

The year in review

Membership year – April 2021 to March 2022



1. Introduction

The outlook for wind energy can only be regarded as exceptional. There is an exciting pipeline of development activity for both onshore and offshore wind with much more required to decarbonise the energy sector.

Of particular note is that, based on the Climate Change Commission¹ and Transpower² forecasts, up to 27 new wind farms will be required by 2035 and over 50 by 2050³ with Wind Energy meeting up to 28% of total demand and having a capacity of around 6,500 MW.

This scale of required electricity infrastructure development is unprecedented in New Zealand's history and a key challenge in meeting such a large growth forecast will be ensuring policies across the energy sector, climate change and environmental domains align to support new build activity.

The wind industry itself also needs to position the sector to support the projected growth with a sustained pipeline of projects ready to be built as demand increases in a global environment with accelerating demand that faces both labour and material shortages.

Decarbonisation of the energy sector beckons, and it is clear that the wind industry is at the forefront of an exciting future contributing towards New Zealand meeting its climate change goals.

2. The Outlook for New Wind Activity in NZ

The significant contribution wind energy has to make to New Zealand's energy future was first recognised in the 1980's. After a consenting boom period post 2000 and an initial growth phase it took until 2019 for the supply / demand balance to be such that the next new wind was confirmed for construction with Mercury's announcement it would be building the Turitea Wind Farm, New Zealand's largest at 222 MW.

Since then Tilt has built and commissioned Waipipi (133 MW), Mercury has completed the Turitea North development (119 MW), Meridian has commenced building Harapaki (176 MW) and Mercury has commenced building Turitea South (103 MW).

MainPower is expecting to reach financial close in the near future on Mt Cass (93 MW) as are Hiringa Energy and Balance Agri-Nutrients on the 24 MW Kapuni Wind Farm. Mercury has obtained a consent for its proposed Northland Kaiwaikawe Wind Farm (73 MW) and New Zealand Wind Farms has had approval to use the fast-track consent process for their proposed repowering of Te Rere Hau (an increase of 85MW).

¹ Climate Change Commission, 2021 Final Advice, May 2021.

² Transpower, Whakamana I Te Mauri Hiko Report, March 2020.

³ Based on an average wind farm capacity of 100 MW.

The Kaimai Wind Farm (150MW) is in the consent process and Contact Energy has announced an accelerated focus on wind development with a pipeline of 600 MW. Similarly, Trustpower (Manawa Energy from 1 May) has advised of its intention to focus on wind and solar development.

There has also been considerable interest in developing large scale offshore wind, particularly off the South Taranaki coast, with four offshore developers having joined the Association during the year. The Government has recently committed to the development of a licensing / regulatory framework, a key enabling step to support the establishment of the industry.

The development of grid scale solar has also been another area of rapid progress during the year with a significant number of new developments and partnership arrangements announced. Should all these developments proceed it would seem that previous forecasts of solar penetration are likely to be exceeded. The challenge for the electricity sector will be to manage the integration of significant large daytime and summer weighted generation into an electricity system that has winter morning and night demand peaks. International market experience is that increased penetration of solar actually increases the value of wind generation by diversifying the electricity supply.

The decision of Tiwai Aluminium Smelter to contract through to December 2024 has provided a measure of short-term certainty. That the Smelter has indicated a preference to continue operation beyond 2024, and potentially play an important role in dry year risk management, will need to be factored into growth projections.

The NZ Battery project has created a level of market uncertainty and it will be important for the Association to keep a close watch on the project's development. The Association supports the development of options to address the dry year issue and, depending on the recommended option and operating guidelines, the project may also support short term wind and solar variability.

Wind energy, when coupled with an upward trend in the price of carbon, is widely recognised as having the lowest long run marginal cost. Importantly wind generation's ability to support New Zealand's peak winter demand is often underestimated and an important consideration in forecasting expected generation weighted average yields. Over the past three years the quarterly generation profile of wind was 21% quarter 1, 24% quarter 2, 27% quarter 3 and 27% quarter 4 with an increase in the geographical diversity of wind farms expected to reduce short term variability.

