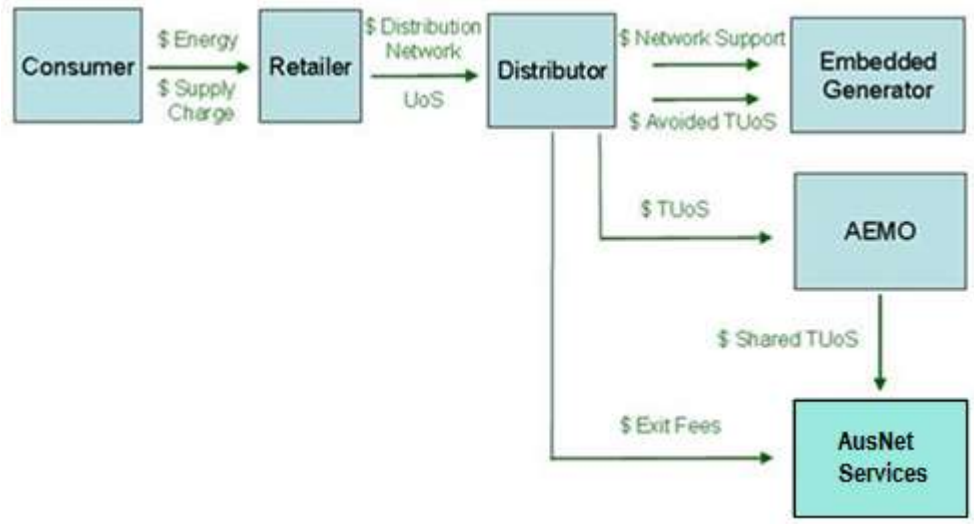

Figure 3 – Avoided TUoS

The methodology that AusNet Services applies for calculating avoided TUoS charges is outlined in Clause 5.5 (i) of the NER. The methodology is based on differencing the TUoS charges that would apply 'with' and 'without' the generator in place, as follows:

Step 1: 'With generator case': A calculation of TUoS charges with the embedded generator in place is performed for the 10 maximum demand days[1] and these charges are then matched to the amount billed by AEMO.

Step 2: 'Without generator case':

- The metered energy injected into the network by the embedded generator is then added back to the network loadings to derive the load assuming the embedded generator was not connected to the network.

[1] For Victorian Networks the Australian Energy Market Operator (AEMO) defines the locational component as those charges that are made on the basis of the 10 maximum demands (MD) at a transmission connection point over the extended Summer Period. The extended Summer Period is between 1 December and 31 March.

- Using the same rules for determining the 10 maximum demand values set out in Step 1 a new MD10 value is calculated: and
- The recalculated value is applied to the published AEMO TUoS locational rate for the terminal station that the generator is connected to.

Step 3: The difference between the TUoS charges calculated in steps 1 and 2 is the amount payable.

5.9. Factors for negotiating connection agreements with embedded generators

An embedded generation connection agreement is a prerequisite for a Network support Agreement to be contracted. Once an embedded generation connection application is received, AusNet Services and the proponent negotiate on the details of the connection.

The negotiation process covers technical design aspects as well as commercial details of the proponent's connection application. Typical factors included in negotiating connection agreements include:

- Equipment associated with each generating system including network interfaces and protection requirements.
- Compliance to the performance standards.
- Services necessary to maintain power system security.
- Physical layout of the generator facilities; and
- Connection charges.

During these negotiations, connection applicants may be asked to provide any further information, to a reasonable extent, that may be required to assess the technical performance and costs of the required connection.

The negotiation process undertaken is held in good faith and AusNet Services connection personnel aim to be helpful and guide proponents through the process. Once the connection arrangements, technical standards and commercial terms are agreed, AusNet Services prepares a formal offer to connect. If the proponent accepts this offer, then AusNet Services will prepare a formal connection agreement.

5.10. Process and requirements for connection agreements for embedded generating units

As required by the Australian Energy Regulator (AER), AusNet Services' process for setting charges and the terms and conditions for connection agreements for embedded generators are set out in Section 6.21 under Chapter 6 of the National Electricity Rules (NER).

AusNet typically requires that generator proponents pay a monthly connection charge for the connection services under the connection agreement from the date the connection services are available.

