Chairman: [redacted],
[redacted]
Secretary: [redacted]

2 July 2021

Infrastructure Commission
DX SX33303
Wellington

By email: info@infracom.govt.nz

Dear team,

RE: Infrastructure for a Better Future consultation paper

The Independent Electricity Generators Association (IEGA) welcomes the opportunity to engage on the Infrastructure Commission's (Commission) development of a 30-year infrastructure strategy. [1]

The IEGA agrees with the proposed *Infrastructure Vision 2050 – Infrastructure lays the foundation for the people, places and businesses of Aotearoa New Zealand to thrive for generations.*

Infrastructure exists across the whole economy. The Commission has an important role in facilitating 'joined up thinking' about the implications of a wide range of regulatory instruments and institutions to ensure this Vision is achieved.

As an Association we were not involved in the Asset Owners Survey (although individual members may have responded) and we have not engaged with the Commission thus far. We would welcome the opportunity to meet your team and discuss our contribution to New Zealand's renewable electricity supply and our key regulatory focus areas that represent barriers and opportunities for our members.

Your State of Play report for Energy appears to recognise the contribution from distributed generation in the past and we agree a trend to further disaggregation is likely.[2]

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

[2] "Although distributed generation (i.e., generation located within distribution networks) has been a significant feature in New Zealand for several decades, these technological advances are likely to continue shifting the balance towards disaggregation." Page 17 https://infracom.govt.nz/assets/Uploads/Energy-Sector-State-of-Play-Discussion-Document-February-2021.pdf

The first part of this submission introduces the IEGA. The second part of the submission provides some context for our submission and in we respond to some of the questions raised in the consultation paper in part three.

1. Background on the IEGA

The IEGA comprises about 40 members who are either directly or indirectly associated with predominantly small-scale power schemes connected to local networks throughout New Zealand for the purpose of commercial electricity production. IEGA members are small, entrepreneurial businesses, essentially the SMEs of the electricity generation sector, who have made significant economic investments in generation plant and equipment with 95% of the plant using renewable fuel. Combining the capacity of member's plant makes the IEGA the sixth largest generator in New Zealand. We are price takers in the electricity market – our members do not have the financial or human capacity to operate 24/7 dispatching into the wholesale market.

In our view there is considerably more potential for investment in distributed lower emissions sources of electricity. Members have new generation investment options which can meet growth in local demand. However, decisions about when to invest depend on stable and predictable government targets and regulatory environment.

We anticipate the supply of electricity will become more diverse as consumers decide to invest in solar pv and / or battery storage; and distributed generation, or distributed energy resources, may become the norm with investment in physical transmission and distribution network infrastructure becoming the 'alternative'.

Appendix 1 provides more information on the IEGA as well as distributed generation in New Zealand.

2. Context for our submission

The energy participants in the Asset Owners Survey[3] are predominately owners of 'traditional' infrastructure (poles and wires) consistent with the comment in the Consultation paper that our infrastructure is "the powerlines" … part of "a connected system that delivers and supports essential services like power".[4]

The IEGA submits the Commission should also include consideration of investment in electricity generation assets in any infrastructure strategy and recommendations. This is because:

- these generation assets are also long-life, lasting 50 -100 years
- the traditional infrastructure (poles and wires) would have no function if there was no electricity to transport
- distributed generation competes with the traditional infrastructure – and is likely to do so increasingly – which alters the way investment in traditional infrastructure should be considered/managed. In fact, both transmission and distribution owners are required to consider non-network solutions to investment needs.

[3] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 112
[4] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 20. The Table on page 95 of the consultation paper also refers only to electricity distribution and electricity transmission.

The total system (generation, distribution and transmission) works together to deliver electricity which we suggest is, in the context of today's society, how we live and our socio-economic well-being, an essential service. The Commission recognises this in it comments on infrastructure affecting our wellbeing "Energy infrastructure powers it all: our homes, hospitals, cars, trains, factories and businesses".[5] Over time the best solutions for consumers and the economy may be new generation technologies rather than investment in traditional poles and wires infrastructure.

While preparing our feedback on the consultation paper we reviewed the analysis of responses to the Asset Owners Survey. The following key themes in this analysis resonate with IEGA members – our feedback on these themes is incorporated in our responses below to specific questions in the consultation paper (noted in brackets below):

- transitioning to a low emissions economy (Question 5)
- focus on the legal and regulatory environment (Question 3)
- focus on influencing consumer demand (Question 3)
- finding and retaining skilled and experienced staff and contractors
- access to new sources of funding (Question 3)
- improving strategic asset management

In our view these themes are equally relevant across the 1-10 year and 10-30 year timeframes.

3. IEGA response to Consultation paper questions

Q1. What are your views on the proposed 2050 infrastructure vision for New Zealand?

The IEGA supports the proposed *Infrastructure Vision 2050: Infrastructure lays the foundation for the people, places and businesses of Aotearoa New Zealand to thrive for generations.*

In particular, we anticipate IEGA members' infrastructure will support *"a productive, sustainable and carbon-neutral economy"* and *"reliable, affordable and accessible travel options powered by renewable energy"*.[6]

Along with our discussion above about electricity being essential to modern society, the proposed Infrastructure Vision appears compatible with the government's objective for the electricity/energy sector "*to achieve an affordable, secure and sustainable energy system that provides for New Zealander's well-being in a low emissions world*".

Q2. What are your views on the decision-making outcomes and principles we've chosen? Are there others that should be included?

The proposed outcomes and decision-making principles appear sensible. We assume these will apply directly to infrastructure investment decisions by central and local government.

[5] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 27
[6] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 24

We query how these outcomes and principles might facilitate private sector infrastructure investment; would these outcomes and principles influence development of government policies that have a direct impact on private sector infrastructure investment?

Q3. Are there any other infrastructure issues, challenges or opportunities that we should consider?