The role of renewable electricity generation, and wind energy in particular, in enabling the decarbonisation of the energy sector is unquestioned. That New Zealand has access to a high-quality wind resource presents a significant opportunity for sector growth in support of future economic prosperity. Key will be the timing of Government initiatives to reduce emissions which will stimulate electricity demand growth and the impact of resource management system reforms on the ability to consent new wind farms.

3. Global Trends

New wind installations worldwide increased by 94 GW in 2021 (95 GW in 2020) with total wind capacity at 837 GW avoiding over 1.2 billion tonnes of CO₂.

Europe, Latin America, Africa and the Middle East had record years which offset a slowdown in growth in China and the USA.

Offshore wind grew by 21 GW more than 3 times that of 2020. China made up 80% of the offshore wind growth with total offshore wind capacity now at 57 GW.

GWEC has forecast that 557 GW of new capacity is expected to be added over the next 5 years under current policies with offshore wind comprising 90 GW of the projected growth.

However GWEC forecast the growth projection needs to be quadrupled by the end of the decade if the world is to stay on-course for a 1.5 degree pathway and net zero by 2050 and comments that the energy reform packages underway in Europe in light of the Ukraine crisis may accelerate growth.

4. NZWEA Strategic Direction

During 2021 the Association's board revised NZWEA's vision to *Empowering New Zealand's sustainable energy future* and reaffirmed the objective of *wind energy providing 20% of NZ's electricity requirements by 2035*.

At its February 2022 meeting the board reviewed the Association's strategy. Factors influencing the review included:

- Ensuring the health and safety standards of wind industry are maintained particularly given new developments and growth projections.
- The resource management systems review and the risk that if environmental limits are inappropriately set and absolute in their application, they may prevent the development of renewable electricity generation and in particular wind energy.
- The expected impact of the Government's emissions reduction budget and make up of initiatives including the level of ambition to enable domestic mitigation.
- The positioning of wind energy.
- Whether the level of site investigations and consenting activity is sufficient to provide a pool of available options to fully take advantage of demand growth projections and actions to achieve NZ's net zero goal.
- Impact of the proposed NZ Battery Project and Tiwai's announcement that the smelter is likely to seek to continue operations beyond 2024.
- Carbon and gas price increases challenging older coal / gas generation plants.
- Gas supply issues and ability of thermal plants to support wind's variability.
- Impact of increased grid scale solar growth projections.
- How to best support smaller community and industrial renewable projects and those which combine wind, solar and batteries.
- Developing a roadmap of priorities and initiatives to support offshore wind and the opportunity for renewables with hydrogen to significantly increase future growth projections.
- Energy system transformation and options to support renewables variability at lowest cost including DER and demand side management.

The Association's strategy is to focus on three key areas:

- Leveraging New Zealand's emissions reduction imperative to enable the energy transition to renewables, particularly wind energy.
- Optimising wind energy's position and ensuring the regulatory environment supports wind farm development.

- Expanding the opportunity for wind energy development to enable community and industrial projects including wind's integration with other technologies.

5. NZWEA Activities

The Association's activities have been targeted at achieving the three key areas of strategic focus and included:

Health and Safety. The Health and Safety Group has met in March 2021, October 2021 and April 2022. Agenda topics included presentations on the wind farm technical training programme and health and safety developments in civil construction and an update from WorkSafe. A key feature of meetings was the sharing H&S near misses and incidents. The Association also attends the Australian Wind Safety Forum.

Government Relations. The Association met with the Minister of Energy and Resources in November 2021. Minister Woods is very supportive of wind and was interested in the meeting agenda – forecast wind growth, the importance of RM reforms, steps to develop offshore wind and expansion of the energy sector. There was considerable discussion on offshore wind and the Power-to-X opportunity (green hydrogen production etc) and the Minister acknowledged the importance of progressing a licensing / regulatory framework to enable offshore wind development.

