December 2024

Light vehicle emissions intensity in Australia: trends over time

Research report

National Transport Commission

CEO Foreword

For the first time since the National Transport Commission began reporting on light vehicle emissions intensity, we now have a picture of almost every registered light vehicle on our roads.

As well as new car sales, this year's report includes emissions intensity data covering around 17 million cars registered since 2003, when emissions performance data was first captured.

This expanded scope offers the nation's most complete view of tailpipe emissions across the vehicles we drive every day, and how we are tracking towards Australia's net zero by 2050 goal.

While Australia is making progress with over 150,000 battery electric vehicles now on our roads — our national average still lags most developed countries.

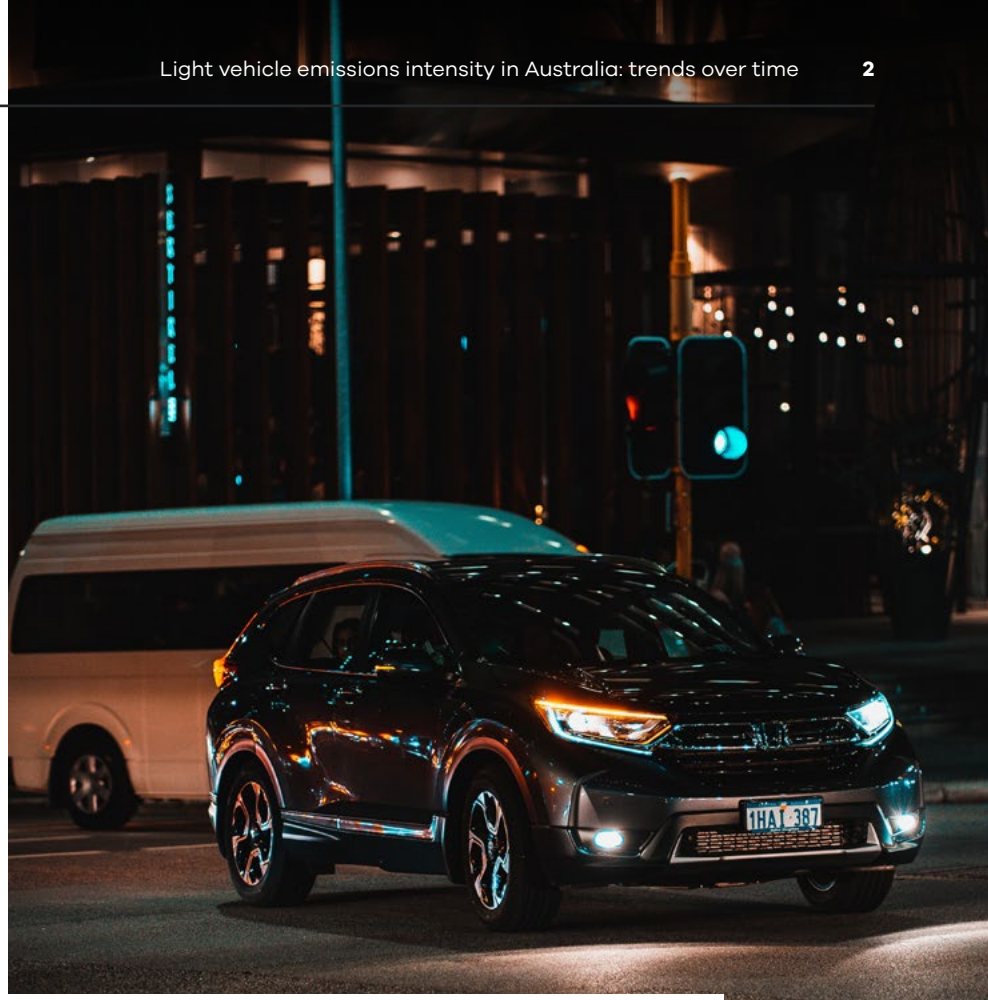
There is good news: the emissions intensity for new vehicles sold in 2023 was down by 5 per cent compared to 2022, marking the largest percentage drop since reporting began in 2009.

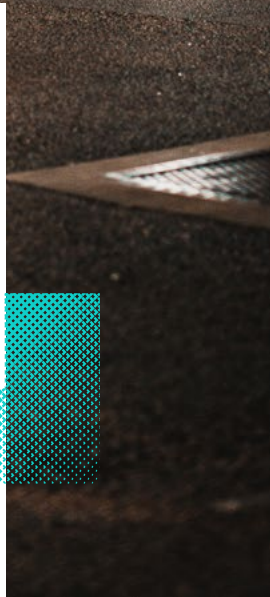
This year's analysis was made possible through collaboration with Austroads, who provided access to anonymised data on the light vehicles registered on our roads, alongside new car sales data from the Federal Chamber of Automotive Industries.

Their support has enabled us to deliver a comprehensive overview that provides all Australian governments with robust data to inform good policy and offers the community valuable insights into how their vehicle choices can contribute to lowering emissions intensity.

Michael Hopkins

Chief Executive Officer
and Commissioner





This expanded scope offers the nation's most complete view of tailpipe emissions across the vehicles we drive every day.

Highlights

Australia's most comprehensive report on the emissions intensity of cars on our roads

With every litre of petrol producing 2.3 kg of carbon dioxide emissions, Australia needs to step up its efforts to cut emissions from the cars we drive every day.

To understand emissions intensity trends over time, the National Transport Commission has published Australia's most detailed analysis yet of carbon dioxide emissions intensity across almost 17 million light vehicles on our roads.

By including vehicle registration data and historic sales records, this year's report offers a broader picture over a longer period, assessing progress in reducing light vehicles' contribution to transport's 21 per cent share of Australia's carbon dioxide emissions.

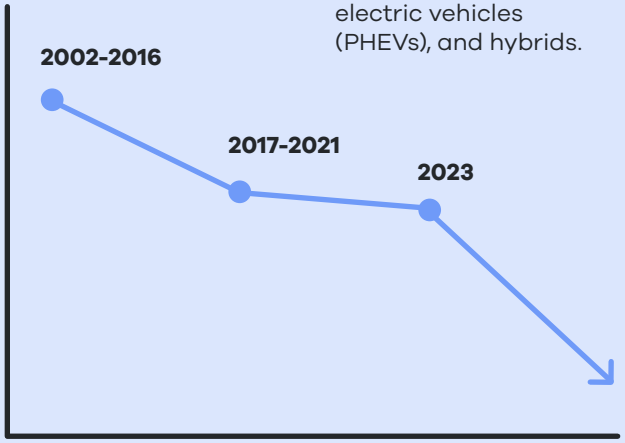
Our report shows that for vehicles entering the fleet since 2003 and still registered as of January 2024, the average emissions intensity is 193.7 g/km – significantly higher than the average of 165.2 g/km for new cars sold in 2023.

Emissions intensity reductions are picking up

Between 2017 and 2021, emissions intensity flatlined, decreasing by less than one per cent annually. Looking back, we did a lot better between 2002 and 2016 when emissions intensity dropped by 28 per cent.

However, emissions intensity for new cars sold in 2023 dropped by 5 per cent compared to 2022 – the biggest annual reduction since our reporting began in 2009.

The recent improvement is driven by increased sales of battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and hybrids.



More EVs, more choice, better range, less emissions

Our report shows that more people are choosing electric vehicles and there are a lot more to choose from with 127 models available in 2023, up from just six in 2015.

The average battery electric vehicle driving range keeps getting better too – it's now 470 km – 100 km higher than in 2021.

The greater choice and improved driving range led to a 151 per cent increase in BEV and PHEV sales in 2023 compared to 2022.

Despite this increase, electric vehicles still only represent 1.2 per cent of Australia's light vehicle fleet, compared to 3.2 per cent globally.

Hybrids on the rise

Hybrids continue to grow in popularity, with 98,172 sold in 2023, a 20 per cent increase.

In January 2024, there were 435,887 hybrids registered across Australia.

Larger cars, larger impact

Australians are buying fewer small vehicles, shifting towards larger vehicles.

A decade ago, 'small' vehicles accounted for 24 per cent of all new car sales. In 2023, this had dropped to just 7 per cent of new sales.

Sports utility vehicles (SUVs) accounted for 59 per cent of all vehicle sales in 2023, doubling their share from just a decade ago. There were 6.48 million SUVs on our roads in January 2024.

The growing share of SUVs on our roads has also contributed to a big increase in average vehicle footprint. For example, vehicles first registered in 2003 had an average footprint of 8.29 m^2, but this had increased to 8.78 m^2 in 2023.

The growth in vehicle footprint is particularly striking for utes. In 2003, utes had an average footprint of 8.69 m^2, but by 2023, this had increased to 10.19 m^2 – a substantial growth of 1.5 m^2.

The largest utes on our roads today are as big as 13.25 m^2 and have an emissions intensity of 506 g/km, more than double that of many other utes.

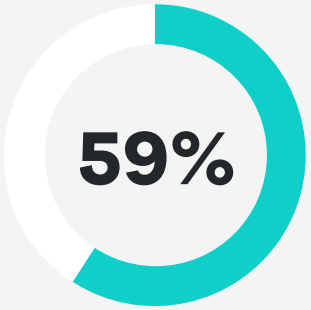
Australians still love Fords and Holdens

Seven years after local manufacturing ended, Holden Commodores and Ford Falcons remain popular, and still in the top 10 of vehicle models on our roads.

These models, with a high average emissions intensity of around 260 g/km, are emblematic of a broader trend: 77 per cent of all vehicles on our roads today with an emissions intensity above 250 g/km first entered the fleet between 2003 and 2013.

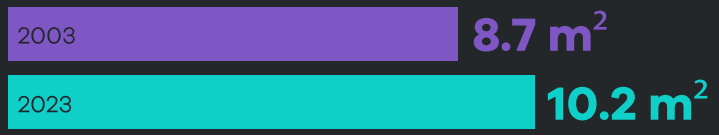
By contrast, 93 per cent of registered vehicles with an emissions intensity of up to 120 g/km entered the fleet in the years since 2014.

SUVs account for



of all sales in 2023

Average vehicle footprint grew by 0.5m² from 2003 to 2023.



1.5m² increase in average ute footprint between 2003 and 2023.

Price and emissions intensity

Unsurprisingly, our report highlights a relationship between average price and average emissions intensity: generally, the more expensive the car, the higher its emission.

However, on a positive note, nearly all popular models priced under $30,000 (adjusted for CPI for when first purchased) sold in recent years have average emissions below 165 g/km – well below the average for all vehicles in our analysis. In comparison, the average price of all light vehicle models entering our fleet in 2023 was $55,575.

Car choice and location

This year, for the first time, we have analysed sales data on the location of the buyer, either metropolitan or rural, to assess differences in the emissions intensity and types of vehicles purchased.

Our report shows that new cars purchased in metropolitan areas in 2023 had an emissions intensity that was 20 g/km lower on average than those bought in rural areas.

This was true for all states and territories, albeit to varying degrees, and reflects the types of vehicles chosen for different conditions and driving tasks.

While rural areas consistently show higher emissions intensity than metropolitan areas – with the gap widening since 2013 – there are encouraging signs of growing EV adoption in regional areas.

International comparison

Australia's vehicle emissions intensity is notably higher than in Europe, where emission standards and broader EV adoption have led to significant reductions. The overall weighted average emissions intensity for new passenger vehicles and SUVs (not including utes and vans) in 29 European countries is 107 g/km. In comparison, Australia's emissions intensity for the same type of new vehicles is 150 g/km.

While Australia is making progress, our average emissions intensity remain closer to – but still higher than – levels in the United States and Canada, driven by a strong preference for larger, higher-emission vehicles.

Average emissions intensity for new passenger vehicles and SUVs (not including utes and vans)

29 European countries

107 g/km

Australia

150 g/km

Why we report on emissions

Our report, 'Light Vehicle Emissions Intensity in Australia: Trends Over Time,' helps governments, fleet managers, and consumers understand the collective impact of vehicle choices on carbon dioxide emissions intensity.

By including emissions data from nearly all cars on our roads—not just new vehicles sold each year—we can build a clear and comprehensive picture of emissions intensity across the entire fleet.

This provides valuable insights to support informed decision-making by Australian governments and other stakeholders in efforts to reduce our carbon dioxide emissions.

Our average emissions intensity remain closer to – but still higher than – levels in the United States and Canada

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Abbreviations

Abbreviation	Term
BEV	battery electric vehicle
BITRE	Bureau of Infrastructure and Transport Research Economics
CPI	Consumer Price Index
EEA	European Environment Agency
E-REV	extended-range electric vehicle
FCAI	Federal Chamber of Automotive Industries
g/km	grams per kilometre
GFEI	Global Fuel Economy Initiative
GVM	gross vehicle mass
HEV	hybrid electric vehicle
ICCT	International Council on Clean Transportation
ICE	internal combustion engine

Abbreviation	Term
I-CEV	internally-charged electric vehicle
IEA	International Energy Agency
LPG	liquefied petroleum gas
MHEV	mild hybrid electric vehicle
MIRO	mass in running order
NEVDIS	National Exchange of Vehicle and Driver Information System
NTC	National Transport Commission
PHEV	plug-in hybrid electric vehicle
SUV	sports utility vehicle
VIN	vehicle identification number

1. Introduction

This year our report on carbon dioxide emissions intensity goes beyond new light vehicles sold in the previous year.

For the first time, we have also analysed the emissions intensity of the currently registered light vehicle fleet in Australia, including almost all vehicles that entered the fleet between 2003 and the start of 2024.

By reporting beyond new car sales, we can get a sense of how Australia is tracking in cutting emissions intensity across all light vehicles on Australian roads.

Each year since 2009, the National Transport Commission (NTC) has published a carbon dioxide emissions intensity report on new Australian light vehicles sold during the previous calendar year. This year's report also continues this data series and provides data for 2023.

Vehicle emissions intensity is a measure of vehicle efficiency, not actual vehicle emissions, which depend on many real-world factors such as distance travelled, the nature of the driving, and road and traffic conditions.

The Federal Chamber of Automotive Industries (FCAI) collates carbon dioxide emissions intensity data from vehicle manufacturers and sales for each calendar year. We analyse this data in preparing each year's report (see Methodology section).

In this year's expanded report, the registration data on all light vehicles on our roads was provided by Austroads, with data sourced from the National Exchange of Vehicle and Driver Information System (NEVDIS). We would like to thank Austroads and state and territory registration authorities for making this data available to us for this report.

Through analysis of carbon dioxide emissions intensity and sales data aggregated by vehicle class, type of use by purchaser and by state or territory, the report helps inform governments, fleet managers and consumers of the broad impacts of buying choices on carbon dioxide emissions intensity.

This report is divided into three main sections:

- **Chapter 2** describes the methodology used.
- **Chapter 3** presents the results of the analysis.
- **Chapter 4** compares Australian data with international data.

An appendix containing detailed tables of data is available at the end of the report.

Chapter 3 is divided into 13 sections focusing on different analysis themes (such as vehicle make, vehicle segment, buyer type, etc.). Some of these sections focus on just one of the datasets because the relevant data is only available for that dataset (for example, buyer type data is only available for the 2023 sales data; and price data is only available for the registered vehicles dataset). Where we have analysed both datasets for a particular theme in **chapter 3**, we have split the sections into a sub-section focusing on each of the datasets, given the very different nature of the data being analysed (latest annual sales compared with all registered vehicles).

2. Methodology

This section describes the methodology used to calculate the carbon dioxide emissions intensity data for Australia.

2.1 Dataset on new vehicles sold in 2023

The FCAI and its members collate data on the sales of new vehicles each year (in a database known as VFACTS). It provided data on 2023 sales to the NTC. We entered the FCAI data into a database and analysed it. These records consisted of:

- **vehicle attributes:** make, model, vehicle generation, body style, engine capacity, number of cylinders, engine power, transmission type, gears, number of seats, gross vehicle mass (GVM), kerb mass[1], driven wheels, country of origin, fuel type, secondary fuel type, carbon dioxide emissions intensity, vehicle category and fuel economy
- **vehicle segment:** consistent with the classifications and definitions as described in **Table 1**
- **sales data:** sales by state and region and by type of buyer (that is, government, business or private).

Carbon dioxide emissions intensity for vehicles is calculated using the method described in *Vehicle Standard (Australian Design Rule 81/02 – fuel consumption labelling for light vehicles)* and expressed in grams of carbon dioxide per kilometre (g/km).[2] The data in this report reflects tailpipe emissions. It does not reflect all aspects of lifecycle emissions for a vehicle, which also include those involved in manufacturing the vehicle, transporting it to the point of sale, and disposing of it.

For the previous three years' reports, the NTC used a reporting methodology broadly aligned with the FCAI's voluntary industry-led emissions standard. These included the use of super-credits (with low emissions vehicles having a sales weighting above 1, with the weighting value depending on the vehicle's emissions levels) and reporting of most results separately in two categories (with one category comprising passenger cars and light SUVs, and a second category comprising heavy SUVs and light commercial vehicles).

Carbon dioxide emissions intensity for vehicles is calculated using the method described in Vehicle Standard (Australian Design Rule 81/02 – fuel consumption labelling for light vehicles) and expressed in grams of carbon dioxide per kilometre (g/km).

However, with the release of the New Vehicle Efficiency Standard (DITRDCA, 2024) and ceasing of the FCAI's voluntary standard, we have returned to the reporting methodology used in NTC reports until 2019. This involves the calculation of a simple sales-weighted average for vehicle emissions for different vehicle attributes, categories and buyer types. A weighted average calculation is similar to an arithmetic average (the most common type of average), but instead of each data point contributing equally to the final average, some data points contribute more than others. In this case, the average is weighted to vehicle sales.

As a result of this return to using a simple weighted average, some of the results relying on weighted averages for 2022 (and the two previous years) will be different in this year's report to those that were reported in recent years' reports. We have restated any results involving the past three years – the period that the FCAI's voluntary standard was in operation – to be based on simple averages to allow for meaningful comparisons over time in this year's report.

1 For some vehicle models, the dataset was missing data on kerb mass. For these vehicles, the NTC entered the tare mass values as the kerb mass values. Using the kerb mass values, we then calculated Mass In Running Order (MIRO) for each vehicle by adding 75 kg to the kerb mass value.

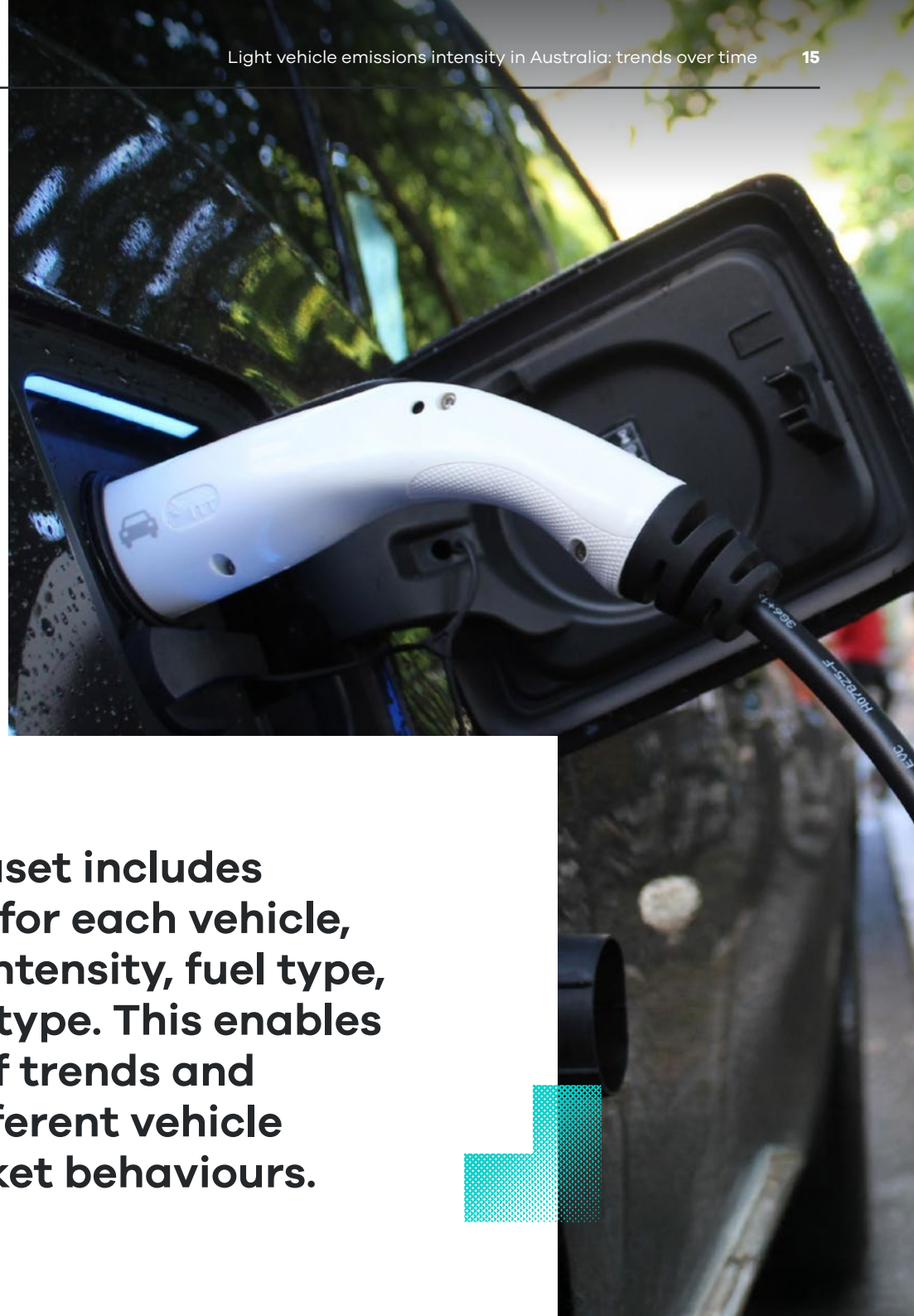
2 As noted by the Green Vehicle Guide, fuel consumption and carbon dioxide emissions intensity results are 'based on a laboratory test involving a standard drive cycle. This allows different vehicle models to be compared equally, as all vehicles are tested in the same conditions...These tests cannot and do not simulate all possible real-world driving conditions. This means the emissions and fuel consumption you may experience on the road will vary due to traffic and road conditions, the condition of your vehicle and how you use it.' (Green Vehicle Guide, 2024a)

2.1 Dataset on new vehicles sold in 2023 (continued)

A change to the methodology in recent years is that battery electric vehicles (and hydrogen vehicles) with no secondary engine and emissions of 0 g/km are included when calculating weighted average emissions intensity values in most tables and figures in this report.[3] Although vehicles operating on their electric engine may have no tailpipe emissions, the electricity used to charge the battery may produce carbon dioxide emissions depending on its source.

Tesla sales data became available for the first time through the FCAI's VFACTS data in 2022. As a result, in some cases there are quite significant changes in emissions intensity or sales results from 2022 compared with earlier years. Most tables and graphs which relate to the annual sales data in this report do not include estimated Tesla sales for any years prior to 2022 (with the exception of **Figure 52**). (Note that Tesla data is available for all years for analysis of the January 2024 registered vehicles dataset, as discussed in **section 2.2**.)

Light vehicles are classified into three main classes by the FCAI: passenger motor vehicles, sports utility vehicles (SUVs) and light trucks. These classes are then broken down into segments. For example, the segments of SUVs are light, small, medium, large and upper large. **Table 1** presents the classifications and definitions.



The 2023 sales dataset includes detailed attributes for each vehicle, such as emissions intensity, fuel type, and sales by buyer type. This enables in-depth analysis of trends and patterns across different vehicle segments and market behaviours.