This question is wide ranging and appears to cover content on pages 27 to 41 of the consultation paper. We comment below on topics of interest covered in this section of the consultation paper.

Making the most of existing assets

While the Commission is emphasising the benefits of making the most of existing infrastructure assets recent changes to environmental regulations have a high potential to reduce generation output from existing assets. Examples are the National Policy Statement for Freshwater Management (NPS-FM) and the National Policy Statement on Indigenous Biodiversity.

The NPS-FM has imposed higher environmental standards on our members' hydro generation plant compared with plant operating in five large catchments. Members' hydro plant can be on waterways that feed into the catchments that are exempt from national bottom line attributes. This means the small hydro generator faces costs to ensure at or above current state water quality. This high quality water will flow into low quality catchments where the hydro owner faces no additional environmental costs. In fact, the small hydro owner could be helping the exempt hydro owner by diluting its poor quality water. We submitted (to no avail) that anything other than a level playing field is anti-competitive. All existing hydro generation capacity has equal weight in the NPS-REG and must be placed on a consistent equal footing under the NPS-FM.

This additional cost may negatively impact decisions about ongoing operation or reconsenting of existing generation capacity. The NPS-IB has the potential to impact investment decisions for a range of infrastructure assets.

New Zealand's infrastructure challenge is growing

The IEGA agrees this 30-year infrastructure strategy can assist in building public acceptance of closing the infrastructure gap[7] – including the need for consenting new generation capacity.

It would be interesting to understand consumers' perceptions of the 'social licence' to operate for small commercial scale distributed generation relative to utility scale generation plant. We suggest the Commission could undertake a study to evaluate the public's preferences in relation to the scale of future renewable power schemes. This could identify the social cost of utility scale versus incremental smaller regional generation capacity and assist with identifying and addressing barriers to new generation investment.[8]

[7] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 29-30

[8] We also provided this feedback in our submission on MBIE's Accelerating Renewables and Energy Efficiency discussion paper.

Long term trends on the infrastructure horizon[9]

A more urbanised population is particularly interesting for distributed generation which, by definition, is connected to the distribution networks supplying the population.

Distributed generation is different from generation connected to the transmission grid – because it is closest to individual consumers there are minimal losses. About 3-4% of the electricity generated by grid connected plant is lost to the atmosphere as it is conveyed on the transmission network; and about 5-7% of electricity conveyed across the distribution network. The laws of physics mean the amount of electricity lost to the atmosphere increases exponentially as the quantity transported increases. Thus, during periods of peak demand, electricity lost – that is generated at a plant distance from load but does not reach consumers – is about 500MW, equivalent to two units at the Huntly thermal power station. Huntly is often the marginal generator and so is generating to meet peak demand at times of high losses, producing the highest greenhouse gas emissions of the entire generating fleet.

Members also own generation assets in remote parts of NZ which supplies electricity directly to the local remote communities and avoids the potential for any transmission constraints.

We fully agree with this comment in the State of Play Energy report[10] but note that rooftop solar generation is only one type of distributed generation – as discussed above distributed generation includes commercial scale generation connected to local distribution networks.

"*Technology will also fundamentally alter what is needed from transmission and distribution infrastructure. Distributed generation (such as rooftop solar generation), combined with battery storage and effective demand-side management like smart-chargers for EVs, has the potential to reduce the need to build additional infrastructure capacity to cope with peak demand. This is a strength in relation to other infrastructure sectors where forms of congestion pricing are less or not prevalent. Adopting transmission and distribution pricing that more closely reflects marginal costs will be important for funding and incentivising efficient investment in these sources of energy and peak demand management."*

The focus of the Commission on congestion pricing to manage peak demand across infrastructure assets - and the acknowledgment in the above quote of the existence of congestion pricing in the electricity sector is interesting. The electricity sector regulator, after many iterations, made a temporary congestion price an option for transmission pricing – but this is not being proposed by the transmission asset owner. At this stage, distribution companies are implementing peak and off-peak prices but at the same time increasing the proportion of revenue earned from fixed charges (and reducing the variable component – this is not equivalent to marginal pricing. We discuss the topic of 'getting the price right' to maximise the use of existing assets below in answer to question 31.

We agree technology change is and will continue to put downward pressure on the long-run marginal cost of new renewable generation technology. Members have new investment options, including in solar, that are economic with utility-scale generation investment.

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[9] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 31-32

[10] https://infracom.govt.nz/assets/Uploads/Energy-Sector-State-of-Play-Discussion-Document-February-2021.pdf page 11

Unique features of infrastructure

We agree infrastructure creating and delivering electricity is long-lived, lumpy, interconnected and shared.[11]

For existing distributed generation, lumpy investment in transmission infrastructure, due to huge economies of scale, does not mean the system value provided by distributed generation changes over time. Distributed generation can defer investment in transmission up to the point when a lumpy investment can no longer be avoided. Distributed generation is a long-life asset, like transmission, with a number of plant around New Zealand over 100 years old. Figure B represents the correct analysis of the economic efficiency impacts of distributed generation on excess supply of delivery capacity. Further, it is common and acceptable to have surplus capacity following an economically sized infrastructure expansion that meets future demand projections.

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

Distributed generation investment is incremental no regrets additions to electricity supply that is more in line with growth in demand for electricity.

Issues and challenges facing networked infrastructure

The IEGA agrees with the Commission's identified issues and what's on the horizon for the energy sector.[12]

Managing affordability and energy security while we transition is a significant issue for both the demand side and the supply side of the electricity sector. Retaining options is important – noting "*new and improved energy technologies are expected to greatly reduce the cost of the transition over time".*[13]

Infrastructure is undergoing significant change

The Commission, rightly in our view, has identified reform of the Resource Management Act as a reform that will have a significant impact on energy and other infrastructure sectors.[14]

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[11] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 33
[12] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 34-35
[13] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 35
[14] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 36

We agree "The planning system must be enabling of the infrastructure necessary for climate change mitigation and adaptation." [15] The IEGA strongly supports the Infrastructure Commission being involved in providing advice on the implications of these reforms to how infrastructure is consented, delivered and governed.