Resource Management System Reform. The RM system reform has been recognised as the highest priority area of focus for NZWEA.

After considerable industry focus the Government has recognised the significant deficiencies in National Policy Statement for Renewable Electricity Generation (NPS-REG) and allocated \$3 million of funding for a review. The announcement of wider RM system reform has delayed progress on the NPS review yet the importance of having stronger national direction for renewables is essential to support development during the transition period to the new system.

The Ministry for the Environment has issued two consultations on RM Reform – on the exposure draft of the Natural and Built Environments Bill and Our Future Resource Management System - materials for discussion. The Association has joined major electricity generators in collectively focusing on responding to the consultations.

The Association has also submitted in its own right with the key message being that the Association supports the resource management reform objectives however considers that there is a real risk if environmental limits are inappropriately set and absolute in their application they may prevent the development of renewable electricity generation and in particular wind energy. Other comments included:

- a transition pathway is essential to enable renewables development.
- Regional spatial strategies and NBEA Plans may assist renewables development but should not constrain development in other areas.
- An effective conflict resolution mechanism is key to meeting reform objectives.
- Ensuring climate change, electricity and environmental sector targets are aligned.

The Associations submissions can be viewed here:

<https://www.windenergy.org.nz/activities/submissions/inquiry-on-the-natural-and-built-environments-bill>

<https://www.windenergy.org.nz/activities/submissions/submission-on-our-future-resource-management-system>

Interactions with the Climate Change Commission. The CCC has delivered its final advice for Government on its first three emissions budgets for the period up to 2035.

<https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/inaia-tonu-nei-a-low-emissions-future-for-aotearoa/test-summary/>

The advice is largely consistent with previous reports from the Productivity Commission and Interim Climate Change Commission (ICCC) but is very explicit that current government policies do not put NZ on track to meet the CCC's recommended emissions budgets and the 2050 targets contained in the Zero Carbon Act.

The Association has continued to engage with the CCC, most recently in relation to the increased interest in the development of offshore wind.

Emissions Reduction Plan. The Ministry for the Environment released a consultation document to gain feedback on a number of ideas to reduce emissions following the release of the CCC's final advice.

The Association's submission highlighted the importance of improved co-ordination across Government, continuing to improve the emissions trading scheme, ensuring resource management reforms enable the development of renewable electricity and associated infrastructure, and developing an energy strategy with a renewable energy target.

<https://www.windenergy.org.nz/activities/submissions/transitioning-to-a-low-emission-&-climate-resilient-future-submission>

Energy Strategy. Minister Woods has confirmed the Government will develop a national energy strategy which will include developing a market for demand response, digitisation, decentralised solutions and regulatory changes to drive decarbonisation all being highlighted as priorities.

Development of the strategy will commence in the second half of 2022 and in advance of this the Aotearoa Circle has issued a Low Carbon Energy Roadmap. NZWEA provided feedback on the draft noting that the focus was transitioning the energy sector rather than the wider economic opportunity from renewables. The Association supported the draft roadmaps recommendations including a focus on a renewable energy target (50% by 2035) rather than 100% renewable electricity generation and that enabling the build of low carbon energy infrastructure should be a key success criteria of the RM system reform.

The Low Carbon Energy Roadmap can be viewed here:

<https://www.theaotearoacircle.nz/low-carbon-aotearoa>

It will be important for the Association to contribute to the development of the energy strategy so as to optimise the role renewable electricity can play in the NZ supporting economic growth and prosperity. In particular the potential to utilise New Zealand's vast onshore and offshore wind resource for economic growth both domestically and as a potential export opportunity. Venture Taranaki has published a report which further considers the opportunity to create green products and services which can be easily stored, transported and used to balance energy demand in their December 2021 Power to X Report:

<https://www.venture.org.nz/assets/Power-to-X-Report-Nov-2021.pdf>

National Policy Statement - Indigenous Biodiversity. The Ministry for the Environment released a draft NPS-IB in November 2019 for consultation.

