VOICES OF CARBON TRADING 2023

Foreword

It is pleasing to release the inaugural Voices of Carbon Trading report. With NZX being at the centre of New Zealand's capital markets, this report brings together the stories of participants and stakeholders in New Zealand's carbon markets. We thank all those that contributed insights to this report and the important work that is being done around decarbonisation.

Since 2021 NZX, in partnership with the European Energy Exchange (EEX), has been managing the New Zealand Emissions Trading Scheme Auctions for New Zealand Units (NZUs). The auction now has 102 fully registered participants, ranging across multiple sectors within New Zealand and abroad. The partnership with EEX is consistent with NZX's strategy of building global connections with partners that have proven expertise.

The relationship with participants, the Ministry for the Environment (MfE) as the operator and EEX, remains strong and collaborative. This has enabled NZX to not only successfully operate the auction platforms each quarter, but to provide system and process efficiencies to benefit the market and operator.

NZX has been grateful for the support we have received from participants over the past two years. We will continue to look for ways to enhance our offerings for the benefit of participants and stakeholders.

New Zealand has committed to a net zero emissions by 2050. Public markets will continue to play an important role in achieving this goal, facilitating the flow of capital towards decarbonising the New Zealand economy.

MARK PETERSON
NZX Chief Executive

The New Zealand Emissions Trading Scheme

BACKGROUND

New Zealand's Emissions Trading Scheme (ETS) was launched in 2008. The ETS is New Zealand's key tool for meeting domestic and international climate change obligations.

The ETS puts a price on each tonne of CO2 equivalent - a measure used to standardise the climate effects of greenhouse gases. This price is known as a New Zealand Unit (NZU) or colloquially referred to as 'carbon credit'.

At a simplified level, the ETS works by requiring emitters to measure and report their greenhouse gas emissions (GHG) and surrender one NZU back to the government for each tonne of GHG emitted. While some trade exposed emitters receive NZUs directly, most emitters acquire NZUs either through quarterly government auctions or through the secondary carbon market. NZUs are allocated back to GHG absorbing participants, such as forest owners. The intended effect is to create a financial incentive for emitters to reduce their carbon footprint.

NZU AUCTIONS

In 2019, Government introduced a package of reforms to the ETS, including the establishment of auctions to efficiently allocate NZUs. NZX, in partnership with EEX, was appointed by the Ministry for the Environment to operate the NZU Auctions.

In the NZU Auctions, participants bid for specific unit amounts. Government decides the annual allocation of units into the Auction, and the number of units allocated for sale each quarter. When all orders are placed, they sell at the lowest successful bid price. This becomes the marginal clearing price, and all units are allocated at this same price.

Government also has a reserve of credits, the Cost Containment Reserve (CCR). These are added to the auction if a trigger price is reached. They are credits that would have been sold in future years but have been brought forward to meet current demand. If the CCR is triggered, the clearing price is set by the last bid above the trigger price.

CONTINUED

The New Zealand Emissions Trading Scheme

SECONDARY CARBON MARKET

Carbon credits can be traded between firms and investors in the secondary market year-round, with price fluctuating based on supply and demand dynamics. Most NZUs are traded on the secondary market.

NZUs can be traded directly through a bilateral agreement, through a broker, or via a trading platform. Trading can occur either on a spot basis or as a forward contract, where the parties agree to trade units at a specified price in the future.

VOLUNTARY MARKET

New Zealand also has a voluntary carbon market. This market is small in comparison to the NZU market and is typically used by entities as opportunity to voluntarily offset their emissions by investing in projects that reduce or remove emissions. Pricing in this market varies from project to project.

HE WAKA EKE NOA

Agriculture is not currently obligated to participate in the ETS.

There is a proposed pricing system to put a price on emissions from agricultural activities as an alternative to the ETS. It is based on a farm-level split gas levy that has been designed by those involved in He Waka Eke Noa.

Biogenic methane and nitrous oxide would be priced separately. Business owners who meet the emissions thresholds (equivalent to around 2000 tonnes of CO2-e per year) would be responsible for reporting and paying for their emissions, either at an individual farm level or via a collective.

A price pathway would be set for five years, to be reviewed after three years.

It's also proposed that new categories of sequestration could be included in the NZ Greenhouse Gas Inventory and the ETS. An interim approach would be taken for rewarding sequestration through a declaration-based system from 2025, followed by a transition to the ETS. At minimum, sequestration from riparian plantings and from increases in carbon from indigenous forest linked to specific management interventions will be included from 2025.

The NZ Government is set to make decisions on agricultural emissions pricing in early 2023.

INTERNATIONAL MARKETS

According to the World Bank, in 2022 around 23% of global GHG emissions were covered by either an ETS or carbon tax. There are 68 direct carbon pricing instruments operating, in the form of 36 carbon taxes and 32 ETSs. The World Bank note that less than four percent of global emissions are currently covered by a direct carbon price in the ranges needed by 2030 in order to meet the temperature goal of the Paris Agreement[1].

New Zealand's carbon market operates independently of international markets. Price levels vary from country to country, though recent years have seen a generally upward trend in all markets.

The world's first ETS was set up by the European Union in 2005. It now covers all EU countries, as well as Iceland, Liechtenstein, and Norway. Switzerland's ETS is linked to the EU scheme. New Zealand's ETS is modelled on the EU version.

An Australian Carbon Exchange is currently being developed and is scheduled to commence operation in 2023[2]. It builds on Australia's existing safeguard mechanism, which places a legal obligation on large industrial polluters to keep net emissions below baseline levels. Otherwise, Australia's carbon market is voluntary, with units able to be earned through the Emissions Reduction Fund.

There are several other ETSs around the world, either at a national or regional level. Settings vary, and they are not usually linked to each other.

[1]https://www.worldbank.org/en/news/press-release/2022/05/24/global-carbon-pricing-generates-record-84-billion-in-revenue

[2]https://www.cleanenergyregulator.gov.au/Infohub/Markets/australian-carbon-exchange

Retrospective on NZU Auctions to date

The Emissions Trading Scheme NZU Auctions have performed well over the past two years.

