Demand Side Engagement Document

Version 001

D2020/407603

PowerWater

Contents

1 Introduction

Purpose

The purpose of this document is to describe how and when Power and Water Corporation engages with stakeholders on matters related to demand side solutions to the alleviation of constraints within the Northern Territory electricity distribution network.

It applies to potential suppliers of non-network services, registered participants, customers and other interested parties, and details the approach and processes we use to identify and evaluate non-network options to solving network constraints. It also describes how non-network service providers are consulted and invited to submit non-network solution proposals.

Demand side engagement strategy objectives

The objective of our demand side engagement strategy is to ensure that we have considered all credible options – both network and non-network – to provide the best value solution and most efficient outcome for customers when planning distribution network augmentation projects to alleviate constraints and limitations in our electricity distribution network.

Demand side engagement register

Power and Water is interested in receiving information on new ideas and possible non-network solutions to the identified needs and network limitations it has identified. We are establishing a demand side engagement register in which we will maintain a record of all individuals and organisation who express an interest in, and who can demonstrate the capability to supply, non-network demand management solutions to Power and Water.

Until we have established a web portal specific to demand side engagement registration, all interested parties should submit an expression of interest to Power and Water's single point of contact for all matters related to demand side management:

Tat Au-Yeung
Senior Manager Power Development and Planning
NetworkDevelopandPlanning.PWC@powerwater.com.au

Following receipt of an expression of interest, Power and Water will contact you to seek further details about your interest, and to evaluate your capability to deliver the range of demand management services that we may require in the future.

Following your inclusion on our demand side engagement register, you will receive direct notification of the following:

- Publication of our Transmission and Distribution Annual Planning Report (TDAPR)
- Projects that will be subject to the RIT-D
- Results of screening RIT-D projects for non-network options
- Publication of Non-Network Options Reports (NNOR)
- Publication of Request for Proposals (RFP) for demand management services
- Publication of Draft and Final Project Assessment reports.

Any registered party may also request to be removed from the demand side engagement register by notifying us at the same email address.

Online information sources

We make reference to various sources of information throughout this document. The following table summarises these sources and provides the URL/hyperlink to their online location.

DOCUMENT	URL/HYPERLINK
Index to Transmission and Distribution Annual Planning Reports (TDAPR)	https://www.powerwater.com.au/about/what-we-do/our-plans-and-values/past-corporate-reports

DOCUMENT	URL/HYPERLINK
Transmission and Distribution Annual Planning Report 2019 (TDAPR)	https://www.powerwater.com.au/__data/assets/pdf_file/0014/40118/2019-Power-and-Water-Transmission-Distribution-Annual-Planning-Report.pdf
Network Technical Code and Network Planning Criteria (NTC)	https://www.powerwater.com.au/developers/power/technical-code-and-planning-criteria
Embedded Generator Connection Guideline	https://www.powerwater.com.au/__data/assets/pdf_file/0018/49032/Embedded-Generation-Guideline-NT-NER-Ch55A-.pdf
System Strength Impact Assessment Guidelines (draft)	https://www.powerwater.com.au/__data/assets/pdf_file/0017/50219/DRAFT-System-Strength-Impact-Assessment-Guidelines.pdf
Generator and Load Model Guidelines and Model Change Management Requirements (draft)	https://www.powerwater.com.au/__data/assets/pdf_file/0016/50218/DRAFT-Generator-and-Load-Model-Guidelines-and-Change-Management-Requirements.pdf
AER - Final RIT-D application guidelines - December 2018	https://www.aer.gov.au/system/files/AER%20-%20Final%20RIT-D%20application%20guidelines%20-%2014%20December%202018_0.pdf
AER - Final Determination - Cost thresholds review - November 2018	https://www.aer.gov.au/system/files/AER%20-%20RIT%20cost%20threshold%20review%20-%20Final%20determination%20-%20November%202018.pdf

2 Regulatory requirements

The electricity network and market in the Northern Territory are regulated by the Australian Energy Regulator, and are subject to the National Electricity Rules as in force in the Northern Territory (NT NER), published by the Australian Energy Market Commission. The requirements that govern demand side engagement with non-network service providers are detailed in rule 5.13.1 parts (e) to (j), and schedule 5.9.