As much as possible the Infrastructure Strategy should be consistent with or be enabled by any legislative reform (or be able to be updated as the need arises).

The IEGA agrees with the following list of recommendations for change included in the report analysing responses to the Asset Owners Survey[16]:

Recommendations by participants for change include:

- A full review of the Resource Management Act (which is currently underway).
- A more enabling regulatory regime.
- More certainty and advance warning of likely future legislative and regulatory changes to aid in future planning and decision-making.
- Consistent planning throughout regions.
- Recognise regionally and nationally significant infrastructure.
- Assistance with funding implications of new standards.
- Consider the development of approved codes of practice or acceptable solutions for environmental management such as health and safety and the Building Code.
- Promote adoption of new technologies to improve regulatory performance.

For our submission to MBIE on the 'Accelerating Renewables and Energy Efficiency' discussion paper members were asked for their views on the three key regulatory barriers that are discouraging them from developing or investing in renewable distributed generation plant at this time.

The responses to this question categorically rated as the number one barrier issues relating to the licence to build and operate renewable generation plant granted via the resource management regulatory system and the conservation regulatory system[17]. Complexity, lengthy timeframes and uncertain outcomes were issues heighted as well as uncertainty about ongoing rights to water for hydro generation.

We can provide numberous examples of lengthy delays in consenting process – noting the two (duplicate) processes being the RMA and getting consent from the Department of Conservation.

The Resource Management Act is a one-size-fits-all framework. The cost and reach of this legislation is disproportionate to the size of IEGA members' generation assets, the majority of which is less than 10MW operating capacity. Our submission to MBIE provided a proportionate solution - this section of our submission is attached as Appendix 2 to the submission.

In addition, overall regulatory requirements now engulf about 50% of time for member companies. We support the following feedback in your report[18]:

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[15] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 14

[16] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 9

[17] As well as securing a resource consent under the Resource Management Act (RMA), many projects require a concession consent from the Department of Conversation to access land or renewable fuel. This concession process duplicates the RMA process, is time consuming with uncertain outcomes.

[18] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 42

"Cost of meeting regulatory requirements is major factor for a small company. Our performance is better than most other companies in the industry yet we are lumbered with a lot of disclosure and other regulatory requirements. Provide better set of regulatory requirements for small companies."

The IEGA supports the following recommendation[19] - this will make a substantial difference.

C1.2	Standardise planning rulebooks to increase capacity and reduce cost and uncertainty
2022-2026 BUP, RAN, JUL	Merge regional and district plans into a combined plan, resulting in 14 combined plans rather than roughly 100 council plans. Prior to developing combined plans, develop the National Planning Standards into a nationally standardised planning rulebook that local authorities are required to adopt with limited variations.

The IEGA agrees the Infrastructure Strategy should include recommendations around changes to the legal and regulatory environment that are enabling rather than restrictive, more regulatory stability and more standardisation around asset management and risk.[20] The Commission could be monitoring the need for regulatory resets over the 10-30 year timeframe depending on progress towards NZ's climate change goals. The IEGA supports recommendation S7.3[21] (copied below):

S7.3	Develop a planning system that is more enabling for infrastructure
2022-2026	• Require the proposed Natural and Built Environment Act to recognise that the natural and built environments are different. Therefore, different environmental management rules should apply to each. • Require resource consent decisions to take into account the length of time in which an activity will affect the environment, rather than assume the effects are in perpetuity. • Ensure consenting pathways for infrastructure through the National Planning Framework, potentially through setting standards for planning policies and regulations for infrastructure. • Limit the scope of effects considered under the proposed Natural and Built Environment Acts to matters related to natural and physical resources, not extraneous matters like commercial and amenity matters. • To support national direction, establish a national GIS database for mapping nationally important resources (built and natural), including corridors and assets of nationally significant infrastructure. • Ensure that regional spatial strategies can respond rapidly to changing national and regional priorities. • Require a pre-notification audit of proposed regional unitary plans to ensure consistency with national direction. • Allow infrastructure consents to be bundled with complementary plan changes in surrounding areas.

However, it is not just about how the legislation applies to infrastructure but also how local (or central) government implements legislation. Achieving quality asset management depends on the decisions of the approving/enabling regulators and independent regulators. We suggest the

[19] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 75
[20] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 64
[21] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 123

Commission should identify opportunities to improve planning and consenting processes by local government – improving timeframes is critical as is local government being appropriately funded for all the delegated decision-making imposed by legislation written by central government.

Natural hazards and climate change

Insurance costs are escalating and the IEGA supports the Commission investigate options for a national infrastructure insurance scheme and who might be eligible.

Q4. For the 'Building a Better Future' Action Area and Needs: • What do you agree with? • What do you disagree with? • Are there any gaps?

The IEGA agrees with the areas of change needed; in particular our perspective is that change is needed to prepare infrastructure for climate change; transition energy infrastructure for a zero-carbon 2050; and ensure the security and resilience of critical infrastructure.

Q7. What infrastructure issues could be included in the scope of a national energy strategy?

At a high level, we expect a national energy strategy to encourage timely (ahead of need and not just-in-time) investment in the infrastructure needed to transition to a low emissions economy. All types of energy infrastructure should be on a level playing field (particularly in the competitive parts of the market). This includes ensuring different participants are paid for providing the same services.

IEGA members are proud to contribute to achievement of New Zealand's sustainability goals. We strongly support efforts to lower emissions in the electricity and energy sector as well as the entire economy. There are 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 load[22].

Renewable distributed generation has advantages over utility scale grid connected generation, for example: lower losses on the transmission grid; lower losses on the distribution network as the generation is located close to load; deferring or avoiding investment in transmission and distribution infrastructure; and a smaller environmental footprint and visual impact.