The clearing price has risen more than 100% over the course of the auctions, from $36 at the first March 2021 auction, to a peak of $85.40 at the September 2022 auction, before falling to $79 at the final auction of the year.

The auction volume has cleared every time – 4.75 million NZUs at each 2021 auction and 4.825 million NZUs at each 2022 auction. Movement in CCR volume was more mixed. In 2021 the full amount of CCR units cleared at the September auction, as soon as the $50 trigger price was hit. In 2022, the CCR units took a little longer to clear. 5,693,300 NZUs were cleared from the CCR at the March auction, when the $70 trigger price was hit. The remaining 1,306,700 CCR units cleared at the June auction.

We also did not see too much movement in clearing prices between the December 2021 and June 2022 auctions – an increase of just $2 between the December and March auctions, and another $6 added at the June auction.

Secondary market prices have typically worked in tandem with the auctions. It has been usual to see the secondary market price trade up before the auction and then either ease or flatten once the clearing price is known and there is less interest in trading NZUs.

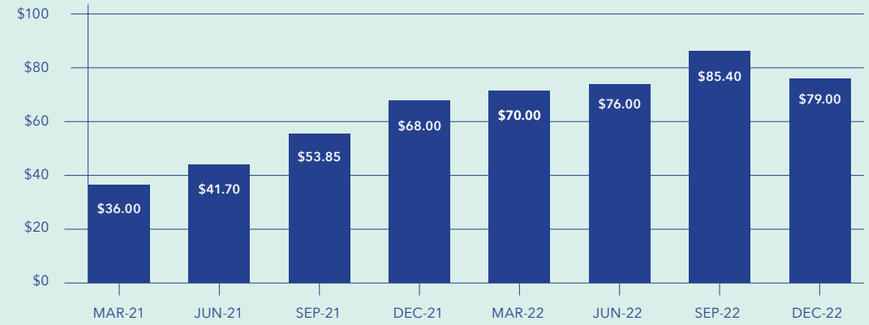
Prices have been flatter through much of 2022, both at auction and on the secondary market. Softer prices are likely due to less interest once companies have enough credits for their May surrender deadline. More recently, global economic uncertainty and regulatory uncertainty on changes to the ETS have contributed to a softer market.

Usually, the volume of bids submitted has far exceeded the actual auction volume sold (and the volume that was available), resulting in relatively high cover ratios (excluding CCR units), typically over a ratio of 2 (that is, more than twice as much volume bid for as was actually sold). The exceptions have been the September and December 2022 auctions, which had a cover ratio of 1.33 and 1.28 respectively, not much above the volume that was available and sold. The number of units per bid has averaged just over 29,000 over the course of the auctions to date.

The number of participants has narrowed over the last few auctions, with the June and September 2022 auctions at 26 participating bidders. There were 17 winning bidders at the June auction and 23 winning bidders at the September auction. December had just 23 total participants, with 21 of those winning bids. The March 2021 auction started with 40 participating bidders and 30 winning bidders.

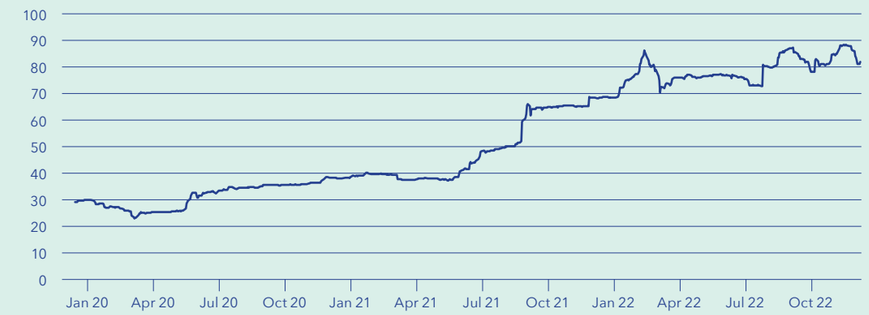
NZX: VOICES OF CARBON TRADING 2023

FIGURE 1: **Clearing price**



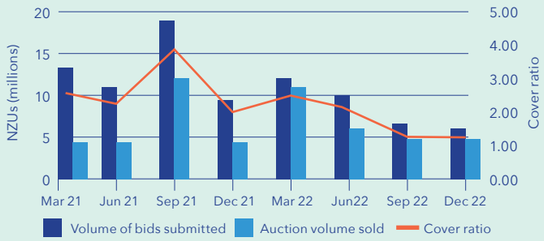
Source: NZX

FIGURE 2: **Jarden Commtrade secondary market price**



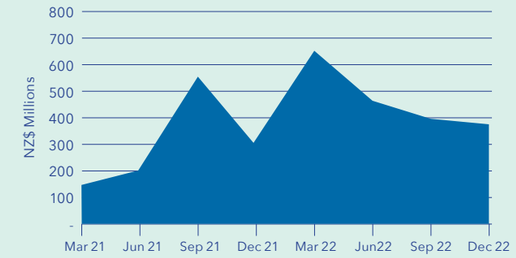
Source: NZX, Jarden

FIGURE 3: **Volume of bids submitted vs volume sold**



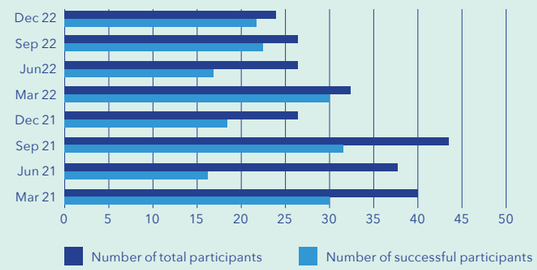
Source: NZX

FIGURE 4: **Revenue generated**



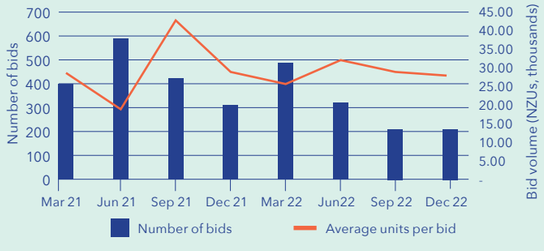
Source: NZX

FIGURE 5: **Number of participants**



Source: NZX

FIGURE 6: **Bidding volume**



Source: NZX

What's coming up?

