April 2025

Energy End Use Database Insights 2023 data







Contents

| 1 | Summary | | 1 |
|---|---------|--|---|
| | 1.1 | The Energy End Use Database is now updated with 2023 data — key insights | 2 |
| 2 | Higl | ı level insights — 2023 energy data | 2 |
| | 2.1 | Stationary energy | 2 |
| | 2.2 | Business sectors | 2 |
| | 2.3 | One of the unique attributes of the EEUD is its end use and technology breakdowns | 3 |
| | 2.4 | Boiler systems dominate technology use for stationary energy consumption | 4 |
| | 2.5 | Energy consumption for all businesses | 5 |
| | 2.6 | Industrial / manufacturing sectors used more renewables in their fuel mix in 2022, but this was not maintained in 2023 | 6 |
| | 2.7 | The dairy product manufacturing sector is using less coal | 7 |
| | 2.8 | The meat and seafood product manufacturing sector does not show fuel switching impact at the national level yet | 8 |
| | 2.9 | The commercial sector continues to use fossil fuels – mainly fossil gas and diesel | 8 |

1 Summary

1.1 The Energy End Use Database is now updated with 2023 data — key insights

- Manufacturing in the dairy, petrochemicals, metals and wood sectors continue to dominate business energy consumption. High and intermediate temperature process heat and boiler systems continue to be the primary end uses and technology.
- An aggregate of all business shows no movement in the mix of fuel grouping electricity, fossils and renewable proportions are steady across the last seven years.
- The industrial sector group showed a promising increase in electricity and a decrease in fossils from 2021 to 2022. However, this appears to have reversed in 2023.
- The dairy products sector has showed a clear decreasing trend in coal. This is consistent with numerous conversions away from coal in the sector across 2022 and 2023.
- The meat and seafood product manufacturing sector does not show fuel switching impact at the national level yet.

2 High level insights — 2023 energy data

2.1 Stationary energy

Stationary energy refers to the energy consumed by systems or processes that are fixed in one place, rather than being used in the transport context. This includes uses such as process heat for manufacturing, space heating, water heating, lighting, refrigeration, pumping and electronics. Stationary energy is the metric used in the insight graphs to follow.

2.2 Business sectors

Figure 1 shows the top 10 business sectors by stationary energy consumption. Dairy product manufacturing, petrochemical manufacturing, and the primary metals sectors are New Zealand's largest energy consuming industrial sectors making up 32% of total business stationary energy consumption in New Zealand. Renewables, primarily in the form of biomass and geothermal, are used significantly in the wood, pulp and paper sectors. However, these sectors have had a number of site closures during 2024 which will change their energy profile in the future¹.

Top 10 Business Sectors — Stationary Energy Consumtpion



Figure 1: 2023 — Top 10 Business Sectors – Stationary Energy Consumption

¹ Winstone Pulp closures: 'It's just a really bad day for those communities' — local MP | RNZ News; More than 200 jobs to be axed as Kinleith Mill closes paper division | RNZ News; ojifs.com/ojifs-confirms-penrose-mill-closure/

2.3 One of the unique attributes of the EEUD is its end use and technology breakdowns

Figure 2 shows stationary energy consumption broken down by the top 10 end use applications in New Zealand. High temperature and intermediate temperature process heat requirements in manufacturing dominate, making up 30% of total stationary energy consumption, of which 38% of high temp heat is electricity and 61% of intermediate temperature heat is renewables. Non-transport vehicles (Motive power, mobile) is about 14% of all stationary energy consumption. This is mainly diesel and petrol used in offroad and recreational marine vehicles.² Renewables for intermediate heat (100 to 300 degrees) for processing is primarily biomass consumption in industry, in particular, the wood products sector.



Top 10 End Uses — Stationary Energy Consumption

Figure 2: 2023 — Top 10 End Uses — Stationary Energy Consumption

² Offroad and recreational marine vehicles are not classified as transport as they are not vehicles used on roads for the purposes of moving people and goods.



2.4 Boiler systems dominate technology use for stationary energy consumption

In terms of technology, boiler systems are the largest stationary energy consumer, making up 26% of total stationary energy usage, of which about two thirds are fossil fuels and a third is renewables. The renewable fuel consumption is primarily biomass in industry.





Figure 3: 2023 — Top 10 Technologies — Stationary Energy Consumption

2.5 Energy consumption for all businesses

Figure 4 shows that the fuel mix for all businesses in aggregate has remained relatively constant across the past seven years, although fossil fuels reached their peak at 55% in 2019 and have trended down slightly since to 52% at 2023. Inversely, from 2019 electricity has increased by 2% from 34% to 36%. This is a promising trend, but consistent increases in renewables remains a challenge.



All business

Figure 4: Stationary Energy Consumption across all businesses in New Zealand



2.6 Industrial / manufacturing sectors used more renewables in their fuel mix in 2022, but this was not maintained in 2023

Figure 5 shows industrial sectors by fuel grouping (fossil fuels, electricity and renewables) for stationary energy use. Renewables showed a 3% increase from 2021 to a share of 19% - the highest it has been in seven years of data. The percentage dropped to 17% in 2023, which is still higher than the previous 2017-2021 years. Maintaining and increasing the use of renewables in industry remains a challenge for New Zealand.³



Industrial / manufacturing

Figure 5: Industrial sectors stationary energy consumption by fuel grouping.

³ Common challenges to fuel switching are high capital costs, energy cost and fuel security concerns, local electricity infrastructure capacity, current asset condition (where current assets are in relatively good condition), practicality (product disruption or product quality risk) and competing priorities/lack of resources.

2.7 The dairy product manufacturing sector is using less coal

The dairy product manufacturing sector is one of the largest energy using sectors in New Zealand, accounting for around 18% of all industrial stationary energy use in 2023. Coal consumption has been decreasing year on year since 2018. In 2023 Open Country Dairy's Waharoa site went operational with a biomass boiler replacing coal, which would have contributed to the trend. Electricity usage continued to increase. Electrode boilers were in use a lot more at Synlait's Dunsandel site and <u>Open Country Dairy's Awarua site</u>, which would have contributed to this. Fossil gas saw an upswing in 2023. Fonterra has recently <u>announced</u> a plan to convert two of its gas boilers to electricity, so this should impact gas usage in the future. EECA co-funded industrial fuel-switching projects continue to become operational across the sector. We expect to see more renewable energy projects trending across future years.



Dairy Product Manufacturing

Figure 6: Dairy Product Manufacturing — Stationary Energy Consumption (primary fuel types only).



2.8 The meat and seafood product manufacturing sector does not show fuel switching impact at the national level yet

As with the dairy products sector, several industrial co-fuel-switching projects across the meat products sector became operational across 2023 (e.g. fuel switching projects at sites for Alliance, AFFCO, ANZCO). As yet the data does not indicate fuel switching impacts to date. However, we expect to see a decrease in fossil fuels across future years.



Meat and seafood product manufacturing

Figure 7: Meat Product Manufacturing — Stationary Energy Consumption (primary fuel types only).

2.9 The commercial sector continues to use fossil fuels – mainly fossil gas and diesel



Commercial

Figure 8: Commercial Sector — Stationary Energy Consumption.

While the commercial sector mainly uses electricity, it also continues to use fossil fuels, mainly natural gas and diesel. These fuels make up around 40% and 44% of all the sector's fossil usage respectively. Diesel usage has increased over the four years. The exact drivers are unclear. Renewable fuel usage is mainly geothermal with a small amount of biogas used. Renewable volumes have remained constant however, rather than increasing its share.

