ANZ Research

NZ Insight: The NZ carbon market

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Carbon markets 102: what drives the carbon price?

Summary

This note identifies the factors that will influence the price of carbon and examines whether the carbon price will continue its upward trajectory. Additional background information about NZ carbon markets can be found in our previous publication NZ Insight: Carbon markets 101.

- Carbon prices will be influenced by existing and future regulations that impact how land is allowed to be used, or the profitability of particular land uses.
- The large volume of units in circulation has the potential to mute the ability of the government to influence this market through limiting the supply of units.
- The market is relatively immature and regulations are continuing to develop, which has the potential to disrupt the market and cause prices to move in either direction. Likewise, the large amount of speculative holdings also have the potential to amplify price movements.

Carbon markets

New Zealand's carbon market operates independently of international markets. Prices are generally trending up in all global markets but the price levels vary considerably from country to country.

Agreements reached at the recent COP-26 summit pave the way for a global carbon market to develop. Initially bilateral or regional agreements will allow exchange of units.

Wider-scale carbon markets will potentially reduce the cost of carbon offsets, as projects that have the lowest cost will be the first to be implemented. There is also potential to speed up reducing GHG emissions if funds earned from the scheme are then invested into additional projects to reduce emissions.

How does NZ's carbon market work?

There are actually several carbon markets that operate in New Zealand. Firstly, there is the market where New Zealand Units (NZUs) are released by the Government are sold at quarterly auctions. Then there is the secondary market where NZUs in circulation are traded bilaterally – often aided by platforms that match buyers and sellers. These trades provide timely information about what's most commonly referred to as the 'carbon price'. There is also a voluntary carbon market. More information about NZ's carbon market can be found in NZ Insight: Carbon 101.

Voluntary carbon market

The voluntary market exists outside of the government-regulated carbon market. In the voluntary market there is a range of standards and credits available. Companies that participate in this market tend to do so as they typically see it as an opportunity to market their 'green' credentials. The voluntary market provides an opportunity for businesses to offset their emissions by investing in projects that reduce green-house gas (GHG) emissions, such as planting trees. Deals are typically facilitated by a broker or a company that offers a certifiable standard. Pricing of credits in the voluntary market tends to be privately negotiated, so can vary from project to project.

Market for New Zealand Units (NZUs)

This paper will concentrate on the market for NZUs.

NZUs can be purchased directly from the Government auctions or purchased on the secondary market. Any individual or organisation is able to own NZUs. There is no requirement to be part of the Emissions Trading Scheme (ETS) to own units.

Demand factors

There are several factors that affect the demand for NZUs. These include:

- **Offsetting current emissions:** companies from industries included in the ETS are required to submit an emissions return every year and must relinquish sufficient units to offset their GHG emissions.
- **Changes in emissions by participating companies:** some companies may find their emissions are lower than expected and therefore may have excess units available that they may choose to sell. This may occur due to improvements in technology that reduce their emissions, or a reduction in production, which means emissions are lower than previously expected.
- **Offsetting future emissions:** companies who expect to emit CO2-e in the future may look to purchase units today to offset their future emissions. This is known as 'banking' units.
- **Free allocation:** certain industries such as growers and manufacturers of products that are considered to be 'emission intensive and trade exposed' are currently eligible for a free allocation of units. Any changes to free allocations will potentially influence the NZU market.
- **Speculation:** anyone can buy or sell NZUs. Like any other asset, demand to buy units will increase if there is an expectation amongst investors that the price will rise.

Supply factors

The Government is able to create and supply NZUs, and units already in circulation can also be traded.

Units available at quarterly auctions: Government emissions budgets should determine the number of units made available at the quarterly auctions. The Government currently has a provisional budget for the period 2021-2025, which was to be finalised before the end of 2021, but this date has now been pushed out to the end of May 2022. The government provides forward guidance on the number of units that it plans to release over the next five-years. It is not able to make changes to the units being sold in the current year and can only change offer volumes for the following two years in exceptional circumstances. This provides a degree of certainty to the market as to the volume of units offered in the primary market.

