brave trace

ANNUAL PRODUCTION YEAR REPORT 2025

Including Residual Supply Mix (RSM) for New Zealand

1 April 2024 - 31 March 2025 (PY25)

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Words from the CEO

Shaun Goldsbury, BraveTrace Chief Executive Officer
Production Year 2025 (PY25) - 1 April 2024 to 31 March 2025

The last 12 months have been challenging for the electricity sector in New Zealand. Ongoing issues with gas production combined with significant periods of drought pushed up wholesale electricity prices to record levels last winter. The reduced hydro output meant a significant increase in coal and diesel generation to keep the lights on in New Zealand. As a result of the increased thermal generation, emissions from electricity generation in PY25 rose by a whopping 40% compared to the previous year.

For BraveTrace, it was another year of growth in energy users wanting to certify their electricity purchases as renewable and reduce their reportable Scope 2 electricity emissions. In PY25 we redeemed 2.16m NZ-ECs (New Zealand Energy Certificates), representing 5.2% of the total electricity generation in New Zealand, up from 1.79m (4.2%) in PY24. The total number of energy users also jumped from 307 in PY24 up to 375 in PY25, and as of today we have over 400 active energy users registered with BraveTrace. With ongoing strong growth in demand for NZ-ECs, we expect to be certifying over 10% of New Zealand's generation in three years time.

A noticeable trend in PY25 was a clear move towards newer generation, less than 15 years old, that is compliant with the RE100 technical criteria. In PY23, just two years ago, 99.4% of NZ-ECs were issued from hydro production. Compare that with PY25 in which wind (46%) and solar (4%) accounted for half of our total certification and we can clearly see how the preferences of our energy users are evolving.

NZ-EC prices are confidential between the buyers and sellers, but we have regularly heard there is now a clear price separation between NZ-ECs for new generation that are RE100 compliant (mainly wind and solar) compared to NZ-ECs for older generation that are not RE100 compliant (mainly hydro). As highlighted in the Certification Trends section of this report, there is a tightening of the supply and demand balance in RE100 compliant NZ-ECs, which seems to be driving the lift in prices.

Background

We all need energy, but how we use it, and how we buy it, matters. BraveTrace enables energy consumers to demonstrate they are investing in and supporting renewable energy.

Our system equips them to claim their consumption is matched with verified renewable sources through purchasing NZ-ECs (1 NZ-EC = 1 MWh). NZ-ECs are digital certificates that document the attributes of generated electricity – such as what renewable fuel is used, where the generation site is located, and how much carbon is emitted at the point of generation. By purchasing NZ-ECs and matching them to their consumption, a consumer can make credible statements about the type of energy they support. They can use NZ-ECs to meet leading international best practice, action corporate goals, as part of mandatory climate-related disclosures, or to simply strive to make a difference.

As more consumers purchase NZ-ECs, the "residual supply mix", or remaining uncertified generation, becomes more carbon intensive. This increases the incentive on other consumers to use market-based instruments to maintain a lower Scope 2 profile and avoid reputational or compliance risks.

Residual Supply Mix for Electricity Certification

At BraveTrace, we strive to increase the visibility and impact of NZ-ECs. One important way we do this is by publishing information on the New Zealand electricity Residual Supply Mix, or RSM. The RSM describes the carbon intensity of the electricity used by electricity consumers who **do not** purchase NZ-ECs. It is a key part of how greenhouse gas emissions are accounted for in international best practice.

Several summary statistics regarding generation volumes and their emissions factors are presented in this document. Care is taken in tracking renewable energy volumes, their associated NZ-ECs, and in calculating the RSM to ensure double-counting[1] does not occur.

For PY25 the RSF is 113.47 kg CO_2-e/MWh and the NSF is 107.59 kg CO_2-e/MWh.

[1]The renewable and/or carbon zero attributes of energy production should only be sold once, otherwise the environmental impact of energy production is underestimated. This outcome is referred to as double-counting.

The Residual Supply Factor (RSF) should be used for reporting the **market-based** emissions for those organisations who have not purchased NZ-ECs, and the National Supply Factor (NSF) should be used for reporting the **location-based** emissions as part of dual reporting requirements as laid out by the Greenhouse Gas Protocol.

