

Submission by



to the

**Market Development Advisory Group**

on the

**Price discovery under 100% renewable electricity supply  
Issues Discussion Paper**

16 March 2022

# **PRICE DISCOVERY UNDER 100% RENEWABLE ELECTRICITY SUPPLY ISSUES DISCUSSION PAPER – SUBMISSION BY BUSINESSNZ ENERGY COUNCIL<sup>1</sup>**

## **INTRODUCTION**

1. BusinessNZ Energy Council (BEC) welcomes the opportunity to provide feedback on the Market Development Advisory Group's (MDAG) Issues Discussion Paper *Price discovery under 100% renewable electricity supply* (referred to as 'the paper').
2. The paper describes how our electricity supply system is likely to change physically with 100% renewable electricity supply and the likely impact on prices. The paper identifies seven key issues to be addressed: Real-time co-ordination, Ancillary services, Accurate price signals, Demand-side flexibility, contracts, orderly transition, and competition.
3. We would like to congratulate the Market Development Advisory group on their well-researched paper which thoroughly canvases the possible issues. We appreciate the collaborative approach putting this work together and encourage this to continue.
4. In general, we agree with MDAG's views on how electricity supply is likely to change and with the issues identified. This submission provides our view of the future according to our modelling, some general comments on the issues identified, as well as some other wider risks to consider.
5. Members have been consulted in preparing this submission. Given the diversity of our membership, some members will have specific issues they wish to comment on in more detail. We have encouraged members to make their own submissions raising those issues specific to their areas of interest. This submission is not confidential.

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<sup>1</sup> Background information on BusinessNZ is attached as Appendix One.

## GENERAL COMMENTS

### TIMES-NZ Scenarios – Our view of the future

6. Our modelling work – TIMES-NZ – shows similarities of the potential future supply and demand scenarios when compared to the MDAG modelling presented. We agree there is likely to be large increase in electricity demand. This is likely to be met in large part by intermittent renewable generation – wind and solar.
7. BEC in conjunction with the energy sector has developed a New Zealand specific model TIMES-NZ<sup>2</sup> to explore two possible future energy scenarios; 'Kea' where climate change is prioritised as the most pressing issue, and 'Tūi' where climate change is one of many pressing issues. Our bottom-up model selects from available technologies to produce a least-cost energy system over the medium to long term.
8. In our scenarios, growth in electricity demand broadly aligned with the work presented on page 37, although demand is projected to grow even higher in the Tui scenario, particularly in 2050.

**Table 1: Comparison of Forecast Demand (TWh) and Assumptions\***

Model	2020**	2035	2050	Assumptions
<b>MDAG Reference Case</b>	37 (42 including NZAS)	40	66	Figures quoted exclude Tiwai demand. Tiwai is assumed to retire by 2035.
<b>TIMES-NZ Kea</b>	43	52	69	Tiwai closes in 2024 with associated demand reduction
<b>TIMES-NZ Tui</b>	43	60	90	Tiwai stays open indefinitely (or is replaced by new demand of the same size).

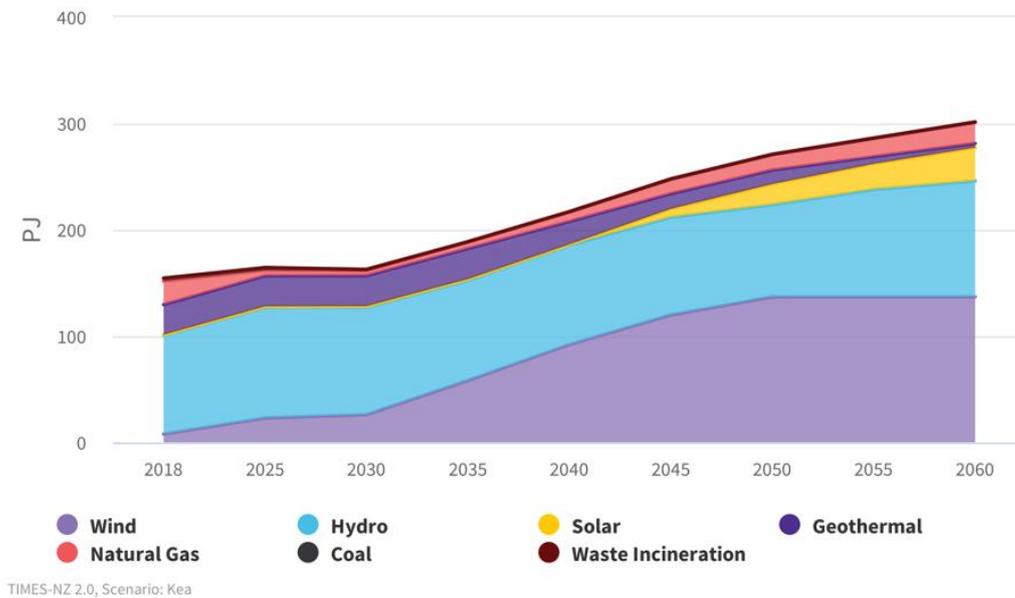
\*TIMES-NZ calculates values in PJ. Values have been divided by 3.6 to provide an indicative TWh.

