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Products insights report

Residential products

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ENERGY EFFICIENCY & CONSERVATION AUTHORITY

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Report summary

This residential products insights report is designed to inform purchasers and product suppliers about trends in energy efficiency technology, as well as market trends, for the residential products that EECA (the Energy Efficiency and Conservation Authority) is responsible for regulating.

The report addresses the following regulated residential products:

- air conditioners and heat pumps under 20kW – Section 2
- clothes dryers – Section 3
- clothes washers – Section 4
- computer monitors – Section 5
- dishwashers – Section 6
- household refrigerating appliances – Section 7
- electric storage water heaters (ESWHs) – Section 8
- gas water heaters – Section 9
- televisions – Section 10.

Most of the major energy consuming appliances in a home are subject to minimum energy performance standards (MEPS) or mandatory energy performance labelling (MEPL), or both. These regulatory initiatives have been in place for more than 20 years, with the purpose of regulating poorer performing products out of the market (MEPS) and helping consumers to choose products that use less energy (MEPLs), thereby saving them money and reducing the country's energy requirements.

There has been a general trend over time to increase the standards that apply to existing regulated products, add new products to the MEPS regime and improve labelling information.

About this analysis

The analysis to prepare this report was based largely on a database of product registration data held by EECA.

Consideration was also given to a range of macro-economic and market factors that may impact on individual and combined consumer buying decisions, including:

- economic growth
- Covid-19 pandemic effects
- cost of living, inflation and interest rates
- housing construction market
- demographic and lifestyle changes
- population growth and net migration.

There are a few key terms and definitions relevant to energy consumption and energy efficiency, and to this analysis generally, that apply to most of the product categories assessed in this report.

- **CEC** – comparative energy consumption. This is the claimed amount of energy a product will use in a year, based on test data conducted in accordance with the standards, and usage assumptions. CEC allows consumers to compare the energy use of different models of appliance and potentially calculate their running costs. This information is provided on the energy rating label, which also includes the product's star rating.
- **Sales-weighted averages** – used throughout this report and the associated analysis to calculate average figures for a variety of features based on a weighted average number of models sold, thus

taking into account the popularity of models. For example, the average capacity of a washing machine or the average television screen size.

- **Supplied products** – used to include all products advertised for supply, lease hire or purchase.

Key insights

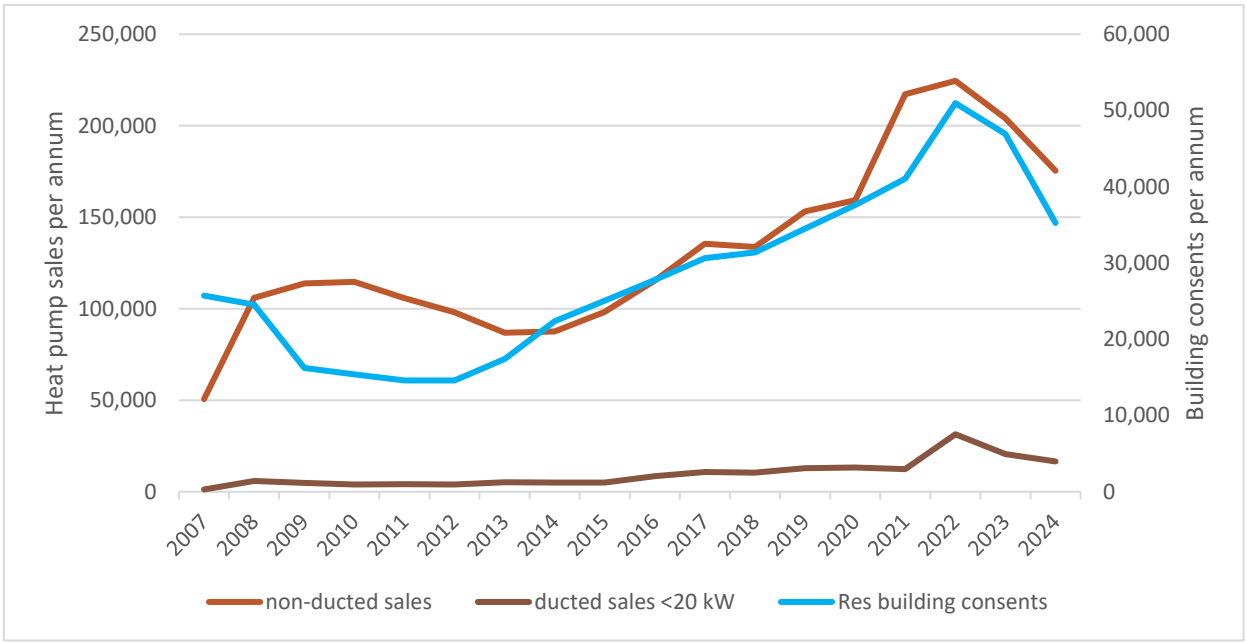
Energy efficiency is generally improving. In general, products are becoming more energy efficient, particularly when measured on an energy intensity level, for example kWh per size of screen for televisions and monitors, or kWh per litre of capacity for household refrigerating appliances. However, the improved efficiency in product energy consumption is countered to some degree by ongoing growth in the size of some home appliances. For example, the average television screen size has grown from 37.5 inches to 50 inches over the past 10 years.

Increasing numbers of brands and choice. Across all product categories, there has generally been significant growth in the range of companies, brands and models operating in the New Zealand market, showing that consumers are buying a wider range of models, from more brands and companies.

Changes in country of manufacture. Historically, many appliances sold in New Zealand were produced in New Zealand. However, for all product categories addressed in this report (with the exception of ESWHs, which are still predominantly manufactured in New Zealand), the majority of products are now sourced from overseas. The most common country of manufacture is China, followed by Thailand.

The residential construction boom from 2021 to 2023 led to increased demand for home appliances across the board. This can be seen, for example, in Figure 1 with respect to air-conditioners (heat pumps), where there is a strong correlation between building consent numbers and sales of heat pumps, particularly single-split systems, which are the most common type.

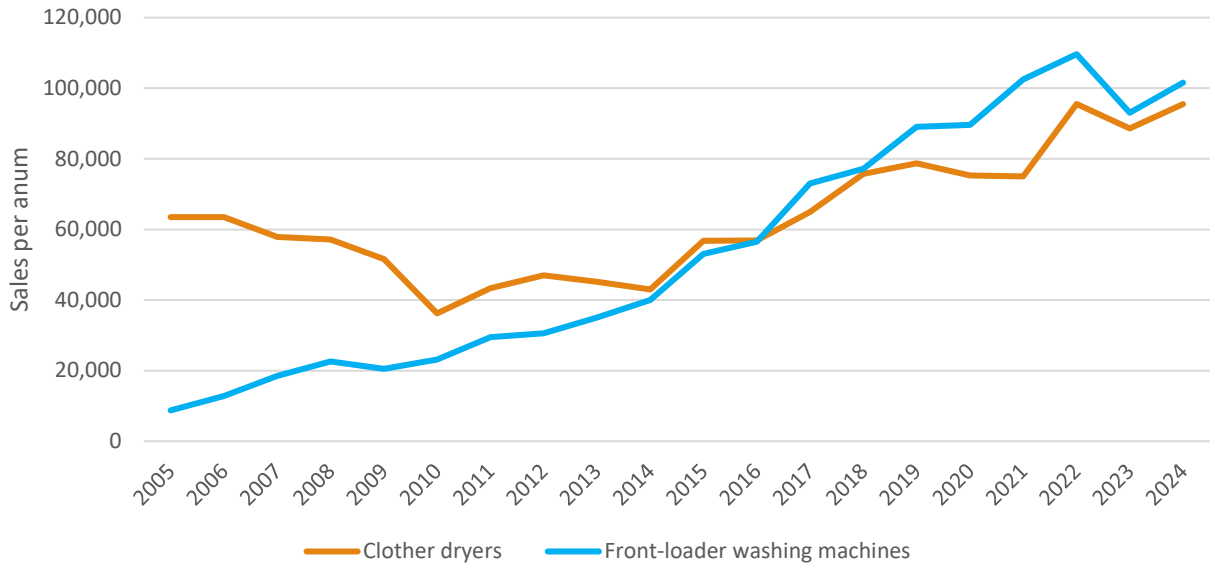
Figure 1: Relationship between heat pump sales and building consent numbers



Key insights for clothes washing and drying appliances

From 2010, there has been a strong correlation between sales of front-loader washing machines and sales of clothes dryers, as can be seen in Figure 2. This indicates that front-loader clothes washers and clothes dryers are often being bought together, potentially to stack on top of one another to save space.

Figure 2: Correlation between sales of clothes dryers and front-loader washing machines



Growth in size of appliances. Clothes washers and dryers have increased in size over time, with the average capacity growing by 14% and 36%, respectively, over the past 10 years.

However, there is some doubt as to whether consumers are using the full capacity of these appliances. Research has found that most consumers in Australia wash approximately 3.5kg in a load, and would struggle to shut the door of their clothes washer if it was filled to capacity.[1]

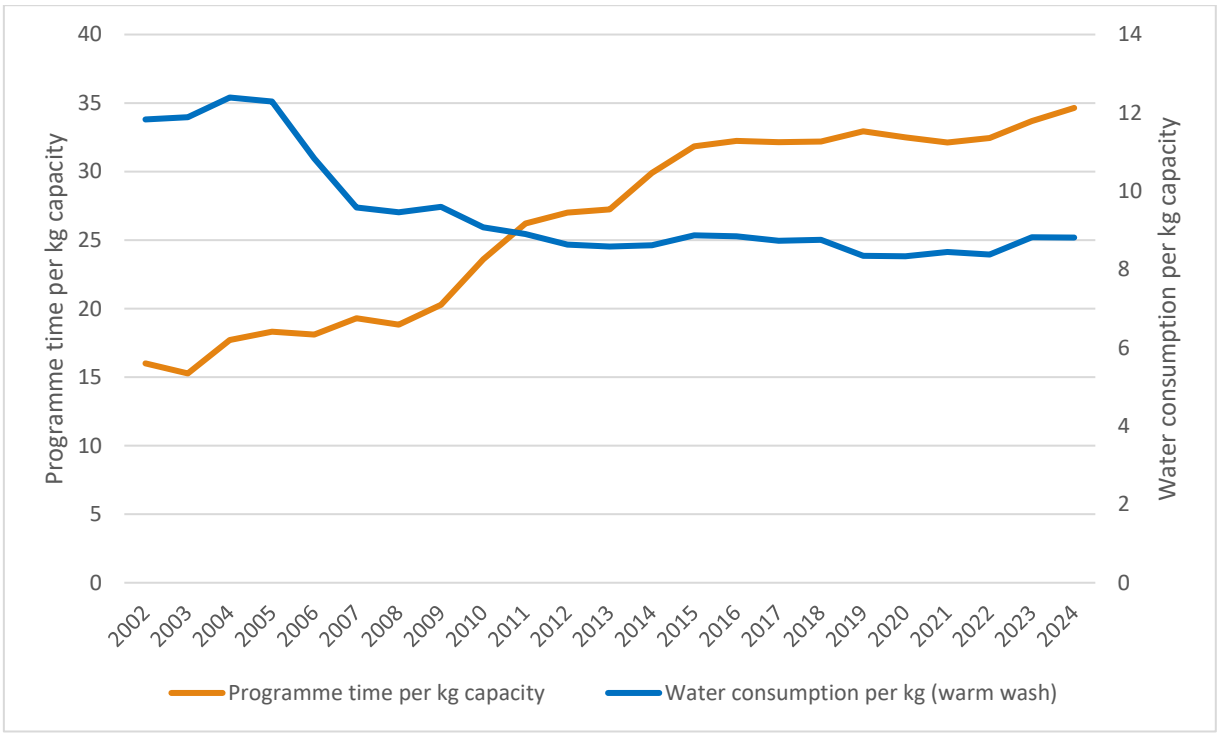
By comparison, the size of dishwashers has stayed relatively static, as dishwasher size tends to be constrained by the available space in a kitchen.

Cleaning circle. The Cleaning circle is a model developed by Herbert Sinner (also called Sinner's cycle) that describes the four key factors influencing the effectiveness of any cleaning process: chemistry, mechanics, temperature and time. These factors interact and influence each other; changing one factor requires adjustments to the others to maintain cleaning effectiveness.

Figure 3 shows that since 2002 the programme time for clothes washers has steadily increased, while there has been a corresponding reduction in the amount of water used per kg of capacity over that time.

[1] Choice May 2025, page 53

Figure 3: Relationship between clothes washer programme time and water use per kg of capacity

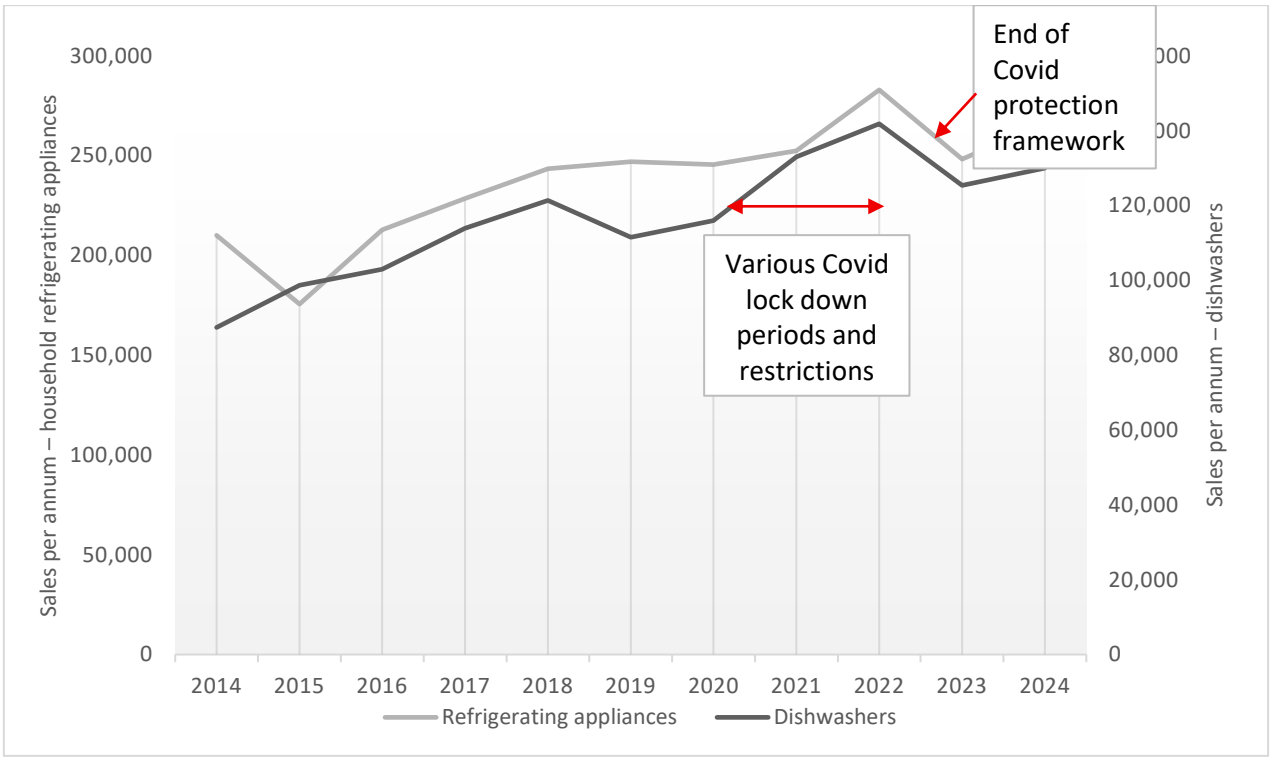


The programme cleaning times that suppliers use in tests for attaining energy rating labels for their appliances have increased. However, this may not represent how householders are actually using these appliances. The average programme time tested for a front-loader washing machine is now five hours. It is unlikely that many householders would use a five-hour programme.

Key insights for kitchen appliances

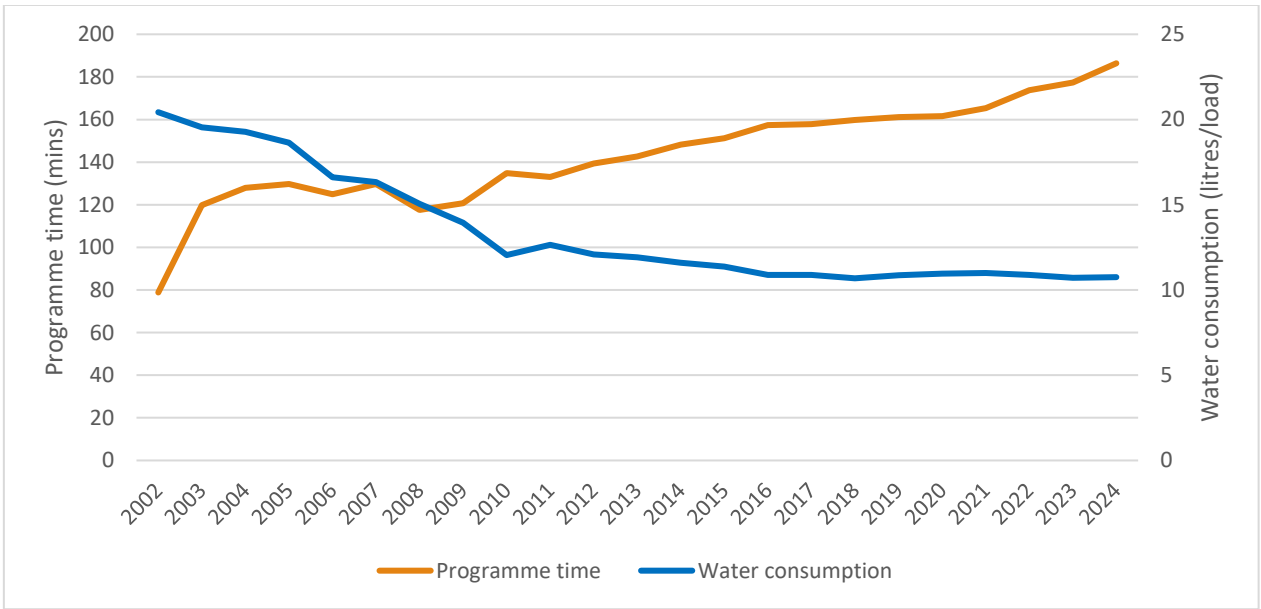
Figure 4 shows that there was an increase in sales of household refrigerating appliances and dishwashers from 2020 to 2022, aligning with Covid lockdowns and anecdotal reports of householders spending money on upgrading their kitchens over this time, as an alternative to overseas travel which was generally not possible.

Figure 4: Relationship between sales of household refrigerating appliances and dishwashers and Covid restrictions



Changes to the programme time and water use, as discussed in relation to the Cleaning Circle above, may also apply to dishwashers, as can be seen in Figure 5.

Figure 5: Relationship between dishwasher programme time and water use per load



Key insights for water heaters

Gas instantaneous water heating was popular until about 2021, with a steady growth in annual sales from 2013. Sales then began to decline steadily, reducing by 30% from 2021 to 2024, despite an increase in home building over much of that time. This reduction may have been driven by concerns about potential gas shortages and price increases, plus a general move away from using fossil fuels in favour of electricity.

ESWHs showed growth from 2016 to 2024. Some of this will have been driven by the growth in home building from 2021 to 2023. However, part of the increase in sales will have been as a result of declining interest in purchasing gas water heaters.

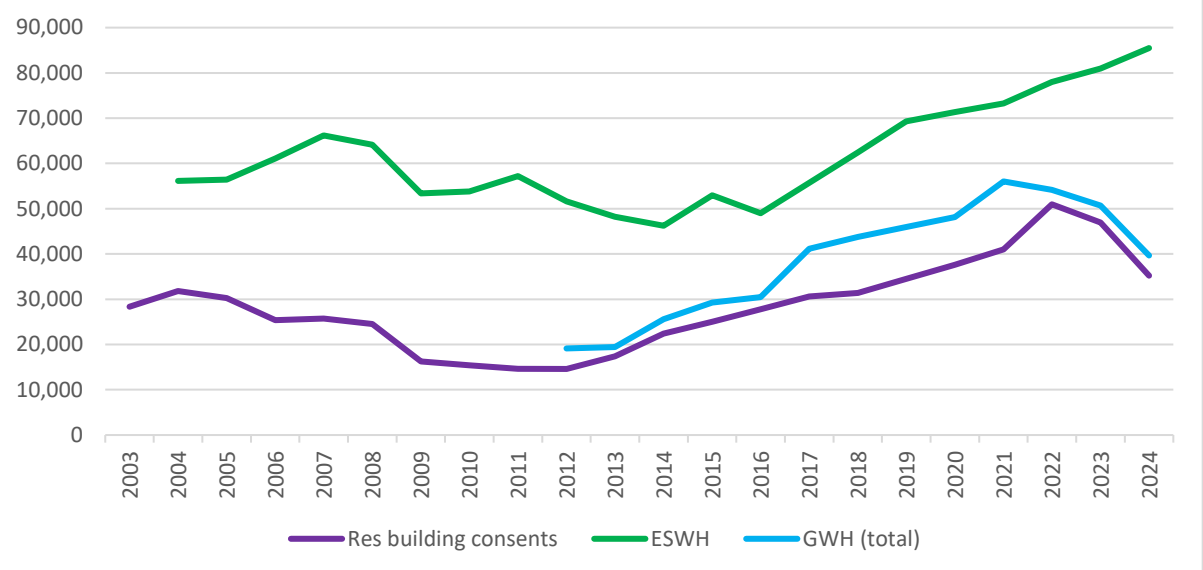
The measured rate of heat loss from ESWHs has increased slightly over the years, so that the measured ESWH heat losses are higher in 2024 than they were in 2014.

Average gross storage volumes within each of the cylinder size groupings (under-bench, small, medium and large) have been absolutely flat for 15 years.

Consumers are showing a preference for mains-pressure ESWHs. Low-pressure ESWH sales have declined by 50% over the past 5 years. In that time, mains-pressure system sales are up by over 50%.

Figure 6 shows that sales of gas water heaters (including both instantaneous and storage systems) have generally followed the same pattern as residential building consents. Sales of ESWHs also followed the same path as residential building consents from 2014 to 2022, but since then has continued to increase while the number of building consents and sales of gas water heaters has declined. This is likely to be due to householders replacing old low-pressure systems and failed mains-pressure ESWHs, and also potentially replacing gas water heaters with electric models.

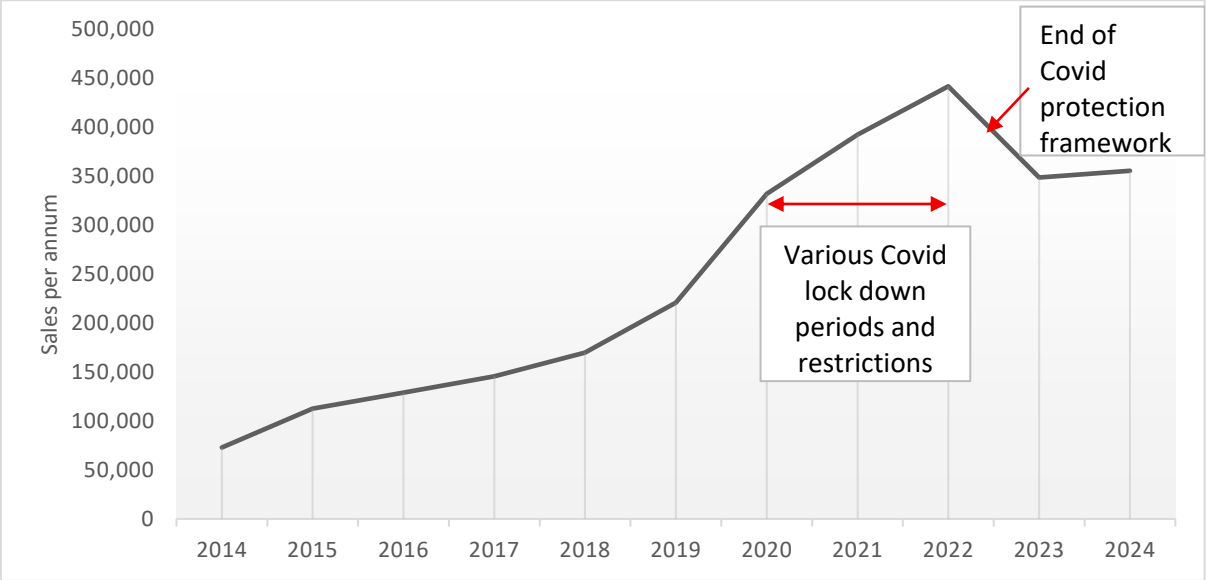
Figure 6: Relationship between sales of water heating systems and building consent numbers



Key insights for computer monitors

While sales of computer monitors had been on a growth path since 2014, there was an acceleration of sales from 2020 to 2022, aligning with Covid lockdowns and a strong movement towards working from home, as shown in Figure 7. Monitor sales peaked in 2022 at 442,000 units.

Figure 7: Relationship between sales of computer monitors and Covid restrictions



During the Covid period, the average monitor size continued to increase, as did the share of sales of high-resolution monitors.

Key insights for televisions

The average size of television screens grew steadily from 2013 to 2022, increasing by 33% over that time to an average of 50 inches. Since 2022, the average size has remained flat, potentially indicating that for many householders they have reached the limit of what can be accommodated within a living room without overly dominating the space.

There has been a strong move to higher resolution screens, with 4K screens now dominating sales with 67% market share. On average, 4K televisions use 81% more energy than HD televisions per square inch of screen size. However, as the average 4K television is larger than the average HD television, the overall average energy use of 4K television is more than three times that of HD televisions.

Key insights for air conditioners / heat pumps

There has been enormous growth in sales of heat pumps over the past 15 to 20 years. High levels of sales are likely to continue, as the majority of new homes are likely to have a heat pump installed. Given that the average economic lifetime of a heat pump is around 10 to 15 years, some current and future sales are likely to be replacements for older, existing units.

Heat pumps are the choice of heating for many new and existing homes because of their convenience and energy efficiency, when compared to woodburners or electric resistance heaters. Sales of heat pumps have also been driven in rental properties by the Healthy Homes Standards which, in many cases, have resulted in a heat pump being installed to enable the property to meet the heating requirements, which became mandatory on 1 July 2025.

There is a trend towards ducted heat pumps as homeowners look more for a whole-of-home heating solution. There is also a move towards low-ozone-depleting (ODP) refrigerants and low-global-warming-potential (GWP) refrigerants being used in heat pumps. Virtually all single-split and ducted systems now use R32 as a refrigerant, which has a GWP of 675. This represents a relatively rapid move away from the previously commonly used R410A refrigerant, which has a GWP of 2,088.

1. Overview and purpose of these reports

This report is part of a series of product insights reports from EECA (the Energy Efficiency and Conservation Authority), which have the purpose of informing consumers and product suppliers on trends in energy efficiency technology and market trends for regulated products.

This report focuses on a number of residential product categories that are regulated in New Zealand and required to comply with the minimum energy performance standards (MEPS) or the mandatory energy performance labelling (MEPL) regime, or both.

1.1 Data sources and analysis methodology

The insights in this report are based on an analysis of product registration and sales data held by EECA, captured as part of the Equipment Energy Efficiency (E3) programme, and supplemented by research into each of the product categories.

The data used for all products is for sales for the **year ending 31 March**. This means that data that is identified as, for example, 2024, represents data for the period 1 April 2023 to 31 March 2024.

Data on general economic factors, such as gross domestic product (GDP) and residential building consents, was obtained from www.stats.govt.nz.

The analysis involved the following steps:

- raw data was extracted from a database of product registrations held by EECA
- the data was checked and assessed for invalid values
- analysis and calculations of key parameters was conducted for each product, including sales-weighted averages, size distributions and efficiency measures
- results were output as pivot tables and charts for inclusion in these reports.

1.2 Report structure

There is a separate section in the report for each of the product categories analysed. Each section covers:

- description of product class
- relevant regulations
- market and sales trends
- product trends
- product efficiency trends
- additional commentary
- summary of key insights.

2. Air conditioners / heat pumps (under 20kW)

2.1 Description of product class

Domestic air conditioners, generally known as heat pumps in New Zealand, are a popular choice for energy-efficient year-round climate control.

Heat pumps offer both heating and cooling capabilities, although they are used primarily for heating purposes in New Zealand. Systems come in various types and sizes to match different home layouts and heating and cooling requirements. Outputs typically range from 2.5kW to 9kW for single-split (non-ducted) systems and from 12kW to 18kW for ducted systems. Most sales of heat pumps that are under 20kW are for the residential market.

Heat pumps are a highly efficient form of home heating. Their energy efficiency is measured using the coefficient of performance (COP), which is the ratio of heat energy output to electrical energy input. COPs typically range from 3.0 to 5.5, but depend on many factors including ambient air temperature. When used for heating, the efficiency of a heat pump typically decreases as the ambient air temperature decreases.

Heat pumps are electrically powered and, in heating mode, use a vapour compression refrigerant cycle to remove heat from the outside air and transfer it to the air inside a room or home.

The main types of heat pump systems are:

- **wall-mounted split systems** (also known as single-split systems): the most common type of system, consisting of an indoor unit mounted on the wall and an outdoor unit; ideal for heating or cooling individual rooms
- **floor-standing units** (console): installed at floor level; suitable for homes with limited wall space
- **multi-split systems**: connect multiple indoor units to a single outdoor unit, allowing individual temperature control in different rooms
- **ducted systems**: provide whole-home climate control, distributing conditioned air through a network of ducts with minimal visual impact; ideal for new builds or major renovations.

This report focuses on single-split and ducted heat pump systems. It is possible to buy unitary window or wall and portable air conditioners, but these make up just 0.4% and 2.4% of the market, respectively, and are not discussed further in this report. Multi-split, packaged and VRF systems are also available, although they are more commonly used in commercial settings.

A summary of the key statistics for single-split (non-ducted) and ducted heat pump systems is given in Table 1.

Table 1: Heat pump statistics 2024

Type	Single-split system (non-ducted)	Ducted
		
Description	Consist of an indoor unit mounted on the wall (high-wall or hi-wall model) or floor (console model) and an outdoor unit. Ideal for heating or cooling individual rooms.	Provide whole-home climate control, using ducted systems to distribute conditioned air through a network of ducts, with minimal visual impact. Ideal for new builds or major renovations.
Market share of sales in 2024	92%	8%
Average capacity	5.7kW	12.5kW
Average COP at full load	4.1	3.9

Type	Single-split system (non-ducted)	Ducted
Average HSPF* (cold zone)	3.76	3.47
Dominant type of refrigerant	R32	R32

Note: *HSPF = heating seasonal performance factor.

Key considerations when choosing a heat pump include the following.

- **Capacity or size:** the unit should be sized to match the size and insulation of the space to be heated or cooled. Factors such as room dimensions, ceiling height and heat loads (e.g., kitchen appliances and lighting) influence the required capacity. Most heat pump suppliers have proprietary sizing tools to help determine the correct size models.
- **Energy efficiency:** most models will come with energy rating labels indicating their level of energy efficiency. Models with higher star ratings use less electricity per kW of heating provided (compared to models of the same size) and therefore have lower operating costs.
- **Climate compatibility:** the performance of heat pumps generally declines with ambient temperature, so in colder regions it is important to select a model with reliable performance at low temperatures.
- **Noise levels:** noise levels of models will vary. It is useful to consider units with low noise output for bedrooms or study areas or in close proximity to neighbours.
- **Additional features:** modern heat pumps may include air purification systems, app-based controls, and programmable settings for enhanced comfort and convenience.

2.2 Relevant regulations

Heat pumps are regulated in Australia and New Zealand, with most common types required to have a zoned energy rating label (ZERL) and meet the MEPS.

In New Zealand, the requirements are set out in the Energy Efficiency (Energy Using Products) Regulations 2002, which reference the AS/NZS 3823.4 series of standards for 'Performance of electrical appliances - Air conditioners and heat pumps'. Heats pumps are currently not required to display their ZERL when they are only sold online.

Since 1 July 2021, updated regulatory requirements have applied in New Zealand, including:

- when products are being assessed for energy efficiency rating purposes, the seasonal energy efficiency ratio (SEER) standard must be used
- some products are to carry a ZERL, which replaces the previous energy rating label and uses SEER data as an input. (Note that certain product types are required to test for and register the information, but are not required to display the ZERL, for example, ducted units.)

The introduction of the ZERL means labels now show energy ratings for three climate zones across Australia and New Zealand. For devices capable of both heating and cooling, the ZERL shows heating and cooling ratings for each of the three climate zones. The heating seasonal performance factor (HSPF) is calculated in accordance with clause 6.1 of AS/NZS 3823.4.2:2014 and derived from the use of rated values. The star rating corresponds directly to the HSPF, according to a table of values within certain ranges.

More information on rating labels for heat pumps can be found at Air conditioners | EECA.

2.3 Market and sales trends

Total sales for heat pumps in 2000, including ducted and non-ducted systems, were around 16,500 units. From 2008 to 2015, total sales were typically around 100,000 per annum, then accelerated to a peak of

272,000 sales in 2022, and have declined slightly since then. Overall, sales of heat pumps have doubled in the last 10 years.

One of the key drivers for this increase in the uptake in heat pumps is likely to have been the Healthy Homes Standards, which became mandatory for all rental properties in New Zealand from 1 July 2025. While the standards were introduced on 1 July 2019, private landlords had a transition period to comply with the new regulations. Private landlords who started or renewed a tenancy between 1 July 2021 and 27 August 2022 had 90 days to comply with the standards.

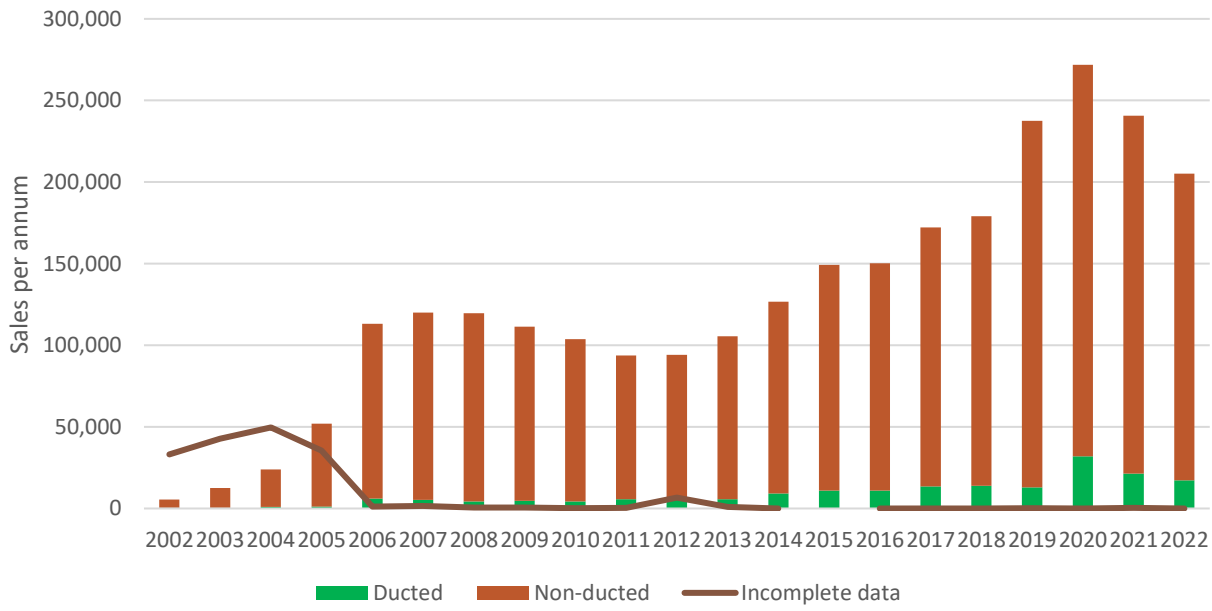
EECA's Warmer Kiwi Homes programme and other regional heating incentive programmes have also contributed to sales of heat pumps. Another driver has been the home construction boom which peaked from late 2021 to late 2022.

The sales trends for heat pumps split by ducted and non-ducted systems are shown in Figure 8.

Sales of simple, non-ducted split systems have dominated ducted systems, with 92% of heat pump systems sold being non-ducted. However, the share of the market for ducted systems has doubled from 4% in 2009 to 8% in 2024, indicating an increasing preference for ducted systems as they offer more of a whole-of-home solution.

Data quality for heat pumps before 2008 is poor, with the exception of sales numbers. The line in Figure 8 shows the number of sales for which relevant data was not available. As a result of this data issue, all other graphs for heat pumps in this document do not include any data from prior to 2008.

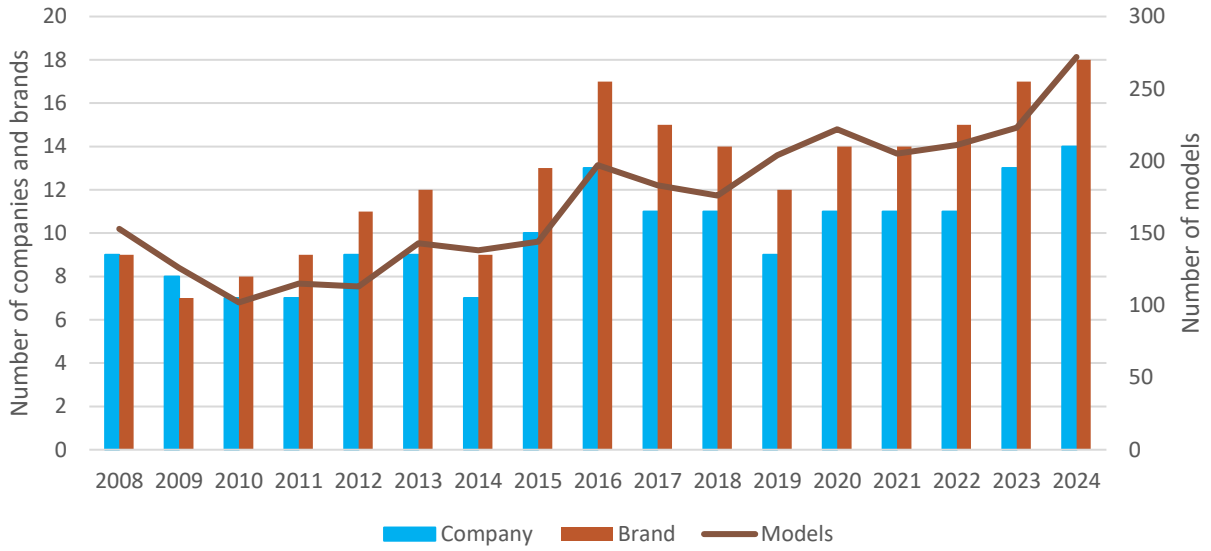
Figure 8: Heat pump sales trend



The availability of ducted heat pumps in New Zealand has increased over the past 16 years, with 272 models, 18 brands, and 14 importers or manufacturers in the market in 2024.

The increase in the number of models available has been significant, from the 153 models available in 2008. The number of companies and brands available has also increased over that time, although this has not been a steady trend, with increases and declines over the past 16 years. These trends can be seen in Figure 9.

Figure 9: Changes in number of companies, brands and models – ducted heat pumps

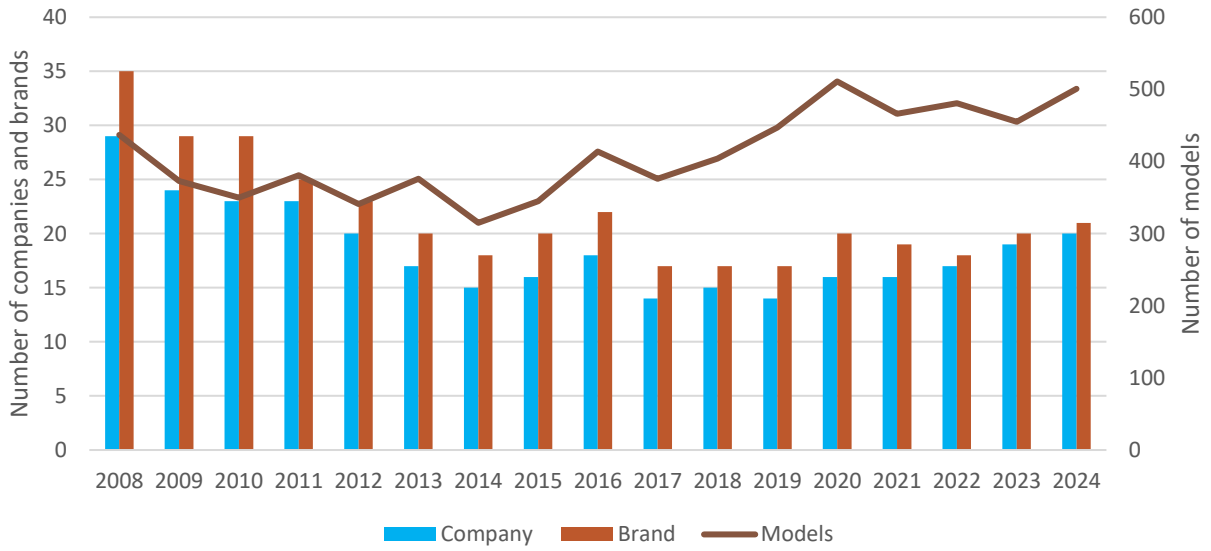


For non-ducted, single-split heat pumps, the number of models available in the market has increased slightly over the last 16 years, from 437 in 2008 to 501 in 2024.

The number of brands and importers or manufacturers both followed a similar pattern of decreasing from 2008 to between 2014 and 2019, then increasing slightly; the net effect has been that there were fewer brands and importers and manufacturers operating in the market in 2024 than there were in 2008.

These trends can be seen in Figure 10.

Figure 10: Changes in number of companies, brands and models – non-ducted heat pumps



2.4 Product trends

The sales trends for single-split systems by size category are shown in Figure 11.

The figure shows that sales for all size categories have followed a similar path. Peaks occurred for all categories around 2021 and 2022, followed by a marked drop off. These peaks could be due to a surge in

sales driven by the need for Healthy Homes Standards compliance for rental properties. There was also a surge in new building construction from 2019 to 2022, which will have driven purchases of heat pumps.

Figure 11: Sales trend by capacity – single-split systems

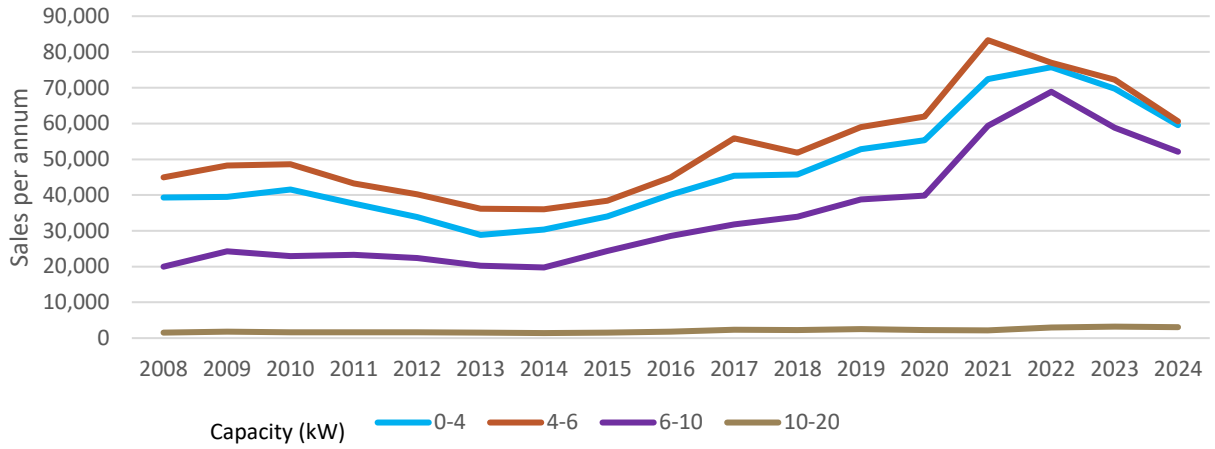


Figure 12 shows that 0–4kW single-split systems have remained relatively steady at around 35% of total sales. The share of sales of 4–6kW systems has declined slightly, from around 42% of sales in 2008 to 35% of sales in 2024. Sales of 6–10kW systems have grown considerably from 19% of sales in 2008 to 30% in 2024, indicating the increasing popularity of systems in that size bracket. This is likely to be due to sales of replacement systems and new systems designed to heat the main living areas of homes, and is consistent with increases in building consent numbers around that time. Sales of very large single-split systems (10–20kW) have remained low and static at 1.5% of sales.

Figure 12: Sales split by capacity – single-split systems

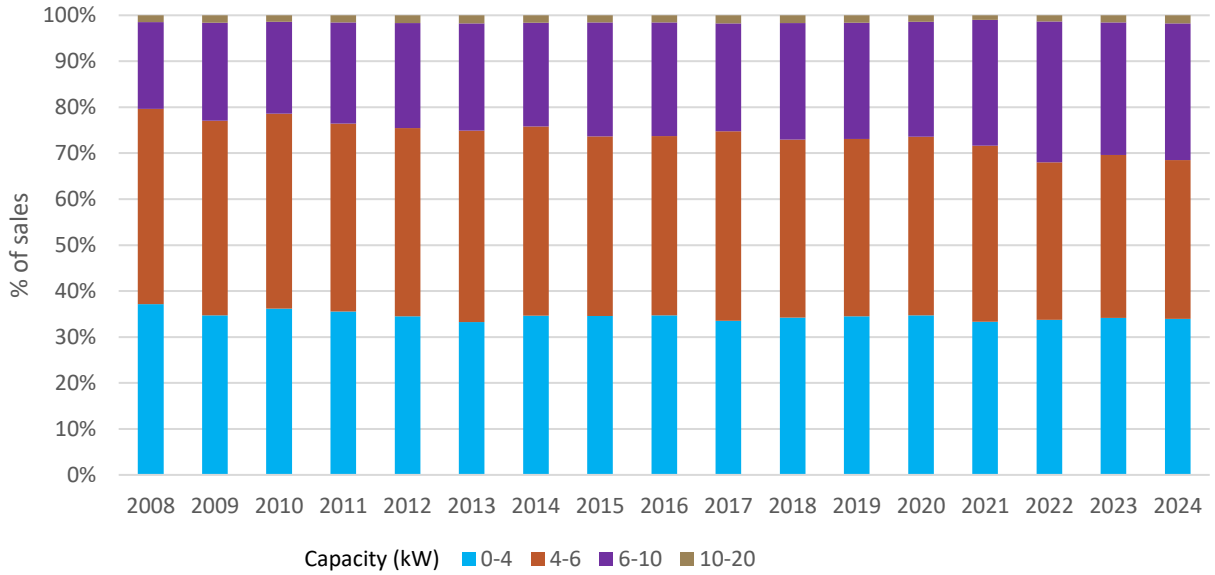
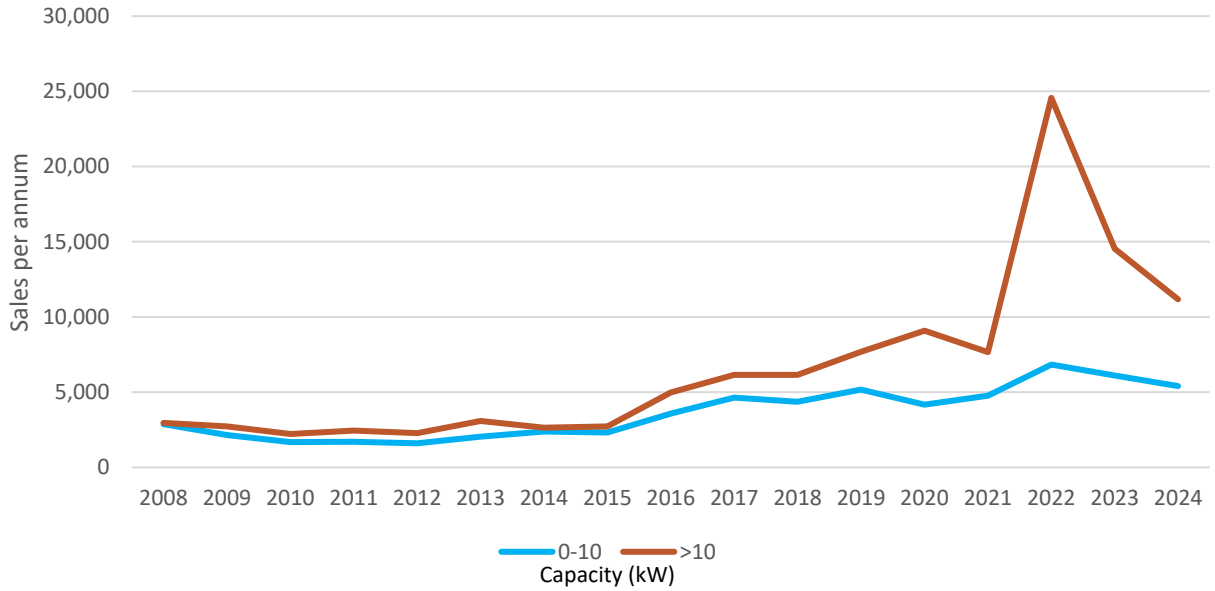


Figure 13 shows that ducted systems have increased in popularity over the past 16 years, with sales nearly tripling from 5,800 systems sold in 2008 to 16,600 sold in 2024. There was a spike in sales in 2022 when 31,400 ducted systems were sold, likely as a result in the residential building boom, which peaked around then. In 2008, 51% of the ducted systems sold had a capacity greater than 10kW; this proportion has

increased steadily to 67% of all systems sold in 2024. In 2022, when total sales spiked, 78% of systems sold were greater than 10kW.

Figure 13: Sales split by capacity – ducted systems



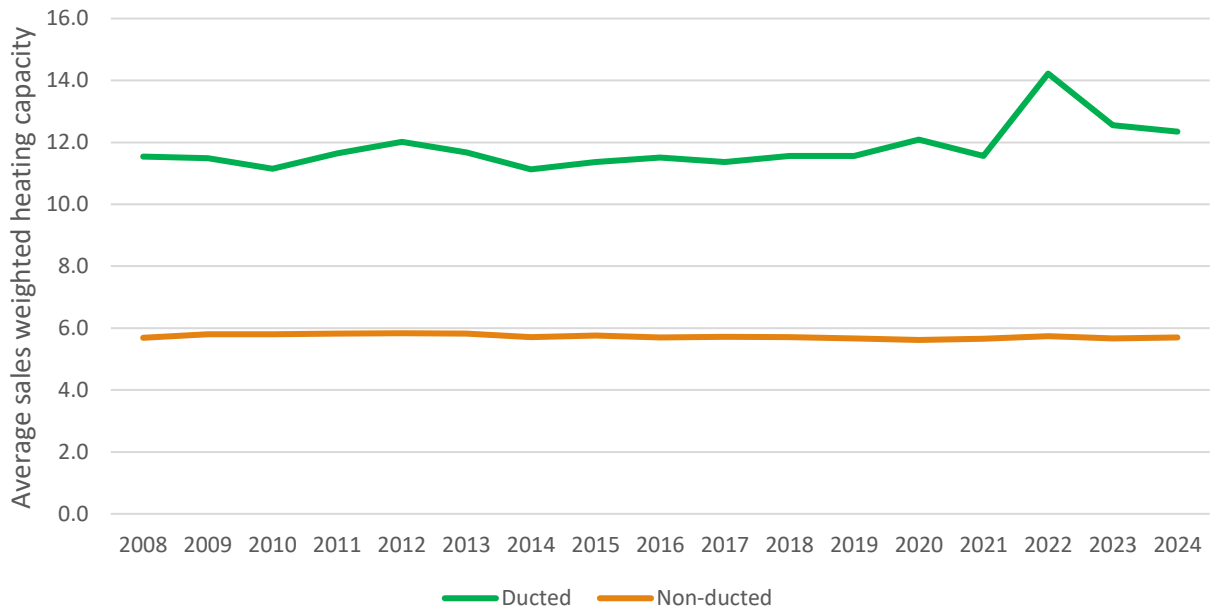
Capacity

Figure 14 shows the trend in average sales-weighted heating capacity for heat pumps.

For non-ducted systems, this capacity has remained steady at 5.7kW over the past 16 years. The average capacity of these systems has remained stable, as the sales proportion of larger (6 to 10kW) systems has increased, while the average heating capacity of the smaller categories has decreased since 2008.

For ducted systems, the sales-weighted average heating capacity has increased slightly over that time, going from 11.5kW to 12.5kW. The exception to this was a peak in 2022 where the average increased to 14.2kW; this increase will have been driven by the large number of large ducted systems sold in that year.

Figure 14: Average sales-weighted heating capacity – heat pumps

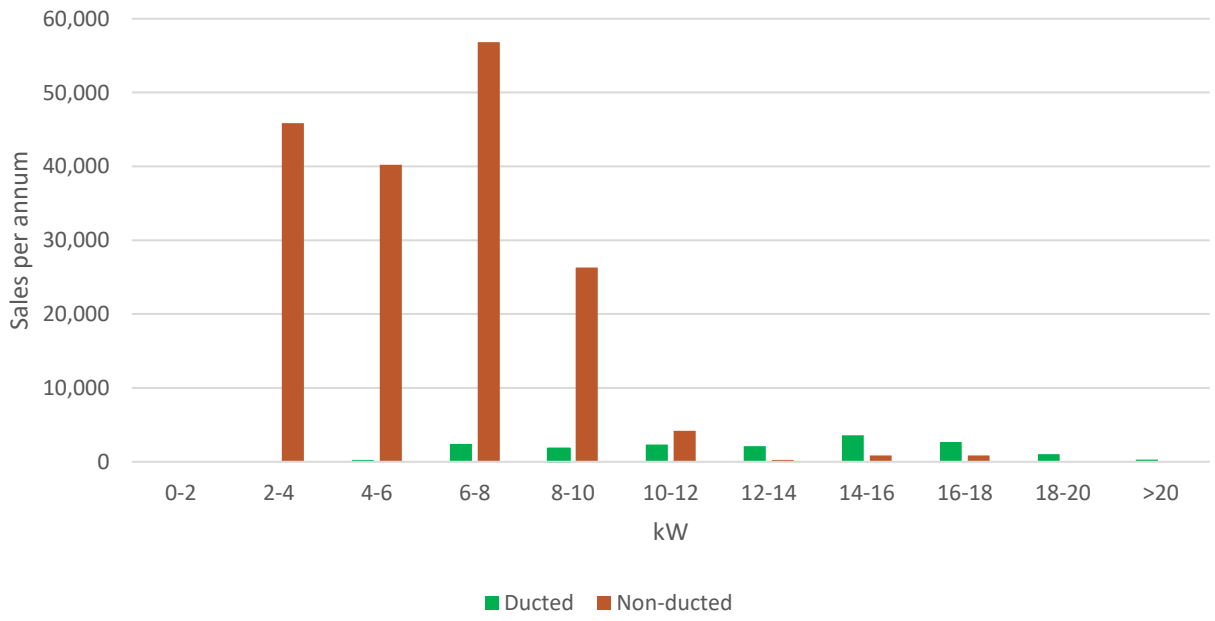


There is a range of capacities available in the heat pump market, and the capacity distributions for non-ducted and ducted heat pumps are shown in Figure 15.

This figure shows that the most popular sales category for non-ducted systems is 6kW to 8kW, and the second most popular category is 2kW to 4kW, with 32% and 26% of non-ducted sales, respectively.

Sales of ducted systems are more evenly spread across a range of capacities from 6kW to 18kW, with the most popular size being 14–16kW, with 22% of ducted sales.