Units offered to the secondary market: There are two main factors here:

- **Units earning through sequestering carbon:** companies that can prove they have sequestered CO2, typically through planting trees, are entitled to receiving NZUs. Some of these units may be offered to the market, increasing the supply of available units, but there is no guarantee that additional units earned will be made available for sale. NZU's may be held onto by the owner to offset future emissions, or because they expect to be able to realise a higher return at a later date. Previously, forestry owners typically earned units whilst forests were growing but were then faced with repaying these units when forests were harvested. Therefore, forest owners often held onto units to offset future emissions. But forestry rules have now changed to 'averaging' which means forest owners now earn less units but are not liable to repay any units so long as they replant any areas of land where trees are harvested. This generally means that planting land in pine trees provides an income stream for approximately 16 years.
- **Changes to units in circulation** will potentially impact prices. The Government has acknowledged there is a large number of units in circulation and this stockpile provides elasticity in the market and could dampen the carbon price. It was previously proposed that the stockpile of units be reduced by 5.4 million units per year, via reducing auction volumes, but this was to be dependent on price movements. Given the full volume of the CCR has been released to the market in 2021, there is not yet any immediate reduction in units in circulation, so the excess supply issue remains a risk that may impact prices at a later date.

Other factors that will influence supply of NZUs

- **Agriculture inclusions in ETS?** From 2025 onwards a price will be put on methane emissions from livestock and fertiliser. He Waka Eke Noa – the partnership between MPI and primary industries – are trying to develop a scheme that is separate from the ETS. If agreement cannot be reached on how to implement such a scheme, then the fall-back position is that agriculture will join the ETS. Under the scheme proposed by He Waka Eke Noa, the methane emissions from agriculture would be priced separately to carbon emissions, so if this scheme is adopted then it is unlikely this will have a direct impact on the carbon price. It is also possible that there will be some offsets for soil carbon and offsets for natives (and other plantings) introduced at a later date that don't currently match the ETS criteria. Further details about how agricultural emissions may be priced are expected to be released in February 2022.
- **Financial returns from alternative land uses:** including the price of logs, which will impact the harvesting of forests.
- **Forestry registrations:** It is voluntary to register post-1989 forests. At present 54%[1], or 400,000ha. of post-1989 forest is not in the ETS. If more existing forests are registered, or more land is converted to forestry, then this could potentially double the units in circulation.
- **Existing stock of units:** At present there is a large number of NZUs in circulation relative to the annual imbalance of demand and supply (see Figure 1). As at 30 June 2021 there were a total of 138.4 million NZUs held, whereas current demand is less than 40 million units. Total holdings have generally increased over the past five years and are forecast to continue to increase before peaking in 2022[2]. It shows there is a massive buffer of supply of units (shown on right hand axis), which is forecast to only gradually reduce.

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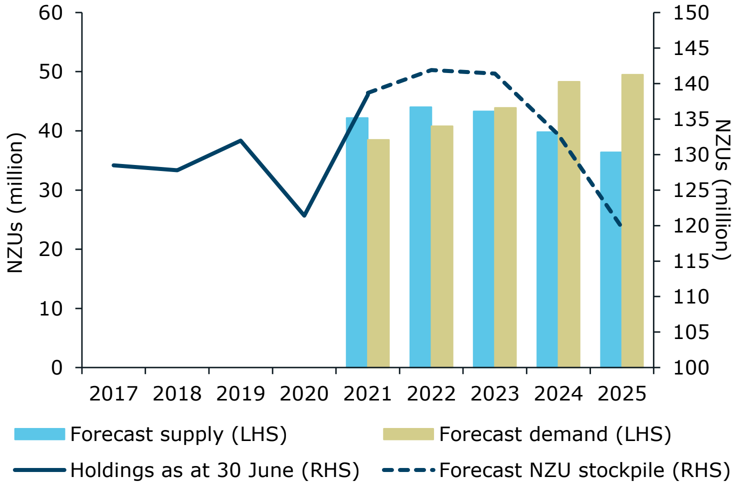
[1] Based on data published by MPI data 30 September 2021.

[2] Note this data does not take into account the 7 million additional units released from the cost containment reserve in September 2021.

This means the relatively small annual imbalances in supply and demand may have a muted impact on the price of NZUs.

