



1. Introduction

In last year's review, we concluded that the longer-term outlook for wind energy in NZ remains very positive. We know the system can support wind providing 20% of NZ's electricity requirements and, after a disappointed plateauing of development over the past few years, planets have aligned. Mercury has announced it will commence construction of the Turitea Wind Farm in August 2019 and the expectation is that a decision on Tilt Renewable's Waverley Wind Farm is not far away.

The energy sector is always a dynamic space but the past twelve months in particular has seen some major shifts that shape the future. In a number of areas policy direction and intent has been set with the detail to come.

One major shift was the government's decision to halt all off-shore oil and gas exploration and limit on-shore exploration to Taranaki. Apart from the commentary on the unexpected nature of the decision, attention soon focuses on the environmental and economic implications. From an electricity perspective the key challenge turned to how to manage future dry period risk and whether the exploration decision may present a future role for hydrogen.

In this review we look back over the past year, update the domestic and international outlook, provide an overview of NZWEA's activities, priorities for 2019 and an overall summary.

2. The Outlook for New Wind Activity in NZ

The increased volatility in the spot market over the past year has surprised many and is a clear indication, among other factors, of pressure on fuel availability whether water, gas or coal. In NZWEA's view the market has undergone a big adjustment and has shifted from one of oversupply to one signalling the need for new investment. The need for better disclosure and transparency of all fuel types is now a priority.

Wind energy, when coupled with an upward trend in the price of carbon, is widely recognised as having the lowest long run marginal cost. As we know, development intentions are closely guarded. However, with the Turitea construction announcement and publicly available information such as the Tilt Renewables / Genesis potential for a PPA to enable the Waverley Wind Farm to be constructed and the lodgement of the consent application for the Kaimai Wind Farm plus general market commentary that existing wind farm consents are being dusted off, it is evident industry activity is picking up.

As we travel into 2019 it's easy to feel the winds of positive change:

- **Demand Growth.** Actual electricity demand increased 1.1% in 2017 and a more modest 0.2% in 2018. The forward story is however future expectations from the impact of the electrification of the wider energy sector. The Ministry of Business Innovation and

Employment in its 2016 Electricity Demand and Generation Scenarios has annual growth ranging from 0.4% to 1.3% based on electricity supply assisting decarbonisation. More recently Transpower in its 2018 Te Mauri Hiko (Energy Futures) White Paper noted “the decarbonisation of New Zealand’s economy will depend on its renewable electricity base” and forecasts that demand could double by 2050. To meet the forecast demand Transpower estimated the source of new generation from a variety of technologies including solar and wind. The share of demand growth met by wind energy is forecast at 16,000GWh which would require 500GWh’s of new wind each year.

- **Future of the NZ Aluminium Smelter.** The restart of the Aluminium Smelter’s fourth pot line has provided a welcome level of demand certainty. Coupled with the use of renewable energy providing a carbon price hedge and a positive world outlook for aluminium demand growth the future outlook is positive.
- **System Security Margins.** Margins have fallen from pre-2015 historic levels of 25-30% to less than 17% today and we are seeing increasing spot price volatility signalling the need for new investment.
- **Climate Change Imperative.** The proposed establishment of a Climate Change Commission and setting of higher targets for renewable electricity generation and achieving a net zero carbon emission position provides a clear pathway for the growth of all renewables and wind energy in particular.
- **Carbon Price.** Over the past year the carbon price has increased from around the \$20 mark to just above the \$25 per tonne fixed price option. While the first tranche of changes to the Emissions Trading Scheme announced in December did not include a lift in the fixed price option there are a number of positive improvements including a process to cap units and for auctions to commence in 2020.
- **Aging Thermal Plant.** As existing thermal plants, especially the Huntly Power Station which was commissioned in 1983, get closer to the end of their economic life key decisions will be required on alternatives to meet an increasing electricity demand. A key challenge will be landing the right generation mix to ensure summer / winter demand differences and continuity of supply during periods of low hydro lake levels are managed.

The adage that change is constant, while a truism, really does not seem sufficient to describe the transformation of the energy sector as we alter direction to a low-emissions future. The role of renewable electricity generation in aiding the transformation 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.

In summary due to positive market conditions, we have seen in 2019, the restart of a period of managed growth in the NZ wind energy sector.

