CEN Submission on
MBIE Consultation on advancing New Zealand's energy transition

Brief Description of CEN

Community Energy Network (CEN) is made up of 22 members spread throughout the country, literally from Kaitaia to Bluff. They are all deeply committed to improving the health, resilience, and overall wellbeing of their communities. Our members are charitable trusts and community enterprises that, amongst other programmes, provide healthy housing advice, retrofits, repairs, renewable generation, and other energy related services.

Over the past 20 years CEN members have insulated more than 160,000 homes and completed over 325,000 healthy home assessments. We have also collaborated with other sector leaders to deliver national scale programmes like the Home Performance Advisor training programme (now jointly owned with Beacon Pathways).

In 2018, CEN began implementation of a strategy that is aimed at supporting the creation of a community energy sector in Aotearoa New Zealand. Alongside our work on all key elements of healthy homes, this work stream allows us to develop integrated community energy programmes. This has involved a steep learning curve re engagement with the energy sector.

Through using a community enterprise model, CEN members can work directly on most of the issues relating to energy wellbeing and hardship while also supporting overall community wellbeing, resilience, energy security, employment, and community investment.

1. Introduction

a. CEN is making this submission as a contribution to development of the forthcoming New Zealand Energy Strategy. We refer to this as the '**Strategy'**.

b. The submission focusses on the document; 'Measures for transition to an expanded and highly renewable electricity system'. It is referred to in this submission as the '**Document**'. CEN assumes that this document contains the core current MBIE analysis of the **Strategy**.

c. The analysis presented in the document overlooks or ignores several components that we consider to be essential to the Strategy, and therefore recommend that these be included as the work goes forward.

d. There is a limited recognition of the roles that communities and especially Māori, as Te Tiriti partners, should play in the future energy system. This despite the provision of Chapter 9, which expressly mentions equity and affordability. As a core principle, this strategy must be written in a way that gives effect to the obligations under Te Tiriti and should be open to opportunities to co-design/manage/govern elements of this strategy that relate to affordability and equity with Māori and communities in general.

2. **The Strategy should assess the applicability to New Zealand of the international trend of rapid growth of distributed generation and battery storage.**

   a. Recent reports from IEA highlight the growth of solar PV and wind generation in many countries and the ramping-up of investment in battery manufacturing that will provide associated storage capacity. For example, the IEA website states, "Distributed solar PV, such as rooftop solar on buildings is set for faster growth because of higher retail electricity prices and growing policy support".

   b. CEN recommends that the **Strategy** assesses the applicability of these trends to the New Zealand energy sector.

   c. CEN's own assessment is that there is potential for substantial growth of Distributed Intermittent Generation with Battery Electric Storage Systems (DIG+BESS). The **Document** implies that the only significant role for DIG+BESS is to provide electricity for Flexibility. *The potential for DIG+BESS is much greater than this, in terms of both scale and wider contributions to the objectives of the **Strategy**.*

   d. CEN's preliminary estimate is that DIG+BESS has can deliver *at least* 500 MW generating capacity and 900,000 MWh annual energy by 2035. This is equivalent to about 9% of current annual supply and about 13% of the overall growth projected by Transpower for 2050. *This scale positions DIG+BESS as an important contributor to overall growth in renewables.*

   e. CEN recommends that DIG+BESS be considered in the **Strategy** as one of the means of meeting the 'dry year challenge'. This requires availability of sufficient electricity storage to meet peak demand when weather events curtail base-load supply. *DIG+BESS can be a substantial provider of this storage capacity, with the advantage that it inherently mitigates locational risk through being geographically distributed.* The actual contribution will depend on the ratio of battery capacity to generating capacity, in aggregate across all DIG+BESS. This ratio should be considered as a core strategic decision.

   f. CEN recommends that DIG+BESS be considered in the **Strategy** for Energy Security. In addition to energy security strategy that focusses on maintaining sufficient supply to the transmission grid to meet demand, another crucial aspect of energy security is a strategy for future energy security for communities and neighbourhoods when the transmission grid and/or EDB lines fail due to severe weather events. This risk will be mitigated when:
      i. DIG+BESS installations can be configured to provide emergency supplies 'behind the meter' at community emergency management sites.
      ii. Essential medium-term supplies of electricity to households, businesses and institutions are provided through isolatable microgrids that have embedded DIG+BESS installations.