3 In previous years, up to and including the report on 2019 sales, these vehicles had been excluded from the analysis on the basis that, when the NTC first began this series of reports over a decade ago, a zero value for emissions was more likely to reflect an error in the data than a true zero value (for a battery electric vehicle). This approach is unlikely to have materially affected the reported emissions results given that in each year between 2010 and 2019 battery electric vehicles comprised well below 1 per cent of total sales (a minimum of 0.004 per cent and a maximum 0.149 per cent). In addition, the international comparison based on Global Fuel Economy Initiative data in **Figure 95** involves non-zero values for battery electric vehicles due to the reporting methodology of the source data.

2.1 Dataset on new vehicles sold in 2023 (continued)

Table 1: FCAI motor vehicle classifications and definitions

Passenger motor vehicles	Sports utility vehicles	Light trucks
Passenger vehicles are classified dependent on size, specification and average retail pricing. Selected vehicle types will be assessed on footprint* defined as length (mm) x width (mm), rounded, as follows:	Vehicles classified as SUVs meet the FCAI criteria for classifying SUVs based on a 2/4 door wagon body style and elevated ride height. Vehicles typically will feature some form of 4WD or all-wheel drive; however, where a 2WD variant of a model is available it will be included in the appropriate segment to that model. Selected vehicle types will be assessed on footprint* defined as length (mm) × width (mm), rounded, as follows:	Vehicles designed principally for commercial use but may include designs intended for non-commercial applications
Micro Hatch, sedan or wagon with a footprint < 6.3 m^2	**Light** ≤ 7.6 m^2	**Light Bus < 20 seats** 8+ seats, but less than 20 seats
Light Hatch, sedan or wagon with a footprint range 6.301–7.5 m^2	**Small** 7.601–8.1 m^2	**Light Bus ≥ 20 seats** 20+ seats
Small Hatch, sedan or wagon with a footprint range 7.501–8.3 m^2	**Medium** 8.101–8.8 m^2	**Van/Cab Chassis ≤ 2.5 t** Blind/window vans and cab chassis ≤ 2.5 t GVM
Medium Hatch, sedan or wagon with a footprint range 8.301–9.0 m^2	**Large** 8.801–9.8 m^2	**Van/Cab Chassis > 2.5–3.5 t** Blind/window vans and cab chassis 2.5–3.5 t GVM
Large Hatch, sedan or wagon with a footprint range 9.001–9.5 m^2	**Upper Large** ≥ 9.801 m^2	**Pick-up/Chassis 4×2** Two driven wheels, normal control (bonnet), utility, cab chassis, one and a half cab and crew cab
Upper Large Hatch, sedan or wagon with a footprint range > 9.501 m^2		**Pick-up/Chassis 4×4** Four driven wheels, normal control (bonnet), utility, cab chassis, one and a half cab and crew cab
People Movers Wagon for passenger usage, seating capacity > 5 people		
Sports Car, coupe, convertible or roadster		

Note: These parameters are indicative only; exceptions do occur based on market focus and other subjective criteria. They are largely based on the specifications listed and are reflective of the volume-selling variant where crossover occurs.

* Note the NTC has converted the footprint units to m^2. The units on the FCAI website are $mm^2/1000$.

Source: (FCAI, 2021a)

2.2 Dataset on January 2024 registered vehicles

This year, for the first time, we have extended our analysis to also include the vast majority of registered light vehicles on Australian roads (see exceptions below), including passenger vehicles, SUVs and light commercial vehicles. To do so, we have used data from the National Exchange of Vehicle and Driver Information System (NEVDIS) to determine the number of light vehicles registered as at 2 January 2024 (and their associated Vehicle Identification Numbers (VINs)), and we would like to thank Austroads and state and territory registration authorities for making this data available to us for this report.

The NTC engaged a consultant, S&P Global, to match the NEVDIS data extract provided by Austroads with S&P Global's own datasets and research (using the VIN data common to both datasets), and prepare summary tables of data in the formats requested by the NTC. S&P Global was chosen for this task because of its role in managing the VFACTS dataset for the FCAI, meaning S&P Global's datasets contain various data fields necessary and of interest for this report, including carbon dioxide emissions intensity, vehicle segment, powertrain, fuel type, vehicle mass, vehicle dimensions, and others.[4] Using the summary data tables provided by S&P Global, the NTC prepared the graph and table outputs for this report.

The NEVDIS data extract supplied by Austroads and provided to S&P Global contained 18,478,364 records, encompassing passenger vehicles (including SUVs) and light commercial vehicles with a retail year from 1991 to 2024. However, the final dataset used for almost all of the tables and graphs in this report contains 16,799,085 records, and only encompasses vehicles with retail years from 2003 to 2024 (inclusive). This reduction in records for the final dataset – which comprised 91 per cent of the original NEVDIS data extract – occurred for various reasons. Firstly, 319,817 records were not in scope, comprising:

- 356 records not used because of duplicated registration (occurring in a different state/territory)
- 37 records not used because of duplicated registration (occurring in the same state/territory)
- 151,296 records not used because they were heavy commercial vehicles
- 110,403 records not used because they were private imports (meaning that S&P Global did not have available information to identify the vehicle model, CO_2 emissions, etc., since privately imported vehicles have not contributed to VFACTS during the initial vehicle sale and therefore will not have model information in S&P Global's database).
- 57,725 records not used because they were not reported to VFACTS (for example, because they were vehicles sold by brands that were not FCAI members), and therefore will not have model information in S&P Global's database.

As a result, after this initial stage, there were 18,158,547 vehicle records potentially in scope. However, there were two additional reasons for other exclusions of records from the final dataset used for this report.

Firstly, a further 975,641 vehicle records were excluded because they did not have CO_2 emissions intensity values – for example, because they were older vehicles, from before the Australian Design Rules required reporting of carbon dioxide emissions intensity values in 2003.[5] Finally, a further 383,821 records were excluded of vehicles that did have CO_2 values but entered the fleet prior to 2003 – albeit **Figure 6** has included these vehicles for reference purposes (no other graphs in the report include vehicles from before 2003). We made the decision to remove all vehicles from before 2003 from the main dataset analysed in this report because of the generally limited availability of CO_2 values for these vehicles,[6] and therefore concerns that including this subset of vehicles may distort/misrepresent any fleet-wide averages that are subsequently calculated.[7]

Vehicles in the final dataset from 2003 to 2024 accounted for

91%

of the original NEVDIS data extract.

4 The definitions of these data fields, including the vehicle segments defined in **Table 1**, are as they were defined in **section 2.1**.

5 Prior to 2003, vehicles instead reported results on fuel consumption based on an older test, which means the figures are not directly comparable with those reported for later vehicles (Green Vehicle Guide, 2024a).

6 The CO_2 emissions intensity data was available for a range of between a minimum of 12 per cent and a maximum of 37 per cent of vehicles from each year from 1991 to 2001, and still reached only 53 per cent of remaining vehicles which entered the fleet in 2002.

7 For example, if only certain vehicle makes or vehicle segments from vehicles entering the fleet in the 1990s tend to have CO_2 emissions intensity values available, the resulting average calculated just on the basis of these vehicles may not truly represent (i.e. may be too high or too low) the true average of all remaining registered vehicles from that year.

2.2 Dataset on January 2024 registered vehicles (continued)

Following the selection of the final scope of vehicles to be included in the dataset, S&P Global (under instruction from the NTC) undertook various data validation checks to try to ensure the dataset was as complete and accurate as possible. This included filling in missing data (for example, if vehicle mass values were not originally provided by the vehicle manufacturer), mapping of VINs for older Tesla and BYD vehicles (which were not part of the VFACTS database), and checks for outlier values (for example, particularly high or low values for a data field, which could then be either verified or corrected if they turned out to be errors).

Notwithstanding the best efforts of the NTC and S&P Global to produce as complete and accurate a dataset as possible, some limitations and caveats remain, so caution should be exercised in interpreting some of the results in this report. In particular:

- Any values or comparisons shown for the year 2024 specifically should be interpreted with a high degree of caution, as these are based on just 3,097 vehicles (compared with at least 300,000 vehicles in any other year after 2003, and typically close to 1 million vehicles per year in recent years). This small number of vehicles reflects the fact that the NEVDIS data extract occurred very early in the calendar year (2 January 2024).
- Results shown by state/territory have the potential to be somewhat misleading if vehicles that are part of a fleet are registered to a different address (such as a business's corporate headquarters) than their typical location of use.[8]
- Vehicle price data includes a mix of recommended retail price and driveaway price, depending on how this data was supplied to S&P Global, although most vehicle makes adopt the recommended retail price methodology.
  - In order to convert vehicle prices to 2024 dollars, the NTC supplied S&P Global with an index based on the Consumer Price Index (published by the Australian Bureau of Statistics) which could be multiplied by the original nominal prices that applied in the year the vehicles were originally sold. While the Consumer Price Index (CPI) may not perfectly represent the rate of price changes over time for light vehicles specifically, it does help to enable a fairer comparison of prices over longer periods of time than would otherwise be the case.
- Some vehicles – for example, particular variants of utes which have a Gross Vehicle Mass above 3.5 tonnes – could not be included in the dataset because they are not required to report CO_2 emissions intensity values (The Guardian, 2024b).
- Vehicle numbers shown for the Liquefied Petroleum Gas (LPG) or Dual Fuel fuel types are likely to under-count the true number of LPG vehicles on Australian roads, as only vehicles originally manufactured with these fuel types are displayed in this category. That is, any vehicles with aftermarket conversions to LPG are not captured.
- While the output tables supplied to us by S&P Global included two additional powertrains/fuel types – Internally-Charged Electric Vehicle (I-CEV) and Extended-Range Electric Vehicle (E-REV) – these had relatively few registered vehicles (2,411 and 556 vehicles, respectively). Therefore, despite some technological differences, we decided to group them with similar types of vehicles, namely hybrid electric vehicles (for I-CEVs) and plug-in hybrid electric vehicles (for E-REVs), for ease of analysis in this report.
- In addition, the dataset supplied to us by S&P Global included separate identification of Mild Hybrid Electric Vehicles (MHEVs) fuel systems. However, for the purposes of our analysis we have simply grouped these with other (non-mild hybrid) internal combustion engine vehicles of the relevant fuel type.

By including registration data and historic sales records, this year's report provides the most detailed analysis yet of light vehicle emissions intensity in Australia.

8 The extent of this issue is unclear, but it appears to potentially be a factor in the large disparity of vehicles in the Vans/Cab Chassis segment in Victoria compared with NSW.

2.3 General methodology

Carbon dioxide emissions intensity per kilometre is directly related to vehicle fuel consumption values.

Table 2 provides fuel consumption figures and the corresponding carbon dioxide emissions intensity for petrol and diesel.

Another way to relate carbon dioxide emissions intensity to fuel is per litre of fuel consumed. For example, 1 litre of petrol will produce about 2.3 kg of carbon dioxide and 1 litre of diesel will produce about 2.7 kg of carbon dioxide.

Table 2: Fuel consumption and corresponding average emissions intensity

Fuel consumption	Average emissions intensity (g/km)	
(litres per 100 kilometres)	Petrol	Diesel
3	68	80
4	91	107
5	114	134
6	137	160
7	160	187
8	182	214
9	205	240
10	228	267
11	251	294
12	274	321
13	297	347
14	319	374
15	342	401
16	365	427
17	388	454
18	411	481
19	433	508
20	456	534

Source: (Department of Climate Change, 2009)

2.3 General methodology (continued)

To help get a frame of reference for carbon dioxide emissions intensity from Australia's vehicles, **Figure 1** shows the emissions intensity from the top 10 selling vehicle models in Australia during 2023. **Figure 1** also contains four low emitting vehicle models[9] and the highest emitting model sold in 2023.

Figure 2 shows the average emissions intensity of the top 10 most common registered light vehicle models in Australia in January 2024 – across all years since 2003 – and compares them with several low emitting vehicle models (using a variety of different powertrains) and the highest emitting model. Three smaller vehicles had the lowest average emissions intensity among the top 10 models, with Toyota COROLLA the lowest at 164 g/km. In addition, two historically popular, Australian-made vehicle models – Ford FALCON and Holden COMMODORE – remained among the top 10 most common registered vehicle models, and both had average emissions above 250 g/km (significantly higher than the highest-emitting vehicle in the top ten sales from 2023 in **Figure 1**, the Ford RANGER). Finally, the remainder of the top 10 comprised several models of utes and SUVs, some of which have also been among the top-selling vehicle models in recent years. The Toyota LANDCRUISER had the highest average emissions intensity among these, at 285 g/km. The RAM 1500 TRX had the highest emissions intensity value overall among registered vehicles, with 506 g/km.

Figure 1: Average emissions intensity for top 10 selling vehicles in Australia plus other selected models, 2023

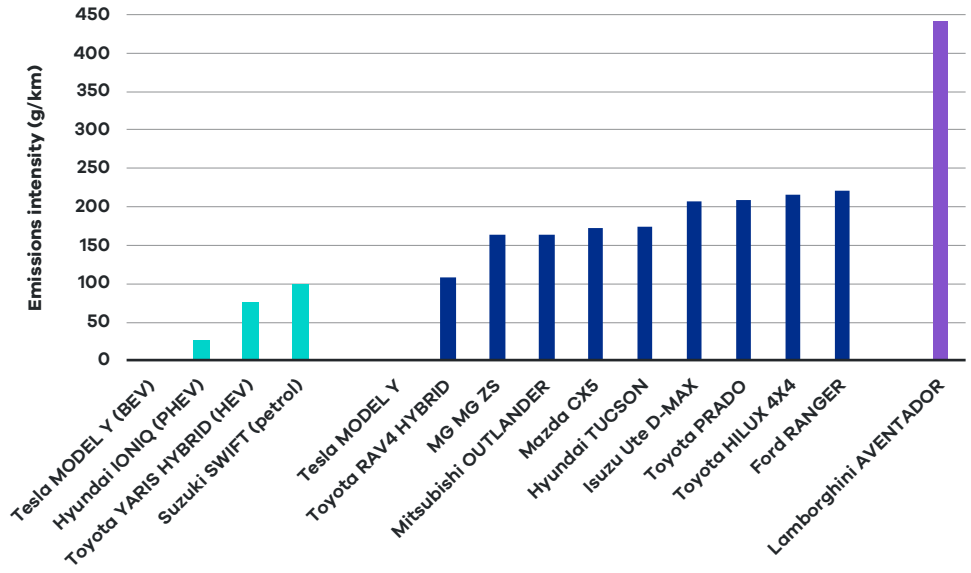
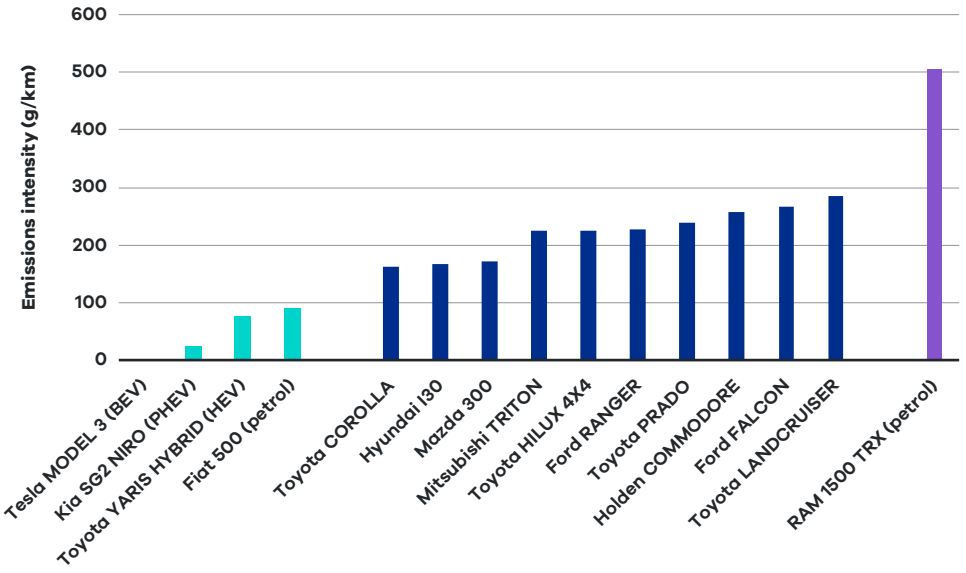


Figure 2: Average emissions intensity for top 10 most common registered vehicle models in Australia, plus other selected models, January 2024 registered vehicles



9 The models selected are a battery electric vehicle (BEV), and the lowest emitting plug-in hybrid electric vehicle (PHEV), hybrid electric vehicle (HEV) and petrol- or diesel-only vehicle.

3. Australian emissions intensity

This section contains Australian data about the carbon dioxide emissions intensity for passenger vehicles and light commercial vehicles.

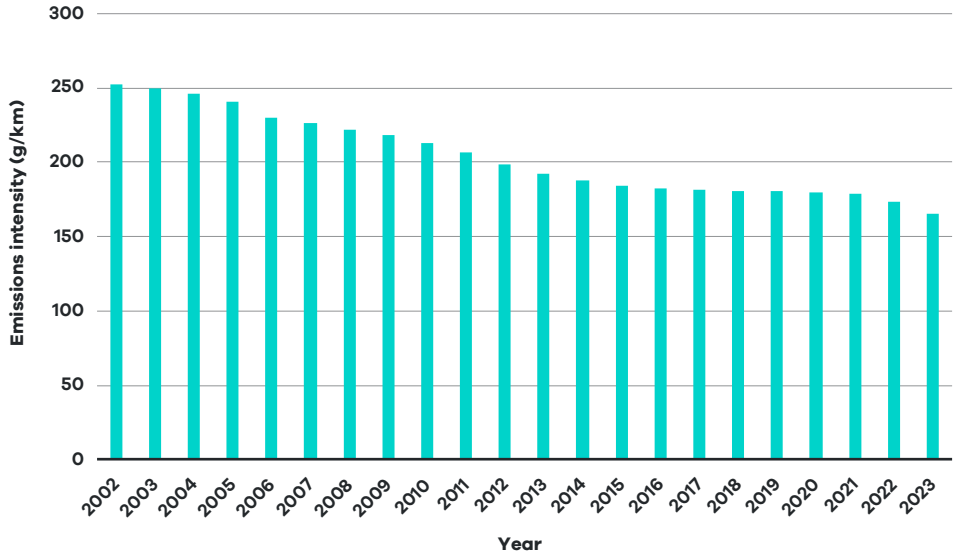
3.1 Longer-term trends

3.1.1 Longer-term trends – VFACTS sales data

Figure 3 shows the national average emissions intensity for new vehicles sold in Australia for each year since 2002. For vehicles sold in 2023, the average emissions intensity figure nationally was 165.2 g/km.

Between 2002 and 2023, there was a reduction of 34.5 per cent in the emissions intensity of new vehicle sales. Most of this decline occurred early in the time period analysed, with the emissions intensity having fallen by around 28 per cent between 2002 and 2016, before declining very gradually (by less than 1 per cent per annum) in the following few years. However, the year-on-year decline between 2022 and 2023 was 5.0 per cent, the highest of any year (in percentage terms) since 2002.[10] Additional data on the annual average emissions intensity is provided in **Table 8** in the appendix.

Figure 3: National average emissions intensity for new passenger and light commercial vehicles, 2002–2023



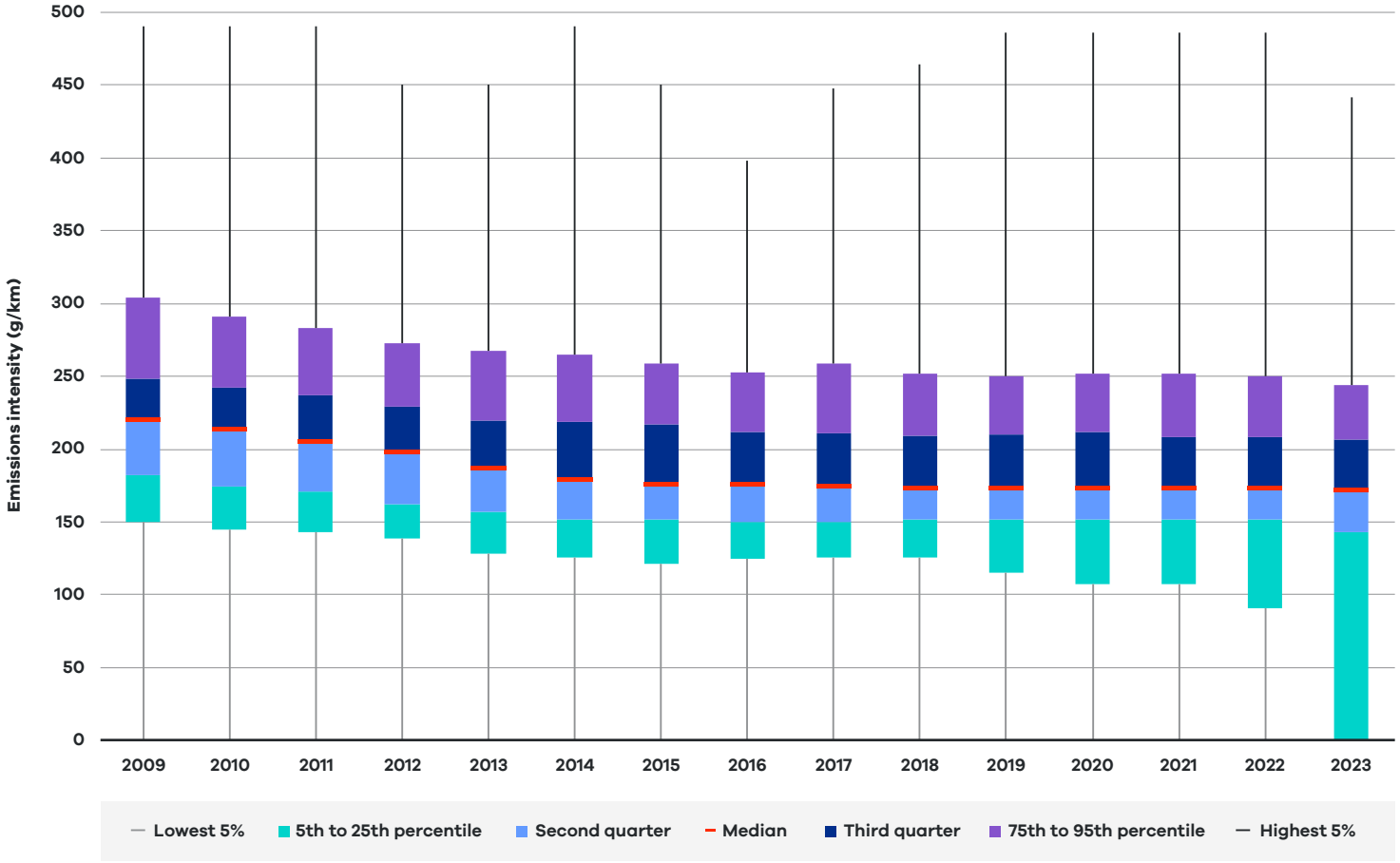
10 In 2006, the emissions intensity decreased by 10.2 g/km, which was the largest decrease in absolute terms (a fall of 4.2 per cent, the second largest in percentage terms in the time period analysed). The 2023 decrease of 8.6 g/km was the second largest (after 2006) in absolute terms, but largest in percentage terms.