3. Global Trends

The latest data released by the Global Wind Energy Council shows that the wind energy industry installed 51.3 GW of new capacity in 2018. Since 2014, the global wind market’s growth has been stable, installing above 50 GW of new capacity each year.

- Wind industry installed 51.3 GW of new capacity in 2018, a decrease of 3.6% compared to 2017 (53.2 GW)

- 46.8 GW of new onshore wind capacity was installed, a decrease of 3.9% compared to 2017 (48.7 GW)
- The offshore wind market grew by 0.5%, to 4.49 GW of new installations (4.47 GW in 2017)
- Total installed wind capacity reached 591 GW at the end of 2018, an increase of 9.6% compared to the end of 2017

Promising growth occurred in developing regions such as Latin America, South-East Asia and Africa which were responsible for 10% of new onshore installations in 2018 (4.8 GW).

Australian wind capacity increase by 812MW with the completion of 8 new wind farms. Total wind generation was 16,171 GWh's which was 33.5% of total renewable generation (second to hydro at 35.2%) and 7.5% of total generation.

For the first time, China installed more offshore capacity than any other market (1.8 GW), followed by the United Kingdom (1.3 GW) and Germany (0.9 GW).

GWEC forecasts that offshore wind will become an increasingly global market. If governments remain committed, and projects and investments continue, annual installations in Asia could reach 5 GW or more each year. In the US, GWEC expects the developing offshore wind market to reach 1 GW by 2022 - 2023.

New installations are forecast to reach 55 GW or more each year until 2023. Stable volume will come from mature regions in Europe and the US, whilst significant growth is forecast to be driven by developing markets in South East Asia and the global offshore market.

4. NZWEA Strategic Direction

In December 2018 NZWEA's board met to consider updating the Association's strategic focus. Factors influencing the review included:

- The increased recognition of the role of electricity and wind energy in transitioning to a low-emissions economy.
- The scale of new renewables development required to achieve net zero carbon and how to ensure this is best enabled.
- How to leverage behind the meter generation and storage to support short-term variability of wind and other renewables.
- Wholesale market arrangements to support new wind generation development.

The Association's strategy was revised 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 ensure 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.

The Association's vision of wind energy providing 20% of NZ's electricity requirements by 2035 is unchanged and aligns with the Government's 100% renewable electricity generation in an average hydrology year target.

The 20% by 2035 objective is a demanding stretch target which will require on average one new significant wind farm per annum and see total wind capacity increase from the current 690MW to over 3,100MW.

5. NZWEA Activities

Government reviews and consultations on initiatives to address climate change and future proof the electricity sector have been a key feature of the year. Association activities include:

- **Low-emissions Economy Inquiry.** The Association has worked closely with the Productivity Commission to best position and address industry and regulatory challenges facing renewable generation. The Commission's Final Report contained key recommendations to stop using fossil fuels and switch to electricity, RMA reform including strengthening the National Policy Statements for Renewable Electricity Generation and Electricity Transmission and a new National Environmental Standard for smaller scale renewable development. The Commission's recommendations are positive for renewables and the Report identified the important role of wind energy in transitioning to a low-emissions economy. The government is soon to formally respond to the Commission's Report and in recent comments has shown an understanding of the need for regulatory change to revise existing consents, obtain new consents and repower existing sites.

NZWEA's submission can be viewed here: www.windenergy.org.nz/draft-report

- **Interim Climate Change Committee.** The Association has been working with the Interim Climate Change Committee (ICCC) as it progresses its mandate to plan for 100% renewable electricity generation in an average hydrology year by 2035 and consider how agriculture might enter the Emissions Trading Scheme. NZWEA's position is that achieving a higher renewable target across the energy sector delivers a better environmental outcome for the required investment than a sole focus on a 100% renewable electricity sector. The ICCC Report is expected, among other recommendations, to confirm the essential role of wind energy.
- **Zero Carbon Bill.** In June 2018 the Ministry for the Environment released its "Our Climate Your Say" Discussion Document on the Zero Carbon Bill. The Discussion Document is an important step in the journey to meet New Zealand's Paris Agreement carbon reduction obligations and sought feedback on the Government's proposals to set up a framework to oversee New Zealand's 2050 carbon transition included targets, the stepping stones to meet them and the establishment of a Climate Change Commission.

