

To: The Electricity Authority
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From: Electricity Engineers' Association of NZ

Date: 3 July 2026

Subject: EEA Submission – Consultation Paper: Promoting reliable electricity supply — Options to address a harmonics issue

OVERVIEW

The Electricity Engineers' Association of New Zealand (EEA) welcomes the opportunity to make a submission on the Electricity Authority's (the Authority's) consultation paper, promoting reliable electricity supply: Options to address a harmonics issue.

The EEA represents over 80 Corporate Members (companies) and 800 Individual Members across Aotearoa New Zealand from all engineering disciplines and sectors of the electricity supply industry.

Collectively, we are the power industry's largest collaborative forum in Aotearoa New Zealand, provide clarity on complex engineering and technical issues, practical support and solutions, and market intelligence to support our members and other industry stakeholders to deliver.

The EEA develops and maintains technical guidance for the sector, including the **EEA Power Quality (PQ) Guidelines**, which are directly referenced in the options set out in this consultation.

In preparing this submission, the EEA consulted a number of members from across the sector — including distribution and transmission sector, power-systems consultants, and academic experts in power quality. This submission reflects the views formed through that engagement. Where members hold differing views on the more detailed questions, we have set those out openly along with suggestions on how to engage with industry and other stakeholders to look at consensus options.

The EEA supports Option 1

The EEA supports **Option 1** as the preferred path: revoking NZECP 36:1993, mandating aspects of the AS/NZS 61000 standard. Our members consider that NZECP 36:1993 is outdated and no longer fit for purpose, and that Option 1 offers the most sustainable, durable, and internationally aligned way forward. In particular, Option 1:

- aligns New Zealand with modern international standards (AS/NZS 61000 and the underlying IEC 61000 series), and with the approaches used overseas;

- supports agreed and consistent treatment of harmonics across both the transmission and distribution networks;
- enables equipment to be procured against internationally accepted standards and accreditation systems, rather than bespoke local specifications; and
- provides more modern and consistent planning levels and reduces the likelihood of unnecessary investment in harmonic mitigation.

Members did not support **Option 3** (amending NZECP 36:1993), on the basis that revising a standard already superseded by AS/NZS 61000 is less efficient than adopting the international standard directly.

Views on **Option 2** were mixed. While a guidance-only approach offers flexibility, on its own this risks inconsistent outcomes without a mandated baseline. Some elements of Option 2 — such as expanding the EEA Guidelines to cover transmission — could complement Option 1.

Key points for the Authority's consideration

1. Cover both transmission and distribution. Harmonics do not respect commercial or network boundaries. A consistent framework spanning both transmission and distribution is essential to avoid the fragmented, and bespoke network-by-network approaches.

2. Planning levels are the agreed foundation; allocation and management need further collaborative development. There is strong consensus that harmonised planning levels (for example, Table 2 of AS/NZS 61000.3.6 for MV/HV/EHV systems) could be adopted as the technical baseline.

3. Implementation is a significant challenge. The main issue is not the choice of standard but its practical implementation. Capability and familiarity with harmonics vary significantly across the sector, particularly among smaller distributors. Successful adoption will depend on clear worked-example guidance, proportionate and risk-based requirements, staged transition timeframes, and practical tools for assessment and mitigation. The EEA Power Quality Guidelines is a valuable tool to support current and future knowledge and implementation.

4. The EEA could support EA through a coordinated industry work programme but would require support. Building on the existing Standards and guidance in the EEA Power Quality Guidelines, the EEA is well placed to coordinate industry engagement. However, as its work programme is set and funded by its members, adding a non-member funded workstream would require additional support.

Suggested implementation approach and next steps

The EEA suggests a staged approach, so that an agreed foundation is put in place quickly while the more complex issues are addressed collaboratively:

Phase 1 — Consult and adopt an agreed baseline.

Phase 2 — Develop a New Zealand methodology that is aligned with international standards.

Phase 3 — Support the implementation through the building of capability and guidance.

Phase 4 — Consider how the data issues should be addressed.