   g. CEN recommends that the **Strategy** acknowledges that most DIG+BESS installations will be owned and operated as community energy enterprises. Each enterprise will embrace the community Kaupapa, it will have strong community engagement and commitment, and it will

be operated according to strongly-held community values and objectives while also contributing to national energy objectives. These enterprises will be financed by communities and impact investors who are comfortable with *reduced financial returns because the enterprises deliver non-monetised benefits to communities.* DIG+BESS installations that are financed in this way will be *very resilient in the face of the economic challenges that will arise from climate change.*

h. CEN considers that the growth potential and outcomes from DIG+BESS installations can be realised only if specific regulatory reforms for EDBs are implemented. These reforms require recognition of a fundamental change in the role and regulation of EDBs and lines charges. CEN recommends consideration of three core strategic issues:
   i. The traditional role of each EDB has been to provide and operate assets that deliver electricity in it specified territory. The introduction of DIG+BESS has added a new role for EDBs: to provide and operate assets that conduct exports from DIG+BESS installations into the grid system.
   ii. Current regulations apply only to the EDBs' distribution function. There are currently no regulations to ensure that EDBs are obliged to meet the needs of DIG+BESS owners. This deficiency needs urgent strategic attention. The growth potential of DIG+BESS cannot be realised until suitable regulations are in place and all EDBs comply with them.
   iii. Many DIG+BESS installations will supply electricity to retailers who provide consumers with local Community P2P matching services. In this case, the present requirement to charge full lines charges is unjustified and will stifle DIG+BESS growth. Regulatory reform is required so that these consumers pay only local lines charges.

3. As the Strategy proceeds, modelling of future energy demand should include scenarios of the economic effects of climate change.

a. As the IPCC warns in 'Climate Change 2022: Impacts, Adaptation and Vulnerability: Summary for Policymakers'. – reinforced by many other commentators - the intensifying effects of climate change will have profound effects on the structure and performance of elements of the global economy – especially changes in food production and trade, changes in overall economic activity, and increasing costs and risks of shipping.

b. These effects will cascade in various ways to countries and their regions, including New Zealand.

c. The projections of electricity demand provided in the **Document** apparently ignore these effects on the New Zealand economy. This is obviously unsatisfactory. Scenarios of these global economic effects must be included in the modelling of demand in the **Strategy**.

d. CEN's own preliminary scenarios suggest that the indirect effects of climate change on the NZ economy – through change in the economies of trading partners and global institutions – are likely to be greater than the direct effects of climate change on the NZ economy. Our work suggests:
   i. Contraction of international trade due to increased supply-chain risks and costs.

ii. Countries increase self-sufficiency, especially in light manufacturing and food production.
iii. Within countries - including New Zealand - economic activity steadily shifts from large cities to regions and towns/communities.
iv. These indications have significant implications for analysis and estimation of energy demand. For example, there would an increasing demand from light manufacturing and parallel shifts in demand to towns and communities because these locations contribute an increasing share of the economy.

4. **Modelling of future energy demand should include scenarios of the physical and biological effects of climate change.**

   The projections of electricity demand in the **Document** also apparently ignore the direct physical and biological effects of climate change on the New Zealand economy. This deficiency undermines the entire analysis and should be remedied in the **Strategy** by inclusion of robust scenarios of these effects.

5. **The Strategy must be based on the principle that climate change mitigation (emissions reduction) and adaptation to climate change are interdependent.**
   a. In a recent presentation at the Climate and Business Conference, Rod Carr (Chair of the Climate Change Commission) asserted that "mitigation and adaptation are in the same bucket .... they cannot be properly considered in silos".
   b. To CEN, the logic of this position is clear because future policies to reduce emissions will be implemented while the impacts of climate change are occurring, and adaptation responses to these impacts will be both responsive and proactive as better information becomes available. The two sets of policies will interact with each other in a dynamic way, some positively, and others negatively. As a generalisation, we think that climate change events and actions to adapt will make emissions reduction more difficult and costly.
   c. In CEN's view, the credibility of the **Strategy** depends on these interdependencies being modelled and analysed in a robust process. Our assessment of the **Document** is that the untenable 'silo' approach has prevailed to date, with strong focus on the energy sector's role in mitigation.