Purchasing NZ-ECs allows consumers to report their market-based emissions as zero carbon showing their investment and support for renewable energy. It lets them set emission and sustainability goals without being impacted by activities outside of their control such as non-renewable electricity generation.

We use independent service provider EnergyLink to calculate and review our national and residual supply statistics using provided and publicly available data. Details on a review of their methodology is here. Additional information is also in this RSM technical note.

PY25 Results

PY25 Residual Supply Mix

The annual RSM is now calculated for the most recently closed NZECS Production Year (1 April 2024 - 31 March 2025), referred to here as PY25. This was the sixth year where NZ-ECs were transacted and the difference between the residual supply and the national supply continues to grow (Table 1).

For PY25, 5.2% of total generation in New Zealand was attributed to NZ-ECs. The period saw relatively high generation from non-renewable sources, with the NSF higher than in the previous two periods. Coal and diesel generation were higher in PY25, making up 4.5% of total electricity generation, compared to 1.4% of total generation in PY24. As a result, the NSF was over 40% higher (74.63 kg CO_2-e/MWh vs. 107.59 kg CO_2-e/MWh). The increase in purchased NZ-ECs further intensified the RSF, up to 113.47 kg CO_2-e/MWh.

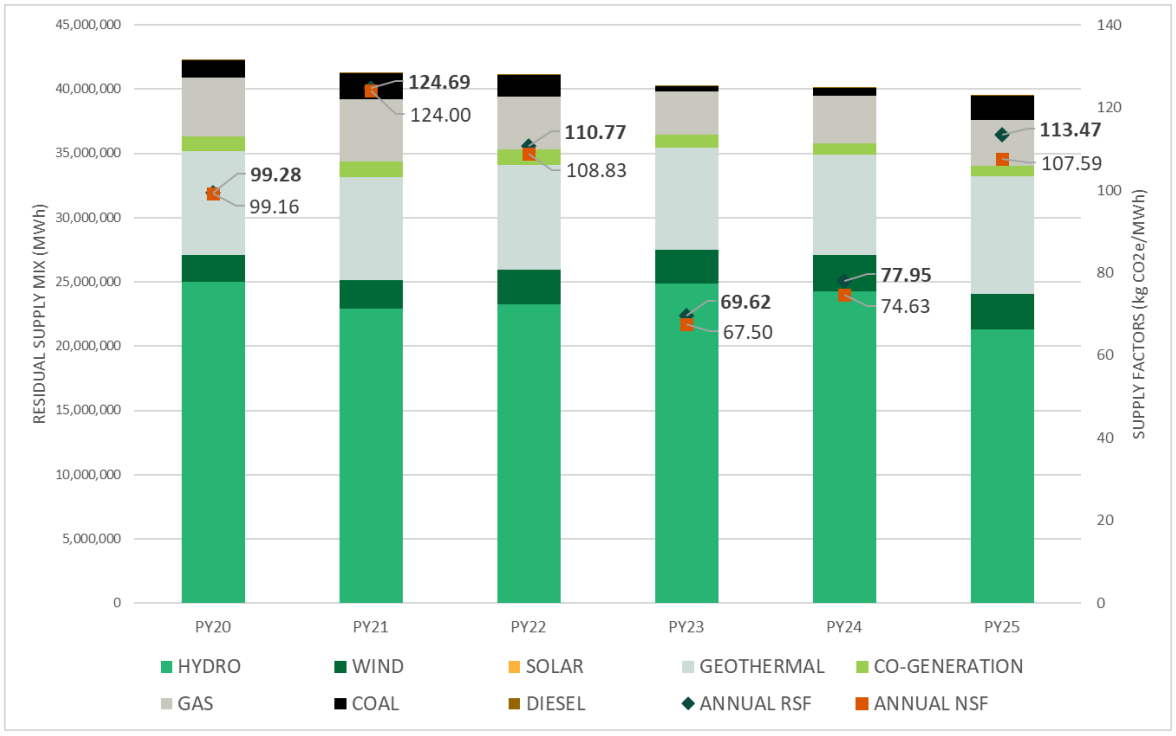
TABLE 1: ANNUAL RESIDUAL SUPPLY MIX RESULTS