Figure 15: Load capacity distribution – heat pumps



Refrigerant type

Figure 16 shows the major change in the refrigerant used in non-ducted systems.

In 2008, virtually all single-split non-ducted systems used R410A as a refrigerant. R22 had previously been used, but by 2008 it was used in only 3% of systems sold.

R22 has a high global warming potential (GWP), as well as high ozone depleting properties. From 2016, another change became apparent with the phasing out of R410A and a move to the lower GWP R32 refrigerant. By 2024, 98% of the single-split systems sold used R32.

Figure 16: Refrigerant type trend – single-split systems

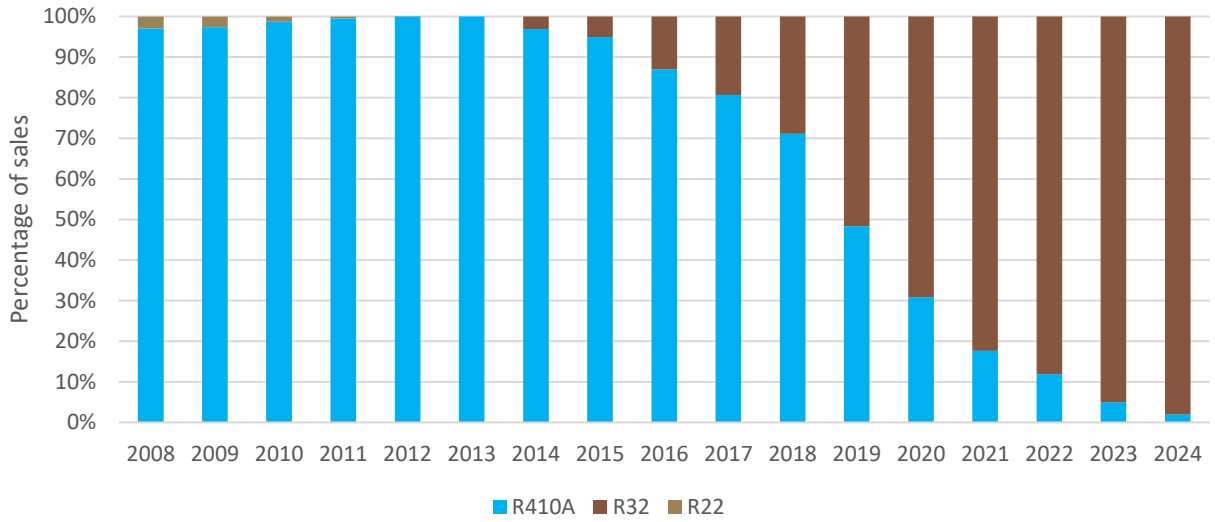
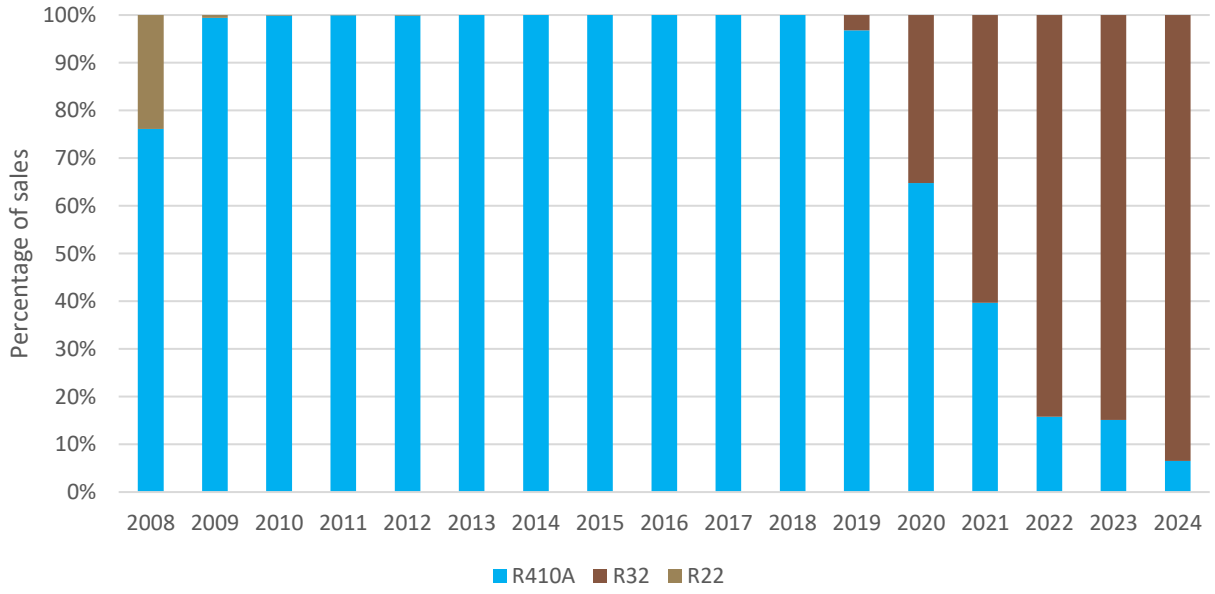


Figure 17 shows a similar pattern for ducted systems.

R22 ducted systems were virtually phased out by 2009, with essentially all ducted systems then using R410A. Around 2019, a shift to R32 refrigerant began – by 2024, 93% of all ducted systems sold used R32.

Figure 17: Refrigerant type trend – ducted systems



2.5 Product efficiency trends

Improved efficiency standards

Advancements in compressor designs, refrigerants and heat exchange methods have led to more energy-efficient heat pumps, reducing energy consumption and operational costs for homeowners. Evidence of this can be seen in various graphs in this section, including trends in metrics such as the COP and EER.

Single-split non-ducted systems – COP at full load

The COP of single-split systems at full load (H1 test conditions) has increased steadily over the past 16 years.

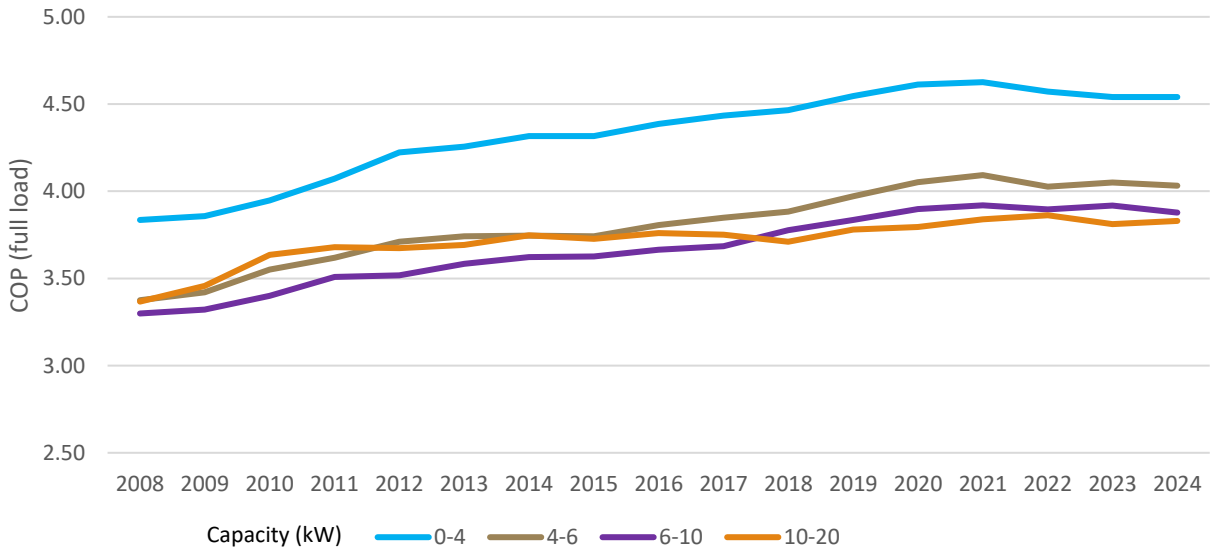
Figure 18 shows the trends for four categories of system size, which all follow a similar path. For the most common size grouping (4kW to 6kW capacity), the full load COP increased from 3.37 in 2008 to 4.03 in 2024.

Increases in COP have been driven by ongoing changes to energy efficiency regulations for heat pumps and labelling requirements. This has included MEPS, ZERLs (which provide information on performance by climate zone) and the performance of products tested against the SEER.

The new ZERL rewards (by giving more stars) part-load performance, compared to the previous star rating system that was based on full-load efficiency only. The increase in the proportion of models sold that are using the new ZERL has meant that importers and manufacturers are optimising their systems to gain higher ZERL stars, which is probably the cause of the decline or stabilisation of full-load efficiency in the past 3 years.

Figure 18 also shows the variation in COP based on capacity groupings. Smaller systems generally have higher COPs than larger systems. This efficiency variation based on system size occurs because larger heat pumps have larger compressors, fans and heat exchangers, which experience greater internal friction, thermal and electrical losses. Also, the surface area to volume ratio of the heat exchanger decreases as size increases, reducing heat exchanger efficiency per kW of output.

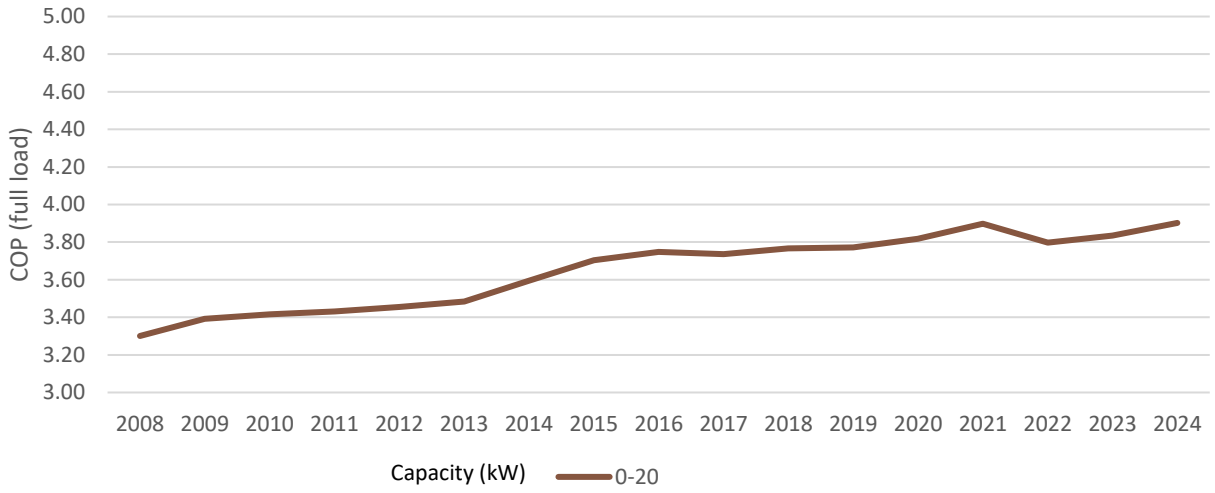
Figure 18: COP by capacity (full load) – single-split systems



Ducted systems – COP at full load

A similar trend is apparent with ducted systems. Figure 19 shows a generally steady increased in the COP for these systems from 3.3 in 2008 to 3.9 in 2024.

Figure 19: COP by capacity (full load) – ducted systems



Single-split systems – EER at full load

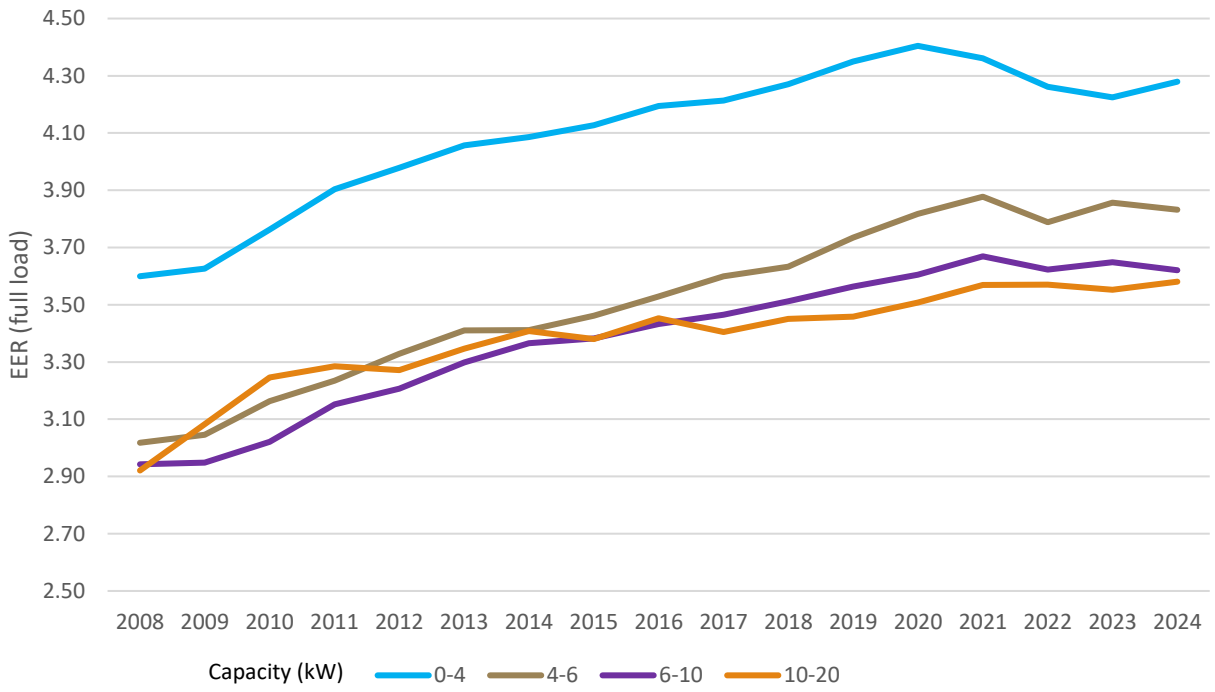
The EER of single-split systems at full load (T1 test conditions) has increased steadily over the past 16 years.

Figure 20 shows the trends for four categories of system size, which all follow a similar path. For the most common size grouping (4kW to 6kW capacity), the full-load EER increased from 3.02 in 2008 to 3.83 in 2024. This trend has been largely driven by manufacturers' responses to increases in the MEPS labelling requirements.

As is the case with COPs for cooling, smaller systems also tend to have higher EERs than larger systems.

Figure 20 also shows the variation in EER based on capacity groupings.

Figure 20: EER at full load, by capacity – single-split systems

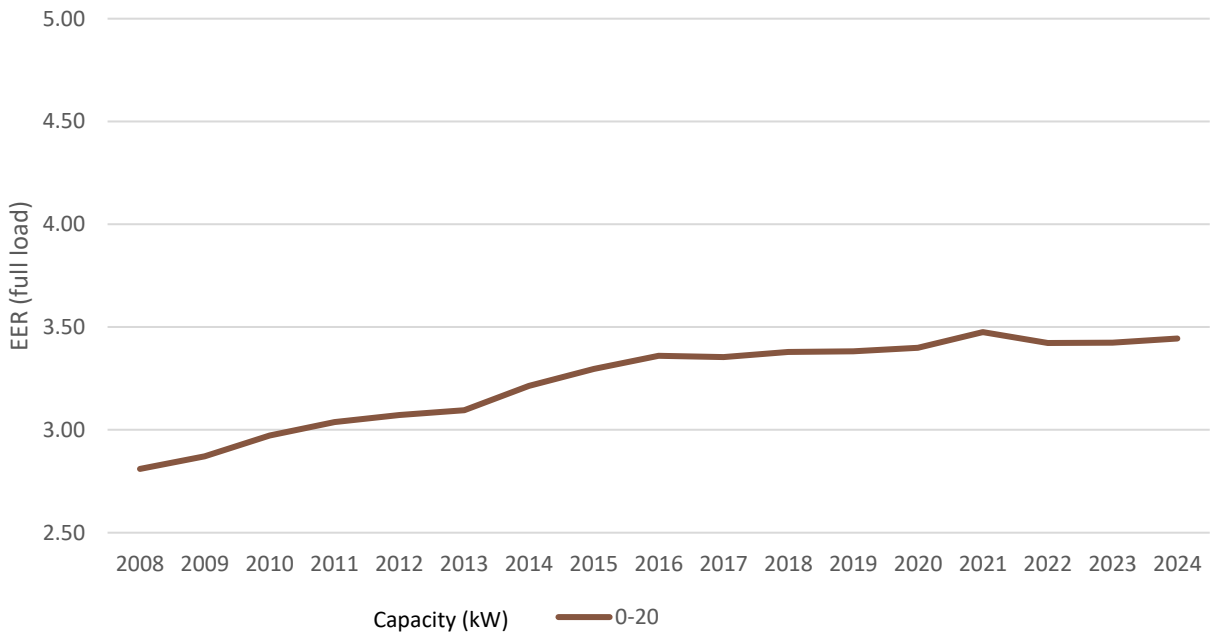


Ducted systems - EER at full load

A similar trend is apparent with ducted systems.

Figure 21 shows a generally steady trend in increasing EER from 2.81 in 2008 to 3.45 in 2024. As with single-split systems, this trend has been largely driven by manufacturers' responses to increases in MEPS labelling requirements.

Figure 21: EER at full load, by capacity – ducted systems

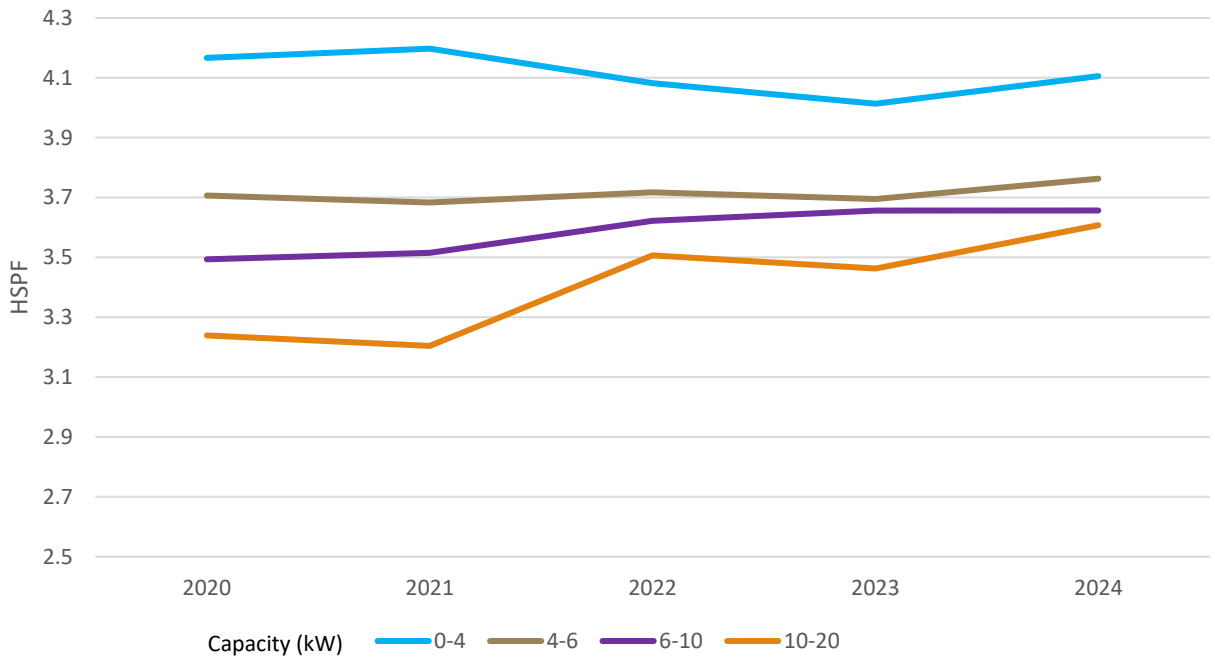


Heating seasonal performance factor (HSPF) – single-split systems: cold zone

The HSPF[2] of most single-split systems in the cold zone has varied only slightly over the past 4 years, since the introduction of ZERL.

As can be seen in Figure 22, for systems up to 6kW, the HSPFs are essentially the same in 2024 as they were in 2020. For 6kW to 10kW systems, there was a small (5%) increase over that time. The HSPF for 10kW to 20kW systems is up by 11%. However, this category has a relatively low sales volume (1.7% of single-split system sales), so any conclusions need to be considered in the light of being based on a small amount of data. Also, there was a lower share of products being sold in 2020 and 2021 with measured HSPF (approximately 25% of models), compared to 2022 to 2024 when over 80% to 90% of the models were labelled with the new ZERL.

Figure 22: HSPF: residential cold zone, by capacity – single-split systems



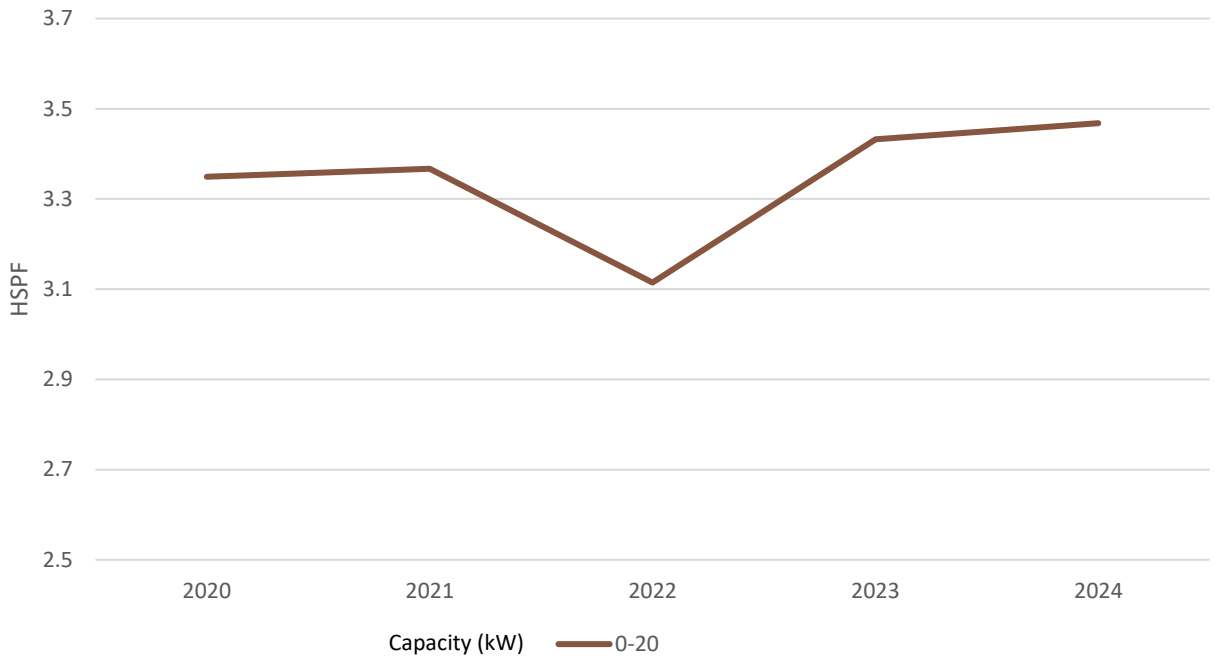
HSPF – ducted systems: cold zone

A similar trend is apparent with ducted systems.

Figure 23 shows a slight improvement in HSPF from 2020 to 2024. However, there was a significant, temporary decline in 2022. This is likely to be due to the large number of large-capacity ducted systems sold that year, probably due to the housing construction boom around that time. The large systems will have a lower HSPF, so will bring down the average for that year.

[2] Heating seasonal performance factor (HSPF) is the ratio of the total annual amount of heat load, including make-up heat, that the equipment needs to add to the conditioned space when operated for heating in active mode, to the total annual amount of energy consumed by the equipment in heating mode.

Figure 23: HSPF: cold zone, by capacity – ducted systems



Cooling seasonal performance factor (CSPF) – single-split systems: cold zone

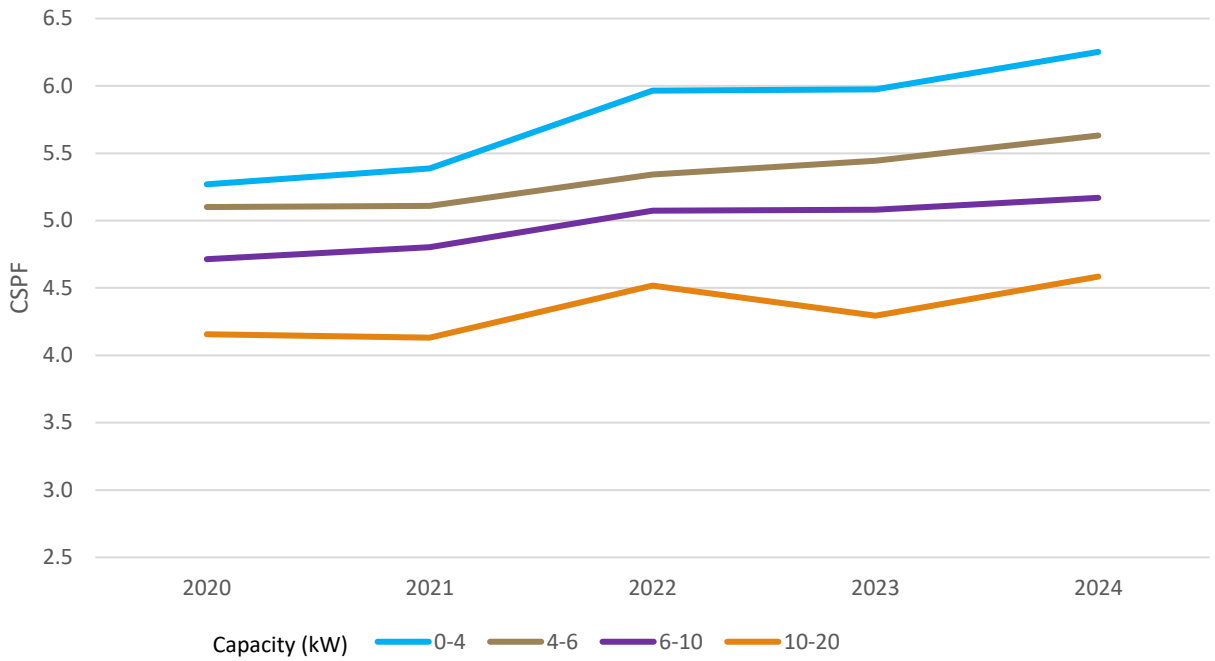
The CSPF[3] of single-split systems in the cold zone has increased steadily over the past 4 years across all size groupings.

Figure 24 shows the trends for four categories of system sizes, which all follow a similar path. For the most common size grouping (4kW to 6kW capacity), the CSPF in the cold zone increased from 5.1 in 2020 to 5.63 in 2024.

As is the case for EER, smaller systems tend to have higher CSPFs than larger systems.

[3] Cooling seasonal performance factor (CSPF) is a measure of how efficiently an air conditioner operates throughout the entire cooling season. It's calculated by comparing the total amount of heat required to be removed from a space during the cooling season (cooling load) to the total amount of electricity consumed by the system over the same period.

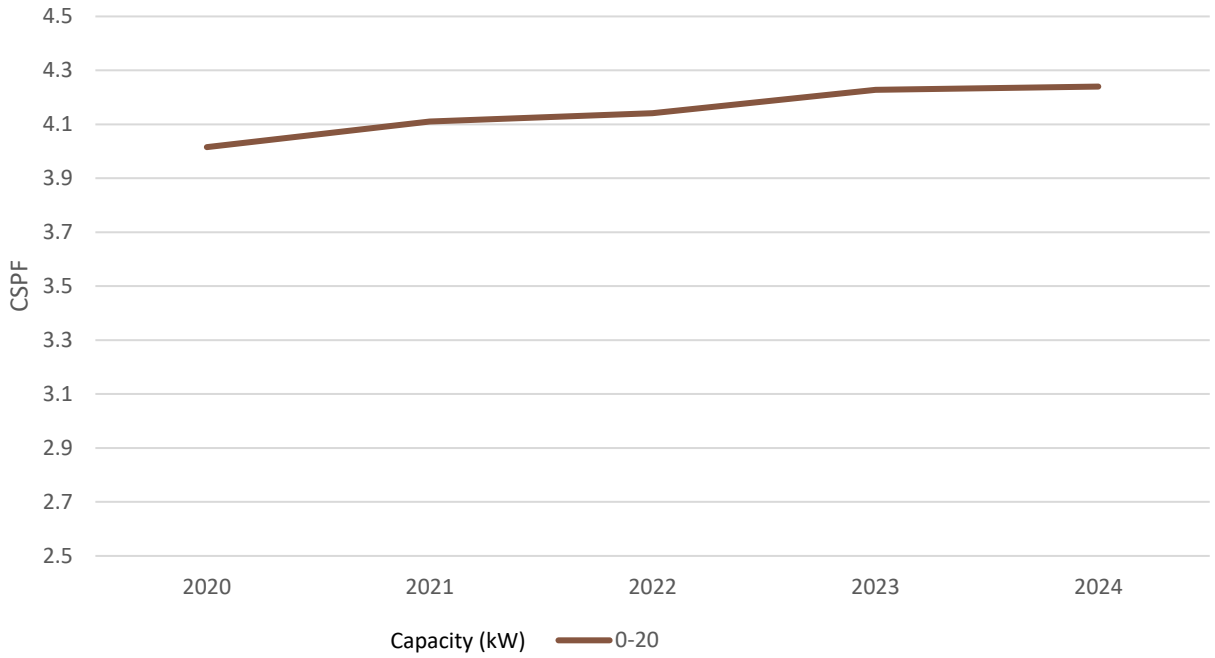
Figure 24: CSPF: cold zone, by capacity – single-split systems



CSPF – ducted systems: cold zone

A similar trend is apparent with ducted systems. Figure 25 shows a 6% improvement in CSPF from 2020 to 2024.

Figure 25: CSPF): cold zone, by capacity – ducted systems



Standby power (in Watts)

Heat pumps use a small amount of power when switched on and in standby mode. Trends in the average amount of power used in standby mode are shown in Figure 26 and Figure 27 for single-split systems and ducted systems, respectively.

Standby energy consumption for all but the largest category of single-split systems has declined from around 6–7W in 2010 to around 1–2W in 2024.

Standby power consumption for large single-split systems has followed quite a different trajectory, initially increasing from around 25W up to nearly 40W in 2013 and 2014, and then declining sharply to 3.75W in 2024.

The reason for this is that larger capacity units use a larger electrical heater in the outdoor unit to help keep the oil warmer than the surrounding refrigerant. Not all heat pumps need a crankcase heater, as it depends on the design and refrigerant used. It is possible that some heat pumps with R32 refrigerant do not require a crankcase heater.

Standby power consumption for ducted systems follows a very similar path to that of large single-split systems, initially increasing from 8W up to 22W in 2019, followed by a sharp decline to 3.65W in 2024. This is because ducted systems also use an electrical heater in the outdoor unit to keep the refrigerant warm.

Figure 26: Standby power, by capacity – single-split systems

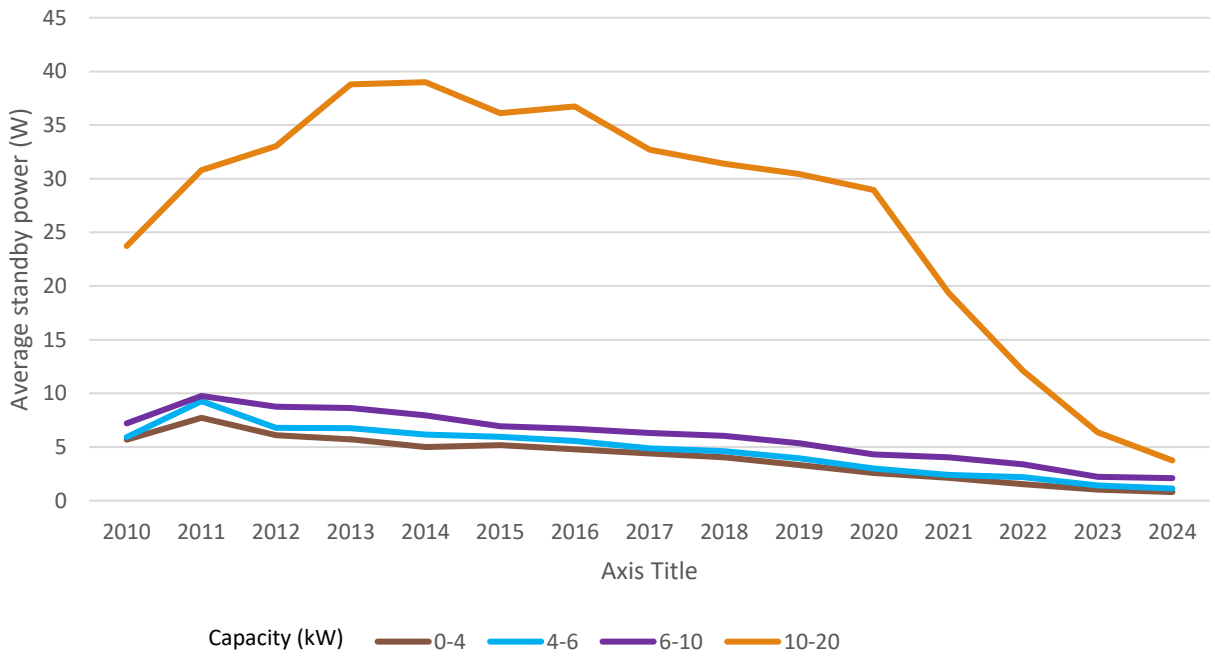
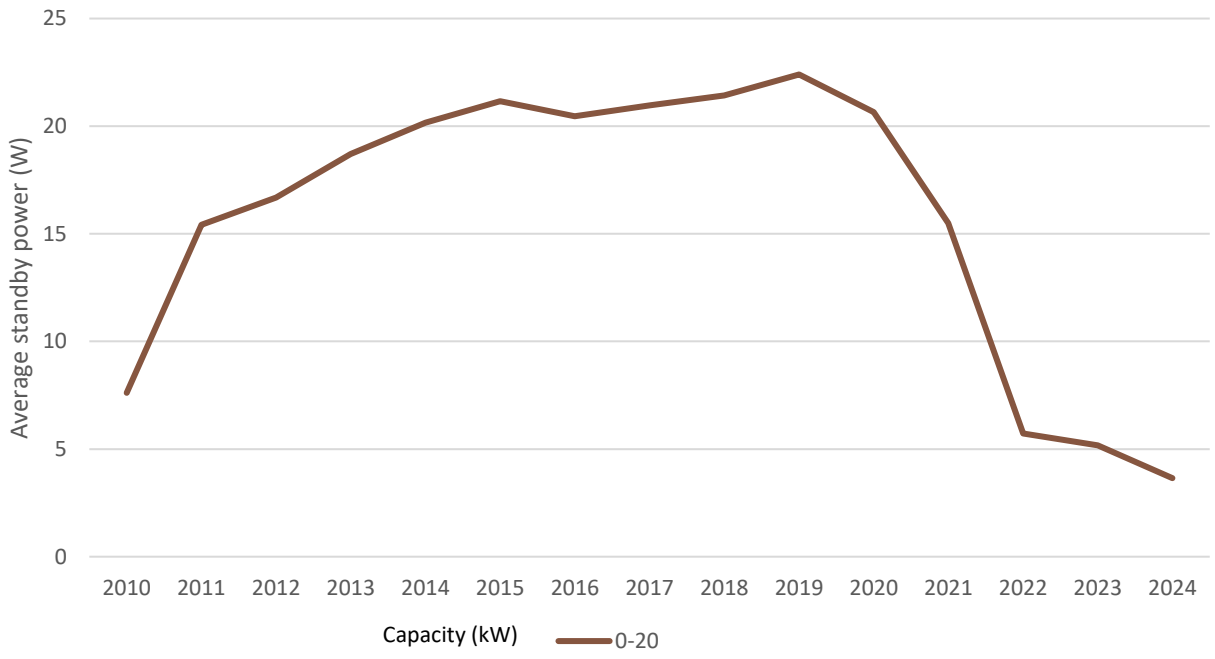


Figure 27: Standby power, by capacity – ducted systems



COP at H2 conditions for single-split systems

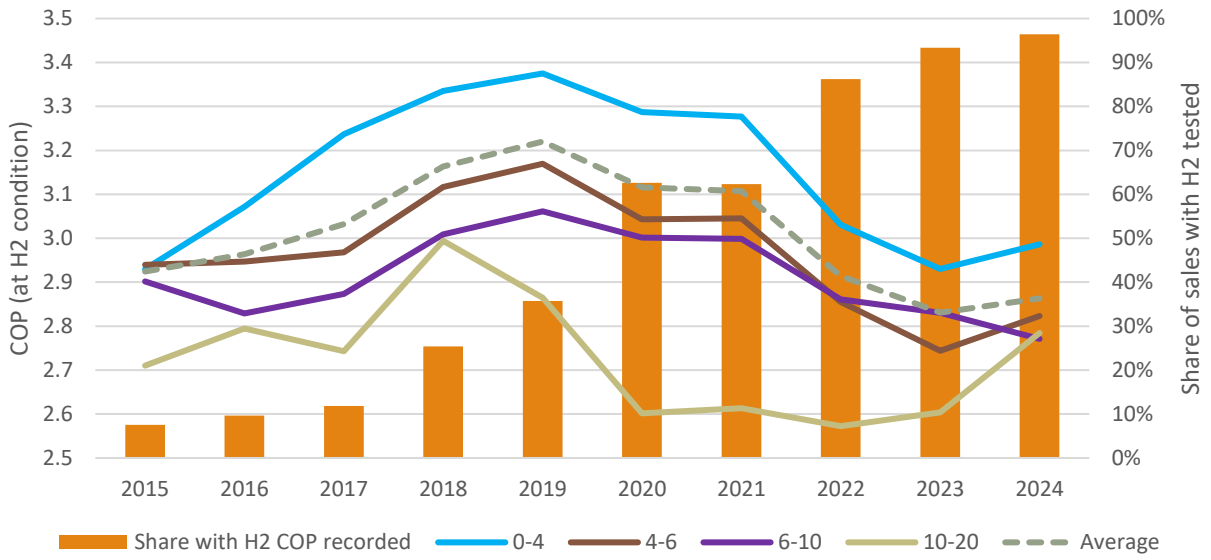
Single-split heat pumps are tested for their performance under H2[4] conditions, and this became mandatory from 2021. As can be seen from Figure 28, almost all single-split heat pumps sold in 2024 have been tested under H2 conditions.

The trends follow a generally similar path for the various size categories.

H2 COP for all sizes increased initially from 2015 to around 2019, and then dropped slightly, followed by an increase from 2023. The reason for the decline from 2019 to 2023 is likely to be the requirement for all suppliers to report this result. The subsequent small rise in 2024 is likely related to the increase in average HSPF for these products, as shown in Figure 22. Note, however, that the lower number of products with measured H2 COP performance from 2015 to 2019 may distort the average values shown in the graph.

[4] H2 testing for heat pumps refers to measuring their heating performance at an outdoor ambient temperature of 2°C. This standardised test provides a more realistic assessment of a heat pump's performance in cooler climates and helps consumers make informed decisions when purchasing heat pumps, particularly in regions with colder temperatures.

Figure 28: COP at H2 conditions – single-split systems



2.6 Additional commentary

Heat pumps sold in New Zealand are manufactured in a range of countries. The largest volume of heat pumps sold in New Zealand now come from Thailand (56%), followed by China (28%). Over the past 10 years, there have been relatively few changes in country of manufacture, with the percentage of sales from China remaining constant. Products from Thailand have increased from 43% of the market to 56% of the market, at the expense of product from countries such as New Zealand, Japan and South Korea.

2.7 Summary of key insights

Overall sales of heat pumps have doubled in the past 10 years. This indicates heat pumps are replacing other heating appliances and equipment, including wood, electric resistance and gas heaters. Non-ducted single-split units dominate the sales.

High, and improving, energy efficiency. Heat pumps are the most efficient and lowest cost form of home heating. The COP of heat pumps continues to improve, driven by changes to minimum performance standards and labelling requirements that require manufactures to continually innovating to increase efficiency standards. COPs now typically range from 3 to 5.8, that is, efficiencies of 300% to 580%.

Wide variety of models and sizes. There is a wide variety of brands and different models (currently 501 single-split systems and 272 ducted systems) to choose from. Heat pumps tend to be available in a wide variety of sizes, with single-split systems generally being available from 2.5kW to 9kW or more output, and ducted systems up to 20kW.

Shift towards larger systems. With single-split systems, there is a trend towards larger systems, with sales of larger (>6kW) single-split systems having grown at a higher rate than sales of systems of <6kW capacity. The average capacity of a single-split system sold in New Zealand is 5.7kW, and for a ducted system is 12.4kW.

Shift in refrigerants. There is a move towards low-ozone-depleting refrigerant and low-GWP refrigerants being used in heat pumps. Virtually all single-split and ducted systems now use R32 as a refrigerant.

Significant energy and cost savings. Upgrading to a more efficient heat pump can lead to substantial savings. Table 2 shows the energy and money saved, compared with a 1-star appliance, over 15 years, based on an electricity cost of 30c/kWh.

Table 2: Estimated average energy and cost savings compared to a 1-star product – air conditioners

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	2,505	1,879	1,503	1,253	1,074	939	835	752	683	653
Annual energy cost	$752	$564	$451	$376	$322	$282	$251	$225	$205	$196
Annual savings	$0	$188	$301	$376	$429	$470	$501	$526	$547	$555
Savings over 15 years	$0	$2,818	$4,509	$5,636	$6,441	$7,045	$7,515	$7,891	$8,198	$8,332
Percentage of energy saved	0%	25%	40%	50%	57%	63%	67%	70%	73%	74%

3. Clothes dryers

3.1 Description of product class

There are three main types of domestic clothes dryers to suit different household needs, with varying energy efficiency, capacity and installation flexibility.

1. **Vented dryers:** traditional models that expel moist air through a vent, requiring external ducting. They generally have a lower purchase price, but can be less energy efficient and may introduce moisture into the laundry area if not properly vented.
2. **Condenser dryers:** extract moisture from clothes and collect it in a reservoir or drain it away, eliminating the need for external venting. While they offer greater installation flexibility, they tend to be more expensive, and can still release some heat and humidity into the room.
3. **Heat pump dryers:** use advanced heat pump technology to recycle warm air, making them the most energy-efficient option available. They operate at lower temperatures, providing better fabric care and significantly reduce energy consumption, though they come with a higher upfront cost. Heat pump dryers use a closed-loop system where air is heated, circulated to dry clothes, and then cooled to condense the moisture, with the dried air being reheated and recycled. This helps to reduce moisture expelled to the air.

A summary of the key statistics for the three main types of clothes dryers is given in Table 3.

Table 3: Clothes dryer statistics 2024

Type	Vented	Condenser	Heat pump
			
Description	Vented dryers circulate heated air through the drum where clothes are tumbled, evaporating moisture. The hot, moist air is then expelled through a vent to the outside.	Condenser dryers extract moisture from clothes and collect it in a reservoir or drain it away, eliminating the need for external venting.	Heat pump dryers use heat pump technology, to recycle warm air. They operate at lower temperatures, providing better fabric care and significantly reduce energy consumption.
Market share of sales in 2024	35%	17%	46%
Average capacity	6.2 kg	6.7 kg	8.3 kg
Amount of energy used per kg of clothes	0.85kWh	0.8kWh	0.3kWh
Comparative energy consumption	276kWh pa	283kWh pa	135kWh pa
Annual energy cost*	$83	$85	$40
Sales-weighted average star rating	2.1	2.5	8.3

Note: Annual energy cost is based on a residential electricity price of 30c/kWh and 52 uses of the dryer per year.

There is a fourth type of dryer typically only seen in combination appliances (appliances that combine a washer and a dryer in one unit). These dryers are generally a type of condenser dryer that uses water, and a water-cooled heat exchanger, to dry the clothes. This results in reduced energy consumption when compared to standard condenser dryers, but uses significant amounts of water during the process. These dryers typically achieve star ratings of three.

More recently, there have been combination washer-dryers available that use a heat-pump-type dryers, and achieve a star rating of eight or more. In 2024, heat pump washer-dryer combinations represented 7% of sales of combination washer-dryers.

Capacity considerations

Clothes dryers vary in capacity from around 4kg to around 10kg, suiting small to large households, as follows.

- Small households (one to two people): a dryer with a capacity of 4–6kg is typically sufficient, accommodating around five outfits or towels per load.
- Medium households (three to four people): a 7–8kg capacity dryer suits medium households, fitting five to seven outfits or towels per load.
- Large households (five or more people): opting for a dryer with a capacity of 9kg or more is advisable, handling eight or more outfits or towels per load.

Installation and features

Modern dryers offer various installation options, including wall-mountable and stackable designs, catering to different space constraints. Features such as reversible doors enhance placement flexibility, while advanced technologies like moisture sensors and steam functions improve drying efficiency and garment care.

For vented dryers it is recommended to vent dryers to the outside to remove moist air from the room, which can reduce mould, condensation, and heating and maintenance costs.

3.2 Relevant regulations

Domestic clothes dryers, including vented, condenser and heat pump dryers, as well as the drying function of combination washer-dryer units[5] must adhere to MEPL requirements. All such products must display this label at the physical point of sale i.e. retail outlets.

AS/NZS 2442.1:1996 deals with the performance testing of household electric clothes dryers, and AS/NZS 2442.2:2000 deal with their energy labelling requirements.

There is currently no MEPS requirements for clothes dryers.

Labelling

An energy rating label displays the energy rating of dryers between one and ten stars, as well as their annual energy consumption, in kWh. Energy consumption is based on standardised tests and an assumption of the dryer being used once per week.

As an example, a 7kg dryer with a nine-star energy rating can save approximately $48 per year in energy costs, compared to a similar model with a two-star rating. Over an 11-year lifespan, this equates to savings of around $528 and a 66% reduction in CO_2 emissions.

An energy rating label must be displayed on clothes washers at the point of sale, either attached to the front or top of the dryer. More information on energy rating labels for clothes dryers is available at Clothes dryers | EECA

[5] Combination washer-dryer units are addressed in the clothes washer section (Section 4).

3.3 Market and sales trends

The sales trends for clothes dryers, in total and segmented by dryer type (vented, condenser and heat pump), are shown in Figure 29 and
Figure 30.

Annual sales since 2002 have gone through an up-and-down pattern, rising through to 2006, then declining to a low of 36,200 sales in 2010, before generally increasing through to 2024. Sales jumped significantly in 2022 to 95,500. This could be due to a number of factors, including an increase in home construction at that time, net migration gains and a post-Covid trend towards buying home appliances.

Figure 29 and
Figure 30 show a noticeable move away from traditional vented dryers to more efficient condenser and heat pump technologies. The move to condenser models increased in 2011 and grew at a steady rate until 2022. Heat pump dryers appeared on the market in 2010 and accelerated in popularity from 2019; they are now the most common technology type amongst clothes dryers.

Figure 29: Share of sales by technology type – clothes dryers

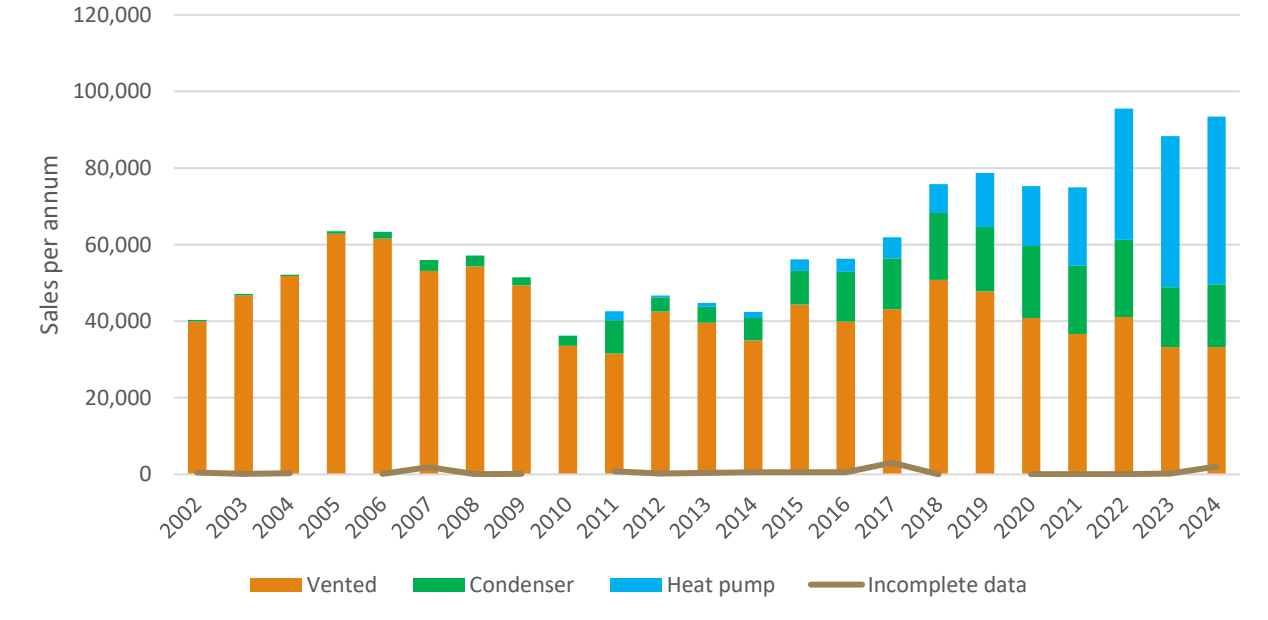
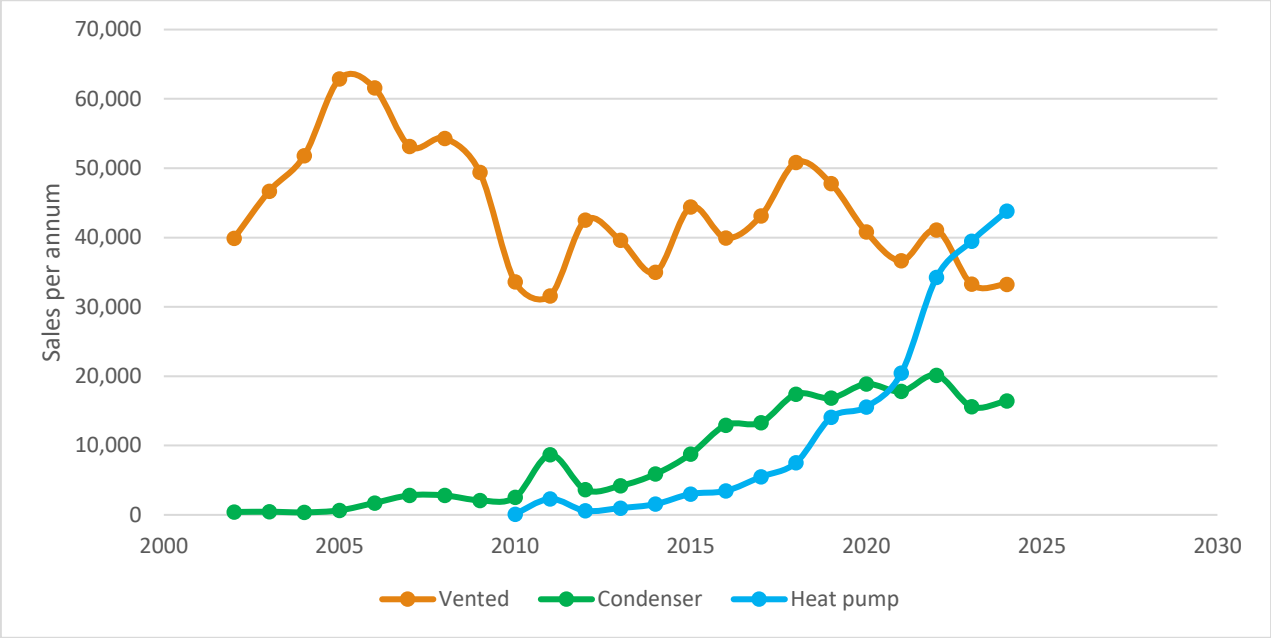


Figure 30: Sales by technology type – clothes dryers

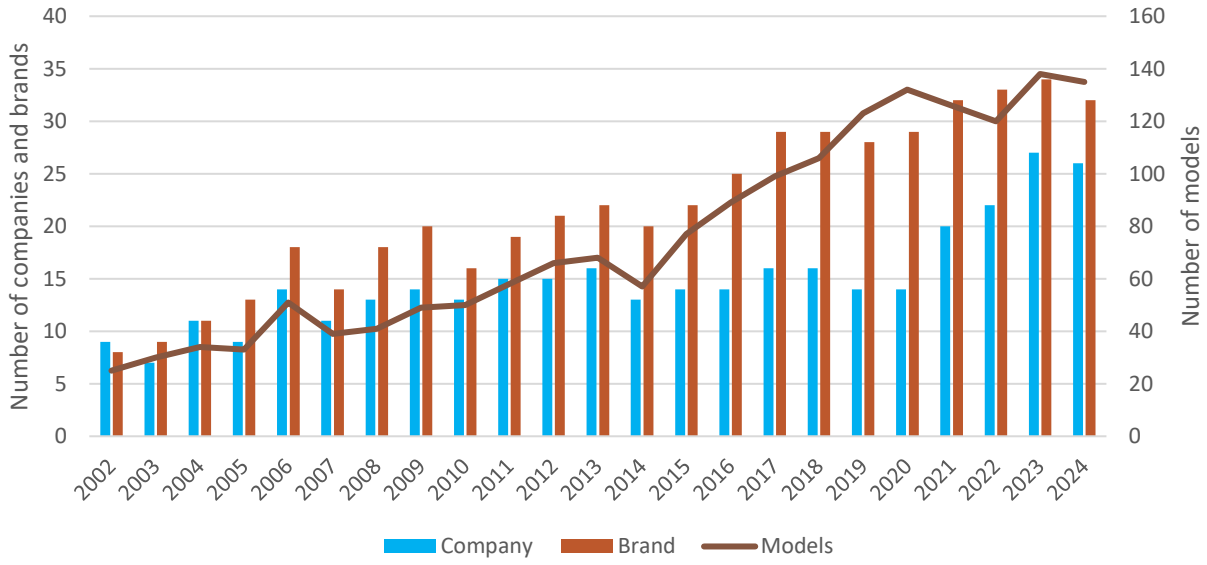


The make-up of the supply companies, brands and models for clothes dryers has also changed, with 135 models, 32 brands and 26 importers and manufacturers operating in the market in 2024.

The number of models available has increased significantly and in a generally steady manner from the 25 models available in 2002.

The number of companies and brands available has also increased in a similar manner over that time. These trends can be seen in Figure 31.

Figure 31: Changes in number of companies, brands and models – clothes dryers



3.4 Product trends

Key product trends for clothes dryers include:

- **smart features and connectivity**: modern dryers are incorporating smart[6] technologies, such as Wi-Fi connectivity and touch-screen controls, allowing users to monitor and control drying cycles remotely
- **quick drying options**: manufacturers are introducing quick-dry programmes for small loads, catering to consumers' need for convenience
- **compact and space-saving models:** with urban living spaces becoming more compact, there's a growing demand for space-efficient dryer models that don't compromise on performance.