The regulatory environment during NZ's transition path to a low emissions economy should involve reducing barriers to entry for consumers and investors so that New Zealand can benefit from the full economic and wider community benefits of solar and other distributed energy resources.

Q8. Is there a role for renewable energy zones in achieving New Zealand's 2050 net-zero carbon emissions target?

We don't have sufficient understanding to know whether this overlaps with the proposed Spatial Planning Act under the RMA reforms. Zoning may not be relevant for generation less than 10MW but whatever is proposed / developed should not disadvantage small scale commercial distributed generation relative to utility scale generation plant.

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

Q9. Of the recommendations and suggestions identified in the Ministry of Business, Innovation and Employment's "accelerating electrification" document, which do you favour for inclusion in the Infrastructure Strategy and why?

We suggest the Infrastructure Strategy or work by the Commission should help with options analysis and that any framework for considering options would make a useful contribution to creating greater certainty about managing low hydro storage and / or low periods of energy from intermittent renewable fuel.

The IEGA is engaged with the Commerce Commission and the Electricity Authority regarding growth in installations of local generation to distribution networks. As per our comments on question 31, in relation to 'getting the price right' to maximise use of existing assets encourage your Commission to provide guidance in this area.

The IEGA suggests the Commission's engagement in the RMA review with an 'infrastructure hat on' should be expected to be positive for the electricity sector as well as other infrastructure sectors.

Q26. How can local and central government better coordinate themselves to manage, plan and implement infrastructure?

We agree there is an ongoing need for infrastructure agencies work collaboratively to progress infrastructure planning and delivery. "*An integrated approach involves policy-makers, regulators and infrastructure providers coordinating work across geographic boundaries and portfolios to deliver better outcomes for communities. There may be benefit in a common set of principles to guide how infrastructure providers are structured, governed and regulated, which takes into account underlying sector and geographic differences*."[23] This co-ordination at the physical infrastructure level should facilitate co-ordination across agencies in achieving the higher level climate change objectives that infrastructure investment must be being planned for. We have been calling for 'joined up thinking' for some time.

Q.29. Are existing infrastructure funding and financing arrangements suitable for responding to infrastructure provision challenges? If not, what options could be considered?

The IEGA's interest in this question is different from, say, local government funding arrangements.

Access to new sources of funding and financing is important for members. The IEGA agrees the "Opportunity for Power Purchase Agreements (PPAs) to drive significant uptake in low cost renewable generation from nonincumbent developers (as happens overseas)". [24] Extracts from the feedback we provided to MBIE on the 'Accelerating Renewables and Energy Efficiency' discussion paper on this topic is in Appendix 3.

[23] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 97

[24] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 66

The IEGA agrees "Regulatory uncertainty and costs of compliance; poor legislation not being addressed; can impact investor sentiment"[25]. We reach this conclusion based on our experience with the change to remove ACOT payments that was not supported by robust impartial analysis.

Q31. What options are there to better manage and utilise existing infrastructure assets?

The IEGA agrees NZ must do better with the infrastructure we already have. The Commission places making better use of existing assets under one of its five proposed priorities – namely 'getting the price right'.[26] Pricing strategies of distribution and transmission companies can and should be used to maximise use of existing assets.

Demand management is promoted by the Commission as an option "*to make better use of existing infrastructure and extend its life*"[27]. This feedback is included in the analysis of Asset Owners Survey responses[28]:

> *Network infrastructure is peak load driven and capital intensive. Influencing consumer demand can optimise the optimise the service/cost trade-off for the benefit of all users of the infrastructure services. We have some degree of controls over consumer demand already that provide benefits to both consumers and network operators. This is based on management of storage loads. We plan to expand this into new storage load areas. The Commission could recommend strategies to Government that enable rather than restrict such initiatives. Energy Sector Organisation*

The Commission's focus should go beyond influencing consumer demand to include other ways of managing network utilisation (to avoid the negative consequences of transporting peak volumes). Management of generation capacity connected (along with demand) to local distribution networks also improves use of existing distribution and transmission infrastructure.

Historically, small commercial scale distributed generation has contributed more than 12% of peak energy generation supply. Distributed generation is enrolled in Transpower's demand response programme.

Distributed generation can defer or avoid investment in both the distribution and transmission networks. Analysis in 2017-2018 also revealed that over 80% of the assumed contribution of existing distributed generation to winter load (megawatts) is required for Transpower to meet its grid reliability standards to ensure secure supply of electricity[29]. Distributed generation is not compensated for this which is effectively a transmission service.

The Commerce Commission's regulatory regime requires Transpower and the distribution companies to consider non-network infrastructure alternatives. These alternatives, such as investment by third parties in distributed generation, provides Transpower and distributors with flexibility to manage uncertainty about the future need for, or timing of, transmission investment. To our knowledge one distributor has signed up generation as an alternative. We also monitor Transpower's consideration of

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[25] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 42
[26] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 13
[27] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 30
[28] https://infracom.govt.nz/assets/Uploads/Infrastructure-Commission-Asset-Owners-Survey-Technical-Report.pdf page 10
[29] See Mitton ElectroNet reports on the four transmission regions in consultation to determine the list of distributed generation eligible to receive ACOT https://www.ea.govt.nz/development/work-programme/pricing-cost-allocation/acot-code-change-implementation/consultations/#c17067

non-transmission alternatives during grid planning. Distributed generation is unlikely to achieve the reliability standard required by Transpower based on their expectations of transmission infrastructure – this is unlikely to change.

In summary, distributed generation competes with transmission and distribution infrastructure to deliver electricity to consumers co-located within the local network. As more distributed generation connects to local networks and generates to supply peak demand, the need for any increase in capacity in the transmission and distribution network can be deferred or avoided.

