National DER Connection Guidelines – Basic and Low Voltage Connections

Webinar

7th March 2019

Energy Networks Australia

Agenda

1. Overview of intent and development process of the guidelines
2. Compliance to the guidelines
3. Feedback received from stakeholders
4. Follow on actions
5. Next Steps – MV & HV Guidelines
6. Questions

Presenters

Dr Stuart Johnston (GM Network Transformation – Energy Networks Australia)

Tim Edwards (Managing Director – CutlerMerz)

Sanika Willard (Consultant – CutlerMerz)

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Housekeeping

- ‘On hold’
  - DO NOT put us ‘on hold’, as this will prevent us from presenting the audio.
- Questions
  - please utilise the dialogue box function to record any questions you would like to pose to the presenters to address at the **end of the presentation**. Due to the number of participants on the webinar, you will not be able to talk directly to the presenters.
    - Please ensure you include enough detail in your question for the presenters to be able to easily understand your issue.

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Overview

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National DER Network Connection Guidelines

- A series of guidelines which set out the structure, definitions and technical settings Australian DNSPs should adopt in the development and application of their technical requirements for grid connection of distributed energy resources (DER).
- The guidelines use instructional language directed towards network service providers (NSPs) in developing and applying their technical requirements

Note:

- The guidelines are intended to address current technical requirements, as “point in time” type documents.
- Future technical requirements are being identified and described through the Energy Networks Australia / Australian Energy Market Operator (AEMO) “Open Energy Networks” (OpEN) program of work.
- As requirements shift from “future” to “now”, revisions of the guidelines will capture these changes.

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Documents

Framework and Principles Guideline

Specifies the number, scope and structure of the subsequent technical guidelines

Any voltage less than 1000VAC

Basic Connections Technical Guideline

Specifies the technical requirements and/or technical outcomes to be achieved for basic connections (<30kVA microEG connections)

Low Voltage Connections Technical Guideline

Specifies the technical requirements and/or technical outcomes to be achieved for all other connections to a low voltage network

Any voltage greater than 1000VAC

Medium Voltage Connections Technical Guideline

Specifies the technical requirements and/or technical outcomes to be achieved for connections to a medium voltage network

High Voltage Connections Technical Guideline

Specifies the technical requirements and/or technical outcomes to be achieved for connections to a high voltage network

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Who do the guidelines Basic & LV Guidelines apply to?

Stakeholder Type	Directly applies?	How guidelines should be used
Distribution Network Service Providers	✓	To directly adopt in the development and application of their technical requirements for grid connection of DER
Transmission Network Service Providers	✗	To consider (principles) in developing technical requirements for grid connection
Proponents	✗	To navigate and understand the technical requirements for connection to Australian networks
AER	✗	To assist in determining whether the technical requirements as proposed by DNSPs (in model standing offers) are fair and reasonable
Other stakeholders	✗	To navigate and understand the technical requirements for connection to Australian networks

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Desired outcomes

1. Increase **consistency** between NSPs in terms of technical requirements, documentation requirements and structure of technical requirements documentation
2. Improve **clarity** with respect to technical requirements
3. Strike the right **balance** between:
    a. Mitigation of network risks / network costs
    b. Efficiency in the connection process

    In terms of the level of **onerousness** of technical requirements
4. Establish a platform for NSPs to develop common standards and protocols for future management of active DER

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How will Energy Networks Australia ensure the guidelines remain relevant given the rate of change regulatory and technical settings?

- The guidelines will be reviewed annually by Energy Networks Australia to identify whether there is a technology or regulatory trigger for update
- An independent evaluation will be conducted to determine:
  - The level of compliance
  - Whether the desired outcomes have been achieved from both an NSP and proponent perspective
- Guideline review and implementation evaluations
  - The first review will occur six months after publication
  - The first independent evaluation will occur one year after publication
  - Independent evaluation will be conducted every two years thereafter

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How did we develop the technical settings?

- Direct engagement with primary stakeholders through meetings and workshops with a cross section of the industry, including:
  - DNSPs
  - Clean Energy Council (CEC)
  - Australian Energy Market Operator (AEMO)
  - Australian Energy Market Commission (AEMC)

- Quarterly briefings to the Energy Networks Australia Asset Management Committee (representing all NSPs)
- Two public webinars
- Draft revision process via email submission from each DNSP and stakeholders such as the CEC and AEC

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Principles in developing technical requirements

- Deliver consistency
- Improve clarity and transparency
- **Balancing network risk with connection efficiency** (reducing unnecessary onerousness)
- Creation of a process that can quickly respond to changing requirements of the industry
- Promoting innovation

