



Chairman: Warren McNabb,
warren.mcnabb@altimarloch.com
Secretary: David Inch, david@nzenergy.co.nz

28 February 2023

Submissions
Electricity Authority
P O Box 10041
Wellington 6143

By email: distribution.feedback@ea.govt.nz

Dear team,

RE: Issues Paper—Updating the Regulatory Settings for Distribution Networks

The Independent Electricity Generators Association Incorporated (IEGA) appreciates the opportunity to make this submission on the Electricity Authority’s (Authority) issues paper which outlines potential options for updating the regulatory settings for distribution networks.¹

The IEGA represents commercial small-scale generation asset owners with plant connected only to distribution networks so we have been and continue to be totally reliant on the performance of distribution companies to connect and distribute our generation output.

We have engaged in the Authority’s and Commerce Commission’s prior engagement processes regarding distribution sector regulation. Feedback in these previous submissions² remains relevant – but the details have not been repeated in this submission.

In our view, the issues paper seeks to address two topics:

- i. enabling the creation and operation of flexibility services – where the Authority’s focus appears to be principally on distributed energy resources (DER) connected to individual premises; and
- ii. improving the effectiveness of Part 6 of the Code – which relates to the connection of distributed generation (a subset of distributed energy resources).

Our submission addresses these two topics.

¹ The Committee has signed off this submission on behalf of members.

² See <https://www.ea.govt.nz/assets/dms-assets/29/Independent-Electricity-Generators-Association-Updating-regulatory-settings-for-distribution-network.pdf> <https://www.ea.govt.nz/assets/dms-assets/25/25052IEGA-Submission-on-Authority-Commission-joint-project-Terms-of-Reference-Spotlight-on-Emerging-Contestable-Services-12-April-2019.pdf>

i. Enabling the creation and operation of flexibility services

IEGA members' generation provides flexibility

Members' distributed generation is an important subset of Distributed Energy Resources (DER) as defined by the FlexForum – which is the definition being used by the Authority.

It is disappointing when the Authority bases its views / conclusions on the assumption that only intermittent generation (wind and solar) are connected to local distribution networks. For example, “*Note that it is mainly demand-side responses to price signals that must be developed, because wind and solar generation do not respond to price signals.*”³ IEGA members own 175MW of hydro generation plant injecting over 750GWh of electricity into distribution networks each year - equivalent to supplying over 100,000 households.

As discussed in our September 2021 submission members have for many years been supplying flexibility to distribution companies and Transpower, in particular when we were incentivised to generate during periods of peak demand. Batteries is defined in the Code as generation and it is controllable and will respond to price signals.

The IEGA is part of the FlexForum and supports any efforts by the Authority to facilitate / encourage / support the development and contracting of flexibility services from any source.

Prioritisation

With respect to flexibility services, the IEGA's suggestions for prioritisation of the Authority's resources are for the Authority to focus on, at a principles level, developing the regulatory environment so that:

- it is agnostic to the type of technology providing flexibility and the size or location of the flexibility supplier. For example, a commercial small-scale distributed generation plant can be contracted to provide the equivalent of demand management on the supply side or voltage support as can a homeowners' EV charger appliance. Or a 'grid-scale' battery connected to a distribution network is the same as aggregation of numerous households' batteries connected to their solar pv arrays.
- there is clarity about how a flexibility supplier (which can be an end consumer) can realise the 'value stack' in its interactions providing flexibility to the distributor it is connected to, to Transpower (ancillary services) and the wholesale market (offering reserves and / or energy). At the moment these different parts of the value stake are being analysed separately. The Authority has been specific that this consultation relates only to flexibility connected to or used by the distribution network; the System Operator is consulting at the same time on its view of enabling distributed flexibility to support whole system reliability and efficiency; and also at the same time MDAG is consulting on how Demand Side Flexibility (DSF) interacts in the wholesale market (and related retail tariffs).

The IEGA supports the FlexForum's call for the Authority to use its new powers to approve exemptions from the Code so that 'learning-by doing' projects can proceed at pace.