6. **The Strategy should include a plan for an equitable transition that encompasses the transition to emissions reduction targets, to social adaptation, and to current energy hardship.**

   a. Energy hardship is largely an expression of poverty and is an outcome of multiple market(s) and policy failures. With the recent exception being the storms from early in 2023, energy hardship has not been caused by Climate Change. However, we consider that as the weather patterns continue to become more unpredictable and we therefore experience increased economic volatility, then climate change will provide and increasing impact on energy hardship alongside the persistent market and policy inadequacies. Therefore, equity and energy hardship must be considered by the energy strategy as a core feature of supporting future adaptation responses.
   b. Key features that the Strategy should include:

i. Community resilience must be well understood and considered alongside typical technical and economic considerations.
ii. The role of the Crown in relation to its obligations under Te Tiriti need to be well articulated in each part of the strategy.
iii. The sector needs to improve overall engagement skills with communities and consumers. At present the highly technical nature of the sector provides a significant hurdle to engagement from other stakeholders.

7. The Strategy work should include all aspects of climate change adaptation that are relevant to the energy sector.

a. The IPCC's 'Climate Change 2022: Impacts, Adaptation and Vulnerability: Summary for Policymakers' specifies categories of necessary adaptation. Based on these categories, CEN's own scenario work has produced the following categories of climate change adaptation that are relevant to the New Zealand energy sector.
   i. **Supply-side adaptation:**
      I. Hydro capacity reductions caused by droughts and depletion of glacial flows.
      II. Disruptions in the national grid and regional/local grids caused by impacts of climate change on this infrastructure. These impacts include damage due to high winds, floods, and landslides, and permanent closure of lines due to coastal inundation and flooded river plains.
      III. Disruptions in natural gas pipelines due to storm-induced landslides.
      IV. Increasing unreliability and increasing costs in the supply chains for oil, coal, the hardware needed for wind and solar generation, and batteries – all due to disruption in the global economy and markets caused by climate change events.
   ii. **Demand-side adaptation:**
      I. Increased energy demand in the infrastructure and construction sectors through the need for adaptation to a wide range of physical impacts.
      II. Changes in the energy needs of the various parts of the primary production and manufacturing sectors as they adjust to major shifts and disruptions in export markets due to global effects of climate change. (See Section 3 above.)
      III. Changes in residential demand for energy as households and communities adjust to the many economic and social effects of climate change.

b. The **Document** focuses on adaptation to drought and modifying grid transmission and lines infrastructure that addresses coastal inundation, flooding, and high winds. This treatment accounts for only two categories of adaptation – 7.a.i.1 and 2.

c. CEN recommends strongly that the scope of adaptation in the **Strategy** be expanded to include *all categories listed above*.

d. CEN recommends that the **Strategy** includes specific strategies for the energy security of towns and communities. The **Document** implies that assurance of core generation and adaptation that focusses on the grid and lines will provide sufficient energy security to towns and communities. ***This position is not plausible***. While the risk of grid failure will be mitigated to some extent by the grid side improvements, it will remain certain that the

transmission and lines that serve towns and communities will fail with increasing frequency as the effects of global warming on climate intensify.

e. As outlined in Section 2 above, substantial energy security for towns and communities can be provided by DIG+BESS installations that are in isolatable microgrids. Development and operation of these assets should be a core part of the **Strategy**. The primary focus of this adaptation should be on securing the maximum possible wellbeing of electricity users and their communities.