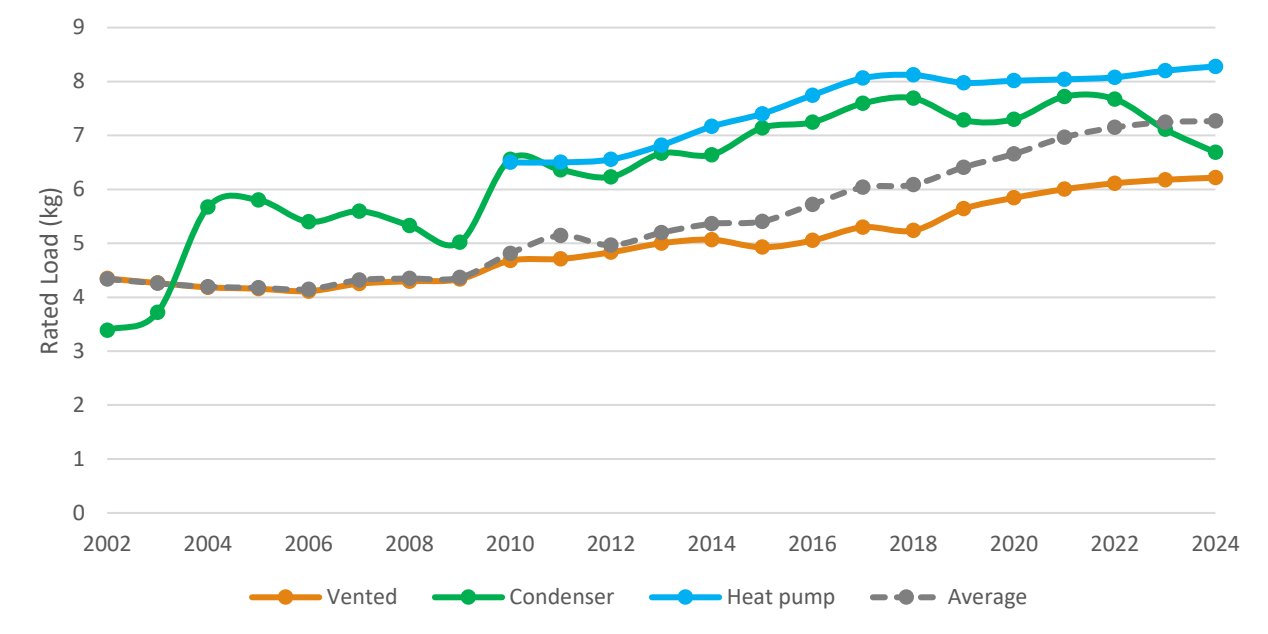
The trends for sales-weighted average capacity for the different technology types of clothes dryers and the average across all technology types is shown in Figure 32.

Heat pump dryers generally have the largest capacity, followed by condenser models and then vented dryers with the lowest capacity.

There has been a steady increase in capacity for heat pump dryers and vented dryers. Condenser models followed a similar path until about 2018, when capacity flattened out and has decreased in the past 2 years.

In 2024, the sales-weighted average capacity was 8.3kg for heat pump dryers, 6.7kg for condenser models and 6.2kg for vented models.

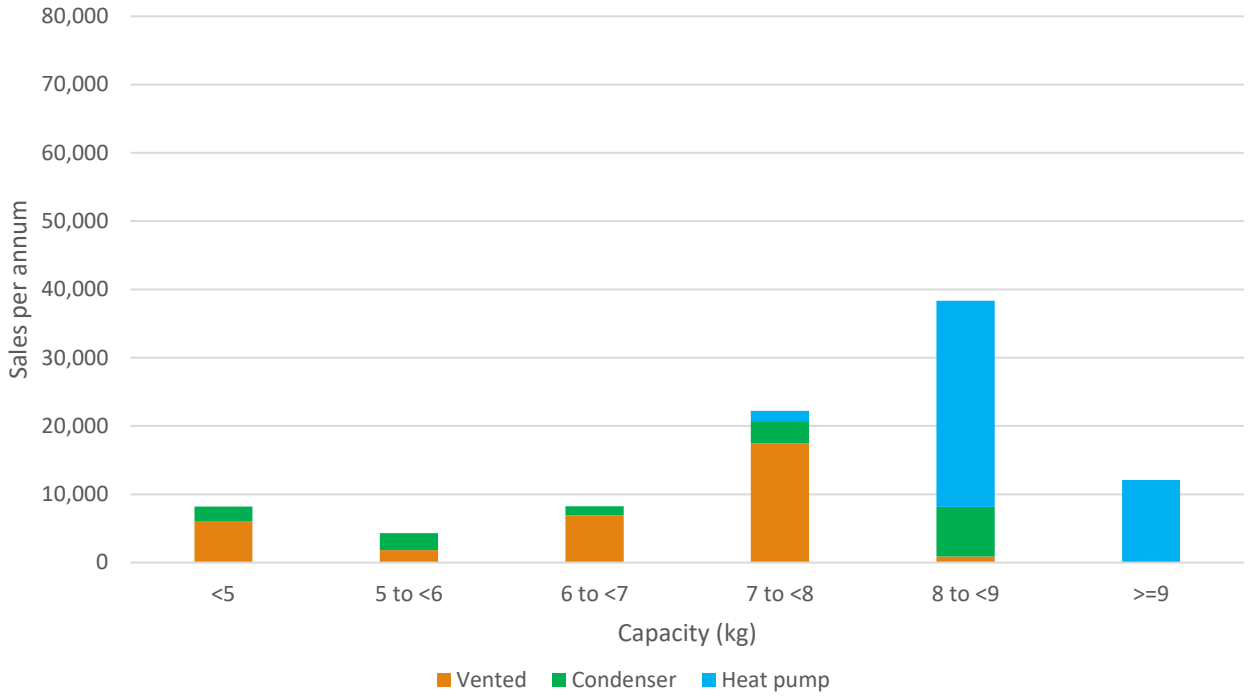
Figure 32: Clothes dryers capacity trend



There is a range of load capacities available in the market and a graph of load capacity distribution for clothes dryers is shown in Figure 33. This shows that the most popular size category for clothes dryers is 8kg to 9kg. Vented models are more common in the smaller size categories, whereas heat pump models are more common in the larger (8kg plus) category.

[6] 'Smart' is used in this report to refer to technologies such as Wi-fi connectivity and touch-screen controls, and is not intended to imply any demand-response or demand-flexibility capability.

Figure 33: Load capacity distribution – clothes dryers



Programme time

The trends for sales-weighted average programme time for the different technology types of clothes dryers and the average across all technology types is shown in Figure 34.

The trend for the programme time length for all technology types has generally been one of increasing length over the past 15 to 20 years.

Heat pump dryers have a longer programme time, followed by condenser models, and vented models have the shortest programme time. In 2024, the sales-weighted average programme time was 258 minutes for heat pump dryers, 223 minutes for condenser models and 173 minutes for vented models. Heat pump dryers have a longer programme time as they have a larger capacity than other types.

Figure 35 shows a graph of programme time per kg of capacity. This shows that programme length per kg of capacity has been relatively flat recently, indicating that the reason for longer programme time is due to larger capacity.

Figure 34: Clothes dryers programme length trend

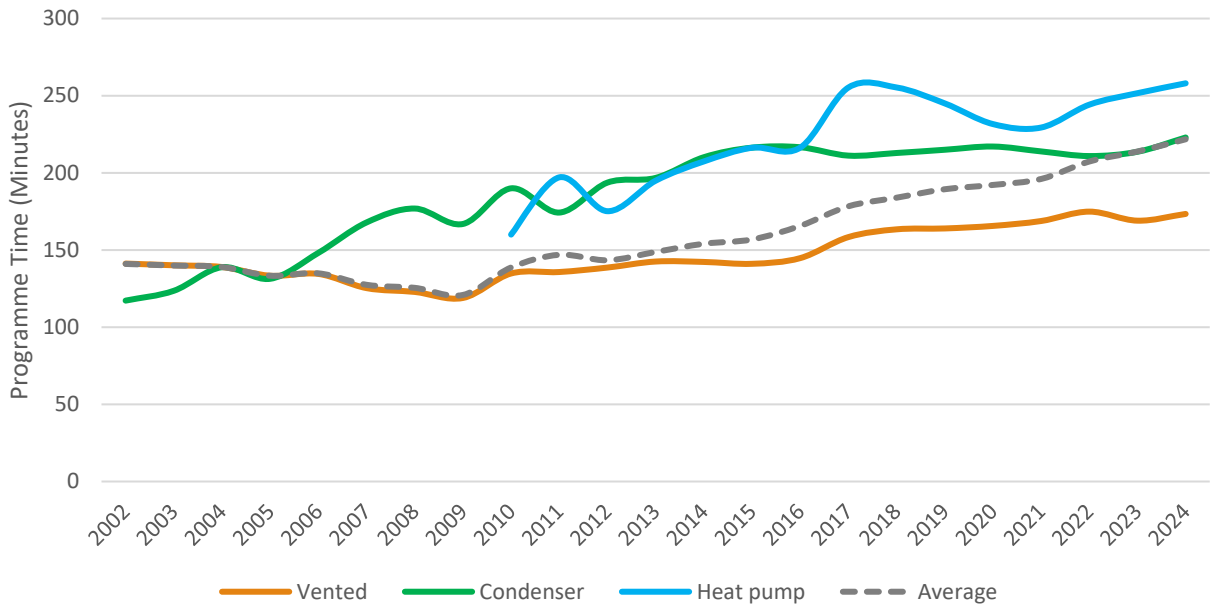
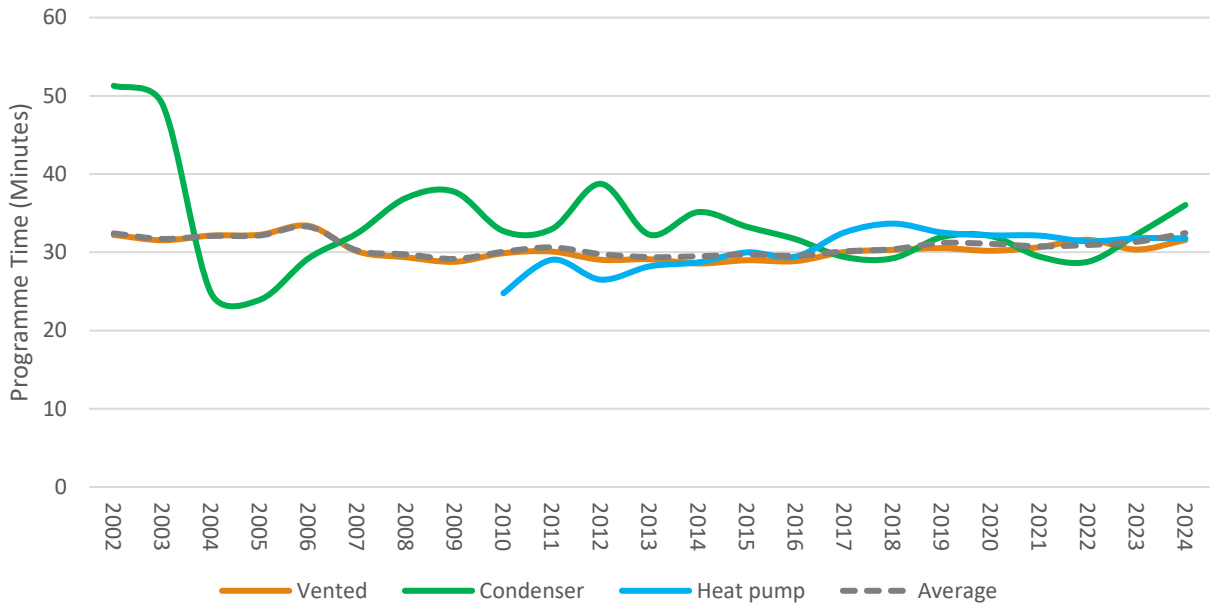


Figure 35: Clothes dryers programme length per kg of capacity



3.5 Product efficiency trends

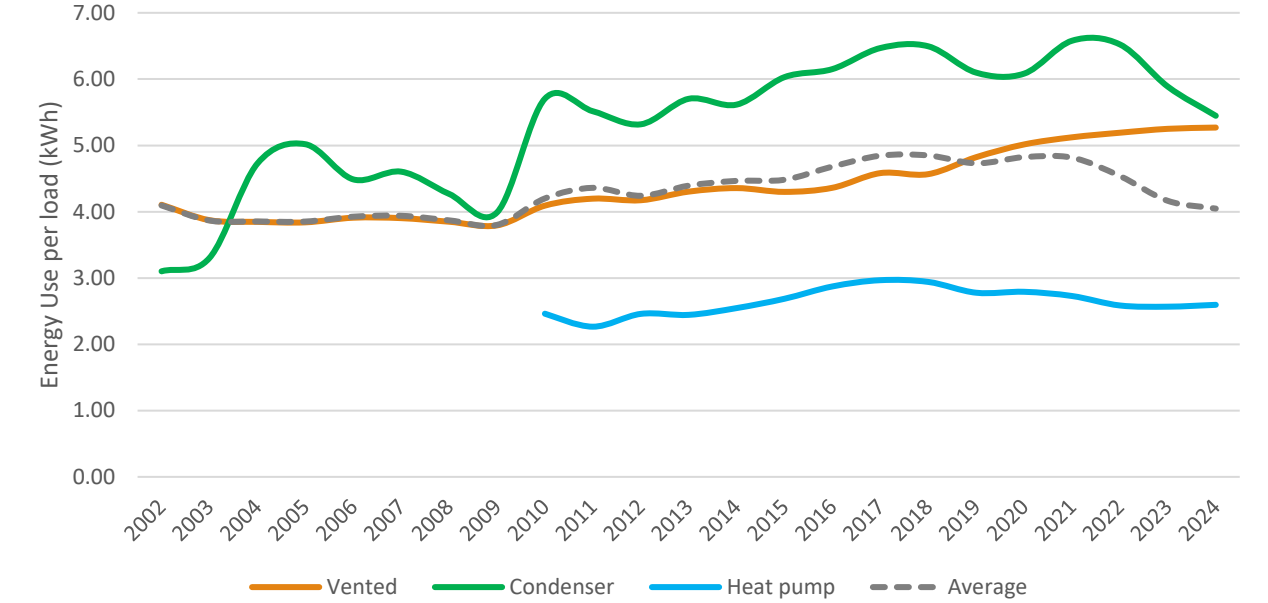
The drive towards energy-efficient appliances has led to the availability of dryers with high energy star ratings. Some models boast 10-star super-efficiency ratings, with estimated annual running costs as low as $25. Using a 7kg dryer with a 9-star rating once a week can save approximately $48 per year compared to a 2-star model, amounting to a saving of $528 over 11 years.

The trend in sales-weighted energy consumption per load of clothes for the various types of dryers can be seen in Figure 36.

There was a noticeable increase in the energy use per load for condenser dryers from 2002 until 2022, followed by a drop off in energy use. Energy use for vented clothes dryers has increased gradually over the

past 15 years, while energy use for heat pump dryers has remained relatively flat since they entered the market in 2010. The energy use of vented and condenser models is now essentially the same at around 5.3kWh to 5.5kWh per load. Heat pump dryers use just less than half the electricity of the other technology types at 2.6kWh per load.

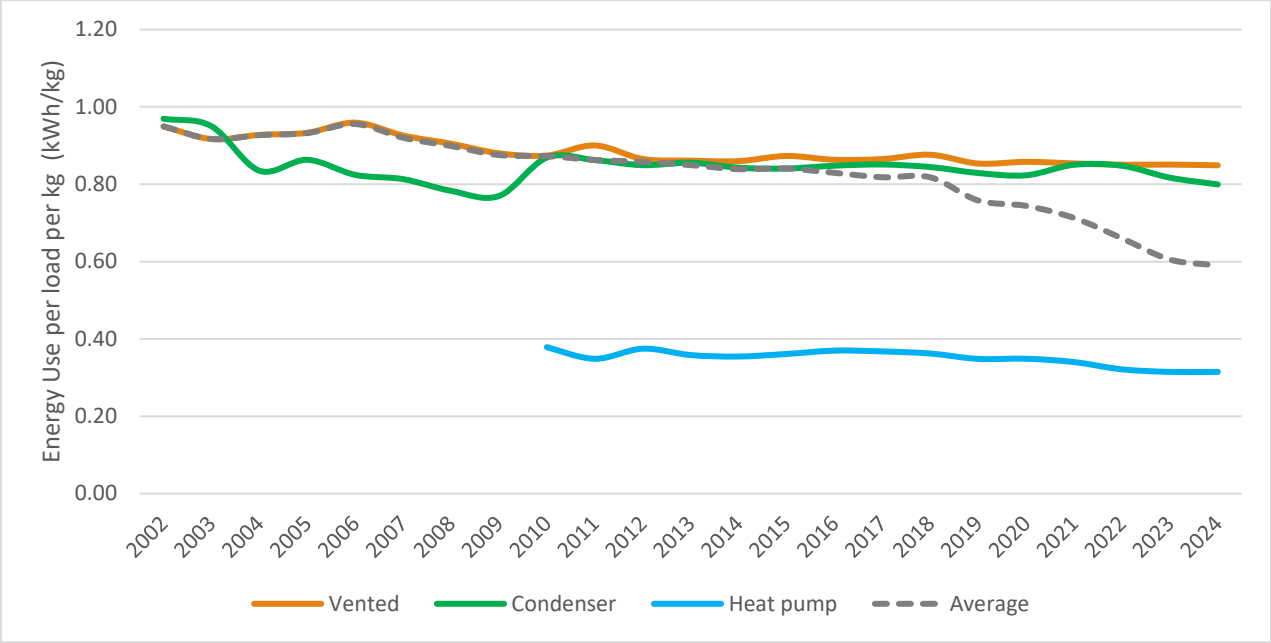
Figure 36: Sales-weighted energy consumption per load – clothes dryers



As noted earlier, the capacity of clothes dryers has grown steadily over the years. It is interesting to analyse the 'energy intensity' trend for dryers by looking at the amount of energy used per kg of clothes on an annual basis. This information is shown in Figure 37.

Figure 37 shows that the energy consumed per kg of load has declined very gradually over time for all technology types. It is interesting to note that the average energy use per load across all technology types has declined relatively sharply from 2018. This reflects the strong move towards heat pump dryers and the fact that they use approximately half the energy of other technology types.

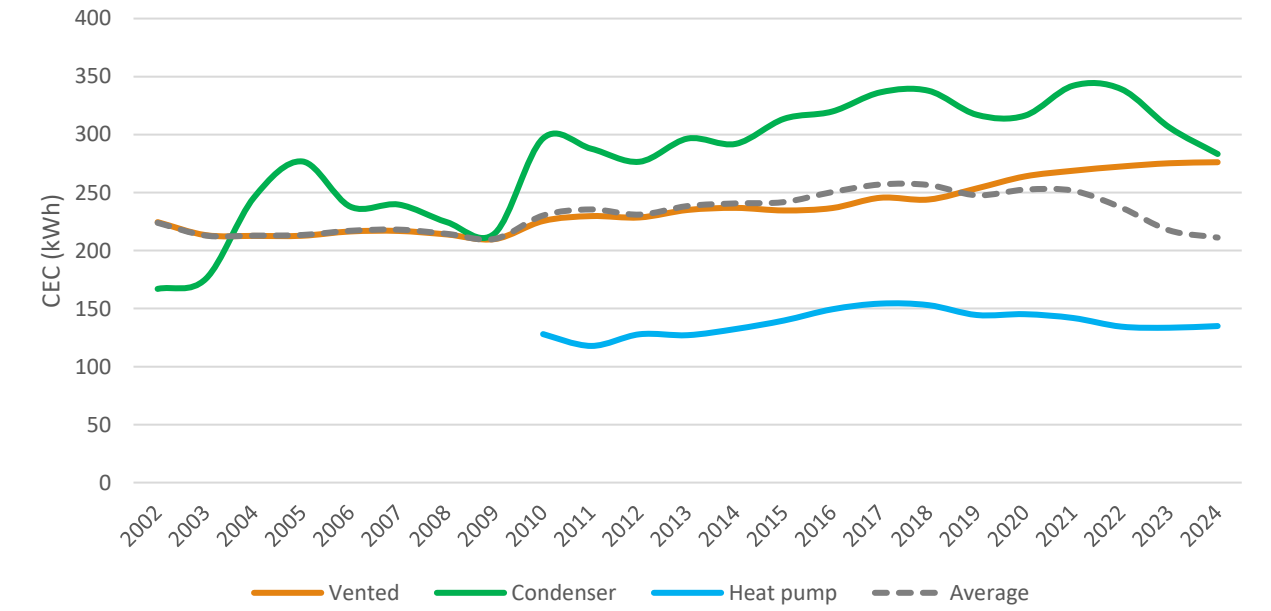
Figure 37: Sales-weighted energy consumption per kg of clothes – clothes dryers



The trends for CEC for the various technology types of clothes dryers are shown in Figure 38 and essentially follow the same trend as in Figure 36, which shows the sales-weighted energy consumption per load.

The sales-weighted average CECs of vented and condenser models are now essentially the same at 280kWh pa, based on one load per week over the year. Heat pump dryers use just less than half the electricity of the other technology types at 135kWh pa. This equates to annual operating costs of $84 and $41 for vented and condenser models, and heat pump models, respectively.

Figure 38: Sales-weighted CEC per annum – clothes dryers



Clothes dryer star ratings have increased slowly over the past 22 years, as can be seen in Figure 39.

Star ratings for vented and condenser models were around 1.2 on a sales-weighted average basis in 2002, increasing to 2.1 for vented models and to 2.5 for condenser models by 2024. By contrast, the much more efficient heat pump models entered the market in 2010 with an average star rating of 7.1 and have increased steadily to 8.3 in 2024.

Figure 39: Star rating trend – clothes dryers

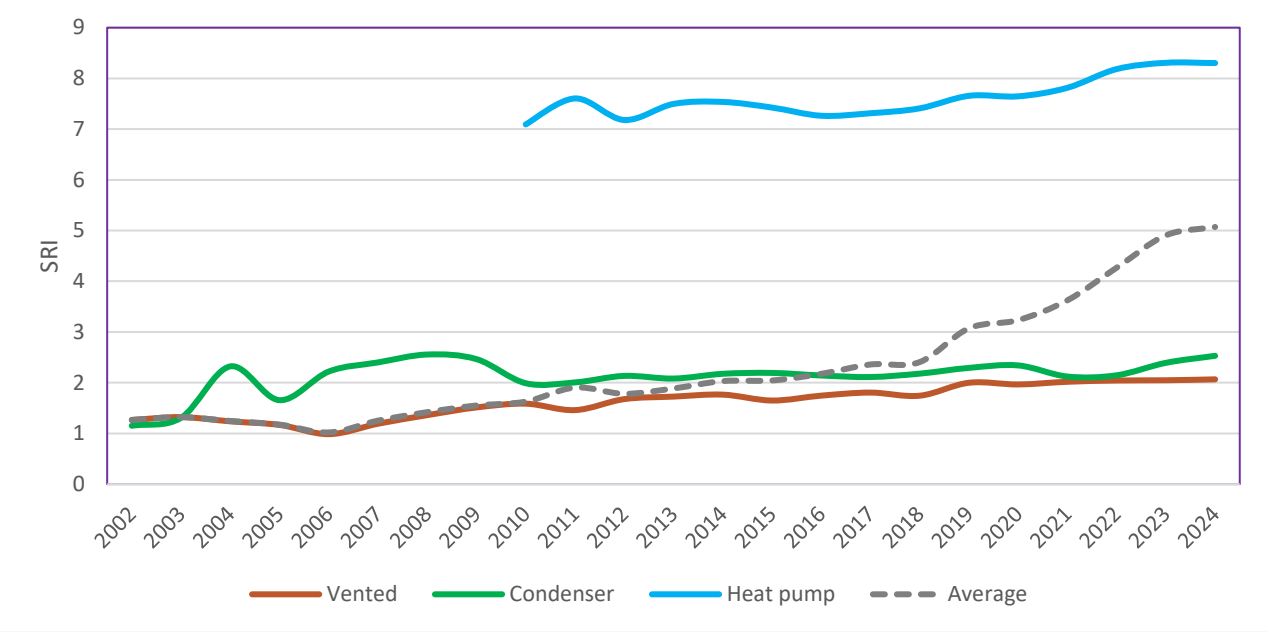
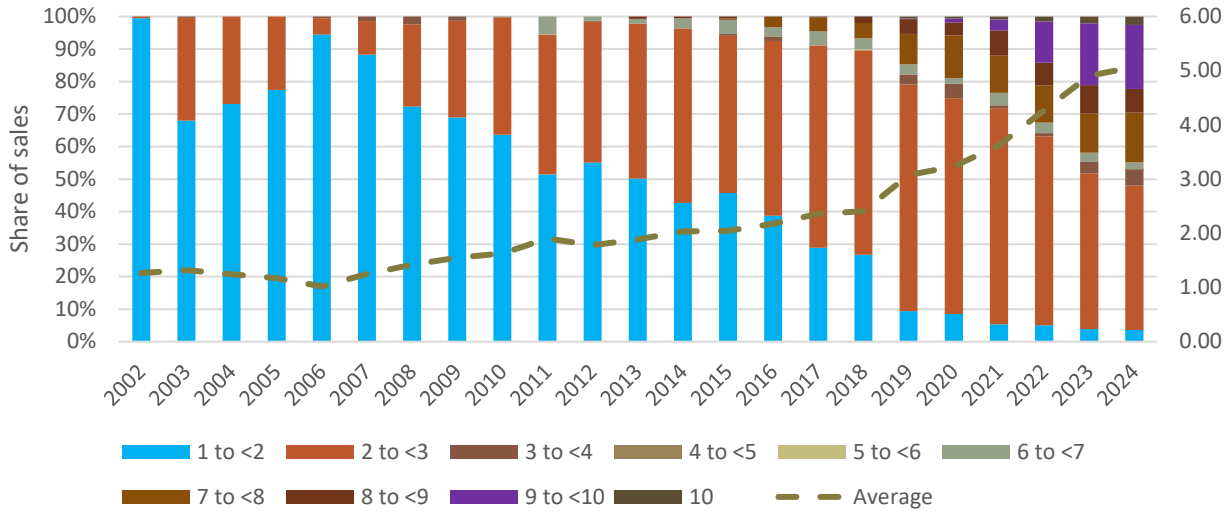


Figure 40 shows the share of sales for the various star-rating groupings, as well as the sales-weighted average star rating (dotted line). This clearly shows the virtual disappearance of low-star-rated models from the market (99% of sales in 2002 were of 1 to <2-star-rated models); alongside a significant increase in 9 to <10-star-rated models.

These observations will have been driven by two factors. Firstly, the improvement in efficiency of vented and condenser models will have lifted the average star rating, as customers buying those technology types were able to buy more efficient models. Secondly the emergence, and increasing popularity, of heat pump dryers means that customers are now able to buy a dryer with a 7 to 10-star rating, which is substantially more efficient than the ratings available from a vented or condenser model.

Figure 40: Star rating share of sales – clothes dryers



3.6 Additional commentary

Clothes dryers sold in New Zealand are manufactured in a range of countries.

The largest volume of clothes dryers sold in New Zealand now come from China with 71% of sales.

Around 2005 and 2006, approximately 60% of clothes dryers sold in New Zealand were manufactured in New Zealand or Australia. Clothes dryers were no longer manufactured in New Zealand from 2012 and from that point on there was a substantial increase in sales volumes from China.

3.7 Summary of key insights

Rise of heat pump dryers. Heat pump dryers are becoming increasingly popular due to their superior energy efficiency and gentler drying process, which extends the lifespan of clothing. In 2024, heat pump dryers accounted for 46% of new dryer sales in New Zealand, up from just 10% of sales in 2018.

Improved energy ratings. Heat pump dryers typically use about 50% less energy than vented or condenser clothes dryers, and therefore offer the potential for long-term savings in energy operating costs.

Much higher star ratings for heat pump dryers. The average star rating of a heat pump dryer in 2024 is 8.3 stars, compared with approximately 2 and 2.5 stars for vented and condenser models, respectively.

Heat pump dryers much cheaper to run. A heat pump dryer will cost less than half the cost of a vented or condenser type of dryer to run annually, based on a typical load and frequency of operation, as shown in Table 4.

Table 4: Comparison of electricity operating costs for clothes dryers

	Annual electricity cost		
	Vented	**Condenser**	**Heat pump**
Per cycle	$83	$85	$40

Note: Based on an electricity cost of 30c/kWh.

Capacity increases. Heat pump dryers generally have the largest capacity (average 8.3kg in 2024), followed by condenser models, and then vented dryers with the lowest capacity. This means that not only do heat

pump dryers use less energy per cycle, they also need fewer cycles for the same amount of drying. Overall, there has been a steady increase in capacity for heat pump dryers and vented dryers over recent years.

Changes in country of manufacture. Historically the bulk of the market comprised products manufactured in Australia and New Zealand, with these two countries having a combined 60% of sales in 2005 and 2006. Clothes dryers manufactured in China now dominate the market, with 71% of sales in 2024.

Significant energy and cost savings. Upgrading to a more efficient clothes dryer can lead to substantial savings. Table 5 shows the energy consumption and costs, and money saved, compared with a 1-star appliance, over 15 years, based on an electricity cost of 30c/kWh.

Table 5: Estimated average energy and cost savings compared to a 1-star product – clothes dryers

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	382	324	276	234	199	169	144	122	104	88
Annual energy cost	$114	$97	$83	$70	$60	$51	$43	$37	$31	$27
Annual savings	$0	$17	$32	$44	$55	$64	$71	$78	$83	$88
Savings over 15 years	$0	$258	$477	$663	$821	$955	$1,070	$1,167	$1,249	$1,319
Percentage of energy saved	0%	15%	28%	39%	48%	56%	62%	68%	73%	77%

4. Clothes washers

4.1 Description of product class

The domestic clothes washer (or washing machine) market offers a diverse array of options tailored to various household needs with over 252 models, 32 brands and 26 importers and manufacturers available in 2024.

The primary categories of clothes washers are top-loaders, front-loaders and combination washer-dryers, each with distinct features:

Top-loader washing machines

Top-loaders offer an ergonomic design, allowing users to load laundry without the user needing to bend. They often have shorter wash cycles, but may be less energy and water-efficient compared to front-loaders (depending on what cycles they are used on). They can also be harsher on fabrics due to the agitator or impeller mechanism.

There are two sub types of top-loader washing machines – agitator and impeller – as shown in Figure 41.

Figure 41: Example of an impeller (left) and agitator (right)

Front-loader washing machines

Front-loaders are known for their energy and water efficiency, as well as their gentle treatment of clothes. They typically offer a variety of wash settings and higher spin speeds, which can reduce drying time, although they often have longer wash cycles. They may come with a higher purchase price, typically around 10% higher than top-loaders, although this can be offset by running cost savings from better energy and water efficiency. Front-loaders are becoming more popular now, especially in newer homes and apartments.

Combination washer-dryers

Combination washer-dryers provide a compact solution for those with limited space, by combining washing and drying functions into a single unit. While convenient, these machines may have smaller capacities and longer cycle times compared to standalone washers and dryers. Also, the drying capacity is around half of the washing capacity, so typically half of the load needs to be removed prior to drying. They sell in relatively low volumes compared to front and top-loader machines.

A summary of the key statistics for the two main types of clothes washers is given in

Table 6.

Table 6: Household clothes washer statistics 2024

Type	Front-loader	Top-loader
		
Description	Front-loader washing machines fill the bottom of the inner drum with a small amount of water, using the rotation of the drum and gravity to move the clothes around.	Top-loader washing machines have either an agitator or an impeller. Agitator models twist clothes by way of a central spindle. Impeller models use a spinning motion guided by an impeller which pulses and spins.
Market share of sales in 2024	58%	42%
Average capacity	8.8 kg	7.4 kg
Average claimed water consumption (warm wash)	77 litres	93 litres
Comparative energy consumption on a warm wash	284kWh	459kWh
Annual energy cost (warm wash)	$85	$138
Sales-weighted average star rating (warm wash)	4.4	2.8

Note: Energy cost is based on an electricity price of 30c/kWh.

Clothes washers have a cold-water feed and may be designed to either use hot-water supplied from the household, or to heat their own water, depending on the design of the machine.

- Top-loaders:
  - usually have two hoses—one for cold and one for hot-water
  - mix the two water feeds to get the desired wash temperature
  - rely on the household's hot-water system.
- Front-loaders:
  - often have cold-water only connections
  - usually have an internal heating element to heat the water to a precise temperatures (e.g. 40°C, 60°C)
  - are more energy efficient and give better temperature control, especially for sanitising cycles.

Front-loaders are generally more efficient on a warm wash, as they use less water overall. However, for households with solar or heat pump water heaters, it might be more cost effective to have a dual connection and use the hot-water produced by the solar or heat pump water heater. Similarly, for households with off-peak hot-water, using the household's hot-water system would cost less than heating the water by the machine.

Some front-loader models offer dual hot and cold-water inlets, allowing for the option of using a hot-water supply if available, although these machines also often have built-in heating elements as a backup.

Key considerations when choosing a washing machine include the following.

- **Capacity:** a machine should be chosen for size to match a household's laundry volume. For instance, a 7kg machine may suit small families, while larger households might opt for a machine with a capacity of 8.5kg or more.
- **Energy and water efficiency:** higher star ratings indicate better efficiency, leading to long-term energy and money savings.
- **Features:** modern machines may offer various features such as:
  - steam functions – for better stain removal and reduction of wrinkles in clothing
  - smart sensors – for efficient water and energy use, and improved cleaning performance
  - Wi-Fi connectivity – to remotely start or stop wash cycles, and to provide alerts when a cycle is complete, or maintenance is required.
- **Dimensions:** Consider the machine's dimensions and door orientation to ensure that it fits into the available laundry space.

4.2 Relevant regulations

Clothes washers must comply with the MEPL requirements outlined in the Regulations and as specified in AS/NZS 2040.2:2005, which outlines energy efficiency labelling requirements.

For the purposes of calculating the annual energy consumption number and star rating index (SRI) that appears on the label, it is assumed that washing machines are used 365 times per year on a warm wash cycle.

Other relevant standards applicable to clothes washing machines include:

- AS/NZS 2040.1:2005, which outlines methods for measuring their performance, and energy and water consumption
- AS/NZS 60335.2.7:2020, which covers the safety aspects of household and similar electrical appliances, specifically focusing on washing machines.

Clothes washing machines installed in New Zealand must also comply with the requirements of the New Zealand Building Code, including those provisions related to laundering services and facilities.

Clothes washer energy rating labels provide information on a model's energy efficiency, including a star rating, and an estimated annual energy consumption (kWh), helping consumers choose more energy-efficient and cost-effective machines.

Points to note about the data relating to clothes washers are:

- standby energy use is included in the annual energy use (CEC) and SRI calculations,
- water extraction is accounted for in the star rating; the higher spin speed of front-loaders can result in more water removal.

Key information on the energy rating label includes:

- **energy rating (or star rating)** – indicates how energy-efficient a model is compared to others of the same size; one scale ranges from one to six stars, and another label is used for machines with seven to 10 stars
- **annual energy consumption (kWh)** – shows the estimated amount of electricity the appliance uses in a year, based on standardised testing and an assumed usage (warm wash) of 365 washes per annum
- **programme time (in minutes)** – the length of the programme used for the product's testing, which is used to calculate its CEC and SRI; note that the requirement to display of the programme time on the label only applies to the revised energy rating label, which is yet to commence in New Zealand, and due to commence in Australia soon
- **other information** – the label also includes the product's test standard, which specifies the testing methods used to determine the energy efficiency rating. For some models, there may be two energy consumption figures, one for warm washes and an optional one for cold washes.

The different energy rating labels for clothes washers – for warm and warm/cold wash options, and for models with six stars and under, and over six stars – and associated information, can be found at Clothes washers | EECA.

The Ministry for the Environment manages the water efficiency labelling scheme (WELS) for water-using equipment, which includes clothes washers and dishwashers. Products must display a water efficiency label either on the product or on both sides of a swing tag affixed to the product, as specified in the Consumer Information Standards (Water Efficiency) Regulations 2010. This is designed to provide consumers with clear information on the water consumption and water efficiency of new water-using products.

The label indicates the estimated annual water consumption in litres per wash for washing and spinning. More information on the labelling scheme, including sample labels, can be seen at Water Efficiency Labelling Scheme.

4.3 Market and sales trends

The sales trends for clothes washers in total, and segmented by front-loader and top-loader, are shown in Figure 42.

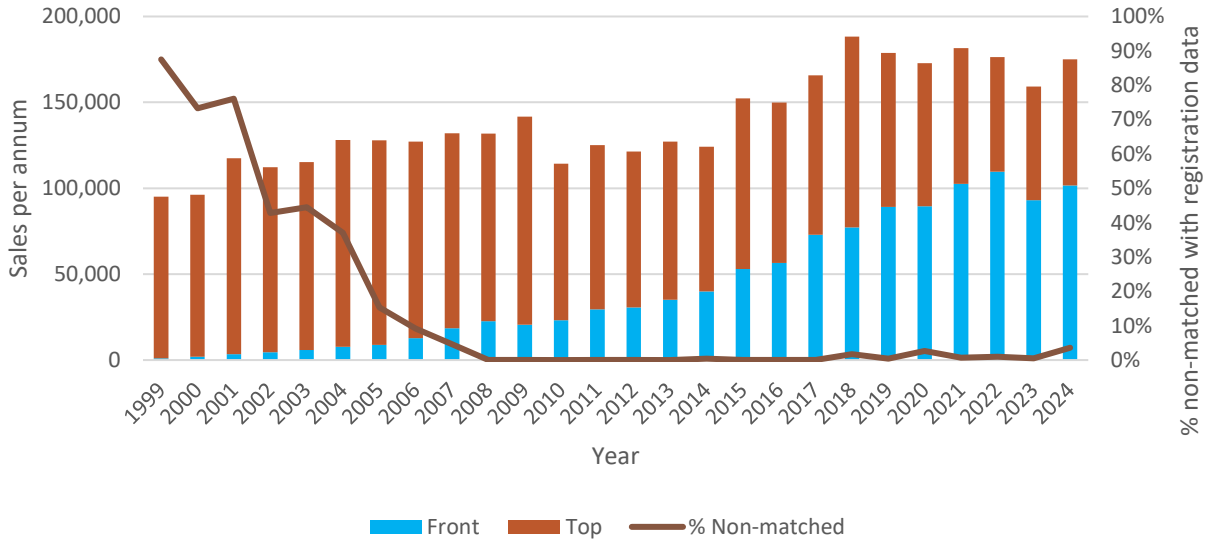
Sales in the 2000s increased from 100,000 machines in 2000 to 142,000 in 2009, followed by a period of 5 years with sales of approximately 120,000 machines. Sales peaked in 2018 with 188,000 clothes washers sold.

Figure 42 shows that overall sales have been relatively static over the past 8 years. There is also a shift towards front-loader machines, with the proportion of front-loader machines increasing steadily from 7% of sales in 2005 to 58% of sales in 2024.

As well as their superior energy and water efficiency compared to top-loaders (using a warm wash), front-loaders are gentler on clothes and often have larger capacities, making them suitable for households with substantial laundry needs.

It should be noted that data quality prior to 2006 is limited for many of the relevant data fields, with the exception of sales numbers. Figure 42 illustrates the percentage of data not able to be matched on an annual basis, on the right vertical axis.

Figure 42: Sales trends and data able to be utilised, by year – clothes washers

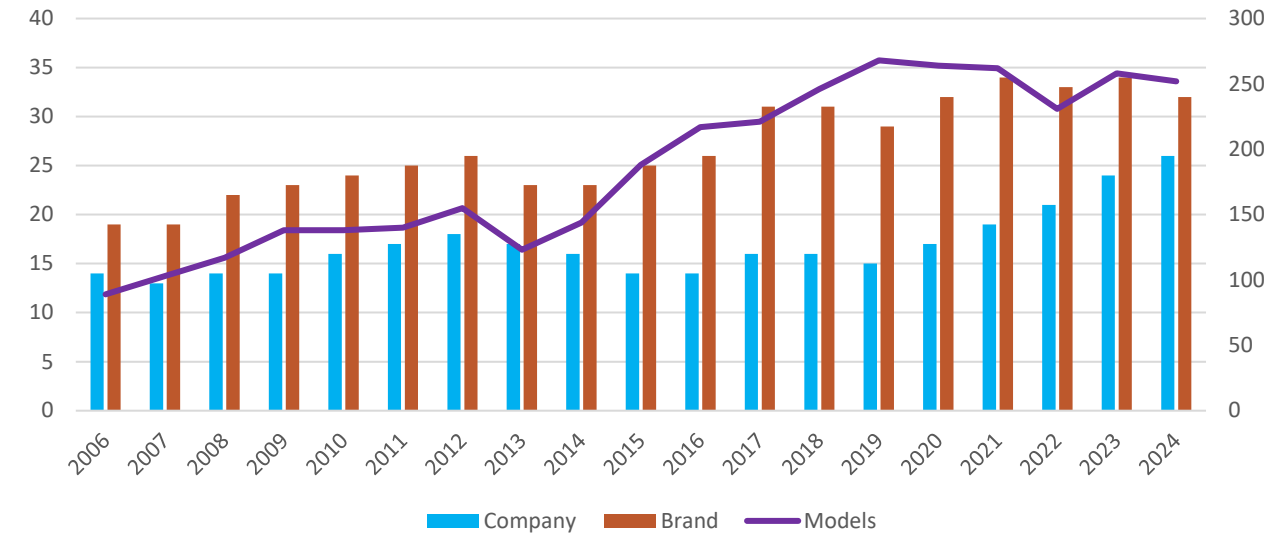


The make-up of brands and models of clothes washers available in New Zealand, and the importers and manufacturers supplying them has also changed, with 252 models, 32 brands and 26 importers and manufacturers operating in the market in 2024.

The number of models available has increased significantly from the 89 models available in 2006.

The number of companies and brands available has also increased over that time, although this has not been a steady trend, with a decline in the number of companies over 2013 to 2020, and a decline in the number of brands available in 2013 and 2014. These trends can be seen in Figure 43.

Figure 43: Changes in number of companies, brands and models – clothes washers



4.4 Product trends

The sales trends for clothes washers, segmented by hot, cold and dual connection, are shown in Figure 44 and Figure 45 for front-loaders and top-loaders respectively.

The figures show that most front-loader machines (77%) have a cold-water connection only. Virtually all (95%) of top-loader machines have dual hot and cold-water connections.

Figure 44: Percentage of sales by product type – front-loader clothes washers

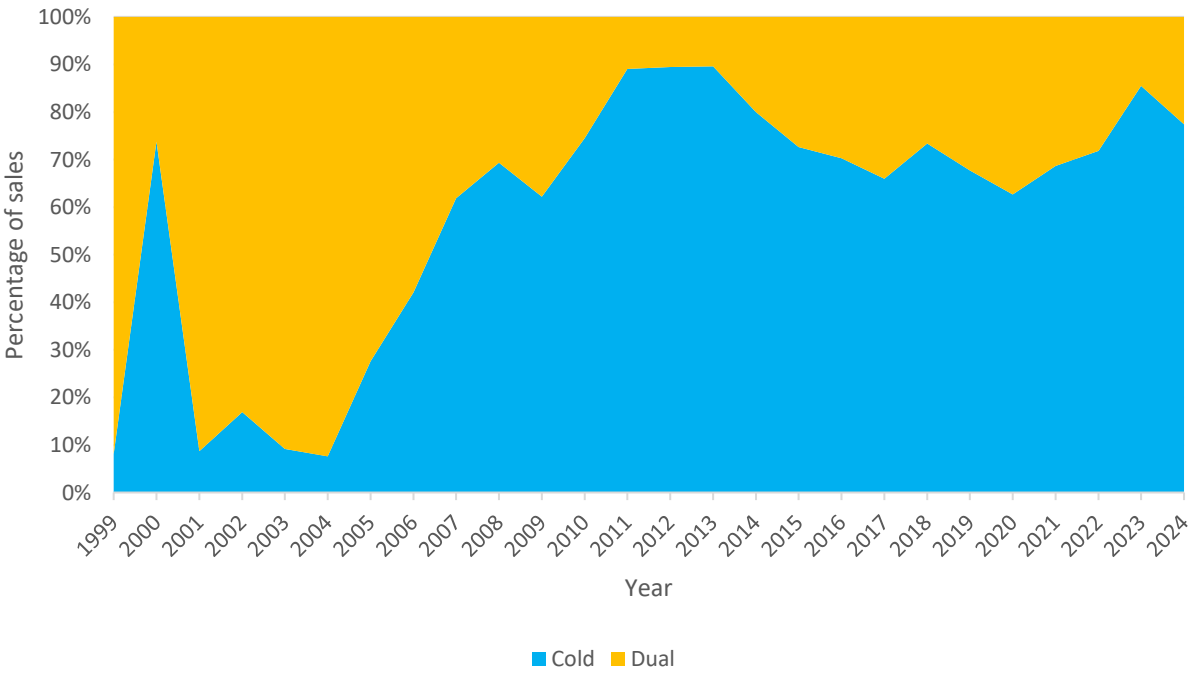
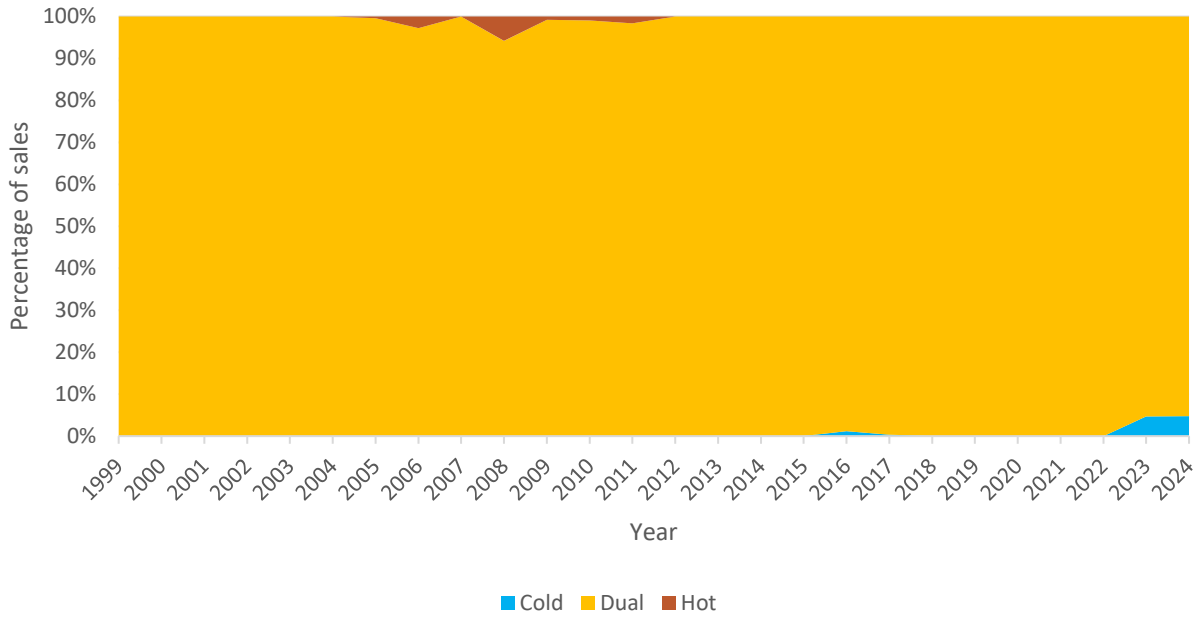


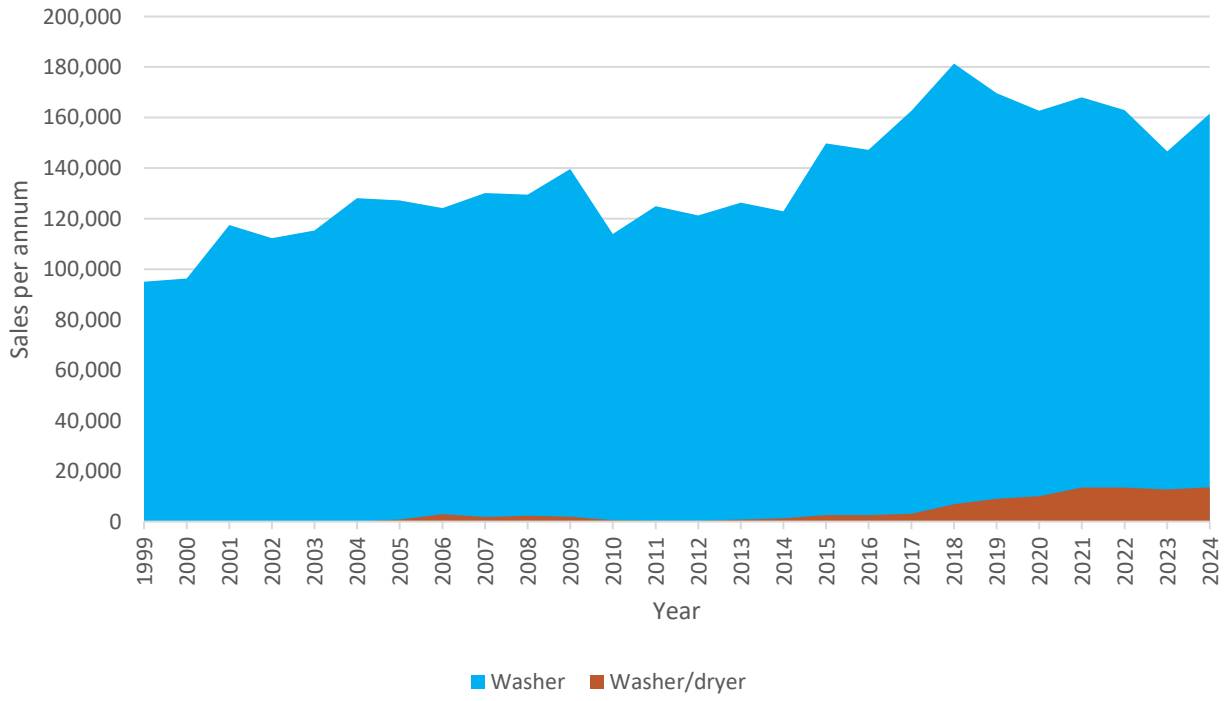
Figure 45: Percentage of sales by product type – top-loader clothes washers



Some clothes washers are combination models that include a clothes washer and dryer in the same unit. The sales trends for clothes washers, segmented by clothes washer only and combination models, are shown in Figure 46.

The figure shows that combination washer-dryers are relatively low volume sellers, typically representing around 8% of total sales. An increase in sales of combination units post 2019 appears to correlate with an increase in the construction of apartments at that time, as the space-saving attribute of combination units would be an advantage in smaller dwellings.

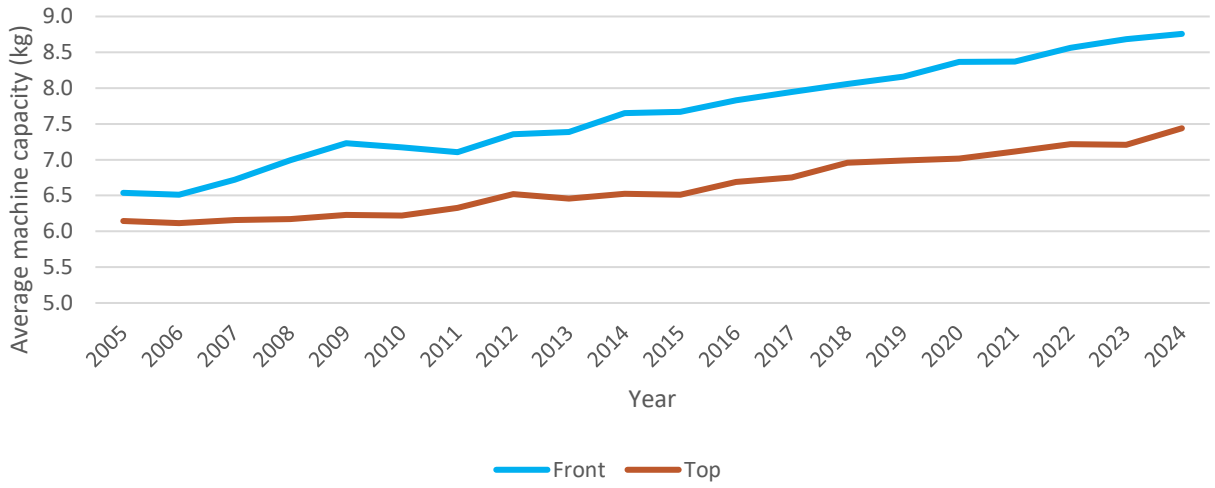
Figure 46: Sales by year and product type – clothes washers and washer-dryers



The trends for sales-weighted average capacity for front-loader and top-loader clothes washers is shown in Figure 47.

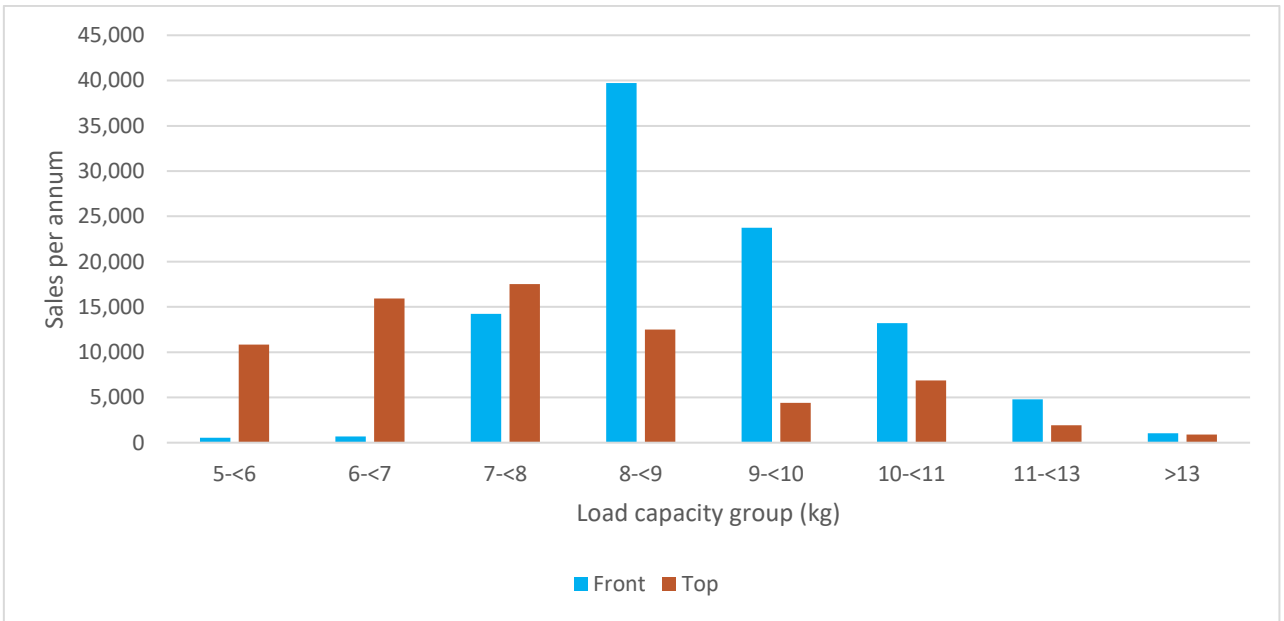
Front-loaders generally have a larger capacity than top-loader machines. In 2024, the average capacity of a top-loader machine was 7.4kg, compared with 8.8kg for a front-loader machine. The trend is for increasing capacity for both product types, with average capacities increasing by a total of approximately 1kg over the past 10 years for both product types.

Figure 47: Clothes washers capacity trend



There is a range of load capacities available in the market – the load capacity distribution for front-loader and top-loader clothes washers is shown in Figure 48.