The connection charge is comprised of the following components:

- Monthly charge for the provision of connection services. This is set depending on the connection facilities required to provide and maintain the connection services and is adjusted annually by CPI and otherwise in accordance with the connection agreement.
- The Distribution Use of System tariff (DUoS) applicable at the time; and
- Adjustment to the charge for any avoided Customer TUoS charges with the amount due being calculated under the NER.

The connection charges are payable by the proponent irrespective of any outages or other service disruption.

As noted in Section 5.9 above, once the proponent accepts an offer to connect, AusNet Services will prepare a formal connection agreement. The terms and conditions that AusNet Services includes in its connection agreements are as outlined in Section 6.21.1 under Chapter 6 of the NER, and include:

- The conditions under which and the time frame within which other Distribution Network Users who use that part of the distribution network contribute to refunding all or part of the payments.
- The conditions under which financial arrangements may be terminated; and
- The conditions applying in the event of default by the Distribution Customer or Embedded Generator.

The process AusNet Services uses to finalise connection agreements is set out in Section 5.3.7 under Chapter 5 of the NER. The process is generally as follows:

- If the generator proponent accepts the offer to connect then it must negotiate and enter into a connection agreement with AusNet Services.
- The connection agreement must include proposed performance standards with respect to each of the technical requirements identified in schedules 5.2, 5.3 and 5.3a under Chapter 5 of the NER.
- The proposed performance standards must be based on the automatic access standard or, if the procedures in clause 5.3.4A have been followed, the negotiated access standard.
- The connection offered by AusNet Services will be made subject to gaining environmental and planning approvals for any necessary augmentation or extension works that may be required to our network.
- Within 20 business days of execution of the connection agreement, AusNet Services and the proponent must jointly notify AEMO that a connection agreement has been entered into between them and forward to AEMO the relevant technical details of the connection.
- Await advice from AEMO, within 20 business days, on the acceptability of the proposed metering installation associated with the new connection.

5.11. Process and factors for an application to connect an embedded generating unit

Chapter 5 of the National Electricity Rules (NER) provides the framework used by AusNet Services to progress an embedded generator *connection enquiry* and *application to connect* to the distribution network[2].

A Generator must apply to connect and enter into a connection agreement with AusNet Services in accordance with Section 5.3 of the NER before the embedded generator can be connected to the AusNet Services network.

Application Process for Large Scale Embedded Generators

Step 1: Preliminary discussion:

AusNet Services encourages informal preliminary discussions with proponents via in-person meeting or email communication to discuss specific network constraint issues, opportunities for network support on our network, and any other matters relevant to connecting an embedded generator to our network.

Initial enquiries can be made via the contacts noted in Section 5.15 of this document.

[2] Additional information on the embedded generator connection enquiry and application to connect to the distribution network process described in the NER can be found at: **http://www.aemc.gov.au/Electricity/National-Electricity-Rules/Current-Rules.html**

Step 2: Connection enquiry:

An embedded generator proponent wishing to make an application to connect must first make a connection enquiry in accordance with the NER, to AusNet Services.

The data required to be submitted by proponents in their connection enquiries is defined in Schedule 5.4 of the NER, and includes details such as the type, magnitude, and timing of the proposed connection to the AusNet Services network.

Step 3: Reply to connection enquiry:

As required by the NER, AusNet Services will then provide advice of the information required to enable the proponent to lodge an application to connect.

AusNet Services will aim to respond within 10 business days on information concerning project and planning details, and within 20 business days with the technical details to be included in the connection application and the application fees.

Step 4: Connection application:

Once a response is received from AusNet Services the proponent may prepare the information required by AusNet Services and submit this as its application to connect along with the relevant application fee required by AusNet Services to assess the application to connect.

Step 5: Application assessment:

Once AusNet Services has received from the information needed to support the proponent's connection application, a technical assessment will be conducted of the embedded generator project.

When assessing an application to connect, AusNet Services considers factors such as:

- The proponent's connection requirements, and the specifications of the facility to be connected.
- The proponent's expected level and standard of service of power transfer capability that the network should provide.
- Technical data included within the application to connect.
- Commercial information supplied by the proponent to allow AusNet to assess the ability of the proponent to satisfy the prudential requirements set out in NER 6.6 and 6.7.
- The amount of the application fee which is payable on lodgement of an application to connect; and
- Any other information relevant to the submission of an application to connect.

AusNet Services aims to respond within 30 business days as to whether the application is accepted or rejected, in accordance with the requirements of the NER. If the proposal is rejected, AusNet Services will advise the connection applicant of any additional information or modifications that may be required to enable AusNet Services to conduct a full assessment of the connection application.