New Zealand's first Emissions Reduction Plan and Budget were released in 2022. The plan contains strategies, policies and actions for achieving the country's first emissions budget and contributing to global efforts on climate change. The next Emissions Reduction Plan is due in 2024.

Settings for the ETS auctions were revised at the end of 2022.

On auction volumes, Cabinet agreed to adjust auction volumes in order to reduce the stockpile. The updated settings will mean there is a gap between the available supply and the units required by ETS participants to meet their surrender obligations. The gap will therefore need to be closed through participants obtaining units from the existing stockpile or from new units from carbon removal activities such as forestry.

(million NZUs)	2023	2024	2025	2026	2027
Status quo	18.6	18	16.5	15.7	not set
New auction volume	17.9	17.1	15.3	13.5	11.7
including CCR	25.9	24.8	22.5	20	17.6
CCR volume	8	7.7	7.2	6.5	5.9

Source: Ministry for the Environment

There is a technical discrepancy issue. Emissions reported by sectors covered by the ETS are intended to align with emissions reported in New Zealand's Greenhouse Gas Inventory; however the Climate Change Commission (CCC) identified discrepancies. The cause is unclear, and so Cabinet chose not to adjust volume for this discrepancy.

Auction pricing was adjusted for inflation, with a 2027 year added. The CCC recommended significant increases in pricing, along with a two tranche CCR. In the Cabinet paper, it was noted that it's clear the CCR trigger price is being interpreted as a signal for NZU prices in the secondary market, conflicting with the intent of the ETS to let the market discover the price necessary to achieve necessary emissions reductions. The triggering of release of the CCR means that the units can be banked and sold later, at a higher price. However, Cabinet's concern was the increased costs for fossil fuel and electricity that would be imposed on households and the economy, and insufficient policy settings to mitigate this factor. As such they chose to stay with the lower pricing.

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	2023	2024	2025	2026	2027
Auction reserve price	$33.06	$ 35.90	$38.67	$41.45	$44.35
CCR trigger price	$80.64	$91.61	$103.24	$115.84	$129.97
CCC recommended auction reserve price	$60	$64	$68	$71	$75

Source: Ministry for the Environment

CCC recommended CCR	2023	2024	2025	2026	2027
Tier 1					
Trigger price	$171	$182	$193	$203	$214
Reserve volume, million NZUs	2.9	2.8	2.6	2.3	2.1
Tier 2					
Trigger price	$214	$228	$241	$254	$268
Reserve volume, million NZUs	5.1	4.9	4.6	4.2	3.8

Source: Climate Change Commission

At COP-27, New Zealand added its support to countries asking for reparations to deal with the impact of loss and damage caused by climate change. New Zealand committed $20 million of climate funding to the cause, joining Scotland, Ireland and Austria.

New Zealand also committed $15 million to the Adaption Fund, a multilateral climate fund that is dedicated to financing adaption projects and programmes in developing countries. For New Zealand, funding is particularly focused on the Pacific.

Continued development of regulations and initiatives – on both a national and global scale – is likely to continue to disrupt the market. Prices will move in response – not necessarily in an assumed upward trajectory. We're likely to face volatile times ahead.

Forecasting NZU prices is getting more difficult

by **Matthew Cowie,** Director, Climate Change, EY New Zealand

Over the 13 years that NZUs have been trading, much of their price history could be explained by just a handful of drivers.

The three drivers with the greatest influence have been international carbon market prices, the fixed price option and the Cost Containment Reserve price. While each of these drivers came with successively higher headline prices, they have featured successively lower volumes (see chart on the following page). This decline in volume has meant a reduction in their influence and power. Forecasts for future NZU prices won't be able to lean on any simple headline price numbers but will need to incorporate a wider range of volume, cost and market sentiment factors.

With perfect hindsight, the NZU price history can be separated into four broad time periods:

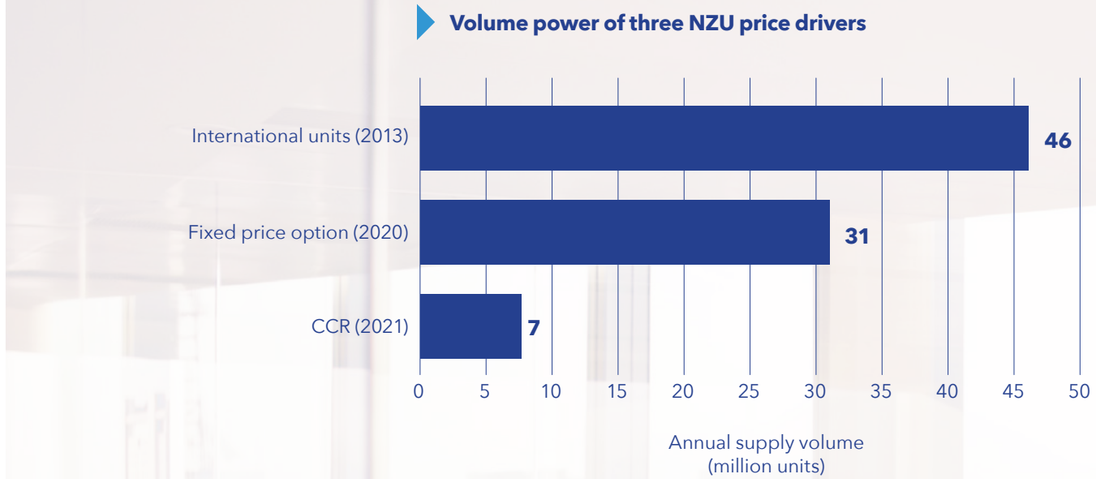
- 2010-2015, the price of international carbon markets was a powerful driver for NZU prices. This was because NZ ETS participants were able to use international units for all of their surrender obligations within the scheme. International unit usage peaked in 2013 at 46 million units (99% of demand).[1]
- 2015 until the middle of 2021, the fixed price option (FPO) was very influential for the NZU price. Once access to international units was removed and the one-for-two began to be phased out, the NZ ETS was structurally short each year and the system needed the supply available through this channel. FPO usage peaked at 31 million units in 2020[1].
- Mid-2021 until early 2022, the NZU price was drawn to the prices set by the Cost Containment Reserve (CCR) within the new auction platform. This saw prices first jumping to the CCR's 2021 level ($50) and then later jumping to 2022's CCR level ($70). The CCR had 7 million units available to it in 2021[2].
- Since early 2022, the NZU price has been more erratic, moving up and down on conflicting signals about future policy direction from both the Climate Change Commission and the Government.