³ Paragraph 2.41 of issues paper

Equal access to data and information

The IEGA supports third party flexibility suppliers⁴ having access to the information needed to be able to contract to offer a service to flexibility owners (that is the end consumer) and flexibility buyers. Issues relating to individual household consumption are not relevant to the IEGA.

The equal access options discussed in the Issues paper attempt to massage the current sources of information into a useable form. We recommend a fundamental review of how information is collected and made available. A central registry with open access to any party is a logical solution. All the relevant data originates at the consumer's meter and is equally relevant for a distributor, flexibility buyer or supplier and retailer. It would be less expensive for end consumers if everyone, including consumers, could access this information from one platform.

More importantly, information about short, medium and long-term congestion on the distribution network is highly relevant to any decision about where to locate commercial small-scale generation. This issue is discussed in more detail in our feedback on the Authority's proposed review of Part 6.

Market settings for equal access – approach to Non-Network Solutions

The IEGA supports the Authority's desired outcomes in paragraph 5.10, namely:

Desired Outcomes

5.10 Ideally, market settings should:

- (a) ensure both network investments and NNS are considered for increasing the capacity of a distribution network, so the most efficient option is pursued
- (b) ensure the benefits of market competition are realised by encouraging distributors to procure NNS by competitive tender
- (c) promote a level playing field for competitors in the market for NNS, so that flexibility services can be offered to all buyers in the value stack.

The IEGA submits that the fundamental issue relating to distributors contracting non-network solutions (NNS) is that distributors view these solutions as a 'short-term fix' for 1-3 years until the need / planning / procurement for traditional network infrastructure is complete. The NNS is approached as a way to defer capital investment and is not considered by the distributor to be an integral part of the network system for the life of the NNS asset once it is installed/operational.

For example, recent expressions of interest issued by distributors relate to their interest in deferring a capital development project. It's unclear if the distributor would be prepared to contract multiple NNS providers over time to manage one network constraint (for example adding on additional batteries as demand increases and thereby gaining economies of scale). If or when the NNS could no longer deliver the required energy, indications are the distributor will undertake the capital development project – stranding the NNS because the network capacity constraint no longer exists.

A NNS contract with a distributor for ~3 years is unlikely to be financially viable compared to a typical NNS asset lifetime, such as 15-20 years in the case of a Battery Energy Storage System (BESS). The IEGA submits that bridging this fundamental divide - namely distributors providing potential NNS

⁴ Our preference is to use the FlexForum definition of Flexibility Supplier – which can be an aggregator in the sense that the Authority refers to flexibility 'traders'. The word 'traders' has a different connotation.

investors with greater confidence in the availability of longer term NNS contracts - will lead to improved and economically efficient NNS procurement outcomes.

Pioneer Generation discussed this issue of 'economic sizing' in relation to transmission investment in a submission on the TPM in 2016.⁵ It is economically efficient for an NNS investment that cost less than the traditional network investment at the time of the investment to remain as 'in-use capacity'. Any traditional investment to increase the capacity of the network should be in addition to the capacity already provided by distributed generation (or a flexibility service) and not immediately displace this NNS investment.

Figure B - Correct Economic Perspective: DG is part of in-use capacity, Transpower upgrade results in excess capacity (AIEG)



Until a more holistic and long term approach to NNS is in place, development and offering of these solutions is unlikely to flourish.

Information about future NNS or flexibility opportunities

As discussed previously, it is our view that the regulatory regime provides sufficient safeguards to ensure distributors are indifferent between purchasing flexibility from a related party or from an independent third party. However, the information needed to provide this flexibility service must be available equally to each party. That is, the information a distributor uses to decide whether to be involved/invest in flexibility services or NNS should be transparently available to third parties.

ii Improving the effectiveness of Part 6

The IEGA suggests distribution sector reform should include a vision that increasing the amount of electricity generated within a network and close to the increasing demand for electricity is economically efficient for all electricity consumers.

With this vision, distributors can assess impacts on their network from both the demand side and the supply side as complementary. This approach should minimise the amount of additional network capacity – both distribution and transmission - required to meet increasing demand.