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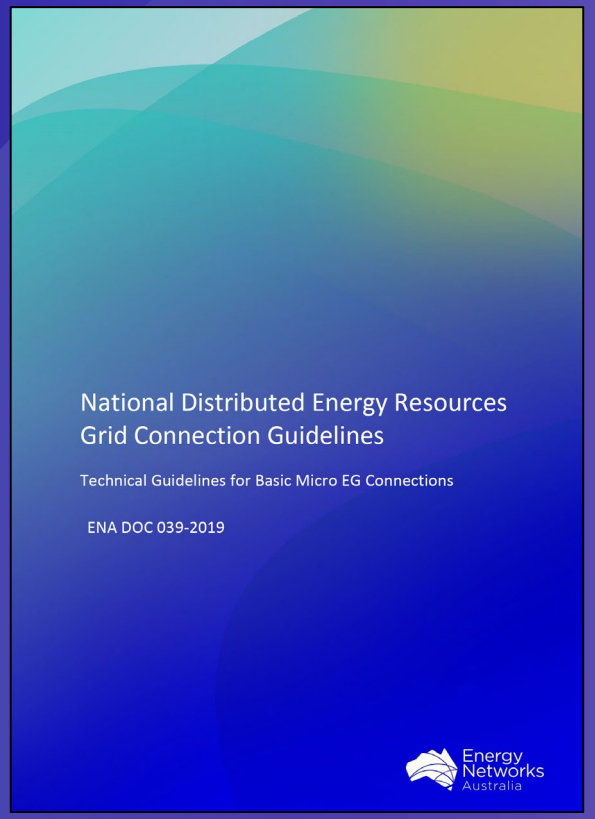
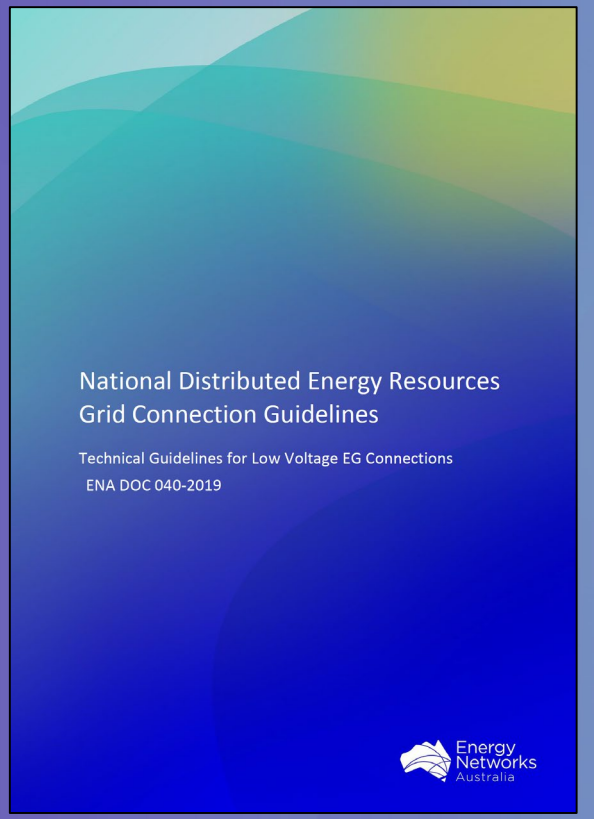
Feedback on Basic & LV Guidelines





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Summary of Basic and LV Connections Guidelines Contents

- About the National DER Connection Guidelines (overview, background, objectives, compliance, etc.)
- How DNSPs are to prepare the LV EG Connections Technical Requirements document including:
  - Introduction of the DNSP Technical Requirements document
  - Definitions, abbreviations and terminology used
  - Relevant Rules, Regulations, Standards and Codes
  - Technical requirements of grid connections
  - Fees and charges
  - Testing and Commissioning requirements
  - Operations and Maintenance requirements
- Appendices including: Deviations with justifications, Connection arrangement requirements and connection agreements

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Key themes covered by external stakeholder feedback

1. Guidelines: objectives, audience and iterations
2. Australian/International standards
3. Expediency in processing embedded generation connections
4. Voltage response modes
5. Energy storage systems
6. Generation control
7. Non-standard network connections
8. Maximum System Capacity
9. Compliance
10. Energy Networks Australia Communications piece and transition plan

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Guidelines: Objectives, Audience and Iterations

- Guidelines aim to establish the structure, definitions and technical settings that DNSPs should adopt for their technical requirements for grid connection of DER
- Audience of guidelines are DNSPs, as the guidelines provide a template for the development of their individual technical requirements documents
- Suggestion regarding the need to empower consumers with access to information about their investment choices
- Purpose of consistency vs specificity
- Process of evolving the guidelines

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References to Australian/ International Standards

- References to standards bring specificity/clarity for consumers and minimise confusions
- Solar PV is the most prevalent DER technology installed across Australia. Technical requirements for ESS and other DER technologies are intended to be introduced in future iterations of the guidelines.
- Guidelines are not an explanatory document
- Reminder that the guidelines are DNSP facing only

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Expediency of Processing Basic EG Connections

- Timeframes for assessments of applications and connections
- Basic connections guideline will enable expediency in processing
- Other connections will need to meet the slightly more negotiated requirements
- Consistency introduced by the guidelines into the DNSP technical requirements documents

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Voltage Response Modes

- Volt-var and volt-watt response modes contribute to network voltage regulation and can ultimately encourage further DER penetration

- Energy Networks Australia will be working closely with AEMO and DNSPs to develop volt-var and volt-watt settings that are forecast to be incorporated into the next iteration of the guidelines (with fixed power factor references removed altogether once the transition period is complete).