NT NER Rule 5.13.1

Rule 5.13.1 parts (e) to (j), require distribution network service providers to develop and document a strategy for engaging with non-network service providers, reviewable at least every three years, and to establish a facility by which parties interested in being notified of network developments can register their interest.

NT NER Schedule 5.9

Schedule 5.9 sets out details of the information that Power and Water must include in this document. Appendix A contains the table summarising where in this document we have provided the required information.

3 Planning process

Annual planning review

Forecasting demand

Power and Water's demand forecasts are calculated for the 12-month period from 1 April to 31 March to coincide with the timing of the Northern Territory's wet and dry seasons. Forecasts for feeders and zone substations are prepared each year. Distribution feeder and zone substation maximum demand forecasts are determined by taking into account historical maximum demand, completed or committed block loads and embedded generation sources and recent or expected changes to the network.

Power and Water's forecasting process comprises the steps shown in Figure 1.

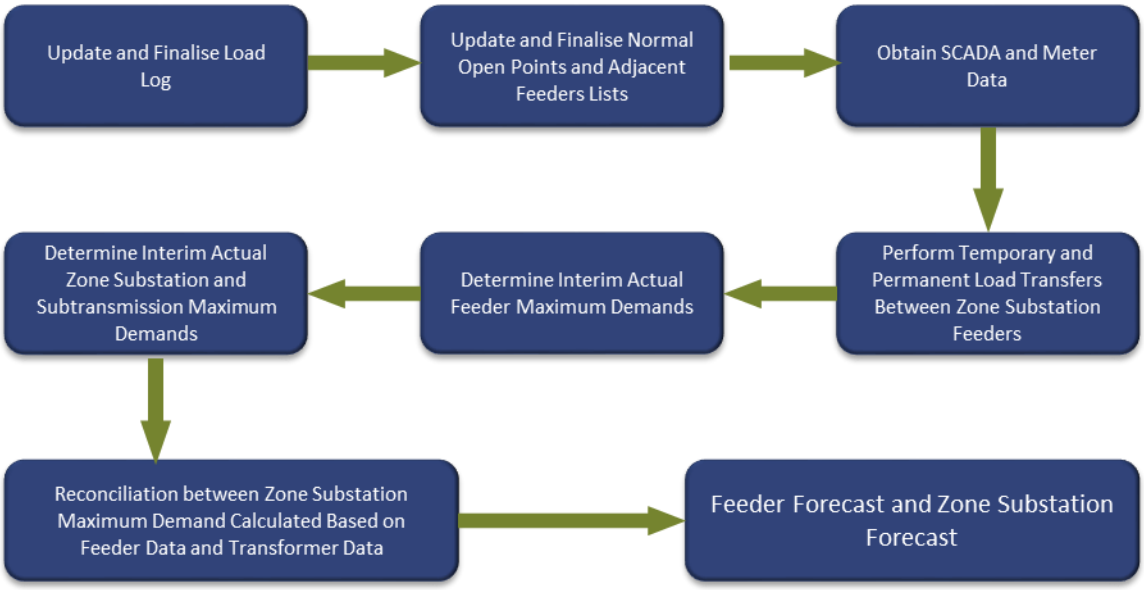

Figure 1 Power and Water's Forecasting Process.

Details of these steps are documented in Power and Water's Transmission and Distribution Annual Planning Report (TDAPR).

Identifying network needs and constraints

The TDAPR details those network locations where Power and Water has identified that network constraints will develop, threatening the future security of supply to customers. The report suggests solutions to those constraints, some of which might have feasible non-network solutions, such as additional embedded generation supplies.

Developers of embedded generation projects should review the TDAPR for opportunities to contribute non-network solutions to network constraints.

Transmission and Distribution Annual Planning Report (TDAPR)

Power and Water publishes its TDAPR annually by 31 December. The TDAPR presents the outcomes of Power and Water's annual planning review, looking forward over a planning period of 10 years for the transmission network and five years for the distribution network.

