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Nova Energy Limited
PO Box 3141, Wellington 6140

Electricity Authority

By email: fsr@ea.govt.nz

Submission on Harmonics and promoting reliable electricity supply

Nova Energy appreciates the opportunity to provide feedback on the consultation paper *Promoting reliable electricity supply: Options to address a harmonics issue*. We support the Authority's focus on modernising harmonics governance to ensure New Zealand's power system remains secure, resilient, and fit for a highly electrified future.

Our submission highlights several key points:

- **Strong support for Option 1** We agree that NZECP 36:1993 is outdated and no longer suitable as a regulatory foundation. Mandating relevant aspects of AS/NZS 61000 for transmission and the EEA Power Quality Guidelines for distribution provides a coherent, internationally aligned framework that reduces compliance complexity and cost.
- **Need for mandatory responsibilities beyond planning levels** Relying solely on planning levels would continue the historic under-management of harmonics. New connecting parties are frequently required to mitigate legacy harmonic issues at their own cost, creating inequitable burdens and investment barriers. Clear Code-level responsibilities for network owners and operators are essential.
- **Support for a hybrid contractual/Code approach** Contractual arrangements should remain the primary mechanism for managing harmonics, but a Code-enforceable backstop is necessary where contractual resolution is not possible. This ensures consistency, fairness, and clarity for all parties.
- **Importance of improved guidance and capability** Industry participants would benefit from standardised methodologies, proportionality principles, clear thresholds for studies, and guidance on supraharmonics, interharmonics, and data sharing.
- **Support for a harmonics measurement database** A centralised database would materially improve early identification of harmonic saturation risks and support whole-of-system planning. Transpower is the logical initial host, with potential for Authority stewardship as distribution-level data expands.
- **Rejection of Options 2 and 3** Option 2 lacks enforceability and risks perpetuating inconsistent practices. Option 3 would require significant effort to update an already outdated standard and would still leave New Zealand misaligned with international practice.

Nova Energy welcomes the Authority's leadership in addressing harmonics governance and supports progressing Option 1 as the preferred pathway. We look forward to continued engagement as the Authority refines the regulatory framework.

Yours sincerely



Charles Teichert
Nova Energy

Appendix: Nova responses to Harmonics consultation paper questions

Q1. Do you agree the Authority should be short listing Option 1 for further consideration? If you disagree, please explain why.

Yes. Option 1 provides the only credible pathway to replacing NZECP 36:1993, which the Authority notes is “widely considered to be outdated and unsuitable” (Consultation Paper, p.11). Mandating AS/NZS 61000 and EEA guidelines will deliver consistency, modernisation, and international alignment.

Q2. Do you agree the Code should not mandate harmonics management requirements, other than harmonics planning levels? If you disagree, please explain why.

No. Limiting Code requirements to planning levels would perpetuate the historic under-management of harmonics identified by the Authority (p.11). In practice, new connecting parties are routinely required to resolve pre-existing harmonic issues at their own cost, including designing complex filters and managing interim curtailment. This is inequitable and creates investment barriers.

Clear, mandatory responsibilities are needed for network owners/operators to manage baseline harmonic conditions, allocate remedial costs where legacy emitters contribute materially, and provide specialist technical capability to support holistic harmonic management.

Q3. What regulatory instrument should regulate installation standards for harmonics?

The Code. This aligns with the Authority’s proposed approach in paragraph 4.2 and ensures consistency with other common quality requirements.

Q4. Which aspects of AS/NZS 61000 need substituting or adapting for New Zealand conditions?

No comment. This is best addressed by technical experts and industry groups referenced in the consultation paper.

Q5. Should harmonics requirements be contractual or Code-enforceable?

A hybrid approach is required. Contractual arrangements should remain the primary mechanism, allowing bespoke and flexible solutions. However, a Code-enforceable backstop is essential where contractual resolution fails—particularly for baseline harmonic management responsibilities, data provision obligations, allocation methodologies, and dispute resolution.

Dispensations can provide flexibility within mandatory Code requirements.

Q6. Should distributors have a mandated responsibility to investigate and resolve security of supply or reliability issues caused by non-compliance with harmonic levels?

Yes. This responsibility should also extend to cases where distribution-level emissions impact transmission-level harmonic conditions.

Q7. What guidance is necessary under Option 1?

Guidance should include standardised harmonic study methodologies, clear thresholds for when studies are required, proportionality principles, allocation methodologies for harmonic headroom, treatment of supraharmonics and interharmonics, and expectations for data sharing and measurement quality.

Q8. What are the main benefits and costs associated with Option 1?

Benefits include alignment with international standards familiar to global OEMs and EPC contractors, reduced compliance complexity, and replacement of NZECP 36:1993, which imposes restrictive limits and significant mitigation costs (p.11–12).

Costs include transition effort for distributors and Transpower, capability uplift requirements, and potential need for interim legacy arrangements.

Q9. Do you agree the Authority should shortlist Option 2?

No. A guidance-only framework lacks enforceability and would make it difficult for developers and asset owners to contractually secure harmonics-related performance requirements. It risks perpetuating inconsistent practices and uncertainty.

Q10. What are the main benefits and costs associated with Option 2?

Benefits include flexibility and lower upfront compliance burden. However, costs include continued inequitable allocation of legacy harmonic burdens, uncertainty for developers and OEMs, and inconsistent implementation across networks. Option 1, with access to the dispensation framework, provides flexibility without sacrificing enforceability.

Q11. Do you agree the Authority should shortlist Option 3?

No. NZECP 36:1993 has fundamental shortcomings (p.11–12), including outdated limits, lack of monitoring requirements, and no treatment of supraharmonics or interharmonics. Amending it would be slow, resource-intensive, and still leave New Zealand misaligned with international practice.

Q12. Benefits and costs of Option 3

No comment.

Q13. Benefits and costs of current arrangements for obtaining harmonics data

Current arrangements will become unworkable as demand for harmonics data increases. Lack of standardisation and inconsistent access impede efficient planning and mitigation.

Q14. Benefits and costs of a database of harmonics measurements

Benefits include ready access to accurate harmonics data as PQ metering expands, early identification of areas approaching harmonic saturation, and reduced duplication of measurement effort. Costs are likely modest and primarily relate to data aggregation and hosting.

Q15. Would access to raw harmonics measurement data be useful?

Yes. It would materially improve early identification of harmonic saturation risks and support whole-of-system mitigation planning.

Q16. Who should host a database of harmonics measurement data?

Transpower is the logical initial host, given its whole-of-grid visibility, existing PQ metering infrastructure, and harmonics expertise. As distribution-level data grows, the Authority may wish to assume long-term stewardship.