

23 December 2022

s9(2)(a)

By email: **s9(2)(a)**

Dear **s9(2)(a)**

Thank you for your request, received on 19 December 2022, for the following information under the Official Information Act 1982 (the Act):

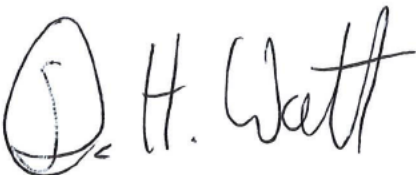
- Board papers regarding the AS/NZS 4777.2:2020 *Grid connection of energy systems via inverters, Part 2: Inverter requirements* decision.

The Electricity Authority (Authority) has identified one document within scope of your request, this is attached to this letter.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

If you wish to discuss this decision with us, please feel free to contact us by emailing oiia@ea.govt.nz.

Yours sincerely



Doug Watt

General Manager - Legal, Monitoring and Compliance (Acting)

Version update to AS/NZS4777.2 in Part 6 of the Code

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Released under the Official Information Act 1982

Date prepared: 17 August 2021

Version update to AS/NZS4777.2 in Part 6 of the Code Recommendations

1.1 It is recommended the Board:

- (a) **note** that the Code incorporates standards for inverters that govern small scale distributed generation (less than 10 kW) connection to the Grid to manage:
 - (i) Efficient and safe operation: The standards ensure inverters installed are suitable for the operating environment and meet the required protection settings of their local distribution network
 - (ii) Security of supply: The standards assist distribution networks in managing the power quality of their electricity supply to consumers
- (b) **note** that the standard is common across Australia and New Zealand and are periodically updated to ensure they remain contemporary and evolve with new technologies and other advancements;
- (c) **note** that the current standard (AS/NZS 4777.2:2015) expires on 18 December 2021 and will be replaced by an updated standard (AS/NZS 4777.2:2020)
- (d) **note** the changes in the new standard are technical in nature for small-scale inverters and will promote efficient operation and enhance security of supply for the distribution network, and have passed a consultation process facilitated by Standards Australia. All submissions have either been resolved or incorporated in the standard
- (e) **approve** the proposed amendment to the Code set to replace the current standard with the new standard set out in Appendix A
- (f) **approve** making the proposed amendment without consultation or a regulatory statement on the grounds that, under section 39(3)(a) of the Electricity Industry Act 2010 (Act), it is satisfied on reasonable grounds that the amendment is technical and non-controversial
- (g) **approve** the proposed amendment coming into force on 18 December 2021 to align with the transit on date to the new standard
- (h) **delegate** authority to the Chief Executive to publicise the proposed amendment on the Authority's website for a period of at least one week, as required under section 39(1)(a) of the Act
 - (i) **delegate** authority to the Chair, or to any other Board member if the Chair is unavailable, to finalise and sign:
 - (i) the proposed amendment
 - (ii) the draft *Gazette* notice (Appendix B).
 - (iii) the draft *Incorporation by Reference* certificate (Appendix C) (which will be attached to the copy of the standard that is required by the Act to be retained by the Authority).

Rationale

1.2 The amendment will promote the efficient operation of the electricity industry and enhance security of supply for the long-term benefit of consumers. This is because the amendment

will align the Code with the most up-to-date inverter standard recognised by Standards New Zealand for connecting small-scale distributed generation (SSDG) to a network.

Two ways consumers will benefit are as follows:

1. Efficient operation: Consumers will have access to inverters that are better suited to the operating environment of their local distribution network. This will ensure small-scale distributed generation will operate with the traditional distribution network in a more harmonious nature.
2. Security of supply: The new AS/NZS 4777.2:2020 standard provides detailed settings and parameters that assist in standardising the operating characteristics of small-scale inverters on the distribution network. This will assist distribution networks in managing the power quality of their electricity supply to consumers.

Next steps

- 1.3 The next steps are as described above in the recommendations.

The Code should provide for the new inverter standard recognised in New Zealand for connecting SSDG

The inverter standard is a key feature of the streamlined process for connecting SSDG under Part 1A of Schedule 6.1

- 1.4 Schedule 6.1 of the Code sets out two processes under which a distributed generator may apply to a distributor to connect SSDG to the distributor's network:
- (a) the slower process under Part 1 of Schedule 6.1, which does not specify a particular inverter standard for the SSDG
 - (b) the more streamlined process under Part 1A of Schedule 6.1, which a distributed generator may use if its SSDG has an inverter that complies with the AS/NZS 4777.2 inverter standard.

AS/NZS 4777.2:2020 will replace AS 4777.2:2015

- 1.5 On 18 December 2020, Standards New Zealand published a new inverter standard, AS/NZS 4777.2:2020. This new standard is already current but will replace AS/NZS 4777.2:2015 on 18 December 2021 when AS/NZS 4777.2:2015 will stop being current.
- 1.6 AS/NZS 4777.2:2020 specifies minimum performance and safety requirements for the design, construction and operation of inverters intended for grid connection of energy systems.
- 1.7 The main changes in AS/NZS 4777.2:2020 from AS/NZS 4777.2:2015 are all of a detailed technical nature and are definite improvements to the design and operation of inverters that will assist with management of low voltage networks and grid support. The changes are not expected to disturb feeder hosting capacity of distribution networks. Examples of the changes include:¹
- (a) revision of sustained frequency response
 - (b) revised set-points and limits to match electricity distributor and grid operator requirements

¹ AS/NZS 4777.2:2020 *Grid connection of energy systems via inverters – Part 2: Inverter requirements* (sample), at <https://www.standards.govt.nz/shop/asnz-4777-22020/>.