With respect to '***getting the price right***' under the 2007 Government policy decision, the Electricity (Connection of Distributed Generation) Regulations 2007, were introduced to facilitate connection of distributed generation to monopoly distribution companies because the government recognised distributed generation avoids or defers infrastructure investment, provides energy diversity and security, has a lower environmental impact and displaces thermal generation contributing to climate change policy – all completely relevant objectives in the current low emissions debate. Distributed generation was eligible to receive the transmission costs the distributor avoided (ACOT) because distributed generation generated during peak demand periods and reduced the volumes the distributors took from the transmission grid.

This regulatory environment was overhauled by an Electricity Authority decision in 2016 which removed ACOT obligations. Distributed generation provides valuable investment deferral benefits but a 'market mechanism' or alternative pragmatic compensation mechanism for this important system benefit has yet to eventuate that would enable investors to maximise the potential of distributed generation. With the removal of the ACOT distributed generation does not get compensated and is no longer incentivised to generate and thus reduce load on the transmission grid.

The IEGA submits that this is inequitable relative to other customers of the distribution company (eg. a lower tariff for controlled versus uncontrolled load when the differential can be up to 8c/kWh).

The Productivity Commission also identified these same issues in its 2018 report on its low emissions economy inquiry. The IEGA agreed with their following statement:[30]

> To fully realise its potential scale, DER should enjoy the same incentives as grid-scale generators to provide energy services and (with high-quality inverters and/or batteries) ancillary services such as frequency and voltage stability (Stevenson et al., 2018; John Crook, sub. 31). Currently DER, unlike grid-scale generators, are only paid the average cost of energy and cannot access markets for ancillary services (such as frequency and voltage control) – even if they meet the requirements.

Policy settings must recognise and include an appropriate mechanism for compensating distributed energy resources for the range of benefits provided. For example, delivering electricity to consumers just like transmission infrastructure does for grid-connected generation.

Investments by both Transpower, distribution companies and distributed generation are efficient, and both should be allowed to be compensated by adequate cost recovery.

The Commerce Commission's regulatory regime should ensure distributed generation contracted as an alternative to transmission investment is compensated on the same basis as Transpower's

[30] https://www.productivity.govt.nz/assets/Documents/4e01d69a83/Productivity-Commission_Low-emissions-economy_Final-Report.pdf Page 409

transmission assets for the life of the investment. Once signed up as an alternative to investing in transmission infrastructure, the cost of this alternative must be recovered in the same way as Transpower's transmission assets and for the life of the investment. The alternative forms part of the integrated transmission grid. The value of the alternative is not eliminated when the next tranche of transmission assets is installed even if that tranche of transmission investment results in excess capacity.

In addition, a peak demand price signal is important to signal the upcoming need for more capacity – which could be provided by a transmission alternative. Peak congestion pricing for the transmission grid has been a contentious issue over a number of years. The new transmission pricing methodology is unlikely to include a peak demand signal – a position the IEGA disagrees with. In our view a price signal is necessary to incentivise third parties to investigate options to offer services at a cost less than that of a lumpy major transmission investment.

A standard measure and value for 'reliability' would be a good start. Government could standardise the value for reliability and ancillary services provided by distributed generation across all networks. The value of reliability should be standard across New Zealand just as the value of lost load in the transmission context and security of supply framework is set at one number of $20,000/MWh.

The IEGA strongly supports work on resolving valuation of and payment for services already provided by existing small scale commercial distributed generation to their network company. Progress in valuing these benefits and agreeing compensation is overdue.

We **recommend a pragmatic nationwide solution to recognise the benefits of distributed generation**. The previous Avoided Cost of Transmission was such a pragmatic standardised approach. A stable well understood compensation mechanism for system benefits (network congestion management and investment deferrals) would assist with securing debt funding for investment in distributed generation.[31]

Thus, we strongly support the Commission's recommendation F2.1:

F2.1	**Enable electricity distribution networks to minimise barriers to the connection and use of large numbers of local generation, storage and demand response facilities (distributed energy resources or DERs)**
2022-2026 EAN, ARE	Require (and possibly fund) electricity distributors to work with DER providers to develop and implement (by 1 July 2023) standard arrangements for procuring support services from DERs and any other associated requirements.

Further, we also agree the Commission should investigate recommending the full cost of carbon be included in infrastructure business case appraisals and decision-making. The consultation paper states[32]:

> *"The true cost of carbon could be more regularly included in infrastructure planning to ensure good project selection." "Getting the price right is fundamental to driving infrastructure decisions that support a low-caron economy."*

[31] The UK's Flexibility Mechanism work could be a useful comparator.

[32] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 49

The CCC's final report notes in the section on 'making investments net-zero compatible' that *"Incorporating long-term abatement cost values consistent with climate change goals into the Government's cost-benefit or cost-effectiveness analysis would have a powerful effect in helping to make sure policy and investment decisions are net-zero compatible. This is sometimes termed a 'shadow price' on emissions and is common practice internationally."* [33]

The IEGA suggests market-based carbon costs as well as the long-term abatement cost values should be included in the distribution companies' and Transpower's capital expenditure proposals. The IEGA supports recommendation F1.1 in the consultation paper.

F1.1	Adapt business case guidelines to ensure full consideration of mitigation and adaptation
2022-2026 CCC, SRC	Require all infrastructure projects to directly assess climate change impacts (mitigation and adaptation). Ensure all infrastructure projects evidence they are compatible with a net-zero carbon emission future to prevent infrastructure with a long asset life locking-in a high-emissions future. Require all infrastructure projects to apply a consistent cost of carbon that is commensurate with New Zealand's international commitments in cost-benefit analysis and sensitivity analysis.

All of our above feedback demonstrates that the IEGA supports recommendation S3.3[34] ". Principles developed by the Commission to improve pricing in other infrastructure areas should also apply to the electricity sector:

S3.3	Improve pricing to optimise use of existing infrastructure
2027-2032	Implement changes to infrastructure pricing to optimise the use of existing infrastructure and potentially defer major upgrades.