As the volume power of these price drivers has dropped away, their influence has declined and the job of forecasting NZU prices has become more complicated. NZU prices are now trading independently of any headline price drivers in a manner that is out of character for a market that hasn't had to do this throughout nearly all its history.

There are now a much wider range of drivers that need to be taken into consideration for any NZU price forecast. It will remain important to investigate thoroughly the drivers that are backed by large supply potential. Three of the most important future drivers are:

- Potential supply from stockpile selling. With 164 million units[3] currently in private accounts and potentially over a third of this volume unencumbered by surrender obligations, the volume supply from this could be substantial.
- Forestry supply. As the recent discussion on permanent forests within the NZ ETS has highlighted, large volumes of supply are possible, particularly in the coming years as newly planted trees start to sequester carbon at pace.
- Auction supply. With 18 million units being sold at auction this year, this volume remains crucial to balance supply and demand within the market. The scale of this volume makes policy decisions about the reserve price potentially influential in the short- and medium-term. However, even the power of auction supply volumes over price will drop over time.

What this evolution means is that the NZ ETS is at a very interesting stage of its development. Participants in the NZU market can no longer rely on the headline price drivers as guidelines for how to trade but must instead ask themselves what price is needed to balance the scheme's future supply and demand volumes. This is a more difficult, but also more valuable, question than the market has historically needed to answer.



Disclaimer: The views expressed in this article are the views of the author, not Ernst & Young. This article provides general information, does not constitute advice and should not be relied on as such. Professional advice should be sought prior to any action being taken in reliance on any of the information

[1]https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/ets-reports/unit-movement/
[2]https://www.etsauctions.govt.nz/public/auction_noticeboard
[3]https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/market-information/privately-held-units/

COMPANY PROFILE: CARBON MATCH

Carbon Match is a multilateral trading platform for those wishing to transact credits which are compliant in the New Zealand Emissions Trading Scheme.

Carbon Match
THE NEW ZEALAND CARBON MARKET

Established in 2011, Carbon Match has helped hundreds of clients transact their New Zealand Units. While bids and offers are placed anonymously, trade volumes and prices are given up to the marketplace in real-time. Our Carbon Match community is broad, from private landowners to larger Maori incorporations, from small and medium sized compliance entities to listed energy companies, from well-known financial institutions to large multinationals with New Zealand exposure. We also serve some of the worlds most significant commodity trading houses.

At its core, Carbon Match is committed to helping New Zealand meet its obligations under the Paris Agreement and reduce its greenhouse gas emissions, by supporting a market-based approach to reducing emissions in a way that is fair, effective and efficient. That relies on transparent carbon pricing to underpin the investment decisions and the behaviours that are so critical to deliver our low carbon transformation.

Carbon Match's direct contracts are a nod to New Zealand's do-it-yourself culture and the unique context in which the Aotearoa carbon market has developed - even today, almost two thirds of NZUs on issue have emanated from the land, and the price of carbon touches that of every other commodity we produce. Likewise, decisions over land-use, and our responses to extreme weather events will very much impact the carbon price.

We are seeing now the effects of Cyclone Gabrielle, both directly, as some sellers seek to monetise New Zealand Units to carry them through a period of recovery, and less directly, as the Government pivots towards the recovery effort. As holding costs and interest rates have risen in an effort to keep inflation in check, cash is king once more. This seems unlikely to change in the near term, with analysts saying a 5.5 percent OCR is still on the cards for this year. So far, the cost of living crisis translates to downside risk for NZUs.

Late last year Cabinet decided not to follow certain critical recommendations from the Climate Change Commission in relation to ETS regulatory settings. Since then, 2023 has delivered a new Prime Minister and a refocus on "bread and butter policies". It's only March and we have already seen the scrapping of the Biofuels mandate, the extension of a fuel tax relief, and now the redrawing of priorities in our transport strategy away from emissions reductions and towards recovery and resilience in infrastructure.

Outside agriculture, transport fuels are our single biggest source of emissions and electrification of transport is

Carbon Match spot prices

Source: Carbon Match

absolutely critical for New Zealand, as will be the additional generation capacity and supporting transmission and distribution. Likewise, any investments in electrification of process heat or other industrial process improvements rely heavily on a robust carbon price. We have the tools and channels to support a transparent market and enable robust price discovery. But these will amount to much less than they should, in the absence of stable regulatory settings - and without appropriate reliance by politicians, on the independently constructed advice of He Pou a Rangi - our Climate Change Commission.

Many people will appreciate any relief in whatsoever form, but there's an underlying point about resilience here. Short-term subsidies or moves by politicians to tinker with fuel prices, or depower the carbon price will not get us there. The recent cyclone has highlighted the political tension between the need to "shore ourselves up for the next event" - ("adaptation" in climate change speak) as opposed to the need to mitigate and to actually reduce emissions. This debate is set to intensify ahead of a General election later this year - anything is possible.