Figure 48: Load capacity distribution – clothes washers



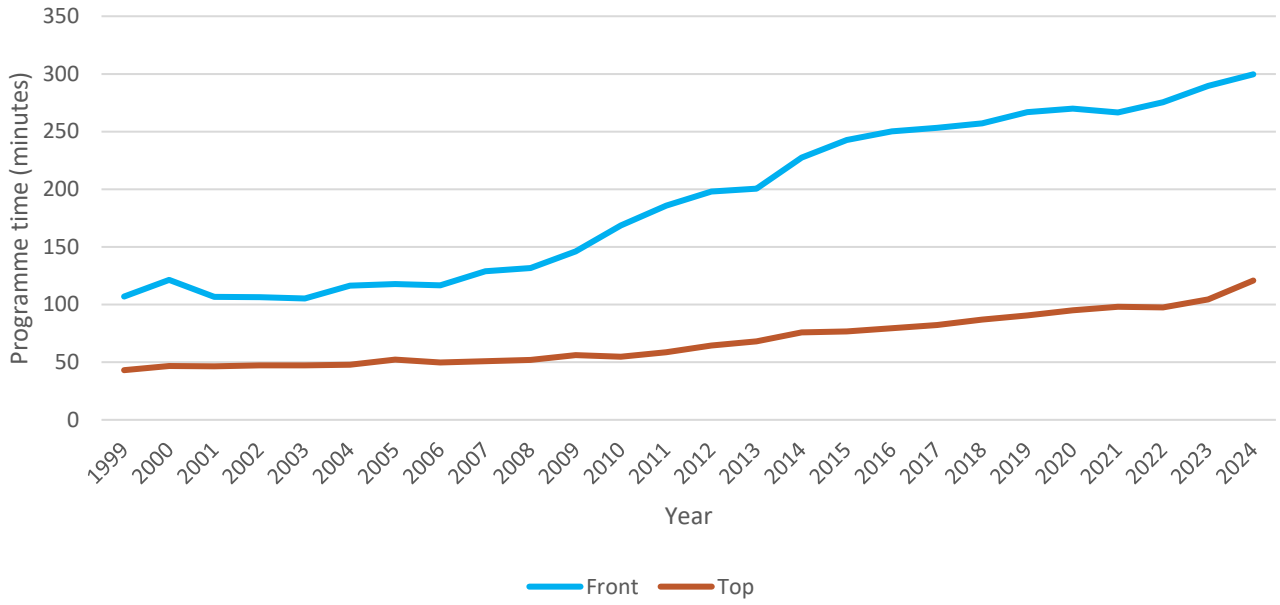
Trends for the programme time length for front-loader and top-loader clothes washers are shown in Figure 49.

Front-loader machines have a significantly longer programme time (2.5 times longer) than top-loaders. Programme times for both types of machines have been increasing steadily over the years. The average programme time for a front-loader is now 300 minutes (5 hours).

These reported average programme times are the times used for energy rating purposes and are referred to in product manuals. They are unlikely to be representative of actual household use.

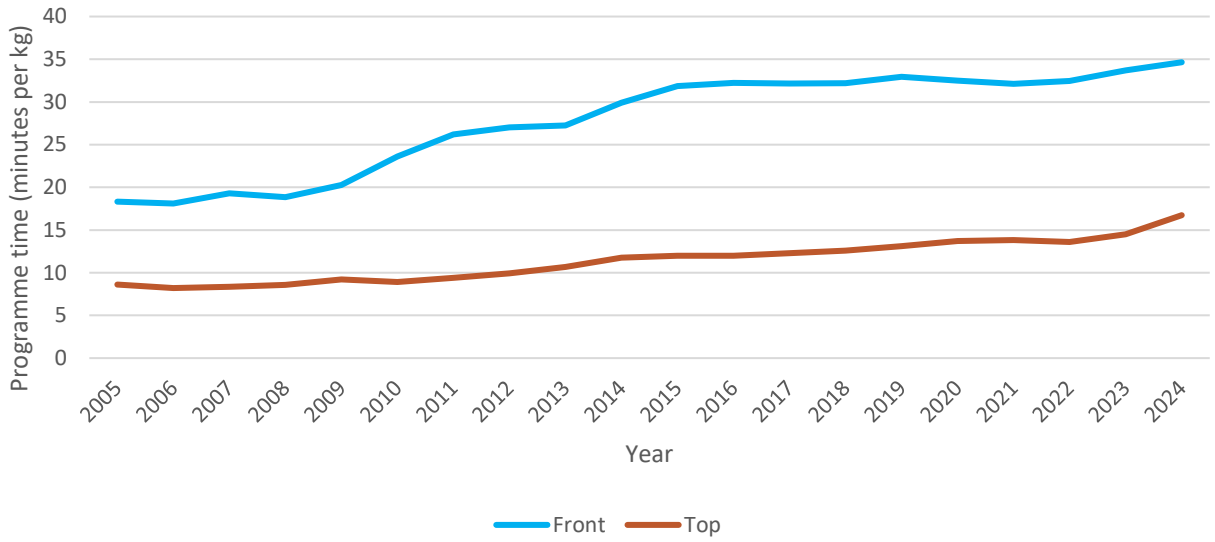
In practice, commonly used wash cycles include a cotton or normal wash (1.5 to 2.5 hours) for versatile, effective washing, and a quick or express wash for lightly soiled items and small loads (approximately 30 minutes). The longer eco-modes are used less in practice, as wash cycles of the order of 4 or 5 hours are generally considered impractical by householders, particularly during the day. No data on actual household use was identified for New Zealand households, but test data from Choice in Australia shows the average cycle time for common cold wash cycles was 2 hours.

Figure 49: Clothes washer programme length trend (as specified in test method)



The programme time relative to the capacity of front-loader machines and top-loader machines has slowly increased over the years, as can be seen in Figure 50.

Figure 50: Programme time relative to machine capacity – clothes washers



Other product trends for clothes washers include the integration of new technologies. Manufacturers are now incorporating features into washing machines that allow users to monitor and control wash cycles remotely via smartphone apps, and that optimise energy usage by adjusting wash settings based on load size and fabric type, among other innovations.

4.5 Product efficiency trends

The trends for CEC for front-loader and top-loader clothes washers when using a warm wash cycle and a cold wash cycle are shown in Figure 51 and Figure 52, respectively.

As can be seen in Figure 51, there was a noticeable reduction in the CEC (warm wash) for top-loaders in 2024. This trend is also apparent in Figure 54, which shows energy intensity (warm wash) reducing in a similar manner. There are two drivers for this observation:

- an increase in the efficiency of top-loaders in the warm wash cycle
- a significant increase in the capacity of machines in 2024, as can be seen in Figure 47.

It should be noted that some models heat the incoming cold-water even on a ‘cold wash’ cycle. This might occur, for example, if incoming water is colder than 20˚C and the machine heats the water to 20 ˚C for a cold wash.

Front-loader machines use considerably less energy than top-loader machines on a warm wash cycle. The average CEC of a front-loader machine on a warm wash is currently 284kWh pa, which is 38% less than the CEC for a top-loader machine at 459kWh pa. This is mostly due to top-loaders using a larger amount of water – the energy associated with heating this water is included in the CEC.

On a cold wash cycle, the situation is reversed with a front-loader machine using more than double the energy of a top-loader machine. Similarly, a front-loader machine uses more than double the electric energy (+135%) compared with a top-loader, as front-loaders generally operate much longer and require a minimum cold-water temperature (they heat the cold-water to this minimum temperature). Direct drive vs belt drive and higher spin speeds may also have an impact. In essence, front loader machines work longer and harder as they use less water. This concept, known as the Cleaning Circle, is addressed in the summary section at the beginning of this report.

Figure 51: CEC for front-loader and top-loader clothes washers – warm wash

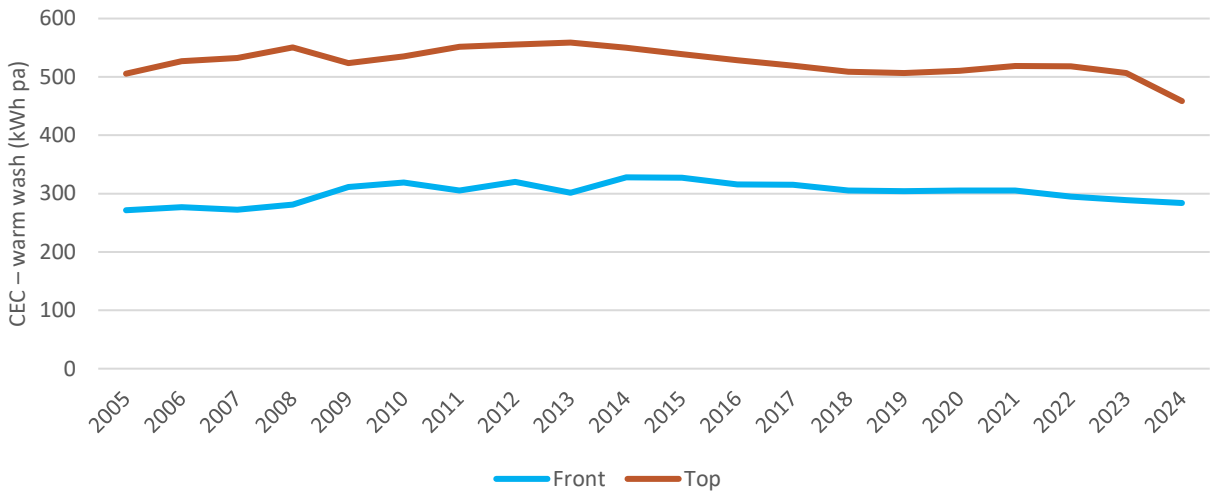
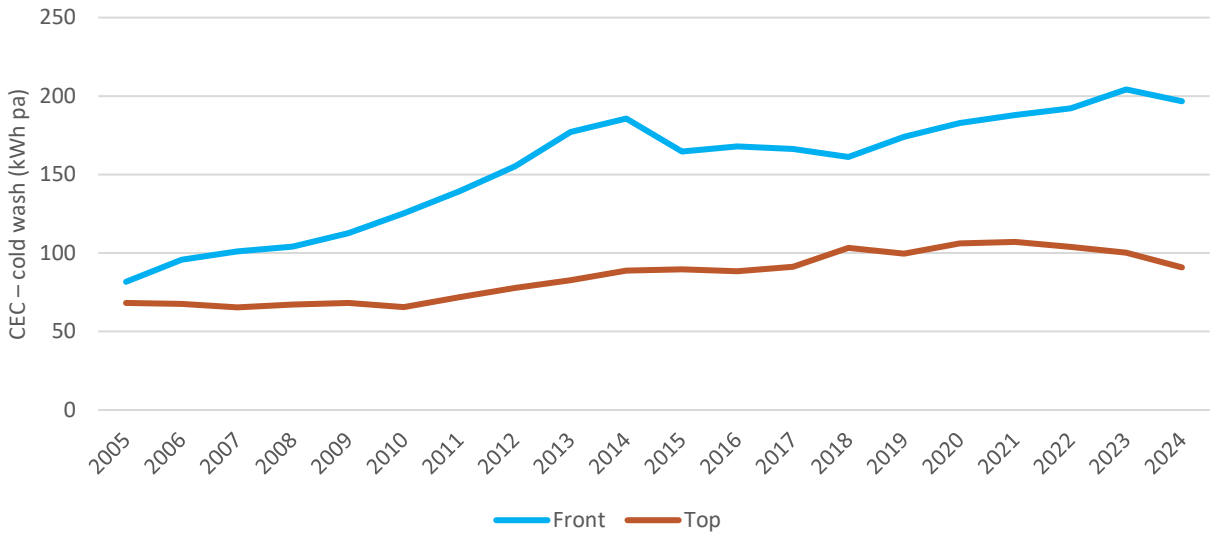
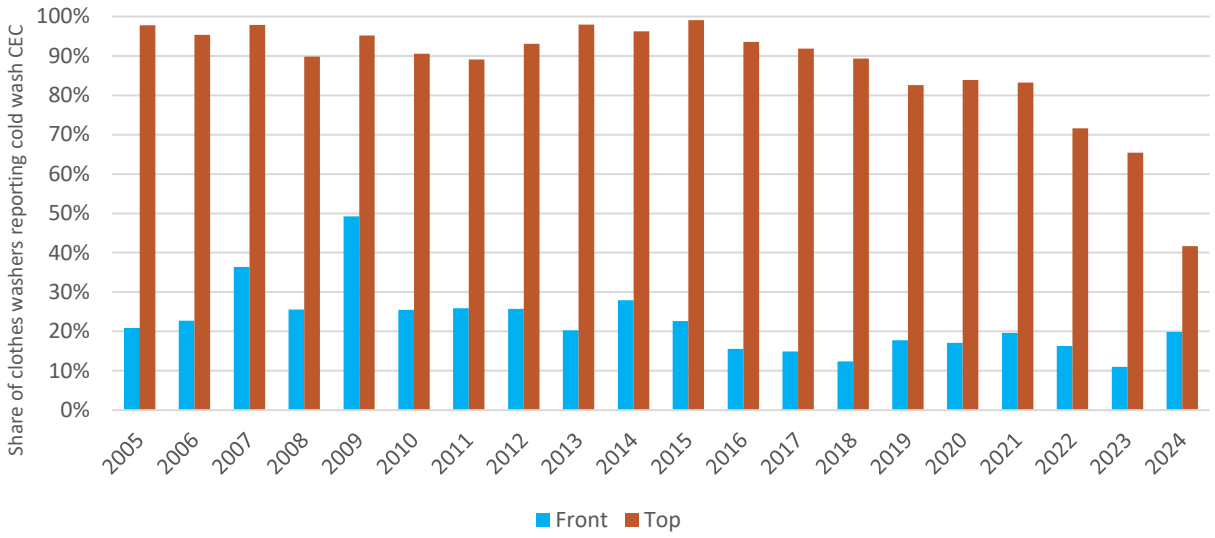


Figure 52: CEC for front-loader and top-loader clothes washers – cold wash



Measuring and reporting the CEC for cold wash is optional for clothes washers. Only 10% to 20% of front-loaders measure and report the cold wash CEC, and in recent years the share of top-loaders reporting cold wash CEC has decreased from 80% to 40%, as shown in Figure 53.

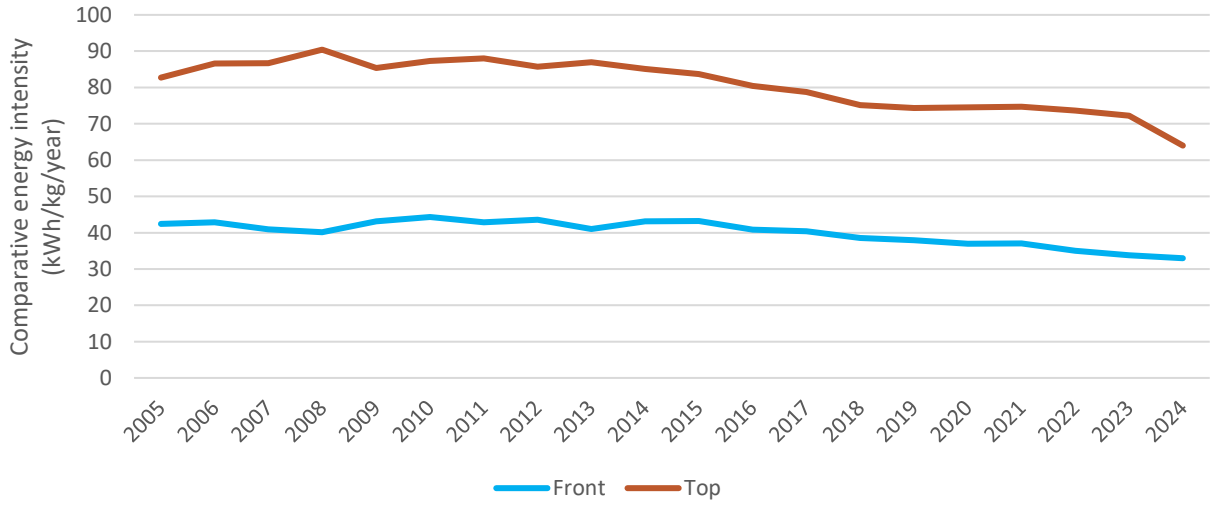
Figure 53: Percentage of machines reporting cold wash CEC – clothes washers



As noted earlier, the capacity of washing machines has grown steadily over the years. It is interesting to analyse the 'energy intensity' trend of washing machines by looking at the amount of energy used per kg of clothes on an annual basis. This information is shown in Figure 54.

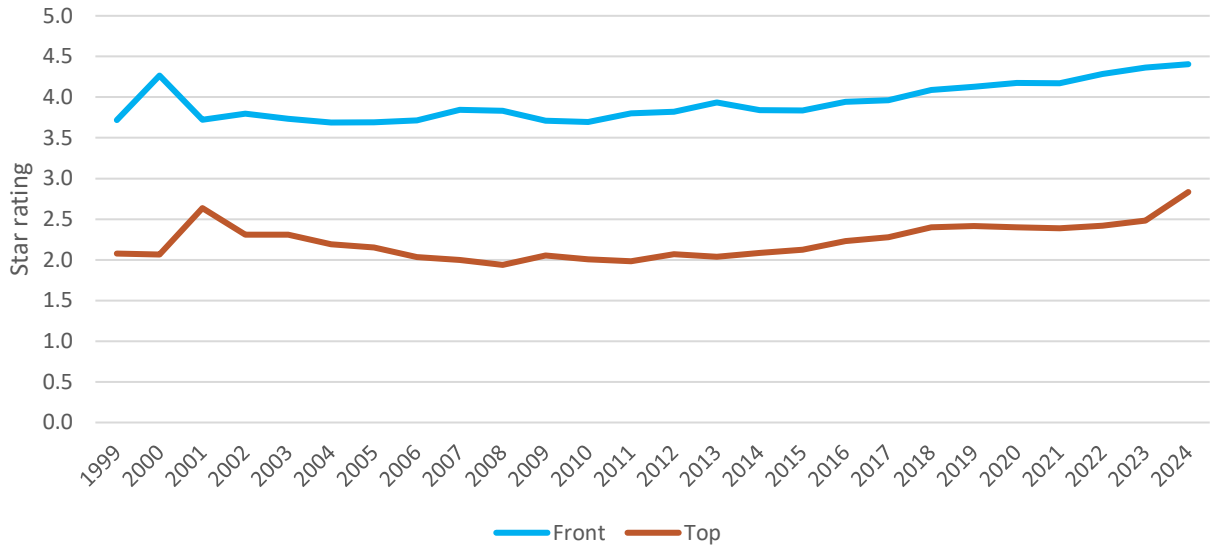
The figure shows a slow, but steady, decline in the amount of energy used per kg of load on a per annum basis. In 2024, the energy intensity for top-loader machines shows a noticeable decline similar to that shown in Figure 51 for CEC.

Figure 54: CEC intensity per annum – clothes washers: warm wash



Washing machine star ratings (on a warm wash) have increased steadily over the past 15 years, as shown in Figure 55.

Figure 55: Star rating trends – clothes washers: warm wash



There is a trend towards sales of more efficient clothes washing machines, with an increasing percentage of sales of higher star-rated machines occurring over time. This trend is stronger in front-loader machines than for top-loader machines, as illustrated in Figure 56 and Figure 57.

Figure 56: Star rating trends – front-loader clothes washers

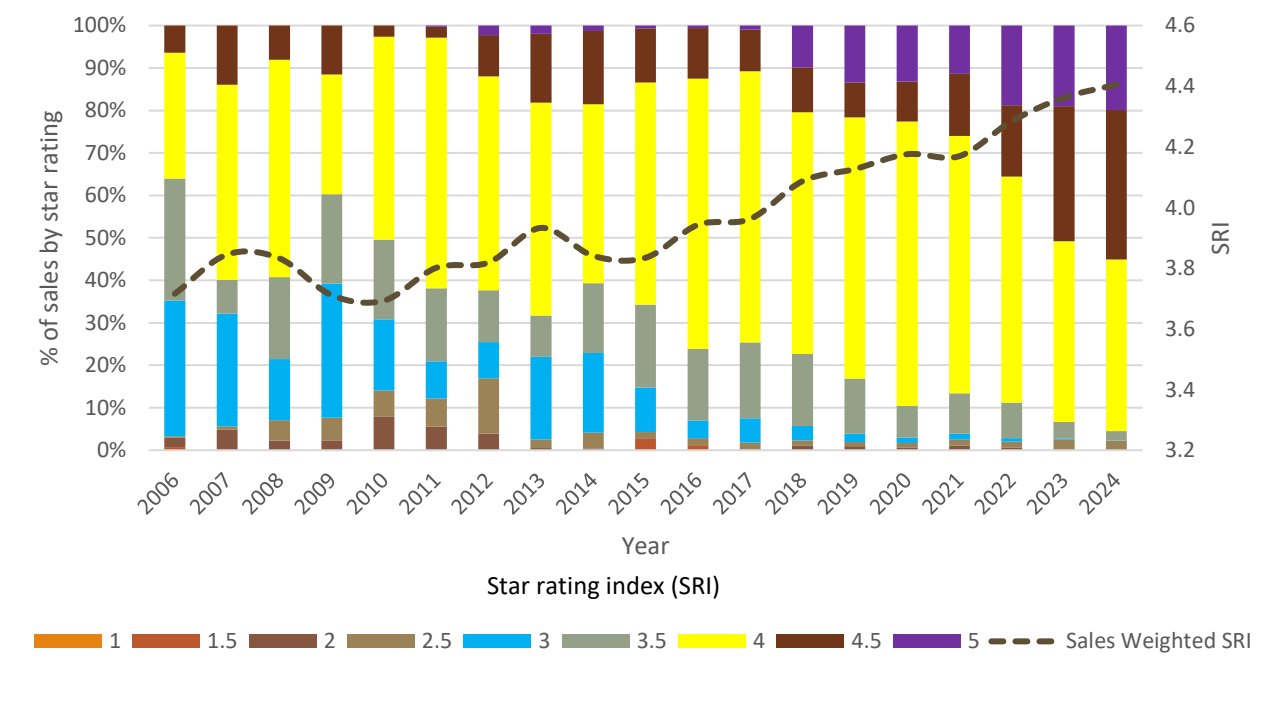
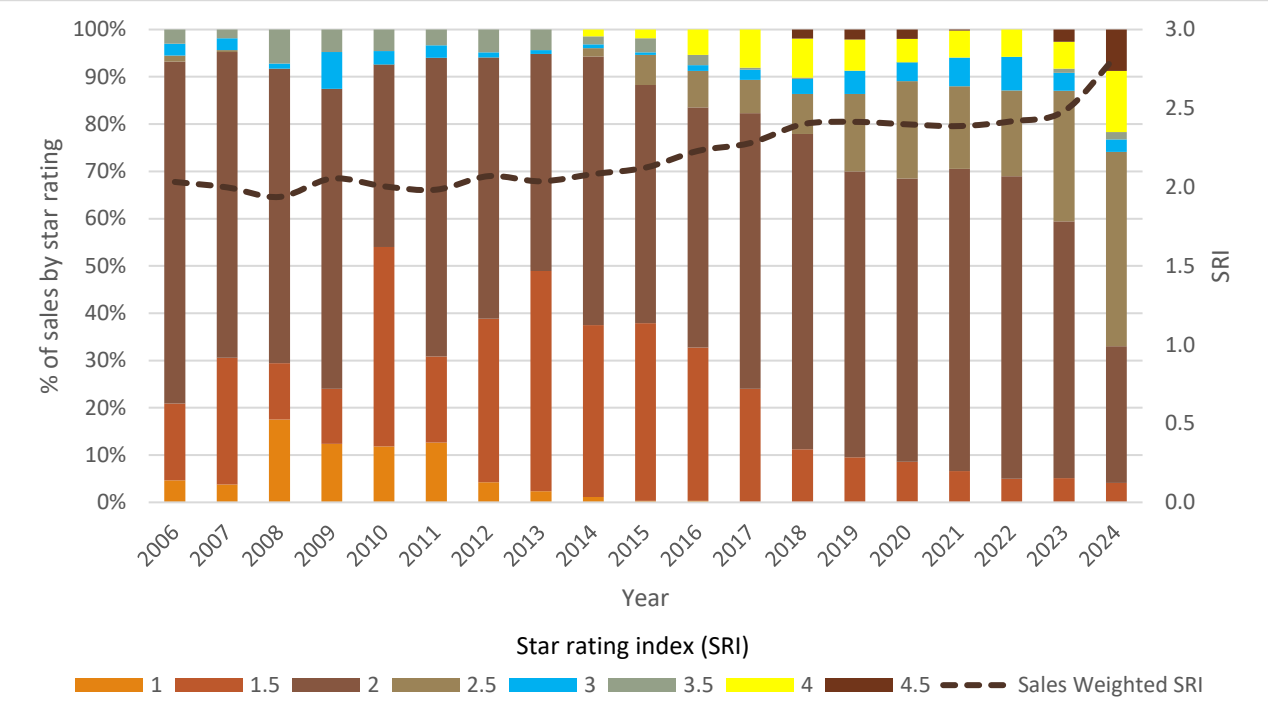
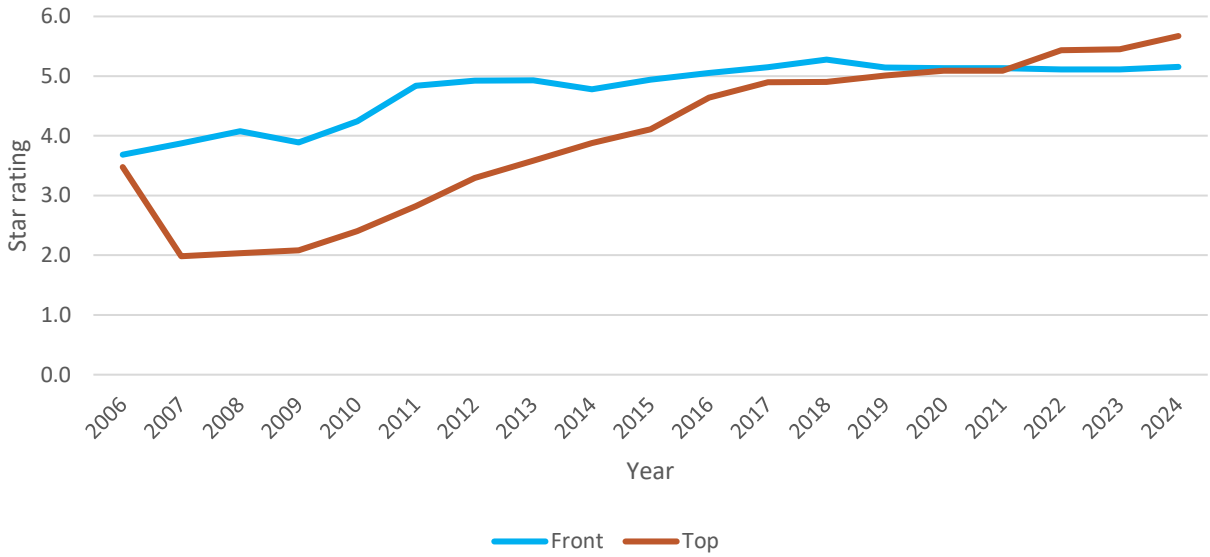


Figure 57: Star rating trends – top-loader clothes washers



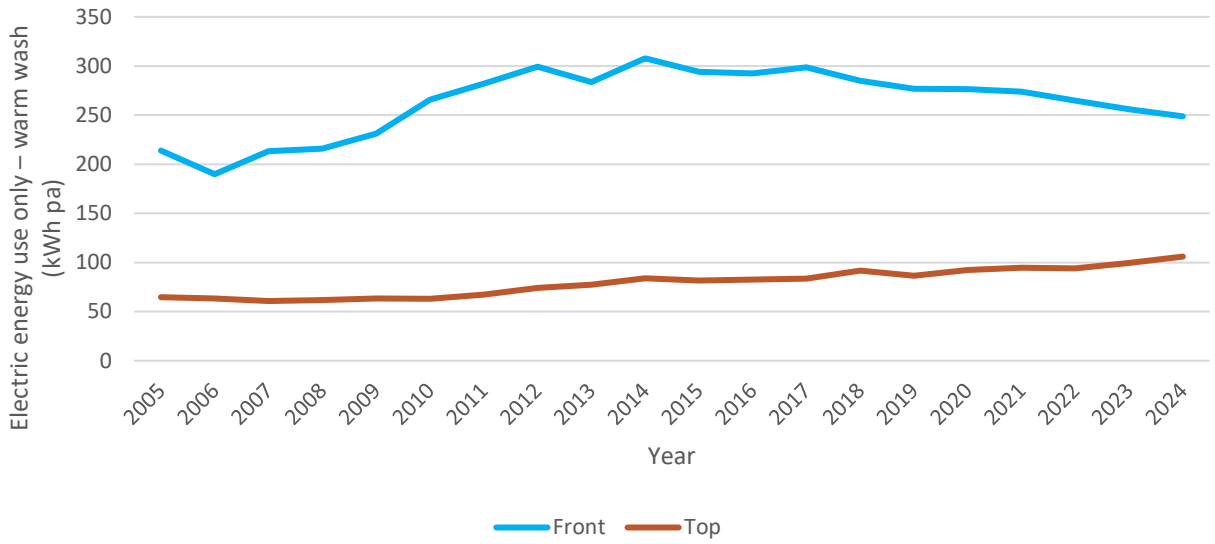
The trends in the star ratings of front-loader and top-loader machines using a cold wash are shown in Figure 58.

Figure 58: Star rating trend – clothes washers: cold wash



The trend in the amount of electric energy used (excluding energy attributed to the hot-water used by dual connected washing machines) per machine per annum for clothes washers using a warm wash is shown in Figure 59.

Figure 59: Electric energy only consumption – clothes washers: warm wash

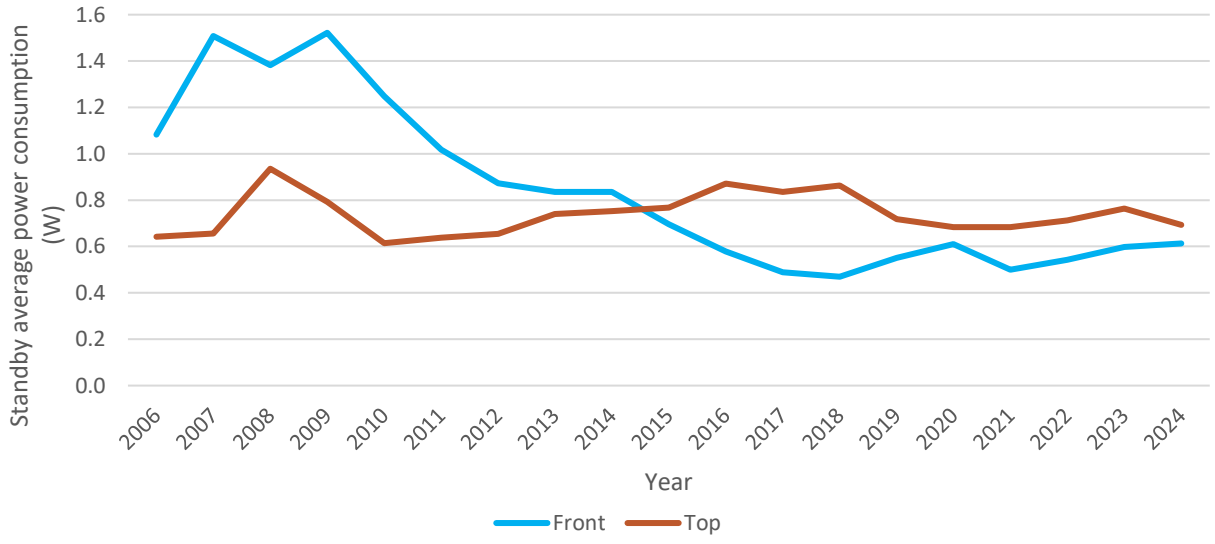


The higher electricity use by front-loaders is due to their use of electricity to heat the water for a warm wash, while top-loaders mostly use the household hot-water from the hot-water heater. There is a small percentage of top-loaders that are now being sold (4–6%) with an internal water heater. However, these products are still using hot-water from the household hot-water in the warm wash cycle test.

Clothes washers use a small amount of power when switched on and in standby mode. Trends in the average amount of power used in standby mode are shown in Figure 60.

Standby energy consumption for both of the main types of clothes washers is around 0.6 to 0.7 W. Standby energy consumption for front-loaders has trended down over the past 15 years and is now less than half what it used to be. Standby consumption for top-loaders has been relatively constant over that period.

Figure 60: Trends in average standby power consumption – clothes washers



4.6 Additional commentary

Country of manufacture

Clothes washers sold in New Zealand are manufactured in a range of countries. The largest volume of clothes washers sold in New Zealand now come from China (60%), followed by Thailand (17%). These percentages have effectively reversed in the past 12 years, as in 2012 the sales percentages from China and Thailand were 16% and 64%, respectively.

The data also shows that, in 2005, 41% of clothes washers sold in New Zealand were manufactured in New Zealand and 25% were manufactured in Australia. By 2014, the percentage from both countries had effectively dropped to zero.

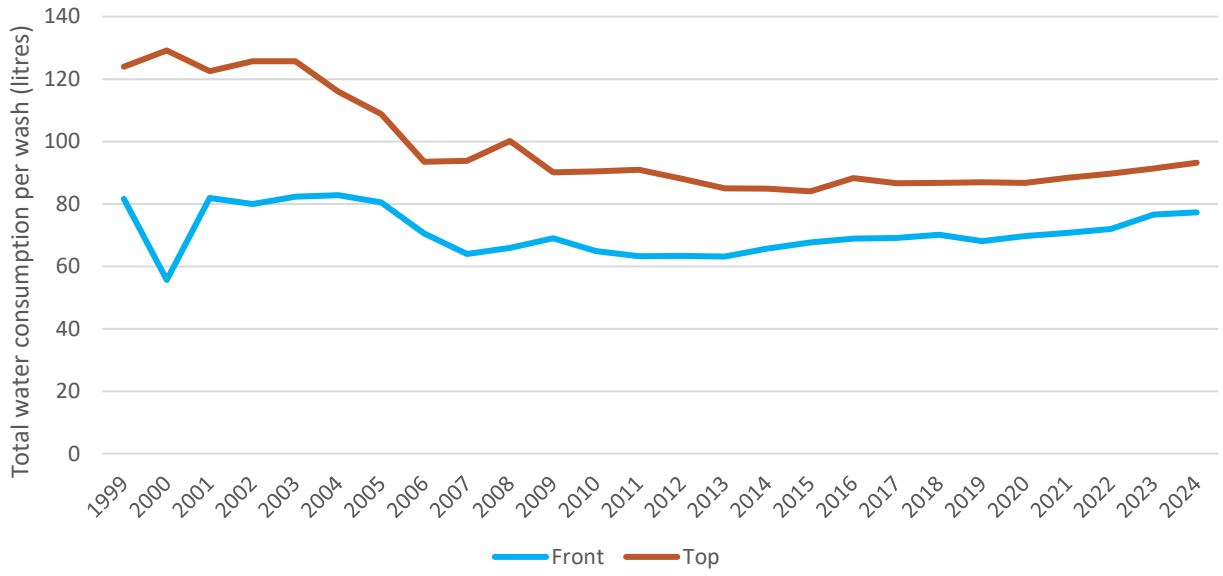
Water use

Water consumption by top-loader machines for a warm wash cycle has remained relatively static over the past 15 years at around 90 litres per wash.

Water consumption by front-loader machines for a warm wash cycle has increased by around 10% over the past 15 years from around 70 litres per wash to 77 litres per wash.

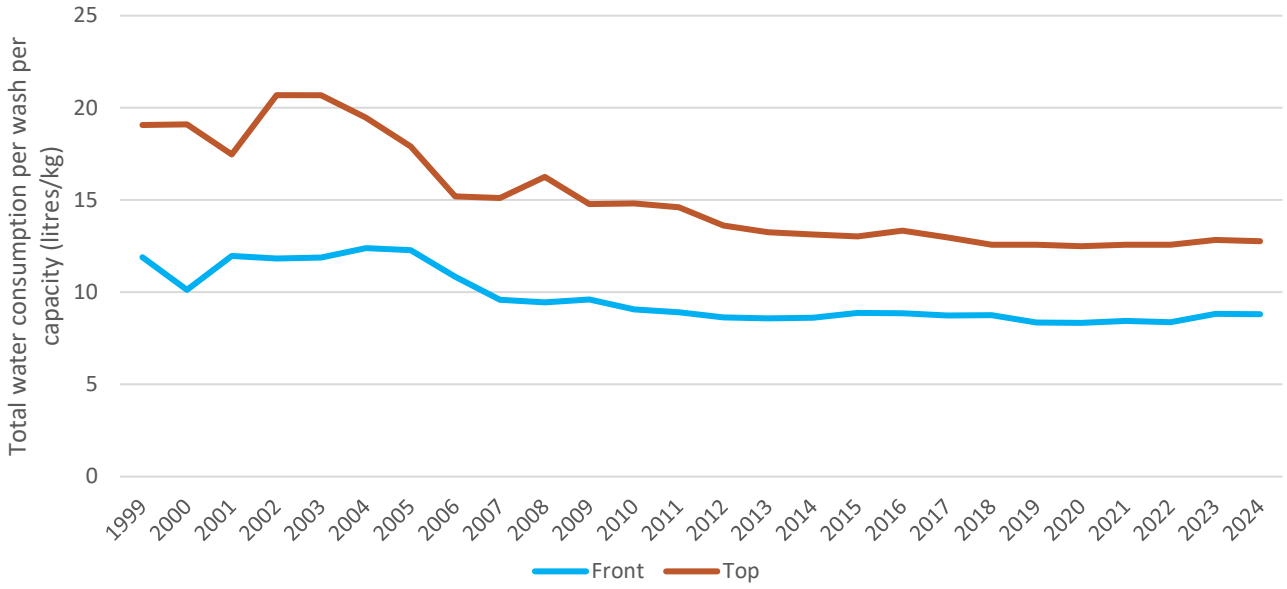
These trends can be seen in Figure 61.

Figure 61: Water consumption trends – clothes washers



However, the water consumption per wash per kilogram of capacity has remained stable over the past decade, as can be seen in Figure 62.

Figure 62: Water consumption per wash per kilogram of capacity – clothes washers



4.7 Summary of key insights

Improved energy ratings. There is a noticeable shift towards consumers purchasing washing machines with higher energy star ratings. In the year ending March 2024, models rated 4.5 or 5 stars comprised 36% of total sales, a significant increase from the less than 1% of sales in 2002.

Running costs. Table 7 shows that top-loader machines are cheaper to operate than front-loaders when doing a cold wash. The opposite is true when doing a warm wash.

Doing a cold wash in a top-loader machine will save 80% in electricity costs compared with doing a warm wash in the same machine. The comparable saving between doing a cold wash and a warm wash in a front-loader machine is only 31%.

Table 7: Comparison of electricity operating costs – top-loader and front-loader clothes washers

	Annual electricity cost	
	Top-load	**Front-load**
Cold wash	$27	$59
Warm wash	$138	$85
Saving – cold vs warm wash	80%	31%

Note: Based on an electricity cost of 30c/kWh.

Shift towards front-loader machines. The proportion of front-loader machines has increased steadily from 7% of sales in 2005 to 58% of sales in 2024.

Changes in country of manufacture. Historically, the bulk of the market comprised products manufactured in Australia and New Zealand with a combined 66% of sales in 2005. Products from Thailand then became more popular, with 64% of products sourced from Thailand in 2012. Washing machines manufactured in China now dominate the market, with 60% of sales in 2024.

Limited visibility of power saved by using a cold wash. There has been a recent decline in the number of clothes washers displaying cold wash energy consumption data on the label for consumers to see. Historically, over 90% of top-loader washers reported cold wash energy consumption. However, from

around 2016, this figure began to decline, with only 42% of top-loader machines showing cold wash energy consumption in 2024. Provision of information on cold wash energy consumption for front-loader machines has been consistently low, generally appearing on about 20% of machines.

Difference between laboratory testing of a cold wash and real-life cold wash. Laboratory testing of washing machines on a 'cold' wash cycle is carried out using water supplied at 20˚C. However, in real life use, cold-water can often be considerably less than 20˚C and the energy consumption of heating the water to 20˚C is not measured during testing. Consumers will therefore use more energy than the cold test results indicate and will not make the full amount of savings that they may expect when selecting a cold wash.

Significant energy and cost savings. Upgrading to a more efficient washing machine can lead to substantial savings. Table 8 shows the energy and money saved, compared with a 1-star appliance, over 15 years, based on an electricity cost of 30c/kWh.

Table 8: Estimated average energy and cost savings compared to a 1-star product – clothes washers

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	932	680	496	362	265	193	141	103	75	55
Annual energy cost	$279	$204	$149	$109	$79	$58	$42	$31	$23	$16
Annual savings	$0	$75	$131	$171	$200	$222	$237	$249	$257	$263
Savings over 15 years	$0	$1,132	$1,958	$2,561	$3,001	$3,323	$3,557	$3,729	$3,854	$3,945
Percentage of energy saved	0%	27%	47%	61%	72%	79%	85%	89%	92%	94%

5. Computer monitors

5.1 Description of product class

The computer monitor market offers a diverse range of options tailored to various needs, from everyday computing to professional tasks and immersive gaming experiences. Key product variations and trends include the following.

- Screen sizes and resolutions: monitors are generally available in sizes ranging from 23-inch displays to expansive 34-inch ultrawide screens. Common resolutions include Full HD (1,920 x 1,080 pixels), Quad HD (2,560 x 1,440), and 4K Ultra HD (3,840 x 2,160), providing users with choices that balance workspace and clarity.
- Gaming monitors: for gaming enthusiasts, monitors with high refresh rates (ranging from 144Hz to 240Hz) and adaptive sync technologies (like NVIDIA's G-Sync and AMD's FreeSync) are prevalent. These features ensure smoother gameplay by reducing screen tearing and input lag.
- Connectivity and ergonomics: modern monitors offer a variety of connectivity options (including HDMI, DisplayPort, USB-C, and Thunderbolt), ensuring compatibility with a wide range of devices. Ergonomic features, such as adjustable stands with tilt, swivel, and height adjustments, are also common, promoting comfortable and customisable workspaces.

A summary of the key statistics for the two main classes of computer monitors is given in Table 9.

Table 9: Computer monitor statistics 2024

Type	Medium-resolution screen	High-resolution screen
		
Description	Screen resolution from 1.1 to < 2.1 megapixels	Screen resolution >= 2.1 megapixels
Market share of sales in 2024	84%	16%
Average screen size	24.7 inches	27.8 inches
On-mode power consumption	16W	30W
Comparative energy consumption (based on being on 10 hours per day)	71kWh pa	124kWh pa
Annual energy cost	$21	$37
Average star rating	6.3	4.7

Note: Energy cost is based on an electricity price of 30c/kWh.

5.2 Relevant regulations

Computer monitors must comply with both MEPS and MEPL requirements, as outlined in the Regulations.

The methods of measurement for energy performance of computer monitors are outlined in AS/NZS 5815.2:2013.

Each computer monitor offered for sale must have an energy rating label attached in a place that it is not obscured when the product is displayed, to help consumers compare the energy efficiency of different monitors.

Computer monitors generally display a star rating between one and nine stars. There is a 20% energy consumption reduction with each additional star. Computer monitors are tested using AS/NZS 5815.1:2012 and rated using AS/NZS 5815.2:2013. The label also shows the annual energy consumption (in kWh per year), and the test standard used.

Some high-performance gaming monitors are not covered by the regulations. Portable monitors are becoming popular and are covered by the regulations. The scope of monitors covered by the regulations can be found here: Monitors MEPS

The annual energy consumption and star rating of a computer monitor is calculated assuming that it is on for 10 hours a day, and in standby for 14 hours. It is also assumed that the monitor is in the recommended 'home viewing' mode.

More information on labelling requirements for monitors can be found on EECA's website: Monitors | EECA

5.3 Market and sales trends

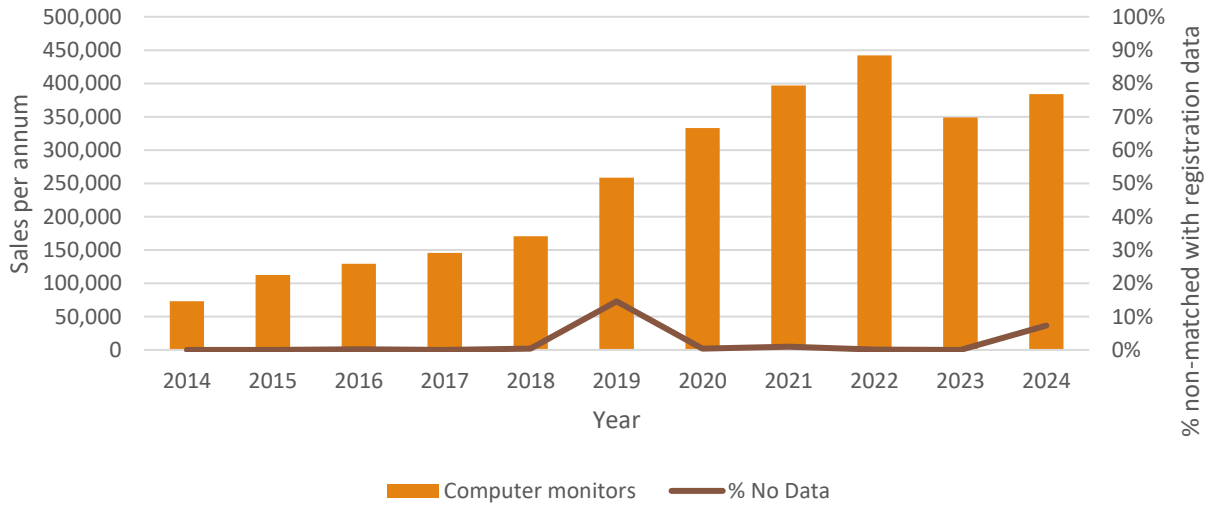
The sales trends for monitors, in total and segmented by technology type (LCD and OLED), are shown in Figure 63.

Annual sales have increased steadily from 73,000 in 2014 to 442,000 in 2022, followed by a slight decline in sales to 384,000 in 2024.

The figure also shows instances of incomplete data in 2019, where 15% of sales cannot be further analysed, and in 2024, where 7% of sales cannot be further analysed.

Virtually all monitors sold have liquid crystal display (LCD) screens, with less than 1% having organic light emitting diode (OLED) screens.

Figure 63: Annual sales of computer monitors

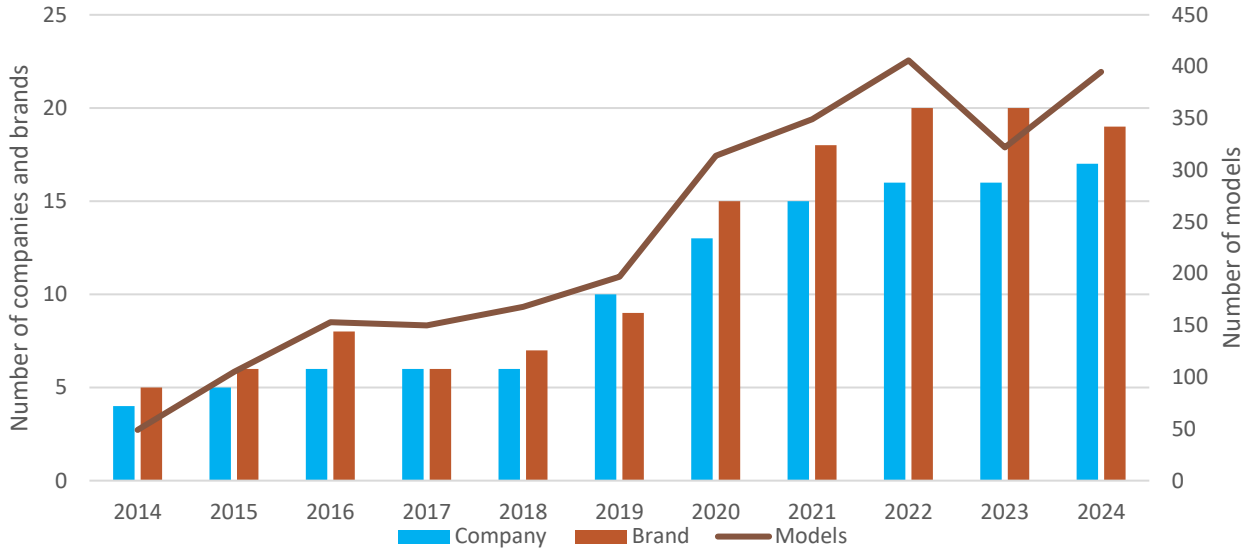


The make-up of brands and models of computer monitors available in New Zealand, and their importers and manufacturers has changed over time, with 395 models, 19 brands and 17 importers and manufacturers operating in the market in 2024.

The number of models available has increased significantly and in a generally steady manner from the 49 models available in 2002, with the exception of a reduction in models available in 2023.

The number of companies and brands available has also increased in a generally steady manner over that time. These trends can be seen in Figure 64.

Figure 64: Changes in number of companies, brands and models – computer monitors



5.4 Product trends

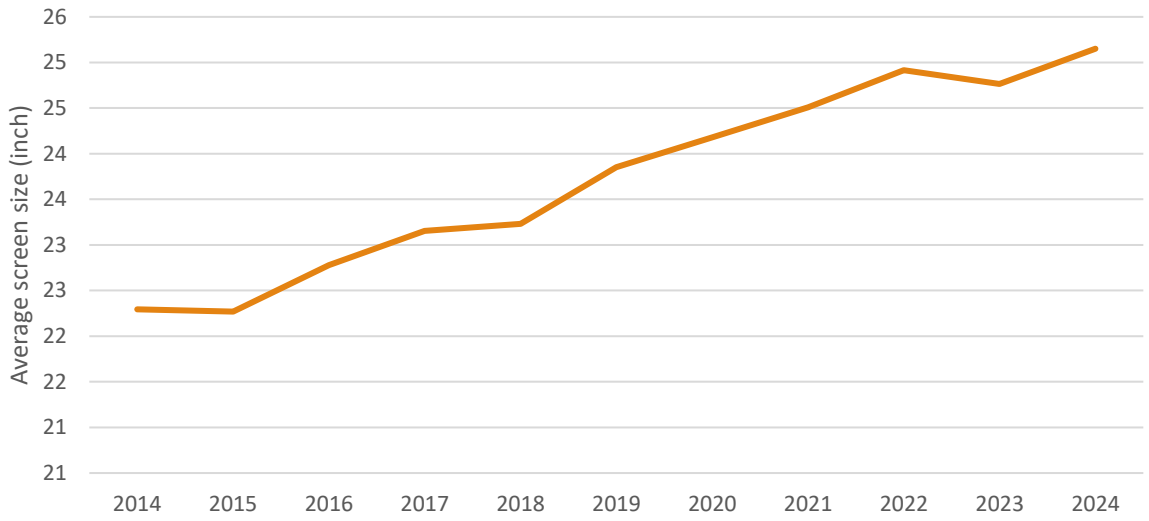
Screen size

Computer monitor size is normally expressed in inches, being the distance diagonally from the top corner of the screen to the bottom corner on the opposite side. Common screen sizes typically range from 22 inches to 34 inches, although a few very large monitor screens are sold, up to 57 inches.

The trends for sales-weighted average size[7] for computer monitors are shown in Figure 65. The average screen size has increased steadily from 22 inches in 2014 to 25 inches in 2024. Sales are dominated by medium-resolution screens, with high-resolution screens tending to be 10% to 15% larger than medium-resolution screens.

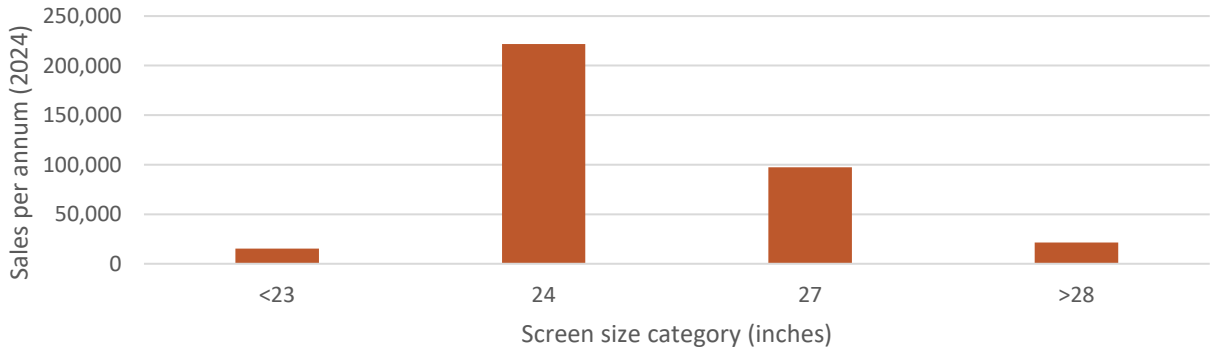
[7] This is the average screen size based on a weighted average number of models sold, thus taking into account the popularity of models.

Figure 65: Average screen size trend – computer monitors



The distribution of screen sizes for computer monitor sales in 2024 is shown in Figure 66. This shows that 24-inch monitors are, by far, the greatest selling size, with 61% of sales in 2024.

Figure 66: Distribution of sales by screen size – computer monitors



Resolution

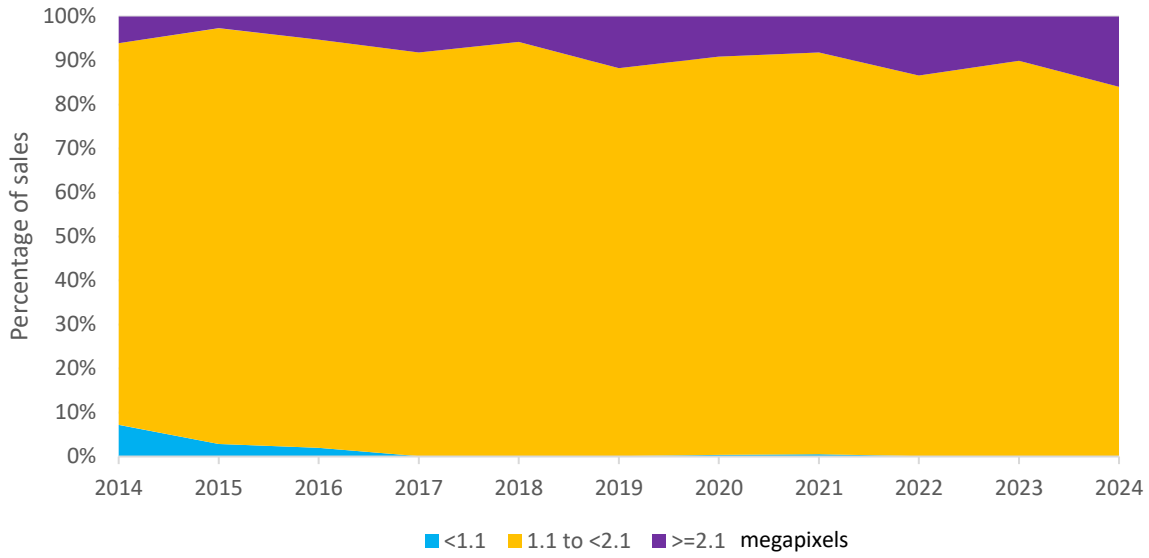
The resolution of computer monitors is measured by the number of pixels and, for the purposes of this analysis, has been grouped into three categories:

- <1.1 megapixels (low resolution)
- 1.1 to <2.1 megapixels (medium resolution)
- >= 2.1 megapixels (high resolution).