3.1 Longer-term trends (continued)

It is also possible to graph the distribution of emissions intensity for all vehicles sold in each year, when vehicle sales are ranked from lowest emitting to highest emitting, without calculating a sales-weighted average. **Figure 4** includes the following:

- The red bars reflect the median emissions intensity of all vehicles sold in a particular year, with 50 per cent of vehicles sold having a lower emissions intensity value and 50 per cent a higher one.
- The thin vertical lines at the bottom and top show, respectively, the ranges for the lowest and highest emitting 5 per cent of vehicles sold in each year. These reflect a relatively wide range of emissions values comprising relatively few sales and, particularly for the line showing the range of higher emitting vehicles, will not include many of the top-selling vehicle models in a year.
- The wider shaded area in different colours reflects the range of emissions intensity values for majority of vehicles sold in a year. The range from the bottom of the green shaded area to the top of the purple shaded area reflects the 'middle 90 per cent' of vehicles sold in a year in terms of emissions intensity values, while the range from the bottom of the light blue shaded area to the top of the dark blue shaded area reflects the 'middle 50 per cent' of vehicles sold.

Figure 4: Distribution of emissions intensity of vehicles sold, 2009-2023



Analysing the entire time period in the graph, there is a clear downward trend in the shaded areas of the graph over time, particularly in the earlier years. In 2009, 90 per cent of vehicles sold had an emissions intensity value between 150 and 304 g/km, whereas by 2023 the corresponding range was 0 to 244 g/km. The increasing sales of electric and hybrid vehicles in the Australian market is evident by the continued decrease of the lower bound of the green shaded area, which in 2022 was below 100 g/km for the first time and in 2023 reached 0 (since battery electric vehicles exceeded 5 per cent of total sales). However, the bounds of the dark blue and purple shaded areas had relatively little change between 2016 and 2022 (before declining slightly in 2023), and this likely reflects the increasing prevalence of SUVs and utes in new vehicle sales (as discussed in more detail later in the report). The median value remained unchanged at 173 g/km between 2018 and 2022, before decreasing to 172 g/km in 2023.

3.1 Longer-term trends (continued)

Figure 5 shows another comparison of emissions performance over time. The vertical axis of the graph shows the number of vehicles sold, while the horizontal axis shows the emissions intensity of the vehicles. The green line depicts vehicles sold in 2023, while the dark blue line shows vehicles sold in 2013 (with vehicles grouped into 'bins' of 10 g/km). The green line in the graph clearly highlights the improvements in emissions intensity due to battery electric vehicles (at 0 g/km) and hybrid vehicles (mostly in the 91 to 120 g/km range), and to a lesser extent the impact of plug-in hybrid electric vehicles in between those two ranges. At the high end of the emissions range, above 230 g/km, there was also a large improvement with the 2023 line below the 2013 line in almost all cases. However, the shift in sales from vehicles in the 'Light' and 'Small' segments in 2013 to utes and medium and large SUVs – as discussed later in the report (for example, see **Figure 25** and **Figure 65**) – may explain the spikes in the green line in the 151 to 170 g/km and 200 to 210 g/km intervals for the 2023 line.

3.1.2 Longer-term trends – January 2024 registered vehicles

The data in **Figure 3** shows all vehicles sold in a particular year, but does not consider whether the vehicles remain in the Australian light vehicle fleet. However, some vehicles, particularly those sold earlier in the time period, may no longer be registered and in use.

Therefore, **Figure 6** shows the average emissions intensity of all currently registered light vehicles, broken down by the year the vehicle first entered the fleet. Years prior to 2003, shown in the dark blue colour, are shown for reference purposes only: the vehicles from these years are not included elsewhere in this report due to a low availability of CO_2 emissions intensity data (as noted in **chapter 2**). The dashed line in the chart, at a value of 193.7 g/km, reflects the average emissions intensity from all January 2024-registered light vehicles that entered the fleet since 2003. Registered vehicles that entered the fleet during 2003 had an average emissions intensity of 250.7 g/km. Registered vehicles that entered the fleet in 2012 had an average emissions intensity of 198.5 g/km, the first year in which the average was below 200 g/km. Additional data on the average emissions intensity by year first registered is provided in **Table 24** in the appendix.

Figure 5: Comparison of distribution of emissions intensity for vehicles sold in Australia in 2013 and 2023

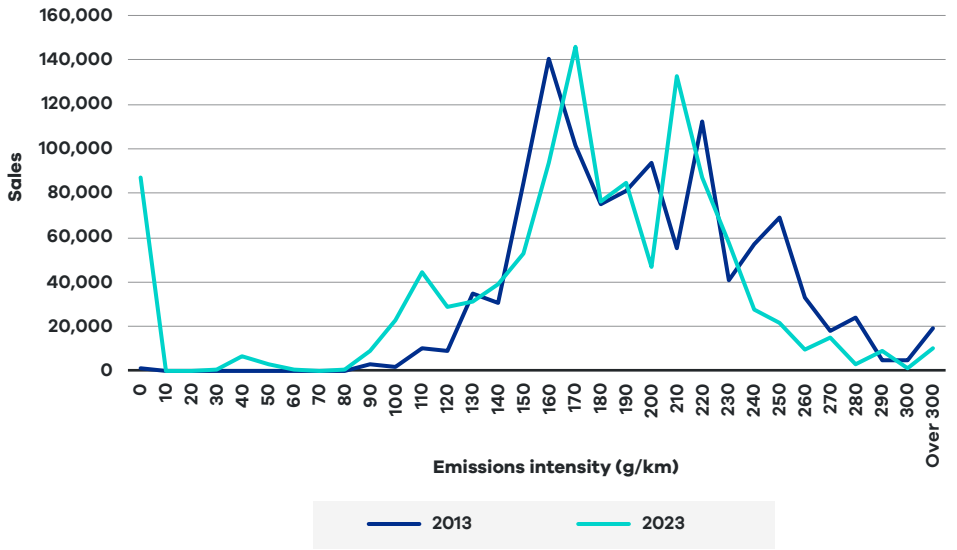
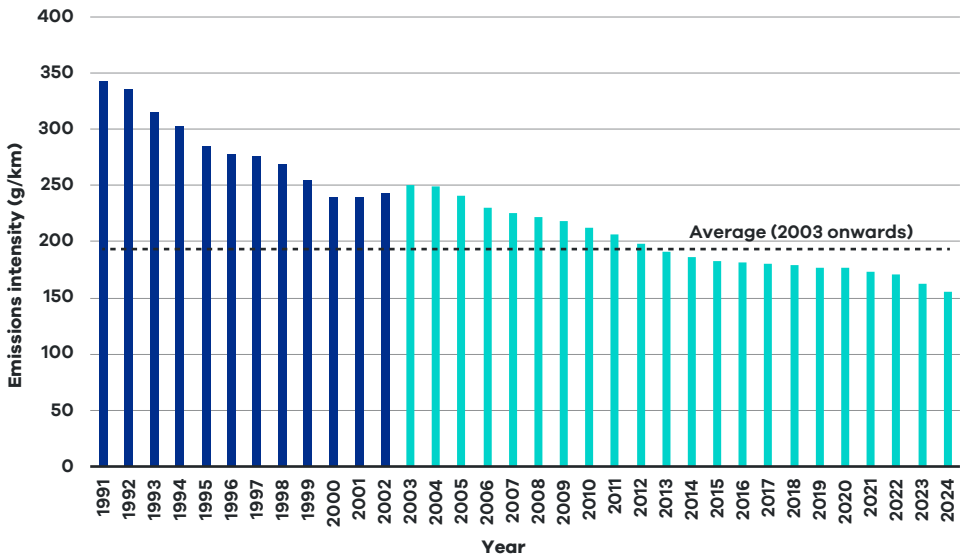


Figure 6: National average emissions intensity by year first registered, January 2024 registered vehicles



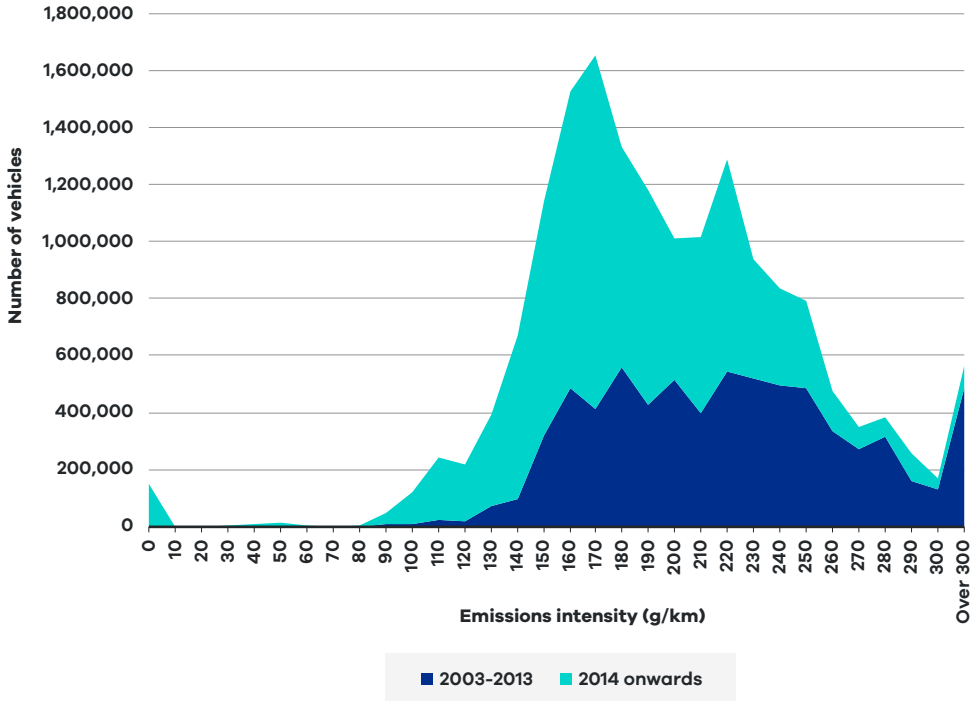
3.1 Longer-term trends (continued)

Figure 7 performs a similar type of analysis to **Figure 5**, although it differs in a couple of ways. Firstly, it shows the registered light vehicle fleet rather than new vehicle sales in a given year. Secondly, it stacks the two distributions on top of each other (i.e. cumulatively), rather than showing them individually like in **Figure 5** (where two individual years were being compared).

Figure 7 shows the distribution of the emissions intensity of all registered vehicles, grouped into 'bins' of 10 g/km. The data is shown in two colours, representing the number of vehicles entering the fleet during two time periods of roughly a decade. Vehicles entering the fleet between 2003 and 2013 were typically at higher emissions intensity levels, particularly for emissions intensities above 250 g/km.

Around 77 per cent of January 2024 registered vehicles with an emissions intensity above 250 g/km first entered the fleet between 2003 and 2013, and this can be seen with the dark blue colour comprising most of the height of the graph at these emissions intensity levels. By contrast, almost all registered vehicles with an emissions intensity of up to 120 g/km entered the fleet in the years since 2014 (93 per cent of January 2024 registered vehicles). These typically consist of electric or hybrid vehicles, along with some relatively small and efficient internal combustion engine vehicle models. The most common bucket of 10 g/km was the 161 to 170 g/km range, which had 1.65 million vehicles (almost 10 per cent of all registered vehicles).[11]

Figure 7: Comparison of distribution of emissions intensity, January 2024 registered vehicles



11 This comprised 411,301 vehicles first registered from 2003 to 2013, and 1,241,252 vehicles first registered from 2014 to 2024.

3.2 Vehicle makes

3.2.1 Top-selling vehicle makes – 2023 sales

In 2023 there were 49 makes of new vehicles sold to Australian consumers.[12] Around 84 per cent of all new vehicle sales were from the 15 highest selling makes. The average carbon dioxide emissions intensity of these market-leading makes largely determines the overall average emissions intensity.

Figure 8 shows the average emissions intensity of the top 15 highest selling makes sold in 2023. Tesla had the lowest average emissions intensity with 0 g/km, while Ford had the highest with 214 g/km. The two highest-selling makes, Toyota and Mazda, both had an average emissions intensity quite close to the national average value. Detailed data on average emissions intensity and sales by vehicle make is available in **Table 9** in the appendix.

The information in **Figure 8** can be further broken down to show the contribution made by different types of vehicles (using the three column categories in **Table 1**) to each make's overall average emissions intensity figure. **Figure 9** shows that SUVs were the largest contributor for most makes, with only Ford and Isuzu Ute's emissions intensities being mostly determined by light trucks (utes and vans) – these two makes had the two highest average emissions intensities among the top 15 selling makes. The respective contributions by SUVs and light trucks were almost the same for Toyota, with a relatively small additional contribution from passenger motor vehicles.

Figure 8: Average emissions intensity of top 15 makes by sales in 2023

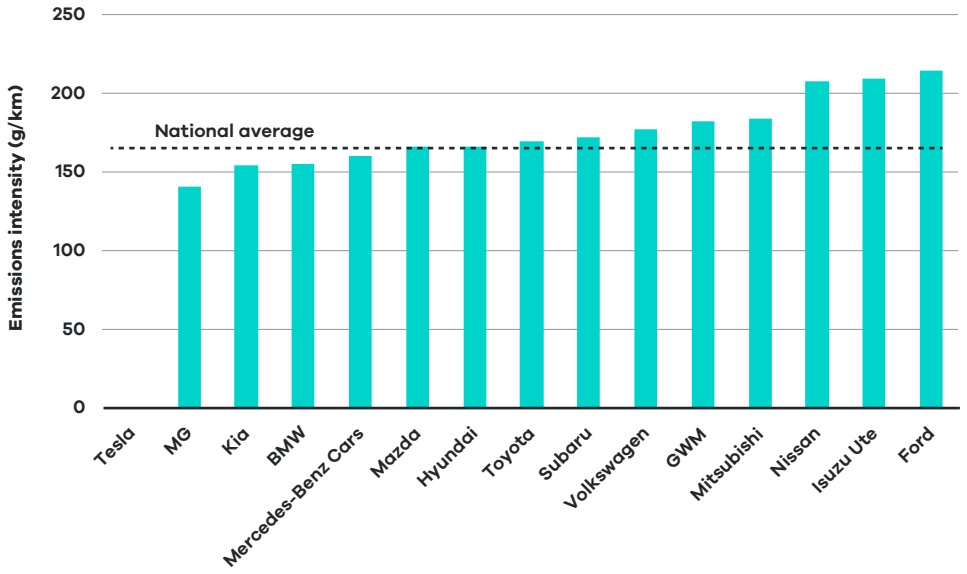
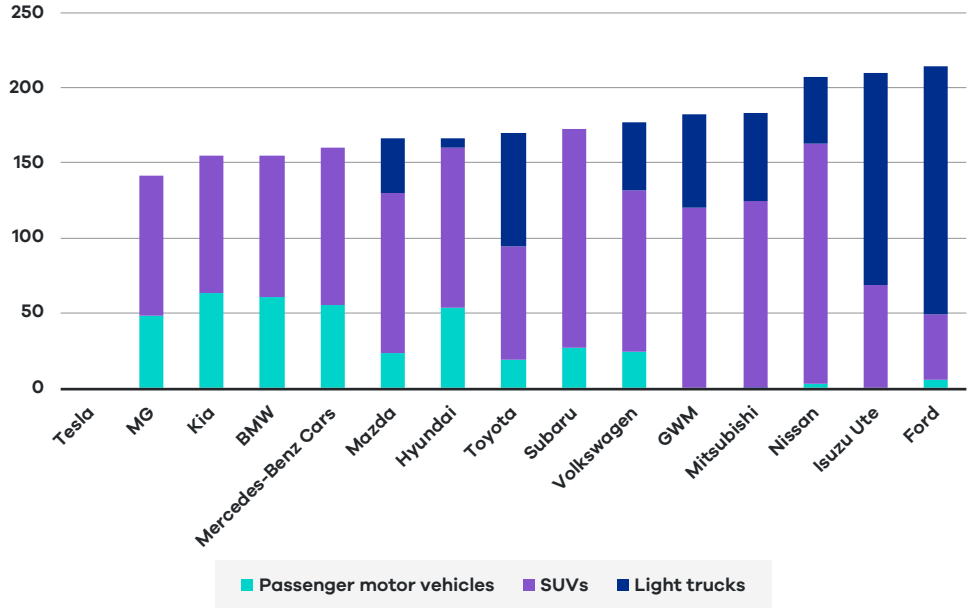


Figure 9: Contribution of different vehicle types to overall average emissions intensity for top 15 makes in 2023



12 This may exclude certain vehicle makes that are not FCAI members or reporting data into VFACTS.

3.2 Vehicle makes (continued)

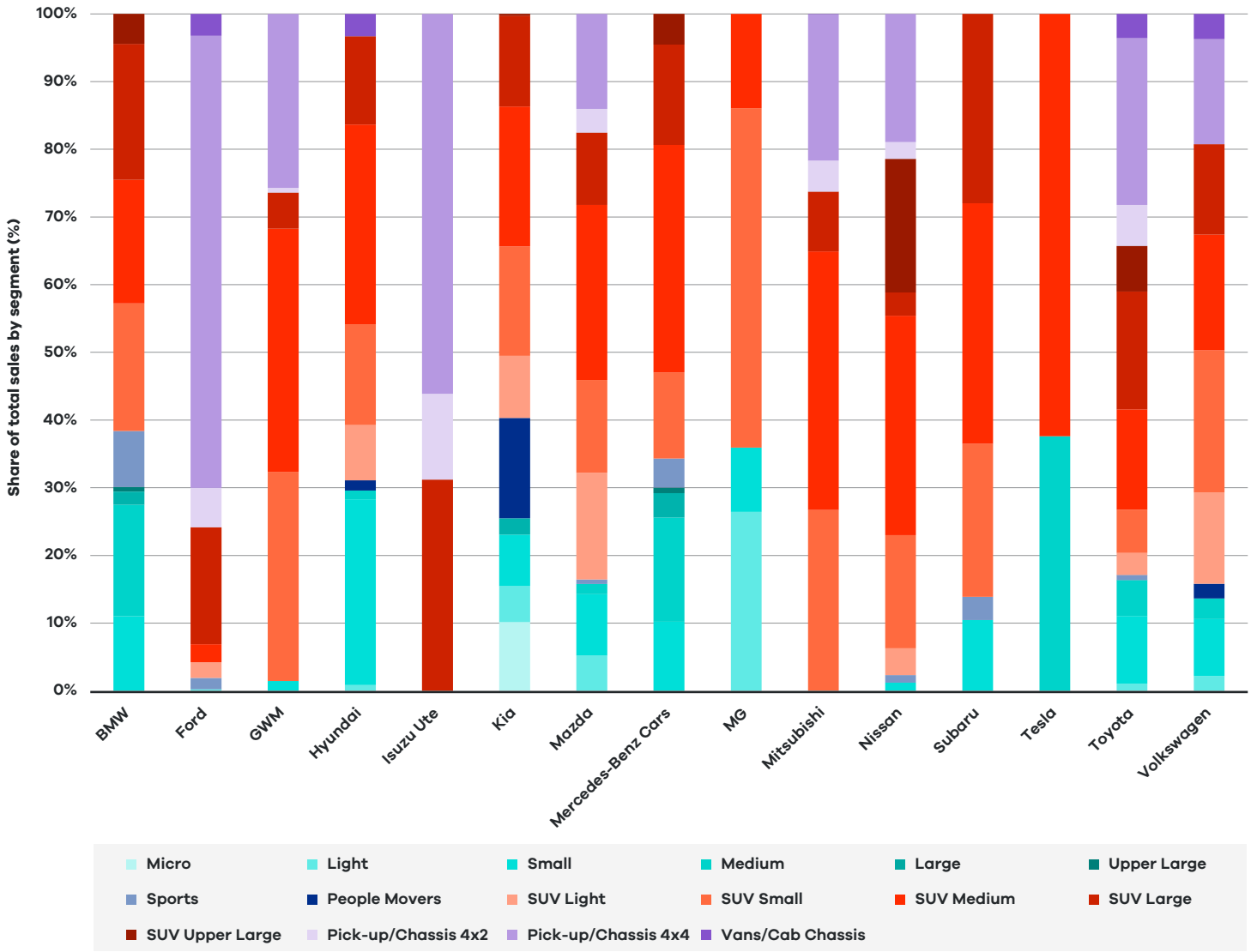
Around

84%

of all new vehicle sales in 2023 came from the 15 highest-selling makes.

These contributions to some extent reflect the share of sales in different vehicle segments (albeit sales of hybrid or electric vehicles may contribute less or not at all to the vehicle make's average emissions intensity). **Figure 10** shows the share of sales in each segment for the top 15 selling makes. All of the top 15 selling makes in 2023 sold more than half of their vehicles in the SUV and Pick-up/Chassis segments, as shown in **Figure 10**. Five of these manufacturers sold over 95 per cent of their vehicles in these segment groups: Ford, GWM, Isuzu Ute, Mitsubishi and Nissan. Kia had the lowest SUV and ute share with 59.7 per cent.

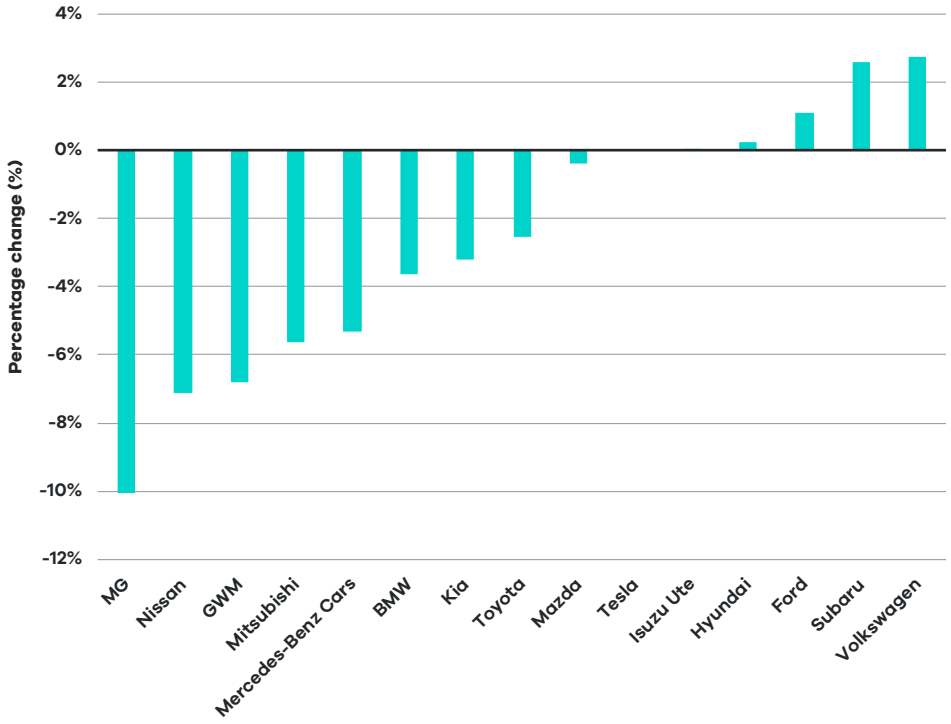
Figure 10: Share of total sales by segment for top 15 selling makes, 2023



3.2 Vehicle makes (continued)

Figure 11 shows the percentage change in average emissions intensity between vehicles sold in 2022 and 2023 for each of the top 15 makes. MG had the biggest improvement, with its emissions intensity reducing by 10.1 per cent, and four other makes each had reductions in average emissions intensity of more than 5 per cent. Five makes saw their emissions intensity increase between 2022 and 2023 – all of which had emissions intensities above the national average in 2023 – with Volkswagen's 2.7 per cent increase being the largest.

