APPENDIX A : Format for Submissions

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Executive summary

To provide context to this submission, we believe that the future of energy will be demand driven, where communities will become a viable building block through scale, and services / functions throughout the low voltage networks will be shared in real time, providing benefits to the community, the members of the communities and the grid the communities is connected to.

The Role of the distributor will evolve into an orchestrator, a system operator (DSO), and the market will provide reconciliation of shared services. Flexible service providers will provide services based on availability and demand.

Question		
Q1	Do you see value in commissioning two separate reviews to look into the merit and practicalities of implementing the recommendations of the UK's Energy Data Taskforce around unlocking the value of customer actions and assets and delivering interoperability in a New Zealand setting?	**NO** One report would make more sense, the UK's actions are sensible and equally apply to NZ Although NZ's problem statement is different we still need to unlock value of customer assets and have an interoperable system to max value of DER Going further I do recommend a complete review of the industry, taking a different path to that of the UK, rather start by looking at a future which would accommodate DER as a solution to capacity issues, focusing on control of demand, and real time control at a micro level, then bring in generation, decarbonisation, and customer centricity. **New Zealand inc.** Although this logic will address developing a decarbonised digital Energy system. New Zealand is different to the UK. We do need to decarbonise, we do need to create customer centricity, but in following the UK there is no understanding of the larger issues, merely trying to digitise the status quo. Reflected in both the Sapere and more recently the report produced by Boston Consulting Group, IPAG or the models proposed by the South Island distribution group, the practical use of DERs to manage Resource Adequacy (infrastructure Offset), and the benefits the focus on control with respect to the current distribution network which outweighs both generation and individual benefits. **Customer Centricity**

		Where the UK is focused on a customer Centric Approach, digitisation and standardisation of the current customer experience, the New Zealand problem is more practical and opens a far more disruptive type of conversation. Noting also that the UK identifying the grid / environment to being considered separately,[1] In our opinion the overriding vision should be to transform how utility services are delivered, creating solutions that are efficient, functional and modular. Addressing real problems by "controlling **infrastructure** to create **smart environments** " In a market where: - • There is little to no understanding on the behaviour of the Low Voltage Network • 4% of energy is described as losses, with little to know knowledge of the actual cause. • The role of the distributor is defined by the way it can recover costs through agreed pricing plans. • Through the cost benefit of shared services, the evolution of Community Energy type solutions will need to be accommodated for.
Q2	Does this capture the key data needs for distributors to make informed business decisions that will unlock the potential of distributed energy resources (DER) for the long-term benefit of consumers? If not, what data is missing and what would it be used for?	**NO** At a basic level DER needs to provide information similar to that of a generator, including the real-time DER capacity available based on changes with time/behaviour etc, limited to current load is insufficient a DSO will need to know how much it can flex up and down given an appropriate signal. **Informed Decisions** To make informed decisions around unlocking the potential of DER, a more holistic approach to data needs to be taken. This includes an understanding of the roles of the participants play, their contractual inter-relationship, the problem being solved and the information requirements to deliver. Merely understand a symptom of the issue has led to DERs internationally been built in isolation, for example: Individual solar installed due to subsidies,

[1] https://www.gov.uk/government/publications/low-voltage-network-capacity-study

		without understanding the long-term effect it causes.[2] Complete visibility needs to be improved within the Low Voltage Network, moving beyond the ICPs, into the distribution transformers, understanding feeder and phase load, local generation, storage (including reserves and demand Being able to identify changing in function requires real time logic and communication through a common language / framework.
Q3	Do you agree with the prioritisation of the key data needs for distributors? If not, why not and how would you suggest the priority is changed?	**YES** **Though the phrasing of this question assumes** EA assumes a low penetration of DER, which is not correct. In isolation Hot Water DER is about 10kWh/day per cylinder, assuming 2M homes that's 20GWh/day!! **Distribution Network** If we agree that New Zealand largest problem is not generation rather than how the distribution network being able to cope with the changing needs in demand, and requirements. Consumption data needs to be unified into a global information framework. ICP information, which has generally provided 30 minute data, downloaded twice a day, will need to be supplemented by • generation data through invertors, or V2Grid, • Storage volume information, • as well as grid based metrics based on loads as identified by the distribution transformer or zone substation. We see a future where a community will "share" function, be it generation, storage or demand control, and access to the grid will be limited through a "Envelope", providing benefits to the distribution network, which will be reflect in a Grid based charges or discounted on Line charges for locally generated energy.