- (c) revision of provisions for demand response and power quality response modes
- (d) requirements for electrical safety of non-PV energy sources in accordance with IEC 62477-1²
- (e) requirements for improved withstand capabilities including multiple voltage disturbances, rate of change of frequency and voltage phase shift
- (f) requirements for measurement system accuracy and functional prioritization
- (g) requirements for stand-alone inverters
- (h) requirements for generation limit and export limit control function
- (i) revised and expanded testing procedures.

1.8 The inverter standard applied in Schedule 6.1 of the Code will not change from AS/NZS 4777.2:2015 until the Authority amends the Code to make this change. However, in practice, from 18 December 2021, AS/NZS 4777.2:2020 will supersede AS/NZS 4777.2:2015 as the recognised inverter standard for connecting distributed generation in New Zealand. The proposed amendment would change the Code to reflect this.

The proposed amendment promotes the efficiency limb of the statutory objective and is consistent with the Code amendment principles

- 1.9 The proposed amendment promotes the efficient operation of the electricity industry for the long-term benefit of consumers because the amendment will:
- (a) align the Code with the most up-to-date inverter standard recognised by Standards New Zealand for connecting SSDG to a network
 - (b) ensure consistency across the inverter standard applied in the industry, and minimise any uncertainty for participants as to the applicable inverter standard in the Code.
- 1.10 As shown in the table below the proposed amendment is consistent with the Code amendment principles.

Principle	Comment
1. Lawful	The proposal is lawful, and for the reason outlined in paragraph 1.9 above, is consistent with the statutory objective and the requirements set out in section 32(1) of the Act.
2. Provides clearly identified efficiency gains or addresses market or regulatory failure	The proposed amendment is consistent with principle 2 in that it addresses a problem created by the existing Code, which requires an amendment to resolve. Specifically, the proposed amendment addresses the problem that from 18 December 2021, the inverter standard in the Code (AS/NZS 4777.2:2015) will not reflect the recognised inverter standard for connecting distributed generation in New Zealand (AS/NZS 4777.2:2020).

² IEC 62477-1 is an International Electrotechnical Committee standard relating to safety requirements for power electronic converter systems and equipment

Principle	Comment
3. Net benefits are quantified	It is not practicable to quantify the benefits of this amendment.

No consultation is required

- 1.11 Section 39 of the Act requires that, before amending the Code, the Authority must publicise a draft of the proposed amendment, prepare and publicise a regulatory statement, and consult on the proposed amendment and the regulatory statement.
- 1.12 However, the Act also provides that the Authority need not prepare and publicise a regulatory statement or consult on a proposed amendment and regulatory statement if the Authority is satisfied, on reasonable grounds, that the nature of the amendment is technical and non-controversial.
- 1.13 For the following reasons, staff consider the Authority does not need to prepare and publicise a regulatory statement or consult on the proposed amendment because it is technical and non-controversial:
- (a) the proposed amendment will not impose any new obligations on participants. The amendment will only update the standard to which an inverter must conform if a distributed generator wishes to apply to connect their SSDG using the streamlined process under Part 1A of Schedule 6.1
 - (b) adopting AS/NZS 4777.2:2020 as the new inverter standard for connecting SSDG under Part 1A would not prevent a distributed generator with an inverter that conforms to a different inverter standard from connecting SSDG using the application process under Part 1 of Schedule 6.1
 - (c) the new inverter standard (AS/NZS 4777.2:2020) is a joint standard (recognised in New Zealand and Australia) that sets technical requirements relating to the design, construction and operation of inverters. Standards New Zealand has allowed a 12 month period from standard publish date to assist the industry to transition between inverter standards.

Commencement date

- 1.14 Staff recommend the Board approve the proposed amendment coming into force on 18 December 2021. This will align the inverter standard in the Code with the inverter standard recognised by Standards New Zealand at the earliest instance.

Attachments

- 1.15 The following items are attached to this paper:
- (a) Appendix A: Draft Code amendment
 - (b) Appendix B: Draft *Gazette* notice
 - (c) Appendix C: Draft *Incorporation by Reference* certification.