Figure 1. Holdings and forecast supply and demand for NZUs



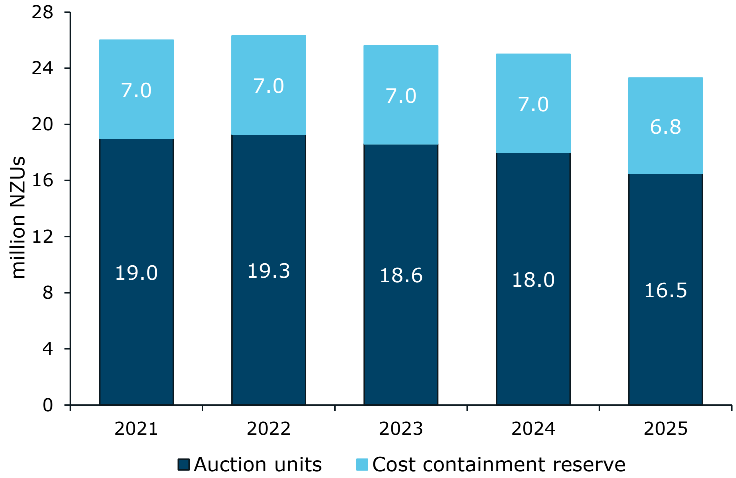
Source: MfE, EPA

- **Regulatory changes:** Any changes to regulation will potentially influence carbon prices. This is considered one of the major risks to price certainty in this market. The Government has shown a preference for some degree of price stability in the market through the introduction of the price floor and price ceiling for the quarterly auctions. But as demonstrated in 2021, regulations may be able to limit the downside movement of prices, but they have limited control over upward movement. There is an expectation that the ETS rules will be adjusted so that emissions are not able to be solely offset by credits generated from pinus radiata plantings, ie there must be some effort by emitters to actually reduced emissions, not just offset them. We may also see tweaks made to overseas investment rules relating to forestry, sequestration rates for natives relative to pines, and land use change rules, which may limit trees being planted on high-class land.
- **International market prices:** Agreement on how to account for international transfers of units was finally reached at COP-26, which paves the way to develop an international carbon market, or at least regional or bilateral markets. An international market would, in theory, result in emissions reductions occurring in regions where it is cheapest to do so. This does mean there is a risk that wealthier countries will continue to pollute if they can buy cheap carbon credits elsewhere. This could result in massive plantings of trees in developing nations, effectively limiting other uses of this land. The World Bank calculated that in 2021, 21.5% of the world's emissions were covered by either a carbon tax (5.5%) or an ETS (16%). The carbon price in NZ is currently relatively high on a global standard but it is still well shy of the EU price, which is currently the world's largest carbon market.

Primary supply of NZUs

Over time, the volume of units available for auction will gradually be reduced. The reduction in volume, all else equal, should put upward pressure on prices and thereby encourage a reduction in behaviours that result in emissions. However, as discussed earlier, this is far from a perfect market.

Figure 2. NZU annual auction volumes



Source: MfE

Offer allocations were set at 4.75 million units for each of the auctions held in 2021 and offerings in 2022 will be slightly higher at 4.825m units per quarter. Buyers bid for these units over the course of a three-hour auction. The highest-priced bids are assigned the available units and buyers must pay the price that was offered by the lowest successful bidder. Therefore, all of the units are allocated at the same price.

There is an undisclosed reserve price, which ensures the market is not able to be manipulated. The market also has a price floor and a price ceiling (see Table 1). If the price ceiling is breached, this triggers more units to be released through what is referred to as a 'cost containment reserve' which contained 7 million units in 2021 and 2022.

Table 1. NZ ETS Carbon Auctions 2021

Auction date	Volume of NZUs available*	NZU floor price	NZU ceiling price	Clearing price	Participants	Successful participants
17 Mar 21	4.75m	$20.00	$50.00	$36.00	40	30
23 Jun 21	4.75m	$20.00	$50.00	$41.70	37	16
1 Sep 21	4.75m + 7m	$20.00	$50.00	$53.85	43	31
1 Dec 21	4.75m	$20.00	$50.00	$68.00	26	18
16 Mar 22	4.825	$30.00	$70.00			
15 Jun 22	4.825	$30.00	$70.00			
7 Sep 22	4.825	$30.00	$70.00			
7 Dec 22	4.825	$30.00	$70.00			

*In addition to the allocated units, there are also 7 million units available annually in the cost containment reserve (CCR). These become available if demand pushes the price above the ceiling price. If any of the reserve units are allocated, this will reduce the size of the CCR in future auctions within a particular calendar year. The entire 2021 CCR allocation was released at the September 2021 auction.