[2] With the outcome being households having solar limits (https://www.theage.com.au/politics/victoria/power-failure-homes-hit-by-solar-limits-as-distributors-protect-network-and-profits-20210311-p579xz.html) or the induction of Community Scale batteries (https://www.energy.vic.gov.au/renewable-energy/batteries-energy-storage-projects/neighbourhood-batteries)

Q4	Does this capture the key data needs for flexibility traders to make informed business decisions that will unlock the potential of DER for the long-term benefit of consumers? If not, what is missing and what would the data be used for?	**NO** **Flexible traders** With the assumption that a distributor will not be a flexible trader and be the orchestrator of flexible solutions rather than providing the control or infrastructure. The future of Flexibility traders will be an all-encompassing control solution managing networks as a local level, where generation, storage and demand will be shared resources, and micro control will be orchestrated as a scalable resource, managing a local problem, with the environment of information not being limited to ICP data.
Q5	Do you agree with the prioritisation of the key data needs for flexibility traders? If not, why not?	**NO - Disagree** **Visibility** Visibility of the Low voltage network need to be addressed far quicker than 3 – 7 years to start creating momentum. Transpower's - Whakamana i Te Mauri Hiko refers to the 68 per cent growth in energy demand between now and 2050 as 'the ramp'[3] BCG "The future is Electricity " , for the goals set out will require "The electricity sector can enable rapid decarbonisation of the energy system. The 2020s will be a critical decade for the electricity sector and New Zealand's transition to net zero carbon"
Q6	Do you agree that the Authority should amend the Data Template to address the above issues to improve its workability? If not, why not?	**YES** **Parallel industries** Many other industries have adopted a common data structure and believe that the movement toward standardisation have seen increased efficiency. For example – within Mobile telecommunications, a Call data record format[4] for a Mobile operator, is a 190-field record, that is interchangeable between manufactures, and operators, and between participants in markets.

[3] TP Whakamana i Te Mauri Hiko.pdf - https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/publications/resources/TP%20Whakamana%20i%20Te%20Mauri%20Hiko.pdf?VersionId=FljQmfxCk6MZ9mIvpNws63xFEBXwhX7f

[4] https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=1915

		Allowing a uniform basis to describe problems, a common language and the instruction of services such as roaming and interoperability
Q7	Are there other changes to the Data Template that would improve it and assist it to be a useful mechanism for open access to data?	**YES** **Evolution** Will need to investigate this more …. . but yes, it is a moving target and will need to change. As stated in Q3 above – "Consumption data needs to be unified into a global information framework." This will need to evolve reflecting new services being introduce to the market, information for APIs, and common interfaces. Including Network conditions and MEPs have to provide to Flex traders / Distributors/Retailers etc
Q8	Do you agree that this is an issue? If not, why not?	**YES** **Limitations in the Code** The code current is limited to the collection of customer information based on ICP data, where an : • ICP means an installation control point being 1 of the following: (a) a point of connection at which the electrical installation for a retailer's customer is connected to a network other than the grid As stated in Q4 above, the future of Flexibility traders will be an all-encompassing control solution managing networks as a local level, where generation, storage and demand will be shared resources, and micro control will be orchestrated as a scalable resource.
Q9	Should the Authority amend the Code to clarify that MEPs can contract directly and provide both ICP data to distributors (and flexibility traders) for permitted purposes? If not, why not?	**YES**, **Market Participants** understanding the market participants, their requirements and the benefits to customers will lead for a need of greater transparency. Needing to understand the problem, the proposed solution and the beneficiaries will require a different level of contractual relationships.
Q10	Should the DDA Data Template be updated to include Power Quality Data? If not, why not?	**YES** **Additional Fields** Additional examples could be GIS information denoting location, and information on Voltage,