NZECS PRODUCTION YEAR	PY20	PY21	PY22	PY23	PY24	PY25
National Supply Mix (MWh)	42,273,518	41,490,913	41,881,730	41,519,448	41,862,459	41,649,794
NZ-ECs Redeemed (MWh)	51,577	228,741	734,700	1,265,475	1,785,921	2,159,123
Residual Supply Mix (MWh)	42,221,941	41,262,172	41,147,030	40,253,973	40,076,538	39,490,671
NZ-ECs Redeemed (% of NSM)	0.12%	0.55%	1.75%	3.05%	4.27%	5.18%
National Supply Factor (kg CO_2-e/MWh)	99.16	124.00	108.83	67.50	74.63	107.59
Residual Supply Factor (kg CO_2-e/MWh)	99.28	124.69	110.77	69.62	77.95	113.47
Factor Difference (% of kg CO_2-e/MWh)	0.12%	0.56%	1.77%	3.14%	4.46%	5.47%

National Supply Mix (NSM): *the total mix of electricity generation supplying New Zealand's domestic demand.*
National Supply Factor (NSF): *the emissions factor of the National Supply Mix.*
Residual Supply Mix (RSM): *the National Supply Mix minus the volume of NZ-ECs redeemed.*
Residual Supply Factor (RSF): *the emissions factor of the Residual Supply Mix.*

The generation make up of the RSM is in Figure 1. The total size of the RSM is decreasing over time due to the increasing volume of NZ-ECs being purchased. The RSF and NSF are also denoted, and show the overall rise in both factors compared to the last two periods, and the growing divergence between the two values over time.

FIGURE 1: ANNUAL RESIDUAL SUPPLY MIX TRENDS



BraveTrace Network Trends

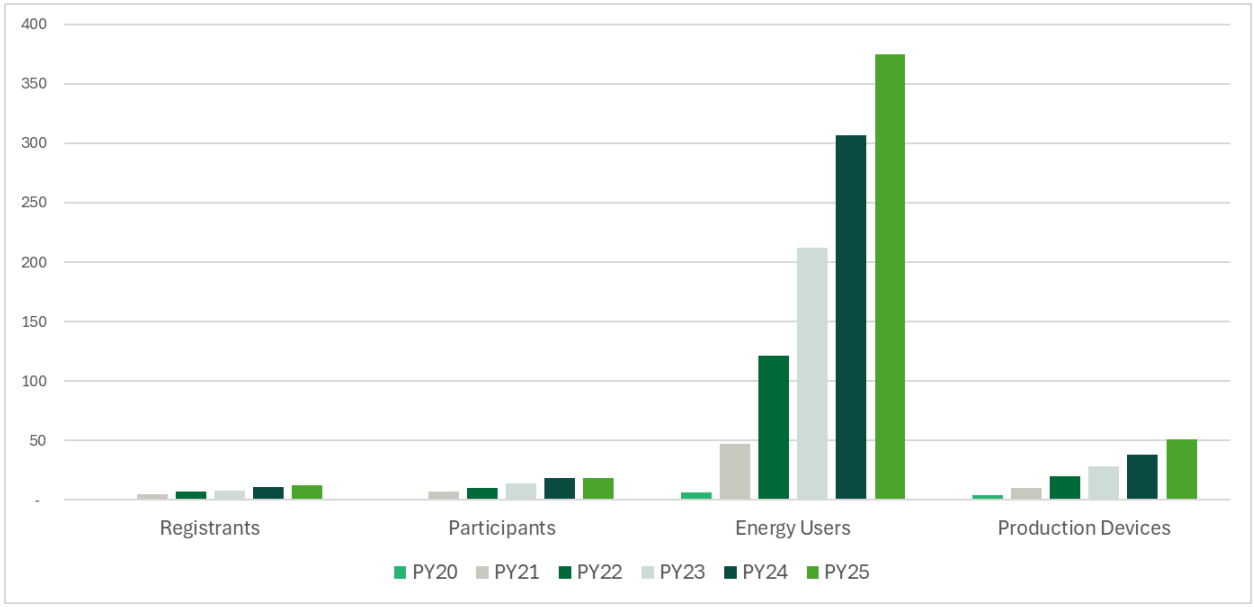
Different organisations or users of the NZECS make up the BraveTrace network:

- Registrants: organisations that have the authority to create NZ-ECs from registered Production Devices
- Participants: organisations that arrange and manage transactions of NZ-ECs between Registrants and Energy Users
- Energy Users: organisations that have purchased NZ-ECs

Production Devices are verified renewable energy generation facilities. Currently four types of generation devices are accepted into the NZECS system: wind, hydro, solar, and landfill gas.

The BraveTrace network continued to grow for PY25 with each category increasing (Figure 2). Energy users in particular grew, from 307 organisations in PY24 to 375 (22% increase).

FIGURE 2: BRAVETRACE NETWORK TRENDS



To learn more about the BraveTrace Network, go here or email enquiries@bravetrace.co.nz

Certification Trends

Overall, NZ-EC redemptions have increased by over 300,000 in PY25, a 21% increase from PY24. Nearly half of the total NZ-ECs were from wind (46%) and solar (4%), which is very different to previous years where over 99% were from hydro production devices (Figure 3). The push towards wind and solar certificates is driven by increasing demand for NZ-ECs that meet the RE100[2] technical criteria. RE100 requires that production devices meet a 15 year commissioning or re-powering date limit. The growth in solar is significant, with solar NZ-ECs increasing from 9,306 in PY24 to 86,071 in PY25 (Table 2). With more solar farms due to come online in the next few years we expect this growth to continue.