Source: MfE, NZX

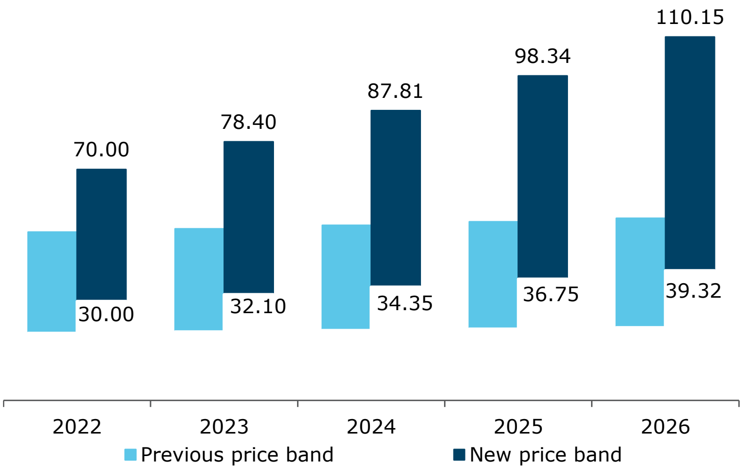
The quarterly auction system was launched in March 2021. At the initial auction units were priced at $36/NZU. At the second auction held in June the clearing price increased to $41.70/NZU. At the September auction the price shot above $50, which triggered the release of a further 7 million units from the cost containment reserve. There was sufficient demand to absorb all of these additional units at a price of $53.85/NZU.

Had the additional units from the CCR not been released, it has been estimated that the price would have lifted to $57.00. At the final auction of the year the units sold just above the prevailing spot price.

In 2021 19 million NZUs were auctioned, split evenly over four auctions, ie 4.75 million units per quarter. In addition, the $7 million units from the cost containment reserve were also sold, meaning a total of 26 million NZUs were made available.

Earlier this year the Government announced a gradual increase in the auction floor price for NZUs in the coming years. Additionally, the ceiling price, or the price which triggers the release of units from the cost containment reserve, has also been increased.

Figure 3. Carbon floor and ceiling prices for quarterly auctions



Source: MfE

Throughout the auctions held in 2021 there was a range of buyers. At each event there have been buyers who have mandatory compliance obligations under the NZ ETS, and those who don’t. At the September event, 58% of the participants had mandatory compliance obligations, indicating that a relatively large number of market participants were speculators.

At the September auction, just two participants purchased more than half of the units traded, indicating there are some large players operating in this market.

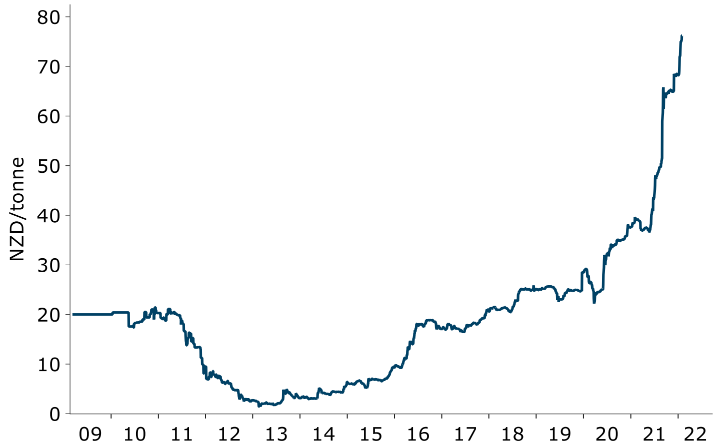
Secondary markets

In addition to the quarterly auctions, there is a secondary market for NZUs. In this market NZUs are traded directly between companies, although trading platforms and/or brokers are often used to match buyers and sellers.

The secondary market is well developed in New Zealand, with numerous brokers involved. Trading can either be on a spot basis (for immediate delivery) or a forward contract, where businesses agree to trade units at a specific price at a future date.