The TDAPR presents the most recent annual load forecasts, network constraints, and network performance data as well as the plans and committed investments made by Power and Water to address identified issues. The TDAPR also presents information on Power and Water's regional development plans, our approach to asset management, and includes a chapter specifically related to demand management.

Demand Management

Historically, system limitations and constraints were generally resolved through the construction of new network infrastructure such as poles, wires and substations. The approach that Power and Water now adopts is one where

demand management (and/or investment deferral) is the preferred strategy, leading to prudent and efficient investment when required.

The TDAPR chapter on demand management will detail examples where non-network options are being considered as solutions to network limitations. Non-network options may include:

- Load curtailment or load shedding – whereby certain customers agree to reduce or disconnect their load at our request
- Solar photovoltaic (PV) – whereby a single large-scale embedded generator or multiple small-scale (rooftop) customers invest in hybrid solar PV and battery energy storage systems connected to the same substation to improve security of supply for all customers connected to the substation
- Micro-grid – whereby sections of the network can be isolated from the network and continue to operate in islanded mode
- Back-up generation – whereby diesel generators are installed at locations deemed to be at risk to provide capacity support as an interim solution while a long-term network or non-network solution is developed.

4 Regulatory investment test for distribution (RIT-D)

What is RIT-D?

NT NER rule 5.13 states that "the purpose of the regulatory investment test for distribution (RIT-D) is to identify the credible option that maximises the present value of the net economic benefit to all those who produce, consume and transport electricity in the local electricity system". In some circumstances, a project may have a negative economic benefit, in which case, it should be delivered at minimum net present cost.

Broadly, the RIT process is designed to ensure that when network businesses undertake network investments where the capital cost will exceed cost thresholds determined by the AER, they must apply a cost benefit analysis in order to identify the most efficient, cost-effective investment option. When applying a RIT, network businesses can skip some parts of the consultation process if the large investments they are exploring are still less than a certain size. The RIT cost thresholds determine what constitutes a sufficiently 'large' network investment for these purposes.