⁵ See pages 18 – 20 <https://www.ea.govt.nz/assets/dms-assets/21/21049Pioneer.pdf>

In relation to connection and operation of distributed generation described in Part 6, the IEGA submits the Authority prioritise:

- distributors providing transparent information about the operating conditions within the network – that is, where locating distributed generation would assist with congestion and operation of the network and where distributed generation would exacerbate operating conditions.
- achieving a more consistent approach among distributors on how they interpret the connection application process in Part 6. We do not support creating a new process for larger distributed generation – this will take time and distract resources when other no regrets options are available.
- addressing the queuing issue for multiple connection applications with one distributor. This is a different issue to recovery of connection costs (incremental costs) although it's unclear if the two issues can be resolved independently.
- providing clarity and consistency in the costs of connection to distribution networks.

Congestion information

Clause 6.3(2) of the Code requires the distributor to publish information, including the following:

- (d) a statement of the circumstances in which **distributed generation** will be, or may be, curtailed or interrupted from time to time in order to ensure that the **distributor's other connection and operation standards** are met; and
- (da) a list of all locations on its **distribution network** that the **distributor** knows to be subject to **export congestion**; and
- (db) a list of all locations on its **distribution network** that the **distributor** expects to become subject to **export congestion** within the next 12 months; and
- (dc) until 1 September 2026, the **maximum export power** threshold and the methodology used to determine that threshold, for locations at which the **distributor** has set a **maximum export power** threshold for applications under Part 1A of Schedule 6.1; and

If all distributors are publishing this information, our feedback is that it is not very transparent or digestible. WEL Networks publishes useful heat maps⁶ but we have struggled to find the equivalent on other distributor websites.

Further, Part 1A of the Code for connection of distributed generation of 10kW or less includes the following requirements on a distributor in relation to congestion – including requiring the distributor to take reasonable steps to work with the distributed generation owner to assess whether solutions exist to mitigate the export congestion (c9D(3)):

⁶ Operational and capital expenditure heat maps <https://www.wel.co.nz/about-us/regulatory-disclosures/maps-of-network-expenditure-and-constraints/>

9D Export congestion

- (1) This clause applies if a **distributed generator** applies to a **distributor** under this Part of this Schedule to connect **distributed generation** or continue an existing connection of **distributed generation** to a location on the **distributor's distribution network** that is included in the list made publicly available in accordance with clause 6.3(2)(da) or (db).
- (2) The **distributor** may advise the **distributed generator** that the **distributed generation** may be subject to **export congestion** as set out in the **distributor's congestion management policy**.
- (3) If a **distributor** has advised a **distributed generator** under subclause (2), the **distributor** must take reasonable steps to work with the **distributed generator** to assess whether solutions exist to mitigate the **export congestion**.

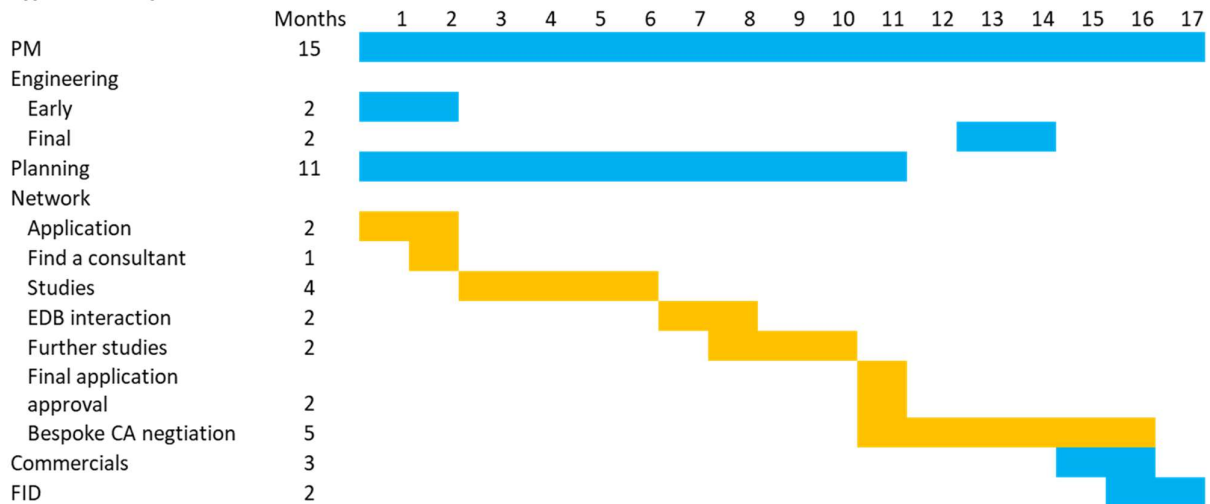
Bizarrely, these provisions do not appear / apply in Part 2 – rules relating to connection of distributed generation above 10kW.