Recommendations in the consultation paper

In relation to F2.2 – this approach may be appropriate if it does not crowd out distributed generation that would provide a more economic solution to supplying near term growth in demand.

F2.2	Reduce barriers to building spare transmission capacity where that would reduce inefficient barriers to large-scale renewable generation and the electrification of large process heating units
2022-2026 TPM, LEE, ARE, GTG	Subject to appropriate regulatory oversight, enable and encourage Transpower to temporarily defer charging customers for the costs of spare transmission capacity built specifically to cater for future renewable generation connections (the deferral would end when sufficient new connections have occurred). By making it easier for Transpower to build spare capacity ahead of provable need, generators would find it easier and faster to commit to renewable investments if electricity demand increased at a higher rate than they anticipated. Similar issues arise with respect to building spare grid capacity to cater for future connections (or augmentations of existing connections) for industrial consumers.

[33] https://ccc-production-media.s3.ap-southeast-2.amazonaws.com/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf page 244

[34] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 111

Critical national infrastructure – we note recommendations F6.1 and F6.2 and suggest the entire electricity supply system may be critical national infrastructure, including commercial scale distributed generation.

Summary of key messages

- The Infrastructure Strategy must cover the generation segment of the system that delivers electricity to everyone for their wellbeing.
- Distributed generation, already playing an important role in NZ's renewable electricity system in competition with transmission and distribution infrastructure, will be an increasingly important part of New Zealand's energy system.
- Progressing a number of the focus areas already identified by the Commission will benefit distributed generation.
- Existing distributed generation must be treated on a level playing field with all other ways of supplying electricity to consumers, including emerging technologies.
- There are options for new generating capacity[35] connected to local networks that are economic, have a smaller environmental footprint than grid-connected generation and provide an incremental increase in supply more aligned to growth in demand. A stable and predictable regulatory environment is important for investors.
- Existing and new distributed generation is/will provide system benefits for distribution and transmission network owners. An equitable regulatory environment would facilitate compensation for these benefits – just as the network owners are compensated for the provision of their assets.
- A stable, pragmatic nationwide solution to recognise the benefits of distributed generation must be implemented – this is within the scope of the Part 4 regulation of monopoly network businesses. Part 4 regulatory regime can enable the ability for distribution companies to compensate distributed generation for deferred or avoided investment as a network alternative and recover that cost from customers.

Concluding comments

Regulators in fast changing and disruptive markets need to ensure that natural competition prevails, and not become the disruptors and create barriers. The IEGA recommends the approach to regulatory arrangements outlined in the report "ReShaping Regulation, Powering from the Future" [36] which describes regulatory principles to shape a new energy system from a blank sheet of paper. This paper comments that the focus on 'transition' is "*resulting in incremental rather than systemic thinking that is creating significant policy and cost "drag", is constrained by incumbent thinking and does not draw sufficiently from drivers of change beyond the energy sector. … Prescription is yesterday, facilitation is tomorrow, all judged against great consumer outcomes.*"

A long-term Infrastructure Strategy has the potential to produce systemic thinking and facilitation of infrastructure which "is fundamental to delivering a stronger, more diverse and more productive

[35] Estimated at over 150MW using Electricity Authority data at https://www.emi.ea.govt.nz/Wholesale/Datasets/Generation/Generation_fleet/Proposed

[36] See https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/collaborative-publications/Reshaping-Regulation-Powering-from-the-future.pdf Page 4

economy”[37]. We hope the Commission has the mandate to influence positive change so that distributed generation contributes to the Infrastructure Vision 2050.

We would welcome the opportunity to discuss this submission with you.

Yours sincerely

Chair

Appendix 1: Background on the IEGA and distributed generation in NZ

Appendix 2: IEGA’s recommended approach to environmental regulation of generation assets less than 10MW

Appendix 3: MBIE’s Proposal 8.1: Introduce a Power Purchase Agreement (PPA) Platform

[37] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-June-2021.pdf page 22

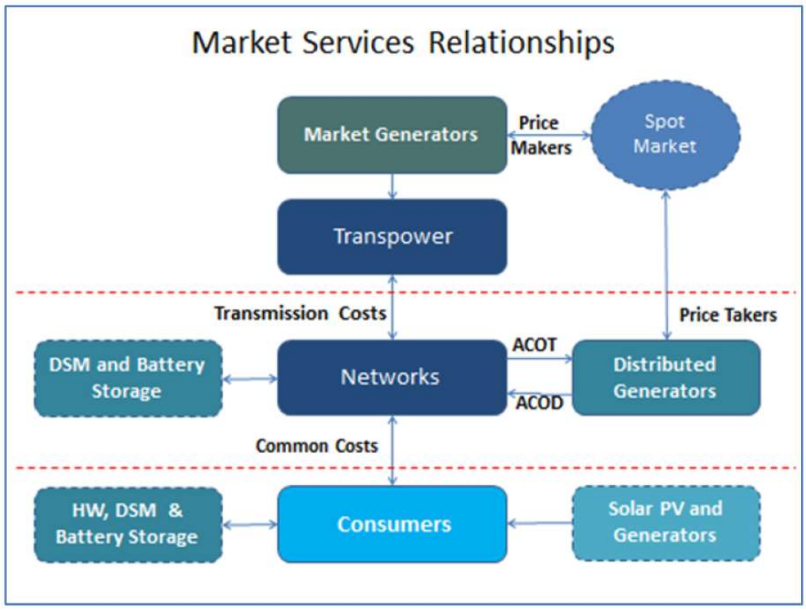
Appendix 1: Background on the IEGA and distributed generation in NZ

The IEGA comprises approximately 30 members who are either directly or indirectly associated with predominately small-scale power schemes throughout New Zealand for the purpose of commercial electricity production.