		Harmonisation, and frequency, as stated in Q6 above, a common data structure / framework could be provided for multiple functions.
Q11	Do you think that the transaction costs associated with negotiating access to MEPs is a problem that the Authority should prioritise? If no, why not? If yes, do you think there is merit in developing a template to develop a default template to help reduce transaction costs?	**YES** **Transactional costs** MEPs provide a service, which should be provided at a cost. With respect to the data, consideration will need to be taken with respect to privacy, the generators of data, and their expected use …. Noting that the trade off between privacy and delivery.
Q12	Do you agree that MEP pricing for ICP Data (including Power Quality Data) and related data services is not unreasonable at this stage? If not, why not?	**NO** As we expect for low volumes MEP pricing will be unreasonable and in the future metering data is not going to be limited to ICP's only, think equipment and control should be a fixed charge.
Q13	Do you agree that MEP pricing for the provision of ICP Data to distributors (and other parties) could be more transparent? If not, why not?	**YES**
Q14	To support the transparency of pricing, standardisation, and equal access to data, do you think that the Authority should consider further implementing IPAG's Input Services recommendation that MEPs publish standard 'pay-as-you-go' terms open to all parties? If yes, why and what do you think this could cover? If not, why not?	**YES** Volumes, frequency of api calls, service performance (eg availability / response time) against a standard data framework (noting there are already internationally recognised standards) And the imposing of a cost to provide non-standard data
Q15	Do you agree that distributors' visibility of the location, size, and functionality of DER needs to be improved within the next 3–7 years to support network planning? If not, why not?	**NO** This will need to addressed far earlier – say within a 1 – 3 year time frame **Micro solutions** Community based DER is a micro solution with the area behind a Distribution transformer providing a scalable building block. The traditional view that houses will be provisioned at 5kv per house, with change with the movement to electrification. Limited visibility will mean that larger zone sub problems will be addressed initially, and the solution provided will generally follow a forklift approach

		rather than optimisation of the current infrastructure.
Q16	Do you have any views on the type and size of DER that needs more visibility?	**Community based solutions** Based on our view of DER, Community based solutions will require visibility and real time communications. Creativity in communication will need be adopted, such as the use of Power lines as a communication medium or Telecommunication technologies such as 5G and EDGE compute.[5]
Q17	The Authority acknowledges that definitions of 'real-time' vary, please explain what real-time data means to you.	**Real time** For our solution Real time is under 1 cycle (sub 20 ms) Which includes an end to end view including Network and backhaul
Q18	Do you agree that access to 'real-time' consumption and Power Quality Data won't be needed for at least five years?	**YES** **Community energy** We are building community energy solutions, where shared services react in real time to demand, supply, storage, and grid constraints. The evolution of non-Network solution being requested through the ENA [6]which will become more common over the next 2 year. Value stacking will mean that grid-based solutions will go beyond capacity to other functions.
Q19	Do you agree that flexibility traders' access to ICP data must be improved so they have the same level of access as distributors (and retailers), with whom they might be competing to provide contestable services? If not, why not?	**YES** **Partial solution** but the flexible service provider is only part of the solution, with parties being identified and demarcation defined through "a multi parties" agreement.
Q20	Do you think the Authority should prioritise modifying the Data Template, so that flexibility traders can use it, or should the Authority prioritise amending the Code to clarify that MEPs must provide ICP data directly to flexibility traders and distributors for a set of permitted purposes without the need for retailer permission? If neither, please explain why.	**YES** **Holistic Approach** Focus needs to become more holistic … Defining the problem that is the priority, understanding the relationships involved, and based on an parallel industry work on a framework that can be used for improving the grid, will providing benefit customers

[5] https://ieeexplore.ieee.org/abstract/document/8821283
[6] https://www.ena.org.nz/resources/edb-requests-for-non-network-alternative-services/)

Q21	Do you agree that flexibility traders need access to granular current and likely future Congestion Data on distribution networks within the next 1–3 years?	**YES**, **A common Framework** more importantly a common language as a framework to define a function needs to be defined, An example could be long run or short run Marginal costs" to define capacity.
Q22	Are there any other issues preventing distributors from providing granular current and likely future congestion data?	**Lack of Visibility** 1% visibility of the Low Voltage network, and a mindset of conservatism. There is also lack of incentive, little in way of cost recovery from DPP to allow costs to be incurred on LV network monitoring and transparency.
Q23	Do you agree that visibility of the location, size, and functionality of larger DER needs to be improved within the next 3–7 years to help understand the drivers of network congestion, what DER is 'controllable', and what services could be offered to owners of DER? If not, why not?	**YES** **Evolution** Shared community energy will evolve, viability will be important, as will Real time AI and Machine Learning. anything that has an interface can be controlled. In the future, who will own the function, and what will be the provision of the service
Q24	Do you have any views on the type and size of DER that flexibility needs to have improved visibility?	**Micro Solutions** DER will be localised, community based, with generation being bounded by a distribution transformer, where these community building blocks acting as a scalable load management structure.
Q25	Do you think that the Authority, instead of a DER registry, should consider amending the registry data fields and / or requirements to improve DER visibility?	**YES** **Legislation** Electricity Industry Act 2010 - limits definition of participants to what is included in Section 7 [7] of the act. It describes the requirement to register and describes at a high level their function. Though participants are identified in different legislative documents, there is no description of function, and the contractual relationships to create the services, other than limited to the traditional supplied based model that is currently prevalent.
Q26	Do you agree that the Authority should prioritise work on addressing the other issues outlined in this paper?	**YES**