As noted in Section 5.9 above, AusNet will also formally engage in negotiations with proponents at this stage with the aim of arriving at a mutually beneficially outcome for both parties.

5.12. An example of how AusNet will assess potential non-network options

The following is a typical example of how AusNet assesses potential non-network options. The example considers two alternatives; a network augmentation option and non-network option to install a 5 MW generator that provides network support over the summer period. The example could equally apply to a non-network service provider who is able to reduce loading, via curtailable load arrangements with customers, by 5 MW when required.

Example: Assessment of non-network option for reducing energy at risk

Zone substation XYZ in AusNet Services' service area has two 20/33 MVA 66/22kV transformers capable of supplying a cyclic maximum summer loading of 40 MVA each. The maximum demand forecast exceeds 40 MVA in summer under both 50% Probability of Exceedance (POE) and 10% POE forecasts.

The energy at risk and consequent expected energy at risk (unserved energy) from the forecast overload is valued at the Value of Customer Reliability (VCR)[3] in accordance with AusNet Services' probabilistic planning criteria. The following table shows the economic value of risk at zone station XYZ.

Initial Risk Level	2022/23	2023/24	2024/25	2025/26	2026/27
Forecast 50% POE (MVA)	48.0	50.0	52.0	54.0	56.0
Forecast 10% POE (MVA)	52.0	54.0	56.0	58.0	60.0
N-1 Rating (40 MVA)					
Energy At Risk – 50% POE (MWh)	353	530	1035	1538	2161
Energy At Risk – 10% POE (MWh)	1035	1538	2161	2903	3806
Weighted Value at VCR	**$86.0k**	**$128.3k**	**$202.4k**	**$283.1k**	**$382.2k**
($43,900 per MWh)					

Table 2 – Economic value of risk (VCR)

The network option to address this constraint is the installation of a third 20/33 MVA transformer at a cost of $4.5M. The cost of capital for this augmentation is $291k per annum at a WACC rate of 6.31%. As shown in the above table, the preferred network option becomes economic in 2026 (just prior to summer 2026/27) as the $291k annualised cost of capital for the project will be lower than the expected $382.2k cost of energy at risk for summer 2026/27.

Even though the network augmentation project would not be economic for delivery until 2026 there is energy at risk prior to this year and a non-network option could offer benefits in addressing this risk prior to 2026/27.

The non-network option is the connection by a proponent of a 5 MW generator to the 22kV network downstream from the substation. The proponent would like the project to be considered for network support payments. The generator would be available for the full summer period (1st November to 31st March) and can generate its full output should substation XYZ be constrained under outage of one of the 20/33 MVA transformers limiting capacity to 40 MVA. The output from the generator will contribute to a reduction in the forecast energy at risk shown in the table above, and while it cannot fully eliminate the risk it would still be able to reduce the risk significantly.

The reduced level of energy at risk after installation of the 5 MW generator (which effectively increases the rating of the zone substation to 45 MVA) is shown in the following table:

Residual Risk with 5MW	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**
Forecast 50% POE (MVA)	48.0	50.0	52.0	54.0	56.0
Forecast 10% POE (MVA)	52.0	54.0	56.0	58.0	60.0
N-1 Rating (40 MVA)					
Energy At Risk – 50% POE (MWh)	15.6	28.8	202.0	397.1	679.7
Energy At Risk – 10% POE (MWh)	202.0	397.1	679.7	1054.5	1349.6
Weighted Value at VCR (at $43,900 per MWh)	**$19.1k**	**$37.3k**	**$81.4k**	**$135.8k**	**$193.4k**
Net Risk Reduction with 5 MW	**$66.9k**	**$91.0k**	**$121.0k**	**$147.4k**	**$193.4k**

Table 3 – Net risk reduction with 5MW embedded generation

[3] Value of Customer Reliability (VCR) figures for AusNet Services are published in DAPR

The NET Risk Reduction shows the economic benefit of installing 5 MW of network support at substation XYZ.

Using these figures, for each year AusNet Services would be prepared to pay up to the value of the NET risk reduction to a provider of network support up until 2026/27, as shown in the last row in Table 2. Beyond 2026/27, either a new transformer is installed, or the non-network option is continued to further defer the network augmentation[4].

