

# Submission form

Promoting reliable electricity supply: Options to address a harmonics issue

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| <b>Submitter</b> | Genesis Energy Limited |
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| Questions                                                                                                                                                              | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Q1. Do you agree the Authority should be short listing Option 1 for further consideration? If you disagree, please explain why.                                        | We support shortlisting Option 1 in principle, though note that we would recommend further investigation is completed before adopting any parts of the 61000 series, other than the indicative planning levels outlined in Table 2 of AS/NZS 61000.3.6:2012, with which we have no objection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Q2. Do you agree the Code should not mandate harmonics management requirements, other than harmonics planning levels? If you disagree, please explain why.             | <p>We agree that the Code should mandate harmonics planning levels, but it should not prescribe other harmonics management requirements at this stage. There should, however, be clear obligations on industry participants to manage harmonics consistently, including investigation, collaboration, data sharing, and cost-reimbursement principles where appropriate.</p> <p>We support an industry led approach to the development of an appropriate harmonics management regime and suggest that further development in this regard is undertaken in consultation with Transpower, distributors, generators and other participants. Further information, and potentially trials, are needed before more prescriptive requirements are imposed, as the consequences, costs and practical operation are not yet sufficiently understood.</p> |
| Q3. What regulatory instrument (ie, the Code or the Electricity (Safety) Regulations) do you consider should be used to regulate installation standards for harmonics? | In principle, installation standards should address both the harmonics produced by equipment and the ability of equipment to withstand harmonic distortion. The Electricity (Safety) Regulations may be appropriate for individual low-voltage equipment and internal installations. However, harmonic emissions from larger works should be assessed and managed at the network level (e.g. point of connection), rather than through equipment-level limits (hence, it may be necessary to ensure the scope of each regulatory instrument is defined, to clarify when each takes precedence).                                                                                                                                                                                                                                                 |
| Q4. Which, if any, aspects of AS/NZS 61000 do you consider need substituting or adapting in order to accommodate New Zealand conditions?                               | At this stage, only the harmonics planning levels, such as those in Table 2 of AS/NZS 61000, should be adopted or referenced. The remaining aspects of the standard relate more to harmonics management practices, monitoring methods and investigation processes. New Zealand should undertake further work before substituting, adapting or mandating those elements, so that any approach reflects New Zealand's regulatory environment and transmission and distribution structure.                                                                                                                                                                                                                                                                                                                                                         |
| Q5. Do you consider the establishment, monitoring and enforcement of harmonics requirements                                                                            | Harmonics monitoring obligations at the point of connection should be codified and applied                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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| should be a contractual matter between electricity network owners and their customers, or a Code-enforceable matter? Please give reasons with your answer.                                                                        | consistently, potentially above an appropriate size threshold. These requirements should not be left solely to individual contractual agreements, as that would risk inconsistent treatment between networks and customers. The Code should set the high-level obligation to monitor, while detailed technical expectations, such as monitoring configuration, data retention and good engineering practice, could be supported through contractual requirements, informed by EEA guidance.            |
| Q6. Do you consider distributors should have a mandated responsibility to investigate and resolve security of supply or reliability issues caused by non-compliance with the harmonic levels specified for distribution networks? | Distributors should not have sole responsibility for investigating and resolving security of supply or reliability issues caused by harmonic non-compliance. There should instead be clear obligations on relevant parties, including distributors, generators and connected customers, to cooperate and collaborate in investigations and resolutions. <b>It would be beneficial to standardise the investigation approach.</b>                                                                       |
| Q7. What guidance for industry participants do you consider would be necessary under Option 1?                                                                                                                                    | Industry guidance should be developed through the EEA and should focus on practical monitoring requirements, data-sharing expectations and investigation procedures.                                                                                                                                                                                                                                                                                                                                   |
| Q8. What do you consider to be the main benefits and costs associated with Option 1?                                                                                                                                              | The main benefits of Option 1 are consistency, fairness and improved national alignment. It would provide clearer expectations for electricity distribution businesses and other participants, reduce repeated negotiations with individual networks, and place less strain on specialist resources. The main costs are likely to relate to monitoring, data management, investigation processes, implementation guidance and any transitional industry work needed to develop practical arrangements. |
| Q9. Do you agree the Authority should be short listing Option 2 for further consideration? If you disagree, please explain why.                                                                                                   | We do not support shortlisting Option 2 because it would reduce national consistency, undermine the benefits of a common approach, and increase the risk of misalignment between networks and participants.                                                                                                                                                                                                                                                                                            |
| Q10. What do you consider to be the main benefits and costs associated with Option 2?                                                                                                                                             | We do not consider Option 2 to provide material benefits. It would require Genesis and other participants to negotiate requirements multiple times with different networks, increasing transaction costs and reducing consistency across New Zealand.                                                                                                                                                                                                                                                  |
| Q11. Do you agree the Authority should be short listing Option 3 for further consideration? If you disagree, please explain why.                                                                                                  | We do not support shortlisting Option 3. It risks relying on arrangements that may be outdated for emerging technologies and could increase regulatory burden across New Zealand without delivering a clear improvement in harmonics management.                                                                                                                                                                                                                                                       |
| Q12. What do you consider to be the main benefits and costs associated with Option 3?                                                                                                                                             | We do not consider Option 3 to provide material benefits. It would likely increase regulatory and administrative burden and may still require Genesis and other participants to negotiate requirements multiple times, reducing efficiency and consistency.                                                                                                                                                                                                                                            |

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| <p>Q13. What do you consider to be the benefits and costs of the current arrangements for obtaining harmonics data from distributors and from Transpower, as a transmission network owner?</p> | <p>The current arrangements appear limited because harmonics data is not consistently available or shared across the sector, especially when resources are strained within Transpower and EDB organisations. The EA already receives and stores metering data, so the incremental burden of adding harmonics data may be relatively small once a standardised approach is established, although some transitional setup costs should be expected. Further work should be undertaken to assess the incremental cost and practicality of harmonics data sharing above existing metering data arrangements.</p> |
| <p>Q14. What do you consider to be the benefits and costs of a database of harmonics measurements?</p>                                                                                         | <p>A harmonics measurement database would provide a clearer national understanding of power quality and support ongoing obligations to maintain reliable supply. It would improve transparency, support better planning and investigation, and may reduce total costs for New Zealand by enabling evidence-based decision-making, as opposed to the present convention of reserving space for future harmonic filtering equipment, even in situations where the need for such equipment at any point in the future is unlikely.</p>                                                                          |
| <p>Q15. Would access to raw harmonics measurement data be useful for your organisation? If so, why?</p>                                                                                        | <p>We consider access to raw harmonics measurement data would be useful. This data would help inform development decisions, including connection assessments, design choices and equipment procurement. For example, it could inform inverter selection, transformer vector-group choices and other design decisions that may reduce harmonic impacts.</p>                                                                                                                                                                                                                                                   |
| <p>Q16. Who do you consider should host a database of harmonics measurement data? Please give reasons</p>                                                                                      | <p>The Electricity Authority should host the database because it already has centralised arrangements for receiving and storing New Zealand-wide metering data. A centrally hosted database would support consistency, transparency and efficient access for relevant industry participants.</p>                                                                                                                                                                                                                                                                                                             |