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Incorporating Energy Storage System (ESS) Technical Requirements into the Guidelines

- Future iterations of the guidelines are intended to incorporate further ESS requirements
- Consideration for ESS guideline to be introduced after the MV/HV guideline is completed
- Currently ESS is intentionally referenced for the purpose of improving consistency without introducing any constraints on battery operation or capacity
- ESS is defined as a system of one or more batteries
- It is intended for the guidelines to be technology agnostic, however there is focus on prominent DER technologies such as solar

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Generation Control

- Basic connections have generation control limits so that can be made consistent
- Setting the single phase Inverter Energy System (IES) export limit of 5kVA or higher is achievable
- Promote network security whilst also allowing customers to maximise export to the grid
- Demonstration of compliance to generation control settings
- Generation control will be influenced by developments in dynamic management and VPP trials, OpEN and individual DNSP research and development programmes.

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Non-Standard Network Connections (Basic EG Connections)

- ‘Non-standard network connections’ typically have their own set of technical requirements
- Due to the variance in network characteristics, there are varying technical requirements and capabilities for networks to be able to handle DER connections and export
- The guideline therefore requires DNSPs to set out generation control limits for each non-standard network type up front within their technical requirements document.

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Maximum System Capacity

- Safeguard from 'masking' of the load

- Once dynamic management requirements are introduced, this section will be amended appropriately.

- Energy Networks Australia have incorporated an additional sentence into the Basic guideline to prevent DNSPs from reducing the maximum system capacity setting from their currently allowed setting, and where they do, to include this as a deviation and provide a justification.

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Compliance with the Guidelines

- Compliance with the guidelines is not mandatory as they are guidelines not standards – ***However,*** it should be noted that:
  - This project has been driven by the DNSPs who have all made a commitment to adopt the requirements of the guidelines
  - DNSPs have agreed to a participate in annual compliance reviews and independent assessments after publication
  - DNSPs are cognisant that if it is identified that the guidelines are not effective in driving desired outcomes, regulators and policy makers may consider mandatory (standards) based options
  - After publishing of the guidelines, the focus of the period that follows will be to both encourage further improvements to the guidelines, in addition to channelling efforts for supporting how the process of implementation could be improved

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Compliance with the Guidelines cont…

- DNSPs must produce their own technical requirements documents that adopt the structure, definitions and technical settings as set out by the guidelines
- Deviations and justifications: Where DNSPs depart from the guidelines they may still be deemed to comply with the guidelines so long as:
  - The departure is documented
  - The reasons for the departure are compelling and documented in terms of the National Electricity Objective

ENA Communications and Transition Plan

- With the publication of the guidelines, Energy Networks Australia will prepare a communications piece and transition plan for DNSPs with consideration of the following feedback provided, including, but not limited to:
  - Changes to DNSP web portals that may be required and the expected timeframes for finalisation;
  - Changes to technical requirements documents and the expected timeframes for finalisation;
  - Consultation process for gauging DNSP feedback from the initial implementation stages;
  - Consultation process for establishing a communications pathway for consumer organisations to facilitate experiential feedback from the industry;

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ENA Communications and Transition Plan cont…

- Guidance on transitioning connection arrangement contracts when updates to the guidelines occur that would impact the DNSPs technical requirements documents;
- Storing all technical requirements in one location;
- Volt-var and volt-watt response modes and their potential to increase network hosting capacity;
- Generation control support for DNSPs and external stakeholders;
- FAQs including suggestions received.

Next Steps

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Next steps

» Basic and LV DER Connections Guidelines (Published March 2019)
  – Available now from ENA website

» MV & HV DER Connections Guideline (Feb to June 2019)
  – Kickoff in early February 2019

» Guideline review and implementation evaluations

  – The first review of the Energy Networks Australia DER Connections Guidelines will occur six months after publication (Sept 2019)

  – The first independent evaluation of DNSP compliance to the Energy Networks Australia DER Connections Guidelines will occur one year after publication of the Basic and LV guidelines (Mar 2020)

  – Independent evaluation of DNSP compliance to the Energy Networks Australia DER Connections Guidelines will be conducted every two years thereafter (Mar 2022, etc.)

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Questions?

The Basic and LV DER Connection Guidelines can be found at:

https://www.energynetworks.com.au/national-grid-connection-guidelines

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