The Association, in its submission, acknowledged the imperative to improve indigenous biodiversity but noted the latest draft would result in most indigenous features being recognised as “significant”. In addition, the list of effects of activities which must be avoided in a significant natural area would result in most if not all new wind farms needing to avoid all indigenous features without the ability to consider a mitigation / offset hierarchy.

A final NPS-IB has been delayed due to the wider resource management system reform and the Association remains hopeful that provisions will be amended to allow reasonable use and specifically cater for renewable electricity generation.

National Policy Statement - Freshwater Management. The Ministry for the Environment issued a new National Policy Statement for Freshwater Management (NPS-FM) effective September 2020.

A new National Environmental Standard for Freshwater has now also been released. The Standard prohibits any earthworks or taking, use, damming, diversion or discharge of water within a natural wetland. The section is problematic for the wind industry as the definition of a wetland is likely to be interpreted extremely broadly as a prohibited activity.

In response to industry feedback the Ministry for the Environment issued a further consultation Managing our wetlands in September 2021. The Association supported the recommended changes and our submission can be viewed here:

<https://www.windenergy.org.nz/activities/submissions/managing-our-wetlands-discussion-document->

Hedge Market Enhancements – Commercial market-making scheme. The EA issued a consultation paper in February 2022. The Association submitted in support of progressing development of market making arrangements on commercial terms.

The Association’s submission can be viewed here:

<https://www.windenergy.org.nz/activities/submissions/hedge-market-enhancements-commercial-market-making-scheme>

Price Discovery Under 100% Renewable Electricity Supply. The Electricity Authority Market Development Advisory Group released a consultation in February 2022 to assess what changes should be made to the wholesale electricity market, assuming 100% renewable supply, to ensure the efficient operation of the electricity industry.

The Association supported most of the conclusions reached by the review including an increase in spot market volatility, the importance of developing improved demand side flexibility and the contracts market. NZWEA did not support comments in the consultation that new generation could be developed rapidly in relation to wind energy given consenting requirements or that wind energy had low technical entry barriers.

The Association’s submission can be reviewed here:

<https://www.windenergy.org.nz/activities/submissions/nzwea-submission-on-price-discovery-under-100-percent-reg>

Transmission Pricing Methodology (TPM). The Electricity Authority (EA) has approved a new TPM for implementation 1 April 2023. The Association supports removal of the HVDC charge but also the widely held industry view that the TPM is too complex to work, in particular the benefits-based charging regime which makes it challenging to model future transmission costs.

In its TPM Decision Paper the EA has sought to address a longstanding industry concern of first mover disadvantage for new connections. The Commission has done so in several ways with a

potential rebate to early investors and ensuring first movers do not pay for connection capacity in anticipation of future investments.

The Association considers that one of the key objectives of a TPM is to signal to consumers that peak demand drives future investment in capacity. NZWEA is concerned that the removal of specific transmission peak pricing signals will lead to additional peak demand and an increased cost for consumers.

Department of Conservation. The Association has been meeting with DoC to discuss the Department's climate change work programme and to progress a shared approach to engagement on wind farm development which would include improving consistency and co-ordination in the assessment of wind farm consents. DoC in November 2021 released a revised engagement process where all resource management advocacy related engagement and applications should now be directed to the national resource management team rather than with the local regional operations team. The change is to enable DoC to assess projects at an early stage and ensure appropriate technical resources are allocated.

Wind Farm Consents. Mercury has obtained a consent for its Kaiwaikawe Wind Farm, Hiringa Energy and Balance Agri-Nutrients will shortly also be seeking consent for their 24 MW Kapuni Wind Farm and the Kaimai Wind Farm is on track to go to hearing in the third or fourth quarter of 2022. New Zealand Wind Farms has had approval to use the fast-track consent process for the proposed repowering of Te Rere Hau (an increase of 85MW).