Detailed responses to consultation questions

Consultation question	EEA response
Q1. Short-list Option 1?	Yes. The EEA supports Option 1 as the preferred option. It aligns New Zealand with modern international standards, supports consistent treatment across transmission and distribution, enables off-the-shelf equipment procurement, and provides more modern planning levels than NZECP 36:1993.
Q2. Should the Code mandate only planning levels, not management requirements?	The EEA supports mandating harmonised planning levels as the agreed technical foundation (i.e. AS/NZS 61000). Views differed on how far the Code should mandate management requirements (such as allocation): some members favour leaving management to best practice or contract, while others favour mandating it for consistency. The EEA recommends agreeing on mandated planning levels at this stage, while allocation and management methodologies are developed collaboratively.
Q3. Code or Electricity (Safety) Regulations for installation standards?	Device standards fit naturally within the Electricity (Safety) Regulations, while installation standards relate to network connections, are covered in the Code. The EEA recommends the Authority clearly define the boundary between device and installation standards and ensure the two instruments are consistent so that ambiguity for industry participants is removed.
Q4. Aspects of AS/NZS 61000 to adapt for New Zealand?	The EEA recommends New Zealand-specific tailoring in a few areas: the harmonic-diversity assumptions (New Zealand has historically had limited diversity, which is changing as switch-mode loads increase); the attenuation / summation exponent factors, which are poorly understood and have caused both under- and over-estimation of mitigation overseas; and the harmonic allocation methodology. This tailoring could be developed through an EEA project manager-led technical working group and supported through the EEA PQ Guide if additional support was available to resource it.

Consultation question	EEA response
Q5. Contractual or Code-enforceable?	There was a range of views — from retaining the current contractual approach, to full Code enforcement, to a split whereby a regulatory model applies to transmission (given the System Operator's role and the smaller number of connection points) and a contractual approach applies to distribution. The EEA recommends the Authority give further consideration to this differentiated transmission / distribution approach, developed with industry.
Q6. Mandate distributor responsibility to investigate and resolve issues?	Members note practical challenges: smaller distributors may lack resources; the source of harmonics is difficult to attribute (total harmonic distortion varies with transmission configuration); and a mandate could conflict with distributors' existing contractual obligations on consumers. The EEA recommends any such responsibility be risk-based, proportionate, and supported by clear guidance, rather than imposed as a blanket obligation.
Q7. Guidance needed under Option 1?	The EEA considers the EEA Power Quality Guidelines the appropriate vehicle for industry guidance, supported by worked examples showing how AS/NZS 61000 and the Guidelines apply in typical situations. Also, periodic industry workshops, and potentially a standardised assessment / calculation tool would assist.
Q8. Benefits and costs of Option 1?	Benefits: alignment with international best practice, off-the-shelf procurement, more modern planning levels that reduce unnecessary mitigation, and consistent treatment across transmission and distribution. Costs: the technical complexity of AS/NZS 61000, possible application of the EEA Guidelines into a regulatory framework, and variable capability across distributors, which will require guidance and support.
Q9 / Q10. Option 2?	Most members do not support Option 2 as a stand-alone approach, as guidance without a mandated baseline risks inconsistent outcomes. The EEA's view is that Option 2's flexibility is valuable but insufficient on its own — although elements, such as expanding the EEA Guidelines to cover transmission, could usefully complement Option 1.
Q11 / Q12. Option 3?	Members do not support Option 3. Amending NZECP 36:1993 is less efficient than adopting an international standard that already supersedes it, and the standard's limitations are too

Consultation question	EEA response
	fundamental to resolve through amendment. The EEA recommends against Option 3 as the primary path.
Q13. Current arrangements for obtaining harmonics data?	Submissions considered current request-based arrangements sufficient and relatively low cost — though manual — with some data-integrity risk where data is relied on for contractual or regulatory purposes. There is value in enabling developers to undertake their own pre- and post-connection measurements to demonstrate compliance and support mitigation design.
Q14. Benefits and costs of a database?	A database could help identify emerging harmonic trends and reduce repeated manual data requests, but members note material costs (monitoring equipment, IT maintenance), currently limited data — especially for distribution — and that raw data needs network context to be interpreted. Any benefits must outweigh the ongoing costs.
Q15. Would raw data be useful to your organisation?	The EEA suggests the value of raw data be tested with the parties most likely to use it — developers, consultants and academics — before significant investment is made.
Q16. Who should host a database?	If progressed, options include the Authority (for neutrality, for example via the EMI platform) or a dedicated independent third party. The EEA recommends deferring this decision pending a clearer case for the database itself.

Contact

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