Figure 67 shows the distribution of sales by these three categories of resolution.

The figure shows that low-resolution screens of less than 1.1 megapixels have virtually disappeared from the market. The bulk of the market (84% of sales in 2024) have a screen resolution of from 1.1 to <2.1 megapixels (medium resolution) and this market share has been relatively steady over the past 10 years. High-resolution monitors have increased from 6% of sales in 2014 to 16% of sales in 2024.

Figure 67: Computer monitors – share of market by resolution



Screen luminance

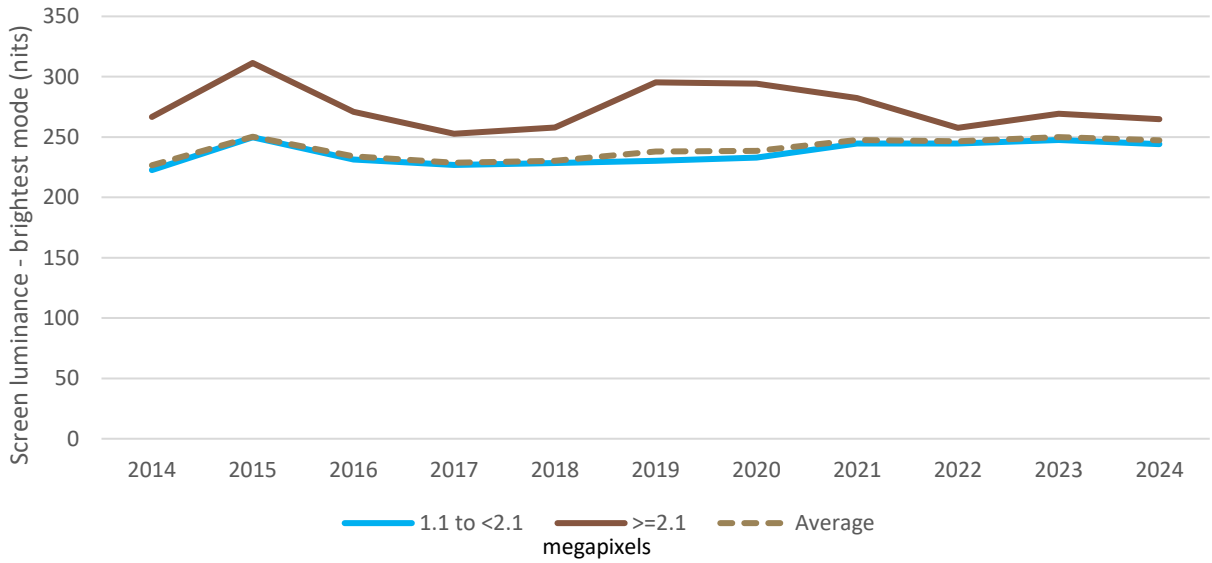
The standard unit for measuring the luminance of a monitor screen is nits, which is equivalent to one candela per square meter (cd/m²). Nits essentially measure how bright a display is, with higher nits indicating a brighter picture.

Luminance for computer monitors is measured only in their brightest mode.

Trends in luminance, based on a sales-weighted average for two screen resolution categories, and on overall average screen resolutions are shown in Figure 68.

Average screen luminance has increased 9% since 2014 and is now 247 nits.

Figure 68: Screen luminance – computer monitors, by screen resolution



5.5 Product efficiency trends

Energy intensity

It is interesting to look at the amount of power consumed by monitors as a function of their screen resolution.

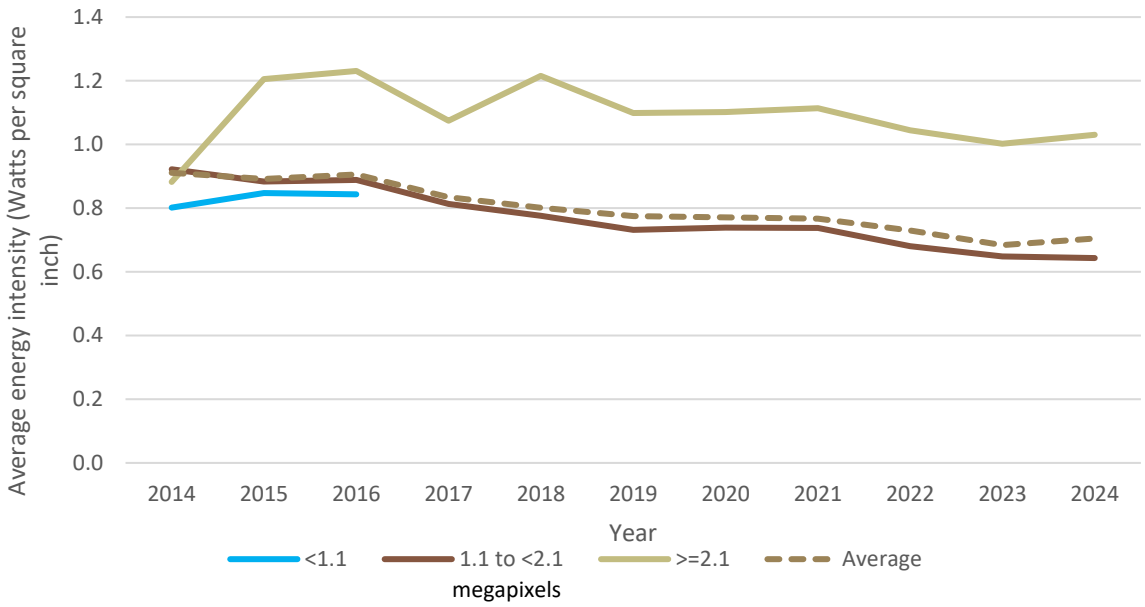
Figure 69 shows the energy intensity, which is defined as the sales-weighted average power used divided by the size of the screen to give a measure in Watts/square inch. Data on the three screen resolution categories is provided, as well as a weighted average across all screen resolution categories.

Energy intensity has gradually declined each year and the average energy intensity of monitors in 2024 is 0.71 Watts/square inch, which is 23% down on the energy intensity of monitors sold in 2014.

As noted above, screens are slightly brighter than in the past, increasing in luminance by 9% since 2024.

As can be seen in the figure, the energy intensity line for medium-resolution monitors closely matches the overall average – this is owing to medium-resolution monitors dominating the market. Higher resolution monitors have an energy intensity 60% higher than medium-resolution monitors. Data for low-resolution monitors is only shown to 2016, as sales are too few to reliably analyse beyond that date.

Figure 69: Energy intensity – computer monitors



Comparative energy consumption

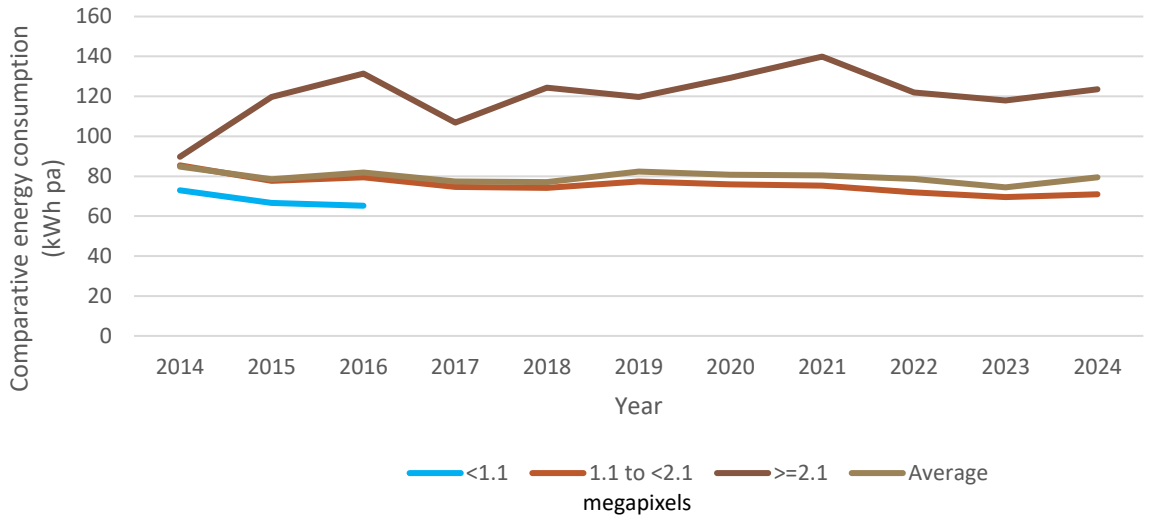
The trends for CEC for the various screen resolution categories of monitors are shown in Figure 70.

As the figure shows, the CEC line for medium-resolution monitors closely matches the overall average, owing to medium-resolution monitors dominating the market. The overall weighted average CEC for all monitors has declined very slightly over the past 10 years and is now 79kWh pa, being 6% below the CEC in 2014.

Higher resolution monitors have a CEC 74% higher than medium-resolution monitors. Data for low-resolution monitors is only shown to 2016, as sales are too few to reliably analyse beyond that date.

These CECs equate to annual operating costs of $21 and $37 for medium-resolution monitors and high-resolution monitors, respectively.

Figure 70: Sales-weighted CEC per annum – computer monitors



On-mode power (in Watts)

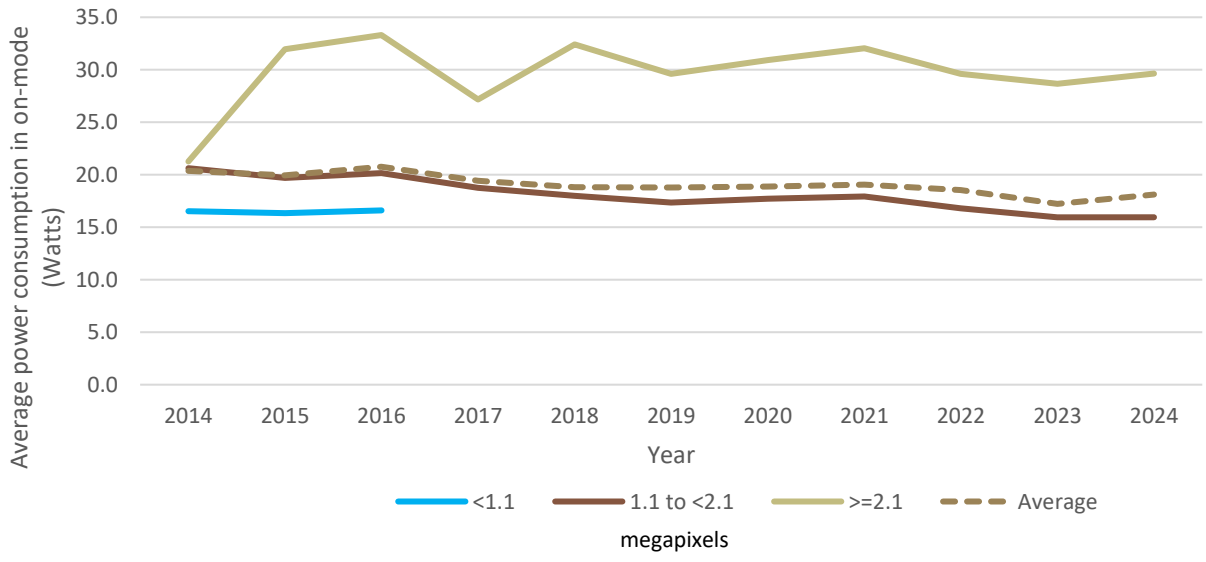
Figure 71 shows data for on-mode power consumption for the three screen resolution categories for computer monitors, as well as a weighted average across all screen resolution categories.

Average on-mode power has gradually declined each year; the average on-mode power use of monitors in 2024 is 18.1W, which is 11% down on the average power use of monitors sold in 2014. It is interesting to note that power consumption of medium-resolution monitors is down 23% over that 10-year period, whereas power consumption for high-resolution monitors is up 39%.

Higher resolution monitors use more power and are usually larger. More pixels in these monitors results in higher power consumption.

As can be seen in the figure, the on-mode power line for medium-resolution monitors closely matches the overall average, owing to medium-resolution monitors dominating the market. However, as higher resolution monitors have increased their market share from around 2019, the line for average power consumption and medium-resolution power consumption tends to diverge slightly, owing to the higher power consumption of high-resolution monitors having an impact.

Figure 71: On-mode power by screen resolution – computer monitors



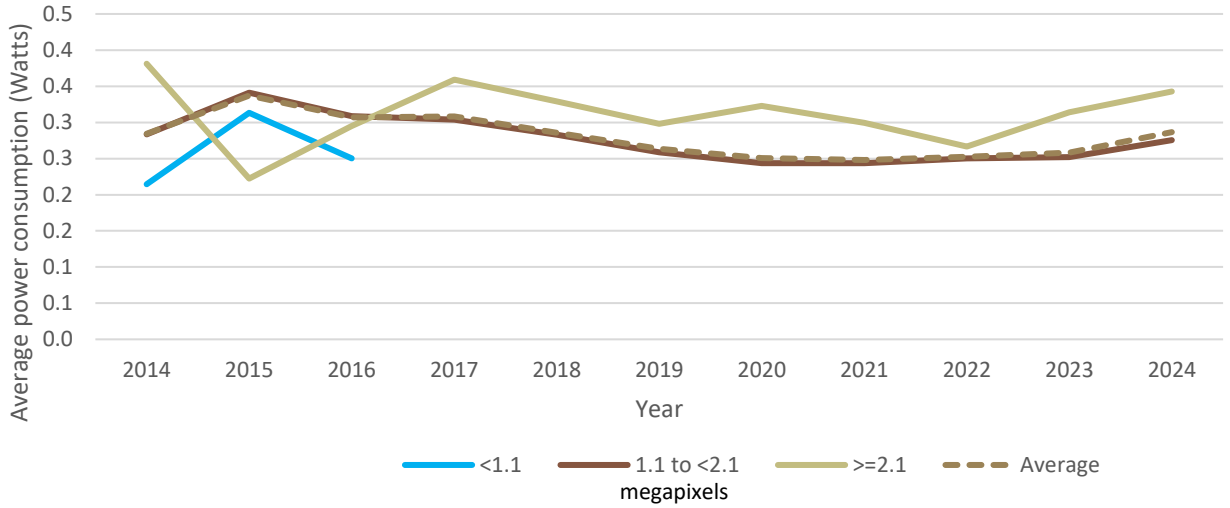
Standby power (Watts)

Monitors use a small amount of power when switched on and in standby mode. Trends in the amount of power used in standby mode are shown in Figure 72.

Average standby power consumption has gradually moved up and down over the past 10 years, with the net effect of standby power consumption of monitors sold in 2024 being 0.29W, which is essentially the same as it was in 2014.

As can be seen in the figure, the standby power consumption for medium-resolution monitors closely matches the overall average, owing to medium-resolution monitors dominating the market. Standby power consumption for high-resolution monitors is slightly higher at 0.34W for sales in 2024.

Figure 72: Standby power by screen resolution – computer monitors



Star rating

Sales-weighted-average computer monitor star ratings have increased steadily over the past 10 years, as can be seen in Figure 73.

The average star ratings for all monitors in 2024 was 6.0, up from 4.8 in 2014. The trend line for the average across all monitors closely matches that for medium-resolution monitors, as that category of monitors dominates the market. It is interesting to note that star ratings for high-resolution monitors are significantly lower than for medium-resolution ones (average of 4.7 in 2024). They have also trended down slightly over time, being 7% lower than they were in 2014.

Figure 73: Star rating trend – computer monitors

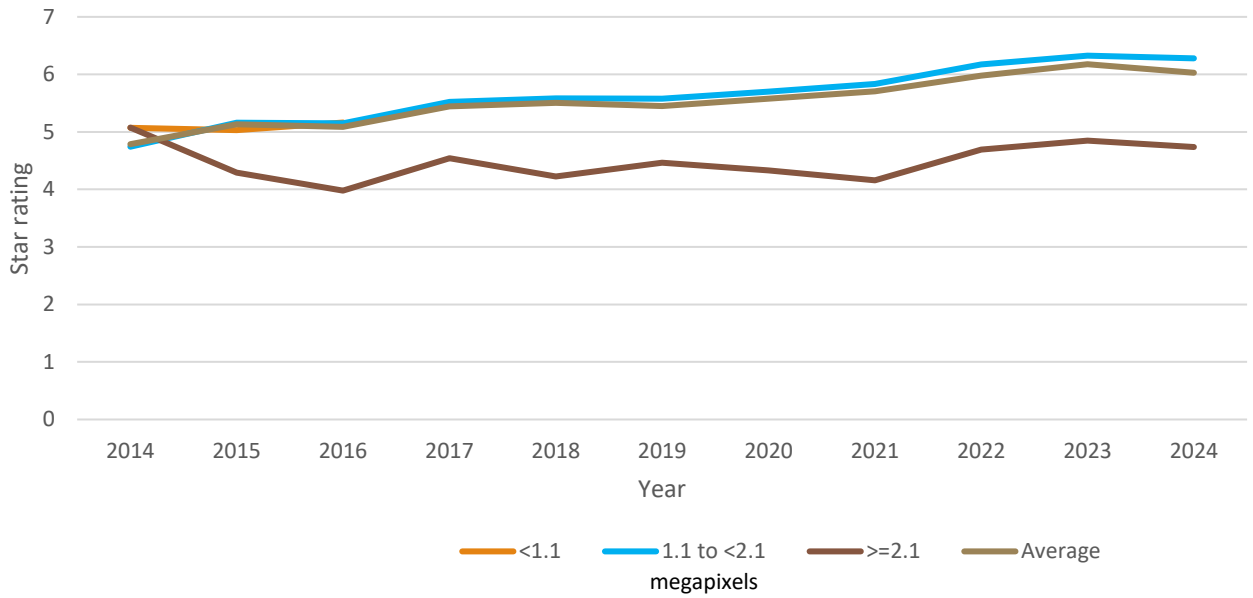
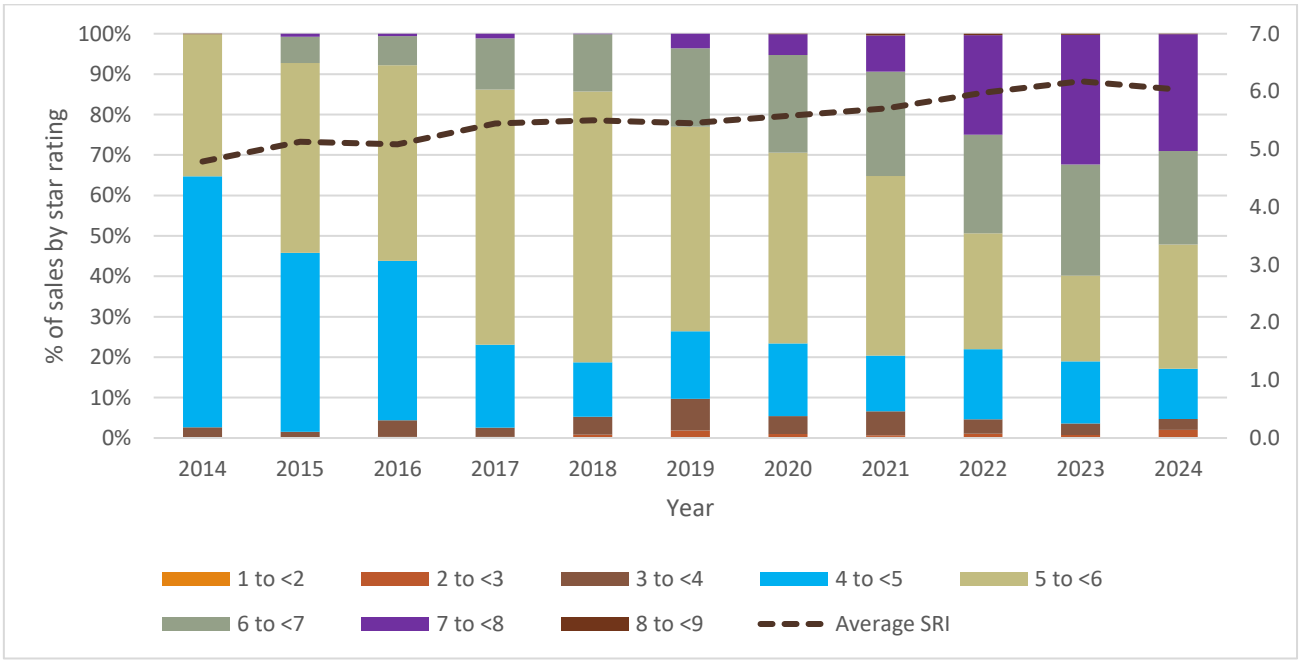


Figure 74 shows the share of sales for the various star rating groupings of computer monitors, as well as the average star rating over the time period (dotted line).

The figure shows the reducing share of sales of monitors with a star rating of <5, going from 65% of sales in 2014 to 17% in 2024. Monitors with a star rating of 5 to 6 increased from 35% of the market in 2014 to a high of 67% in 2018, then declined to 31% of sales in 2024. Monitors with a star rating of 7 or more have risen from 0.1% of sales in 2014 to 29% in 2024.

Figure 74: Star rating share of sales – computer monitors



5.6 Additional commentary

Monitors sold in New Zealand are manufactured in a range of countries. The largest volume of monitors sold in New Zealand now come from China, which has accounted for 80% to 90% of the New Zealand market over the past 10 years.

5.7 Summary of key insights

Increasing sales volumes. Around 384,000 monitors were sold in 2024, well up on the 73,000 sold in 2014.

Increasing choice in the market. The number of models of computer monitors available in the New Zealand market has steadily risen over the past 10 years, and consumers now have 395 different monitor models to choose from.

Average screen size is increasing. While the most popular screen size is currently 24 inches (with 61% of sales in 2024), the average monitor screen size is now over 25 inches, up from 22 inches in 2014.

High-resolution screens are increasing in popularity. While medium-resolution screens dominate the market with 84% of sales, high-resolution screens have increased from 6% to 16% of the market over the past 10 years. Higher resolution monitors use more power and are usually larger.

Improved energy ratings. Monitors with a star rating of 7 or more have risen from 0.1% of sales in 2014 to 29% of sales in 2024. Over the same period, sales of monitors with a star rating of <5 have decreased from 65% to 17% of the market.

Overall energy consumption is relatively flat. While the energy intensity (measured in Watts/square inch) and the star ratings of monitors have improved, monitors have increased in size, and there has been an increased uptake in higher energy consuming high-resolution monitors. The net effect of these factors has been that the sales-weighted-average comparative energy consumption of monitors is the same as it was in 2015.

High-resolution monitors are more expensive to operate. Because of the higher comparative energy consumption of high-resolution monitors, the operating cost of a high-resolution monitor is $37 per year, which is 76% higher than for a medium-resolution monitor.

Most products are manufactured in China. Monitors from China have represented 80% to 90% of the New Zealand market over the past 10 years.

Significant energy and cost savings. Upgrading to a more efficient computer monitor can lead to substantial savings. Table 10 shows the energy and money saved, compared with a 1-star appliance, over 15 years, based on an electricity cost of 30c/kWh.

Table 10: Estimated average energy and cost savings compared to a 1-star product – computer monitors

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	224	179	143	115	92	73	59	47	38	30
Annual energy cost	$67	$54	$43	$34	$28	$22	$18	$14	$11	$9
Annual savings	$0	$13	$24	$33	$40	$45	$50	$53	$56	$58
Savings over 15 years	$0	$201	$363	$492	$595	$677	$743	$796	$838	$872
Percentage of energy saved	0%	20%	36%	49%	59%	67%	74%	79%	83%	87%

6. Dishwashers

6.1 Description of product class

The domestic dishwasher market offers a variety of models designed to accommodate diverse kitchen layouts and household needs.

The primary types include:

- built-in dishwashers: designed to integrate seamlessly into kitchen cabinetry to provide a streamlined look; typically installed beneath benchtops and require professional installation
- freestanding dishwashers: versatile units that can be placed anywhere with the necessary water and drainage connections; ideal for renters or those seeking flexibility, as they can be easily relocated
- on-bench dishwashers: compact smaller units that can sit on benchtops and typically hold up to six place settings; ideal for small households or kitchens with space constraints
- drawer dishwashers: feature single or double drawers that operate independently, with a typical capacity of seven place settings; offer ergonomic benefits and are suitable for kitchens with limited space.

A summary of the key statistics for the two main types of dishwashers is given in Table 11.

Table 11: Dishwasher statistics 2024

Type	Built-in	Freestanding
		
Description	Built-in dishwashers are typically installed beneath benchtops and require professional installation. They typically hold 14 or 15 place settings.	Freestanding dishwashers can be placed anywhere with the necessary water and drainage connections. They typically hold 12 to 15 place settings.
Market share of sales in 2024	29%	69%
Average capacity	11.0 place settings	13.3 place settings
Amount of energy used per place setting	46Wh	53Wh
Average annual energy consumption	185kWh	263kWh
Annual energy cost (based on 365 uses)	$56	$79
Annual energy cost per place setting	$5.05	$5.93

Type	Built-in	Freestanding
Sales-weighted average star rating	3.9	3.5
Sales-weighted average water consumption per load	9 litres	11.5 litres

Note: Energy cost is based on an electricity price of 30c/kWh.

Most new dishwashers are designed to heat their own water, rather than relying on the household's hot-water supply. They are connected to the cold-water tap only. The machine then uses an internal heating element to heat the water to the appropriate temperature (usually between 50°C and 70°C, depending on the cycle).

Heating water internally allows the dishwasher to better control temperature, which is important for hygiene and drying performance. It also means the dishwasher only heats the water it actually uses.

There are some exceptions; a few European models, occasionally sold in NZ, are designed to be connected to a hot-water supply, and may have two inlets for hot and hot There are also some products that have an alternative connection configuration, where they are only connected to a hot tap.

Using hot-water that is external from the dishwasher and heated by a heat pump water heater, will further reduce the energy consumption and running costs.

Key features and trends for dishwashers include:

- advanced wash systems: some brands offer technologies to ensure thorough cleaning by using innovative spray arm movements for comprehensive coverage
- connectivity: some models offer Wi-Fi capabilities, allowing users to control and monitor their dishwasher remotely via smartphone apps
- noise levels: dishwashers are designed with varying noise levels, measured in decibels (dBA). Quieter models, typically rated below 50dBA, are preferable for open-plan living spaces.

Considerations when selecting a dishwasher include:

- capacity: standard models accommodate 12 to 16 place settings, while compact versions are suitable for smaller loads, enabling households to select a size that aligns with their needs
- installation requirements: it is important to consider whether the kitchen can accommodate the chosen dishwasher type, considering factors like space, cabinetry, and plumbing and electrical connections.

6.2 Relevant regulations

Dishwashers must comply with MEPL requirements outlined in the Regulations (which cites AS/NZS 2007.2:2005), and their performance is measured and tested according to AS/NZS 2007.1:2021. The test includes both energy and water consumption.

The label must be placed on the upper-front of the dishwasher when they are being sold in retail stores.

There are currently no MEPS requirements for dishwashers in New Zealand.

More information on energy rating labels for dishwashers can be found at Dishwashers | EECA.

Dishwashers must also display a water efficiency label as specified in the New Zealand water efficiency labelling scheme (WELS). This label is designed to provide consumers with clear information on the water consumption and water efficiency of new water-using products.

For some products, including electrical and electronic equipment, a supplier declaration of conformity is also required, along with a test report from an accredited testing laboratory.

6.3 Market and sales trends

The sales trends for dishwashers in total are shown in Figure 75.

The bars show total sales of dishwashers for each year, while the line represents sales of dishwashers where important data is missing. This incomplete data impacts on the ability to analyse sales data; primarily in 2014.

Annual sales from 2004 to 2012 were relatively flat at around 75,000 dishwashers pa. Sales then increased relatively steadily, rising to a peak in 2022 of 142,000 units, which coincided with a peak in residential construction activity and a post-Covid sales rebound.

Note that sales of dishwashers with seven and fewer place settings (for example dish-drawers) are recorded individually, when in practice they might be sold as a pair. This means sales of complete dishwashers will be fewer than indicated by the data. Analysis of the data suggests that if all the seven and fewer place setting dishwashers were sold as pairs, the total number of dishwashers might have been 5,000 to 10,000 fewer than shown in the figure in more recent years.

Figure 75: Total annual sales – dishwashers

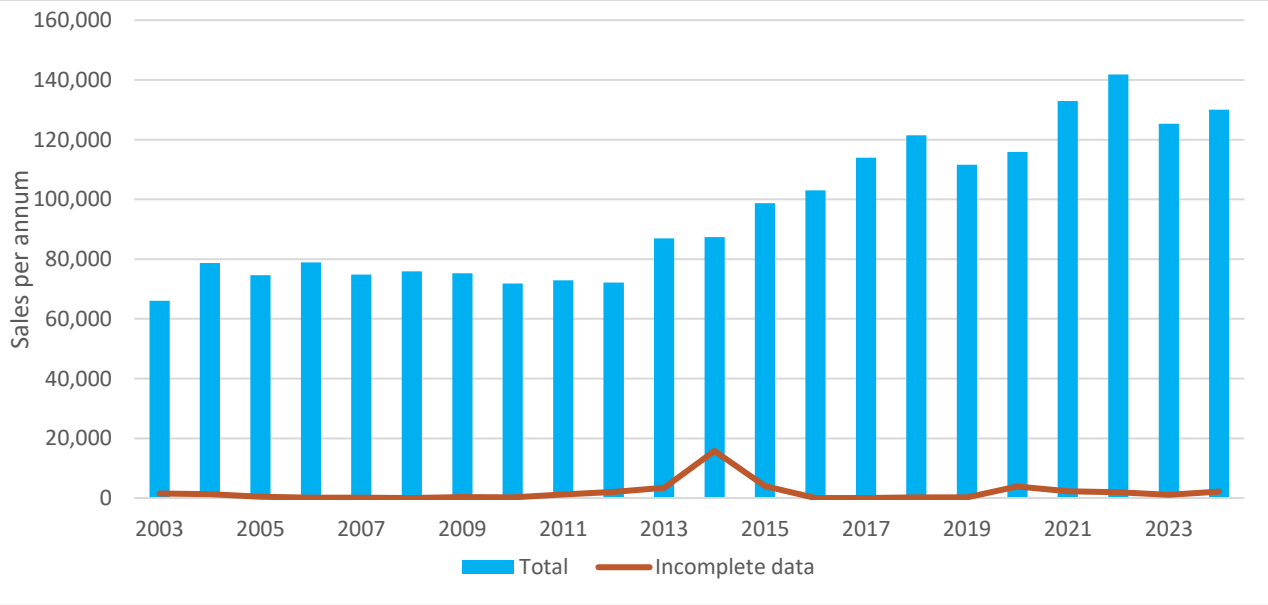
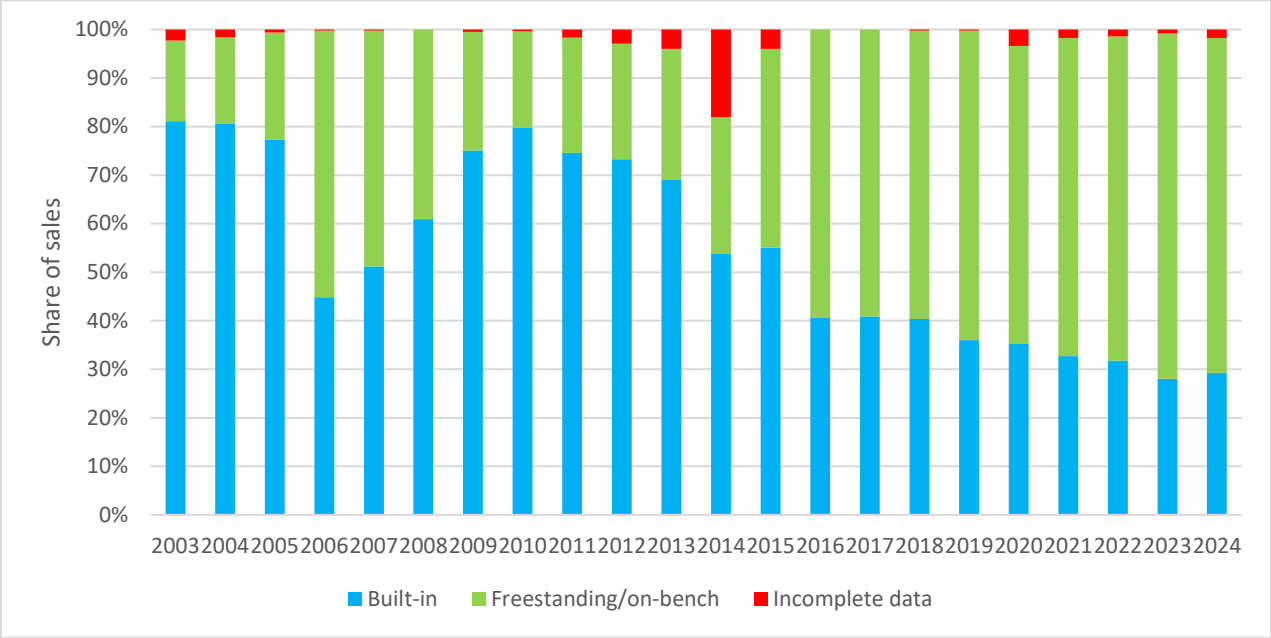


Figure 76 shows a noticeable move from built-in dishwashers, which represented around 80% of total sales in the 2003 to 2010 period, then steadily declined to 29% of sales in 2024. Conversely, free-standing and on-bench models were historically about 20% of the market, with their popularity has increasing steadily from about 2011 to represent about 70% of the market in 2024.

Figure 76: Share of sales by product type – dishwashers

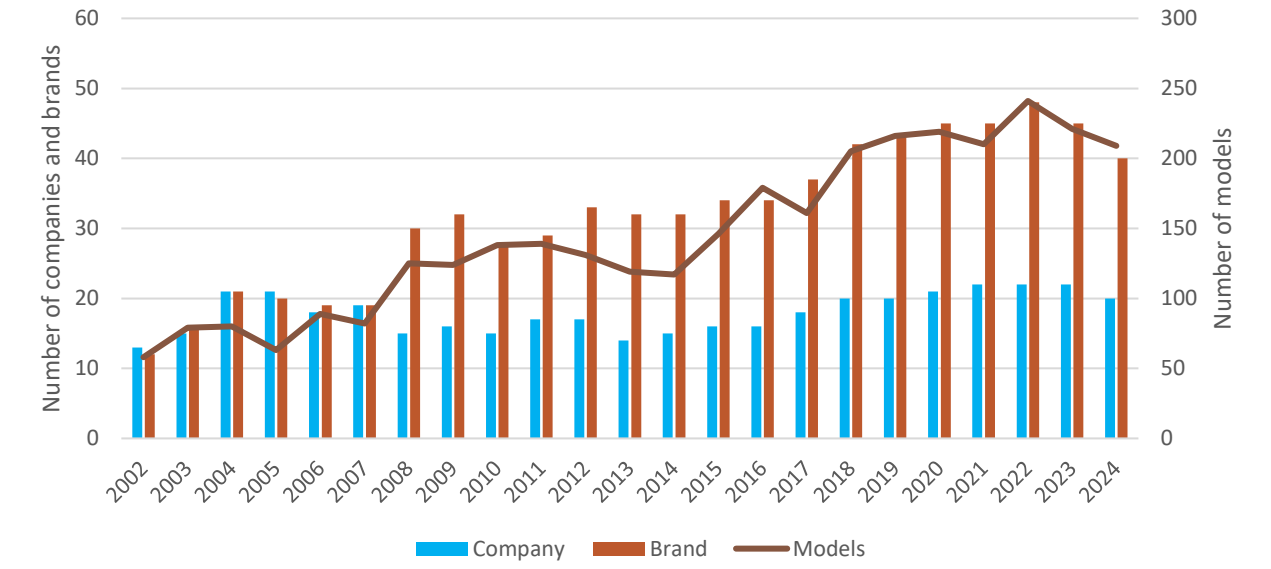


The make-up of brands and models of dishwashers available in New Zealand, and their importers and manufacturers has also changed, with 209 models, 40 brands, and 20 importers and manufacturers available in the market in 2024.

The number of models available has increased significantly from the 58 models available in 2002.

The number of companies and brands available has also increased; in particular, the number of brands has increased from 12 to 40. These trends can be seen in Figure 77.

Figure 77: Changes in number of companies, brands and models – dishwashers



6.4 Product trends

Enhanced energy and water efficiency

Modern dishwashers are designed to use less energy and water per cycle. Features like soil sensors adjust water usage based on the cleanliness of the dishes, optimising resource consumption.

Technology integration

Many dishwashers now offer remote technology features, allowing users to control and monitor cycles remotely via smartphone apps. These technologies can optimise wash cycles for energy savings and provide maintenance alerts.

Flexible loading and design innovations

Adjustable racks, foldable tines, and specialised compartments to accommodate various dish sizes and shapes all improve cleaning efficiency and user convenience.

Single-drawer dishwashers are favoured in compact kitchens, apartments and secondary installations, like sculleries or baches, where space is at a premium. The drawer-style design allows for installation at bench height, reducing the need for bending, and making loading and unloading more comfortable. While suitable for smaller households, the single-drawer design may not meet the needs of larger families or those requiring higher capacity.

Installing two separate single-drawer dishwashers as an alternative to a single larger unit is not the standard practice in New Zealand. The more usual approach for those seeking the benefits of dual drawers is to install a double dish-drawer unit, which integrates two drawers into a single appliance. This design offers the flexibility of running separate wash cycles simultaneously, catering to varying dishwashing needs without the installation complexities of two separate units.

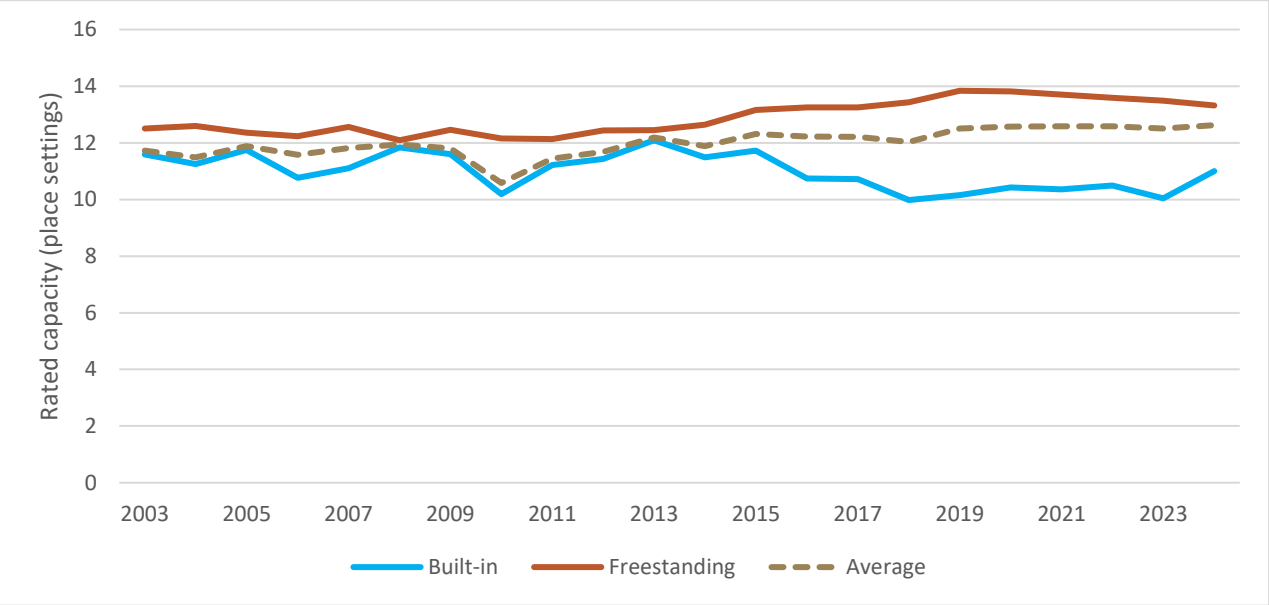
The trends for sales-weighted average capacity for the different types of dishwashers and the average across all types is shown in Figure 78.

On-bench models, which are designed for small households or kitchens with space constraints, have the smallest capacity, typically holding from four to seven place settings.

The capacity of built-in models and freestanding models sold has changed very little over the past 20 years. As can be seen from Figure 78, there has been a very minor decrease in the average capacity of built-in models and a very minor increase in the capacity of freestanding models. The average capacities of built-in and freestanding models in 2024 are 11 place settings and 13.3 place settings, respectively.

The decrease in the average capacity of built-in models is mainly due to the increase in the sales and availability of smaller capacity models (seven or fewer place settings); while the increase in average capacity of free-standing dishwashers is due to the shift in sales from 12 to 14 place settings models over the past 15 years.

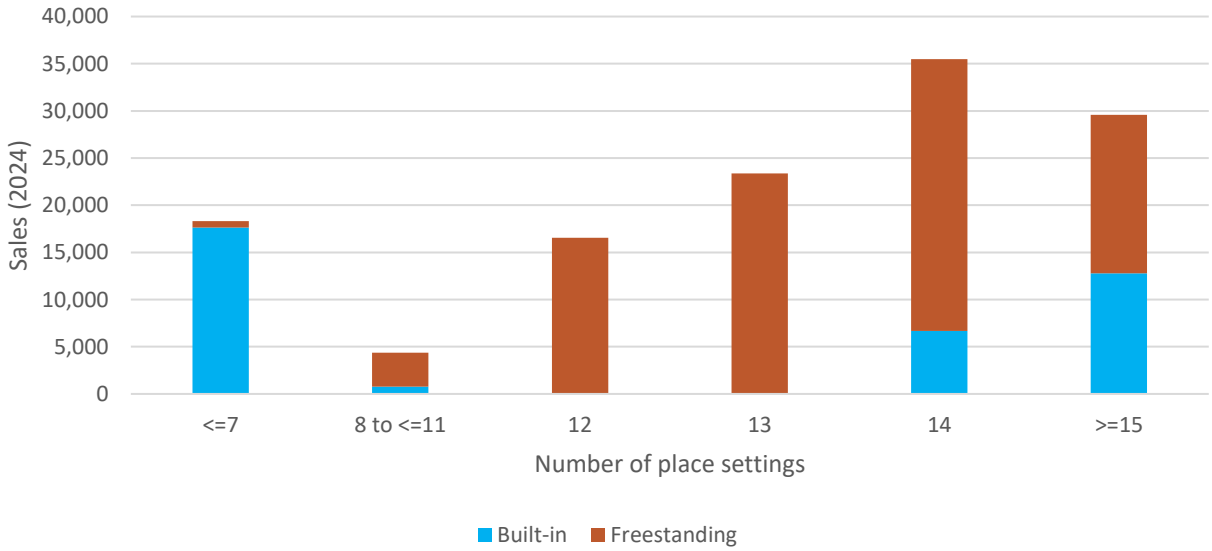
Figure 78: Dishwasher capacity trends



There is a range of load capacities available in the market and a graph of load capacity distribution for dishwashers is shown in Figure 78.

The figure shows that virtually all the small capacity dishwashers (up to seven place-settings) are built-in models, and that virtually all the eight to 13 place-settings models sold are freestanding models. Built-in models are then observed again in the large capacity dishwashers (14 place-settings and more), although these larger categories are still dominated by freestanding models.

Figure 79: sales distribution (2024) by load capacity – dishwashers



Programme time

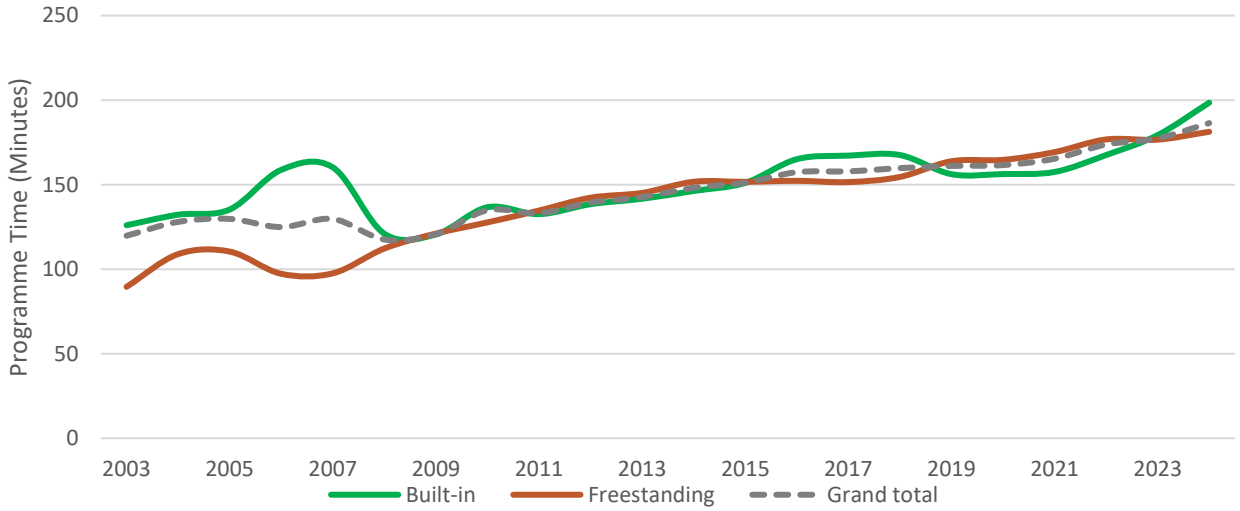
The trends for sales-weighted average programme time for the different types of dishwashers and the average across all types is shown in Figure 80.

Programme time length for all dishwasher types has been increasing over the past 20 years, with programme times for built-in and freestanding models more than doubling over this period.

Average programme times for the three categories of dishwashers in 2024 are:

- built-in: 199 minutes
- freestanding: 153 minutes
- on-bench: 120 minutes.

Figure 80: Dishwasher programme length trends



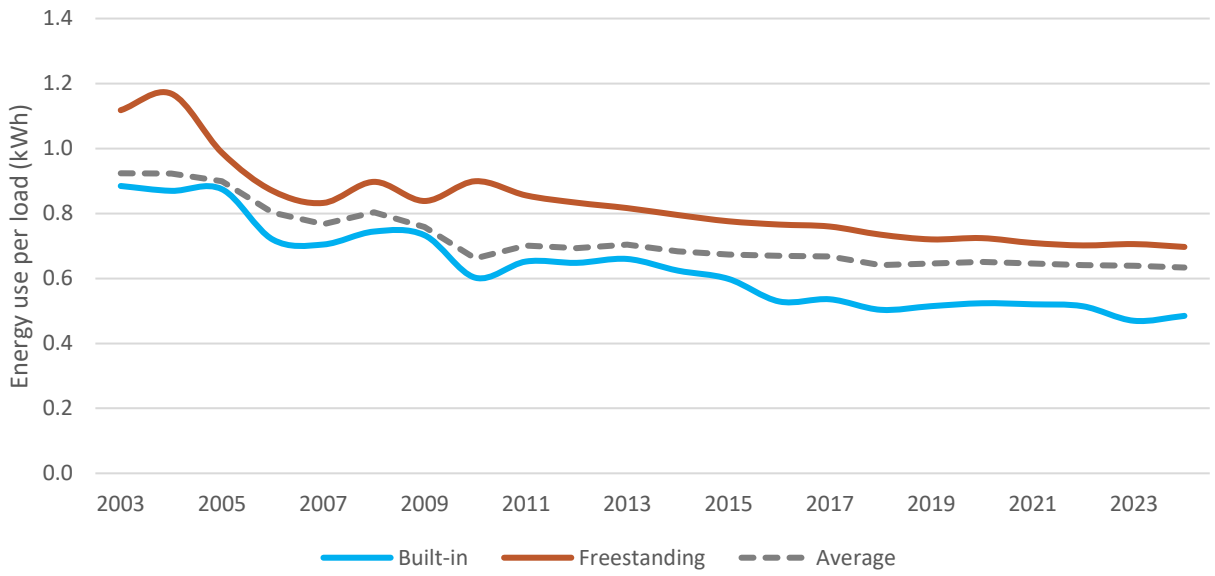
6.5 Product efficiency trends

The trend in sales-weighted energy consumption (excluding standby power) per load of dishes for the various types of dishwashers can be seen in Figure 81.

There is a noticeable decrease in the energy use per load for built-in and freestanding dishwashers from 2002 until 2024. Energy consumption per load for these two categories of dishwashers in 2024 are:

- built-in: 0.5kWh/load
- freestanding: 0.7kWh/load.

Figure 81: Sales-weighted energy consumption per load of dishes – dishwashers



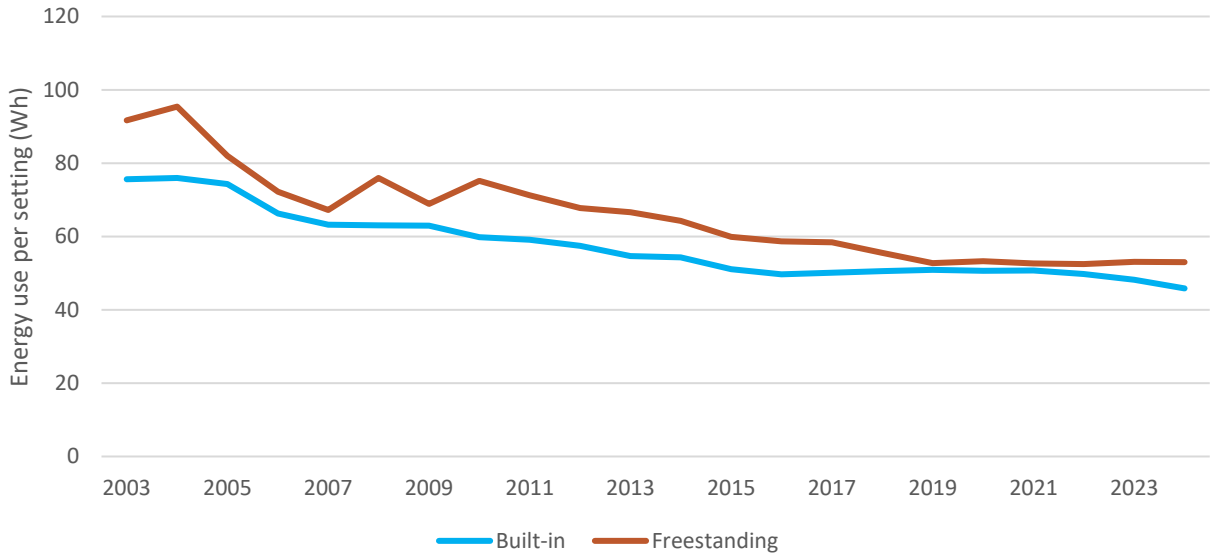
It is interesting to analyse the 'energy intensity' trend of dishwashers by looking at the amount of energy used per place setting. This information is shown in Figure 82.

The figure shows that the energy consumed per place setting for built-in and freestanding models is quite similar, and that both have steadily decreased over the past 20 years and now use 40% to 45% less energy per place setting than in 2002.

Energy consumption per place setting for the two main categories of dishwashers in 2024 are:

- built-in: 46 Wh/setting
- freestanding: 53 Wh/setting.

Figure 82: Sales-weighted energy consumption per place setting – dishwashers

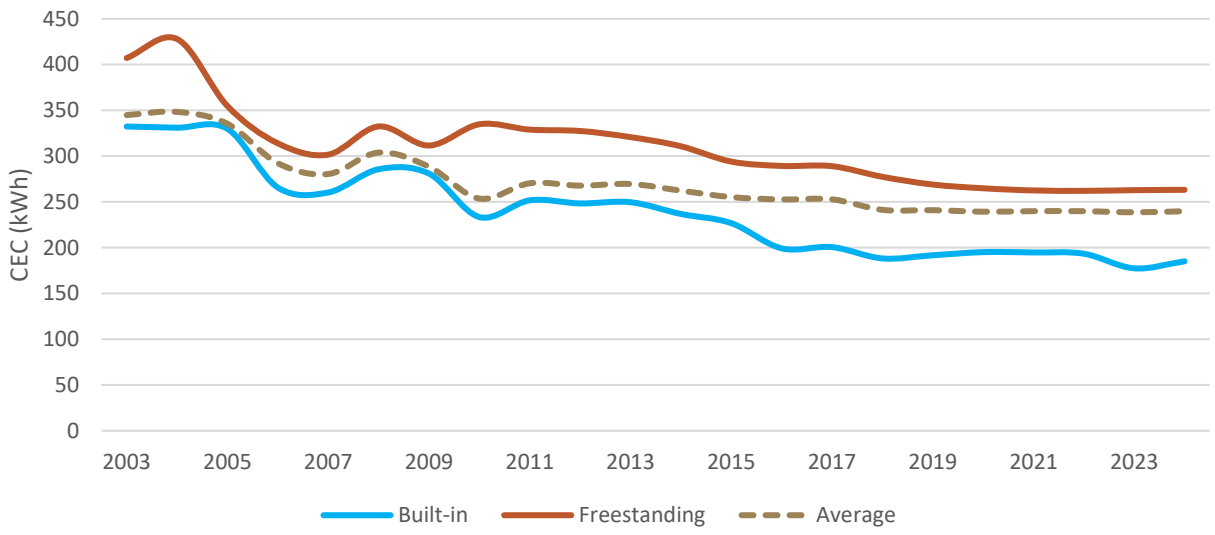


The trends for CEC for the various types of dishwashers are shown in Figure 83 and essentially follow the same trend as in Figure 81 showing the sales-weighted energy consumption per load.

The sales-weighted average CECs of built-in models has declined 49% from 363kWh pa in 2002 to 185kWh pa in 2024, based on 365 loads per annum.

The sales-weighted average CECs of freestanding models has declined 38% from 426kWh pa in 2002 to 263kWh pa in 2024.

Figure 83: CEC per annum – dishwashers



Dishwasher star ratings have increased steadily over the past 22 years, as can be seen in Figure 84.

The trend is similar for both built-in and freestanding models, with the sales-weighted average star ratings increasing from 2.4 to 3.9 since 2002 for built-in models and from 2.0 to 3.5 for freestanding models.