Figure 11: Percentage change in average emissions intensity between 2022 and 2023 for top 15 makes by sales



3.2 Vehicle makes (continued)

3.2.2 Most common vehicle makes – January 2024 registered vehicles

A similar analysis is possible using the January 2024 registered vehicles dataset, which had a total of 67 vehicle makes. **Figure 12** shows the average emissions intensity by make for the top 15 vehicle makes among registered light vehicles. The 15 makes overlapped significantly with the most common vehicle makes for vehicle sales in recent years, although with some differences (such as the inclusion of Honda and Holden in **Figure 12**, reflecting high sales historically but fewer or none more recently). These 15 makes collectively included around 89 per cent of all registered light vehicles. Holden (233.4 g/km) and Ford (227.3 g/km) had the two highest average emissions intensities among these 15 makes. Suzuki's was lowest with 156.0 g/km. Toyota, with 3.58 million vehicles (22 per cent of all registered vehicles) had an average emissions intensity of 202.2 g/km, which was above the national average for the registered fleet (193.7 g/km). Detailed data on average emissions intensity, average mass and the number of registered vehicles by vehicle make is available in **Table 25** in the appendix.

Figure 13 shows the contribution towards the average emissions intensity value for each vehicle make from different vehicle segments. The vehicle makes with relatively low overall emissions intensity values had relatively high contributions from passenger vehicles – passenger vehicles contributed at least half of the emissions intensity value for all makes until Honda in **Figure 13**. By contrast, most makes towards the right of **Figure 13** had relatively high contributions coming from light trucks (utes and vans). Holden, the make with the highest emissions intensity out of the top 15, was the exception in having a relatively high contribution from passenger vehicles (which may reflect both the relative age and types of vehicles – with a significant contribution from large, older passenger vehicles such as the Holden COMMODORE).

Figure 12: Average emissions intensity of top 15 makes of light vehicles, January 2024 registered vehicles

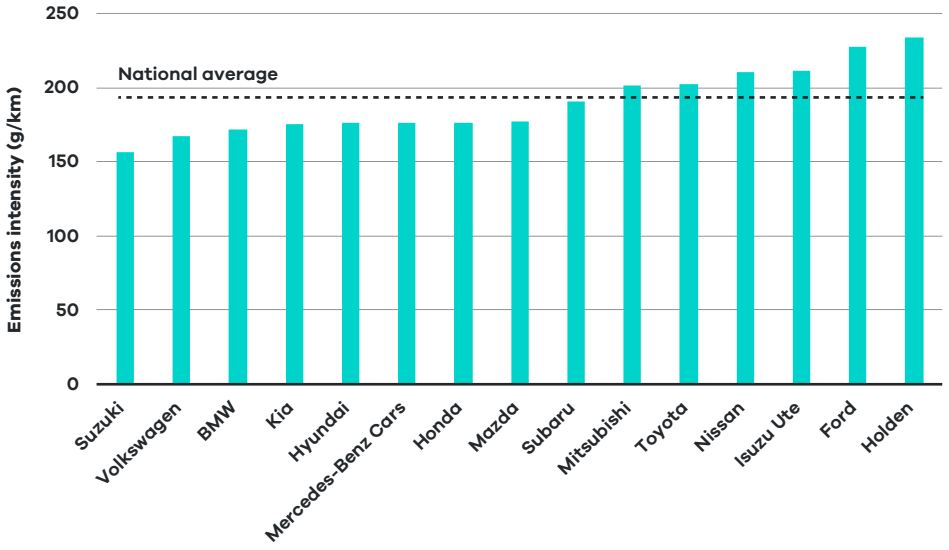
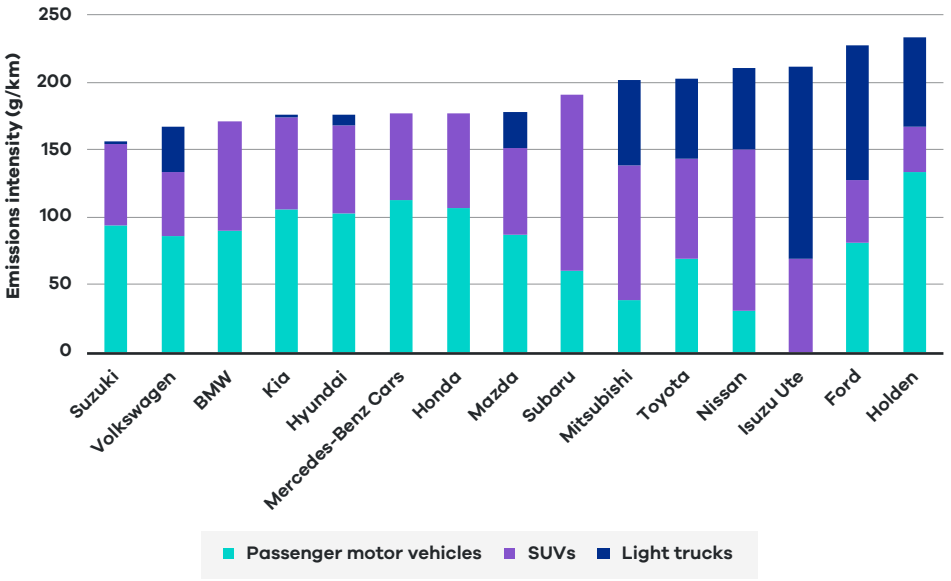


Figure 13: Contribution of different vehicle types to overall average emissions intensity for top 15 makes, January 2024 registered vehicles



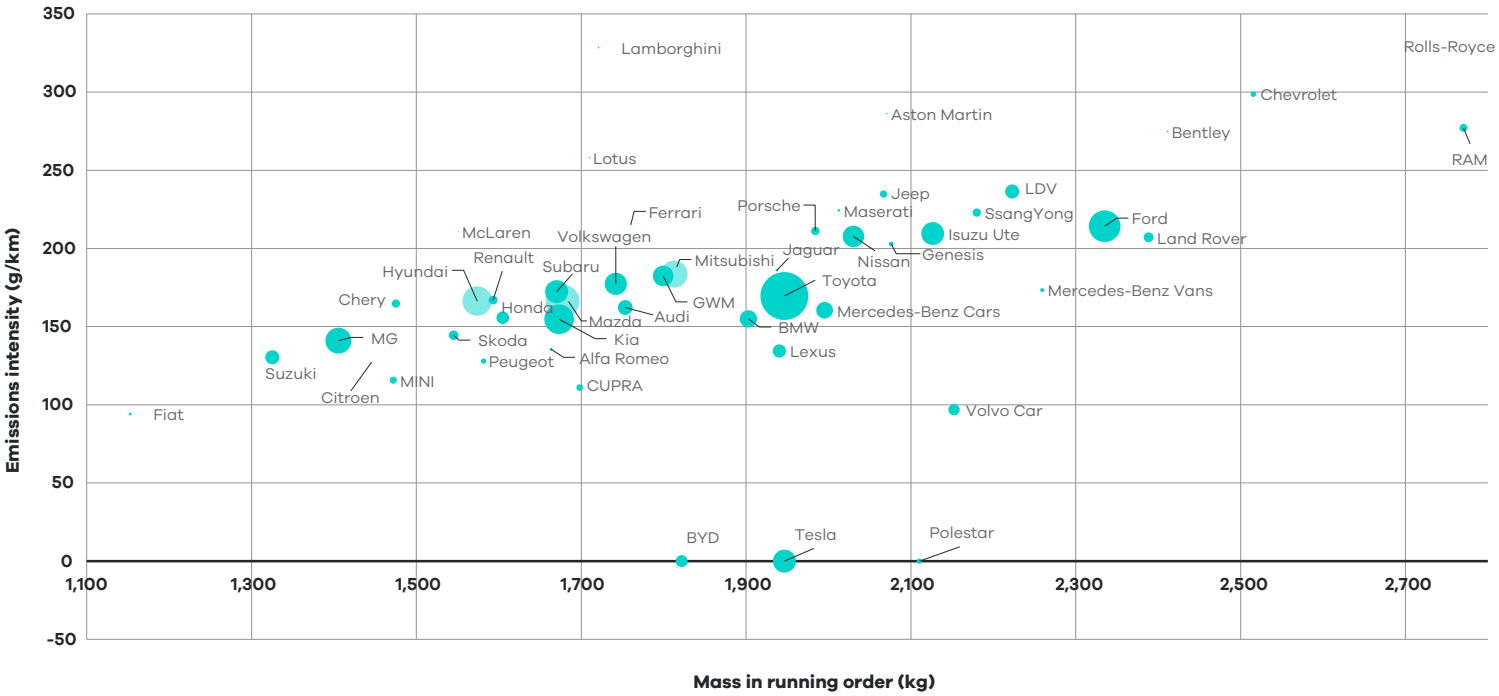
3.2 Vehicle makes (continued)

3.2.3 Detailed vehicle make analysis – 2023 sales

The previous analysis focused on the top 15 makes. **Figure 14** instead shows the average emissions intensity and average mass in running order for all makes (including all types of vehicles sold). Each make is reflected by a circle, with the size of the circle determined by the number of vehicles sold. **Figure 14** shows that most of the top-selling makes were relatively clustered around the average emissions intensity (165.2 g/km) and average mass (1,850 kg). Lamborghini had the highest average emissions intensity (328.5 g/km) – albeit with relatively few sales – while three all-electric makes (BYD, Tesla and Polestar) had the joint lowest with 0 g/km. Fiat had by far the lightest average mass (1,153 kg) and the lowest emissions intensity apart from the three all-electric makes (94.1 g/km). RAM had the highest average mass (2,771 kg) and fifth-highest emissions intensity (277.1 g/km). Rolls-Royce, with very few sales, had both the second highest average emissions intensity and mass.

The New Vehicle Efficiency Standard (NVES) will include two categories of vehicles – passenger vehicles (type 1) and light commercial vehicles (type 2) – each with their own weight-based emission limits (limit curves) and break points (DITRDCA, 2024). Therefore, it is useful to split the data in **Figure 14** into the two NVES categories to get some sense of the relative performance of different vehicle makes for vehicles sold in 2023, prior to the commencement of the standard.

Figure 14: Average emissions intensity and average mass in running order by make, 2023 sales



3.2 Vehicle makes (continued)

Figure 15 and **Figure 16** analyse the data for passenger vehicles (cars and SUVs) and light commercial vehicles (utes and vans), respectively, with each graph showing the average emissions intensity and average mass by vehicle make. Again, the circle sizes in each graph are determined by the sales of each vehicle make. The NTC has not included 'limit curves'[13] in these graphs, since the NVES sets these parameters for 2025 onwards. Given that the NVES did not apply in 2023, it would not have influenced vehicle makes' choices of vehicle supply. A further caveat in interpreting the results of the graphs below is that the final NVES is expected to involve the recategorisation of a limited number of 4WDs from passenger vehicles to light commercial vehicles (DITRDCA, 2024); the NTC has not included this amendment in the following graphs.[14]

Figure 15 has many similarities with **Figure 14**, since the majority of vehicle makes in Australia sold only vehicles categorised as passenger vehicles (32 out of 49 vehicle makes in total). In particular, most of the vehicle makes with the highest and lowest average emissions intensities and masses remain unchanged from the preceding analysis. However, certain makes had relatively significant changes when analysing passenger vehicles only. Toyota and GWM had average emissions intensities 26 and 19 g/km lower, respectively, than for their combined total sales. By contrast, Chevrolet's passenger vehicle-only emissions intensity was higher than its combined emissions intensity for all vehicles (despite Chevrolet having the highest average emissions intensity of all makes for light commercial vehicles, as shown in **Figure 16**).[15]

Figure 15: Average emissions intensity and mass in running order by vehicle make for passenger vehicles, 2023 sales

13 A limit curve represents the mathematical relationship between the sales-weighted mass of a make's vehicles sold within Australia and its applicable emission targets. Simply put, the lower a make's average sales-weighted mass is, the lower its emissions target and vice versa.

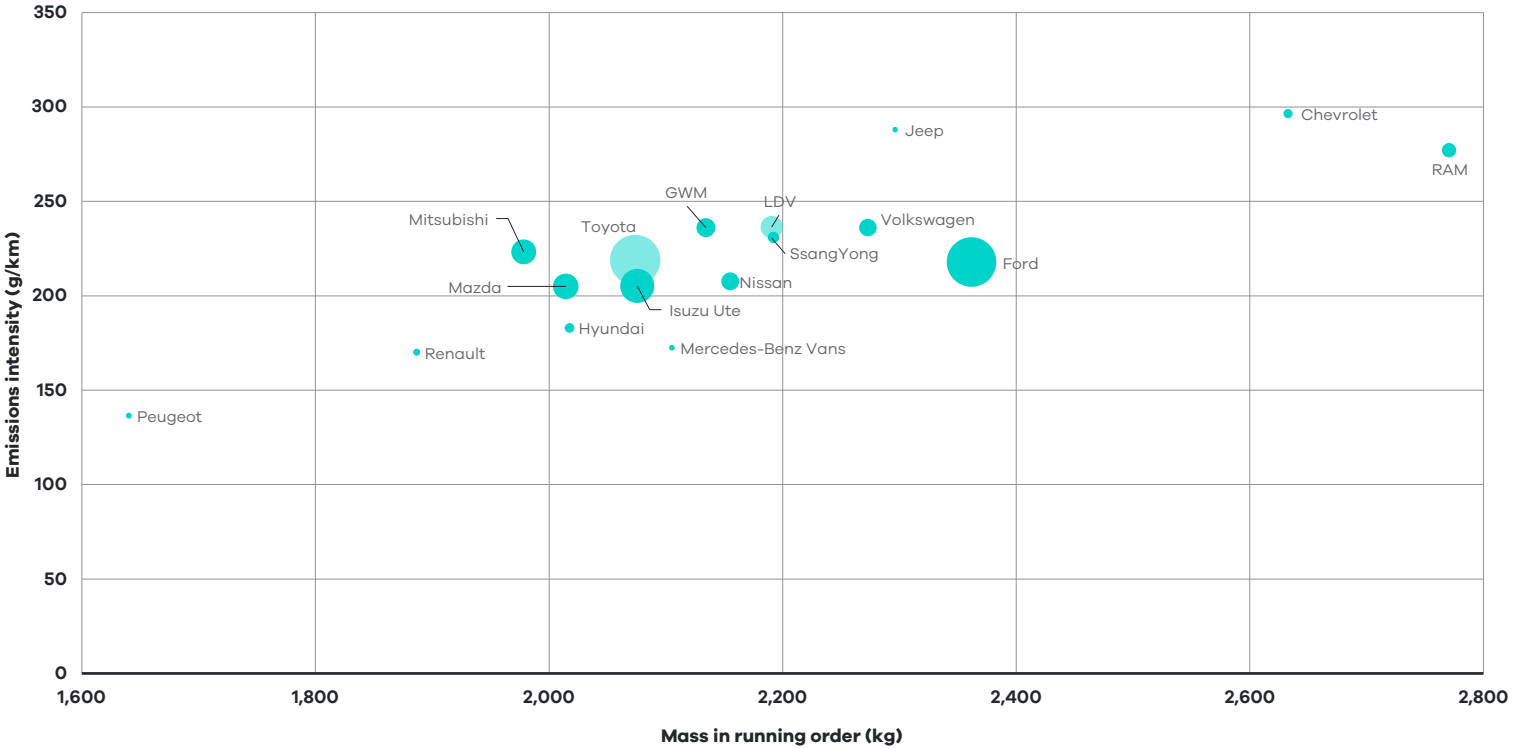
14 Instead, the passenger vehicles graph includes all passenger cars and SUVs (MA and MC categories), while the light commercial vehicles includes all utes and vans (NA category).

15 This is due to the fact that, of the two vehicle models it sold in Australia in 2023, Chevrolet's passenger vehicle model (Chevrolet CORVETTE), had a higher emissions intensity than its light commercial vehicle model (Chevrolet SILVERADO).

3.2 Vehicle makes (continued)

Figure 16 shows the average emissions intensity and mass for light commercial vehicles (utes and vans) for each vehicle make. Toyota (68,504 sales) and Ford (66,344 sales) were by far the two highest-selling vehicle makes, with a combined share of 52 per cent of all light commercial vehicles sold. Most of the top-selling vehicle makes had average emissions intensity values between 205 and 224 g/km, with only LDV (with 236.4 g/km) having a higher value among makes that sold at least 10,000 light commercial vehicles. Ford's average mass was significantly heavier than other top-selling vehicle makes, although RAM and Chevrolet had by far the highest average masses (and emissions intensities, along with Jeep). The four makes with the lowest emissions intensities for light commercial vehicles were those which sold only vans.

Figure 16: Average emissions intensity and mass in running order by vehicle make for light commercial vehicles, 2023 sales



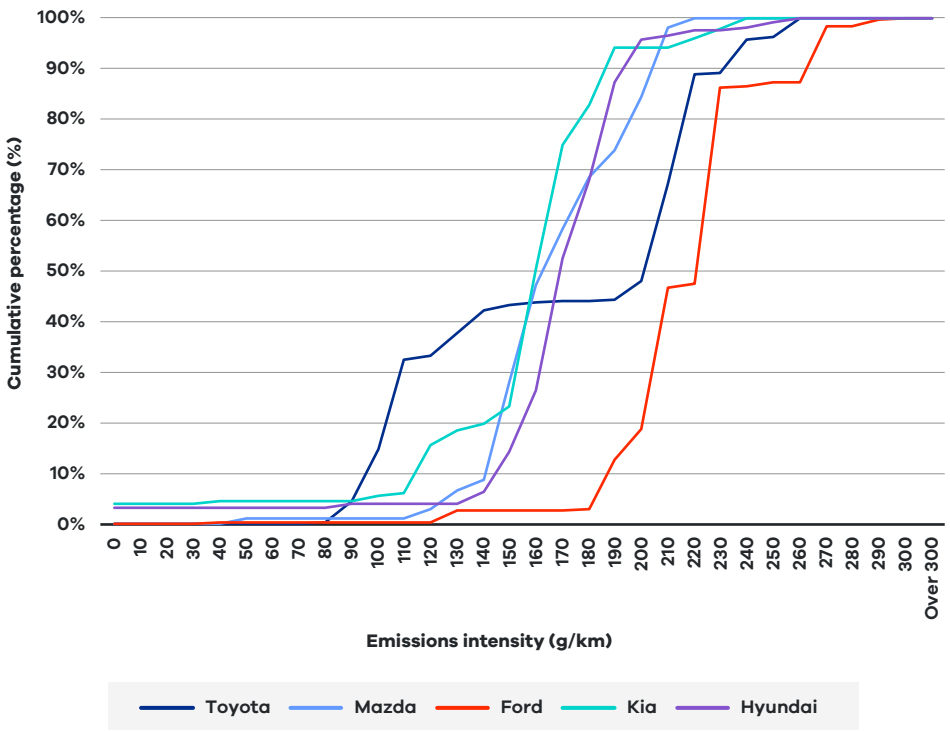
Fiat with
94 g/km
had the lowest average emissions intensity for 2023 sales among non EV-only brands

Lamborghini with
328 g/km
had the highest average emissions intensity

3.2 Vehicle makes (continued)

Figure 17 shows the distribution of emissions intensity for the top 5 selling makes in 2023 when analysing all vehicles (passenger vehicles and light commercial vehicles). The height of each line in the graph can be interpreted as the share of total sales with an emissions intensity less than or equal to a given value on the horizontal axis. Approximately 33 per cent of Toyota's vehicles sold in 2023 had an emissions intensity of 110 g/km or less, which was by far the highest share among these five vehicle makes. However, around 11 per cent of Toyota's sales had an emissions intensity above 220 g/km. Some of the other major vehicle makes had most of their sales in relatively narrower ranges: both Mazda and Hyundai sold around 90 per cent of their vehicles with emissions intensities in the range of 140 to 210 g/km. Kia also followed a similar profile, albeit with slightly lower emissions and over a wider range. Ford had a relatively high emissions intensity compared with its top-selling competitors, with 97 per cent of its sales having an emissions intensity above 180 g/km, and more than half (52 per cent) above 220 g/km.

Figure 17: Cumulative percentage of vehicle sales relative to emissions intensity for top 5 selling makes, 2023



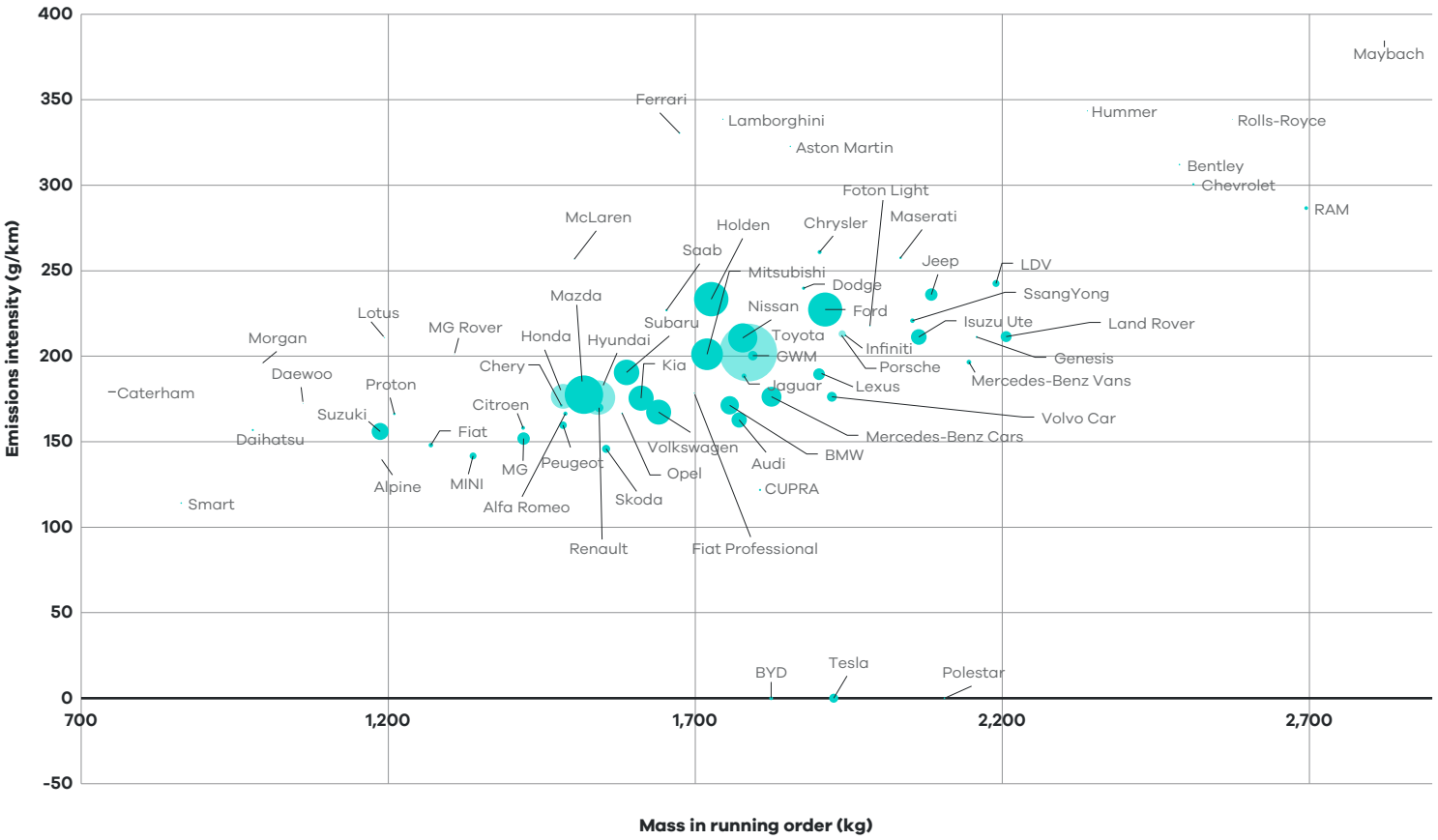
3.2 Vehicle makes (continued)

3.2.4 Detailed vehicle make analysis – January 2024 registered vehicles

The analysis from **section 3.2.3** can be repeated using the January 2024 registered vehicles dataset.