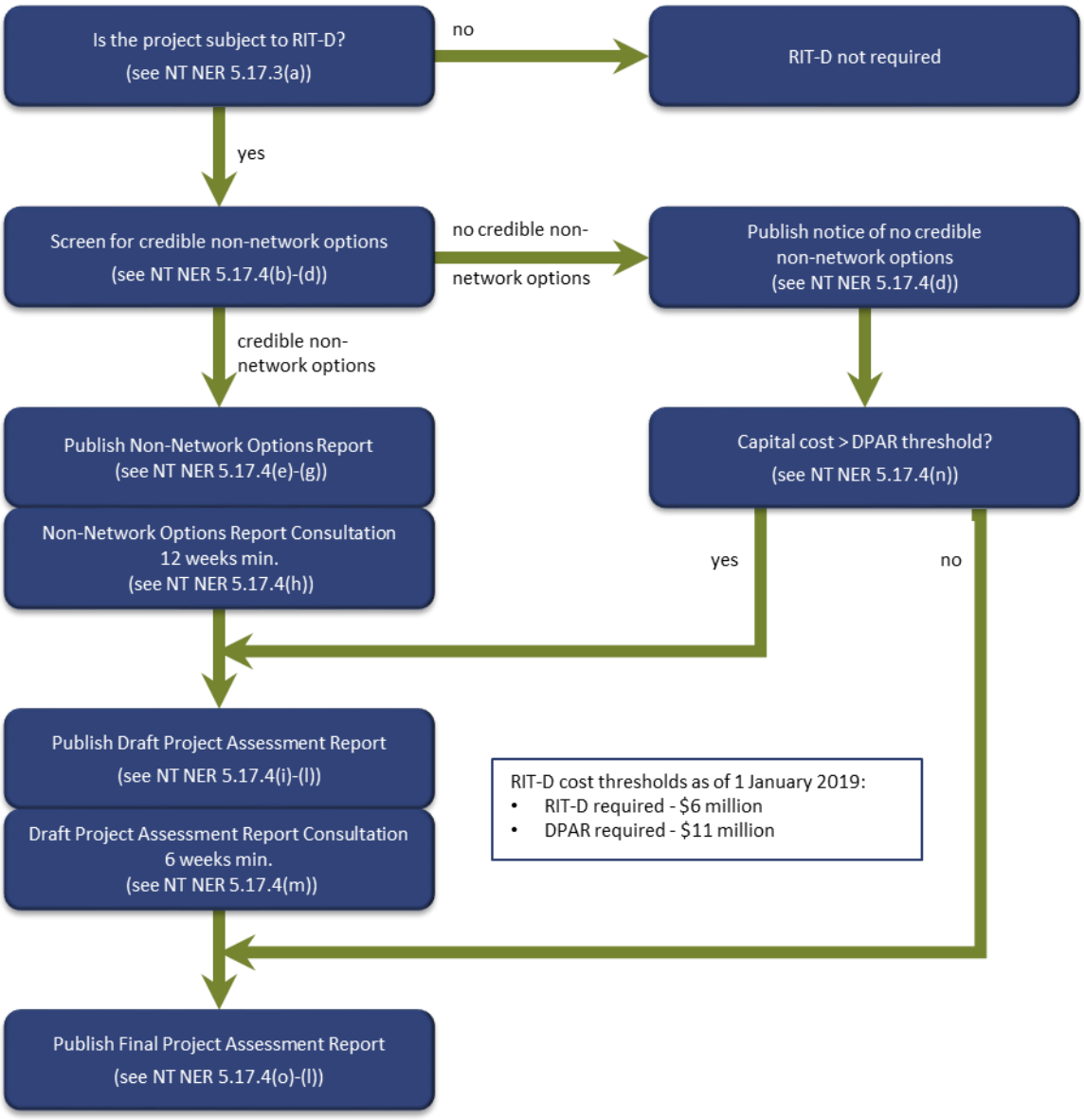

Figure 2 RIT-D Process.

Non-network options

The RIT-D guidelines specifically require network businesses to consult with its stakeholders, and for any project that is subject to RIT-D, to screen the project for credible non-network options. Unless they have reasonably determined that there are no credible non-network options, the business must publish a non-network options report and invite submissions from its stakeholders, including from all parties registered on its demand-side engagement register. This allows interested parties to make submissions to the business proposing non-network options to solve the network limitation identified by the network business.

Draft project assessment report

After reviewing and analysing the costs and benefits of all credible network and non-network options, and if the capital cost of the investment exceeds a value determined by the AER, the network business is required to publish the draft project assessment report and open it up for consultation.

Final project assessment report

The network business must consider all submissions received from its stakeholders on the draft project assessment report, and must publish its final project assessment report either as part of its annual planning report or, if the estimated capital investment exceeds another level determined by the AER, as a stand-alone report.

5 Demand side engagement strategy

Power and Water's demand side engagement strategy is the means by which Power and Water engages with non-network service providers and other interested parties in order to develop credible non-network options to alleviate identified distribution network limitations. All interested parties have the opportunity to submit proposals for non-network options during the process. Power and Water will issue a Non-Network Options Report (NNOR) for each significant network augmentation project. However, non-network solutions proponents may make submissions based on the TDAPR or the publication of the screening report.

This document provides guidelines on how to submit non-network option proposals and the information to be included in a submission, and describes how we evaluate submissions and how we engage successful service providers.

Community consultation

Power and Water engages with its stakeholder community each time we publish documents or information releases on network limitations. These include:

- Transmission and Distribution Annual Planning Report (TDAPR)
- Screening Report or Non-Network Options Report (NNOR)
- Draft Project Assessment Report (DPAR)
- Final Project Assessment Report (FPAR)

All of these documents will be will available from Power and Water's website, updated annually in the case of the TDAPR, and published on a project by project basis in the case of the NNOR, DPAR, and FPAR.