Our members have made significant economic investments in generation plant throughout New Zealand that is embedded within local distribution networks. Our members are proud to contribute to achievement of New Zealand's 100% renewable electricity target with 95% of our electricity generated from renewable fuel compared with ~83% for the entire sector[38]. IEGA members' generation plant range from 0.1MW to around 10MW (with one plant at 25MW and another at 32MW). Combining the capacity of members' plant makes the IEGA the sixth largest generator in New Zealand and the combined portfolio benefits of this group to the energy market are material. At this stage we do not have any investors in solar pv as members.

IEGA members are small, entrepreneurial businesses, essentially the SMEs of the electricity generation sector, providing significant benefits to the regions in which we operate. Members are mostly not vertically integrated with retail. IEGA members' that do not bid their generation output into the wholesale spot market are therefore price-takers. This investment has to be as efficient as utility owned investment in order to be able to make an appropriate rate of return.

IEGA members own distributed generating plants that export electricity in to their local network and for the most part do not utilise transmission services but effectively compete with transmission services to deliver electricity to end users. The services provided by our sector assets differ from market generators and from consumer-owned DG predominately for own use, and the regulatory approach should be commensurately different. The following diagram demonstrates the relationship of distributed generation to other participants.



[38] Source: http://www.emi.ea.govt.nz/Datasets/Wholesale/Generation/Generation_fleet/Existing

Distributed generation in New Zealand

The IEGA's focus is on distributed generation that is not behind the consumer's meter. The benefits of this distributed generation are it:

- provides 10% of New Zealand electricity by output (including utility-owned distributed generation) which is equivalent to over twice the output of the Huntly power station
- introduces competition resulting in lower regional electricity prices for consumers as well as enabling new retailers to enter the market with Power Purchase Agreements
- employs around 500 people across most regions of New Zealand
- results in rebates and distributions back to local communities. For example, Pioneer Energy has distributed approximately $75m over 15 years to its community trust shareholder
- assists with security of supply. Many of IEGA members' distributed generation plant supplied their local regional networks prior to the grid being built so have a proven track record of reliable supply as they are designed to run islanded from the grid in an emergency loss of transmission. Recently one of our member's distributed generation plant provided emergency power to Auckland District Hospital Board's Grafton hospital when Vector lost power
- avoids or defers distribution network and transmission investment
- is complementary to consumer load management. These network-connected services have been incentivised to flatten more than 20% of the New Zealand electricity system's peak demand
- analysis in 2017-2018 revealed that over 80% of the assumed contribution of existing distributed generation to winter load (megawatts) is required for Transpower to meet its grid reliability standards to ensure secure supply of electricity[39].

As well as contributing to New Zealand's renewable energy target, distributed generation also improves New Zealand's energy productivity. Energy productivity includes the cost of producing and delivering electricity. Distributed generation can be built at an LRMC equivalent to grid connected generation. Distributed generation is usually located closer to electricity users than grid connected generation and uses only the local network to deliver electricity to users. Grid connected generation (by definition) uses the transmission grid and the local network to deliver electricity. Transporting electricity results in lost energy (due to resistance). Recent data shows 1,239GWhs (3.2% of total electricity injected) was lost while travelling over the transmission grid; 1,670GWh (6%) was lost while travelling over distribution networks. [40] This is equivalent to the output of the Huntly power station.

[39] See Mitton ElectroNet reports on the four transmission regions in consultation to determine the list of distributed generation eligible to receive ACOT https://www.ea.govt.nz/development/work-programme/pricing-cost-allocation/acot-code-change-implementation/consultations/#c17067

[40] Top Energy took into account the economic value of lost energy (~6% in their case) when deciding to invest in distributed generation compared with investing in 110kV lines. Top Energy application for an exemption http://www.ea.govt.nz/dmsdocument/21586

Appendix 2: IEGA's recommended approach to environmental regulation of generation assets less than 10MW

The IEGA's focus on reform or simplification of environmental regulation reflects our experience over many years of lengthy and expensive timeframes and processes associated with meeting statutory environmental obligations for renewable small commercial generation plant. The regulatory regime imposes disproportionate costs on smaller scale plant because the consenting process is a 'one size fits all' approach whether the generation plant is 330MW or 0.5MW. This disadvantages the development of small-scale renewables due to the complexity, risk, cost and time involved. The following summarised two case studies (more detail is available):

- re-consenting of the 100-year old 0.5MW Raetihi hydro power station took 19 years and cost over $0.5 million (excluding the owner's time). Converting this cost to re-consenting the neighbouring Tongariro Power Scheme of 330MW would cost $330 million
- the decision to invest and fund a new hydro generating plant was made on the basis on a regulatory regime that appeared stable and assisted with funding. By the time all statutory requirements were met, and the plant commissioned 5 years later, the regulatory regime managed by the Authority changed having a significant impact on the financial viability of the plant.

It is critical to remember the RMA process is duplicated if the project requires access to land or renewable fuel that is under the Department of Conservation's (DoC) control. This involves making an identical consent application and awaiting approval for access and information about the concession fee payable for this access. The approach by DoC differs across New Zealand and usually involves lengthy timeframes with highly uncertain outcomes.

DoC is currently reviewing its concession fee framework (including for electricity generation projects). Currently the fee structure is regressive and based on the asset value of the investment as opposed to any consideration of the proportion of the project using the conservation estate. Other parts of government should be engaged on this as it has the potential to impact existing and new energy infrastructure assets.