Yet the potential for "win-win" is there. The most defensible policies will be those that lead to physical solutions which deliver emissions reductions and greater resilience - physical and economic. A recently released Deloitte report stated that decisive climate action could potentially add $64b to the economy by 2040 - however NZ's economy could also lose $4.4b of GDP by 2050 (escalating to $48b by 2070) if there is inadequate action on climate change.

Cross-party support for our commitments under the Paris Agreement is most certainly there and the ETS is here to stay. Climate change affects all New Zealanders as does the way in which proceeds from the ETS are deployed - NZ is crying out for climate resilient infrastructure investment. But, relatively high regulatory uncertainty remains and is unhelpful to those prepared to invest in the solutions - certainly, for the NZU market, that weighs on both the buy and sell sides.

Last year, faced with a sharply rallying market and the prospect of ever more confronting ETS settings, emitters just wanted one worry off the list. Many who were in a position to do so, stocked up a little or moved to secure forward cover in interest rate environments far kinder than this. But in a falling market the pressure is off. Worse, fear of over-paying takes hold.

Yet compliance buyers perceive increasingly that price risk to the upside is somewhat limited - the 2023 cost containment reserve becomes available at just $80.64 - levels far lower than the secondary market highs of late 2022. And buyers have their eye on burgeoning forestry issuance - which will be much higher this year, because 31 December marked the end of the latest five year Mandatory Emissions Reporting Period. Returns for those are due by the end of June. With the general election not until October 14, this year, for NZU holders, will be one of great uncertainty.

The spot NZU price on Carbon Match has slumped from a late November high of $88.50 to a last trade of $66 as we go to print. Certainly, we are a far cry from the carbon prices seen recently by some of our key trading prices - take for example the EU scheme, where in late February front year contracts breached the €100 mark - or around NZD$170 in a week where NZUs struggled to hold their own at NZ$67.

The question is, at what point do things turn?

COMPANY PROFILE: JARDEN

Jarden are leading advisers in the New Zealand carbon market with proven experience in risk management, hedging and trading strategies, backed by market leading research.

Our people played a leading role in the creation of the carbon market in New Zealand's Emissions Trading Scheme (ETS) in 2008 and transacted the first trade in the ETS in early 2009. Since then, we have transacted over 230 million tonnes on behalf of clients. We are the largest intermediary in the ETS.

We also operate CommTrade – an electronic marketplace for carbon trading and we continue to educate and inform our customers as well as the wider community about climate policy and carbon markets

Jarden is also an active participant in the NZ ETS Auctions and we placed the very first bid in the auction in March 2021 and have participated in every auction since.

The market has evolved and matured considerably in the last fifteen years and the ETS itself has undergone major changes, becoming a proper functioning scheme with a descending cap on emissions, a legislated net-zero 2050 target, regular auctioning, and a Climate Change Commission in place to advise the government on how to achieve its domestic and international targets.

The secondary market and auctioning have a symbiotic relationship. You need both simply because there is not enough available volume in the auctions to satisfy the surrender liabilities. The auctions produce four prices a year whereas the secondary market is open every business day. We see that relationship continuing long term.

Jarden is an active participant in the voluntary carbon market for clients as well as dealing with our own emissions. We are now into our fourth year under Toitu certification and offset any unavoidable emissions through the purchase of a wide range carbon credits across New Zealand, Australia, and abroad.

Jarden Securities Limited is an NZX Firm.

NIGEL BRUNEL
Head of Commodities at Jarden

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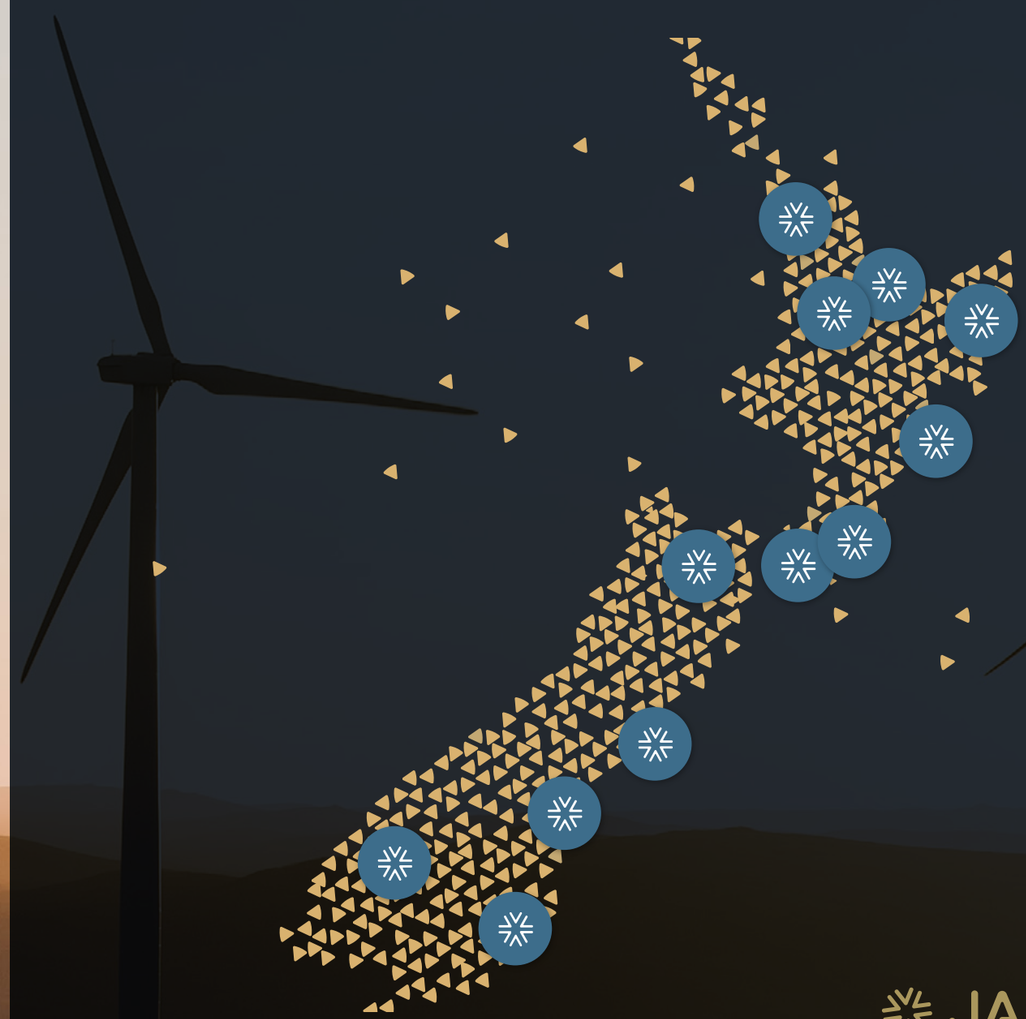
Local knowledge, global reach