AusNet Services will usually contract for a minimum amount of operating time (or MWhrs) to be included in the network support contract considering the hours at risk and the probability of a transformer outage. In this example, a contract requirement for approximately 150 hours of generator operation which would equate to 750 MWhrs (5 MW x 150 hrs.) per annum would be sought.

5.13. Relevant, publicly available information produced by AusNet Services

AusNet Services produces a variety of reports of relevance to providers of non-network solutions which are updated regularly. Some of the most important of these are:

- Distribution Annual Planning Report (2025 – 2030)
- Transmission Connection Planning Report (2024)
- AusNet Services' Critical Peak Demand Tariff
- Pre-Approval Application for Solar PV Systems
- Compliance reports prepared under the requirements of the AER's Demand Management Incentive Scheme
- Electricity Distribution Price Review 2026 – 2031 regulatory proposal

Demand management information and case studies

AusNet Services has developed a series of case studies regarding demand management projects. These include both non-network projects developed in response to identified network constraints and innovation projects that have been initiated under the Demand Management Innovation Allowance. These case studies demonstrate our investigation of new technologies and the processes used by AusNet Services to consider and evaluate non-network project proposals put forward as potential solutions to address limitations or constraints on our distribution system. The demand management information and case studies are available on the AusNet Services website.

Network Opportunities Maps – External Website

The University of Technology Sydney has collaborated with Network Service Providers across Australia to produce an online tool to provide a national overview of network and generation opportunities. This tool is sponsored by the Australian Renewable Energy Agency and provides a visual representation of information that is also contained in the Distribution Annual Planning Report: http://nationalmap.gov.au/renewables/

5.14. Listing on the demand side engagement register

Non-network service providers should send an email to the Networks Planning Manager, Regulated Energy Services division (refer to Section 5.15 for contact details) to register their interest in being listed in AusNet Services' demand-side engagement register.

[4] Example for illustrative purposes only.

You will be requested to provide details of your firm's relevant capabilities and experience, and the extent to which you are able to provide proven demand management and embedded generation solutions.

Non-network service providers that are looking to discuss new and innovative technology options that may not yet satisfy the requirements of being listed on the demand side engagement register should contact the Distributed Energy and Innovation Manager, Regulated Energy Services division.

5.15. AusNet Services' contact details

Please contact the following for further information or registration of interest in non-network service provision.

Ana Erceg
Manager, Grid Evolution
AusNet Services
Level 31, 2 Southbank Boulevard, Southbank VIC 3006
Email: ana.erceg@ausnetservices.com.au

A. Appendix A – NER Schedule 5.9

Rule 5.13 (h) requires a demand side engagement strategy to include the following information (set out in Schedule 5.9 of the NER):

(a) a description of how the *Distribution Network Service Provider* will investigate, develop, assess and report on potential non-network options.

(b) a description of the *Distribution Network Service Provider's* process to engage and consult with potential non-network providers to determine their level of interest and ability to participate in the development process for potential non-network options.

(c) an outline of the process followed by the *Distribution Network Service Provider* when negotiating with non-network providers to further develop a potential non-network option.

(d) an outline of the information a non-network provider is to include in a non-*network* proposal, including, where possible, an example of a best practice non-network proposal.

(e) an outline of the criteria that will be applied by the *Distribution Network Service Provider* in evaluating non-*network* proposals.

(f) an outline of the principles that the *Distribution Network Service Provider* considers in developing the payment levels for non-network options.

(g) a reference to any applicable incentive payment schemes for the implementation of non-network options and whether any specific criteria is applied by the *Distribution Network Service Provider* in its application and assessment of the scheme.

(h) the methodology to be used for determining *avoided Customer TUOS charges*, in accordance with clauses 5.4AA and 5.5; and.

(i) a summary of the factors the *Distribution Network Service Provider* considers when negotiating *connection agreements* with *Embedded Generators*.

(j) the process used, and a summary of any specific regulatory requirements, for setting charges and the terms and conditions of *connection agreements* for *embedded generating units*.

(k) the process for lodging an *application to connect* for an *embedded generating unit* and the factors considered by the *Distribution Network Service Provider* when assessing such applications.

(l) worked examples to support the description of how the *Distribution Network Service Provider* will assess potential non-network options in accordance with paragraph (a).

(m) a link to any relevant, publicly available information produced by the *Distribution Network Service Provider*.

(n) a description of how parties may be listed on the demand side engagement register; and

(o) the *Distribution Network Service Provider's* contact details.

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