Figure 18 shows the average emissions intensity and average mass in running order by make for January 2024 registered vehicles. As with the analysis in the previous section, the size of each circle in the chart reflects the relative number of registered vehicles for each make, with Toyota (3.58 million vehicles) having the largest circle. The three makes with the lowest emissions intensities were the three all-electric makes (BYD, Tesla and Polestar). Aside from the all-electric makes, Smart (114.1 g/km) had the lowest emissions intensity, and it also had the second lowest average mass behind Caterham (740 kg), albeit both had relatively few registered vehicles. Maybach had both the highest average mass (2,822 kg) and average emissions intensity (385.1 g/km), albeit with just 10 registered vehicles. Five other makes had an average mass of more than 2,300 kg, but of these only RAM and Chevrolet had more than 5,000 registered vehicles. Most of the top 15 makes (by number of registered vehicles) had an average mass between approximately 1,500 kg and 1,800 kg, although Suzuki was lighter and Ford and Isuzu Ute were heavier than this range.

Figure 18: Average emissions intensity and average mass in running order by make, January 2024 registered vehicles



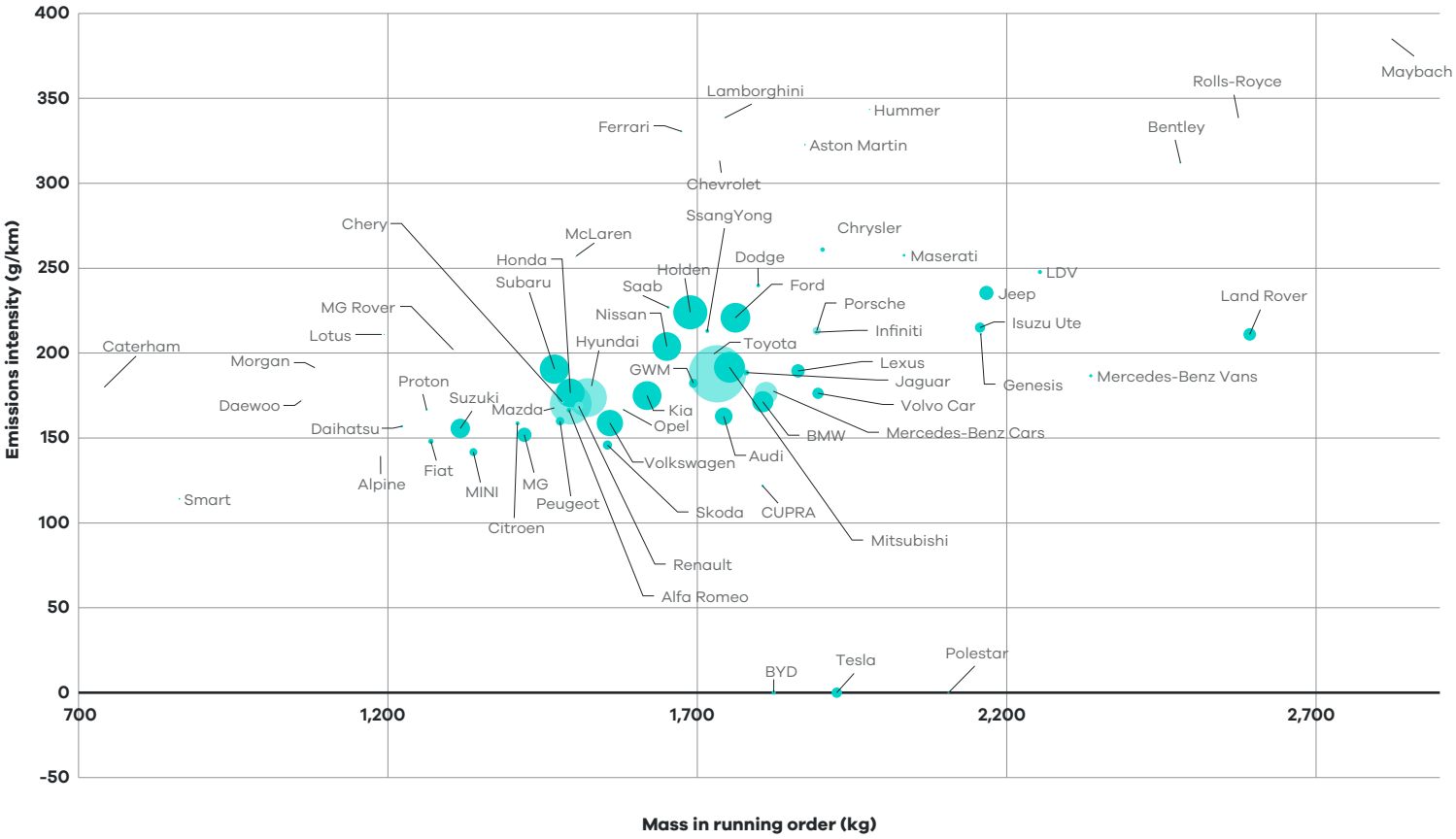
A general trend was that most vehicle makes were positioned higher and to the left in **Figure 18** than they were in **Figure 14** – that is, vehicles in recent years were lower emitting but heavier than vehicles historically. This issue is discussed further later in the report in **section 3.3.2** and also shown in **Figure 90**.[16]

16 There are some exceptions to this general trend, with a few vehicle makes having higher emissions intensities in 2023 than among all registered vehicles from that make, and a number of other makes with lighter vehicles (on average) in 2023 than they had historically. These were mostly less common vehicle makes, and may reflect differences in the vehicle models being imported to Australia over time by those makes.

3.2 Vehicle makes (continued)

Figure 19 provides the corresponding analysis for passenger vehicles (including SUVs) only. Most vehicle makes from **Figure 18** remained represented, and in most cases with the same or relatively similar results since they exclusively or mostly make passenger vehicles and SUVs. However, in some cases there were some material changes. For example, for Toyota the average mass was around 50 kg lower and average emissions intensity around 14.4 g/km lower for passenger vehicles only than for all of Toyota's vehicles (including light commercial vehicles).

Figure 19: Average emissions intensity and mass in running order by vehicle make for passenger vehicles, January 2024 registered vehicles



Most of the top 15 makes (by number of registered vehicles) had an average mass between approximately

1,500 kg

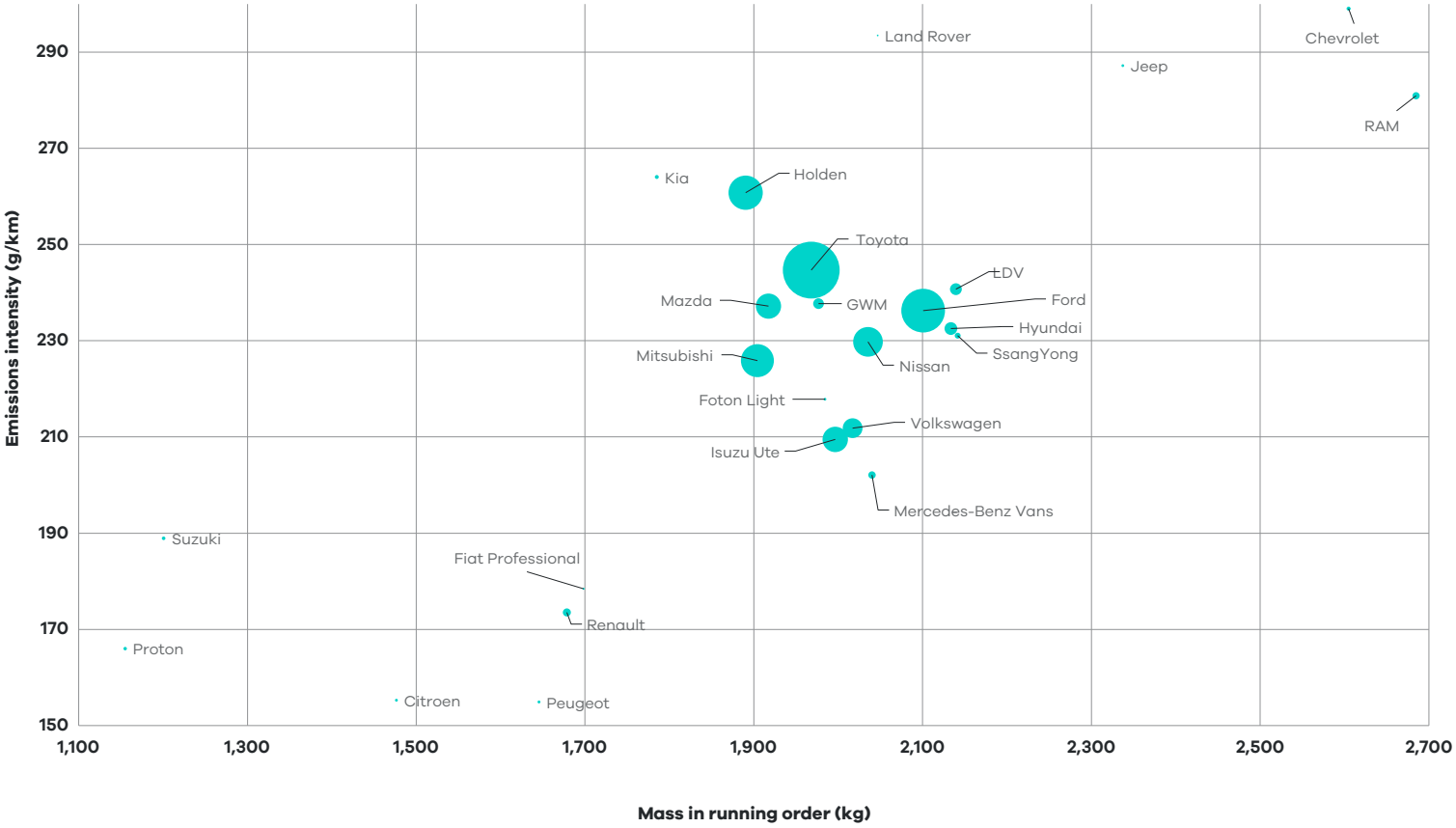
and

1,800 kg

3.2 Vehicle makes (continued)

Figure 20 shows the corresponding analysis for January 2024 registered light commercial vehicles. Chevrolet (299.0 g/km) had the highest average emissions, while RAM's 14,401 registered vehicles had the highest average mass (2,685 kg). The majority of vehicle makes had average masses between around 1,900 kg and 2,100 kg, and average emissions intensities between approximately 210 and 250 g/km.

Figure 20: Average emissions intensity and mass in running order by vehicle make for light commercial vehicles, January 2024 registered vehicles



3.2 Vehicle makes (continued)

Figure 21: Cumulative percentage of vehicles relative to emissions intensity for top 5 vehicle makes, January 2024 registered vehicles

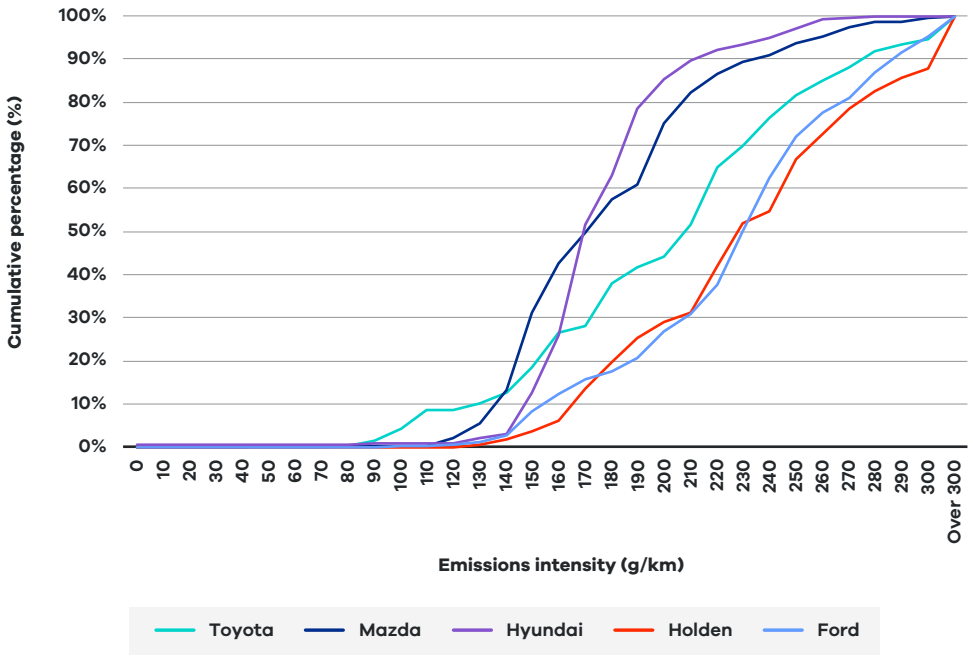


Figure 21 shows the distribution of emissions intensity for the five most common vehicle makes for January 2024 registered vehicles. This is analogous to **Figure 17**, but looking at all registered vehicles rather than just the latest year of sales data. Overall, the lines in **Figure 21** rose far more slowly, indicating more vehicles at higher emissions intensity levels among the registered fleet, as expected. All five vehicle makes shown had approximately 50 per cent or more of their registered vehicles with emissions intensities above 170 g/km. For Holden and Ford, around half of registered vehicles had emissions intensities above 230 g/km. Toyota's strong sales of hybrid vehicles in recent years were demonstrated through its line being the first to increase, although around half of all registered Toyotas had emissions intensities above 210 g/km.

3.3 Segment type

3.3.1 Segment analysis – 2023 sales

Figure 22: Average emissions intensity by segment, 2023

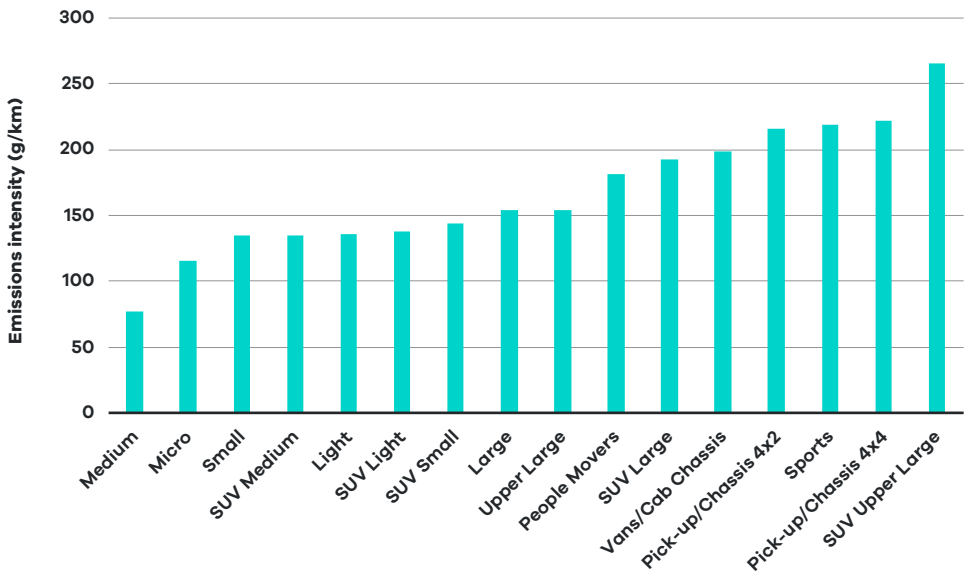
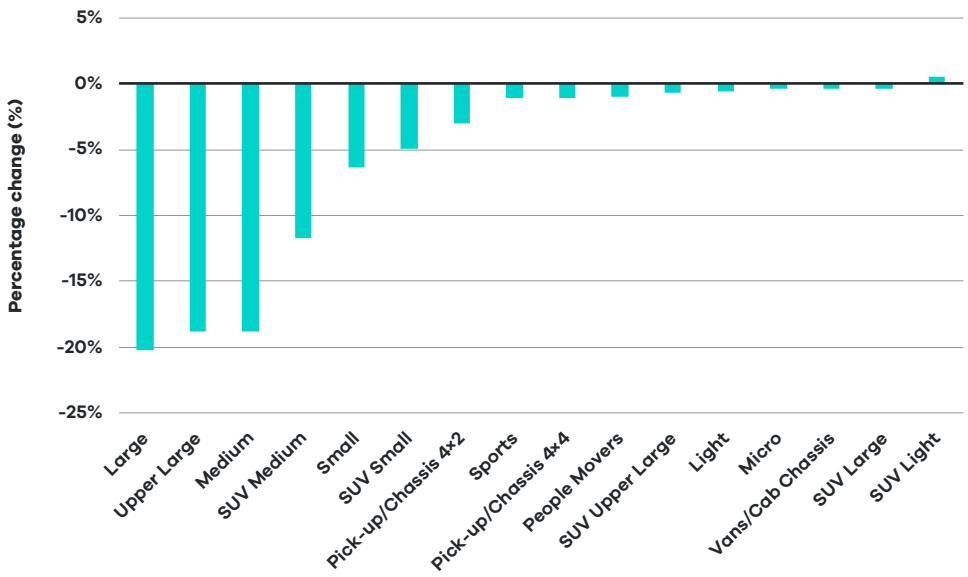


Figure 23: Percentage change in average emissions intensity by segment between 2022 and 2023



We conducted a segment analysis using the categories shown in **Table 1**.

Figure 22 shows the average carbon dioxide emissions intensity by segment for vehicles sold during 2023. The lowest emitting segment by a significant margin was 'Medium' (77.3 g/km). This is the second time (after last year) in the history of this report that the 'Micro' or 'Light' segments[17] have not had the lowest average emissions intensity from all the segments.[18] A key driver of this result was the relatively high sales within the 'Medium' segment of battery electric vehicles (BEVs), in particular the Tesla MODEL 3 and Polestar 2 (the first and third highest-selling vehicle models within the segment). 'SUV Upper Large' (265.2 g/km) was the highest emitting segment on average. Additional segment data, including the top 10 selling models for each segment, is provided in **Table 10** and **Table 11** in the appendix.

Figure 23 shows the percentage change in average emissions intensity by segment between 2022 and 2023. There was significant variation between segments. Emissions intensity for the 'Large' segment fell by 20 per cent, with large declines also for 'Upper Large' and 'Medium' (19 per cent). Each of these segments had battery electric vehicle models among the top sellers, and the latter two also had relatively large emissions intensity decreases between 2021 and 2022. With the exception of 'SUV Light' – which increased by 0.5 per cent – all segments had reductions in emissions intensity in 2023 (albeit around half of the segments had reductions of 1.1 per cent or less).

17 Data classifying vehicles in the 'Micro' segment commenced in 2014; prior to this, these types of vehicles were classified as part of the 'Light' segment.

18 This is evidenced in the corresponding graph for the January 2024 registered vehicles dataset, where 'Micro' had the lowest emissions: see **Figure 27**.

3.3 Segment type (continued)

Figure 24 shows the distribution of carbon dioxide emissions intensity for each of the segments during 2023 (using a methodology similar to **Figure 4** – see the explanation near that graph). The median emissions intensity is shown with a red line, while the wider coloured sections represent the ranges where the majority of sales occurred in each segment. In 2023, there were battery electric vehicles sold in 14 of the 16 segments, with the exceptions being 'SUV Light' and 'Pick-up/Chassis 4×4'. In the 'Medium' and 'Large' segments, BEVs comprised more than 25 per cent of sales, while four other segments had at least 5 per cent of sales as BEVs. The ranges of emissions intensity varied considerably. While some segments had the majority of vehicles sold falling into a relatively narrow 50 g/km range of emissions intensity, others were more spread out.

An alternative analysis of the distribution of emissions intensity by segment is shown in **Figure 25**. The horizontal axis of the graph shows the emissions intensity, in 'bins'/intervals of 10 g/km, while the vertical axis shows the number of vehicles sold in each of these intervals. Each of the top five selling segments is shown with its own colour, while all other segments have been grouped together in red.[19]

There are a number of interesting aspects to **Figure 25**. Firstly, the impact of different types of technology – BEVs, plug-in hybrid electric vehicles (PHEVs) and hybrid vehicles (HEVs)[20] – is evidenced in the first three peaks from the left of the graph. Secondly, different segments contributed to these peaks through the presence of some of the top-selling models. For example, 'SUV Medium' contributed significantly to each of the three initial peaks.[21] By contrast, the peaks at higher emissions intensity levels mostly comprised the 'Pick-up/Chassis 4×4' and 'SUV Large' segments in particular.

Figure 24: Distribution of emissions intensity of vehicles sold by segment, 2023

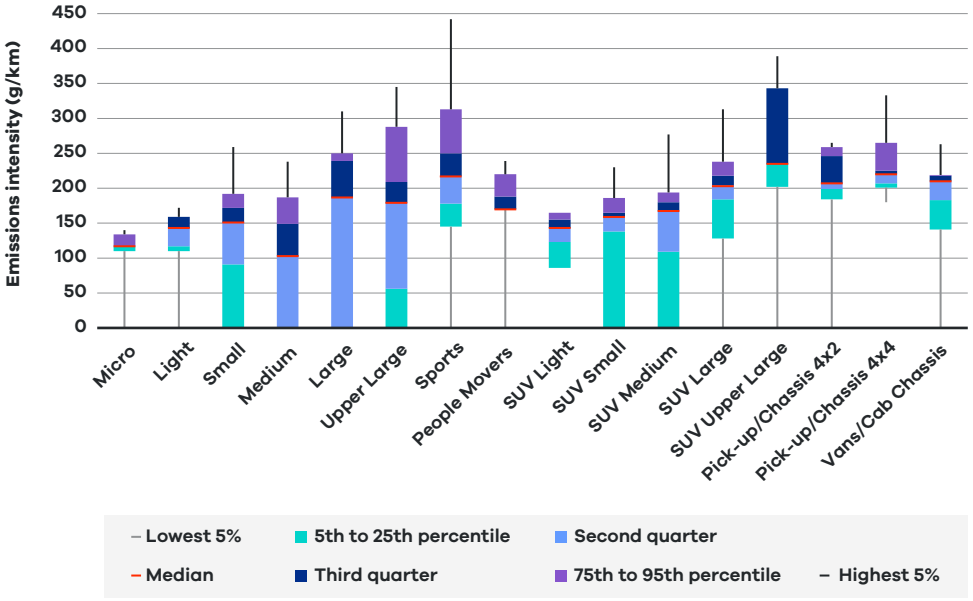
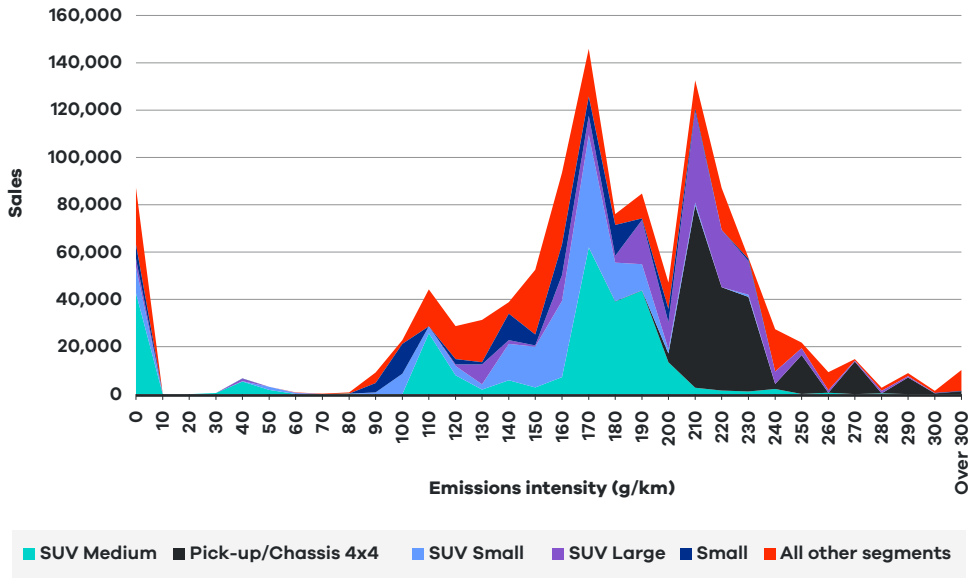


Figure 25: Distribution of vehicle sales relative to emissions intensity, 2023



19 These other segments represent everything from 'Micro' to 'SUV Upper Large', so unsurprisingly the red colour exhibited quite a wide range of emissions intensities.