You'll find our offices in communities throughout New Zealand – with our global perspective always at hand.



COMPANY PROFILE: WESTPAC

Westpac has a role as a market-maker for NZUs. How do the ETS auctions factor into this role?

Westpac New Zealand has longstanding experience and proven expertise in the NZ Emissions Trading Scheme (ETS). We have been providing price discovery, liquidity, and risk management solutions to participants across all sectors in the secondary market since early 2009.

Westpac's value proposition differs to other liquidity providers in the market, such as Jarden's Commtrade and Carbon Match. Westpac uses its balance sheet to market make, we do not match a buyer and a seller together. This allows participants to immediately transfer their New Zealand Units (NZUs) price risk to Westpac providing price certainty for their volumes. Westpac is the buyer or seller the counterparty faces.

The quarterly ETS auctions have become an important liquidity point for the NZU market. They enable compliance entities who have large surrender obligations to source volume that can be difficult to achieve in the secondary market. Having the auction dates set well in advance also helps participants manage any associated cash flows, which has become more important as the carbon price has appreciated.

Westpac has been an active participant in the auctions, not only for its own liquidity book, but also on behalf of NZU buyers who do not want to or are unable to commit large cash amounts to meet collateral payments required by the Ministry for the Environment. As interest rates increase, the cost of funding collateral payments risks reducing the number of buyers participating in the auctions.

Westpac plays an important role in the quarterly auctions by allowing participants to bid at the auction who otherwise may not be able to due to cashflow considerations. It further allows for us to provide structured hedging solutions for compliance entities sourcing volume at the auctions.

Tell us about how your involvement in the carbon market contributes to Westpac's goal of providing innovative finance solutions.

Innovation matters, particularly when a market-based mechanism has a policy outcome that relates to something as critical as limiting climate change. Westpac was the first bank to transact NZUs in the New Zealand carbon market. From the start of market discussions in 2008 to the present day, we have engaged with market participants and policy makers in a range of innovative ways, and together, to support the development of a robust domestic carbon market.

Westpac has always firmly believed in the importance of supporting our customers to help meet their obligations under the NZ Emissions Trading Scheme. By market-making for NZUs, we are helping to support liquidity in the market and provide better price transparency. These outcomes help reduce costs for buyers and sellers across the market. We enjoy supporting our customers at the auction as it shows yet another innovative way for our customers to participate in the carbon market.

What are Westpac's thoughts on the development of the market over time? Do you feel participant involvement in the auctions has increased and liquidity has improved?

We have seen a lot of change in the development of the market over time and would expect to continue to see this going forward, particularly given the legislative nature of the ETS.

Activity in the NZU market increased when the Government closed the fixed price window in 2021. This change forced emitters to cover surrender obligations either by transacting in the secondary market or using the liquidity offered in the quarterly auctions. The rapidly increasing NZU spot price and Government focus on climate change has encouraged new participants, some from offshore and financial intermediaries. The quarterly auctions have provided an additional mechanism for participants to source volume at regular intervals throughout the year. In addition, the auctions have allowed participants to access larger volumes than they might have been able to via the normal secondary market channels.

If you look at a history of NZU prices over time and then overlay events such as consultation announcements, auctions, Government changes to the scheme, and Climate Change Commission recommendations amongst other things, you will notice that these will all often influence market price and participant behaviour.

We would expect, particularly with the introduction of the Climate Change Commission, that changes to budgets, unit volumes and price controls will continue over time and the Government will likely continue to make change to the ETS settings to ensure it is fit for purpose.

In regard to participant involvement in the auctions, and whether or not that has increased, the interim auction monitor reports participant numbers in the auctions have dropped a touch since their inception. The first auction was in March 2021 with 40 participants. June 2021, September 2021, and December 2021 had 37, 43 and 26 participants respectively.

In 2022 we have had 32 in March, 26 in June, 26 in September and 23 in the December auction.

Exact numbers, however, probably differ to those reported and are probably higher. By way of example, Westpac works bid orders for customers at the auctions. We will be counted as one participant but could be working bid orders for numerous customers. This may help explain the slight drop in reported participant numbers.

According to the interim auction monitor reports, the proportion of participants in the auctions with a mandatory compliance obligation varies between 43-62%

What about the secondary market? How have you seen this develop, particularly over the last couple of years whilst the ETS auctions have also been running?

Secondary market turnover grew through 2021 and H1 2022. The ETS auctions have had a positive impact on secondary liquidity as some participants speculate on the potential clearing price and pre-position in the weeks prior to the auction. However, liquidity has declined over the last 6 months despite a larger number of participants involved in the market. In our view this decline in liquidity is mostly due to uncertainty on Government climate policy. There has been a number of discussion documents and Climate Change Commission recommendations all of which could have a material impact on the NZU price, this uncertainty has left many participants on the side lines. The spot price reaction to the Government announcing different auction unit limits and price control settings in December, to what the climate commission recommended, was a reminder of the dangers playing in a heavily regulated market and has caused liquidity to fall dramatically over the last couple of months.