The Association is seeing an increased level of industry activity which includes Contact Energy's announcement of its plan for large wind farms and Manawa Energy (formerly Trustpower) announcing a renewed focus on wind and solar generation.

Community Wind. The Association continues to support small scale wind development including community developments. MBIE's Accelerating Renewable Energy Discussion Document highlights some of the opportunities and challenges for local and community renewable energy development. The Association has promoted the need for Government support with planning and process advice and the need to simplify the resource management consenting process to reduce complexity and cost for small scale wind projects.

The Association has positioned the proposed Paekakariki community wind farm project as an opportunity to pilot small scale development with the Minister of Energy and Resources and obtained her support to progress resolution of a land access challenge within Government.

Offshore Wind. New Zealand has an internationally recognised offshore wind resource technically estimated at around 148 GW for fixed foundations and 2,104 GW for floating foundations. The quality of the resource has resulted in a number of overseas developers announcing intentions to progress options, four of which have joined the Association.

The area of most interest is off the Taranaki coast where there is also an opportunity to leverage existing skillsets and potentially repurpose oil and gas offshore infrastructure and support a just energy transition for the region. Venture Taranaki and Ara Ake hosted an offshore energy forum in November 2021 which was well attended. At the forum Minister Wood's announced a commitment to progressing the regulatory / legislative framework to provide development rights for offshore wind development.

The Association has established an Offshore Wind Energy Working Group to enable the development of the offshore wind resource. The Group has over 70 active and observing members.

2021 Wind Energy Conference. The Association's 2021 Conference was held in May to a full house at the InterContinental with a number of online delegates also in attendance. The theme for the Conference was *Rising to the Challenge* reflecting the current and future build requirement to support decarbonisation of the energy sector and the need for at least one new large new wind farm to be built every year.

Conference presentations are available on the Association's website:

<https://www.windenergy.org.nz/activities/previous-events/conference-2021/presentations>

2022 Wind Energy Conference. The 2022 Conference has been rescheduled from 11 May to 24 August to increase the opportunity to meet in person and network. Online will also be available. The Conference theme is *Accelerating the Transformation*.

More information on the Conference is available on the Association's website:

<https://www.windenergy.org.nz/activities/conference-2022>

Training. In conjunction with several members, NZWEA has been progressing development of a new industry wide training programme for wind farm technicians. Three new courses have been developed a level 2 NZ Certificate Electricity Supply with a strand in understanding wind turbines and systems used, and a NZ Certificate in Wind Farm Maintenance levels 3 and 4. The level 3 and 4 courses cover electrical, mechanical and hydraulic components of wind farm maintenance and has been registered under the NZQA framework.

The level 3 programme will launch in 2nd quarter 2022 with the level 4 programme in the 3rd quarter.

The training programme is an exciting initiative for the industry to position for the significant growth in wind farms and need for qualified technicians.

Renewables Variability. A recent Electricity Survey has identified a marked drop in wind as a priority for development from 26% (2020) to 17% (2021) with new hydro having a big gain 8% to 16% and geothermal rising from 21% to 24%.

Commentary has been that the drop was driven by winter 2021 electricity supply difficulties and weak wind conditions 'undercutting supply'. The Association has commissioned a study on the variability of wind and solar simulating different future build scenarios as the number of wind and solar farms increase. It is expected that the study will identify a reduction in variability as geographical diversity increases and will assist in improving the repositioning of wind energy. The Report will be available in Q2 2022.

Board. The Board met six times during 2021. Activities included reviewing the Association's strategy and submissions. The Board also continued its programme of meeting with industry participants and key stakeholders to develop relationships and share information.

Annual General Meeting. The Association's AGM was held on 27 October 2021. Andrew Beatson from Bell Gully was our guest speaker on RMA reforms and an update consenting considerations for offshore wind development.