Non-network proposal submission details the information we require in order to evaluate non-network option proposals, which should be emailed to Tat Au-Yeung, Senior Manager Power Development and Planning at NetworkDevelopandPlanning.PWC@powerwater.com.au

Power and Water also notifies directly all parties registered on our Demand Side Engagement Register regarding the above documents and invite submissions for non-network alternatives.

When projects fall under the requirement that we conduct a Regulatory Investment Test – Distribution, Power and Water will invite broader consultation at each of the required stages.

Non-network options

When Power and Water screens a project to alleviate a network limitation, and identifies that a network limitation might credibly be managed by the implementation of a non-network solution, we will publish a project-specific Non-Network Options Report. Publication of the NNOR initiates a consultation period during which we invite non-network solution proponents to make submissions and proposals for a solution to the identified need; effectively, publication of the NNOR kicks-off the procurement process for a non-network solution.

If a non-network solution proposed at this stage is later found to be the preferred option to solve the identified need, Power and Water would proceed to procurement of that solution based on the information provided in the proposal. Therefore, it is important that non-network solution proposals are comprehensive and in accordance with Power and Water procurement guidelines, which are available from Power and Water's website.

The NNOR itself will follow Power and Water's procurement guidelines and will include all other documentation to allow proponents to make a compliant submission so that the whole process complies with Power and Water's governance and procurement requirements.

In accordance with the NT NER, NNORs will contain the following information:

- a description of the identified need
- the technical characteristics of the identified need that a non-network option would be required to deliver, such as the size of load reduction or additional supply, location, contribution to power system security or reliability, contribution to power system fault levels, and the operating profile
- the assumptions used in identifying the identified need
- the relevant annual deferred augmentation charge associated with the identified need (if available)
- a summary of potential credible options to address the identified need, including network and non-network options, including a technical definition or characteristics of the option, the estimated construction timetable and commissioning date (where relevant), and the total indicative cost for each potential credible option

- information to assist non-network providers wishing to propose alternative potential credible options including details of how to submit a non-network proposal for consideration.

Following the publication of the NNOR, there will be a 12-week consultation period during which Power and Water will invite submissions and proposals on the non-network options proposed.

Non-network proposal submission

The NNOR will include details of Power and Water's procurement guidelines and an outline of the information service providers are to include in their proposals. The type of information requested in proposals is listed below:

- Name, address and contact details of the entity making the submission
- Size, type and location of load(s) that can be interrupted, reduced, or otherwise modified without or with limited prior notification
- Size, type and location of embedded generation equipment being proposed
- Notification period(s) required to bring proposed demand management solutions into effect safely and securely
- Total cost(s) to implement demand management solution(s), and the level of contribution or compensation requested by the proponent from Power and Water
- Other information that would assist Power and Water in its evaluation of the proposed non-network solution.

Embedded generator proponents must demonstrate the reliability of the equipment being proposed and should provide evidence of previous experience to prove their capabilities.

Embedded generators must also comply with the generator performance standards applicable to the Northern Territory, which differ from those applicable to the NEM owing to the unique nature of the network and the need to maintain its security and reliability for all customers. Power and Water specifies these requirements in the Network Technical Code and Network Planning Criteria (https://www.powerwater.com.au/developers/power/technical-code-and-planning-criteria)

If non-network solution proponents' proposals are incomplete or provide insufficient detail to allow Power and Water to evaluate the proposal in comparison with other network and non-network options, we may evaluate the proposals as they are, or request further information of the proponents, the ultimate objective being to provide our customers with the most cost/benefit effective solution to the identified need.

Non-network option submissions review

All non-network submission will be reviewed as equitably as possible, and will be assessed alongside network options according to the following criteria:

- Potential for demand reduction/supply augmentation
- Diurnal and seasonal profile of demand management available
- Reliability of demand management proposed to meet the identified need
- Lifecycle cost/benefit of the proposal (NPV and $/kVA)
- Timeframe to execute the non-network project
- Assessment of the service provider's capability to achieve the specified outcome
- Risks associated with the proposal.