How does Westpac's involvement in the auctions contribute to the business' wider environmental and sustainability targets?

Emissions trading is a tool for sending price signals to producers, consumers, and investors to encourage and enable them to reduce greenhouse gas (GHG) emissions contributing to climate change. If these markets work well (i.e., participation and liquidity), then they can play an important role in helping to achieve the goals of policy makers. A hallmark of Westpac sustainability efforts is to support its customers to reduce their emissions.

Our 2025 Sustainability Strategy, He rau ringa manaaki/Many hands working together, continues our commitment to Manaaki te ao/Care for the planet as one of three core strategic pillars (the other two being: Manaaki te tāngata/Care for people, and E tipu pūtea ora/Grow financial wellbeing).

As a bank, we recognise the nature of the relationships we have with our customers is unique - we are in it for the long haul. This compels us to look ahead and plan for a world that is different from today. The impacts of climate change are looming large and already forcing a change in the way we live our lives. The nature of our industry means working side-by-side with businesses and communities to support their transition to a low emissions society. We embrace this challenge, and the connection we forge with our clients uniquely positions us to provide the support they need when facing the challenges posed by climate change. Our ***2022 Sustainability Report*** outlines in further detail how we are supporting Aotearoa's transition to a resilient, net-zero society for the benefit of all New Zealanders.

COMPANY PROFILE: FONTERRA

Fonterra has several different climate and sustainability goals, including recent partnership announcements. Can you outline those for us?

Fonterra has been on a journey to improve sustainability for many years. In 2020, we achieved our target of a 20% reduction in energy intensity (the energy used per tonne of product manufactured), using FY03 as the baseline year. Upcoming commitments include a 30% absolute reduction in operations emissions by 2030 compared to FY18, cease using coal by 2037, and a target to be net zero by 2050.

As part of Fonterra's long-term ambitions, we've made becoming a leader in sustainability a core part of our strategy and have committed to spend $1 billion by 2030 to further decarbonise our manufacturing sites and improve water use and quality. Work is advanced in terms of improving energy efficiency in plant (an ongoing workstream), and we are actively investigating and trialling new technologies to reduce process heat and transport emissions.

Several transitions from coal use have taken place to date at Te Awamutu and Brightwater, with biomass boilers under construction at the Stirling and Waitoa sites. All up we have 27 manufacturing sites throughout New Zealand, in addition to science and innovation centres, distribution facilities, and corporate sites. Each factory is unique in terms of the volume of milk it processes, the products it makes, the energy sources available, and the age of its assets. So finding the optimal solution for each site and making sure it will serve us well into the future is a challenge! We recently sent a team of engineers to Europe to investigate leading new solutions in process heat. This is where our recently announced partnerships with MAN Energy Solutions and Genesis Energy come in as options for replacing coal use – looking to design and integrate steam heat pumps, and to accelerate biomass use.

In addition to process heat, we have a number of workstreams focused on transport and electricity supply. Last year we launched the first electric milk tanker "Milk-E" in a trial to understand and optimise battery power to lower on-road emissions. We also concluded a highly successful trial with PolyJoule (an MIT spinoff) for the world's first industrial scale organic battery on farm and have now moved this to our UHT site at Waitoa to stabilise power supply. Our interest in decarbonising electricity has also extended to a partnership with other major electricity users looking to support the build of renewable generation through the use of Power Purchase Agreements.

How do the ETS auctions factor into Fonterra's emissions goals? How do the auctions help Fonterra meet its targets?

Our decarbonisation journey is well underway, but in the meantime, we also need to manage our obligation under the ETS by acquiring and surrendering NZUs. The auctions since they started in January 2021 have provided a regular, material source of liquidity which helps the market to better understand the supply/demand balance. This in turn supports price discovery and confidence for participants to trade. Fonterra utilise a variety of procurement strategies to buy NZUs, including participation in the ETS auctions. This helps us plan ahead to manage a substantial cost, while we optimise capital deployment into decarbonisation measures.

Will the auctions continue to play a role in your decarbonisation efforts in future? What does that look like for Fonterra?

Yes, we expect the auctions will continue to be a major source of supply of NZUs as well as a tool for price discovery. The dates for the auctions provide key milestones throughout the year, combined with anticipated announcements of ETS policy, when we expect to have confirmation from the market on direction and momentum.

How does Fonterra foresee working with farmers as new agriculture emissions goals are legislated for under the ETS?

On-farm emissions have been notoriously hard to abate to date, however there are exciting and promising technologies being researched in the wings. Fonterra have a number of projects underway such as our Kowbucha™ trials, our partnership on Asparagopsis seaweed and we've recently partnered with industry and government in a JV dedicated to solving the methane challenge. We are pleased that on-farm sequestration activities will be recognised under the new agricultural emissions pricing scheme (adjacent to the ETS). We also commend the decision to recycle revenue from agricultural emissions into R&D in the sector, to maintain New Zealand's internationally recognised leadership in this space.

Our farmers are highly motivated to reduce emissions and care deeply for the environment, so it makes sense to work with them on this. Through the Co-operative Difference on-farm recognition programme, we incentivise and recognise sustainable dairying practises. We also work with our farmers directly one-on-one and have New Zealand's largest in-house team of on farm environmental experts which we make available to our farmers at no cost.

Our electric tanker, Milk-E

As efforts to combat climate change ramp up, how do you think wider national and global goals will affect your business?

Competition is already having a notable impact on decarbonisation costs nationally and internationally as global climate efforts ramp up – this can be felt in the price of biomass, costs for solar, wind and battery plant, engineering solutions, and skilled labour, among others. Aside from price appreciation, our customers are increasingly looking for low carbon suppliers to meet their own carbon reduction ambitions, and climate conscious consumers are increasingly seeking climate neutral products in an effort to reduce their individual carbon footprint.