The Association is supportive of the Zero Carbon Bill and its submission can be viewed here: www.windenergy.org.nz/store/doc/NZWEA-Submission-on-the-Zero-Carbon-Bill-Final180717.pdf

The original timeline was for Select Committee review from February to June 2019 but this has been delayed until mid-year to achieve cross-party consensus.

- **Emissions Trading Scheme.** The Ministry for the Environment issued a consultation document titled "Improvements to the Emissions Trading Scheme" in August 2018.

The Consultation Document follows the close of consultation on the Zero Carbon Bill which puts in place the core building blocks to support NZ's transition to a low-emissions economy.

The ETS is the key mechanism to enable the Government to meet its emission reduction targets. The Scheme needs to ensure effective emissions pricing to incentivise businesses to reduce emissions, innovate and invest in low-emission solutions.

In its submission, the Association proposed changes which included aligning the ETS with emission reduction budgets, auctioning proposals and limiting the use of international units: www.windenergy.org.nz/store/doc/NZWEA-Submission-on-Improvements-to-the-ETS.pdf

In December 2018 the government announced the first of two tranches of improvements which included introducing a framework to cap emissions, the introduction of carbon unit auctions expected to begin in 2020 and the addition of permanent forests to the Scheme. The Government has also undertaken to investigate the potential for a price floor in the Scheme, something NZWEA pushed for in its submission.

- **Electricity Price Review.** The Electricity Price Review (EPR) focuses on efficient fair and equitable prices, market and regulatory framework and emerging technologies. The Association has submitted on both the EPR's First Report and Options Paper. The Association is supportive of many of the options favoured by the EPR that impact renewable electricity.

In particular, the Association favours improvements to information, retail pricing, the wholesale market and regulatory system, progressing transmission and distribution pricing as a priority and ensuring the widest possible participation in the spot market for independent generators, aggregators of storage and controllable demand. In addition, the Association has also asked that the EPR address Resource Management Act reform as a priority as this is a key enabler of new lower cost wind generation which will benefit consumers.

www.windenergy.org.nz/activities/submissions/electricity-price-review

- **Wind Farm Consents and new builds.** A consent application was lodged with the Hauraki District Council and Waikato Regional Council for the Kaimai Wind Farm in June 2018. Kaimai Wind Farm Ltd has asked for its application to be publicly notified and a consent hearing is likely in second quarter 2019. The consent application is important for the NZ electricity sector given its 125 MW size, use of latest technology and location. The level of public opposition is disappointing and will be an important test of the RMA given the national priority to address climate change impacts by reducing carbon emissions.

www.windenergy.org.nz/store/doc/NZWEA-Kaimai-Wind-Farm-RMA-Submission-to-Consenting-Authorities.pdf

Mercury has announced it will commence building a 119MW wind farm at its Turitea site in August 2019. Mercury is installing transmission and other infrastructure to enable the development of a further 27 turbines at Turitea and 53 turbines at its Puketoi site. The development is the first major wind farm development since Mill Creek in 2014 and represents the start of what will be a significant investment in new wind generation.

<http://www.windenergy.org.nz/turitea>

- **Wind Offer Arrangements.** The Electricity Authority (EA) in 2018 confirmed that it will be changing the Industry Code to allow wind farm owners to offer their generation into the market in five price bands like other forms of generation. NZWEA supported the change as it recognised that there is a short run marginal cost to wind production and that remaining a price taker with a one cent offer price disadvantages wind generation.

Overall the proposed change is a positive move in affording wind generation the same flexibility as other forms of generation. View the Association's submission here: www.windenergy.org.nz/ea

The change is expected to be introduced in late 2019.

- **Wind Positioning.** The Association continues to promote renewable energy and wind as a key enabler of a low carbon economy. The focus is on providing educational content to teachers and students by way of student fact sheets and teacher lesson plans which are available on the Association's website: www.windenergy.org.nz/resources/for-teachers

- **Wind Energy Conferences and AGM.** The Association's 2018 conference "Optimising Wind Energy for a Low Carbon Economy" focused on the strategic options to achieve the transition to a low carbon economy, the opportunity the transition provides to increase renewables and what we should be doing to ensure wind plays a key role in enabling the transition. Over 85 people attended the event which included speakers from the USA, India and Australia. The Think Tank was on Interconnected Electricity Systems and Networks – What does the future look like? Presentations are available here: www.windenergy.org.nz/conference-2018