\*\*The base case year for the TIMES-NZ model was 2018 with calculations for milestone years in 5-year increments.

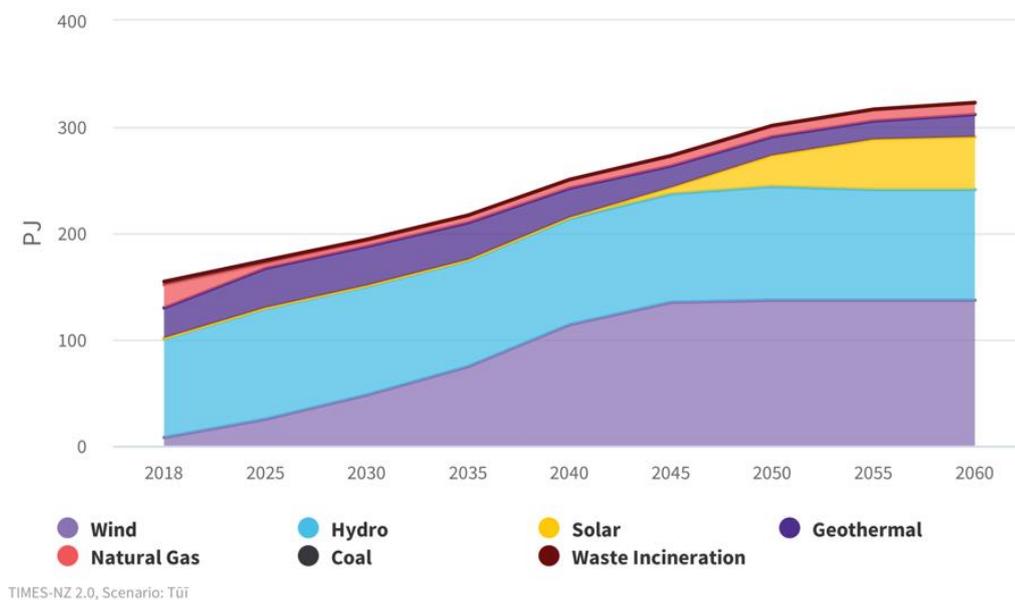
9. On the supply side we agree "a much greater proportion of total supply will come from sources with short-term intermittency such as wind and solar. According to the modelling presented, in the simulation reference case, their share of annual average supply rises from 6% in 2020 to 31% in 2035 and 47% in 2050.
10. With higher demand projected in the TIMES-NZ scenarios, even greater proportions of wind and solar are forecast. Wind and solar contributed 5% in 2018 and were projected to contribute 32% in 2035 and 58% in 2050 in the Tui scenario, and 34% and 55% in the Kea scenario. Although our classification of hydro generation differs slightly, we see a similar trend in declining contributions on a broadly similar order of magnitude.
11. One key difference is the treatment of fossil fuels. Given the question under consideration, the MDAG modelling shows all fossil fuelled generation retiring by 2035. According to our least-cost modelling, coal retires by 2035, while gas plays ongoing role. In fact, in the Tui scenario, gas use increases slightly from 2035 to 2050 to cover higher uptake of intermittent renewables (an additional 3% more wind and solar) and the retirement of geothermal generation which is driven by higher carbon prices.