We strongly value the fact that, due to our pastoral production model and efficient manufacturing and supply chain, we can deliver dairy products to the market with a world leading low-carbon footprint. We expect the cost of emitting to increase in the short-to-medium term via the ETS as well as opportunity cost in the market and are committed to a sustainable and well managed transition to low carbon dairy manufacturing in New Zealand.


Our blessing ceremony for our Waitoa biomass boiler

Carbon Auction Report

Input by EEX on international carbon markets

The EU ETS represents the largest compliance carbon market in the world. Over the course of 2022, EU Allowances (EUAs) representing emissions of more than 9 Gt CO2e with a total trading volume of approximately EUR 750 billion were traded through primary auctions and secondary market spot and futures contracts.[1]

The EU ETS is the EU's central climate policy instrument and so far has delivered around 35% emission reductions in the sectors it covers, compared to 2005 levels.[2] Passing through milestones in 2022 such as a political agreement on its design to contribute the EU's increased 2030 climate targets, European Emission Allowances (EUA) traded at EUR 100 for the very first time on 21 February 2023.

The system's coverage was adjusted in 2021 to reflect the United Kingdom's (UK) departure from the EU and currently covers around 40% of EU emissions. This is due to increase to 70% towards 2030. The shipping sector will be added as of 2024 and a parallel system will be set up for road transport and building emissions.

Auctioning is and will remain the default allocation method for allowances in the EU ETS. With the introduction of a Carbon Border Adjustment Mechanism, the free allocation of EUAs to certain industrial sectors will gradually reduce further. In 2022, over 486 million EUAs and EU Aviation Allowances (EUAAs) were auctioned, down from over 586 million in 2021. In 2022 auctions generated revenues of about EUR 38.7 billion in 2022 of which approximately 76% are spent on climate- and energy-related projects by the EU Member States.

EUA prices initially fell to EUR 58 following the Russian invasion, but soon stabilized in the EUR 75 - 90 region and remained fairly resilient throughout 2022. Traded volumes in EUAs fell by over 30% in 2022 compared to 2021 levels.

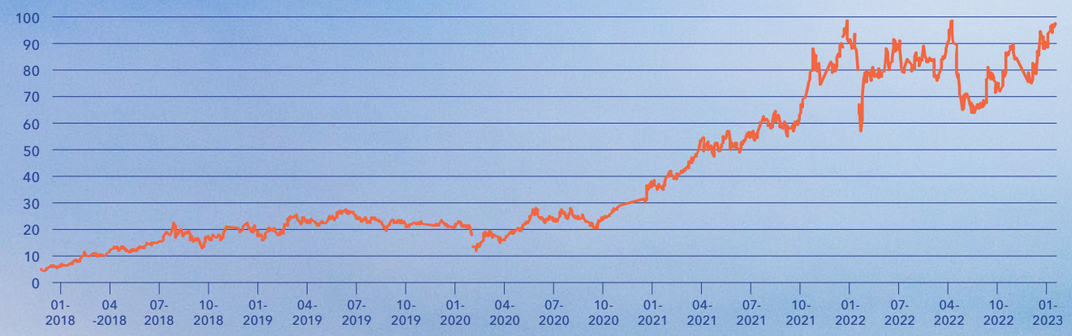
In the two major North American markets, Western Climate Initiative (WCI) and Regional Greenhouse Gas Initiative (RGGI), emission allowances representing emissions of about 2.5 Gt CO2e with a notional value of about EUR 60 billion were traded, setting a new record for annual market value.[1] In both programmes, prices of certificates declined slightly over the course of 2022, but remained at significantly higher levels compared to 2021. California Carbon Allowances (CCAs) Future Contracts at Nodal Exchange with expiry in December 2022 had an average closing price of $29.43 and RGGI Futures Contracts an average closing price of $13.64 over the course of 2022.

In the UK ETS, UK Allowances (UKAs) representing emissions of about 0.5 Gt CO2e were traded in 2022 with a total value of about EUR 46 billion.[1] At the beginning of 2022, UKA Futures with expiry in December 2022 traded at 74.60 GBP, rising to 97.75 in mid-August and finishing the year relatively unchanged at 73.25 GBP. UKAs typically trade with a premium to EUAs, with an average premium of about 12 EUR in 2022.

In the South Korean ETS, about 39 Mt CO2e were traded in 2022 with a total value of approximately EUR 618 mln.[1] Compared to 2021 levels, trading volumes decreased by 28%. Prices of Korean Allowance Units (KAUs) decreased significantly, starting from KRW 35,100 in January 2022 and ending the year at a price of about KRW 16,000. Market observers explain this strong price decline mostly due to the built-up oversupply in the Korean ETS over the past years as economic growth in Korea was significantly lower than anticipated.

The China National ETS began trading in July 2021. Consequently, 2022 marked the first year of full operations. The scheme is now in the second compliance period. Obligated companies in the power sector will need to surrender allowances for 2021 and 2022 emissions by the end of 2023. A draft allocation plan for this second compliance period was released in November 2022, with final implementation details still pending. On average, Chinese Emissions Allowances (CEAs) traded for CNY 55.3 t/CO2e (about EUR 8) in 2022.

EUA Emission Spot Primary Market Auction Price (€/tCO2)



Includes all auction types run by EEX

Source: NZX, EEX

[1]See Refinitiv "Carbon Market Year in Review 2022".
[2]European Commission, EU Carbon Market Report, 14 December 2022

AUTHOR: Amy Castleton.
Additional material from EEX, EY, Jarden, Carbon Match, Fonterra, Westpac.

Amy Castleton	Economist	**M** +64 27 213 2384	**E** amy.castleton@nzx.com
Shane Dinnan	Head of Energy & Carbon	**M** +64 27 886 1210	**E** shane.dinnan@nzx.com
Karen Lin	Energy Business Analyst	**M** +64 44 727599	**E** karen.lin@nzx.com