The AGM was held at the end of October Nevill Gluyas, Director Equity Research, First NZ Capital was our guest speaker. Nevill provided a most interesting talk on the future of the electricity industry sharing highlights from First NZ Capital's report "NZ Electricity generators Decarbonisations Beckons – but at what price?" www.windenergy.org.nz/agm-2018

- **Health and Safety.** The Health and Safety Group has met regularly throughout the year in May, November and March 2019. Agenda topics included presentations on member health and safety strategies, benchmarking industry H&S performance, rope protection issues, lift issues, wind turbine safety processes, contractor management and specific incidents. Members also had presentations from outside organisations including Electrical Engineers Association, Connexis and Napier Port. It's great to see such a high-level of focus on health and safety and support from members as we collaboratively work to ensure our people get to go home safely.
- **Training.** In conjunction with several members, NZWEA has been progressing development of a new industry wide training programme for wind farm technicians. The NZ Certificate in Wind Farm Maintenance (level 4) covers electrical, mechanical and hydraulic components of wind farm maintenance and has been registered under the NZQA framework. The development of the training programme is an exciting initiative for the industry as it will offer a development path for technicians and positions the industry to be able to develop the skills to meet future wind farm growth. Further details are available here: www.windenergy.org.nz/wind-farm-technician-training-programme
- **Palmerston North City Council Plan Changes.** Under proposed plan change 22C – noise, the Council was again introducing noise limits at site boundaries rather than at notional boundaries as set-out in the NZ Wind Farm Noise Standard NZ6808 and agreed through the Environment Court appeal to plan change 15B. The Association's submission was lodged on

15 May 2018 along with a similar submission from Mercury that NZS 6808 be used to appropriately apply the noise limit at the notional boundary.

The Council's S42A Report on Plan Change 22 recommends in favour of NZWEA and Mercury. There was therefore no need for the Association to attend the hearing and a Statement of Evidence in support of the S42A report has been provided.

- **National Planning Standards.** The Draft Standards are a significant step forward in achieving consistency in local planning documents and approach to wind noise management with the adoption of the NZ Standard 6808 becoming mandatory. The Association lodged a submission in support of the Draft. MfE expect the standards to be gazetted in second quarter 2019.

The Association's submission can be viewed here:

www.windenergy.org.nz/draft-national-planning-standards

- **Board.** The Board met six times during 2018. 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 including with Transpower, BusinessNZ, Environmental Defence Society and the Parliamentary Commissioner for the Environment. In addition the Chair and CE held a number of political/stakeholder engagement meetings.

6. Summary

Climate change and reducing carbon emission is now centre stage. The importance of electricity and new renewable generation to enable decarbonisation of the wider energy sector is well understood. During the course of 2018 the key role wind energy plays has become clear from reviews such as the Productivity Commission's Low-emissions Inquiry, the work of the Interim Climate Change Committee and Transpower's Te Mauri Hiko White Paper.

The quantum of new renewable generation required is a challenge and the imperative to strengthen the RMA to recognise the national importance of renewable electricity generation and enable transmission is urgent. Other important areas to progress include retail pricing reform to recognise production and delivery costs, providing certainty on transmission and distribution pricing, implementation of proposed ETS changes and passing the Zero Carbon Bill to establish the Climate Change Commission.

Three other challenges must also be addressed:

- **Wind Positioning.** How to improve the level of support for new wind farms. In the Association's view, expanding the opportunity for wind energy development to enable community and industrial projects including wind's integration with other technologies is a key strategy to achieve this.
- **Renewable Intermittency.** Addressing the variability of renewables. Retail pricing reform and ensuring the widest possible participation in the spot market for independent generators, aggregators of storage and controllable demand are parts of the solution.
- **Winter and Peak Demand.** How we ensure system reliability in dry years and cold winters remains an unsolved issue given the age and future of the Huntly power Station. Perhaps

hydrogen from off-peak renewables can be a viable solution; more will be known by the end of 2019.

In summary there has been a lot of policy development work over the past year which is going to shape New Zealand's low carbon economy. The time has come to implement the necessary changes and commence the development of new renewable generation to power the future. The construction of the Turitea Wind Farm is the start of a sustained and measured development of new wind farms. While there is much to do to best position wind energy and the need to manage potential development capacity constraints it's going to be an exciting year!

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