<https://www.windenergy.org.nz/store/doc/NZWEA-AGM-2021-2-Bell-Gully-presentation.pdf>

The Association's Chair and CE provided an update on international developments, strategy and NZWEA activities which can be viewed here:

<https://www.windenergy.org.nz/store/doc/NZWEA-AGM-2021-1-Chair-CE-presentations.pdf>

6. Other Industry Developments the Association is Monitoring

There are a number of other industry developments that are expected to be of importance to the outlook for wind generation which the Association is closely monitoring including:

Tiwai / Southern Green Hydrogen. NZAS has advised its preference for keeping Tiwai operating beyond the existing contract termination date of 31 December 2024 and that the smelter is interested in exploring how it can support security of supply via demand response mechanisms including in dry years.

Having the smelter stay does impact the outlook for wind generation with Transpower's Whakamana i Te Mauri Hiko Report Tiwai stays scenario increases wind capacity from 5.9 GW to 6.4 GW by 2050 or 18.1 TWh to 19.5TWh.

Meridian and Contact have announced a shortlist of four potential development partners for their Southern Green Hydrogen project. The counterparties are now engaged in an RFP process to identify early-stage business plans for a 600 MW production facility. The intention is to announce a partnership and/or consortium by the middle of 2022.

NZ Battery Project. The objective of the Project is to find a 100% renewable solution to NZ's dry year risk. While a number of options are being considered significant focus is going into a Lake Onslow pumped hydro scheme. The nature of pumped a hydro scheme would support the variability of wind and solar as well as lead to an increase in electricity demand particularly at off peak times.

Transpower Net Zero Grid Pathways Project. The project was established to ensure the electricity transmission grid is able to meet the challenges in enabling the electrification of the economy and meeting NZ's decarbonisation target. The project has two phases – enhancing the grid backbone to 2035 and supporting new interconnections beyond 2035.

The Project has updated electricity supply and demand scenarios and is currently focused on investments that could be implemented within five years.

Electricity Authority Future Security and Resilience Roadmap. The electrification of the energy system is expected to be largely met by variable renewable generation. In response to the changes to the electricity system the EA and Transpower have developed a roadmap for consultation to ensure a secure, reliable and resilient electricity system. The Association will be preparing a submission on the consultation.

Electricity Authority Wholesale Market Review. The EA in its review has questioned whether the market is competitive and concluded there is more work must be done on the structure of offers in the market and has published an issues paper seeking feedback on a range of options that do not include structural separation or asset swaps between generators. Options being considered include prohibiting use-it-or-lose-it clauses, Electricity Authority pre-approval of large contracts, requiring public offering of all (or a proportion of) hedge contracts and requiring large hedges to be traded publicly

A positive that has come out of the consultation is the importance of demand response and the opportunity to improve the harnessing of the capacity that already exists as demonstrated by the 9 August blackout which found untapped ripple control on electricity networks underutilised.

7. Summary

Climate change and reducing carbon emissions is now centre stage. The importance of electricity and new renewable generation to enable decarbonisation of the wider energy sector is unquestioned as is the need to act with urgency.

The imperative to strengthen the resource management system to recognise the national importance of renewable electricity generation and enable transmission remains urgent. Key to the effectiveness of the reform will be the extent to which climate change, energy and environmental targets are aligned. Other important areas to progress include:

- **Energy trilemma.** Sustaining the energy trilemma in the transition to a higher level of renewables particularly for winter peaks and in dry years.
- **Renewable Variability.** Ensuring the electricity industry is able to support the variability of renewables most efficiently by encouraging demand response (DR) and distributed energy resources (DER). Retail and distribution pricing reform are key to valuing DR and DER and reducing peak demand to avoid inefficient investment in generation and transmission.

With the right policy settings, including actions to reduce emissions, the abundance of economic renewable resources in New Zealand can be developed to support a sustained growth in electricity demand.

The Association would not exist without member support so above all thank you for your continued membership of NZWEA and sustaining our work programme. We hope you find value in all we do to promote wind energy in New Zealand.

Kind regards

Grenville Gaskell