Our proposal

Our proposal is a **simplified (less complicated) process for a plant of 10MW or less - the 'SME' sector of the generation market** (ie generation that is not connected behind a consumer's meter).[41]

We recognise the importance of the environmental and engagement focus of the RMA. However,

a) the RMA requires numerous studies to be undertaken prior to an application being lodged that can be proven to be completely irrelevant during the consenting process for generating plant of 10MW or less. For example, the following noise study requirements were imposed on the consent applicant for the Flat Hill wind farm: a noise study was provided as part of the RMA application; a peer review of the noise study was required to be provided for the RMA hearing; and then when settling a potential Environment Court appeal a second peer review

[41] Other statutory obligations are simplified or tailored for SMEs relative to large scale / utility businesses.

was required. No substantive risks or concerns were raised in either of the studies and just exposed the small 7MW project to more expense; and

b) each consenting authority has discretion to consider an application with its own approach / process / focus. For example, consenting authorities can impose different methodologies for testing the same particular effects.

We **suggest an Expert Panel** be created that can assess a generating plant proposal and shape the consent application at an earlier stage before any studies are undertaken. The Expert Panel would have:

- knowledge and expertise of all generating technologies and apply a consistent approach or criteria across projects across New Zealand
- regard to and act consistent with all government policies and objectives
- regard to Regional Council Plans but could encourage a consistent approach across New Zealand to monitoring and testing ongoing compliance with consent conditions. For example, different councils apply different rules for the passage of the same fish past power stations in different catchments – increasing costs for members' have plant located in different areas of New Zealand
- authority to determine what studies are required
- ability to shape the consent application by identifying the issues associated with the project that have to be further investigated or addressed in the consent application, ie determining the consented activities. Determinations would be binding through all consenting processes (RMA and DoC)
- authority to impose conditions which, if met, would not be re-litigated during the consent process by the consenting authority. Or it could impose conditions that form a minimum threshold – this threshold could be exceeded if the investor does a study to satisfy that the aspect of the project is not an issue, eg, a hydro plant that diverts less than 25% of the river's flow is allowed; or the project can take more than 25% if a study proves this will not have a detrimental effect

The advantages of an Expert Panel are:

- provides a higher level of certainty for investors considering a proposal prior to making a significant investment in the regulatory process
    - an investor currently undertakes a large amount of work at considerable cost to put their best foot forward in a consent application but there is absolutely no certainty about whether the information prepared will be sufficient to satisfy the consenting authority
- reduces the cost of undertaking studies to support a consent application
    - Expert Panel will determine the studies that are directly relevant to the application
- hastens consenting timeframes – removing bureaucratic drag. The consenting authority could then be required to approve the consent within a maximum time limit
- creates a consistent approach to reviewing applications across New Zealand
- would use the knowledge of a century of renewable power schemes in New Zealand
- applicants are dealing with an expert body
    - our members are dispersed across New Zealand and are often dealing with small local authorities that infrequently deal with consenting generation plant[42]

[42] This differs from say Meridian and Genesis that deal with one consenting authority for the entire Waitaki power scheme or Mercury for the Waikato power scheme

- process works for reconsenting, repowering and new generation projects
- is consistent with other rules faced by distributed generation in the electricity market
    - Electricity Industry Participation Code has a de-minimus of 10MW in relation to the obligations to the System Operator

This Expert Panel would be consistent with the 'one-stop-shop' process proposed in the European Union for small-scale projects:

The European Union "Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the promotion of the use of energy from renewable sources"[43].

[43] See https://eur-lex.europa.eu/resource.html?uri=cellar:3eb9ae57-faa6-11e6-8a35-01aa75ed71a1.0007.02/DOC_1&format=PDF

Appendix 3: MBIE's Proposal 8.1: Introduce a Power Purchase Agreement (PPA) Platform

In our view, the current wholesale electricity market attributes that make it difficult for small-scale renewable generation investors to secure finance are:

- non-firm generation is very difficult to hedge with ASX products which makes the ASX market unsuitable to IEGA members
- new grid scale generation results in a stepwise increase in electricity volumes which applies downward pressure on spot prices impacting the likely return on investment. This factor, which impacts investment timing, is unlikely with small commercial DG
- managing spot price or merchant power price risk - members are price takers for their generation output. They do not have the financial or physical resources to man a 24/7 desk bidding into the wholesale spot market to influence the spot price
- attempts are made to manage spot price risk by using the hedge market but this is volatile and has limited liquidity
- the absence of a longer dated contract market is one of the factors inhibiting expansion or new investment. It is difficult to negotiate with vertically integrated gentailers that make up ~90% of the generation and retail market and who 'control' the hedge market
- renewable generation projects involve a high upfront cost to construct and this cost is recovered over the long life of the asset. Regulatory certainty is therefore critically important to the bankability of these projects. Distributed generation investors currently face a regulatory environment that might only become more stable in about five years when changes to the TPM and distribution pricing are in place. The level of uncertainty is disproportionate to the size of this sector and the scale of the businesses owned by IEGA members. This uncertainty is also impacting the bankability of existing and new distributed generation investments.

Other regulatory issues that we are concerned about are:

- issues relating to negotiating with monopoly distribution companies
- issues for new DG negotiating with Transpower
- engagement with the Authority

All of these barriers or concerns culminate in it being difficult for independent small commercial investors to debt fund new generation projects. Some fundamental changes to the wholesale market may be required to achieve change, as efforts to improve liquidity in the hedge market have had limited impact since 2010.

Existing rules provide for PPA between generators and consumers. However, any assistance towards enabling easier and a more widely utilised PPA market would be beneficial.

Other options to facilitate new small-scale commercial distributed generation close to load that needs to electrify could be:

- establish a fund that allows a contribution towards construction cost, particularly when this generation contributes to wider benefits

- widening the scope so that access to a long term contract (PPA) for managing price risk (hedging) is available to small scale generator that is not large enough to trade on the ASX (noting, also, the costs of ASX transactions, margin calls etc)
- financial assistance at a proportion of the LOCE (say $20/MWh) with the balance of revenue being the responsibility of the renewable generation investor

The IEGA cautions any proposal that creates excess bureaucracy and a further layer of costs. We also suggest the New Zealand Green Investment Fund may be the appropriate agency to implement any proposals - given its focus on established technologies, green energy and finance focus.