Power and Water will evaluate credible non-network proposals alongside credible network options to identify the preferred option that maximises the net economic value to all those who produce, consume, and transport electricity in the Northern Territory network. The RIT-D Application Guidelines published by the AER sets out guidance for the operation and application of the regulatory investment test for distribution (https://www.aer.gov.au/system/files/AER%20-%20Final%20RIT-D%20application%20guidelines%20-%2014%20December%202018_0.pdf)

Market benefits that we consider when assessing options include the following:

- Changes in voluntary load shedding
- Changes in forced/directed load shedding
- Changes in network losses
- Timing of network expenditure investment
- Changes in costs for participants other than Power and Water.

We will estimate impacts according to the RIT-D Application Guidelines. The final solution to the identified need might be implementation of one or a combination of several options, provided that each proposal proves cost-effective in its own right and provides a combined Net Present Value (NPV)/ Net Present Cost (NPC) that is more beneficial to the preferred network option.

Non-network solution compensation levels

Compensation for non-network options will initially be based on the avoided distribution cost (ADC) of deferring or avoiding the most credible network option.

We will determine the target demand reduction using the most recent demand forecasts for the network component(s) under constraint. Together with the ADC, we will determine a maximum $/kVA payment level available to reduce peak demand. Taking this maximum level into account, payment levels proposed by individual service providers may vary and will be based on the following criteria:

- the total deferral value
- the magnitude of the demand reduction proposed
- the duration of demand reduction proposed
- the availability and reliability of the demand reduction proposed
- running and administration costs for each initiative
- the proportion of the delivered demand reduction compared to the total requirements.

Access to incentive payments

Power and Water will pay proponents a demand management incentive payment based on performance, which will depend on achievement of demand reduction targets when required and the agreed delivery criteria. We also understand that some initiatives may involve a set-up cost, and we are willing to consider providing financial assistance with these costs based on guaranteed delivery in service.

Incentive payments may take a combination of forms, such as:

- Variable $/kVA of verified demand reduction
- Fixed $ for each demand reduction event
- One-off assistance with set-up costs.

Payments will be subject to negotiation during discussions for the provision of the non-network solution.

Non-network program implementation

Following completion of the NNOR consultation process and the economic evaluation of network and non-network options to resolve the identified need, Power and Water will identify a preferred option or combination of options and document the results in a Project Assessment Report. If the capital investment required is less than the level that triggers the requirement for a Draft Project Assessment Report (DPAR), Power and Water will proceed directly to publication of the Final Project Assessment Report (FPAR).

If a DPAR is required, we will publish the draft report and commence the consultation phase required by the RIT-D. All submissions received on the DPAR will be considered prior to publication of the FPAR.

Following publication of the FPAR, we will proceed to implementation of the preferred option to the identified need(s). If the preferred option is a non-network solution, we will negotiate an agreement with the preferred proponent(s), and execute formal agreements to document the service being provided, demand reduction targets, timeframes, milestones, remuneration and compensation, etc.

Embedded generation

If the preferred option involves the installation of an embedded generator the proponent will need to submit the appropriate Application for Connection of a Generator to start the process of securing approval to connect to the Northern Territory network. Power and Water has published an Embedded Generator Connection Guideline (https://www.powerwater.com.au/__data/assets/pdf_file/0018/49032/Embedded-Generation-Guideline-NT-NER-Ch55A-.pdf), which provides guidance about which process and application forms should be used based on the capacity of the proposed embedded generation facility. Embedded generation facilities must also comply with the applicable requirements of the Network Technical Code and Network Planning Criteria (https://www.powerwater.com.au/developers/power/technical-code-and-planning-criteria).

Application for Connection

Power and Water will consider each application for embedded generation to connect to the Northern Territory network on its own merits. The guidelines and application forms, and the Network Technical Code and Planning Criteria provide all the information required for a developer to design its proposed installation in such a manner that approval would be granted with the minimum of disruption.

Generator and Load Modelling

Power and Water is currently consulting on two new guidelines that will be relevant to proponents of embedded generation solutions to network limitations: System Strength Impact Assessment Guidelines (SSIAG) and Generator and Load Model Guidelines and Model Change Management Requirements (Model Guidelines).