Figure 84: Star rating trends – dishwashers

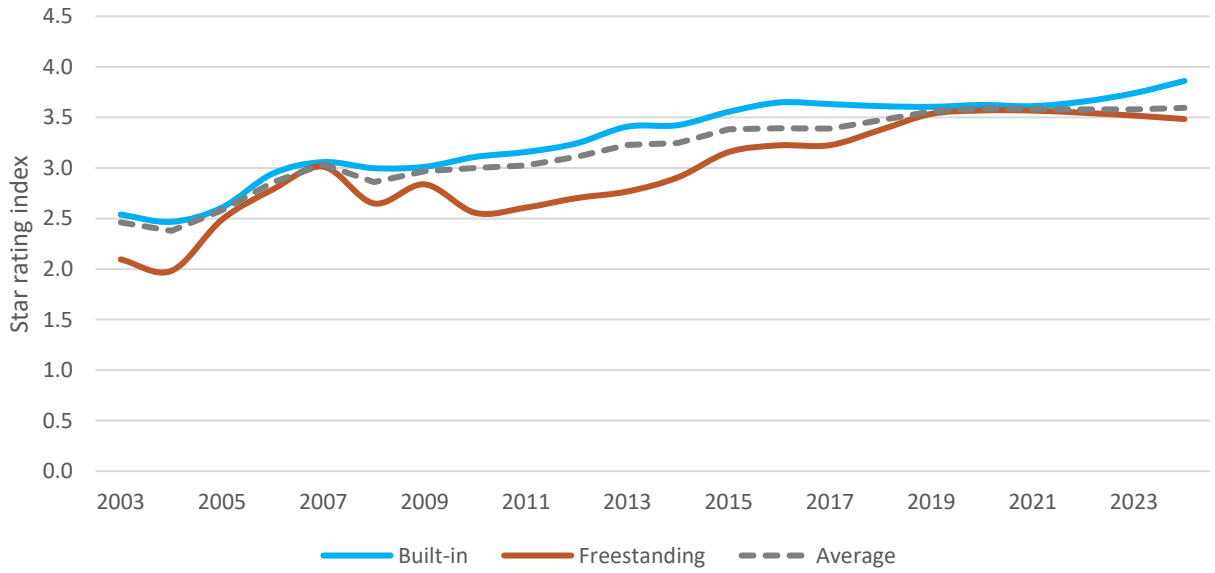


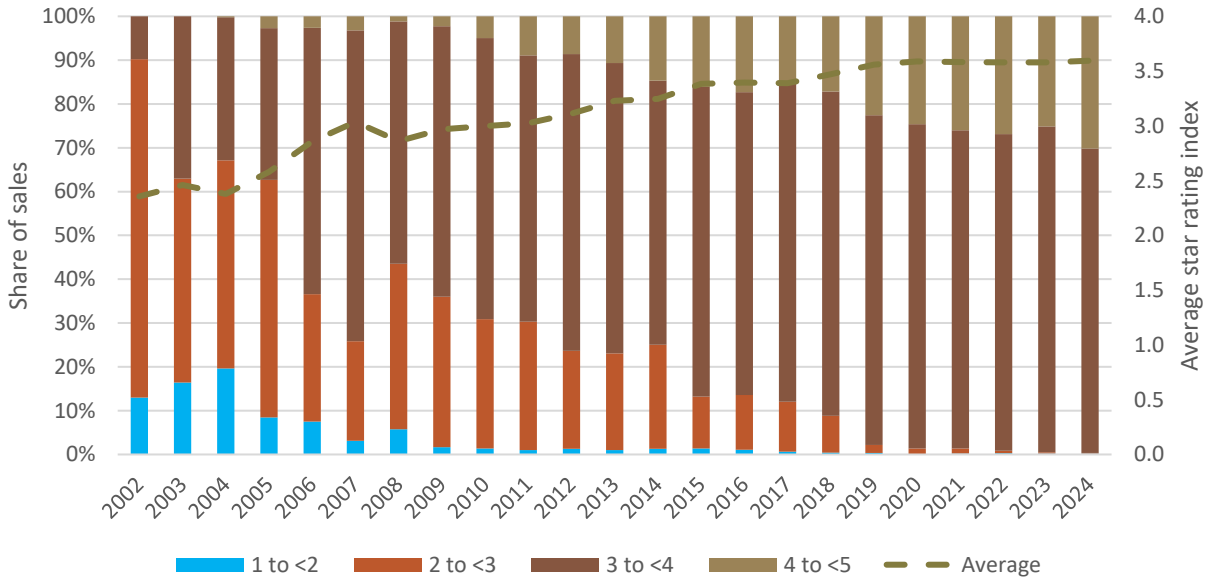
Figure 85 shows the share of sales for the various star rating groupings, as well as the sales-weighted average star rating (dotted line).

This clearly shows the virtual disappearance of low star-rated models from the market (90% of sales in 2002 were of 1 to 3 star-rated models, yet only 0.3% in 2024).

This also shows a significant increase in four to five star-rated models, for which there were no sales in 2002, but have since risen to comprise 30% of the market in 2024.

The overall impact of this can be seen in the dotted line in the figure, which shows a relatively steady increase in the average star rating from 2.4 in 2002 to 3.6 in 2024, representing a 50% increase in the average star rating. This is likely to be driven by the energy rating label requirements.

Figure 85: Star rating share of sales – dishwashers



6.6 Additional commentary

Country of manufacture

Dishwashers sold in New Zealand are manufactured in a range of countries.

The largest volume of dishwashers sold in New Zealand now come from China (47%), followed by Türkiye (21%) and Thailand (14%).

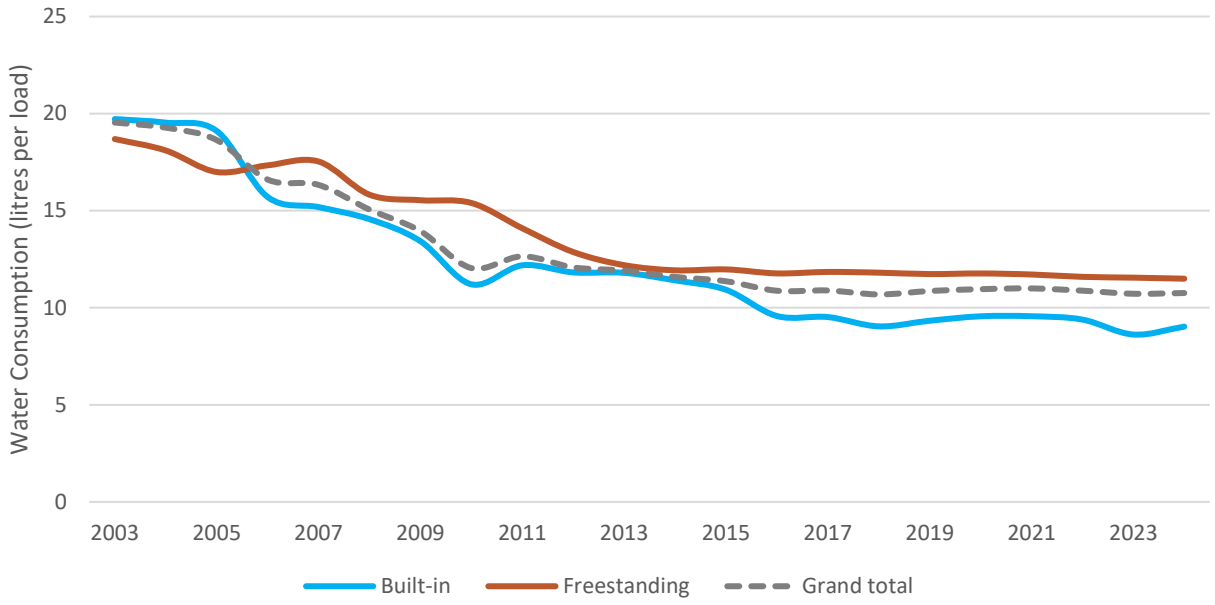
From 2002 to 2005, 50% to 60% of dishwashers sold in New Zealand were manufactured in New Zealand. Dishwashers were no longer manufactured in New Zealand from 2011 and from that point on there was a substantial increase in sales volumes from Türkiye and Thailand, as well as some increase in sales of Chinese dishwashers, which rose from 40% of the market in 2011 to 47% of the market in 2024.

Water use

Water consumption by dishwashers per load has steadily declined over the past 20 years or so, and dishwashers now typically use half of the water per loads that they did in 2002. Freestanding models use the most water at 11.5 litres/load, followed by built-in models at 9 litres/load. These trends can be seen in Figure 86.

The Cleaning circle may help in explaining this trend in water use, as similar to dishwashers' cycle time as discussed in section 6.4, programme time may need to be increased to ensure the same level of cleaning when water use is reduced. See the explanation in the summary section at the beginning of this report for more information about the Cleaning circle model.

Figure 86: Water consumption trends – dishwashers



6.7 Summary of key insights

Improved energy ratings. The energy efficiency of dishwashers, as measured by energy consumption and star ratings, has steady improved over the past 20 years. The sales-weighted average star ratings have increased from 2.4 to 3.9 since 2002 for built-in models and from 2.0 to 3.5 for freestanding models.

Running costs are decreasing. The energy running costs of dishwashers have improved steadily both on a per load basis and a per place setting basis over time. Table 12 shows that freestanding dishwashers are the most expensive to operate. However, they also have the largest capacity, so their cost per place setting is 17% above that of built-in models. On-bench dishwashers are much cheaper to operate, but have a much smaller capacity, meaning that the annual energy cost per place setting is about double the other types.

Table 12: Comparison of electricity operating costs – dishwashers

	Annual electricity cost (2024)		
	Built-in	**Freestanding**	**On-bench**
Annual energy cost	$56	$79	$45
Annual energy cost per place setting	$5.05	$5.93	$10.77

Note: Based on an electricity cost of 30c/kWh.

Shift in most common type of dishwashers. The relative popularity of built-in dishwashers and freestanding and on-bench models has turned around over the past 20 years. Built-in models have gone from 80% of the market in 2004 to 29% in 2024. Conversely, freestanding and on-bench models have gone from 18% to 69% of the market.

Changes in country of manufacture. Historically, the bulk of the market comprised products manufactured in New Zealand, with 60% of sales in 2005. The majority of dishwashers sold in New Zealand now are manufactured in China, Türkiye and Thailand.

Water savings. Water consumption by dishwashers per load has steadily declined over the past 20 years or so, with dishwashers now typically using half the water per load that they did in 2002. Freestanding models use the most water at 11.5 litres/load, followed by built-in models at 9 litres/load.

Significant energy and cost savings. Upgrading to a more efficient dishwasher can lead to substantial savings. Table 13 shows the energy and money saved, compared with a one-star appliance, over 15 years, based on an electricity cost of 30c/kWh.

Table 13: Estimated average energy and cost savings compared to a 1 star product – dishwashers

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	672	470	329	230	161	113	79	55	39	27
Annual energy cost	$202	$141	$99	$69	$48	$34	$24	$17	$12	$8
Annual savings	$0	$60	$103	$132	$153	$168	$178	$185	$190	$193
Savings over 15 years	$0	$907	$1,542	$1,987	$2,298	$2,516	$2,668	$2,775	$2,850	$2,902
Percentage of energy saved	0%	30%	51%	66%	76%	83%	88%	92%	94%	96%

7. Household refrigerating appliances

7.1 Description of product class

Household refrigerating appliances come in various configurations to suit different household needs and kitchen layouts. The primary types are:

- top-mount fridge-freezers: traditional design with the freezer compartment above the refrigerator.
- bottom-mount fridge-freezers: features the freezer below the refrigerator section, offering easier access to fresh food at eye level.
- side-by-side fridge-freezers: freezer and refrigerator compartments are positioned adjacent to each other, providing ample storage and convenient access
- French door fridge-freezers: combines side-by-side doors for the refrigerator with a bottom freezer drawer, offering wide shelves and larger door bins
- chest freezers: provide substantial freezer space and are energy efficient, though they require more floor area.
- bar fridges: compact units typically 40 to 150 litres in size, ideal for small spaces or as secondary cooling options.
- upright freezers: vertical design offering tall storage space, usually featuring shelves for easy organisation and access
- fridges: refrigerator only, with no significant associated freezer space, other than generally a small section such as for ice cubes.

Fridges and freezers vary in size depending on the product type and household needs, and can be categorised by size as follows:

- bar fridges: (40 to 150 litre): ideal for small spaces or as a secondary cooling option
- small fridges (150–300 litre): suitable for individuals, couples or small apartments; often found in top-mount or bar fridge styles
- medium-sized fridges (300–500 litre): ideal for small to medium-sized families (two to four people); common in bottom-mount, top-mount, and some French door models
- large fridges (500–700 litre): designed for larger households (four or more people); these are often side-by-side or French door models
- extra-large fridges (over 700 litres): high-capacity models, typically found in premium French door or side-by-side configurations, suited for big families or those who entertain frequently.

Fridge-freezers are also split into 10 separate category definitions under 'AS/NZS 4474.1:2007 Performance of household electrical appliances – Refrigerating appliances – Energy consumption and performance' as shown in Table 15.

A summary of the key statistics for the three main types of refrigerating appliances is given in Table 14.

Table 14: Refrigerating appliances - statistics 2024

Type	Refrigerators	Freezers	Refrigerator-freezers
			
Description	Designed to keep food chilled, generally operating at around 3˚C, which is cold enough to keep perishable food safe and fresh. Refrigerators are available in a range of sizes and styles, e.g. upright, French door and bottom-mount styles.	Designed for long-term storage of food, generally operating at around -18˚C, which keeps frozen food safe for long-term storage. Freezers are available in a range of sizes and styles including chest and upright styles.	Refrigerator-freezers combine the capabilities of refrigerators and freezers into a single appliance. A range of configurations (top-mount, bottom-mount, side-by-side, and French door) are available.
Market share of sales in 2024	14%	23%	62%
Average gross volume	148 litres	243 litres	376 litres
Sales-weighted energy consumption	191kWh pa	344kWh pa	394kWh pa
Annual energy cost	$57	$103	$118

Average energy consumption per gross volume (2024)[8]	1.87kWh/litre/year	1.62kWh/litre/year	1.16kWh/litre/year
Star rating	2.9	3.2	3.5

Note: Energy cost is based on an electricity price of 30c/kWh.

Recent trends in refrigeration emphasise energy efficiency, new technology and customisable storage solutions. Many modern refrigerators are equipped with Wi-Fi connectivity, allowing users to monitor and control settings remotely.

Features such as 'door-in-door' provide easy access to frequently used items without opening the main door, reducing energy loss. Additionally, variable temperature zones and humidity-controlled compartments help in preserving food freshness.

Some models include functions such as a touch-screen interface with apps for recipes, music and more.

Factors to consider when selecting a refrigerator or freezer include:

- household size
- kitchen space
- energy consumption
- specific required features.

7.2 Relevant regulations

Domestic refrigerators and freezers must comply with both MEPS and MEPL requirements, as outlined in the Regulations.

Refrigerator-freezers are tested for energy efficiency and labelling purposes against AS/NZS 4474.1:2007 and AS/NZS 4474.2:2009, respectively. In 2019, Australia introduced new MEPS and labelling using AS/NZS 4474:2018.

The energy rating label displays the annual energy consumption in kilowatt hours (kWh) per year for the appliance, based on assumed usage and standardised tests, as well as a star rating for energy efficiency comparison. The star rating system uses a scale of up to six stars (or seven to ten stars for super-efficiency), with more stars indicating higher energy efficiency.

Energy efficiency is particularly important for refrigerators and freezers, as they operate continuously.

Models with higher energy rating labels will consume less electricity and have a lower environmental impact than comparable appliance of the same type and size with lower ratings. For instance, a refrigerator-freezer with seven stars on its energy rating label will save $105 per year in electricity costs and produce 70% less CO_2 emissions than a similar appliance with only 1 star.[9]

More information on labelling requirements can be seen here: Fridge Freezers | EECA

7.3 Market and sales trends

The sales trends for fridges and freezers, in total and segmented by product type (refrigerator, freezer and refrigerator-freezer), are shown in Figure 87.

[8] On a temperature-corrected basis.

[9] See https://www.genless.govt.nz/for-everyone/at-home/energy-saving-appliances/choose-good-appliances/fridges-and-freezers/

Annual sales since 2002 have gone through a generally steady pattern of growth. In that time, refrigerators and refrigerator-freezers have more than doubled in sales volume, and freezers have more than tripled in sales volume.

Refrigerator-freezers are the most popular product category, comprising 62% of sales in 2024. The combination of two functions within a single appliance saves space in a kitchen and reduces cost compared with buying two separate appliances. Refrigerators as a standalone product represent only a relatively small 14% of the sales for the entire product category.

Figure 87: Sales by product category – refrigerating appliances

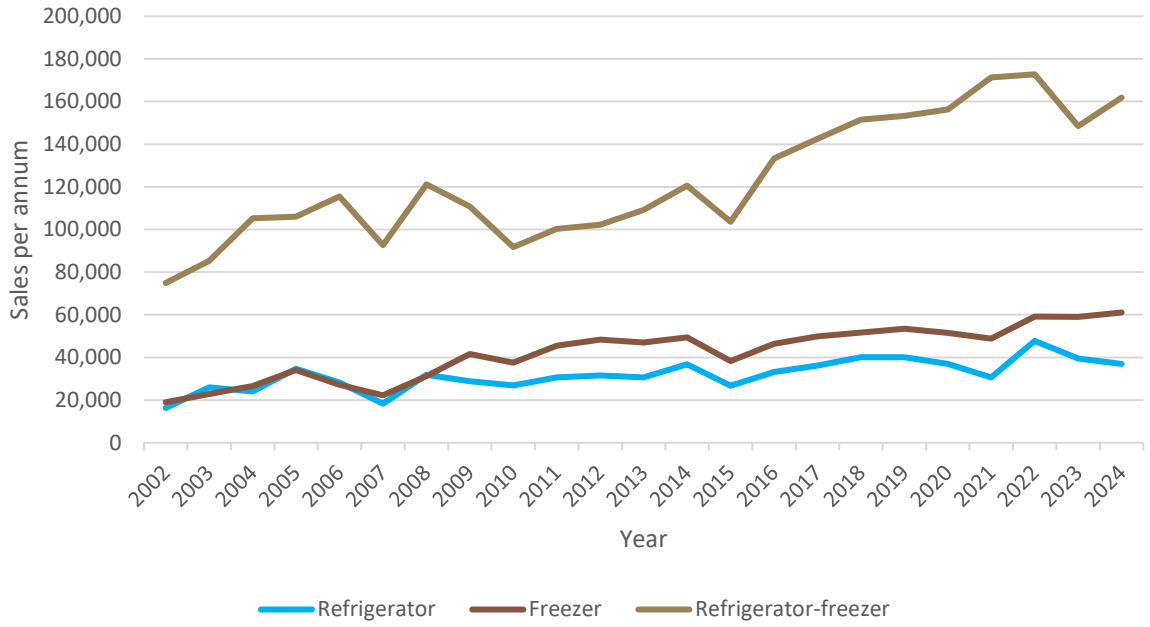


Table 15 shows a breakdown of the sales of refrigerators and freezers in 2024 by the categories used in AS/NZS 4474.1:2007. This shows that the most popular product category is 'Refrigerator-freezer, both compartments automatic defrost, bottom-mounted freezer'.

Table 15: Sales breakdown by AS/NZS 4474.1:2007 categories – refrigerating appliances

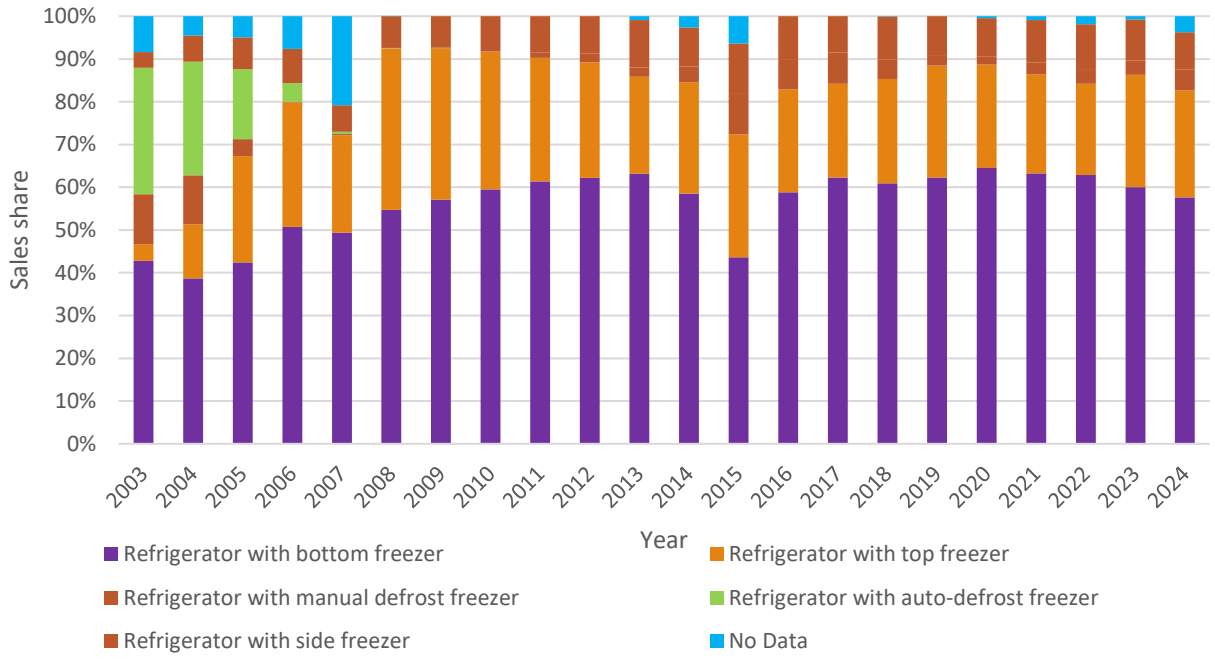
AS/NZS 4474.1: 2007 category	AS/NZS 4474.1:2007 Description	% of 2024 sales
1	Refrigerator without a low temperature compartment, automatic defrost	6%
2	Refrigerator with or without an ice making compartment, manual defrost (bar refrigerators)	8%
3	Refrigerator with or without an ice making compartment, includes a short-term frozen food compartment, manual defrost	0%
4	Refrigerator-freezer, fresh food compartment is cyclic defrost, freezer is manual defrost	3%
5B	Fridge-freezer, both compartments automatic defrost, bottom-mounted freezer	37%
5S	Fridge-freezer, both compartments automatic defrost, side by side	6%

AS/NZS 4474.1: 2007 category	AS/NZS 4474.1:2007 Description	% of 2024 sales
5T	Fridge-freezer, both compartments automatic defrost, top-mounted freezer	16%
6C	Chest freezer, all defrost types	15%
6U	Vertical freezer, manual defrost	4%
7	Vertical freezer, automatic defrost	4%

Figure 88 shows the trends in the type of refrigerator-freezers sold by type.

The figure shows that the most popular configuration is a refrigerator with a bottom freezer. Sales of this type have generally been increasing steadily and currently represent 60% of sales of all refrigerator-freezers. The next most popular category is a refrigerator with a top freezer, currently at 26% of sales of refrigerator-freezers.

Figure 88: Sales share of fridge-freezers, by type

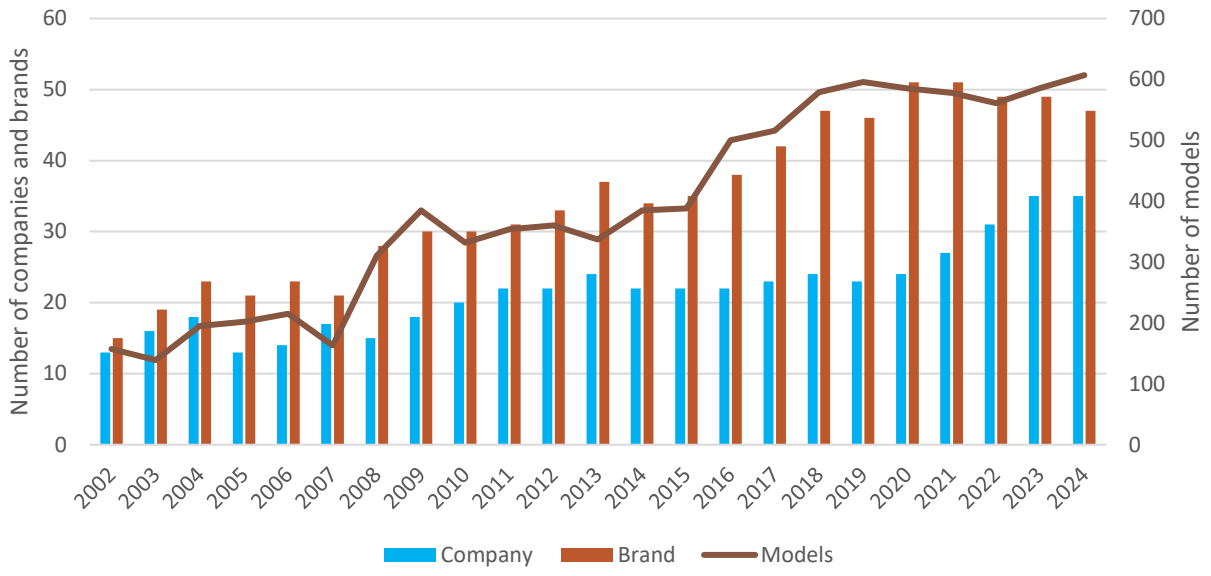


The make-up of brands and models of household refrigerating appliances available in New Zealand, and their importers and manufacturers has changed, with 607 models, 47 brands and 35 importers and manufacturers operating in the market in 2024, across the three main product categories.

The number of models available has increased significantly, nearly quadrupling since 2002.

The number of companies and brands available has also increased in a similar manner over that time. These trends can be seen in Figure 89.

Figure 89: Changes in number of companies, brands and models – refrigerating appliances



7.4 Product trends

The trends for sales-weighted average gross volume for the different types of refrigerators and freezers, and the average across all types, are shown in Figure 90.

The figure shows that the volume of refrigerators and freezers has generally been the same over the past 15 years.

Fridge-freezers have an average volume that is substantially larger than either pure refrigerators or freezers. This would be expected, as they are essentially fulfilling the functions of two product types. The ratio of fresh food to freezer volume for refrigerator-freezers has been relatively stable over the past 20 years.

In 2024, the average volume of a fridge-freezer was 376 litres, compared with 243 litres for a freezer and 148 litres for a refrigerator.

Figure 90: Refrigerating appliances volume trend

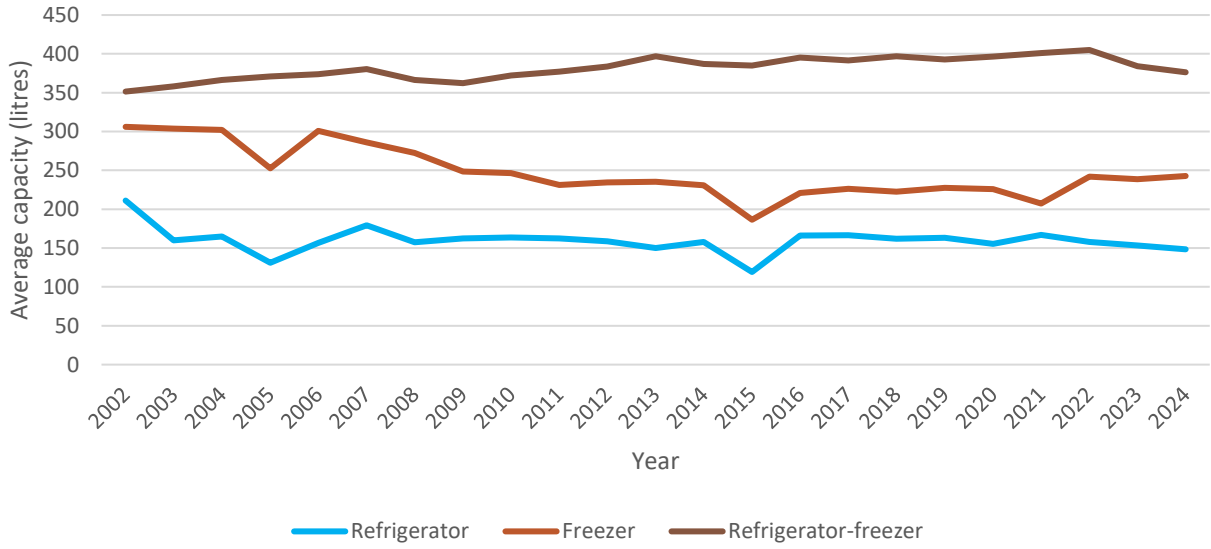
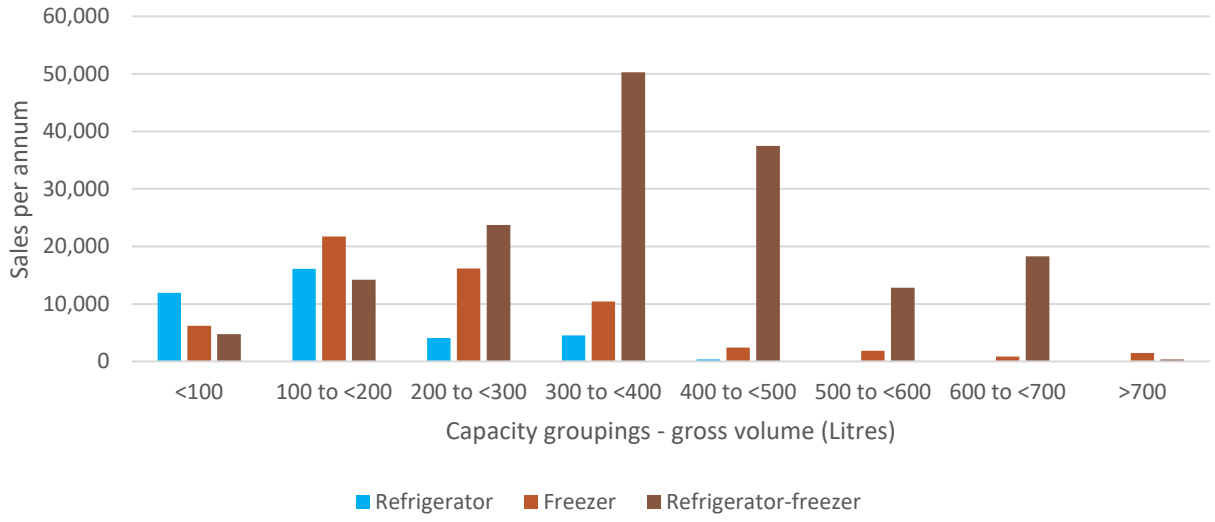


Figure 91 shows the distribution of capacity of refrigerators and freezers. The most popular capacity for refrigerator-freezers is 300 to 400 litres, with 100 to 200 litres being the most popular capacities for individual refrigerators and freezers, respectively.

From 2019, under the new testing requirements, the measured volume is the usable and accessible space of the appliance's compartments and excludes hidden inaccessible spaces, such as volumes inside air duct work. The newly defined volume in most cases will be smaller than gross volumes measured using the previous Australian/New Zealand methodology. However, any difference in claimed volume depends on the specific design characteristics of each model. For example, the volume of a chest freezer that is not frost free did not change, because all of the space inside the freezer compartment is measured in the same way under the old and new measurement procedures. However, the volume of an upright frost-free freezer that has cold air ducts that cannot be accessed will appear to be smaller under the new measurement system.

This is likely to explain a slight dip in volumes from around 2020.

Figure 91: Capacity distribution of refrigerating appliances



7.5 Product efficiency trends

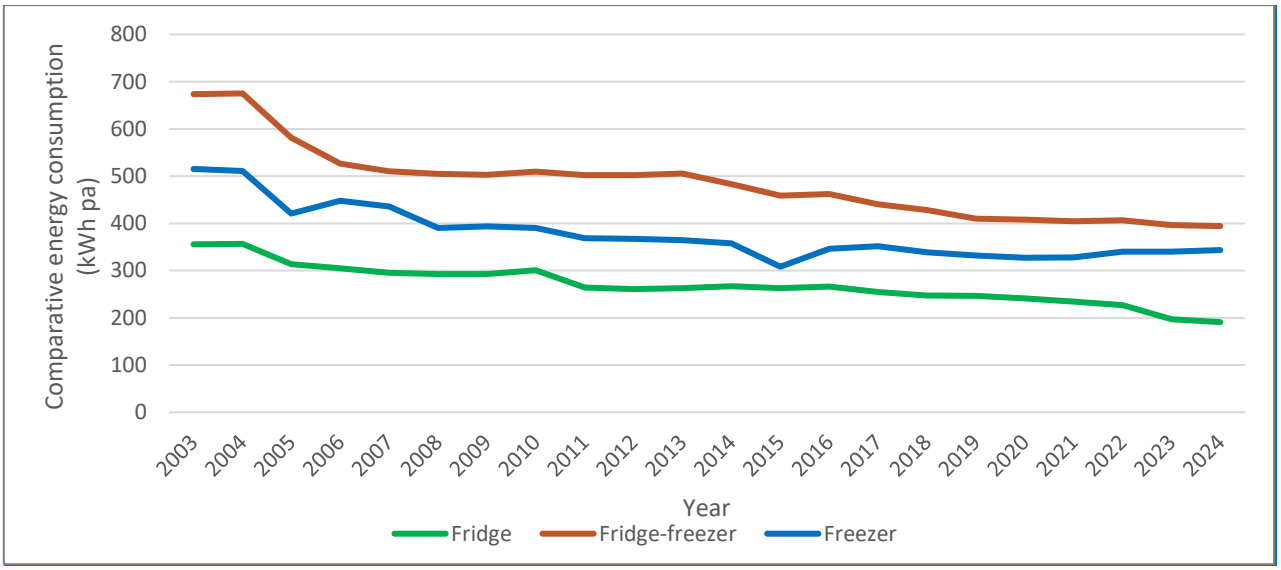
Comparative energy consumption

The trend in sales-weighted energy consumption per annum for the various categories of refrigerators and freezers can be seen in Figure 92.

There is a general decline in the energy use per annum for all three product categories. In 2024, refrigerators use 46% less energy per annum than they did in 2003. The comparable figures for refrigerator-freezers and freezers are 41% and 33% less energy, respectively.

The graph shows a slight increase in annual energy consumption for freezers from 2020. The increasing size of refrigerator-freezers may be a factor in this, as could be changes in the test method.

Figure 92: Sales-weighted CEC per annum – refrigerating appliances



Energy intensity

It is interesting to analyse the 'energy intensity' trend of refrigerators and freezers by looking at the amount of energy used per annum per volume of the appliance. This information is shown in Figure 93

The graph shows that the energy consumed per annum per adjusted volume has generally trended downwards over the past 20 years for all three product categories.

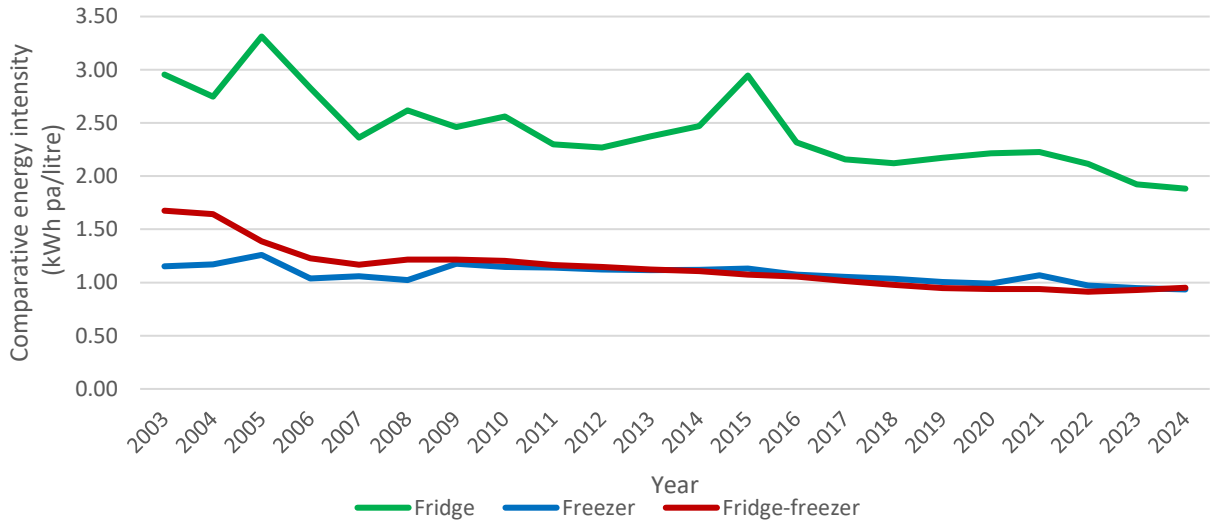
In 2024, refrigerators had an energy intensity of 36% less than they did in 2003. The comparable figures for refrigerator-freezers and freezers are 43% and 19% less, respectively.

Energy intensity for the three categories of refrigerators and freezers in 2024 are:

- refrigerators: 1.88kWh/litre pa
- freezers: 0.93kWh/litre pa
- fridge-freezers: 0.95kWh/litre pa.

The above figures are based on the adjusted volume, which is a calculated volume that reflects the thermal load of different compartments within a refrigerator or refrigerator-freezer. Because some compartments (like freezers) need to maintain much lower temperatures than others (like fresh food compartments), their actual volume is adjusted using weighting factors to represent their relative energy demand.

Figure 93: Energy intensity – refrigerating appliances



Star rating

Sales-weighted average star ratings for all three product categories have increased steadily over the past 18 years, as can be seen in Figure 94.

Star ratings for refrigerators have nearly tripled over the past 18 years, from an average of 1.0 to 2.9 in 2024. Star ratings for freezers have increased 61% from 2.0 to 3.2, and for refrigerator-freezers have nearly doubled from 1.8 to 3.5 over that time.

It is important to note that there were significant changes to the basis for calculating star ratings for refrigerators and freezers in 2010, and again with a new determination and standard in 2019.

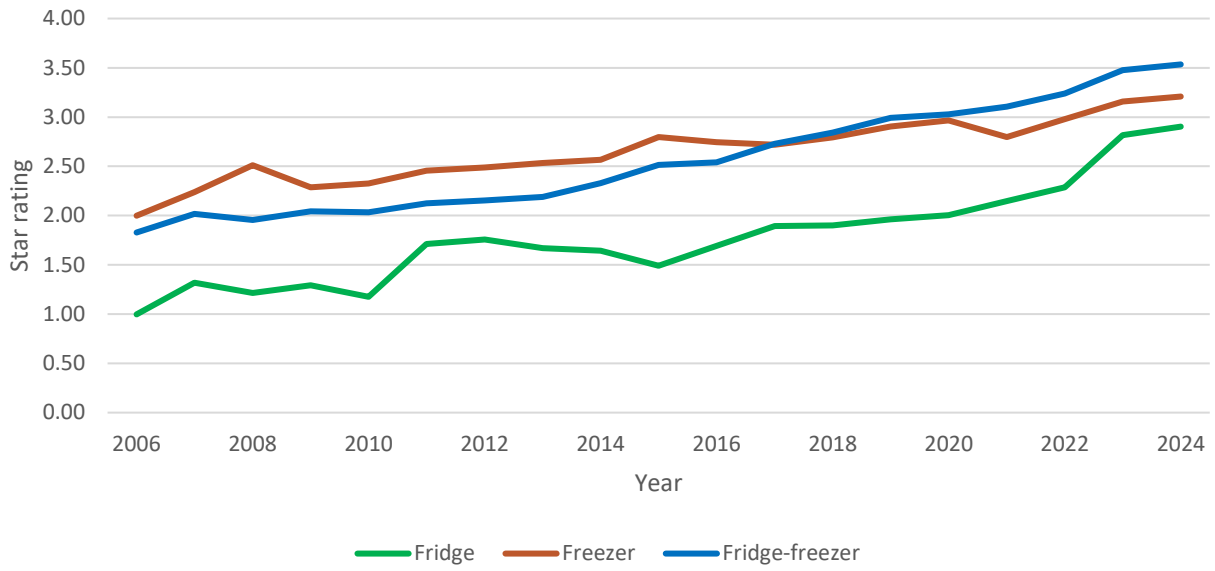
The changes to the calculation of volume mentioned earlier in this report will also have impacted on the star ratings of refrigerators and freezers– it is not possible to discern the direct impact of this from the data, nor to normalise star ratings to remove the impact of this change.

The changes to star ratings in 2010 also require adjustments to normalise these to the same as the pre-2010 ratings, which is not possible with the data provided for this analysis.

In essence, though, each of the changes (2010 and 2019) has made it more difficult to obtain higher star ratings compared to previous methods. So, the fact that average star ratings are still increasing is significant.

Despite these changes making it harder to achieve a higher star ratings, importers and manufacturers have continued to innovate and so the average star ratings for each of the three categories have continued to improve.

Figure 94: Star rating trend – refrigerating appliances



The distribution of product sales by star rating and the overall trend in the sales-weighted star rating for each of the three product categories can be seen in Figure 95, 96 and 97.

All graphs show an increasing trend in sales-weighted average star ratings over the 2006 to 2024 period. All graphs also show declines in the percentage of sales of products with low star ratings and an increase in the percentage of sales of higher star-rated products.

Figure 95: Star rating sales distribution and trends – refrigerators

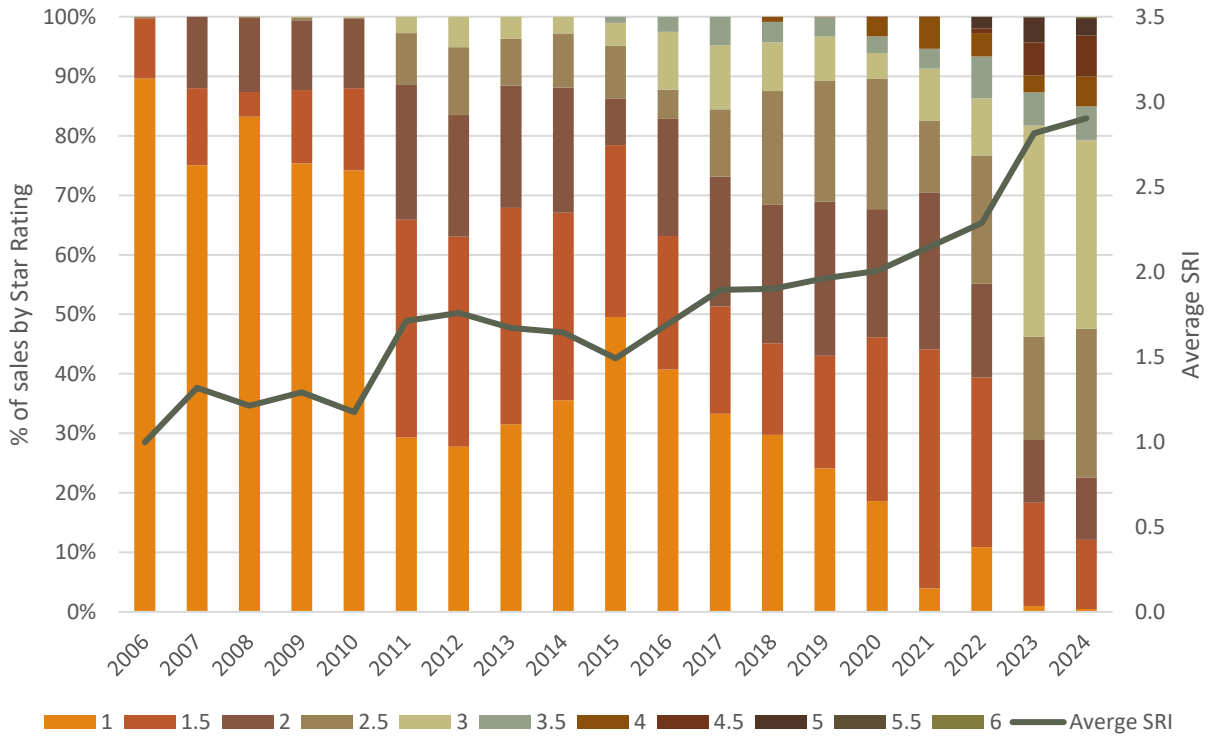


Figure 96: Star rating sales distribution and trends – freezers

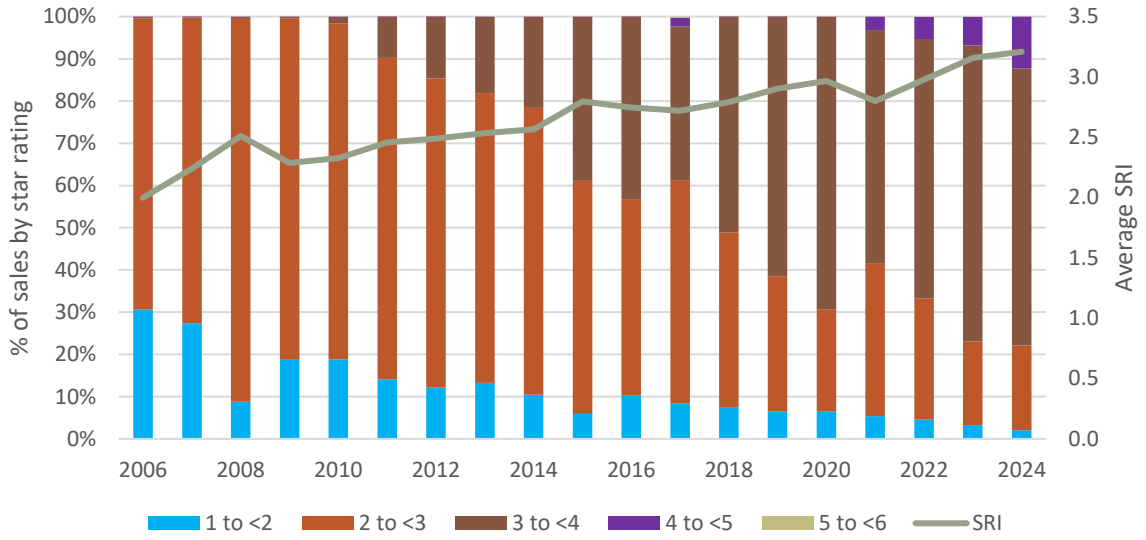
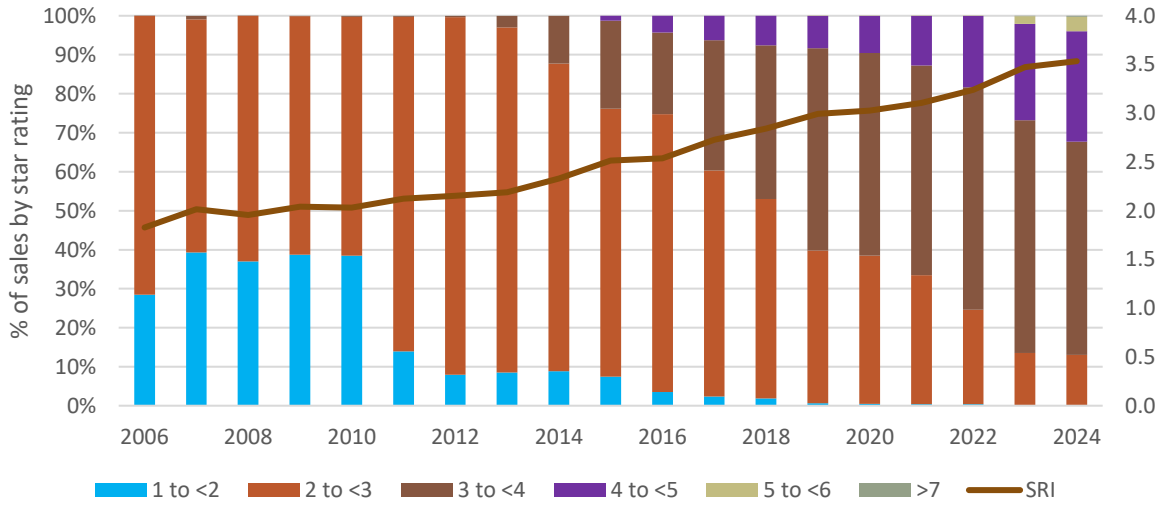


Figure 97: Star rating sales distribution and trends – fridge-freezers



7.6 Additional commentary

Refrigerators and freezers sold in New Zealand are manufactured in a range of countries.

The largest volume of products sold in New Zealand, based on the total of all three product categories, now come from China with 68% of sales. Up until 2007, approximately 50% of refrigerators and freezers sold in New Zealand were manufactured in New Zealand and a further 20% came from Australia. The volume of products manufactured in New Zealand and Australia then began to decline, and by 2020, very few of these products are manufactured locally.

7.7 Summary of key insights

Improved energy ratings. There is a noticeable shift towards consumers purchasing refrigerators and freezers with higher energy star ratings. In the year ending March 2024, models rated three stars or more comprised 52% of total refrigerator sales, 78% of freezer sales and 87% of refrigerator-freezer sales. This is a significant increase from the less than 1% of sales of these higher rated appliances 15 years ago. The

criteria for calculating star ratings have also grown harder over that period, making a three-star rating now a higher measure of energy efficiency than previously.

Decreased running costs. The energy running costs of household refrigerating appliances has decreased steadily over time. In 2024, the average refrigerator used 46% less energy than in 2003. Comparative figures are 41% and 33% savings in energy consumption for refrigerator-freezers and freezers, respectively.

Table 16 shows a comparison of annual operating costs for the different product categories based on a sales-weighted average energy consumption as well as an operating cost per litre of gross volume.

Table 16: Comparison of electricity operating costs – refrigerating appliances

	Annual electricity cost (2024)		
	Fridges	**Freezers**	**Fridge-freezers**
Annual energy cost	$57	$103	$118
Annual energy cost per litre of gross volume	$0.39	$0.42	$0.31

Note: Based on an electricity cost of 30c/kWh.

Preference for combined refrigerator-freezers. Combined refrigerator-freezers dominate this product category with 62% of total sales. The combination of two functions within a single appliance saves space in a kitchen and reduces cost compared with buying two separate appliances. Refrigerators as a standalone product represent only a relatively small 14% of the sales for the entire product category.

Refrigerator-freezers much larger than individual refrigerators or freezers. Combined refrigerator-freezers have an average volume that is substantially larger than either dedicated refrigerators or freezers. This would be expected, as they are essentially fulfilling the functions of two product types. In 2024, the average gross volume of a refrigerator-freezer was 376 litres, which is 50% more than for a freezer (243 litres) and for a refrigerator (148 litres).

Refrigerator-freezers are more efficient than using a separate refrigerator and freezer. It is more energy efficient to use a single refrigerator-freezer than it is to operate an individual refrigerator and a freezer.

Changes in country of manufacture. Historically, the bulk of the market comprised products manufactured in Australia and New Zealand, with a combined 66% of sales in 2005. Products from Thailand then became more popular, with 64% of products sourced from Thailand in 2012. Fridges and freezers manufactured in China now dominate the market, with 60% of sales in 2024.

Significant energy and cost savings. Upgrading to a more efficient refrigerator-freezer can lead to substantial savings. Table 17 shows the energy and money saved, compared with a 1-star appliance, over 15 years, based on an electricity cost of 30c/kWh.

Table 17: Estimated average energy and cost savings compared to a 1-star product – refrigerator-freezers

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	719	590	483	396	325	267	219	179	147	121
Annual energy cost	$216	$177	$145	$119	$98	$80	$66	$54	$44	$36
Annual savings	$0	$39	$71	$97	$118	$136	$150	$162	$172	$180

Savings over 15 years	$0	$582	$1,060	$1,452	$1,773	$2,036	$2,252	$2,429	$2,574	$2,693
Percentage of energy saved	0%	18%	33%	45%	55%	63%	70%	75%	80%	83%

8. Electric storage water heaters

8.1 Description of product class

Domestic electric storage water heaters (ESWHs) are available in various types and capacities to suit different household needs. The primary variations are:

- mains-pressure cylinders: designed for homes with high water demand, these cylinders can supply multiple outlets simultaneously without significant pressure loss, and are commonly lined with materials like vitreous enamel or stainless steel to enhance durability and corrosion resistance
- low-pressure cylinders: suitable for older homes or regions with specific plumbing configurations, these systems operate at lower pressures and are often constructed with copper or vitreous enamel linings.

Many ESWHs are now designed to integrate with solar water heating systems, allowing homeowners to harness solar energy effectively.

A summary of the key statistics for ESWHs is given in Table 18.

Table 18: Electric storage water heater statistics 2024

Size	Under bench	Small	Medium	Large
				
Description	Cylinder <= 50 litres: typically used in specific areas that are distant from the main hot-water cylinder, such as a kitchen	Cylinder >50 to <= 142 litres: suitable for one or two person households	Cylinder >142 to <= 186 litres: suitable for two to four person households	Cylinder >186 litres: suitable for four or more person households
Market share of sales in 2024	8%	21%	55%	17%
Average water volume	32 litres	130 litres	179 litres	277 litres
Annual heat loss	293kWh	501kWh	606kWh	774kWh
Energy cost of annual heat loss	$88	$150	$182	$232

System pressure	87% mains-pressure, 13% low-pressure

Note: Energy cost is based on an electricity price of 30c/kWh.

When selecting an electric storage water heater, it is essential to consider factors such as:

- household size
- water usage patterns
- available space.

8.2 Relevant regulations

ESWHs must comply with the MEPS requirements outlined in AS/NZS 4692.2:2005.

The relevant standard for testing ESWHs is AS/NZS 4692.1:2005.

MEPS levels for ESWHs are based on a maximum permitted amount of heat loss per day, measured in kWh/day, depending on the size of the system.

MEPS for ESWHs were introduced in New Zealand in 2002, with MEPS for small electric water heaters subsequently made more stringent in 2005.

In the past, ESWHs that did not meet the New Zealand MEPS were still able to be sold in New Zealand through the Trans-Tasman Mutual Recognition Agreement, as long as they met the less stringent Australian MEPS. However, to comply with the Building Code (Acceptable Solution H1/AS1), products must now meet the New Zealand MEPS or use an alternative pathway to establish code compliance.

ESWHs installed since 2002 must have 'A' grade insulation, while cylinders installed prior should have insulation in the form of a cylinder wrap added.

Other standards applicable to ESWHs include:

- NZS 4606.1:1989: Storage water heaters - General requirements
- NZS 4602: Thermal storage electric water heaters
- NZS 4603:1985: Installation of thermal storage electric water heaters.

There are currently no MEPL requirements for ESWHs.

8.3 Market and sales trends

The sales trends for all ESWHs are shown in Figure 98.

Annual sales since 2000 followed an up-and-down pattern until 2016, then increased at a steady rate until 2024, with sales peaking in 2024 at 85,500 units.

No data is available for 2003 and there were some years where some data was missing, which has prevented any further analysis of the data in these years, notably in 2009 (11% of data unmatched) and 2018 (15% of data unmatched).

Figure 98: Total sales of ESWHs

One of the drivers for the increase in sales volumes from 2016 is the increase in the number of new dwellings being consented, which began to increase steadily around that time. This trend can be seen in dwelling consent data in Figure 129 and Figure 130.

Importer and manufacturer make-up

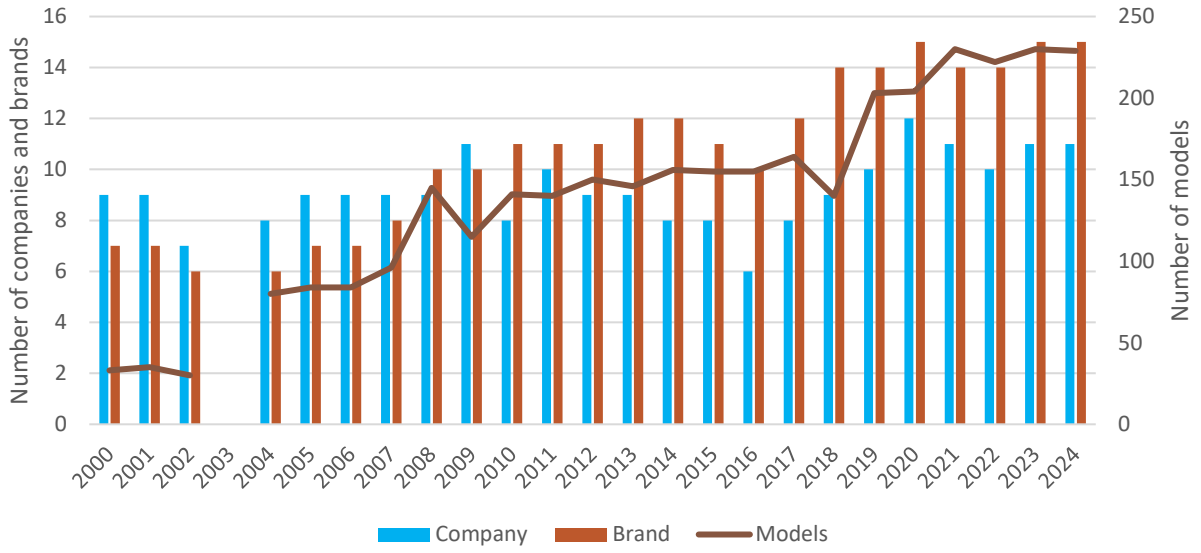
The make-up of brands and models of ESWHs available in New Zealand has changed, with 229 models and 15 brands in the market in 2024. The number of brands has nearly doubled over time and there is a seven-fold increase in the number of models available.