Appendix A Draft Code amendment

Recommended changes to Schedule 6.1:

1D When application may be made under Part 1A

- (1) A **distributed generator** may elect to apply to a **distributor** under Part 1A instead of Part 1 if the **distributed generation** to which the application relates—
- (a) is designed and installed in accordance with AS/NZS 4777.1:2016; and
 - (b) incorporates an inverter that—
 - (i) has been tested and issued a Declaration of Conformity with ~~AS/NZS 4777.2:2015~~ AS/NZS.2:2020 by a laboratory with accreditation issued or recognised by International Accreditation New Zealand; and
 - (ii) has settings that meet the **distributor's connection and operation standards**.
- (2) Until 1 September 2026, a **distributed generator** may only elect to apply to a **distributor** under Part 1A instead of Part 1, if the **distributed generation** to which the application relates has, in addition to the requirements in subclause (1)—
- (a) a volt-watt response mode;
 - (b) a volt-var response mode;
 - (c) control settings and volt response mode settings that meet the **distributor's connection and operation standards**; and
 - (d) a **maximum export power** limit at the **ICP** of the **distributed generator** that does not exceed the **maximum export power** threshold, if any, specified by the **distributor** in its **connection and operation standards**.”

...

9B Application for distributed generation of 10 kW or less in total in specified circumstances

...

- (2) An application must include the following:

...

(f) if the inverter is not included on the **distributor's** list of approved inverters, a copy of the ~~AS/NZS 4777.2:2015~~ AS/NZS 4777.2:2020 Declaration of Conformity certificate for the inverter:

Electricity Industry Participation Code Amendment (Inverter Standard for Distributed Generation) 2021

Under section 38 and section 39(3)(a) of the Electricity Industry Act 2010, and having complied with section 39 of that Act, I make the following amendments to the Electricity Industry Participation Code 2010.

At Wellington on the _____ day of September 2021

Dr Nicola Lane Crauford
Chairperson
Electricity Authority

Certified in order for signature:

Nicholai Mumford
Senior Legal Counsel
Electricity Authority

Nick Crang
Partner
Duncan Cotterill

___ September 2021

___ September 2021

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Amendment

1 Title

This is the Electricity Industry Participation Code Amendment (Inverter Standard for Distributed Generation) 2021.

2 Commencement

This amendment comes into force on 18 December 2021.

3 Code amended

This amendment amends the Electricity Industry Participation Code 2010.

4 Schedule 6.1, clause 1D(1)(b)(i) amended

In Schedule 6.1, clause 1D(1)(b)(i), replace "AS/NZS 4777.2:2015" with "AS/NZS 4777.2:2020".

5 Schedule 6.1, clause 9B(2)(f) amended

In Schedule 6.1, clause 9B(2)(f), replace "AS/NZS 4777.2:2015" with "AS/NZS 4777.2:2020".

Explanatory Note

This note is not part of the amendment, but is intended to indicate its general effect.

This amendment to the Electricity Industry Participation Code 2010 ("Code") comes into force on 18 December 2021.

The amendment replaces references to the current inverter standard adopted in Schedule 6.1 of the Code for connecting small-scale distributed generation to a network, with references to a new inverter standard recognised by Standards New Zealand.

Date of notification in the *Gazette*: 22 September 2021

Appendix B Draft Gazette notice

Notice of the Electricity Industry Participation Code Amendment (Inverter Standard for Distributed Generation) 2021

1. Under sections 38(3)(b) and 39(3)(a) of the Electricity Industry Act 2010 ("Act"), and having complied with section 39 of that Act, the Electricity Authority ("Authority") gives notice of making the Electricity Industry Participation Code Amendment (Inverter Standard for Distributed Generation) 2021 ("amendment").
2. The amendment comes into force on **18 December 2021**.
3. The amendment replaces references to the current inverter standard AS/NZS 4777.2:2015 adopted in Schedule 6.1 of the Electricity Industry Participation Code 2010 ("Code") for connecting small-scale distributed generation to a network with references to a new inverter standard AS/NZS 4777.2:2020 recognised by Standards New Zealand.
4. In accordance with section 39(3)(a) of the Act, the Authority has not prepared and publicised a regulatory statement or consulted on the amendment or a regulatory statement, because it is satisfied that the amendment is technical and non-controversial.
5. A copy of the amendment and the Code is available on the Authority's website <http://www.ea.govt.nz/code-and-compliance/the-code/>
6. A copy of the amendment and the Code may also be inspected free of charge or purchased from the Electricity Authority, Level 7, ASB Bank Tower, 2 Hunter Street, Wellington.
7. The amendment incorporates by reference the following standard approved by Standards New Zealand: AS/NZS 4777.2:2020 Grid connection of energy systems via inverters - Part 2: Inverter requirements.
8. A copy of this standard is available for inspection during normal officer hours, free of charge, at the Electricity Authority, Level 7, Harbour Tower, 2 Hunter Street, Wellington. A copy of the standard may be purchased online from Standards New Zealand at www.standards.govt.nz.

Dated at Wellington this ____ day of October 2021.

DR NICOLA CRAUFORD, Chairperson, Electricity Authority.

Appendix C Draft *Incorporation by Reference* certificate

This is the correct copy of *AS/NZS 4777.2:2020 Grid connection of energy systems via inverters - Part 2: Inverter requirements* as incorporated into the Electricity Industry Participation Code 2010 on 18 December 2021 by the Electricity Industry Participation Code Amendment (Inverter Standard for Distributed Generation) 2021.

Dated at Wellington this ____ day of October 2021.

DR NICOLA LANE CRAUFORD, Chairperson, Electricity Authority.

Released under the Official Information Act 1982