We support Transpower’s efforts to be transparent about their network. Transpower describe their online tool Envision as “our *geospatial interface to transmission network information – providing information to help our customers understand the opportunities and constraints on the transmission network*”. [emphasis added]

Consistent interpretation of Part 6 connection of distributed generation process

Developing distributed generation projects is lengthy and distribution network approvals are usually critical path. The following typical timeline is provided.

Typical Development Process



Part 6 is difficult to navigate (does not include a flow chart for example) and the experience of members is that each distributor has a (slightly) different process for network connection approvals. The inconsistency in timing and information required/received makes it difficult to plan a development project and creates unnecessary inefficiency.

An IEGA member has developed a process diagram which is used to ask the distributor what part in the process the distributor believes they are up to. This helps clarify what the next steps are likely to be and the information that can be expected to be required.

We do not support creating a new process for larger distributed generation – this will take time and distract resources when other no regrets options are available. However, the IEGA strongly submits

the Authority facilitate a workshop where distributors and distributed generation investors discuss in detail how best to streamline the connection process so that it is consistent across all relevant distributors.

We query whether there can be more standardisation of distributors’ individual connection and operation standards. This would provide efficiencies in the network studies that are being undertaken as part of the connection process. In addition, or alternatively, we suggest investigating the option of centralising the work on network studies. An expert body could be available to all distributors to provide the capability and capacity to undertake this work. At the moment a distributor might maintain the expertise in-house for one connection application per year while another distributor is trying to sequence network studies for multiple applications.

Queuing of connection applications

Again, the IEGA recommends the Authority facilitate a workshop where distributors and distributed generation investors discuss in detail how best to address managing or queuing multiple generation (and load) connection applications.

Transpower has implemented a queuing system which might be transferable. Transpower publish good quality information about the size of generation investment and location in front of an investor in the queue. This information is not visible in the distribution network.

In addition, there is no transparency about whether the connection of distributed generation might result in the need for new investment at the distributor interface with the transmission grid – when the distributor’s project then goes into the Transpower queuing system. Transpower’s timeframes then impact the timing of an embedded generation investment – causing a delay of months or years. There is currently no transparency for the distributed generation investor of this potential delay.

Clarity and consistency in the costs of connection to distribution networks

Again each distribution company has discretion to charge their assessed amount for connection assets. This contrasts with Transpower who has published a table of Typical New Generation Connection Options with costings. We query whether each of the 29 distributors are so different that a standard table like this could not be published for generation connections to distribution networks.