f. CEN suggests that a suitable standard for the energy security of towns and communities is: *When grid supplies are cut by damage to the grid or network infrastructure, local generation and storage capacity is sufficient to support essential community services indefinitely, and essential household and business usage for at least 7 days.*

g. This standard can be achieved by installation of sufficient DIG+BESS capacity in and near to each community. Together with modifications to lines networks, this will allow for switching to and from local microgrids for any community during periods when the distribution network to that community is cut. During periods when the grid and network infrastructure is functioning, the distributed generation and storage assets supply to the grid. Thus, this large, decentralised DIG+BESS asset delivers three important outcomes:
    i. Community energy security – its core purpose.
    ii. A substantial increase in national renewable generation.
    iii. Generation that reduces/removes the need for fossil fuel generators when hydro capacity is low due to droughts.

j. The **Strategy** should include the principle that extreme weather emergency response needs specific energy assets that are designed and installed to mesh directly with other Emergency Management assets and systems in towns and communities. These assets include specifically designed configurations of DIG+BESS installations.

k. CEN submits that the **Strategy** include specification of the urgent actions are required by the Electricity Authority (EA) and Commerce Commission (ComCom) - to modify and expand the sector's regulations and operating protocols so that they are effective in enabling and encouraging a wide range of adaptation responses. Although the processes of changing regulations and protocols must continue to be robust, they must be much faster than the ponderous approach observed in recent years. The broadened scope of the work that EA and ComCom need to undertake may require changes in their statutory remits. These would be matters for Government to address, also on an urgent basis. CEN suggests that the key roles of the EA, ComCom, and EDBs in the processes of adaptation are:
    i. **Energy Authority:**
        I. Establish regulations that ensure that development and operations of distributed generation and storage can proceed without hindrance or limitation by EDBs.
        II. Instead of the current approach of exploring how the current regulations for distribution can be modified, simply address the question: 'What regulations are necessary for distributed community-level generation to proceed?' Answer the question carefully and quickly, then implement the outcome regulations with urgency.

III. Change the Code so that EDBs, in their role as local monopoly distributors, must not exercise this monopoly to pursue vertical integration of lines operations with distributed generation and storage. This concept is incompatible with encouraging investment by commercial and community enterprises.
IV. Ensure that the regulations establish clearly that the core role of EDBs is to support in an equal manner their two groups of customers – electricity users and electricity exporters.

ii. **Commerce Commission**: modify the protocols that regulate the costs and revenues of EDBs so that these models and procedures accommodate the wider scope of EDB investment and operations that are determined by the new regulations to be promulgated by EA.

iii. **EDBs**

I. Adjust and modify strategies and business models to accept the sector developments needed by adaptation.
II. Engage positively with EA and ComCom as new regulations and protocols are developed to enable rapid growth in DIG+BESS.
III. Work transparently and helpfully with investors and operators of distributed generation and storage.
IV. Use the new protocols that ComCom will adopt to ensure that resources are allocated to hiring and training the expanded technical workforce that adaptation requires.
V. Reconfigure LV networks so that they can be switched to establish isolated microgrids for every community that has rights to this infrastructure if it is needed to meet the energy security standard. Specification of the boundaries of each microgrid are decided by agreement with the community.

8. The 'Whole of System' approach outlined in the document is essential.

a. CEN supports very strongly the approach presented in Part 5 of the **Document**. We consider this approach to be essential so that all important interdependencies and interactions among stakeholders are included in the analysis and formation of strategies.

b. This approach receives strong validation from the IPCC document 'Climate Change 2022: Impacts, Adaptation and Vulnerability – Summary for Policymakers'. The section 'Enabling Climate Resilient Development' on pages 32-33 is especially helpful.

c. CEN considers that there is a strong case for open sharing of a knowledge base of scenarios relating to climate change and its effects, that would be shared by all stakeholders in the energy sector. This approach would help to avoid a serious shortcoming that is demonstrated by the **Document.** This apparently relies heavily on the National Adaptation Plan and the Infrastructure Action Plan as its sources of information about the effects of future climate change. The information contained in these publications is actually very limited. Although they use sufficiently detailed information about the effects of rising sea levels and flooding, other effects of climate change are described only as brief high-level generalisations while several other substantial effects are totally ignored. Thus, these publications do not include the robust and comprehensive scenarios that are needed to form sound adaptation

strategies for the energy sector. The approach of sharing and reviewing scenarios would help to avoid situations of this kind.