Once implemented, proponents will have to ensure that they provide computer models and data with their connection applications that conform to the requirements of the Model Guidelines so that Power and Water can properly assess the impact of the proposed generation installation on the system strength of the Northern Territory network.

During the consultation process, the draft guidelines can be downloaded from Power and Water's website at https://www.powerwater.com.au/market-operator/consultation-papers.

Generator Connection Offer

Power and Water will provide an offer to connect to the embedded generation proponent. Any additional connection requirements and conditions will be detailed in the offer and may include details of network augmentations and customer installation upgrades required to enable the network to accept the connection without compromising network safety, security, reliability and power quality.

Technical Studies and Design

Power and Water may need to undertake additional studies to properly assess applications to connect for large embedded generation facilities in order to ensure network safety, security, reliability and power quality. In these cases, we will detail the scope, procedures and associated costs in the connection offer.

Connection Works

The NER details the conduct of the generator connection process, and details the processes associated with the generator connection charges, which can include: network capability and capacity, generator capacity, connection voltage, augmentation requirements and connection complexity of the proposal.

Any connection works directly associated with the customer/embedded generator are contestable and may be performed by any competent contractor in accordance with the standards required by Power and Water. However, any works on the shared network are usually funded by Power and Water unless advised otherwise.

The connection applicant would normally be financially responsible for the full cost of the generator connection assets and services, and the cost of mitigating any distribution network constraints that are specifically related to the connection of the embedded generator.

The connection applicant would also be responsible for Power and Water's costs reasonably incurred to process the connection application, including application to connect processing fee and connection charges. Connection charges may include:

- Network Augmentation Works
- Recovery of Power and Water's reasonable expenses if the scope of the project expands beyond the scope of the original application to connect
- Legal and commercial negotiation fees
- Commissioning works such as inspections and or performance validation.

Connection Agreement

The Connection Agreement will form the finally agreed conditions and performance requirement for the embedded generator connection. Standard terms and conditions would normally be adequate for small and micro embedded generators subject to chapter 5A of the NER for larger installations, subject to chapter 5 of the NT NER, a negotiated agreement will likely be required, unless the proponent can comply unconditionally with all the requirements of the Generator Performance Standards in the Network Technical Code and Planning Criteria.

Test and Commissioning

All embedded generators must be tested and commissioned by the embedded generation owner prior to entering commercial operation. Depending on the capacity of the embedded generation facility, Power and Water may require

specific test procedures to be performed to prove compliance with the generator performance standards and any connection conditions specified in the connection agreement.

Appendix A

NT NER Schedule 5.9 compliance

Table 1 Compliance with NT NER schedule 5.9.

PART	REQUIREMENTS	SECTION
(a)	a description of how the Distribution Network Service Provider will investigate, develop, assess and report on potential non-network options	3 Planning process
(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	Demand side engagement register
(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	Non-network proposal submission
(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	Non-network proposal submission
(e)	an outline of the criteria that will be applied by the Distribution Network Service Provider in evaluating non-network proposals	Non-network option submissions review
(f)	an outline of the principles that the Distribution Network Service Provider considers in developing the payment levels for non-network options	Non-network option submissions review
(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	Non-network solution compensation levels
(h)	the methodology to be used for determining avoided Customer Transmission use of System (TUOS) charges, in accordance with clauses 5.4AA and 5.5	Not applicable in the Northern Territory
(i)	a summary of the factors the Distribution Network Service Provider takes into account when negotiating connection agreements with Embedded Generators	Embedded generation
(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	Embedded generation
(k)	the process for lodging an application to connect for an embedded generating unit and the factors taken into account by the Distribution Network Service Provider when assessing such applications	Application for Connection Generator Connection Offer
(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)	No worked example yet available in Power and Water
(m)	a hyperlink to any relevant, publicly available information produced by the Distribution Network Service Provider	Online information sources
(n)	a description of how parties may be listed on the demand side engagement register	Demand side engagement register
(o)	the Distribution Network Service Provider's contact details.	Demand side engagement register