Typical New Generation Connection Options

Connection To	Connection kV	Connection Via	Connection Security Level	Indicative MW Range	Typical Capital Cost Range (\$m)		Diagram Reference
					Connection	Wide Area Protection	
Existing GXP/GIP - N security	11, 22, 33, 66	1x new circuit	N	existing transformer capacity	0.5 - 1	0 - 5	EN-1
		2x new circuits	N	existing combined transformer capacity	0.5 - 2	0 - 5	EN-2
	110, 220	1x new circuit	N	0 - 500	1 - 3	0 - 10	EN-3
		2x new circuits	N	0 - 500	2 - 5	0 - 10	EN-4
Existing GXP/GIP - switched N-1 security	11, 22, 33, 66	1x new circuit	N	existing combined transformer capacity	0.5 - 1	0 - 5	ESN-1-1, ESN-1-5
		2x new circuits	switched N-1	existing combined transformer capacity	0.5 - 2	0 - 5	ESN-1-2, ESN-1-6
	110, 220	1x new circuit	N	0 - 500	1 - 3	0 - 10	ESN-1-3, ESN-1-7
		2x new circuits	switched N-1	0 - 500	2 - 5	0 - 10	ESN-1-4, ESN-1-8
Existing GXP/GIP - N-1 security (or greater)	11, 22, 33, 66	1x new circuit	N	existing combined transformer capacity	0.5 - 1	0 - 5	EN-1-1, EN-1-5
		2x new circuits	N-1	existing combined transformer capacity	0.5 - 2	0 - 5	EN-1-2, EN-1-6
	110	1x new circuit	N	0 - 250	1 - 3	0 - 10	EN-1-3, EN-1-7
		2x new circuits	N-1	0 - 250	2 - 5	0 - 10	EN-1-4, EN-1-8
220	1x new circuit	N	0 - 500	2 - 3	0 - 10	EN-1-3, EN-1-7	
	2x new circuits	N-1	0 - 1000	3 - 5	0 - 10	EN-1-4, EN-1-8	
New GIP - N security	110, 220	single hard-tee	N	0 - 500	10 - 15	0 - 10	NN-1
		double hard-tee	switched N-1	0 - 250	15 - 20	0 - 10	NSN-1-1
New GIP - switched N-1 security	110	single-circuit H-bus	switched N-1	0 - 250	15 - 24	0 - 10	NSN-1-2
		double hard-tee	switched N-1	0 - 500	18 - 23	0 - 10	NSN-1-1
	220	single-circuit H-bus	switched N-1	0 - 500	20 - 29	0 - 10	NSN-1-2
		double hard-tee	N-1	0 - 250	18 - 23	0 - 10	NN-1-1
New GIP - N-1 security (or greater)	110	single-circuit H-bus	N-1	0 - 250	18 - 27	0 - 10	NN-1-2
		double hard-tee	N-1	0 - 1000	21 - 26	0 - 10	NN-1-1
	220	single-circuit H-bus	N-1	0 - 1000	23 - 32	0 - 10	NN-1-2
		multi-circuit bus	N-1 (or greater)	0 - 1000	30+	0 - 10	NN-1-3

Our concern is also heightened by the fact that distributors can provide an estimate of the cost of a connection at the start of a connection application process that is multiples less than the costs charged on completion (for example, one network's connection charges increased by 60% when final costings were available several months after the connection was operational; another distributor's connection costs increased 300% between the initial estimate and final amount). These discrepancies impact project viability but only surface after a final investment decision (FID) has been made.

Concluding remarks

There is an imperative for investors to commit to building new renewable generation capacity. IEGA members have new small commercial scale distributed generation options available that are environmentally and economically sustainable. Construction of this capacity will contribute to NZ's renewable energy target as well as realising substantial benefits from generating electricity close to local load⁷. But at the moment investors are expected to make significant financial decisions with low-grade information.

Further, the economic benefits of commercial smaller-scale distributed generation built by numerous independent companies appears to be being overlooked. The IEGA believes that increasing the amount of electricity generated within a network and close to the increasing demand for electricity is economically efficient for all electricity consumers. Maybe there is a need to go back to basics and assess the economic value of distributed versus centralised generation and the total current and future costs of delivery⁸ to underpin important decisions about future regulation.

We would welcome the opportunity to discuss this submission or individual members' experiences with you.

Yours sincerely

David Inch
Secretary

⁷ Including improving local resilience and security of supply especially with an increased dependence on electricity, reduced transmission and distribution losses

⁸ For example, are there alternatives to the projected \$22bn and \$8.2bn investment needed in distribution and transmission network infrastructure respectively by the end of the 2020s as forecast by Boston Consulting Group.