[7] Electricity Industry Act 2010 No 116 (as at 01 September 2022), Public Act 7 Industry participants – New Zealand Legislation

		The evolution of an EBD into an DSO, the development of Flexible trading, and the ability for shared solutions to be financially recognised. Positions on community assets ownership ?
Q27	Do you agree that flexibility trader access to real-time congestion and ICP data won't be needed for at least five years?	**NO,** **Realising we have a problem** in working directly with several distributors, we are working on community-based solutions. This type of solution will develop rapidly, and without exceptions the legislation will need to keep up.
Q28	Do you agree that model privacy disclosure terms are appropriate?	**YES** Data can be anonymised - but see Q29
Q29	Do you agree that model privacy disclosure terms would facilitate data access?	**YES** **Trade off** There will always be a trade-off between Privacy of customer information, and the increased flexibility, for example – in a Mobile network, the location of a Sim is a dependency for creating mobility, solutions such as decoupling the phone number, the device and the SIM have been put in place to ensure privacy. For a power grid, customer demand information makes up a small part of the entire information that is required for a flexible solution. **Community solutions** If the ultimate model is moving toward a community-based model, and data / logic is being used for the benefits of the entire community, a trade off could be easily sort … "if information / control was put in place to give customers a cheaper power bill, would you be willing to give out this information"
Q30	Do you see any practical issues with this proposal? Should the Authority create model terms for distributors and MEPs as well given the range of data being collected through smart meters? If not, why not? Would the industry find it helpful for the Authority to conduct workshops on privacy preserving/minimisation techniques?	**Data Collection** The logic of data collection needs to be expanded well beyond on MEP and a Smart Meter. The "players" need to be defined, and data as an asset needs to be defined Pilots are being built currently to start looking into this type of solution.

Q31	What are your views on the three options presented above, to deal with Issue 1 (that distributors might prefer network investments to NNS)? What alternative option/s would you favour, if any?	**Agreement with the EA** With the amount of investment required to create DER at a large enough scale – We think that NNS will evolve as a viable alternative to traditional grid-based investment. Given this, with the assumption that the Distribution company is the orchestrator of function, payment will need to be made for both availability and the ability to deliver. Communities through scale will create static and dynamic envelopes for grid load … this static load will be based on availability with the ability to dynamically burst when required? Therefore we would support option 2, which will allow solutions to be trailed and learning sort.
Q32	Do you agree with the tentatively preferred intervention to deal with Issue 2 (Option 3: encourage standing offers) and the collection and monitoring of information proposed under Option 4? If not, what alternative option/s would you favour, if any?	**AGREE** Agreed with Option 3, but this will need to be tied up with the evolution of an EBD into a DSO Noting - The Council of European Energy Regulators (CEER) effectively recommends that distributors should not be involved in contestable services. Rather, they should act as neutral facilitators providing the information, system operation, network infrastructure and management functions. Option 2 – does have its merits, but will need to be considered with respect to MTR Lite from Kainga Ora among other projects.
Q33	Do you think there are circumstances in which the Authority should extend the arm's length rules? If not, why not?	**YES** Will depend on the evolution into DSO
Q34	Do you agree with the Authority that Option 1 should be implemented, and that Option 2 could be considered in the event of allegations of, or instances of anti-competitive harm in contestable markets (Issue 3)? If not, what alternative option/s would you favour, if any?	Would like to see the EDBs evolve into an orchestrator of solutions rather than a provider of NNS. This will require the EA to provide a common language and definition of the entities
Q35	What do you think of the Authority's option of using the education option proposed elsewhere in this paper, to include some guidance on how distributors should collaborate in future?	**YES** **Guidance for Distribution companies** Part 2 of the Commerce Act (in particular, the prohibitions against anti-competitive arrangements, cartel conduct and misuse of market power), is enforced by the Commerce Commission, and may