The secondary market provides a constant source of pricing information for NZUs, which is most commonly referred to as “the carbon price”.

Figure 4. Carbon spot price



Source: Bloomberg, Macrobond, ANZ Research

Immediately after the quarterly auction held on 1 September 2021 the spot price for carbon shot up to $59.00/NZU, peaking at $65.80 just 10 days later. Since this time, units have traded near this level.

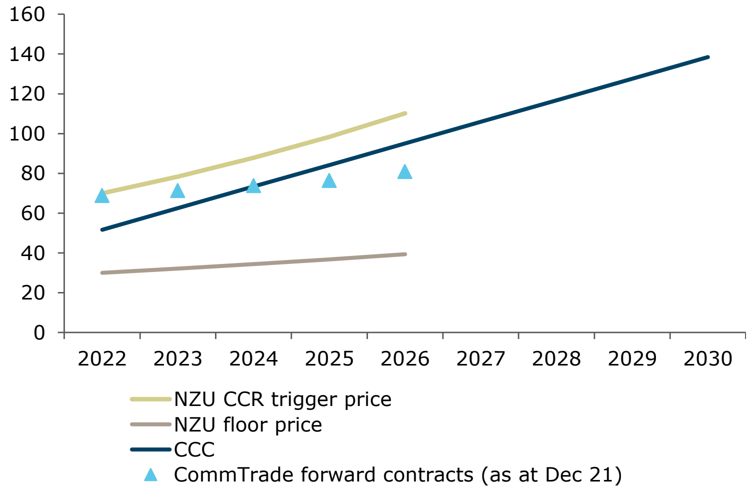
Where will prices head from here?

There are many factors that will influence the price of NZUs in the future. The market for carbon is relatively immature, and the regulatory environment it operates within is continually evolving. At present the market is unregulated.

There are not many genuine price forecasts available for this market, but several organisations have modelled where prices need to be to encourage the required reduction in emissions to meet our Paris Accord obligations, ie what NZ needs to do to limit warming to less than 1.5 degrees Celsius.

Data released in 2021 by the Climate Change Commission indicate prices need to be over $138 per tonne by 2030 and to $250 per tonne by 2050 (see Figure 5).

Figure 5. Carbon price indicators



Source: CCC, CommTrade, MfE

While the Climate Change Commission (CCC) clearly points out this is not a forecast price, it has helped drive the expectation that carbon prices will continue to rise and indeed they need to, in order to encourage the behaviour changes required to lower our emissions.

The CCC also advised the Government to increase the price floor and the price at which the cost containment reserve (CCR) would be released at its quarterly NZU auctions. The increase in these prices, combined with steeper price increases in subsequent years, also helped build the expectation that carbon prices will continue to rise. On the other hand, the annual forward contracts (dated at April each year), which trade on CommTrade, show only a mild upward price projection.

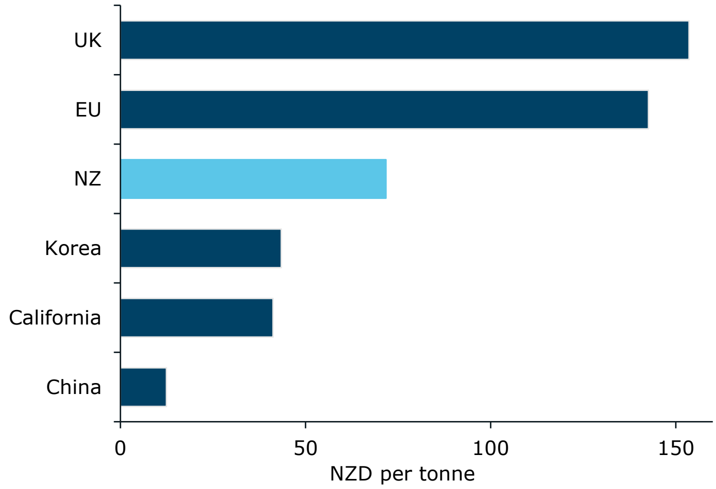
Other prices used by NZ organisations tend to mimic the prices used by the CCC, so in general any carbon price that has a future date attached to it tends to be higher than the current prices.