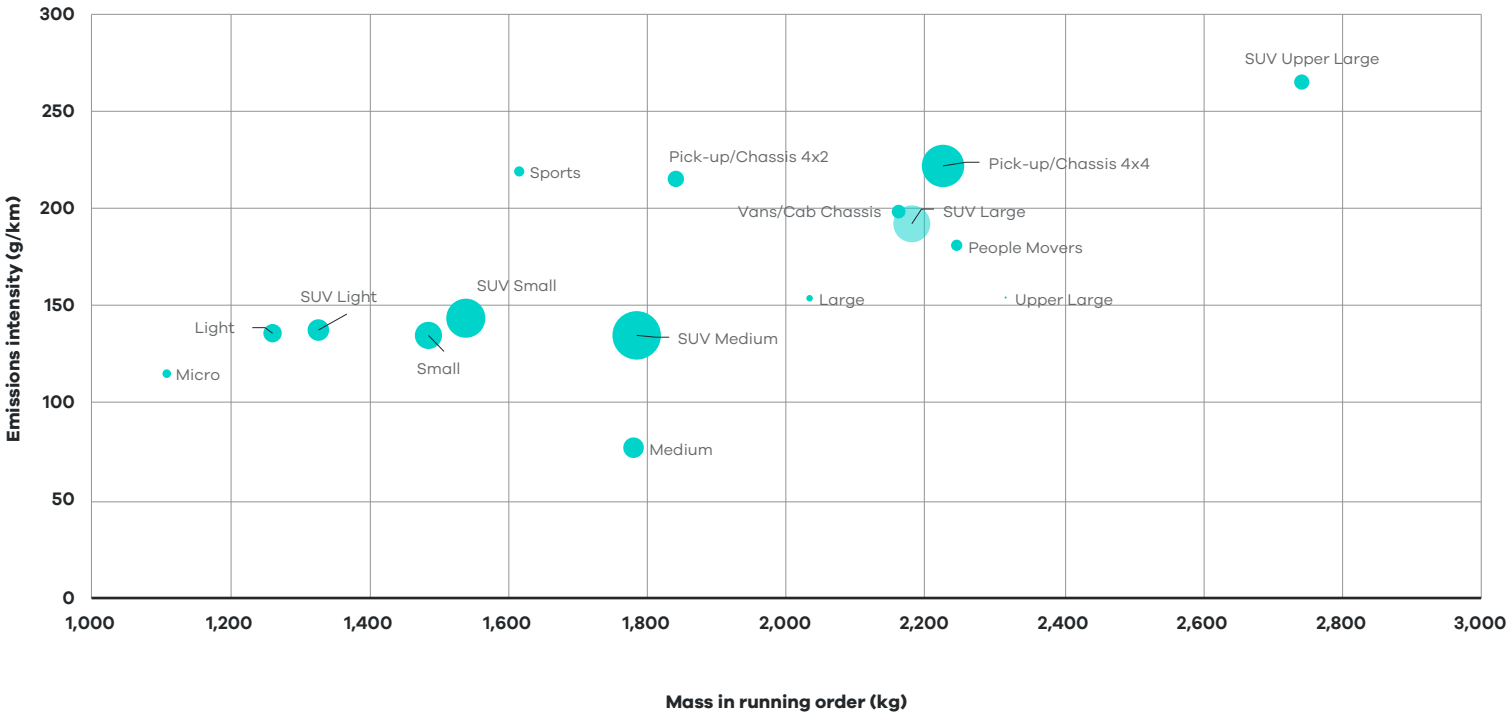
20 The third peak also comprises some more efficient internal combustion engine (ICE) vehicles, particularly at the smaller end of the fleet, in addition to HEVs.

21 Through the Tesla MODEL Y and BYD ATTO 3 (BEVs); Mitsubishi OUTLANDER and MG MG HS PHEV (PHEVs); and Toyota RAV4 HYBRID (HEVs).

3.3 Segment type (continued)

The average mass of vehicles varies considerably across segments, and in general there is a strong positive correlation between average mass and average emissions intensity in Australia. **Figure 26** plots these two variables against each other, with the size of each circle in the chart reflecting the relative number of sales in each segment. Vehicles in the heaviest segment, 'SUV Upper Large', were on average more than two and a half times as heavy as vehicles in the lightest (the 'Micro' segment). The difference in average emissions intensity was similar, with the larger and heavier segment's emissions intensity around 2.3 times higher. This strong positive relationship between mass and emissions intensity holds true because of the relatively low share of electric vehicles in the Australian market currently (since electric vehicles – in addition to having lower emissions – tend to be heavier than internal combustion engine cars due to the weight of the batteries (The Guardian, 2024a)).[22]

Figure 26: Average emissions intensity and average mass in running order by segment, 2023



Another feature shown in **Figure 26** is that, for each of the five different segment sizes with a corresponding SUV segment (ranging from Light through to Upper Large), the SUV segment was in each case both heavier and higher emitting (on average) than the corresponding passenger car segment (with the SUV segment being located above and to the right on the graph). In some cases these differences were relatively small, whereas in others – particularly at the larger end of the fleet – they were much larger.

22 By contrast, a graph plotting the same two variables and comparing across countries for passenger cars in Europe shows two distinct relationships – see the European Environment Agency's (EEA) dashboard (EEA, 2024a). Near the top-left corner, there is a positive relationship between vehicle mass and emissions data, as seen in Australia, comprising data for European countries that still have relatively few electric vehicle sales. A second mostly negative correlation between mass and emissions intensity is then visible for countries with higher electric vehicle sales shares, with Norway, Sweden and Iceland being the three lowest-emitting countries but also having the highest average mass of vehicles.

3.3 Segment type (continued)

If Australian consumers had purchased vehicles with best-in-class carbon dioxide emissions in 2023, the national average carbon dioxide emissions intensity for vehicles sold in 2023 would have been reduced by 78 per cent (to a national average emissions intensity value of 36.2 g/km). These figures reflect the fact that 14 of the 16 segments had battery electric vehicles available (in total, these 14 segments comprised around 77 per cent of total sales).[23] This shows the potential emissions reduction with currently available vehicles and technologies (noting that, in practice, issues such as vehicle supply constraints and the lowest emitting vehicle model's attributes may mean that a substitution to this model may not necessarily be possible or suitable in all circumstances).

Table 3 shows the best-in-class vehicles for carbon dioxide emissions intensity available for each segment. Where the best-in-class vehicle model's primary engine is listed as electric for a segment, we have also shown the best-in-class with the primary engine listed as petrol or diesel (including hybrid vehicles).

Additional data comparing the top 10 highest selling models[24] in each segment against best-in-class vehicles is provided in **Table 11** in the appendix. Additional average emissions intensity data for all models that sold more than 1,000 vehicles is provided in **Table 12** in the appendix.

Table 3: Best-in-class vehicles for carbon dioxide emissions intensity for each segment, 2023

Segment	Make and model (fuel source/s)*	Best-in-class vehicle emissions intensity (g/km)
Micro	Fiat 500E (electric)^	0
	Mitsubishi MIRAGE (petrol)	109
Light	MINI COOPER (electric)	0
	Toyota YARIS HYBRID (petrol-electric)	76
Small	MG MG4 (electric)^	0
	Toyota PRIUS (petrol-electric)	80
Medium	Tesla MODEL 3 (electric)^	0
	Toyota CAMRY HYBRID (petrol-electric)	96
Large	Porsche TAY (electric)^	0
	Citroen C5 X (petrol)	137
Upper Large	BMW I7 XDRIVE60 (electric)^	0
	Lexus LS500H (petrol-electric)	150
Sports	Rolls-Royce SPECTRE (electric)	0
	MINI COOPER (petrol)	136
People Movers	Mercedes-Benz Vans EVITO TOURER (electric)^	0
	Lexus LM350H (petrol-electric)	123
SUV Light	Toyota YARIS CROSSHV (petrol-electric)	86
SUV Small	Volvo Car XC40 (electric)^	0
	Hyundai KONA (petrol-electric)	89
SUV Medium	Tesla MODEL Y (electric)^	0
	Toyota RAV4 HYBRID (petrol-electric)	107
SUV Large	Kia CV EV6 (electric)^	0
	Lexus RX350H (petrol-electric)	114
SUV Upper Large	Kia MV EV9 (electric)^	0
	Land Rover RANGE ROVER (diesel)	190
Pick-up/Chassis 4×2	LDV T60 (electric)	0
	Isuzu Ute D-MAX (diesel)^	177
Pick-up/Chassis 4×4	Isuzu Ute D-MAX (diesel)^	180
Vans/Cab Chassis	Peugeot PAR (electric)^	0
	Volkswagen CADDY VAN (diesel)	129

* If two fuel sources are shown, the first is the primary engine.
^ At least two vehicle models in this segment have the equal-lowest emissions. The make and model reported in this table is the one with the highest sales.

23 An alternative best-in-class comparison, using just internal combustion engine vehicles and HEVs (but excluding BEVs and PHEVs from consideration as the lowest emitting vehicle model in each segment) would still see a significant improvement, with an average emissions intensity of 119 g/km (a 28 per cent reduction).

24 Top 10 models, or as many vehicle models as were sold in that segment.

3.3 Segment type (continued)

3.3.2 Segment analysis – January 2024 registered vehicles

Much of the analysis from the previous section can also be undertaken using the January 2024 registered vehicles dataset.

Figure 27 shows the average emissions intensity for each vehicle segment. As would be expected, the segments were broadly ordered in increasing vehicle size from left to right in the graph. However, one somewhat unexpected result in **Figure 27** is the relative ordering between similar vehicle segments in the passenger vehicle and SUV segments (for example, the 'Small' passenger vehicle segment and 'SUV Small'). In the 2023 sales analysis in **Figure 22** and in **Figure 26**, the SUV segment of a given size in all cases had a higher emissions intensity than the corresponding passenger vehicle segment (for example, 'SUV Medium' had a higher emissions intensity than 'Medium'). This result appears intuitive, given the generally higher mass and height of SUVs. By contrast, in **Figure 27** several SUV segments ('SUV Light', 'SUV Small' and 'SUV Large) had lower emissions intensities than the corresponding passenger vehicle segments. A potential explanation for this result is the general improvements in engine and other technologies (such as electric vehicles) that have led to emissions intensity reductions over time as well as the shift in vehicle sales towards SUV segments over recent years. That is, the relative recency of vehicles in certain SUV segments (which utilise emissions-reducing technologies) was in this case enough to more than offset SUVs' inherent emissions intensity disadvantages from being larger/heavier vehicles. Additional segment data, including the average mass and number of registered vehicles, is provided in **Table 26** in the appendix.

The distribution of emissions intensities by segment for January 2024 registered vehicles is shown in **Figure 28**. In general, there was a wider spread of distributions for each segment among registered vehicles in **Figure 28** than there was in the corresponding graph for 2023 new vehicle sales (**Figure 24**). Common higher emitting vehicles – those between the median and the 95th percentile – were also typically spread over a wider range in **Figure 28**.

Figure 27: Average emissions intensity by segment, January 2024 registered vehicles

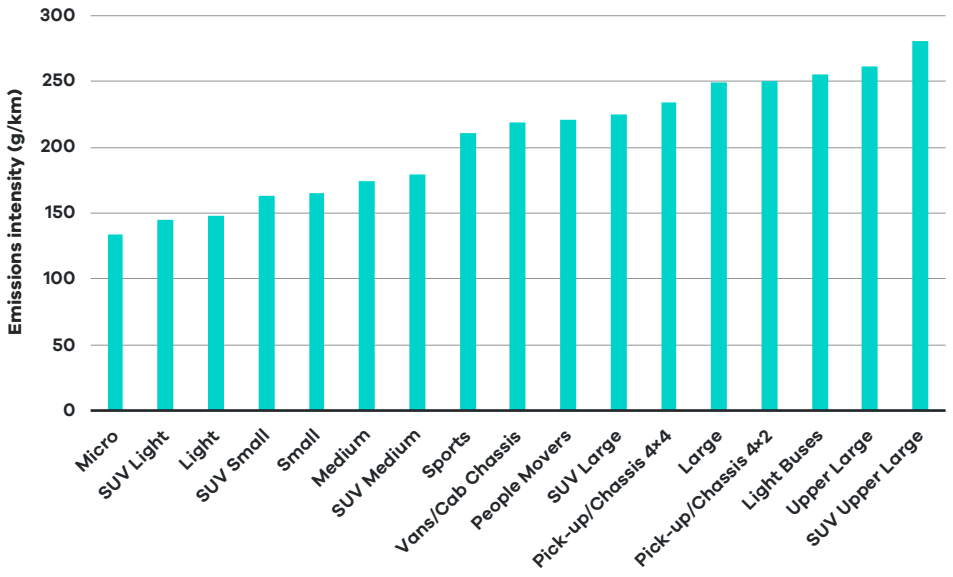
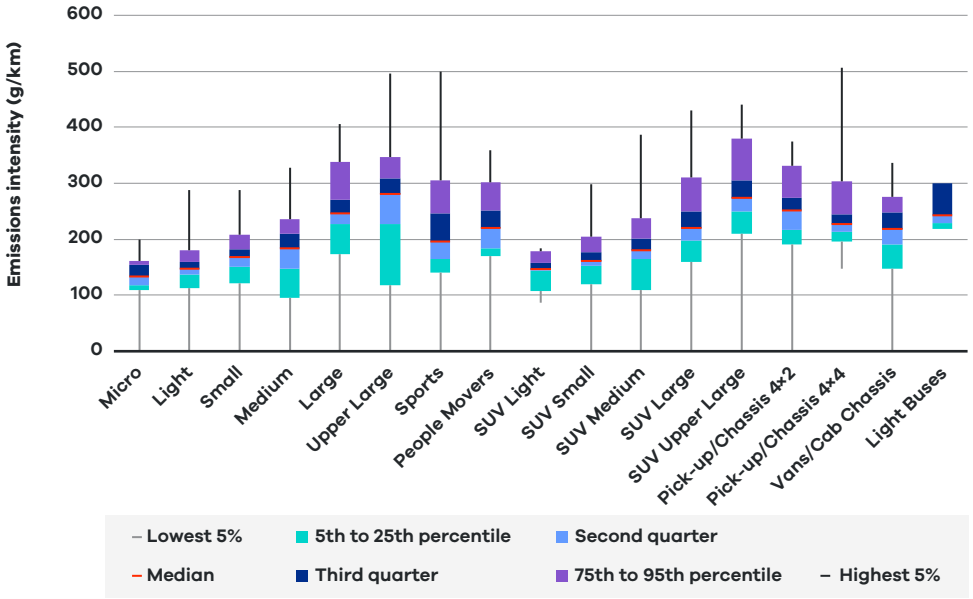


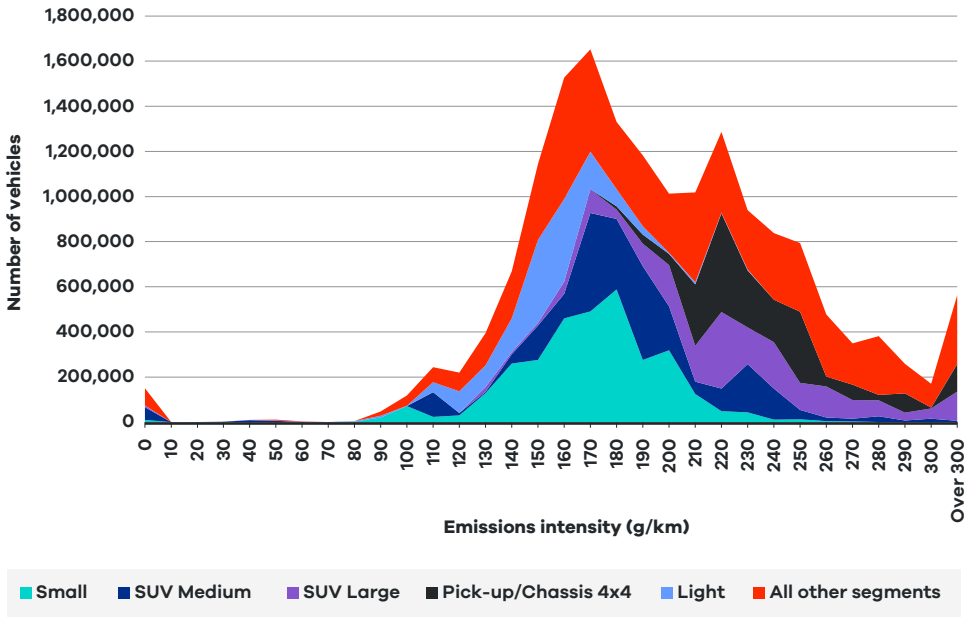
Figure 28: Distribution of emissions intensity of vehicles by segment, January 2024 registered vehicles



3.3 Segment type (continued)

Figure 29 shows the distribution of the emissions intensity of the top five most common vehicle segments, each with their own colour, as well as all other segments grouped together (shown in the red colour). One interesting feature of the graph is the inclusion of the 'Light' segment as one of the top five segments, reflecting its historical importance among new vehicle sales, notwithstanding relatively fewer of these vehicles entering the fleet in recent years. This segment, shown in the light blue colour, typically had moderately low emissions intensities, mostly between 110 and 180 g/km. The red colour reflecting 'all other segments' comprised a relatively high share of the total number of vehicles, particularly when compared to the corresponding graph for new vehicle sales (**Figure 25**). This was particularly so at higher emissions intensities above 250 g/km. This result likely reflects the shifts in vehicle preferences over time, with historically popular segments such as 'Large' having very few sales in recent years (which have been dominated by SUVs and utes). The 'Large' segment was therefore outside the top five segments for registered vehicles overall, and shown as part of the 'all other segments' grouping (where it was a significant contributor to the highest emissions intensity levels in **Figure 29**).

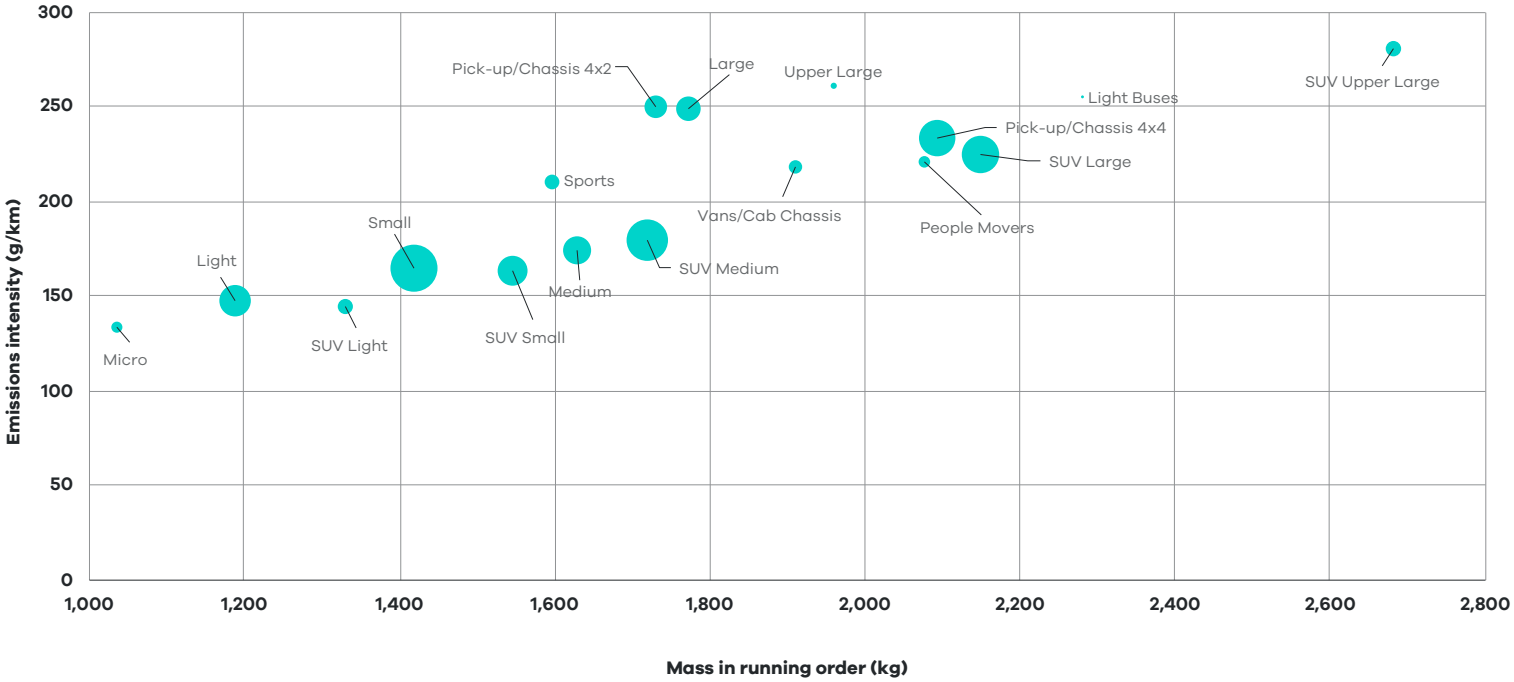
Figure 29: Distribution of vehicles relative to emissions intensity, January 2024 registered vehicles



3.3 Segment type (continued)

Figure 30 plots average emissions intensity against average mass for January 2024 registered vehicles in each segment, with the circle sizes reflecting the relative number of vehicles in each segment. The 'Small' segment had the most vehicles (3.2 million), and had the fourth lowest average mass and emissions intensity. 'SUV Upper Large' had by far the highest average mass (2,681 kg) and also the highest average emissions intensity (281 g/km). The 'Micro' segment had the lowest average emissions intensity (133.7 g/km) and also the lowest average mass (1,035.3 kg). The mass difference between the passenger vehicle and SUV segment of a given size (for example, 'Medium' and 'SUV Medium') were generally much larger in **Figure 30** than in the corresponding graph for 2023 sales (**Figure 26**).