<sup>2</sup> For full results (shown by PJ or percentage) and assumptions see New Zealand Energy Scenarios, <https://times.bec.org.nz>

**Figure 1: Kea – Electricity Generation for all subsectors, all end use, all technology (PJ)**



**Figure 2: Tūi – Electricity Generation for all subsectors, all end use, all technology (PJ)**



12. In our view natural gas will remain an important part of our energy mix for some time. Our own modelling suggests gas is likely to provide firming to intermittent generation until 2050. Alongside investment in renewable generation, we believe it will be important to maintain existing infrastructure to ensure ongoing access to secure, affordable energy, and achieve a smooth energy.
13. As well as bio-diesel and hydrogen (which are mentioned in the paper), we believe renewable natural gas has significant potential. Biogas can be upgraded to bio-methane and injected into the gas distribution system for use by thermal generators. Alternatively biogas can be converted to electricity on-site, as occurs with landfill gas plant today. We note further investigation into biogas and hydrogen is being undertaken as part of MBIE’s NZ Battery Project. We would support any further work to understand the economics and availability of such fuels.

14. However, we believe it is an important exercise to investigate how a market might operate if there was 100% renewable electricity supply.

**We agree with the seven issues identified**

15. This paper has provided a good identifying and describing seven key issues which could be faced.
  - Real-time co-ordination – we agree with the questions posed in relation to real-time co-ordination. It will be important to ensure forward scheduling processes remain effective when short-term system conditions change more rapidly. We agree there is a need for improved access to real-time information and note the move to real-time pricing is a valuable step. In future, it may be worth considering shorter trading periods to encourage more efficient use of resources within the current 30-minute trading period. It appears likely that during the transition there may be periods of surplus energy, in which case a review of the Must Run Dispatch Auction is recommended.
  - Ancillary services – we agree with the key issues identified. Given the relevance of spot-market and real-time co-ordination to manage intermittency we note the co-optimisation of procurement of energy, frequency-keeping and instantaneous reserves will be important to maintaining the energy system. Batteries are likely to be capable of responding in real-time so digitisation of current services dispatch will be necessary to achieve least cost outcomes. Further work should consider not only what services will be required but also who should bear the costs of those services.
  - Accurate price signal – we agree with the principles provided on page 84 and that failure to meet these criteria will impact on the success of the market and the energy transition in general. We believe any measures to increase confidence in spot prices should be thoroughly considered before requiring backstop measures such as compulsory contracting obligations.
  - Demand-side flexibility – we are pleased to see this included and agree demand-side engagement has been difficult to achieve in the past. We believe there is significant benefit from enabling more demand-side participation in the market. We would like to see further work in this area and believe it will be important to include the voice of the consumer going forward.
  - Contracts – We agree that efficient and often volatile spot price signals are key to enabling the wholesale market to adapt to an increasing proportion of renewable energy. We believe that a key way to enable this is by maintaining effective hedge markets. As noted above, we believe it will be important to understand the views of consumers to ensure any market design changes are fit for purpose.
  - Orderly transition – in principle, we would prefer investigating measures to strengthen market processes for retirement before exploring backstop mechanisms which may undermine existing property rights and investor appetite.
  - Competition – we support a focus on ensuring there is sufficient competition and would support further analysis as to how market concentration may change in future. In principle, we support market mechanisms and agree the wholesale market is the preferred mechanism to co-ordinate plans and actions between resource owners. This work could inform future measures to be included for monitoring in the recently proposed Structure, Conduct and Performance framework.
16. We agree it is important to first 'establish robust and clear insights into the nature and scope of the issues to be addressed.' We have focussed our comments on issues but would note we have some reservations about some of the solutions proposed, particularly backstop measures. We look forward to further consultation on these matters.