A poll of economists undertaken by Reuters in later 2021 asked where the carbon price needed to be to keep warming below 1.5°C. Answers ranged from US$50 to $250 (NZ$70-NZ$350) with the majority saying the price needs to move above US$100 immediately to encourage a quicker reduction in emissions. The IMF has recommended a global average carbon price of US$75 (NZ$107) per tonne by 2030.

Prices in other carbon markets

NZ's carbon price is still well below these recommended levels but is relatively high compared to carbon prices in other markets. Carbon prices in Europe are leading the way. The price of EU allowances (EUAs) also rose rapidly in 2021, and this lift also contributed to expectations that the NZUs would continue to lift in price.

Figure 6. Selected ETS carbon prices (as at January 2022 converted to NZD)



Source: World Bank, EEX, SEEE, KRX, ARB, CommTrade, RBNZ

Speculation has been blamed for the rapid rise in the price of EUAs and there has been a call to restrict access for financial investors. However, this was dismissed by European Securities and Markets Authority, who said it was mainly economic and political factors that caused prices to rise. Stricter rules have been introduced that mean emissions will need to be reduced more quickly and this has fuelled increased demand for EUAs.

While there are different factors driving prices in the NZ market, the design of our market has largely followed the EU market, so it is not unreasonable to think pricing may also move in a similar direction. Speculators now make up a large portion of the participants in both of these markets.

How will a globally traded market impact the price of NZUs?

The impact of a global carbon trading market depends how global its reach really is and the relative costs of offsetting emissions in different parts of the world. A true global carbon market is likely to put downward pressure on the NZ carbon price (all other things being equal) as our companies may be able to purchase international units, which would be cheaper than buying NZUs. The average carbon price in the 20 largest economies is just €4 (NZ$7).

If we just link our ETS to the EU ETS (which also covers Norway, Iceland & Liechtenstein), which has a higher carbon price than NZ, then that could put upward pressure on our carbon price. Agreement on a global traded market for carbon is unlikely to occur anytime soon and it may take years before bilateral or regional carbon markets are introduced.

Where will prices trend from here?

Despite carbon prices rising sharply over the past 12 months, and a general expectation that it will rise further, there is no certainty this trend will continue. In fact, eventually carbon prices should fall to zero as emissions are mitigated and there is no longer a need to offset emissions. But we are not likely to reach this point for decades.

In the interim we expect carbon prices to strengthen further, but the market is expected to be volatile. Prices could move sharply in either direction, depending on future regulatory changes and future price expectations. The large portion of units that are in circulation, but not required for immediate offsetting, means there is a large speculative element to the market. This could exacerbate price movements even further.

There is no easy way to reconcile the motivations of companies and individuals to hold units, making it difficult to separate demand for units to offset emissions from pure speculative demand. There are over 2500[3] companies registered in the Emissions Trading Scheme. Participation is voluntary for the majority of these companies as 90% of the participants are involved in forestry – just 10% of the participants are involved with industries that emit GHGs.

The Government has an incentive to ensure the carbon market operates in a credible fashion, but it is inevitable that changes to regulations that either directly or indirectly impact the ETS will potentially disrupt the market and have an impact on prices. The primary goal of the Government is to reduce emissions rather than develop a perfectly functioning carbon market. A carbon market is a tool that can encourage the reduction in emissions but it will also require other fiscal policy levers to achieve these aims.

While the market is immature and regulations are still developing it is difficult to maintain a steady market and therefore also difficult to forecast carbon prices.

Generally, it is expected that while there is upside potential for prices then units will be retained, but if an event (such as a change in ETS rules) triggers a fall in prices then we may well see units sold off quite quickly. This, in turn, could continue to drive the price lower. Therefore, we are likely to see quite some volatility in carbon prices in the future.

The Government has forecast a reduction in the number of NZUs that will be available relative to expected demand. This will, in theory, support prices, but the Government also acknowledges that the large number of units currently in circulation will potentially dilute market signals. If companies opt to sell some of their existing holdings of units, or more forestry land enters the ETS, then reducing the supply of units may have very little impact on pricing.

Carbon prices therefore are likely to rise in the future but price movements are likely to be volatile and ongoing changes to regulations will be a disruptive factor in these markets.

[3] NZ Emissions Trading Register – data accessed 11 January 2022 showed 2595 participants

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