Figure 30: Average emissions intensity and average mass in running order by segment, January 2024 registered vehicles



The five SUV segments combined had an average emissions intensity of

156 g/km

In comparison the Small segment had an average of

135 g/km

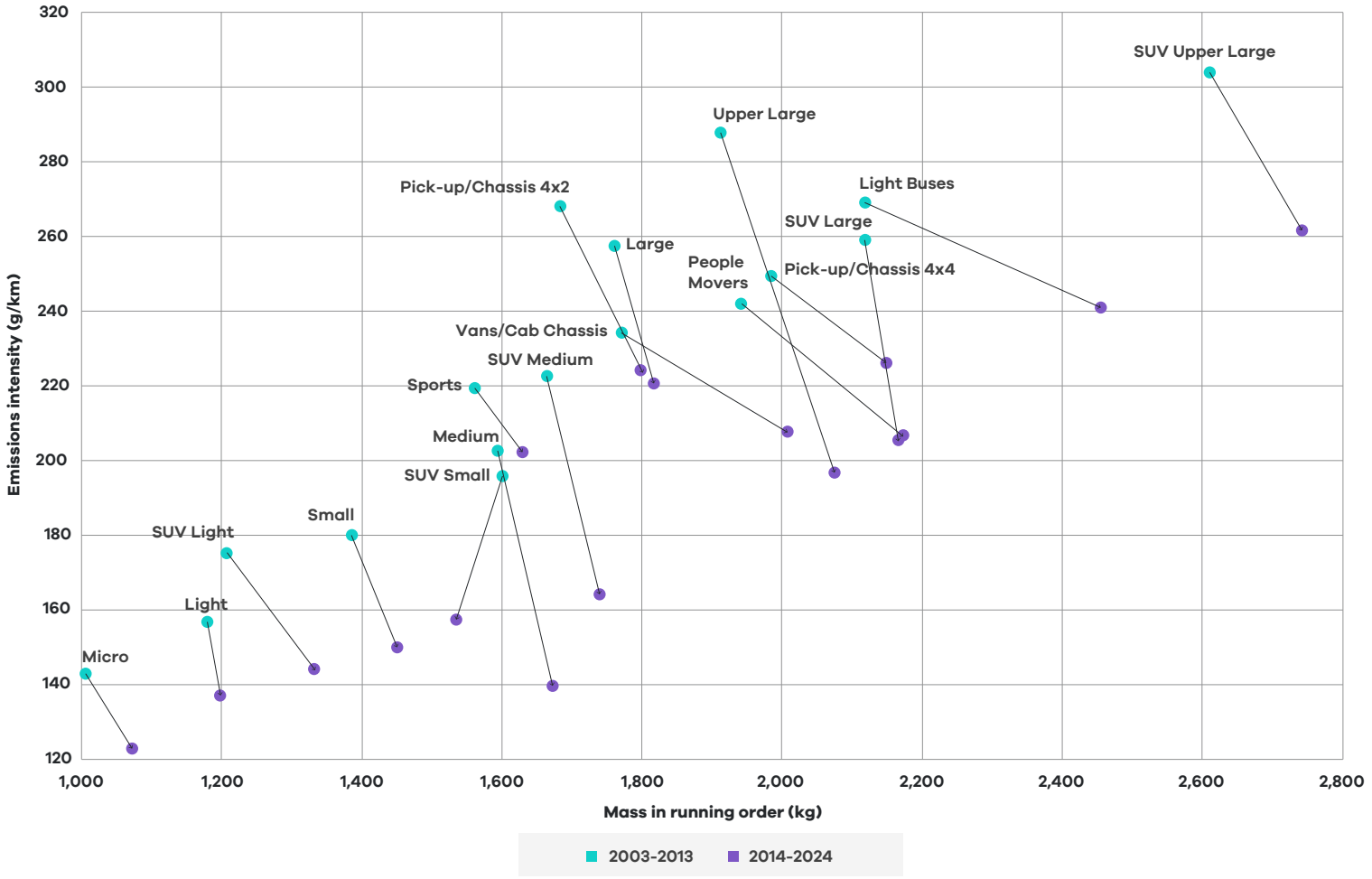
3.3 Segment type (continued)

It is also possible to analyse changes over time in average mass and average emissions intensity within segments. We have grouped vehicles into two time periods of approximately a decade[25] – from 2003 to 2013 (inclusive) and 2014 to 2024 (inclusive) – based on the year when the vehicle first entered the Australian fleet, and then compared those two time periods.

Figure 31 plots the average mass and average emissions intensity for each segment in each of the two time periods, with an arrow pointing the direction of change between the first and second decade for each segment. All but one of the arrows had a slope down and towards the right (the exception being 'SUV Small'), meaning that the average emissions intensity decreased and the average mass increased. While the general direction of change was similar across segments, the magnitude of the change in average emissions intensity and average mass varied significantly.

For example, the average mass of registered vehicles increased by more than 200 kg for the 'People Movers' and 'Vans/Cab Chassis' segments between the two decades, whereas the increase was much smaller for other segments such as 'Light' and 'SUV Large' (and decreased for 'SUV Small'). There were similar disparities in the change in emissions intensity between the two decades, with a decrease of 91 g/km for 'Upper Large' but just 17.5 g/km for 'Sports' (other segments also decreased by around 20 g/km).

Figure 31: Average emissions intensity and average mass in running order by segment and time period, January 2024 registered vehicles



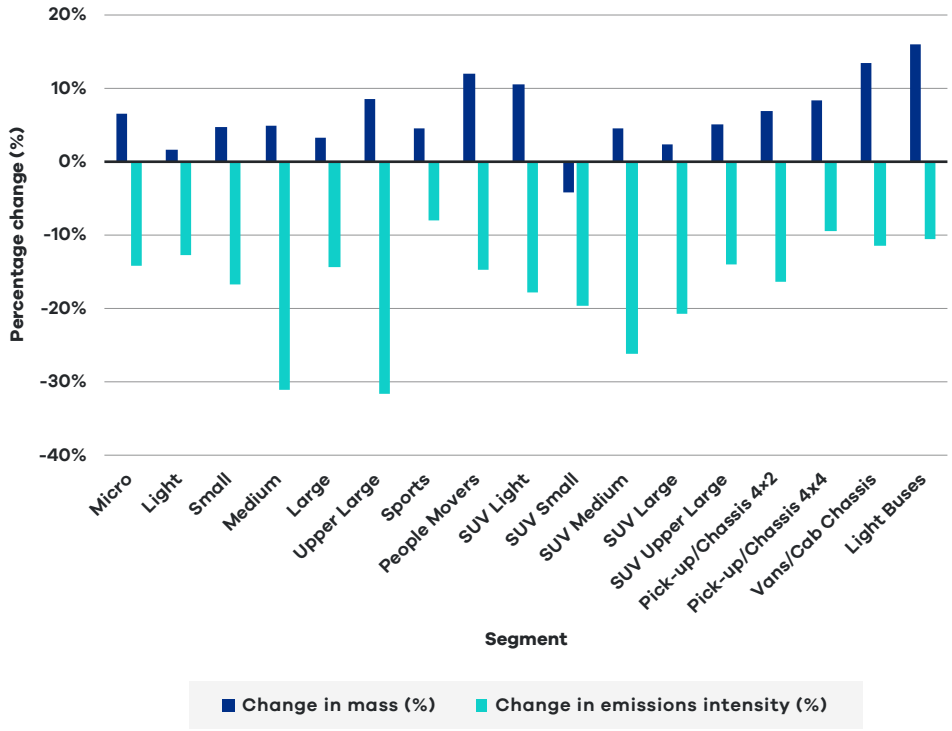
25 Each period technically contains 11 data points.

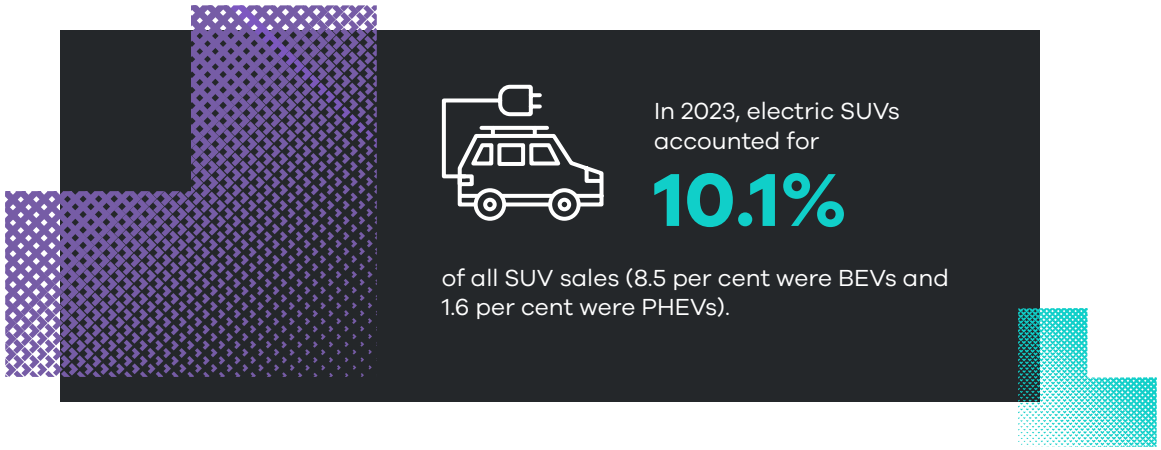
3.3 Segment type (continued)

These changes in average mass and average emissions intensity can also be compared in percentage terms (given the relatively large differences in mass and emissions intensity between segments). **Figure 32** analyses January 2024 registered vehicles, and again groups vehicles into two time periods of around a decade (2003 to 2013; and 2014 to 2024) and compares the results between decades. Four of the segments had average mass increases above 10 per cent for vehicles entering the fleet between 2014 and 2024 (compared with vehicles that had entered the fleet between 2003 and 2013), with 'Light Buses' being the largest (albeit with relatively few registered vehicles). Four segments also had average emissions intensity decreases of more than 20 per cent between the two decades, led by 'Upper Large' (32 per cent) and 'Medium' (31 per cent), with the latter result likely due to the Tesla MODEL 3 and other electric vehicles in that segment.

While it is unsurprising to see average mass for the fleet overall increasing over time (see **Figure 90** later in the report) – given shifts in the vehicle sales towards larger vehicles such as SUVs and utes – it is perhaps more surprising to see this occurring *within* vehicle segments for almost all vehicle segments. This result could potentially be due to a range of factors, including: vehicle mass increasing from additional safety or vehicle comfort features that have become standard on modern vehicles (J.D.Power, 2019); additional mass due to batteries for electric or hybrid vehicles; and vehicles becoming larger over time within their particular segment.[26]

Figure 32: Percentage change in average emissions intensity and average mass in running order by segment and decade, January 2024 registered vehicles





26 That is, even where a vehicle segment is defined by a minimum and maximum vehicle footprint, it may be that more recent vehicle models tend to be closer to the maximum value than they were historically.

3.4 Buyer type

This section only includes data from the 2023 sales dataset; no information is available on the current owner in the January 2024 registered vehicles dataset.

3.4.1 Buyer type analysis

Figure 33 shows the average carbon dioxide emissions intensity by buyer type in 2023. Vehicles bought by private buyers had the lowest average carbon dioxide emissions intensity (158 g/km), followed by government buyers (171 g/km) and business buyers (174 g/km). All three buyer types had lower emissions intensities in 2023 than the previous year, with private buyers having the largest reduction (5.9 per cent) and government the smallest (2.1 per cent), as shown in **Figure 34**. Additional data on buyer types is provided in **Table 13** in the appendix.

The three buyer types can be broken down further:

- private: local delivery and overseas delivery
- government: federal, state and local
- business: company capitalisation, dealer demonstrator, diplomatic, fleet, large fleet, not-for-profit organisation, overseas delivery, rental, taxi and other.

Figure 33: Average emissions intensity by buyer type, 2023

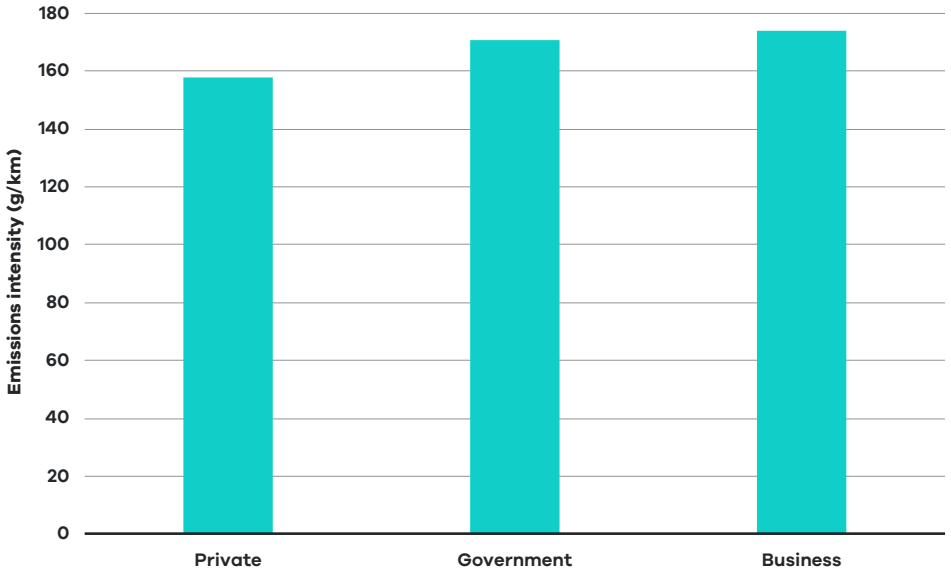
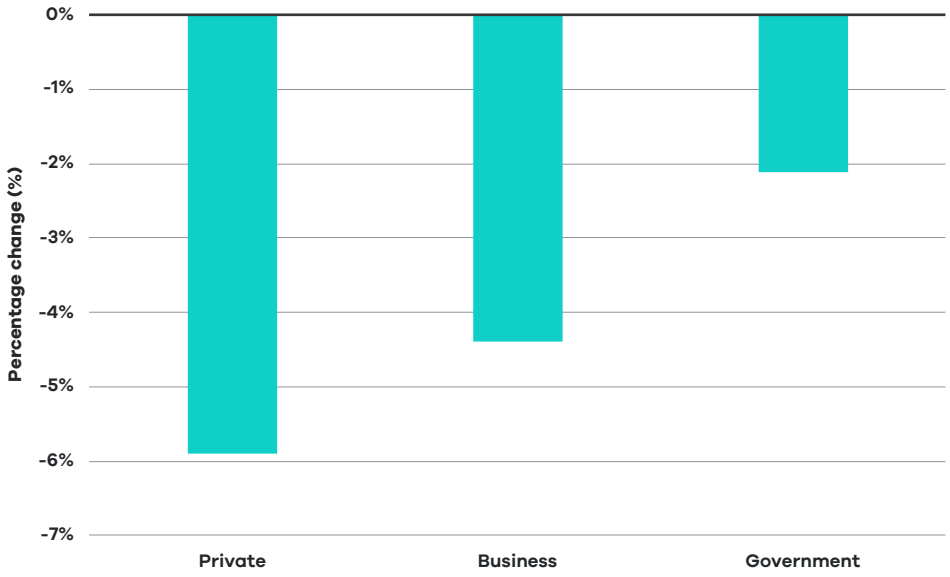


Figure 34: Percentage change in average emissions intensity by buyer type between 2022 and 2023 (%)



3.4 Buyer type (continued)

Figure 35 shows the average carbon dioxide emissions intensity for these buyers, while **Figure 36** displays the annual percentage change in emissions intensity for each of these buyer types. Taxi buyers had the lowest average emissions intensity levels in 2023, as in many previous years, while the two fleet buyer types had the highest.[27] Vehicles bought by the Federal Government had the third highest average emissions intensity (177 g/km), with local governments slightly lower and state governments having the lowest average emissions intensity among the different levels of government (168 g/km).

'Business – overseas delivery' had the biggest improvement in emissions intensity in 2023, by around 18.6 per cent, but with just 30 sales. 'Fleet' buyers also had a large improvement, by 7.4 per cent, with 'Private – local delivery' in third with a 5.9 per cent improvement: these two buyers were the only buyers of the two models of Tesla (as well as being the two largest buyer types for non-Tesla BEVs). The emissions intensity increased for three buyer types, with the largest being 3.5 per cent for 'Not-for-profit organisation' (the only one of the three with a material sales volume). Additional data on the detailed buyer types is provided in **Table 14** in the appendix.

Figure 35: Average emissions intensity by detailed buyer type, 2023

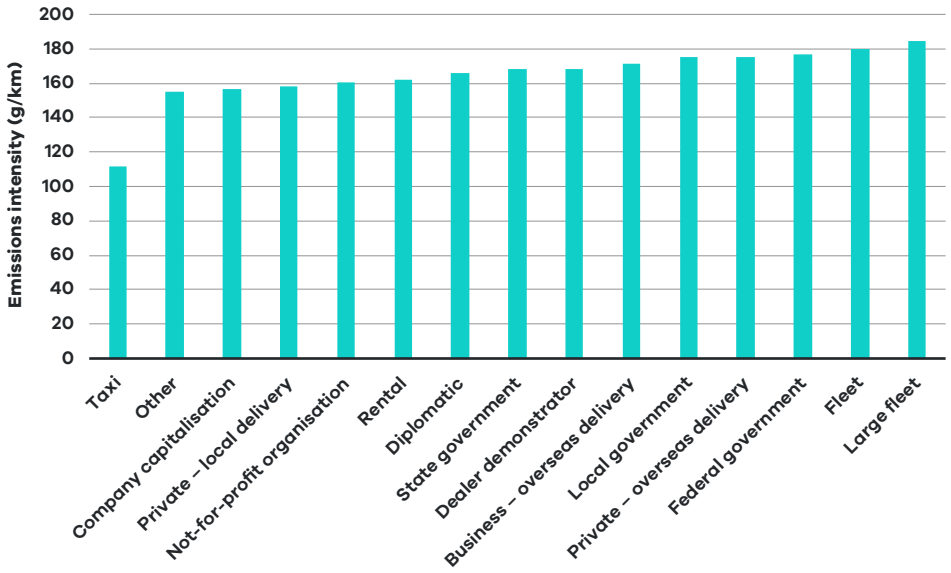
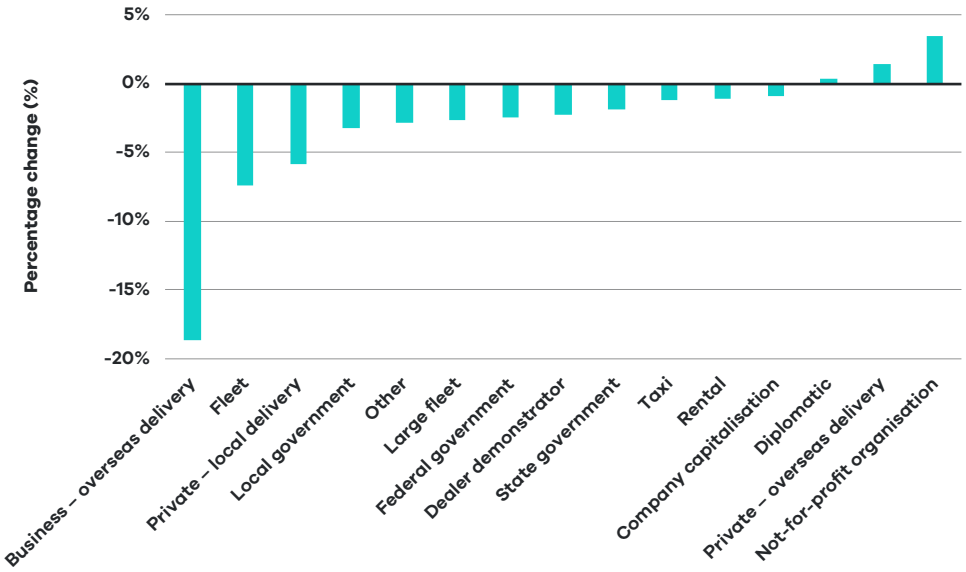


Figure 36: Percentage change in average emissions intensity by detailed buyer type between 2022 and 2023 (%)



27 Although 'Fleet' buyers had several BEV models among their most purchased vehicles, most of the other top-selling vehicle models for fleet buyers were utes or SUVs, many with an emissions intensity above 200 g/km.

3.4 Buyer type (continued)

3.4.2 Government analysis

A further comparison of the emissions intensity for governments' vehicle purchases is possible by breaking down the 'State government' into each of the state and territory governments, while reporting the 'Federal government' and 'Local government' alongside.

Figure 37 shows that the ACT government had the lowest emissions intensity (123.3 g/km) while the WA government had the highest (186.7 g/km).[28] **Figure 38** shows that the biggest reduction in emissions intensity in 2023 occurred for the ACT government (27.4 per cent), with the NT second. The emissions intensity increased in 2023 for governments in South Australia and Tasmania.

Figure 37: Average emissions intensity by government, 2023

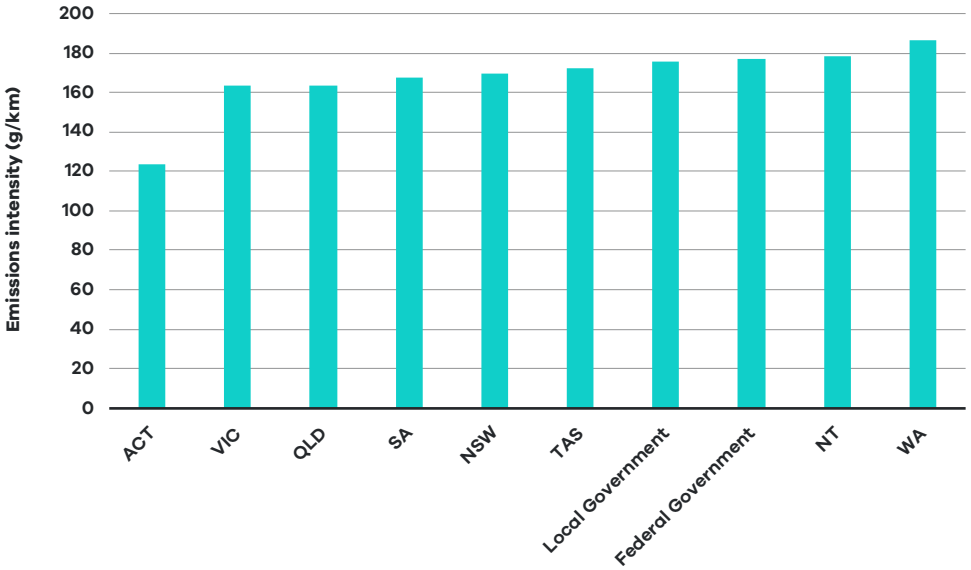
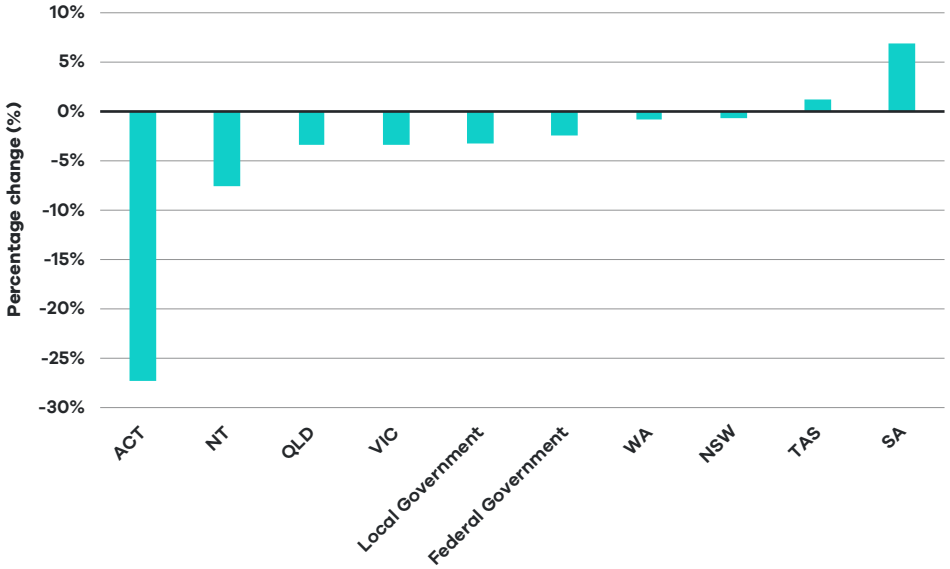


Figure 38: Percentage change in average emissions intensity by government between 2022 and 2023 (%)



28 The ACT, Queensland and Victorian governments had lower emissions intensities than other governments. These three governments had the highest percentages of BEVs, PHEVs and HEVs in their new vehicle purchases (see **Figure 47**).