FIGURE 3: NZ-EC VOLUME BY GENERATION TYPE

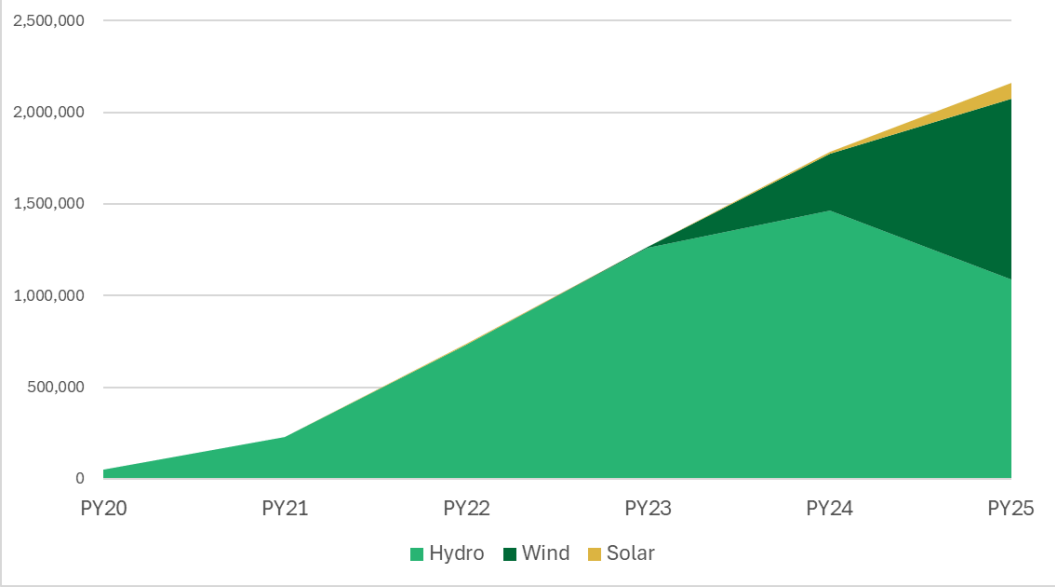


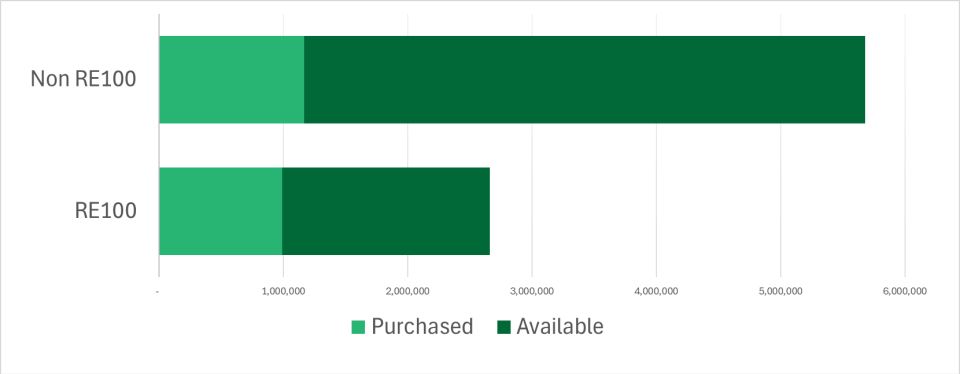
TABLE 2: NZ-EC VOLUME BY GENERATION TYPE

NZECS PRODUCTION YEAR	PY20	PY21	PY22	PY23	PY24	PY25
Hydro	51,295	227,046	730,580	1,258,465	1,462,297	1,089,939
Wind	282	1,448	2,048	4,570	314,318	983,113
Solar	0	247	2,072	2,440	9,306	86,071
Landfill Gas	0	0	0	0	0	0
Total	**51,577**	**228,741**	**734,700**	**1,265,475**	**1,785,921**	**2,159,123**

[2] https://www.there100.org/

Only about one third of the generation registered on the NZECS is from RE100 compliant devices (Figure 4). Additionally, demand for RE100 compliant NZ-ECs is relatively higher compared to available supply than non RE100 compliant NZ-ECs. BraveTrace expects this demand trend to continue, and foresees the potential for demand to exceed supply in this certificate category.

FIGURE 4: NZ-EC VOLUME BY RE100 CRITERIA



The addition of new production devices, renewable seasonality and low wind production during winter all contributed to lift RE100 compliant generation in spring. However, any production devices that pass their 15 year commissioning anniversary date are no longer considered RE100 compliant from 1 January each year. This "roll-off" means that there was less RE100 compliant supply at the end of PY25 than at the start of the year. These effects are shown in Figure 5 below.

FIGURE 5: MONTHLY NZ-EC VOLUME BY RE100 CRITERIA

The trend of continued strong demand for NZ-ECs, especially for NZ-ECs issued from newer production devices, is likely to influence NZ-EC prices over the coming years. Higher certificate prices will further incentivise an increasing number of new generators and production devices to be registered on the NZECS. This is an exciting time for the NZ-EC marketplace, demonstrating the significant role the NZECS is performing in supporting renewable generation in New Zealand.

Monthly Residual Supply Mix

In addition to the annual RSM, BraveTrace has published a trial monthly RSM. The monthly RSM is currently calculated using the same approach as the annual RSM, and includes a rolling 12-monthly average RSF as a more flexible option for parties who wish to report on a period that does not match the PY25 period. Values are updated throughout the open Production Year on our website. RSM values within an active Production Year are subject to change, and are finalised at the end of the year. Read our blog article on the intent behind the monthly RSM.

The monthly RSM values for PY25 are now final as the Production Year has closed (Table 3). Please visit our website to see a visual representation of the monthly RSF. The monthly RSF shows high variability as it was influenced by the changing mix of generation (renewable vs. non-renewable). Non-renewable generation, such as coal, had a significant impact on the RSF due to its high emission factors.

TABLE 3: MONTHLY RESIDUAL SUPPLY FACTOR VALUES

TIME PERIOD	MONTHLY RSF (kg CO_2-e/MWh)	ROLLING 12 MONTHLY AVG RSF (kg CO_2-e/MWh)
Apr-24	116.57	84.83
May-24	150.64	94.06
Jun-24	157.39	103.42
Jul-24	183.94	112.06
Aug-24	167.51	116.95
Sep-24	64.99	113.65
Oct-24	54.28	113.61
Nov-24	31.65	110.42
Dec-24	29.65	105.26
Jan-25	70.01	104.70
Feb-25	142.38	110.04
Mar-25	162.17	113.47