However, the number of companies supplying ESWHs is virtually unchanged, having increased from only nine in 2002 to 11 in 2024.

In some years prior to 2010, the data shows that there were more companies than brands. This could be due to poor data, or it could potentially be due to multiple companies selling a single brand.

These trends can be seen in Figure 99.

Figure 99: Changes in number of companies, brands and models – electric storage water heaters



8.4 Product trends

Figure 100 shows a split of sales by capacity categorisation and Figure 101 shows sales per annum for each of the size groupings. The figures show that:

- sales of under-bench cylinders have been relatively flat over the past 20 years, generally in the range of 5,000 to 7,000 units per annum, and are the smallest selling sales category
- sales of small cylinders have been up and down over the past 20 years, and in the past 5 years have been relatively steady at around 18,000 units per annum
- sales of medium cylinders have accelerated since 2016, approximately doubling from then to sales of 46,600 in 2024 – this is the most popular sales category, representing 55% of the market in 2024
- sales of large cylinders were relatively flat from 2000 to 2016, and then, as for medium cylinders, doubled in sales volume from 2016 to 2024, with 14,300 units sold in 2024.

Figure 100: Split of sales by cylinder size grouping – electric storage water heaters

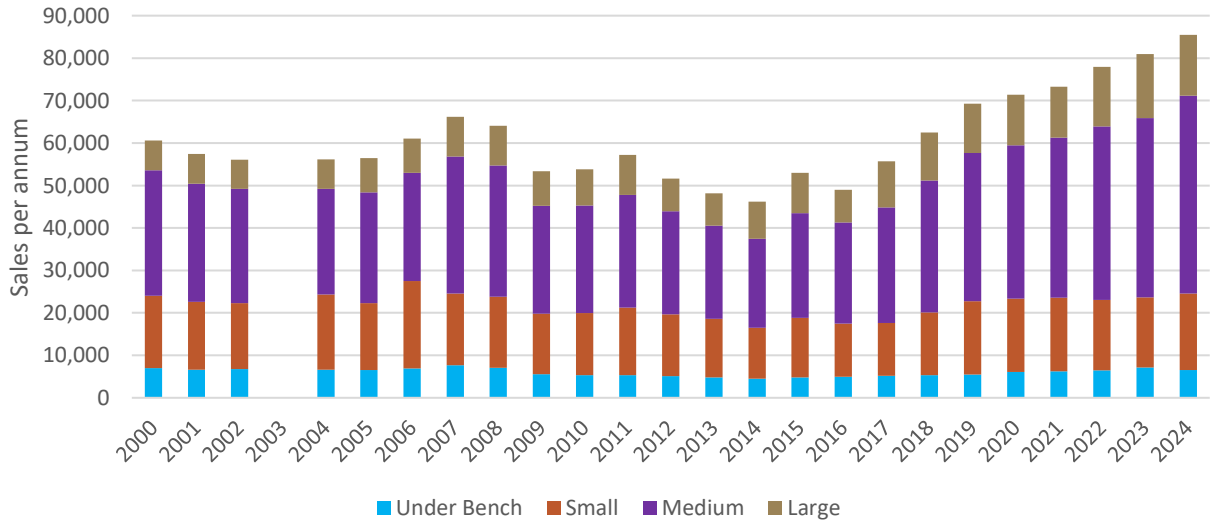


Figure 101: Annual sales by cylinder size grouping – electric storage water heaters

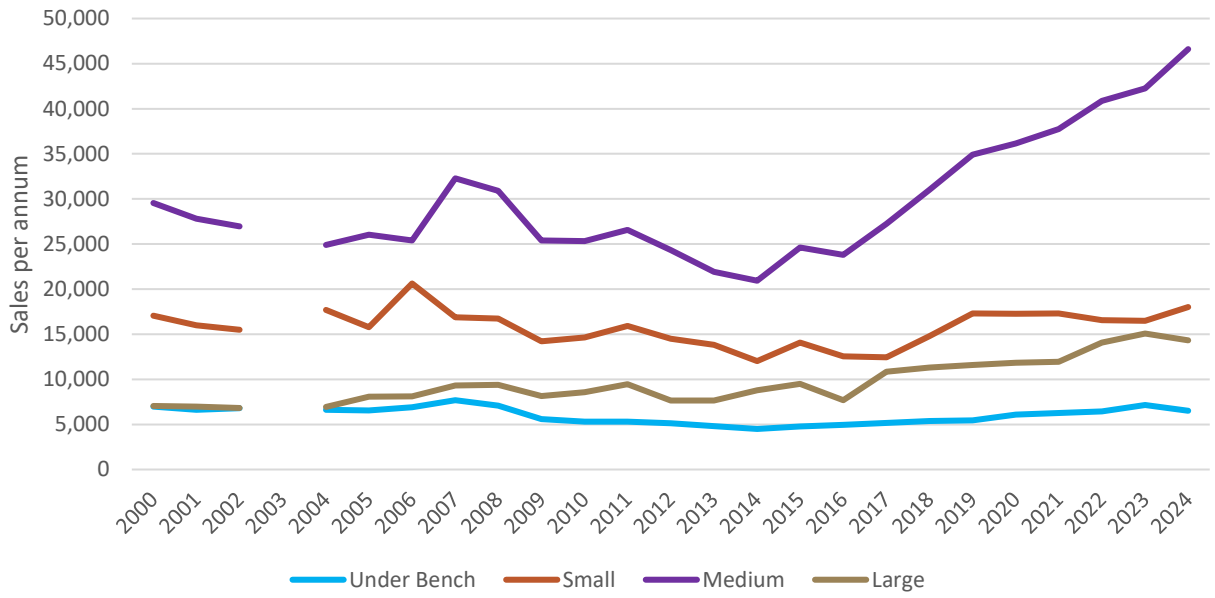
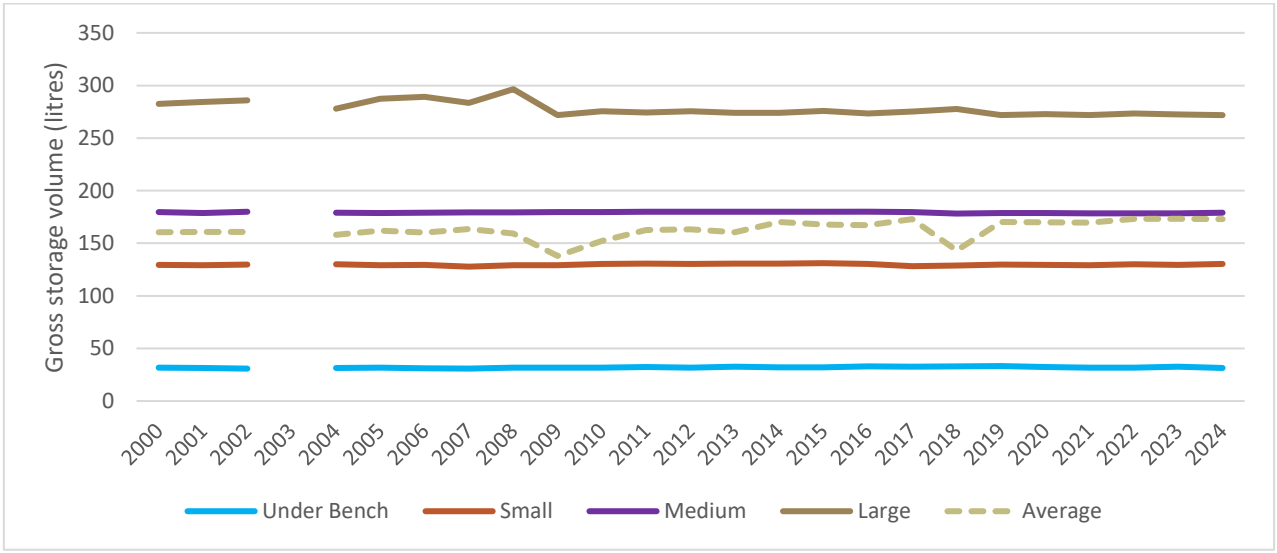


Figure 102 shows trends in the gross storage volume of ESWHs categorised by under-bench, small, medium and large cylinders, as well as an average across all size categories.

The average-size ESWH sold in 2000 held 160 litres of water. By 2024, this had grown 8% to an average of 173 litres.

Figure 102: Gross storage volume trends – electric storage water heaters

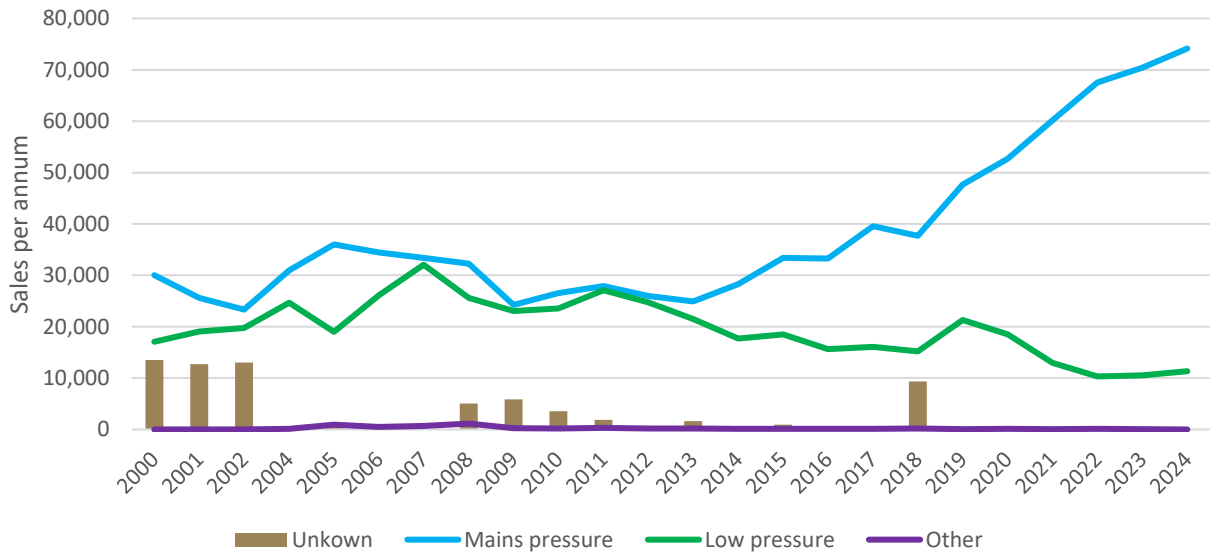


ESWH system pressure

ESWHs can be sold either as low-pressure systems or mains-pressure systems. Many years ago, low-pressure systems were the norm in New Zealand, but mains-pressure systems have become more popular. Consumers prefer the superior water pressure of mains-pressure systems and their compatibility with modern plumbing fixtures that deliver a stronger, more consistent flow of hot-water to taps and showers.

Figure 103 shows the trend since 2000 in the sales volume of low-pressure and mains-pressure ESWHs. This graph shows a relatively steady pattern between 2000 and 2012, with only moderate variability in sales volumes and mains-pressure systems tending to just outsell low-pressure systems. From 2012, the sales lines diverge. Mains-pressure systems increased from 26,000 sales in 2012 to 74,100 sales in 2024 and now represent 87% of the market. Low-pressure systems decreased from 24,700 sales in 2012 to 11,300 sales in 2024 and now represent just 13% of the market.

Figure 103: Sales distribution by pressure – electric storage water heaters



Technology integration

Some modern water heaters are incorporating new technology features, allowing users to monitor and control their systems remotely via smartphone apps. These systems can learn household hot-water usage patterns and adjust operations to optimise energy efficiency.

8.5 Product efficiency trends

Rate of cylinder heat loss

The rate of cylinder heat loss, measured in kWh per year, is the metric used for the efficiency of ESWH systems.

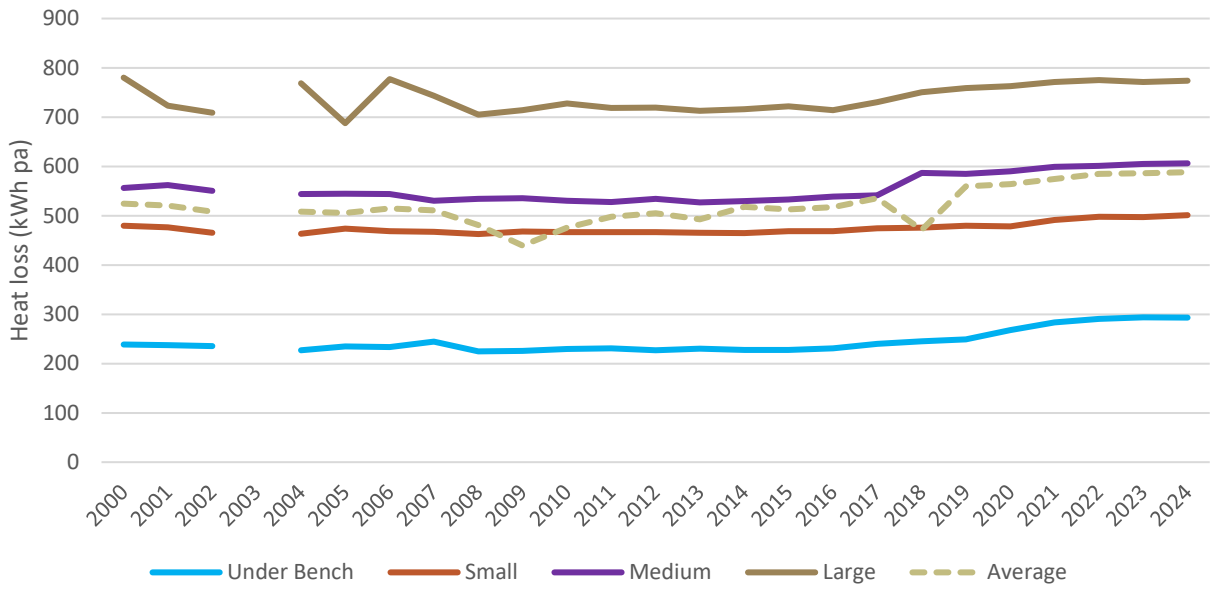
Figure 104 shows the trend in heat loss by cylinder size category and the overall average.

The figure shows that all ESWHs had an increasing rate of measured heat loss over the past 10 years, including a 29% increase for under-bench units, an 8% increase for small systems, 14% increase for medium systems and an 8% increase for large systems, giving an overall 14% average increase.

Under-bench units have seen the largest increase in heat loss. As they are smaller, they are more sensitive to small changes in measured heat loss per litre.

There is a slight, apparent increase in cylinder heat loss for all size categories between 2014 to 2024, but this may be as a result of manufacturers and importers registering their ESWH systems with a slightly higher value for daily heat losses to ensure that they are compliant with any check-testing work that EECA periodically undertakes.

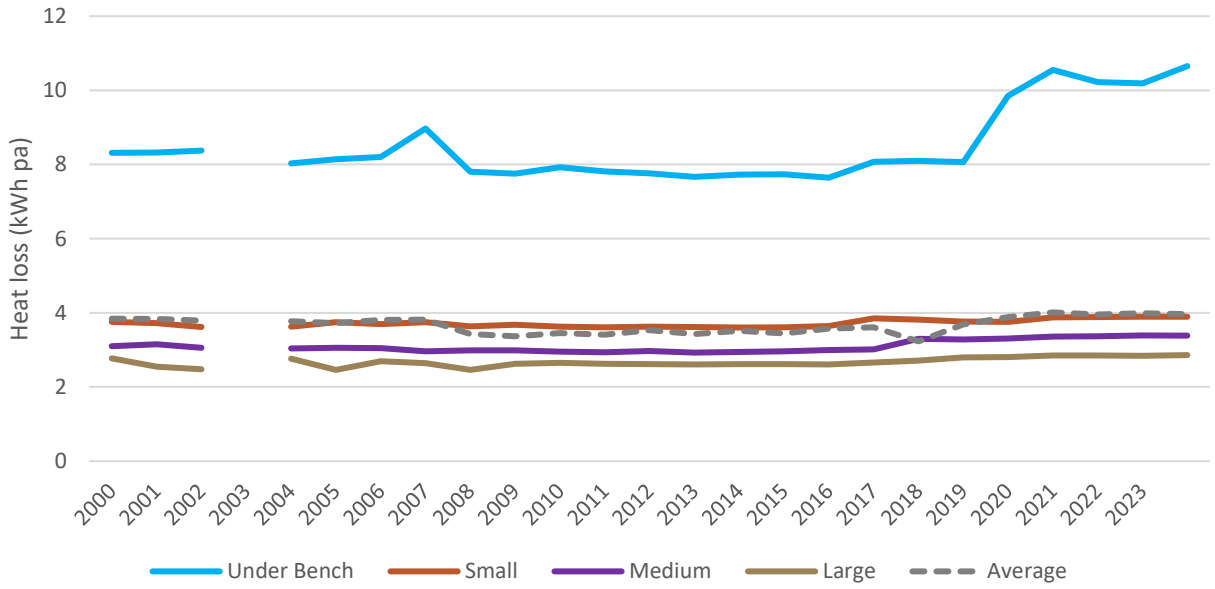
Figure 104: Rate of cylinder heat loss – electric storage water heaters



Energy intensity

Energy intensity is defined as the rate of heat loss per annum divided by the gross storage volume. This metric has the purpose of showing heat loss, while taking into account any changes in cylinder size that may impact on cylinder heat loss. Figure 104 shows that the rate of heat loss per cylinder volume has increased over the past 10 years. It has increased by 13% on average across all cylinder sizes. The increase has been much higher for under-bench units at 38% over the past 10 years.

Figure 105: Energy intensity (heat loss per annum by gross storage volume) – electric storage water heaters



8.6 Additional commentary

ESWHs sold in New Zealand are still manufactured predominantly in New Zealand.

New-Zealand-manufactured ESWHs typically had around 95% market share until 2016. From 2016, there has been a gradual decline to 76% of ESWH sales being manufactured in New Zealand in 2024. This decrease

in sales of New-Zealand-manufactured products has been matched by increasing sales of products from China and Australia, which now supply 11% and 8% of ESWHs. respectively.

8.7 Summary of key insights

Sales of ESWHs are increasing. Sales of ESWHs have increased by 85% over the past 10 years. Sales of medium-sized cylinders have grown the most in that time (up 123%) and represent 55% of the market.

Increased preference for mains-pressure cylinders. Since about 2013, there has been a strong move towards mains-pressure systems in preference to low-pressure system. Mains-pressure systems now represent 87% of the market.

ESWHs are still predominantly made in New Zealand. Historically, 95% of ESWHs were manufactured in New Zealand. There has been a gradual decline in sales from New Zealand manufacturers to 76% of sales in 2024. Products from China and Australia now supply 11% and 8% of ESWHs, respectively.

Average gross storage volumes are unchanged within size groupings. Within each of the cylinder size groupings (under-bench, small, medium and large), average cylinder volumes have been absolutely flat for the past 15 years.

9. Gas water heaters

9.1 Description of product class

Domestic gas water heaters are available in two primary types, each catering to different household needs and preferences: instantaneous gas water heaters and gas storage water heaters.

When selecting a gas water heater, it is essential to assess the household's hot-water demands and the available installation space.

Instantaneous gas water heaters

Also known as continuous flow or tankless water heaters, these units heat water on demand, eliminating the need for a storage tank. The design saves heat losses from hot-water being stored for long periods, as would be the case with a cylinder. However, energy losses are incurred through having to heat up the heat exchanger every time a hot tap is turned on. One of the main benefits for consumers from this type of water heaters is effectively having unlimited hot-water.

Instantaneous gas water heaters offer compact designs, allowing for flexible installation options, as a storage tank is not required. Some instantaneous gas water heaters can be mounted on or recessed into exterior walls, catering to homes with limited space.

Leading brands incorporate advanced features, such as precise temperature controls, safety mechanisms and compatibility with both natural gas and LPG.

Gas storage water heaters

These systems maintain a reservoir of hot-water at mains pressure, ensuring the immediate availability of hot-water for households with consistent or high simultaneous hot-water usage. They are particularly suitable for larger families or homes with multiple bathrooms.

A summary of the key statistics for gas water heaters is given in Table 19.

Table 19: Gas water heater statistics 2024

Type	Gas – instantaneous	Gas – storage
		
Description	These systems heat water on demand, eliminating the need for a storage tank.	These systems use a gas burner to heat water that is then stored in a cylinder to maintain a reservoir of hot-water.
Market share of sales in 2024	99%	1%
Average gas consumption	18,700 MJ pa	20,600 MJ pa
Annual energy cost for natural gas	$571	$629
Annual energy cost for LPG	$1,267	$1,396
Average hot-water flow rate	24.9 litres/minute	Not applicable
Average water volume	Lot applicable	155 litres

Note: Energy cost is based on a natural gas price of 11 c/kWh (3.06 c/MJ) and an LPG price of 24.4 c/kWh (6.78 c/MJ).

Gas type

Gas water heating systems are generally available with options to operate on natural gas or liquefied petroleum gas (LPG). Reticulated natural gas is available in many parts of the North Island, but is not available in the South Island. LPG water heaters are used in areas where natural gas is not available or a connection to the natural gas reticulation network is not feasible.

9.2 Relevant regulations

MEPS were introduced for gas water heaters in 2011 in New Zealand, in accordance with AS/NZS 4552.2:2010: Gas fired water heaters for hot-water supply and/or central heating—Part 2 which specifies certain efficiency levels.

Gas water heaters have been subject to an industry-based energy rating label in Australia since 1987. This is not a mandatory requirement for systems sold in New Zealand, but labels are commonly seen on products sold here.

9.3 Market and sales trends

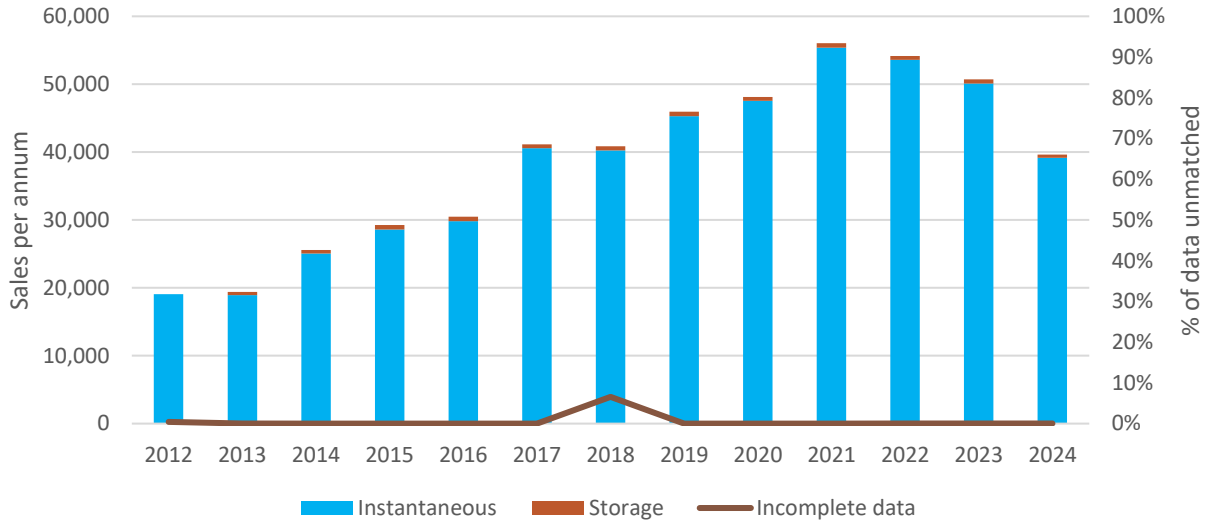
The sales trends for gas water heaters, in total and segmented by instantaneous and storage types, are shown in Figure 106.

Annual sales of gas water heaters increased steadily from 19,100 sales in 2012 until 2021 (with 56,000 sales), followed by a decline in sales to 39,600 units in 2024. This decline is likely to be due to a preference for ESWHs, which can be seen in Figure 98.

Instantaneous water heaters are overwhelmingly the most popular of the two forms of gas water heating, representing 99% of the market in 2024.

Note that the line in the figure shows that, in 2018, 6.6% of sales data could not be matched, meaning that further analysis of data for that year is based on 93.4% of sales.

Figure 106: Sales by gas water heater type



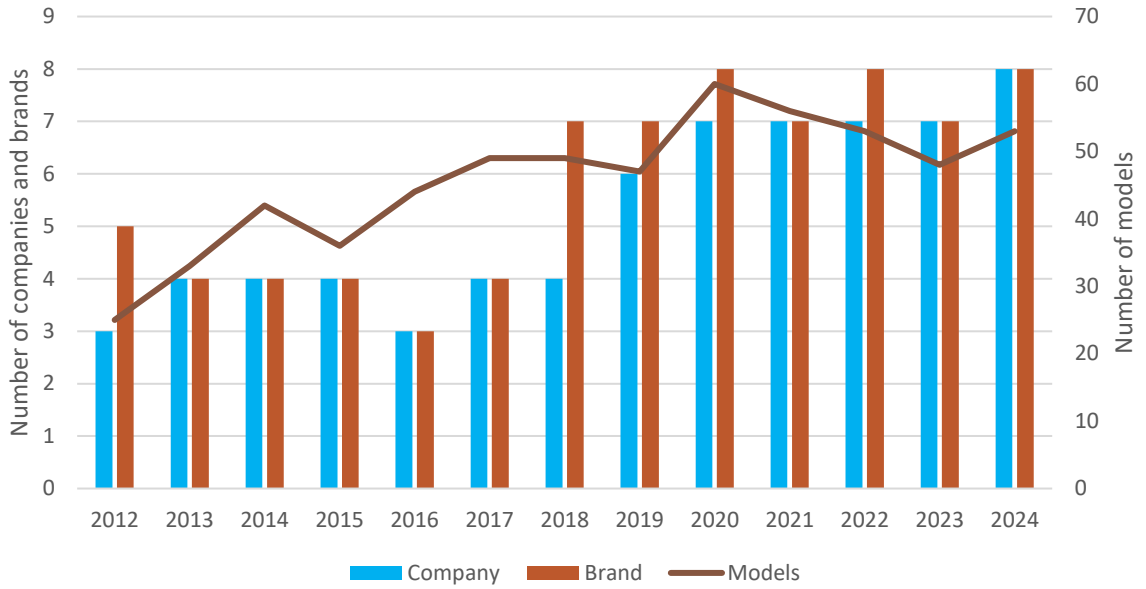
The make-up of brands and models of gas water heaters available in New Zealand, and their importers and manufacturers has also changed, with 53 models, eight brands and eight importers and manufacturers operating in the market in 2024.

The number of models available has increased significantly and in a generally steady manner from the 25 models available in 2012.

The number of companies and brands available was relatively steady from 2012 to 2018, and then essentially doubled in 2019 and has remained relatively constant since then.

These trends can be seen in Figure 107.

Figure 107: Changes in number of companies, brands and models – gas water heaters



9.4 Product trends

Capacity – gas instantaneous systems

Gas instantaneous water heaters heat water on demand. These systems have a nominal water heating capacity measured in litres per minute to indicate their ability to supply an amount of hot-water.

The trends for sales-weighted average capacity for instantaneous gas water heaters is shown in Figure 108.

Water heating capacity was relatively flat from 2012 to 2018 at 15 to 16 litres per minute. In 2019, there was a sudden 50% step up to 23 litres per minute. The average capacity has increased gradually since 2019 and is currently 24.9 litres per minute.

One possible explanation for the sudden jump in 2019 could be as a result of one or two suppliers changing their standard model from a 16 litres/minute unit to a 25 litres/minute one.

Figure 108: Instantaneous gas water heater capacity trend

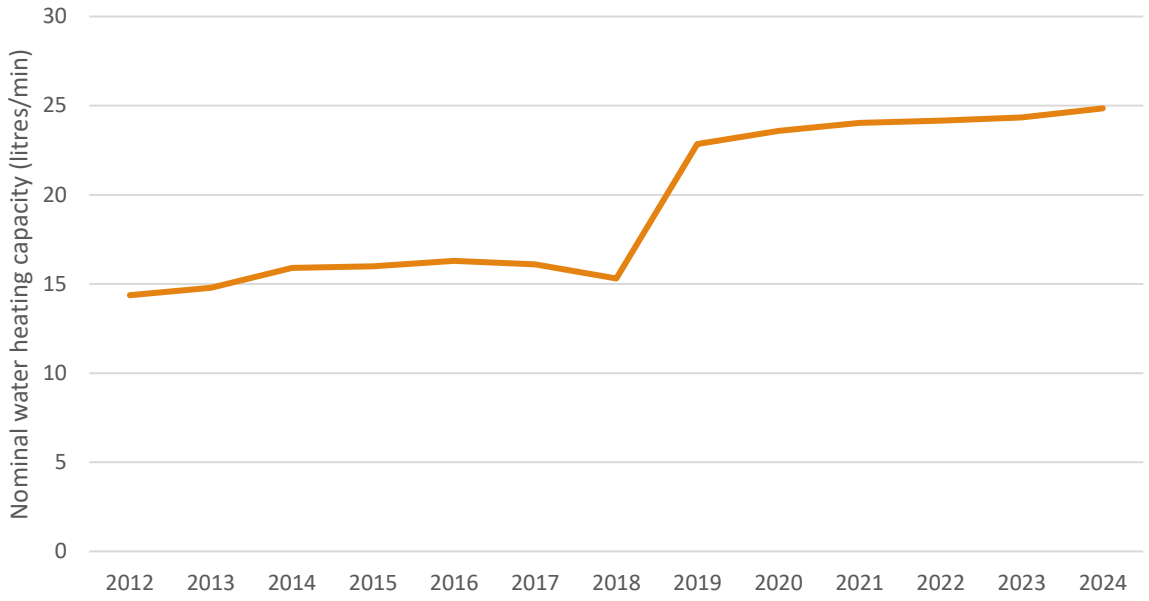
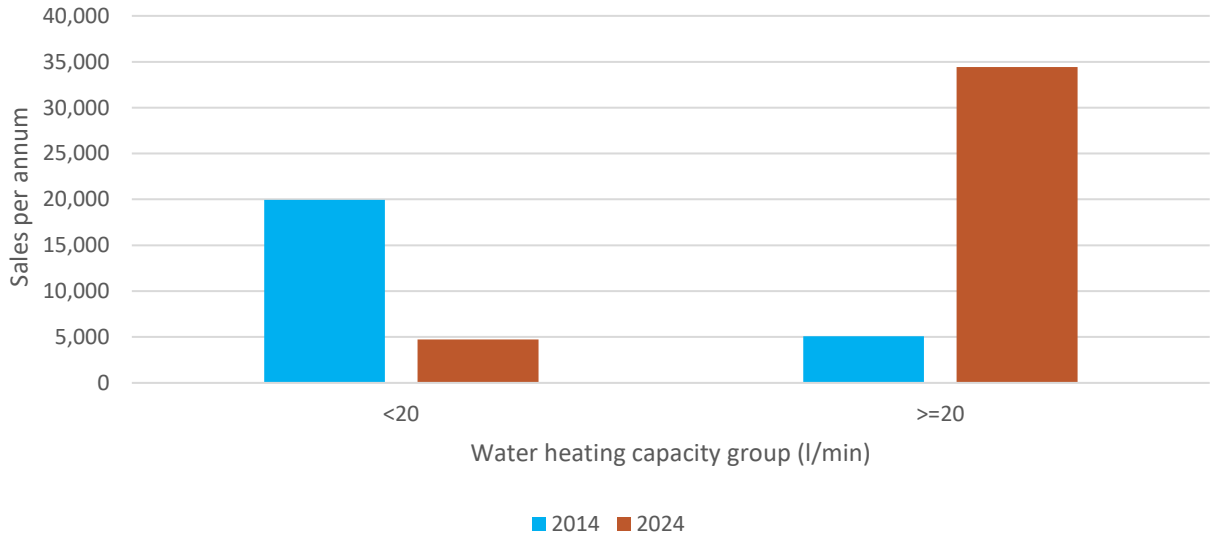


Figure 109 shows an analysis of water heating capacity, by capacity groupings of less than 20 litres per minute and greater than or equal to 20 litres per minute, comparing 2014 data with 2024 data. This shows a complete reversal of purchasing patterns over that time. In 2014, systems with a capacity of less than 20 litres per minute dominated sales with 80% of the market. By 2024, these smaller systems were only 12% of the market, with systems greater than or equal to 20 litres per minute representing 88% of sales.

Figure 109: Instantaneous gas water heater capacity groupings



Capacity – gas storage systems

Sales of gas storage water heaters are very low, so it is not possibly to carry out a statistically significant analysis of the data, other than to report that the average capacity of a gas storage system has remained relatively constant over the past 10 years at 153 to 155 litres.

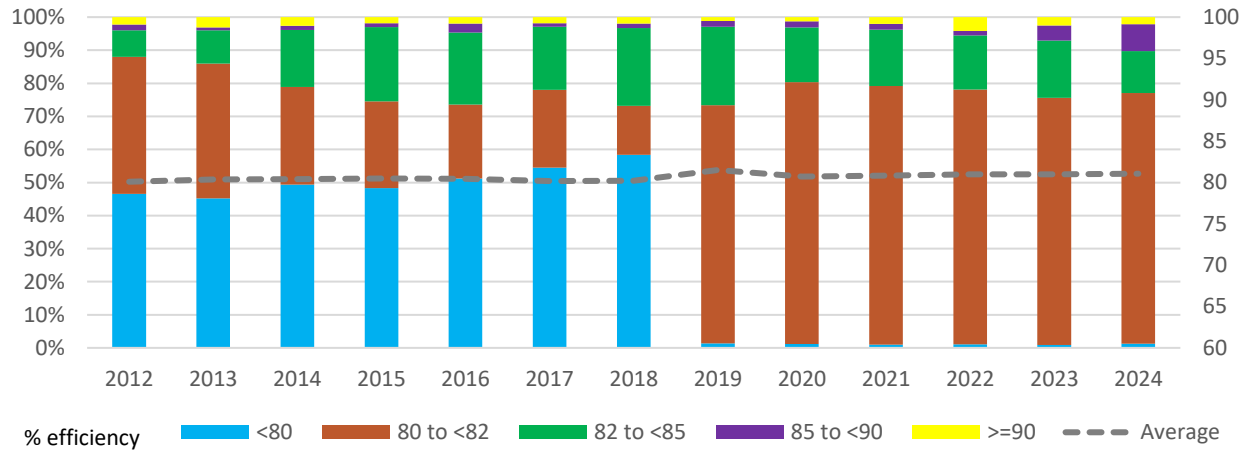
9.5 Product efficiency trends

System efficiency

Figure 110 shows trends in the efficiency groupings for gas instantaneous systems. This shows that systems with an efficiency of <80% virtually disappeared from the market from 2019.

From 2019, the market has been dominated by systems with an efficiency between 80% and 82%. This segment of systems currently represents 76% of sales. From 2023, there has been an increase in the sale of systems with an efficiency of between 85% and 90%, having grown from a market share of 2% to 8% in 2024. Units with efficiency above 90% represent those with condensing boilers.

Figure 110: Market share by efficiency groupings – instantaneous gas water heater systems



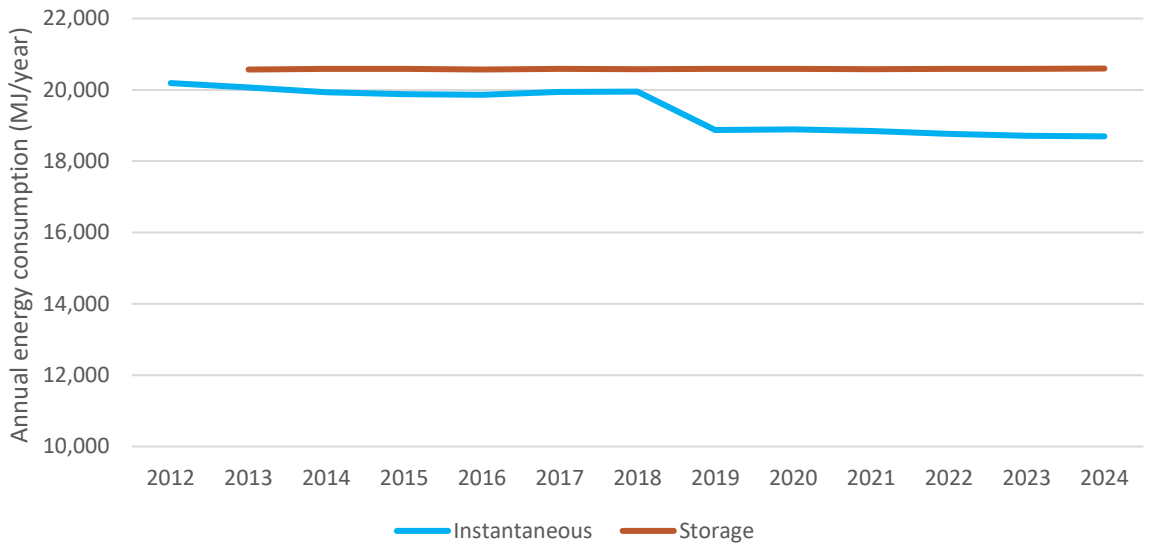
Annual energy consumption

Figure 111 shows the trends in annual energy consumption for gas storage and instantaneous water heaters. The line for gas storage systems is essentially flat, representing a steady average energy consumption of 20,500 MJ per annum.

The annual energy consumed by gas instantaneous systems has decreased by 7% over the past 12 years. There was a sudden dip in gas consumption in 2019, but other than that, the trend has been one of a very slow decline in gas consumption.

This analysis also shows that gas storage heaters use 10% more gas annually than instantaneous systems.

Figure 111: Annual energy consumption – instantaneous and storage water heater systems



9.6 Additional commentary

Gas water heaters sold in New Zealand are manufactured in a small range of countries.

The largest volume of gas water heaters sold in New Zealand come from Japan (83%), followed by China (13%). Japanese sourced product has dominated the market for at least the past 12 years, typically representing 80% to 90% of sales.

9.7 Summary of key insights

Overwhelming preference for gas instantaneous systems. Gas instantaneous systems totally dominate the gas water heater market, with 99% of sales. Customers like the ability to have unlimited amounts of hot-water. Instantaneous systems do not require any storage space for a hot-water cylinder which also appeals.

Minimal change in energy efficiency. The energy efficiency of gas storage systems has essentially remained unchanged since 2013 at around 88.5%. The efficiency of gas instantaneous systems has improved very slowly over the years, and the sales-weighted average is currently 81.1%. In recent years, there has been a move in the market whereby systems with an efficiency of less than 80% have essentially disappeared, and there has been growth in systems with an efficiency of 85% to 90%.

LPG systems are much more expensive to run. The cost of LPG is currently more than double that of reticulated natural gas, so the operating cost of an LPG system (storage or instantaneous) will be more than double that of the equivalent natural gas water heater. This can be seen in

Table 20.

Reticulated natural gas is only available in approximately 300,000 households in New Zealand (about 15% of total households), and all natural gas connections are in the North Island. South Island residents and those in the North Island without a natural gas connection will need to use the more expensive LPG option if they choose a gas water heating system.

Table 20: Comparison of operating costs – instantaneous and storage gas water heater systems

	Annual gas cost	
	Instantaneous system	**Storage system**
Natural gas	$571	$629
LPG	$1267	$1396

Note: Based on a natural gas cost of 11c/kWh and an LPG cost of 24.4 c/kWh, and excluding lines fees.

No notable changes in country of manufacture. Japanese sourced products have dominated the market for at least the past 12 years, typically representing 80% to 90% of sales, including 83% of sales in 2024.

10. Televisions

10.1 Description of product class

There is a diverse range of technologies and sizes of televisions available in the New Zealand market, catering to various preferences and budgets.

The key types of display technologies are:

- **liquid crystal display (LCD):** the screen has a backlight (usually LEDs), which illuminates the entire screen, shining through the liquid crystals that are then modulated to create the image
- **organic light-emitting diode (OLED):** use organic materials that emit light when electricity is applied. They are renowned for their superior picture quality, offering deep blacks, vibrant colours and enhanced contrast. They also feature wide viewing angles and sleek, thin designs that complement modern interiors.

A summary of the key statistics for the two main types of television technologies is given in Table 21.

Table 21: Television statistics 2024

Type	LCD screen	OLED screen
		
Market share of sales in 2024	93%	7%
Average screen size	49 inches	58 inches
On mode power consumption	83W	106W
Sales-weighted average star rating	4.95	4.9
Comparative energy consumption	310kWh pa	393kWh pa

Type	LCD screen	OLED screen
Annual energy cost	$93	$118

Note: Energy cost is based on an electricity price of 30c/kWh.

10.2 Relevant regulations

EECA is responsible for implementing the New Zealand Energy Efficiency (Energy Using Products) Regulations 2002, which includes the MEPS and MEPL requirements for televisions.

In New Zealand, televisions must meet MEPS, ensuring they don't exceed a certain maximum operating power consumption (adjusted for screen area) under test conditions.

Televisions are tested using AS/NZS 62087.1:2010 and rated using AS/NZS 62087.2.2:2011.

The annual energy consumption and star rating of a television is calculated assuming that it is on for 10 hours a day, and in standby for 14 hours. It is also assumed that the television is in the recommended 'home viewing' mode.

Televisions offered for sale must have an energy rating label displayed and supplied with them, with the label displaying the television's energy consumption in kWh pa, and a star rating ranging from one to six stars. A variant of the label is available for super-efficient models, which shows a crown with up to an additional four stars (maximum total of 10 stars) and the words 'super efficiency'.

More information on labelling requirements can be seen on EECA's website: Televisions | EECA

10.3 Market and sales trends

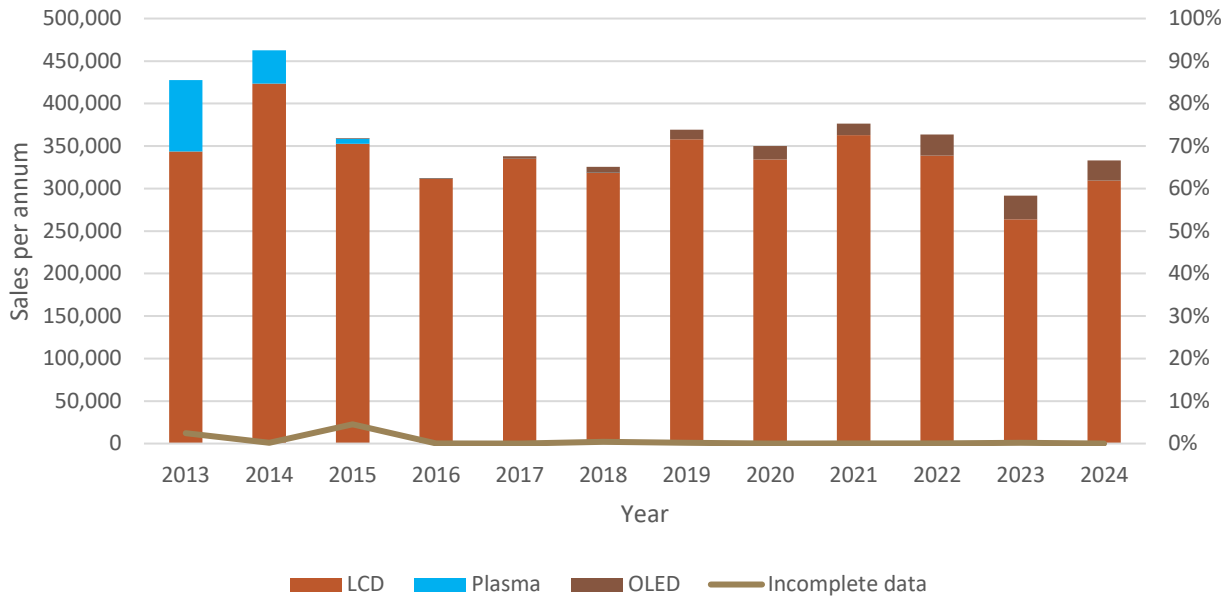
Sales trends for televisions, in total and segmented by technology type (LCD, Plasma and OLED), are shown in Figure 112.

Annual sales since 2013 have gone through an up-and-down pattern, varying between a peak sales volume of 463,000 in 2014, and a low of 291,500 sales in 2023. Sales in 2024 were 333,000 units.

LCD televisions have been the most popular technology type over the past 12 years, generally representing 90% to 95% of the sales volume. Plasma televisions still accounted for some sales volume in 2013 to 2015, but essentially disappeared from the market from 2016 onwards. OLED televisions appeared on the New Zealand market in 2015 and have increased in volume since then and now represent 7% of the market.

Figure 112 also shows a line for incomplete data, representing sales data that cannot be used in any detailed analysis owing to the lack of information. This is a minor issue for 2013 and 2015 data, but not for any other year.

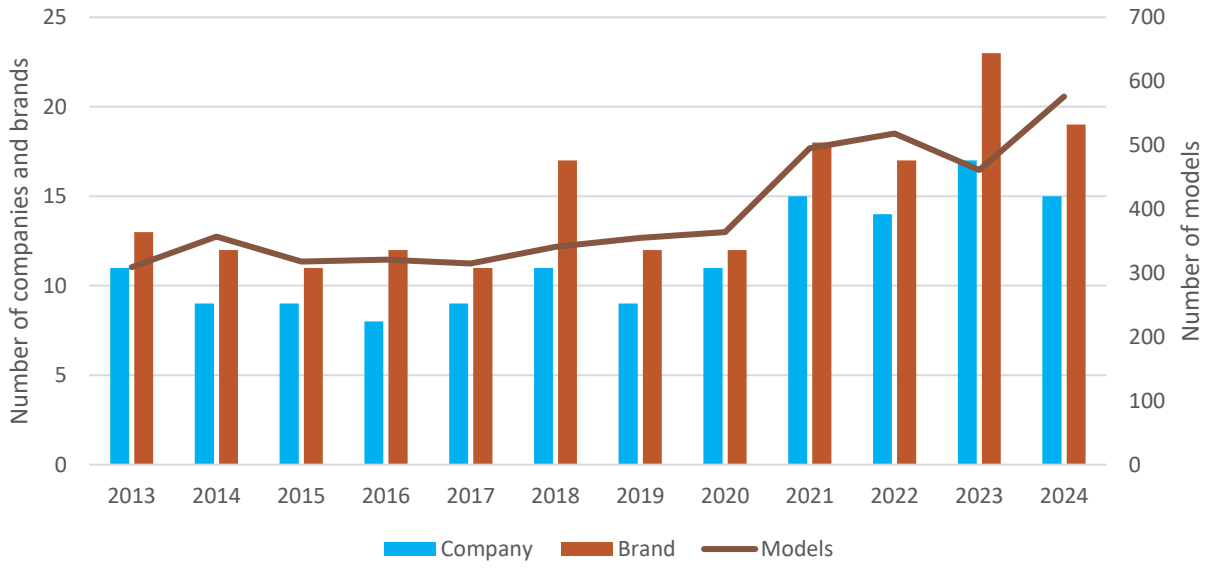
Figure 112: Share of sales by television technology type



The make-up of brands and models of televisions available in New Zealand, and their importers and manufacturers has changed, with 576 models, 19 brands and 15 importers and manufacturers operating in the market in 2024, as can be seen in Figure 113.

The figures shows that there are a high number of models on offer per brand (approximately 30). The number of models available has nearly doubled since 2013, while the number of companies and brands in the market has increased at a lesser rate.

Figure 113: Changes in number of companies, brands and models – televisions



10.4 Product trends

Rise of smart and connected televisions

Smart televisions, equipped with internet connectivity and built-in streaming applications, have become increasingly popular. Modern televisions are increasingly being incorporated into smart home setups,

enabling features like automatic power-down, brightness adjustments and integration with other smart devices. These functionalities contribute to overall energy savings and enhanced user convenience

Recent advancements in television technology have introduced innovative features to the market. For instance, LG unveiled a transparent OLED television, aiming to blend seamlessly into living spaces when not in use. Additionally, there is a growing emphasis on larger screen sizes and AI-driven personalisation to enhance user experience.

Television screen size

Television size is normally expressed in inches, being the distance diagonally from the top corner of the screen to the bottom corner on the opposite side.

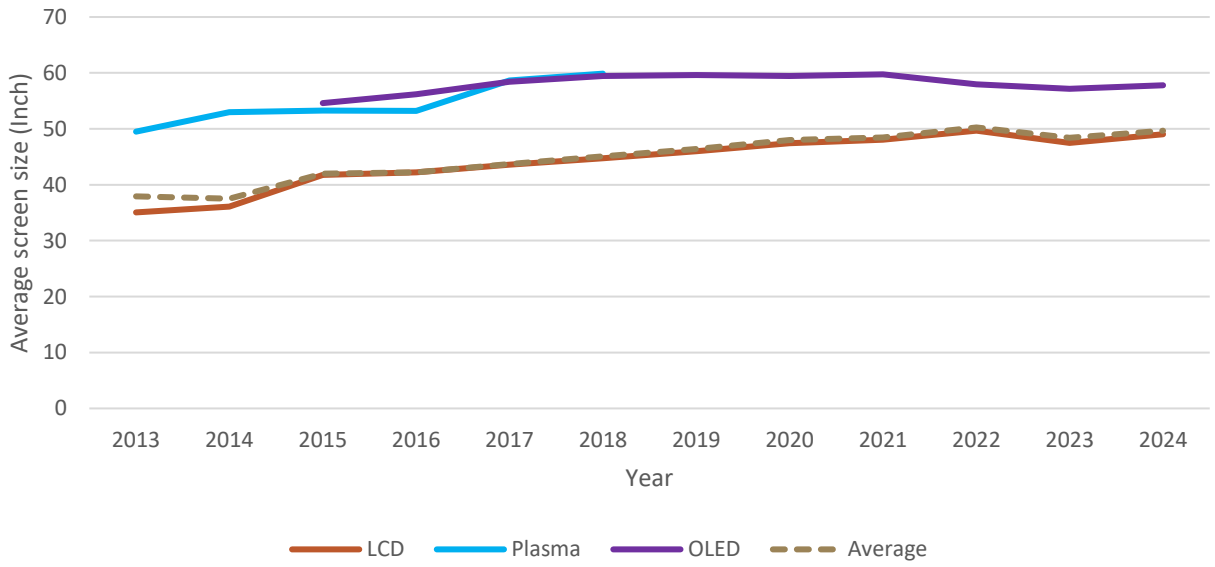
Screens typically range in size from 32-inches to 75-inches, with 43-inch, 50-inch , 55-inch and 65-inch being the most common sizes, although there is a growing trend towards larger sizes like 75-inch, 85-inch and even 98-inch. All television screen aspect ratios are 16:9 (widescreen).

The trends for sales-weighted average screen size for the different screen types of televisions and the average across all screen types are shown in Figure 114.

There has been a steady increase in the average size of televisions sold, increasing from 38-inches in 2013 to 50-inches in 2024.

OLED televisions on average have a larger screen size than LCD televisions. In 2024, the sales-weighted average size of OLED televisions was 58-inches and that of LCD televisions was 49-inches.

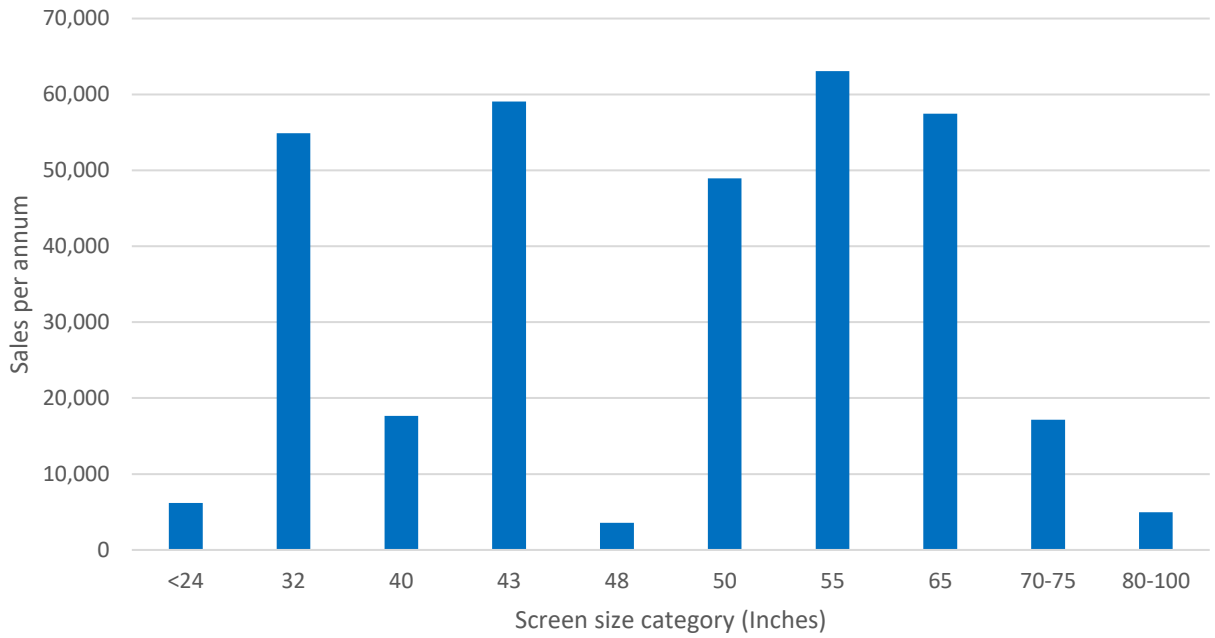
Figure 114: Television size trends



In 2024, the most popular television size sold in New Zealand was a 55-inch screen. Other popular sizes include 32-inch, 43-inch, 50-inch and 65-inch screens, as can be seen in Figure 115. Nearly 5,000 televisions (1.5% of the market) sold in 2024 had a screen size of 80 to 100 inches.

Televisions with 43-to-65-inch screens will be popular choices for lounge and living room settings. The high popularity of 32-inch screens could be due to their use in smaller dwellings or secondary locations such as bedrooms, or could be driven by their cheaper price point.