**We support agile and collaborative approach**

17. We support the interactive approach MDAG has taken to engage the industry. We acknowledge the work done to capture a wide range of views. In particular we would like to acknowledge the literary reviews and interviews conducted to provide international examples and experience. While they may not always apply directly to the New Zealand context, they provide a useful reference point. We appreciate MDAG's awareness of and reference to related work which has been completed, for example

references to Transpower's Whakamana I Te Mauri Hiko – Empowering our Energy Future report, MBIE's "NZ Battery Project" and the Future Security and Resilience project.

18. We believe it will be important to continue this collaborative approach and note the potential for crossover with other government agencies which will require a co-ordinated response. For example, competition issues which may fall under the Commerce Commission's remit. Similarly, the paper highlights the importance of demand side flexibility which may be delivered from the implementation of technologies like EV charging. This may require co-ordination with new agencies not traditionally involved in electricity market design – Ministry of Transport, NZTA or EECA.
19. We believe ongoing collaboration with industry and co-ordination between government agencies will be required to help ensure as smooth a transition as possible and avoiding any perverse outcomes.

#### **Transition issues**

20. We note the current project plan consists of three stages: (i) issues discovery, (ii) options identification and analysis and (iii) recommendations. While this paper has focused on a given end-state (100% renewable electricity supply) we note this is a transition. For a number of the issues identified, it will be difficult to predict when they may arise. While we are keen to provide clear signals to market participants in advance, we appreciate it will be difficult to predict when some of the issues identified may arise and prioritise accordingly. As such, we support a 'least-regrets' approach which must be clear enough to provide signals to market participants, but flexible enough to prioritise where action is required.
21. As mentioned in this submission, we would prefer exploring measures to increase confidence in the market or strengthen market processes before introducing backstop measures. We would note any major market changes would create uncertainty at a time when huge investments are required. Least regrets, least cost, low unintended consequences first.

#### **Wider issues – digitalisation, future workforce**

22. We would like to highlight two other areas of consideration which could present opportunities or may become barriers to achieving a highly renewable system if not addressed.
23. The paper acknowledges the energy system is likely to become more decentralised. We agree, and we believe with the implementation of more new and decentralised technologies the system will become more digitalised. We think data ownership, privacy and cyber security will be important issues that will need to be addressed by the regulator in this transition.
24. We also note the increasing workforce which will be required to deliver such significant increases in generation.

## Appendix One - Background information on BusinessNZ Energy Council

The [BusinessNZ Energy Council \(BEC\)](#) is a group of New Zealand's peak energy sector organisations taking a leading role in creating a sustainable energy future. BEC is a division of BusinessNZ, New Zealand's largest business advocacy group. BEC is a member of the [World Energy Council \(WEC\)](#). BEC members are a cross-section of leading energy sector businesses, government and research organisations. Together with its members BEC is shaping the energy agenda for New Zealand.

Our vision is to support New Zealand's economic wellbeing through the active promotion of the sustainable development and use of energy, domestically and globally. With that goal in mind, BEC is shaping the debate through leadership, influence and advocacy.

[BusinessNZ](#) is New Zealand's largest business advocacy body, representing:

- Regional business groups [EMA](#), [Business Central](#), [Canterbury Employers' Chamber of Commerce](#), and [Employers Otago Southland](#)
- [Major Companies Group](#) of New Zealand's largest businesses
- [Gold Group](#) of medium sized businesses
- [Affiliated Industries Group](#) of national industry associations
- [ExportNZ](#) representing New Zealand exporting enterprises
- [ManufacturingNZ](#) representing New Zealand manufacturing enterprises
- [Sustainable Business Council](#) of enterprises leading sustainable business practice
- [BusinessNZ Energy Council](#) of enterprises leading sustainable energy production and use
- [Buy NZ Made](#) representing producers, retailers and consumers of New Zealand-made goods

BusinessNZ is able to tap into the views of over 76,000 employers and businesses, ranging from the smallest to the largest and reflecting the make-up of the New Zealand economy.

In addition to advocacy and services for enterprise, BusinessNZ contributes to Government, tripartite working parties and international bodies including the International Labour Organisation ([ILO](#)), the International Organisation of Employers ([IOE](#)) and the Business and Industry Advisory Council ([BIAC](#)) to the Organisation for Economic Cooperation and Development ([OECD](#)).



[www.businessnz.org.nz](http://www.businessnz.org.nz)