		also influence distributors' decisions in respect of connecting third parties to their networks. According to the purpose of the Commerce Act 1986 – "The purpose of this Act is to promote competition in markets for the long-term benefit of consumers within New Zealand" There needs to be a trade-off between risk and the benefits to the community, but overall a collaboration should be preferred where there are systemic issues to be addressed.
Q36	Do you think it would be helpful for the Authority to encourage the use of joint ventures between distributors to increase their integration of DERs and their procurement of NNS projects? And should this be combined with the first option?	**YES** **A sandpit** Piloting solutions at scale have been proved to be a viable sandpit. As with respect to the ENA several Distribution companies are getting involved in NNS[8] - Coupled with this there is a general understanding of the evolution of a Distribution company moving toward DSO and creating the ability to orchestrate[9].[10]
Q37	Do you agree with the proposed approach to monitor progress between Transpower and distributors in developing standard offer forms for procuring NNS, and monitor whether issues associated with operating agreements for flexibility services are developing, and prioritise resource to progressing the other chapters? If not, why not?	**YES** **FLEXPOINT** Noting that Transpower has created Flexpoint – based on open ADR https://www.transpower.co.nz/our-work/distributed-energy-resources/flexpoint this combined with a common market, and the evolution of distributions companies toward DSO
Q38	Do you have any views on the best way the Authority can monitor whether issues associated with operating agreements for flexibility services are developing?	**Parallel Industries** A very good example of this type of process running with respect to Mobile operators roaming …. Under an industry body, GSMA, by lateral agreements are defined under a common format, testing and development is uniform – and constantly evolving. Data is exchanged through a common format, and the movement from off line to CAMEL (an online language)

[8] https://www.ena.org.nz/resources/edb-requests-for-non-network-alternative-services/

[9] https://www.countiesenergy.co.nz/news/setting-out-the-vision-and-strategy-for-our-dso-transition

[10] https://www.ea.govt.nz/assets/dms-assets/29/SIDG-update-on-new-operating-models.pdf

Q39	Do you have any suggestions for how the Authority can support industry-led work on providing guidance on best practice and templates for operating agreements?	**Managed Pilots** We think that the form of such trials will be industry led, where EA play a role as a observer, giving flexibility under the code for variation.
Q40	What are your thoughts on the proposed scope for the Part 6 review? What, if anything, would you include or exclude, and why?	Part 6 of the code needs to be modified to accommodate a bilateral conversation – between the distributor, the flexibility trader, the Community and the customer.
Q41	In order, what are the three most important issues that should be addressed as part of a Part 6 review, and why?	**Issues** • Contractual relationship between parties • Increase the size of embedded generation beyond 5 kw and the associated export limited • Include all forms of DER – including generation, storage and demand management •
Q42	What are your thoughts on amending Part 6 of the Code to explicitly include DER, and what do you think are the key issues to be considered?	Issues • The participants • The future use of DER • Ability, willingness to change
Q43	What are your thoughts on increasing the size threshold for Part 1 DG applications, including the benefits and drawbacks?	**Grid Base Problems** As discussed in Q2 above, the understanding of cause and effect needs to be addressed, and the problems from a macro level need to be considered Grid considerations https://www.theage.com.au/politics/victoria/power-failure-homes-hit-by-solar-limits-as-distributors-protect-network-and-profits-20210311-p579xz.html
Q44	If the threshold were to change, what do you think the new threshold should be and why?	Considering the lack of visibility of the Low Voltage network, the automatic reaction of any distributor will automatically be “No” A good starting point might be 15kW (~63A to match standard load connection.)
Q45	What are your thoughts on adjusting the ten-business day timeframe in Part 1A?	Considering the lack of visibility of the Low Voltage network, the automatic reaction of any distributor will automatically be “No” We do not think this is an issue for Part1A, it is more or less a rubber stamp process as no ability to deny connection. It is more a case of resourcing to process increase in applications.
Q46	What are your thoughts on maintaining the current approval timeframes in Part 1 (comprehensive) and Part 2?	No comment

Q47	If you seek a change to approval timeframes, what evidence can you give to support this?	No comment
Q48	What are your thoughts on adding a new DG application process for large-scale DG to Part 6? Please provide examples in support of why you think change is or is not necessary.	**Application Process** Distributed generation will evolve from being primarily residence based, as there is little to no economic benefit … The bigger problem will be the evolution of embedded generation within a community, and the "rules" of having to create an Embedded Network to be able to support this.
Q49	If you think a new application process should be added, where should the threshold be and why?	**YES,** **Community Based function** for community based function, and thresholds be defined for Static and Dynamic envelopes.
Q50	What are your thoughts on reviewing the priority of applications clause in Part 6 of the Code?	No comment
Q51	Should the AS/NZS 4777.2:2020 Standard be mandated for inverters in New Zealand? If so, how should this be accomplished?	**YES** **Common interface** Yes, think that standards for invertors will become common place, this will also need to be extended into interfaces such as RS485, MODBUS, Open ADR etc …. Which over time will be extended to common communication interfaces and IOT standards.
Q52	What are your thoughts on the Authority reviewing the prescribed maximum fees in Part 6 of the Code?	Will depend on the role of EA in this model