Figure 115: Size distribution graph – televisions



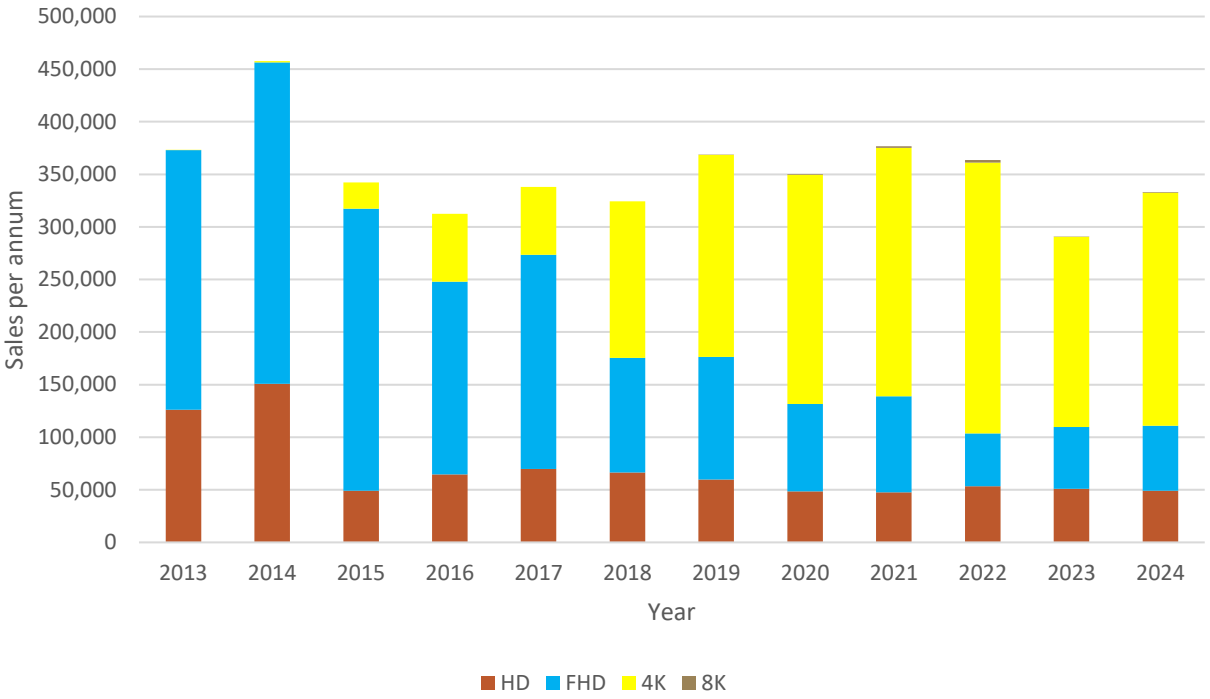
Screen resolution

The screen resolution of televisions can be categorised as follows:

- **HD** (high definition): 720p resolution, offering good clarity for smaller screens
- **FHD** (full high definition): 1080p resolution, offering crisper images suitable for mid-sized screens.
- **4K ultra HD:** 2160p x 3840p resolution, four times the pixels of FHD, delivers sharper images on larger screens
- **8K ultra HD:** 4320p x 7680p resolution, even more pixels for extremely large screens, providing unparalleled clarity. These televisions are currently less common and quite expensive.

As can be seen in Figure 116, in 2013, the market in New Zealand was dominated by FHD screens and HD screens. 4K screens came onto the market in 2015 and increased in popularity from then, and now dominate with 67% of the market. 8K screens started to appear from 2019, but their sales volume is low at 0.1% of the market currently. The balance of the market is split between HD (15% of sales) and FHD (19% of sales).

Figure 116: Television screen resolution trends



Screen luminance

The standard unit for measuring the luminance of a television screen is nits, which is equivalent to one candela per square meter (cd/m²). Nits essentially measure how bright a display is, with higher nits indicating a brighter picture.

Luminance is measured in two modes:

- recommended home viewing mode (test mode)
- brightest mode.

Trends in luminance in these two modes can be seen in Figure 117 and Figure 118.

The pattern in both modes is similar. LCD screens show a slight upward trend in screen luminance over the past 11 years. The luminance of OLED televisions increased rapidly after their introduction in 2015, until 2020, and has remained relatively steady since then.

Screen luminance in its brightest mode is on average about 25% brighter than the test mode for the energy rating label. Generally, the energy consumption of a television is proportional to its screen luminance, which suggests that average energy consumption in the brightest mode would by 25% higher than measured and reported for the energy rating label.

Figure 117: Television luminance trends – test mode

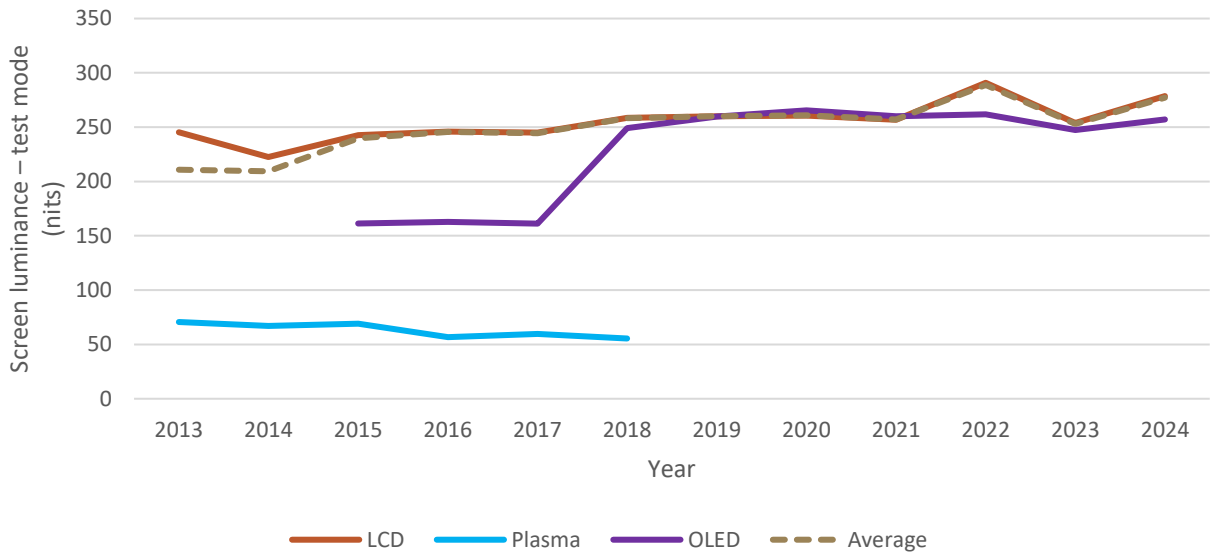


Figure 118: Television luminance trends – brightest mode

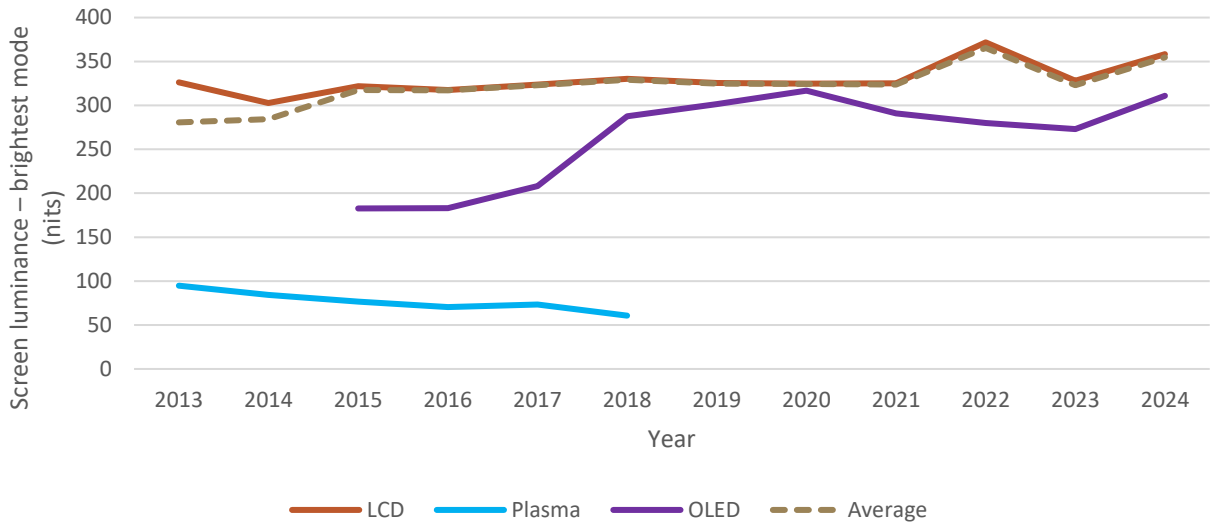
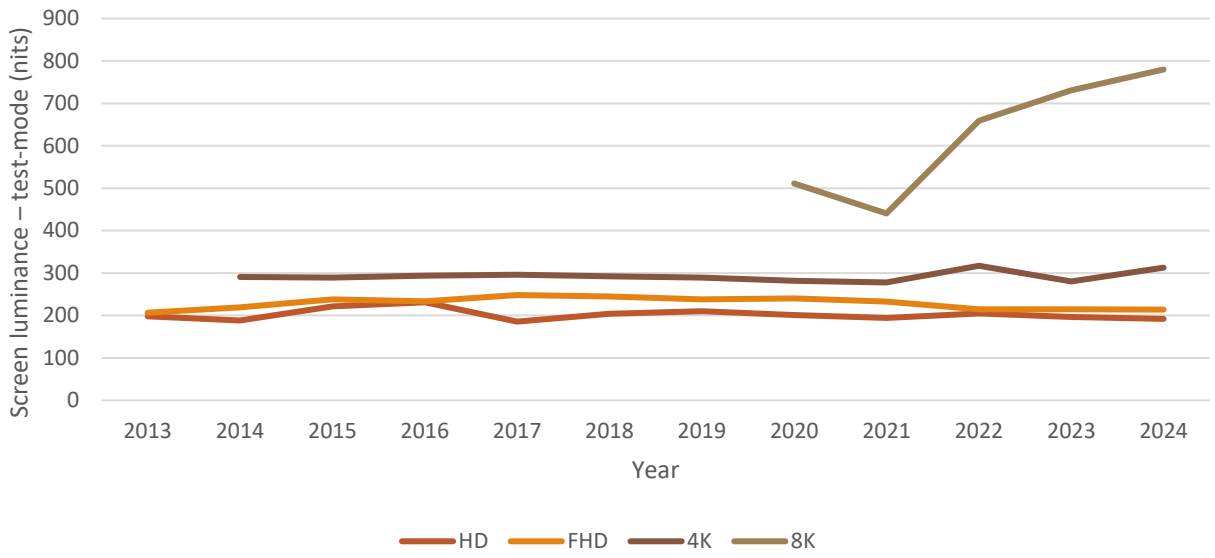


Figure 119 shows trends in luminance (test-mode) for different screen resolutions. For all except 8K televisions, luminance has generally been the same for the past 10 years. The luminance of 4K televisions is about 50% more than HD and FHD televisions. However, the luminance of 8K televisions has increased rapidly lately and is now around four times that of HD and FHD televisions.

Figure 119: Television luminance trends – test-mode



10.5 Product efficiency trends

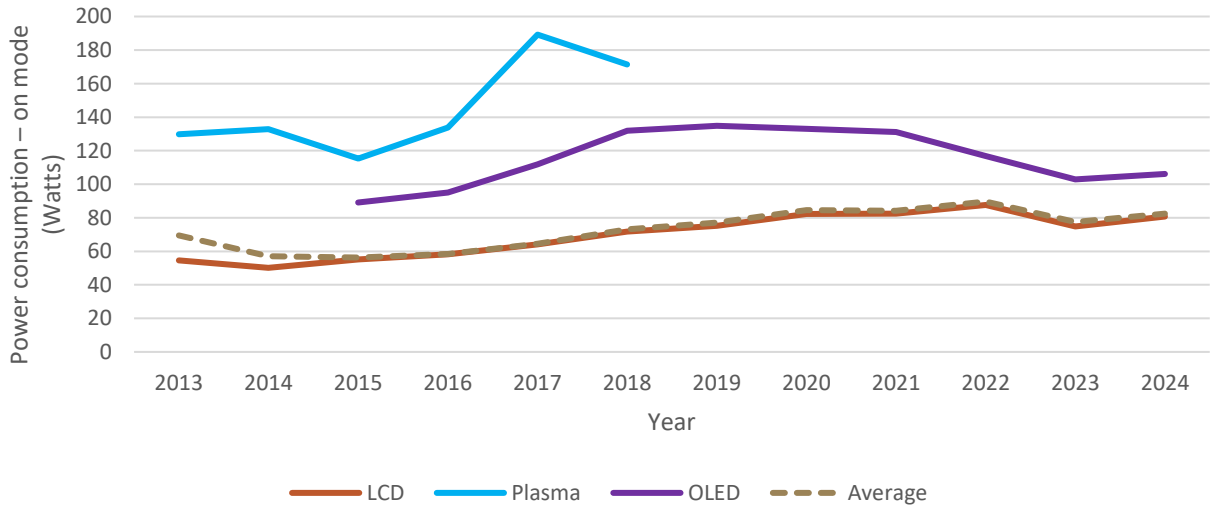
On-mode power

On-mode power consumption refers to the power used by the television when switched on in normal viewing mode and is measured in Watts. Trends in the sales-weighted average amount of power used by televisions in on-mode are shown in Figure 120.

The trend for on-mode power consumption for LCD televisions shows a small, steady rise over the past 11 years, with the net result that on-mode power consumption is now 48% higher than it was in 2013.

The trend for on-mode power consumption for OLED televisions was initially a rise, followed by a relatively flat period, with the net result that on-mode power consumption is now 19% higher than it was in 2015 when OLED televisions were introduced to New Zealand.

Figure 120: On-mode power by screen type – televisions



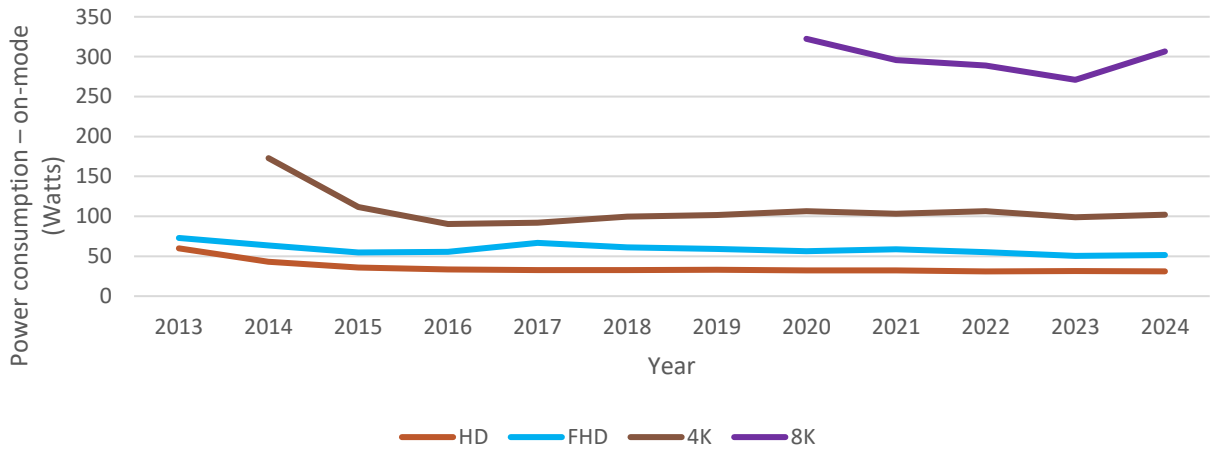
Power by screen resolution

It is interesting to look at the amount of power consumed by televisions as a function of their screen resolution.

Figure 121 shows the power consumption in on mode measured in Watts, and Figure 123 shows the energy intensity, which is defined as the sales-weighted average power used divided by the size of the screen to give a measure in Watts/square inch.

The trends in both figures are similar. They show that 8K televisions use substantially more energy than other types of televisions. Compared with a 4K television, an 8K television uses three times the amount of power and has an energy intensity 2.3 times greater. In turn, a 4K television uses over three times the amount of power and has an energy intensity of nearly double that of a HD television.

Figure 121: Power consumption by resolution – televisions

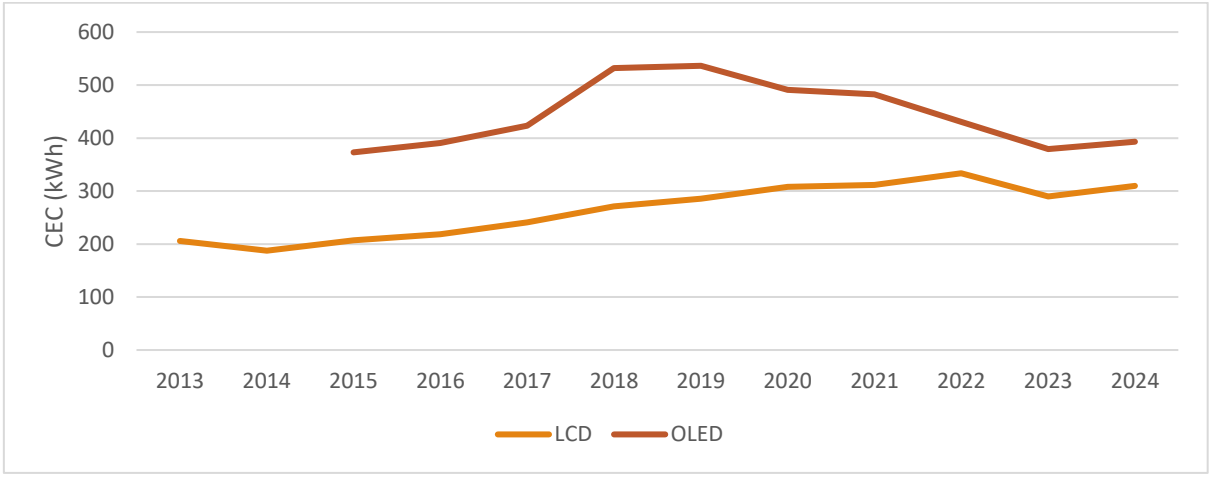


Comparative energy consumption

The trends for CEC for the various technology types of televisions are shown in Figure 122.

The sales-weighted average CECs of LCD televisions have gradually increased over the years, from 206kWh in 2013 to 310kWh in 2024. The trend for OLED televisions has been more variable, initially rising and then declining, with the result that the CEC in 2024 of 393kWh is largely the same as it was in 2015 when OLED televisions were introduced.

Figure 122: Sales-weighted CEC per annum – televisions



As can be seen in Figure 123, OLED televisions have a slightly higher (11%) energy intensity than LCD televisions. The energy intensity of OLED televisions increased slightly from their introduction in 2015, peaking around 2019, and reducing slightly since then. The energy intensity of LCD televisions has varied slightly up and down over the past 12 years.

Plasma televisions have a relatively high energy intensity. However, as noted previously, plasma televisions essentially disappeared from the market by 2016.

Figure 123: Energy intensity by resolution – televisions

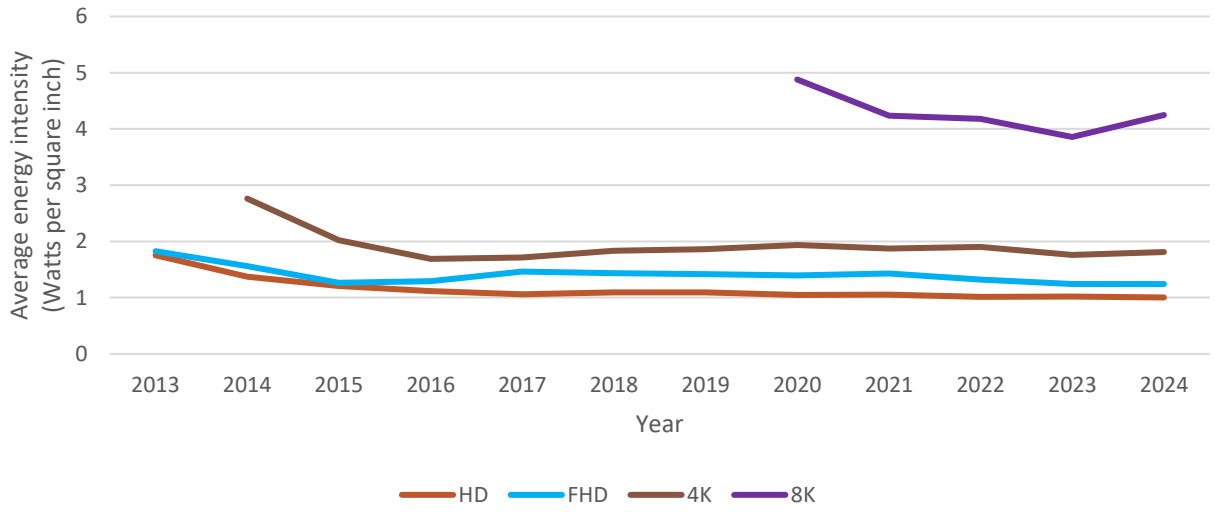
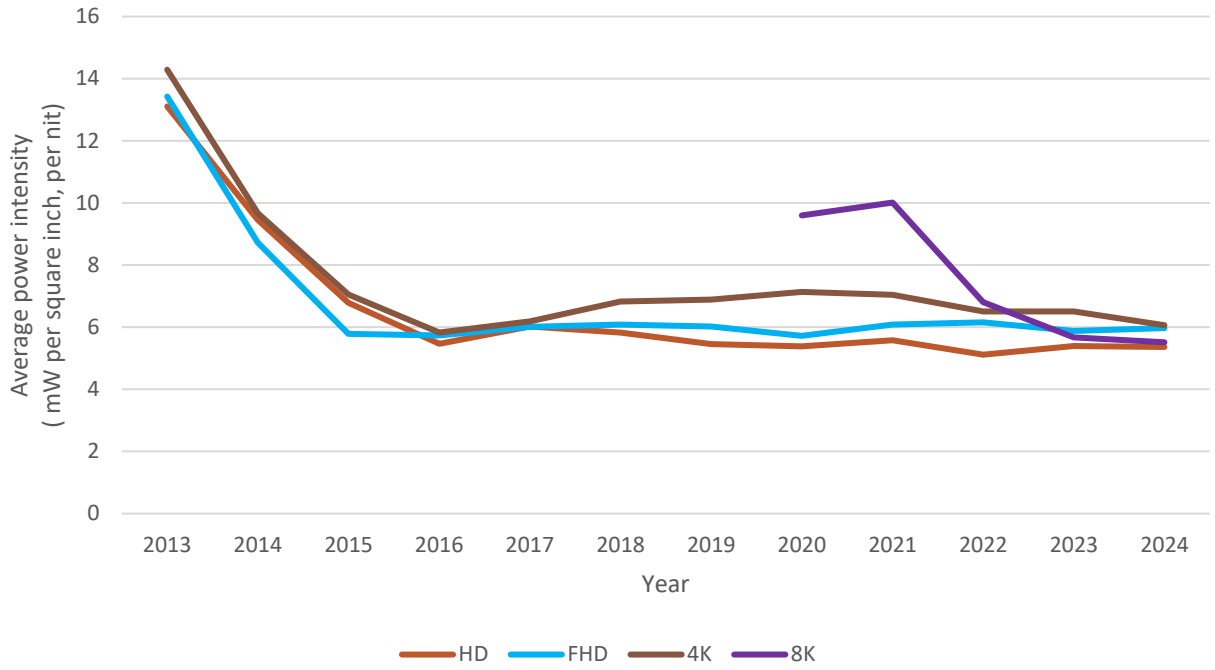


Figure 124 shows the above information normalised for luminance. The figure shows that for all types of resolutions, the energy intensity per area is similar at around 6mW/in^2/nit.

It is interesting to note that while Figure 119 and Figure 123 show much higher luminance and energy intensity, respectively, for 8K screens, the energy intensity per area of screen per nit is approximately the same for all screen resolutions.

Figure 124: Energy intensity per area per nit – televisions

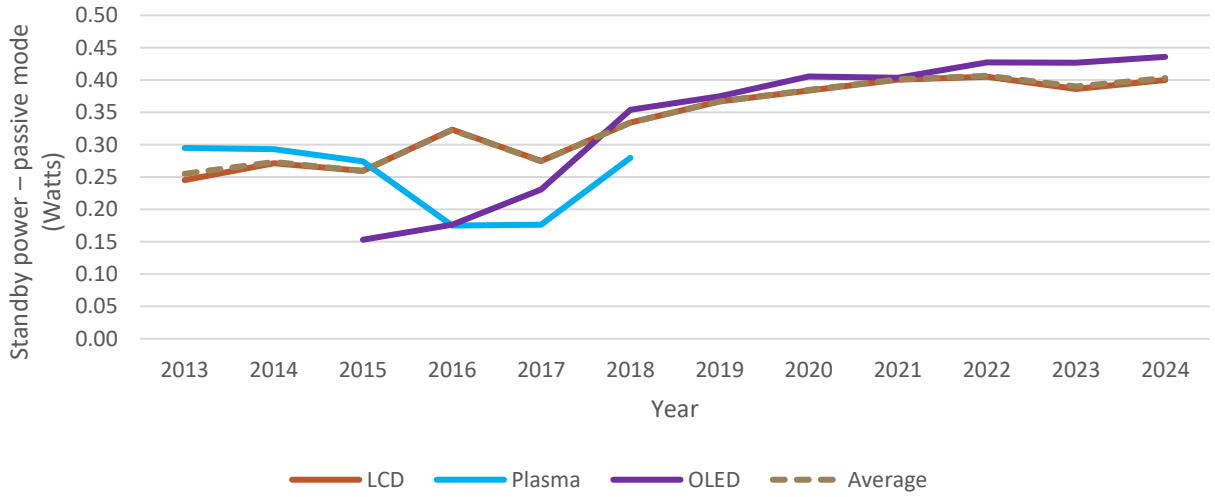


Standby power

Televisions use a small amount of power when switched on and in standby mode, measured in Watts. Trends in the average amount of power used in standby mode are shown in Figure 125.

Standby energy consumption for LCD and OLED televisions has generally grown over recent years. However, the amount of power consumed in standby mode is very small, being 0.4W pa for LCD televisions and 0.44W pa for OLED televisions.

Figure 125: Standby power by screen type – televisions

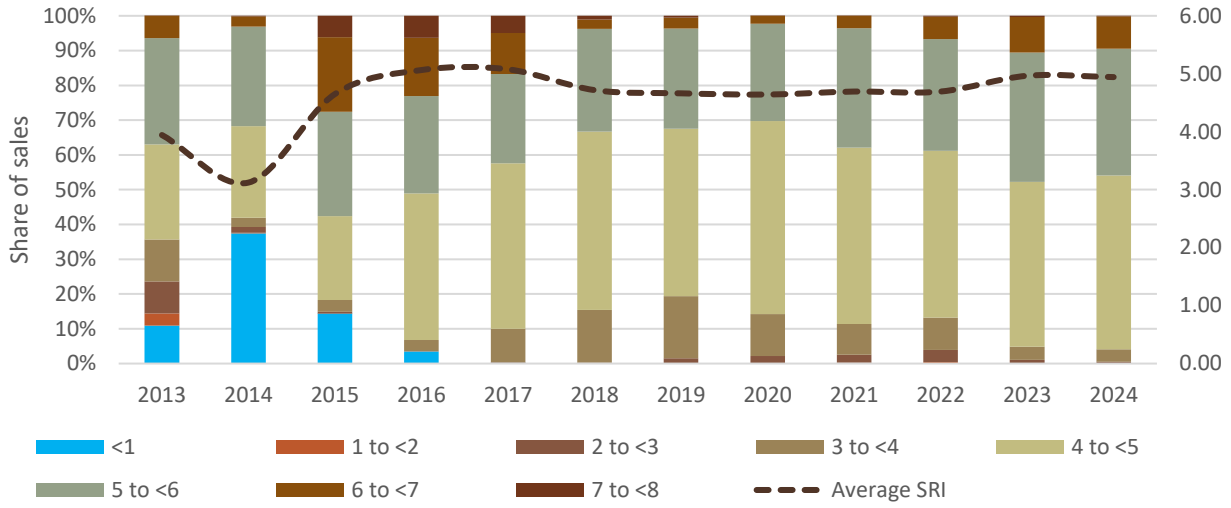


Star rating

As can be seen in Figure 126, the average star rating of televisions sold in New Zealand increased significantly from 2014 to 2016, and has been relatively unchanged since then, hovering around an average star rating of five.

The increase from 2014 to 2016 will have been caused by the phase-out of plasma televisions, while the average star rating since then will have been impacted by various competing factors, including general energy efficiency improvements on the one hand, countered by a move to brighter and higher resolution screens on the other.

Figure 126: Star rating index trends and share of sales – televisions



10.6 Additional commentary

Televisions sold in New Zealand are manufactured in a range of countries.

The largest volume of televisions sold in New Zealand now come from China (58%), followed by Vietnam (21%). Between 2013 to 2016, just over half of televisions sold in New Zealand were made in Malaysia. Sales of Malaysian-built televisions has since declined rapidly to represent just a low volume of sales in 2024.

10.7 Summary of key insights

Improved energy ratings. The average star rating for televisions sold in New Zealand increased significantly from 2014 to 2016, and has been relatively unchanged since then, hovering around an average star rating of five. The increase from 2014 to 2016 will have been caused by the phase-out of plasma televisions. The average star rating since then will have been impacted by various competing factors, including general energy efficiency improvements on the one hand, countered by a move to larger screen sizes and more energy hungry 4K screens on the other.

LCD televisions running costs are decreasing slowly and are cheaper than for OLED televisions. The energy usage and therefore the energy running costs of LCD televisions has increased gradually over the years, primarily owing to increasing screen size. However, a television with an OLED screen has an average screen size 18% larger than the average LCD screen and uses 13% more electricity per annum, as shown in Table 22.

Table 22: Comparison of electricity operating costs – televisions

	Annual electricity cost (2024)	
	LCD screen	**OLED screen**
Annual energy cost	$93	$118

Note: Based on an electricity cost of 30c/kWh.

Shift towards new technology. Recently there has been a gradual shift from the dominant LCD televisions to OLED televisions. OLED televisions offer superior picture quality, vibrant colours and enhanced contrast. They also feature wide viewing angles and sleek, thin designs that complement modern interiors. OLED televisions appeared on the New Zealand market in 2015 and have increased in volume since then to now represent 7% of the market.

Shift towards higher screen resolution. Ten years ago, the whole New Zealand television market essentially had HD or FHD screen resolution. 4K screens came onto the market in 2015 and increased in popularity from then, so they now dominate with 67% of the market. 8K screens started to appear from 2019, but they are very expensive, and their sales volume is very low currently.

Shift towards larger screens. There has been a steady increase in the average size of televisions sold, increasing from 38 inches in 2013 to 50 inches in 2024. In 2024, 55-inch screen televisions are the most popular size category. Nearly 5,000 televisions (1.5% of the market) sold in 2024 had a screen size of 80 to 100-inches.

Changes in country of manufacture. Televisions sold in New Zealand are manufactured in a range of countries, with the largest volume of televisions sold coming from China (58%), followed by Vietnam (21%) and Indonesia (13%).

Significant energy and cost savings. Upgrading to a more efficient television can lead to substantial savings. Table 23 shows the energy and money saved compared with a 1-star appliance over 15 years, based on an electricity cost of 30c/kWh.

Table 23: Estimated average energy and cost savings compared to a 1-star product – televisions

Star rating	1	2	3	4	5	6	7	8	9	10
Annual energy consumption (kWh)	669	535	428	342	274	219	175	140	112	90
Annual energy cost	$201	$160	$128	$103	$82	$66	$53	$42	$34	$27
Annual savings	$0	$40	$72	$98	$118	$135	$148	$159	$167	$174
Savings over 15 years	$0	$602	$1,083	$1,468	$1,776	$2,023	$2,220	$2,378	$2,504	$2,605
Percentage of energy saved	0%	20%	36%	49%	59%	67%	74%	79%	83%	87%

11. New Zealand macro-economic and market factors

Over the past decade, several macroeconomic, market and societal trends in New Zealand have significantly influenced consumer purchasing behaviour with respect to large home appliances and entertainment systems, such as televisions, washing machines and dishwashers. The most impactful of these trends are discussed below.

Note that years referred to in this section are calendar years, which will differ somewhat from the 'sales data' years used in the analysis elsewhere in this report, which are years to 31 March.

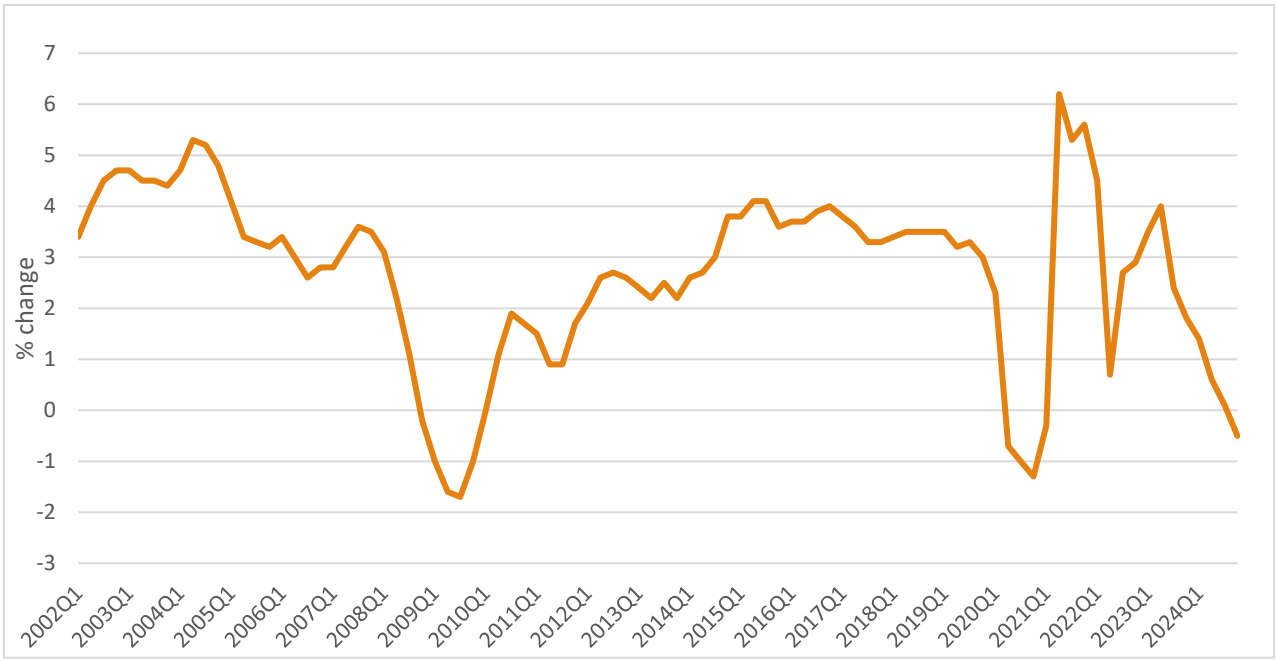
11.1 Economic growth and GDP trends

Figure 127 shows the following trends.

- **Moderate GDP growth:** between 2013 and 2019, New Zealand experienced consistent GDP growth (averaging around 2.5–3% annually), supporting increased consumer spending on durable goods like appliances.
- **Post-COVID rebound:** after a sharp contraction in 2020 due to the pandemic (GDP fell ~2.1%), growth rebounded in 2021, partly fuelled by pent-up demand and government stimulus.
- **Recent stagnation and mild recession:** in 2023 and 2024, GDP growth slowed significantly due to inflation, higher interest rates and global economic uncertainty, dampening discretionary consumer spending.

The impact of these factors has been that during growth years, consumers were more likely to upgrade or purchase higher-end appliances, while during periods of slowdown, purchases became more price-sensitive and were more likely to be deferred.

Figure 127: New Zealand quarterly change in GDP



Source: www.stats.govt.nz

11.2 Covid-19 pandemic, 2020–2022

The following factors influenced consumer behaviour during the Covid-19 pandemic.

- **Lockdowns and remote work:** time spent at home increased, driving strong demand for home improvements, better entertainment (e.g. larger or smart televisions), and newer appliances to support increased home activity, including working from home. The inability to travel overseas led some householders to buy new appliances as an alternative to spending on travel.
- **Supply chain disruptions:** delays and price hikes affected appliance availability and led to stock shortages.
- **Government support and low interest rates:** wage subsidies and mortgage holidays kept household finances relatively stable in the short term, temporarily boosting consumer spending.

The impact of these factors was that consumers redirected spending from travel to home-based goods, and appliance and electronics retailers experienced a sales surge, especially in 2020 and 2021.

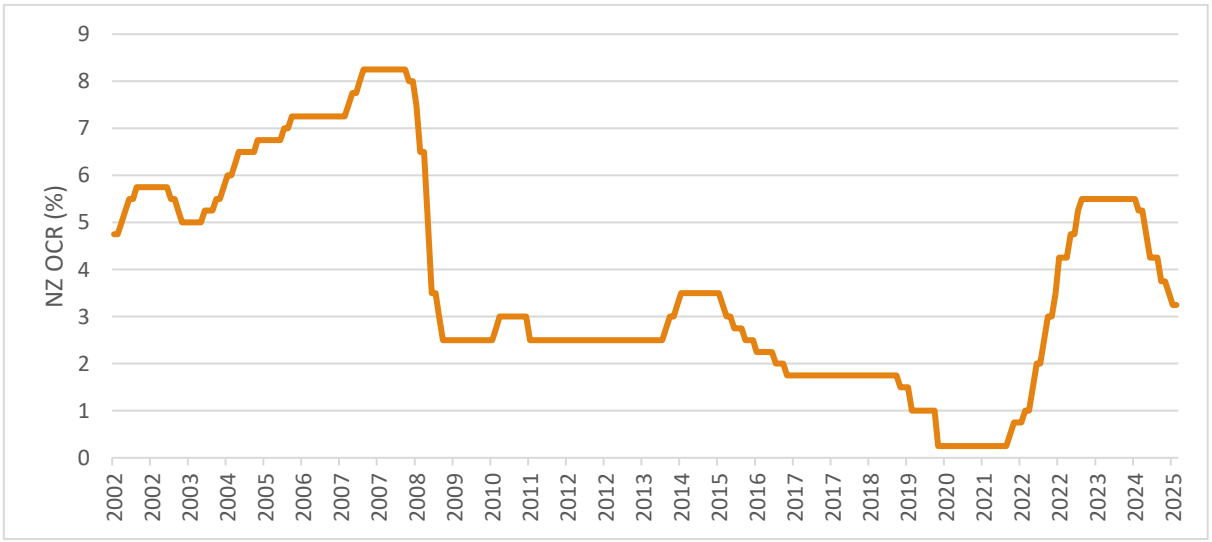
11.3 New Zealand official cash rate

The official cash rate (OCR) is the interest rate set by the Reserve Bank of New Zealand (RBNZ) to influence borrowing costs across the country. It acts as the primary tool for the RBNZ to manage inflation and maintain price stability. The OCR impacts the wholesale price of borrowing for registered banks, which in turn affects the interest rates they offer on loans and savings.

As can be seen in Figure 128, the OCR was relatively steady in the range of 1.75% to 3.5% from mid-2009 to early 2019. In early 2020 (coinciding with the start of the Covid-19 pandemic), the OCR plummeted to 0.25% where it remained until October 2021. From then, the OCR was increased rapidly in a number of increments to a peak of 5.5% from mid-2023 to mid-2024, in a bid to control inflation, before it was steadily reduced again to 3.25% in May 2025.

The impact of the reduction of the OCR to historically very low levels (during the pandemic) saw consumer interest rates fall, particularly for mortgages, encouraging consumer spending on appliances and property.

Figure 128: New Zealand OCR trend



11.4 Cost of living and inflation

Significant factors relating to the cost of living and inflation have been:

- **high inflation post-2021:** inflation peaked at 7.3% in 2022, driven by global supply chain issues, fuel costs and housing pressures
- **real wages stagnated:** despite nominal wage growth, high inflation eroded consumer purchasing power
- **energy costs increased:** growing awareness of electricity costs helped to encourage purchases of energy-efficient appliances.

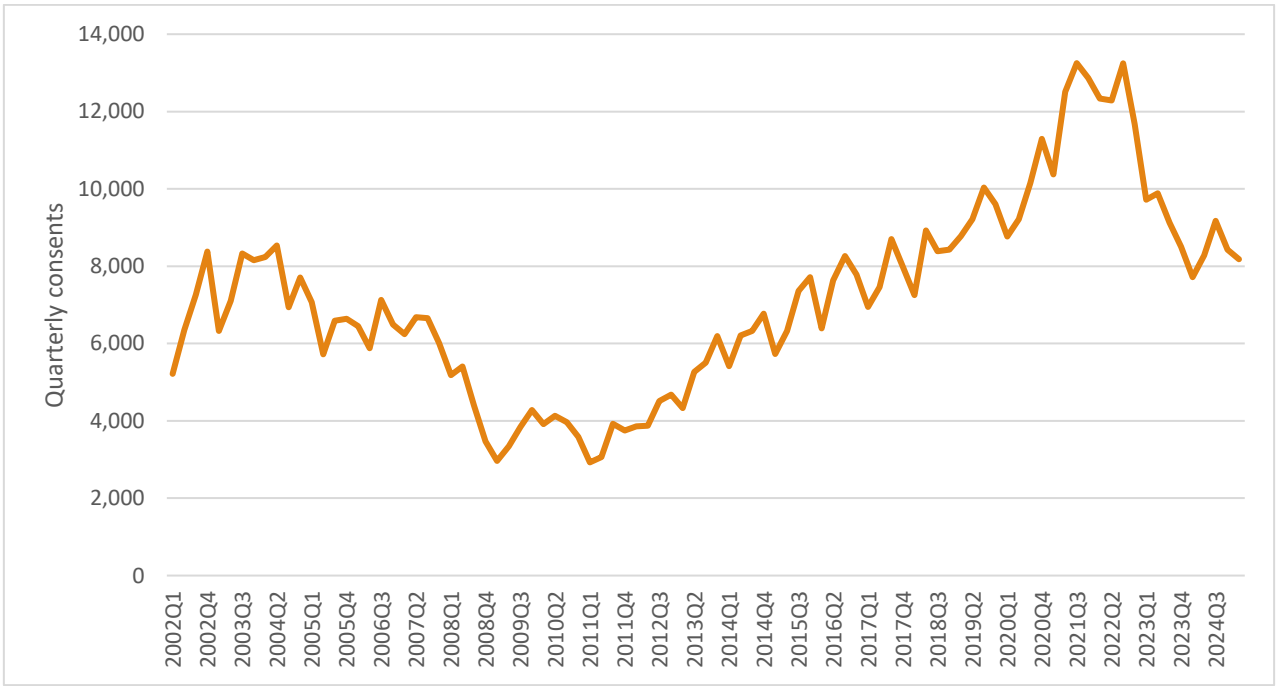
The impact of these factors has been greater consumer focus on the affordability, durability and energy efficiency of appliances. There is now more interest in mid-range rather than premium appliances, unless the latter are heavily discounted or financed.

11.5 Housing and construction market

Figure 129 shows trends in the number of dwelling building consents issued each quarter. These trends reflect:

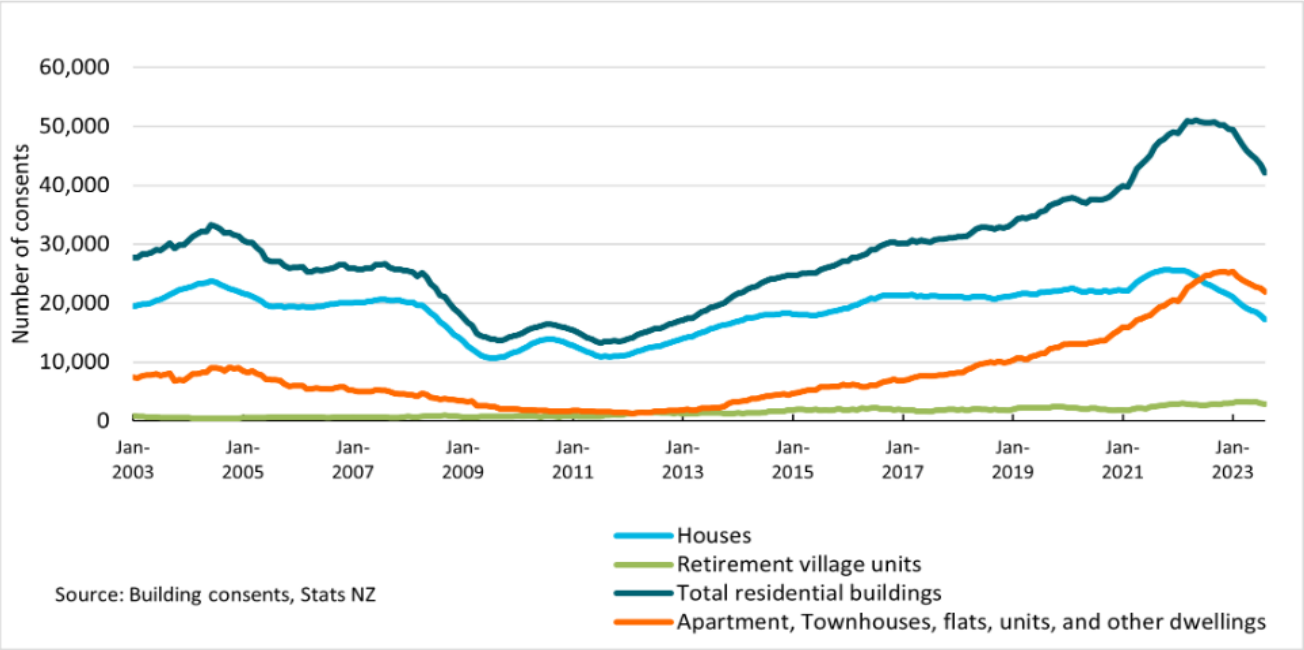
- the housing boom from 2016 to 2021: high levels of new dwelling building consents (peaking in 2021 at over 49,000 new homes consented) drove strong demand for appliances in both owner-occupied and rental properties
- the recent slowdown: due to higher interest rates and inflation in construction costs, new build activity has declined from late-2022 onward.

Figure 129: Building consents for dwellings, by quarter



Source: www.stats.govt.nz

Figure 130: New residential dwellings consented by dwelling type



Source: https://www.mbie.govt.nz/building-and-energy/building/building-system-insights-programme/sector-trends-reporting/building-and-construction-sector-trends-annual-report/2023/key-new-zealand-economic-and-industry-trends

The impact of these trends was to boost appliance sales during the boom period, particularly through developers and new homeowners fitting out entire kitchens and laundries, shifting to sales being driven by the replacement and upgrade market as new builds tapered off.

11.6 Demographic and lifestyle changes

The following trends can be noted in the demographics and lifestyle choices of New Zealanders:

- **smaller households and more renters:** increased apartment and townhouse living, especially in Auckland and Wellington, favours compact or stackable appliances
- **ageing population:** older consumers prioritise reliability, ease of use and lower maintenance appliances
- **younger, tech-savvy buyers**: this group of consumers are more inclined to buy smart appliances and larger 4K and 8K televisions, and this was particularly the case during the Covid pandemic.

These trends have driven greater segmentation of the large appliance market, with premium smart features appealing to younger buyers and practical value to older homeowners or landlords.

11.7 Population and net migration changes

Population and net migration both have an impact on the large residential appliance market.

- New Zealand's population has risen in a relatively steady manner over the past 20 years at an average annual growth rate of 1.3%, with the exception of a period of essentially zero growth from March 2020 to June 2022, as can be seen in Figure 131.
- Over the past 20 years, annual net migration in New Zealand has varied from a net loss of 20,000 people to a net gain of 136,000, averaging a net gain of 30,000 people per annum. Figure 132

shows that the past 5 years have been particularly volatile, with net migration swinging from periods of large gains to net losses, and then back to large gains.

These increases in population due to net migration and natural increase will result in additional purchases of household appliances and technology.

Figure 131: New Zealand population growth

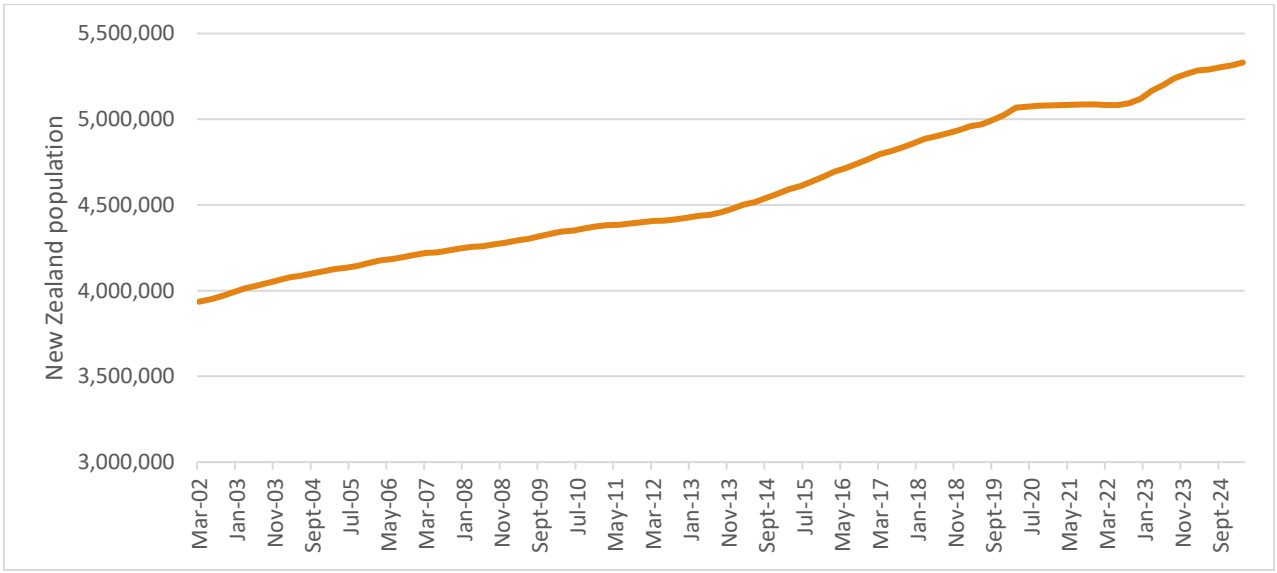
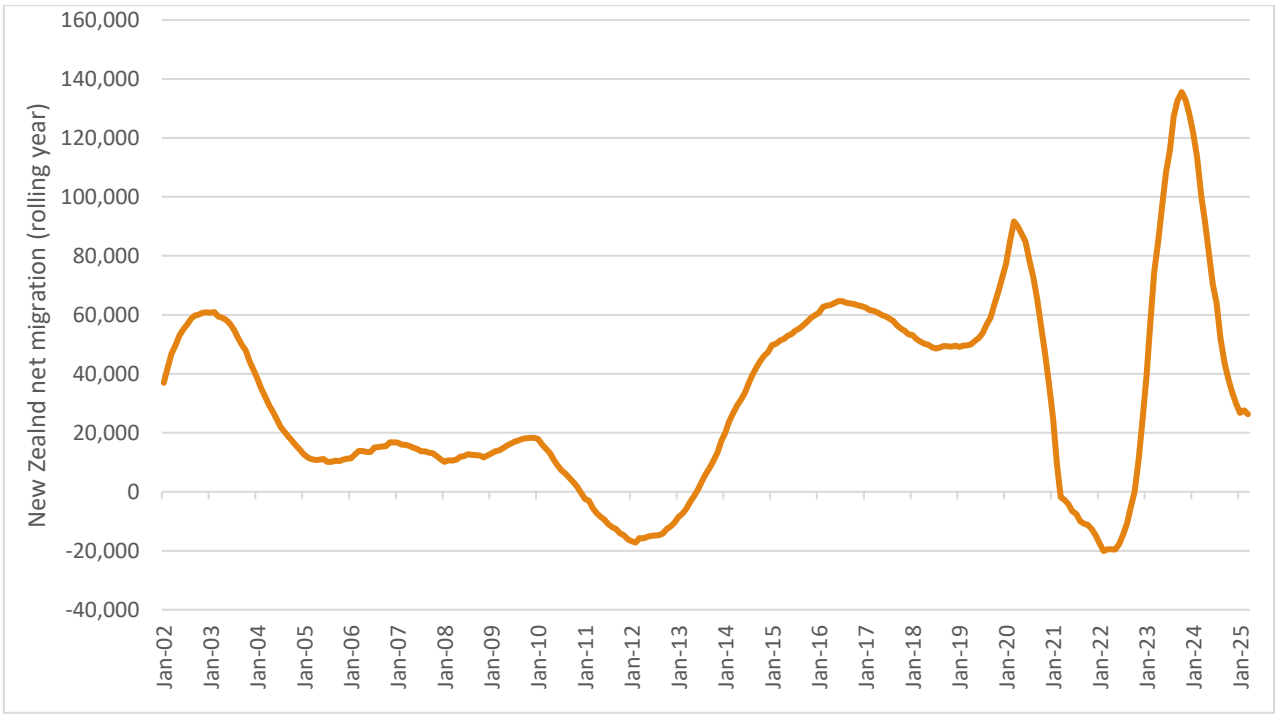


Figure 132: New Zealand net migration



11.8 Retail and e-commerce trends

Price comparisons and reviews are becoming more influential, with consumers now shopping more based on online ratings, energy rating labels and deals. In general, buyers are becoming more informed and cost-conscious; requiring brands to compete on value, service and delivery speed.

11.9 Environmental awareness and regulations

MEPS and energy rating labels on appliances are guiding consumers towards more efficient products. In addition, the national push for energy-efficient homes (for example, through the Warmer Kiwi Homes programme) has subtly encouraged investment in more efficient whiteware, and towards greater electrification and decarbonisation.

Eco-labels and energy ratings are increasingly influencing consumer purchases, particularly for washing machines, dryers and refrigerators.

12. References

2021 Residential baseline study for Australia and New Zealand for 2000 to 2040

[report prepared for the Equipment Energy Efficiency (E3) Programme].

13. Glossary

CEC	Comparative energy consumption - the claimed amount of energy the product will use in a year, based on tested data in accordance with the standards, and usage assumptions. This allows consumers to compare the energy use of different models and potentially calculate their running costs. This information is provided on the product's energy rating label, which also includes its star rating.
COP	Coefficient of performance - the ratio of heating output to energy input for heat pumps.
CSPF	Cooling seasonal performance factor - a measure of how efficiently an air conditioner operates throughout the entire cooling season. The factor is calculated by comparing the total amount of heat required to be removed from a space during the cooling season (cooling load) to the total amount of electricity consumed by the equipment over the same period.
E3	Equipment energy efficiency programme - an initiative of the New Zealand and Australian Governments to improve the energy efficiency of appliances and equipment.
ERL	Energy Rating Label, as specified in the standard for the products' MEPL requirements.
HSPF	Heating seasonal performance factor – the ratio of the total annual amount of heat load that the appliance can add to the conditioned space when operated for heating in active mode, to the total annual amount of energy consumed by the equipment in heating mode.
Load or heating load	A general term referring to the demand or need for heating. It is also used to specifically refer to a standard amount of heating, as a function of outdoor temperature, which is used to evaluate and compare heaters.
MEPL	Mandatory energy performance labelling – the Regulations require that certain products must display this label at the point of sale i.e. retail outlets. It must be fixed to the appliance in such a way as to be clearly visible to the consumer. The label includes energy performance about that particular model, such as the CEC and star rating for the product, along with other useful information for consumers when making a comparative purchasing decision.
MEPS	Minimum energy performance standard – this is usually a minimum level of energy performance that a product must be able to achieve before it can legally be sold. These limits are set in the regulations and or Standards as referenced in the Regulations.
Nominal gas consumption (NGC)	An appliance's gas consumption, in megajoules per hour (MJ/h), as stated in the manufacturer's specifications, instructions, general communications and on the appliance.
Rated	A rated value or amount is one that is claimed by the manufacturer, as based on a tested value or amount.
SEER	Seasonal energy efficiency rating - a metric for assessing the energy efficiency of air conditioners over a range of seasonal ambient temperature variations.
SRI	Star rating index - a calculated measure of energy efficiency (compared to a 1-star product), which allows consumers to make comparisons between different models of a similar size.
Star rating	Uses the SRI, which has been rounded-down to the nearest half star (up to six stars) or to the nearest full star above six stars. This star rating is what appears on the energy rating label. The more stars on a label, the better it's energy efficiency.
ZERL	Zoned energy rating label – a specific type of energy rating label for air conditioners only, to reflect the fact that their performance will vary depending on ambient climatic

	conditions, unlike other whiteware and home appliances. The label provides a seasonal efficiency rating for three distinct climate zones — hot, average and cold, and displays performance information to help consumers select a product that is suitable for their climate zone. Ratings are up to a maximum of 10 stars for both heating and cooling.