3.5 Powertrain and fuel type

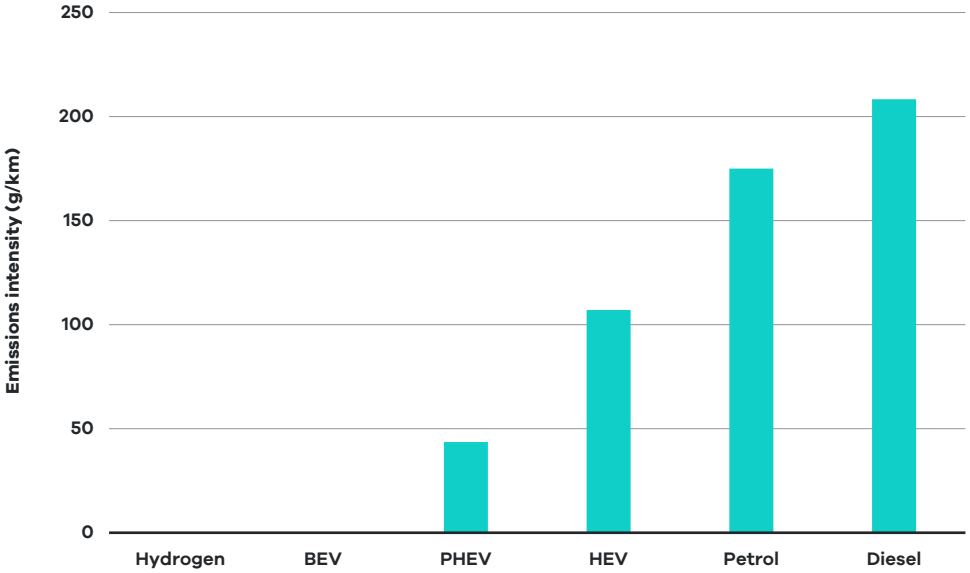
This section contains data on average carbon dioxide emissions intensity by powertrain and fuel type.

3.5.1 Powertrain and fuel type analysis – 2023 sales

Figure 39 shows the average carbon dioxide emissions intensity by powertrain and fuel type in 2023. More detailed information about electric and hybrid vehicles is reported in the following section. We have reported the emissions intensity of hybrid vehicles separately from petrol- and diesel-only vehicles. Petrol-only vehicles had an average emissions intensity of 175 g/km, while diesel vehicles' average emissions intensity was 208 g/km; this was significantly higher than the emissions intensity of HEVs (107 g/km). There was just one model of hydrogen vehicle sold in 2023 (the Toyota MIRAI), with a total of 6 vehicles sold. The emissions intensity increased relative to 2022 for HEVs and petrol vehicles (2.2 per cent and 1.1 per cent, respectively), with small decreases for PHEVs and diesel vehicles.

Additional data on sales and emissions intensities for different powertrains and fuel types is provided in **Table 15** in the appendix.

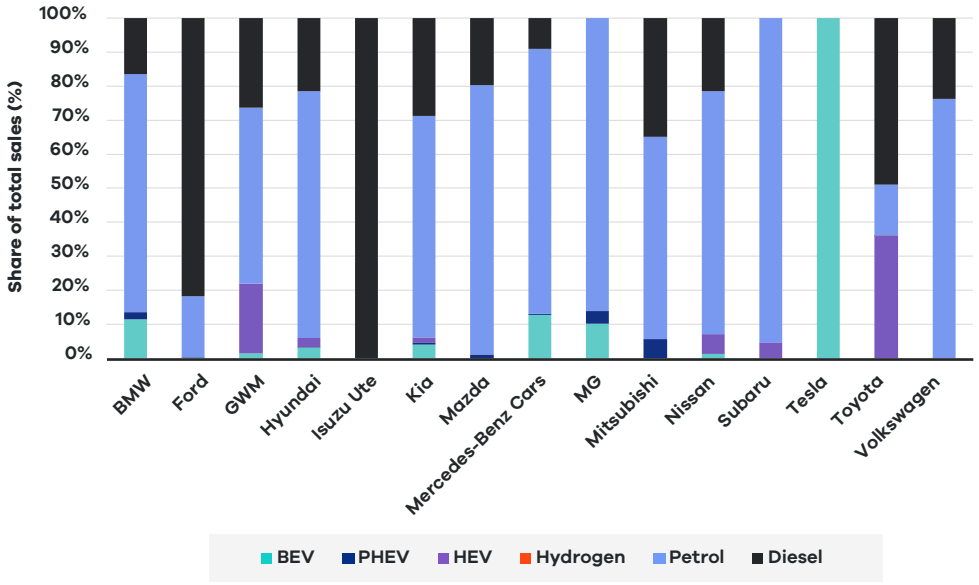
Figure 39: Average emissions intensity by powertrain and fuel type, 2023



3.5 Powertrain and fuel type (continued)

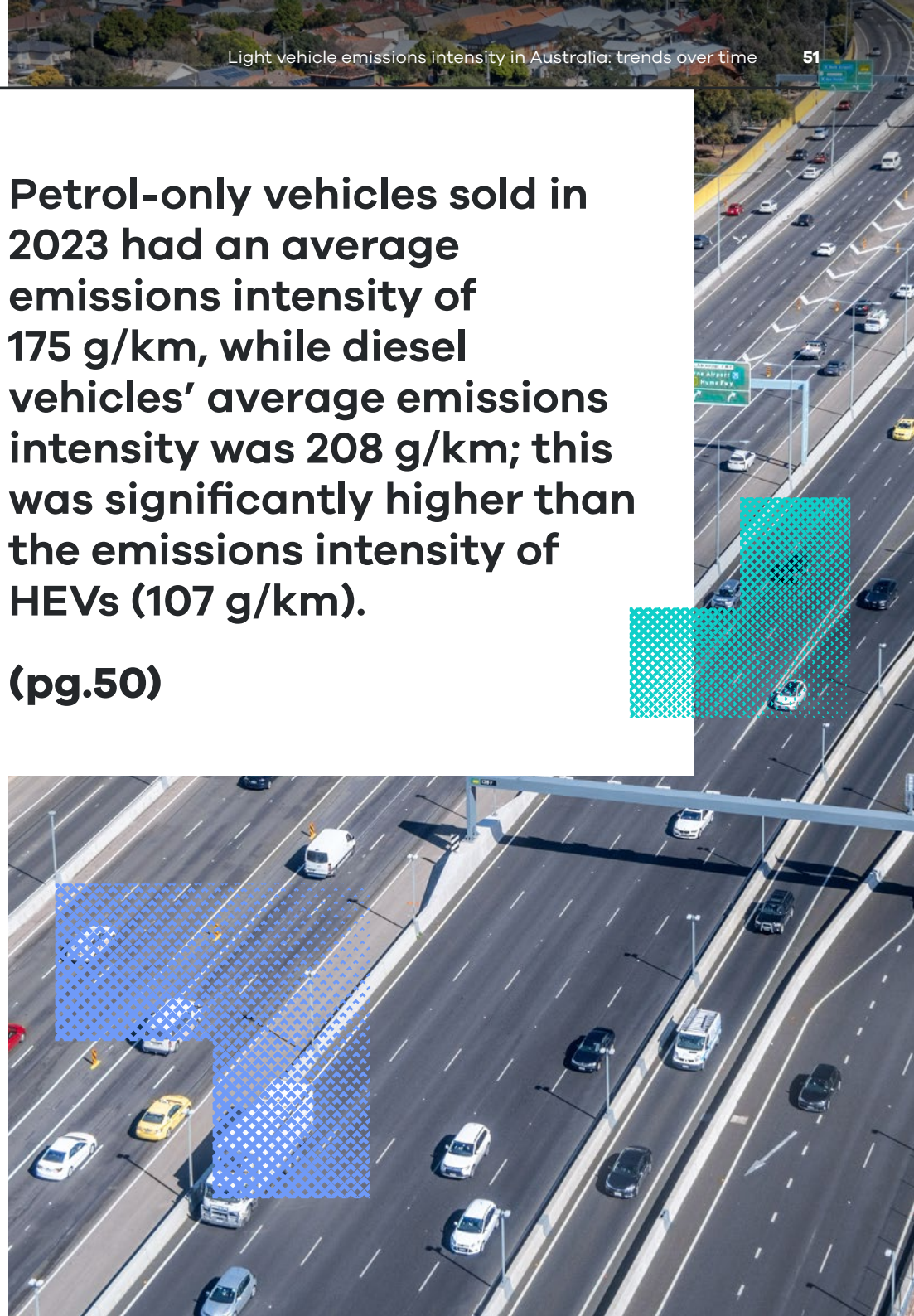
Among the top 15 selling manufacturers, there is some variation in the adoption of different technologies. **Figure 40** shows the differing mixes of petrol and diesel vehicles sold among the top 15 selling manufacturers in 2023. Most of Isuzu Ute and Ford's sales were diesel vehicles, as were almost half of Toyota's. Tesla had 100 per cent of its sales as BEVs, while three other makes (BMW, MG and Mercedes-Benz Cars) had more than 10 per cent of sales as BEVs. Toyota had the highest proportion of hybrid vehicle sales (36 per cent), with GWM second (20 per cent).

Figure 40: Share of total sales by powertrain and fuel type for top 15 selling makes, 2023



Petrol-only vehicles sold in 2023 had an average emissions intensity of 175 g/km, while diesel vehicles' average emissions intensity was 208 g/km; this was significantly higher than the emissions intensity of HEVs (107 g/km).

(pg.50)



3.5 Powertrain and fuel type (continued)

3.5.2 Powertrain and fuel type analysis – January 2024 registered vehicles

A similar analysis can be conducted using the January 2024 registered vehicles dataset. **Figure 41** shows the average emissions intensity by powertrain and fuel type. Liquefied Petroleum Gas (LPG) and Dual fuel (petrol and LPG) vehicles are included, and had the highest emissions (237 and 268 g/km, respectively). Registered vehicles with LPG as a primary or secondary fuel type were older vehicles (with the latest entering the fleet in 2017, but most doing so significantly earlier), in larger vehicle segments, and therefore they had the highest average emissions intensities. Internal combustion engine vehicles using diesel also had an average emissions intensity above 200 g/km. Additional data on the number of registered vehicles, most common vehicle models and average emissions intensity by powertrain and fuel type is available in **Table 27** in the appendix.

Figure 42 shows the share of vehicles by powertrain/fuel type for each of the top 15 most common vehicle makes. With the exception of vehicles made by Isuzu Ute, at least 50 per cent of registered vehicles were petrol for all of these vehicle makes. Around 10 per cent of Toyota's registered vehicles were hybrid vehicles. Ford and Mitsubishi had the second- and third-highest diesel vehicle shares, behind Isuzu Ute, and both also had a small share of LPG and dual fuel registered vehicles. The share of electric vehicles was small, with BMW's share of around 2 per cent being the highest among these vehicle makes.

Figure 41: Average emissions intensity by powertrain and fuel type, January 2024 registered vehicles

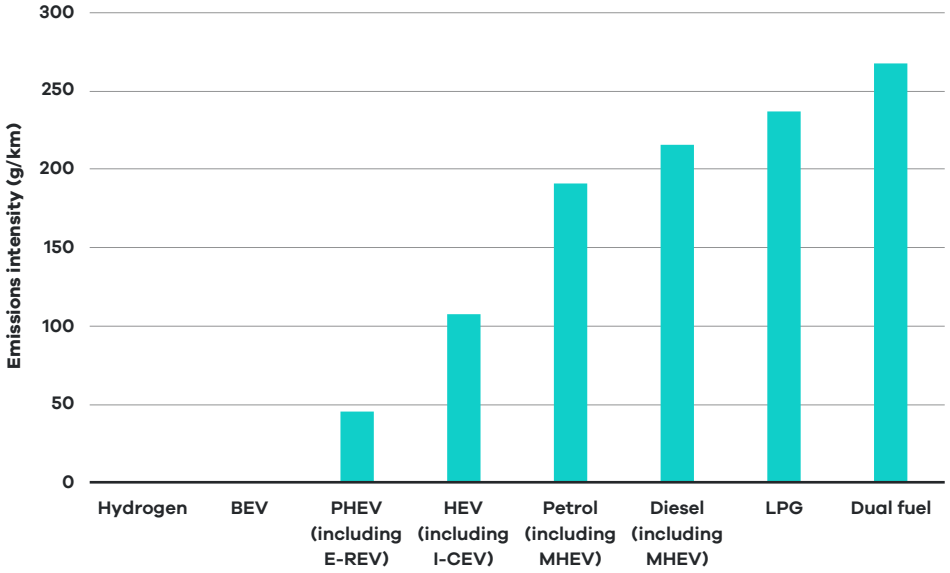
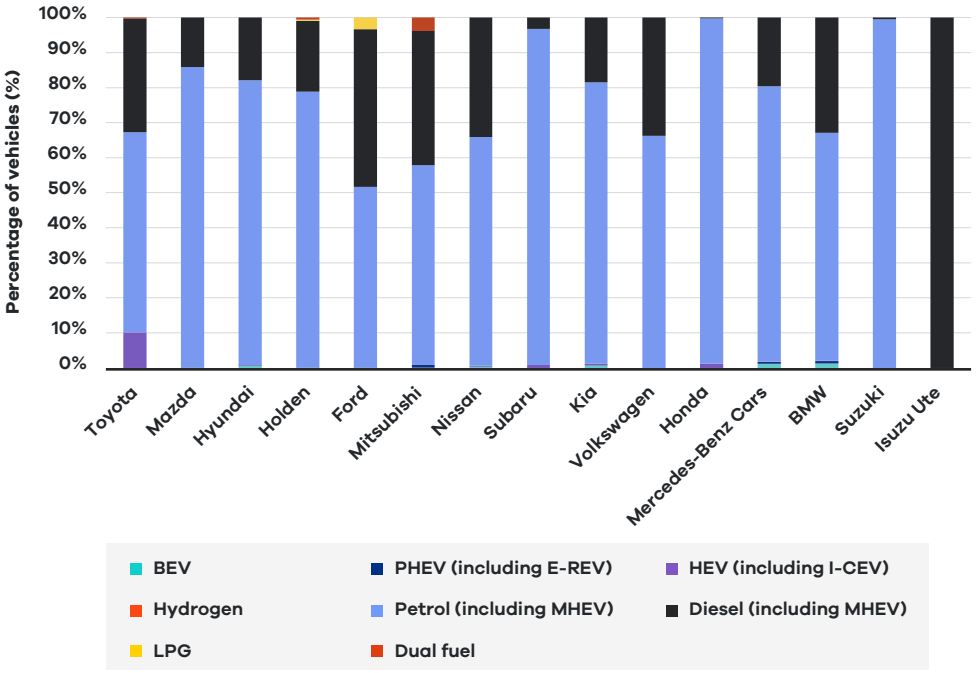


Figure 42: Share of total vehicles by powertrain and fuel type for top 15 makes, January 2024 registered vehicles

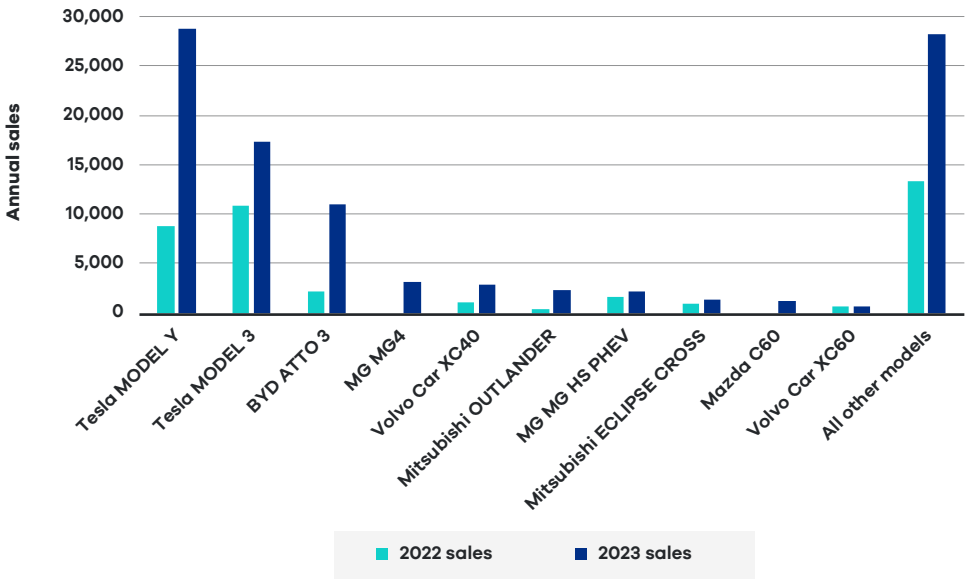


3.6 Electric and hybrid vehicles

This section provides more detailed information on electric vehicles – both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) – as well as separate graphs and data on hybrid electric vehicles (HEVs).[29]

3.6.1 Electric and hybrid vehicle analysis – 2023 sales

Figure 43: Sales of selected electric vehicles, 2022 and 2023



Data on electric vehicle sales and emissions can be broken down into the categories shown in **Table 4**. Plug-in hybrid electric vehicles are vehicles whose primary fuel type is electric (in the FCAI data), but which have a secondary engine/fuel type (that is, petrol or diesel) and have a non-zero emissions figure. Battery electric vehicles have no secondary engine/fuel type, and therefore no (tailpipe) emissions listed in the FCAI data. Sales of PHEVs almost doubled in 2023 compared with the previous year (a 95 per cent increase), while BEV sales increased by 161 per cent.

There were 127 models of electric vehicles sold in 2023 compared with 79 models in 2022. **Figure 43** shows the sales of the more popular electric vehicle models in 2022 and 2023. The first five models in the graph were the top-selling BEVs in 2023, the next five were the top selling PHEVs, followed by the combined total of all other electric vehicles. Additional data on sales by model, state and buyer type for 2022 and 2023 are provided in **Table 16**, **Table 17** and **Table 18** in the appendix.

Table 4: Emissions intensity and annual sales for electric vehicles, 2022 and 2023

Electric vehicle type	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Plug-in Hybrid Electric Vehicles (PHEV)	44	44	-0.9%	5,930	11,582
Battery Electric Vehicles (BEV)	0	0	N/A	33,393	87,215
Total	**N/A**	**N/A**	**N/A**	**39,323**	**98,797**

29 HEVs are powered by an internal combustion engine in combination with one or more electric motors that use energy stored in batteries, with the batteries not being recharged from an external electricity source. They are listed in the FCAI data as having a petrol or diesel primary fuel source, and an electric secondary fuel source. For the purpose of this report, we have not included 'mild hybrid' vehicles – which cannot be solely powered by the electric motor – with HEVs (which are able to operate on electric-only power, though in some cases for short distances or at low speeds). Instead, mild hybrid electric vehicles (MHEVs) have been included with the relevant fuel type of internal combustion engine vehicles (in the analysis of the January 2024 registered vehicles data).

3.6 Electric and hybrid vehicles (continued)

Table 5 summarises electric vehicle sales data by state and territory, with most sales occurring in the three main eastern states (as expected given the higher populations).

Table 19 in the appendix contains more detailed information on BEV sales by state/territory and model in the latest year. A July 2023 article by the ABC discussed prices and trends in used electric vehicles, noting that among certain buyer types such as fleets and governments, vehicles are expected to enter the second-hand market at the conclusion of lease periods of three to five years (ABC, 2023). **Table 20** in the appendix contains data on annual electric vehicle sales, comprising both BEVs and PHEVs, by buyer type from 2013 to 2023.

Table 6 reports on the sales and emissions intensity for hybrid vehicles (HEVs). Sales of these vehicles were around 20 per cent higher in 2023 than the previous year, while their average emissions intensity increased by around 2 per cent.

There were 37 models of hybrid vehicles sold in 2023 compared with 35 models in 2022. **Figure 44** shows the sales of the most popular hybrid vehicle models in 2022 and 2023. Toyota sold around 73 per cent of all hybrid vehicles in 2023, down from a corresponding figure of 89 per cent in 2022. Sales of most of Toyota's hybrid vehicles decreased in 2023 compared with the previous year, with the exception of the Toyota CAMRY HYBRID and Toyota COROLLA CROSSHV (although the total number of hybrid vehicles Toyota sold fell only slightly, decreasing by 750 to 72,065). Sales of hybrid vehicles from other makes increased significantly. Additional data on hybrid vehicle sales by model for 2022 and 2023 is provided in **Table 21** in the appendix.

Figure 44: Sales of selected hybrid vehicles, 2022 and 2023

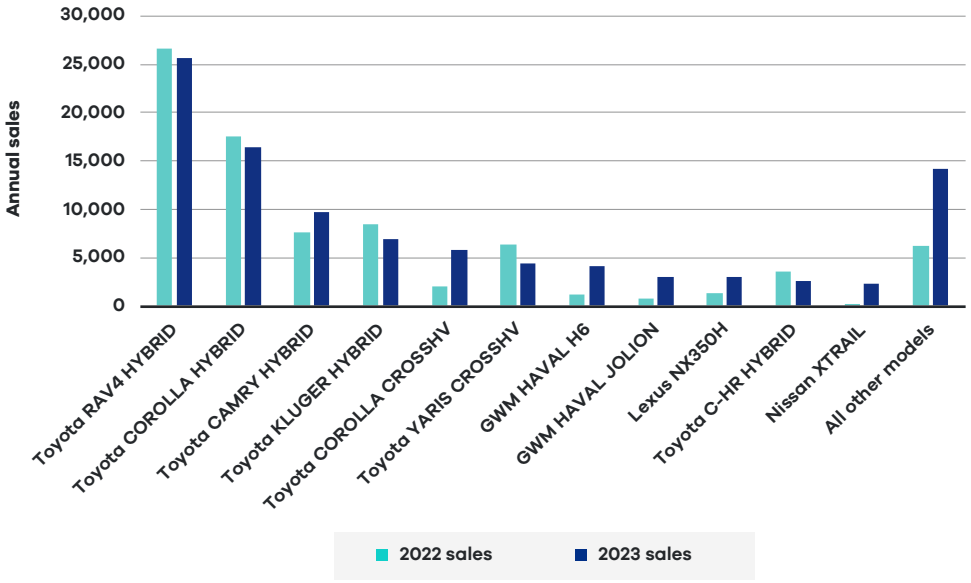


Table 5: Electric vehicle sales by state and territory in 2023

Description	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Australia
Electric vehicle sales in 2023	3,956	32,367	316	20,795	5,157	1,590	25,262	9,354	98,797

Table 6: Emissions intensity and annual sales for hybrid vehicles, 2022 and 2023

Hybrid vehicle type	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Hybrid Electric Vehicle (HEV)	105	107	2.2%	81,825	98,172

3.6 Electric and hybrid vehicles (continued)

Electric and hybrid vehicles have been purchased to varying degrees by different buyer types. **Figure 45** shows the percentage of total sales made up of BEVs, PHEVs, HEVs and hydrogen vehicles for various buyer types. Overall, private buyers were by far the biggest purchasers of electric vehicles in both absolute numbers and as a percentage of total sales. Private buyers were also the largest purchaser of HEVs in absolute numbers, although government buyers had a higher share of sales that were HEVs (with over 15 per cent of government purchases being hybrid vehicles).

Figure 46 shows similar information by detailed buyer type. 'Company capitalisation', 'Business – overseas delivery', 'Private – overseas delivery' and 'Fleet' were the buyer types with the highest proportions of electric vehicle sales (all with approximately 10 per cent of total sales being either BEVs or PHEVs). As in previous years, around 90 per cent of taxi purchases in 2023 were hybrid vehicles, albeit this represented around 880 vehicles.

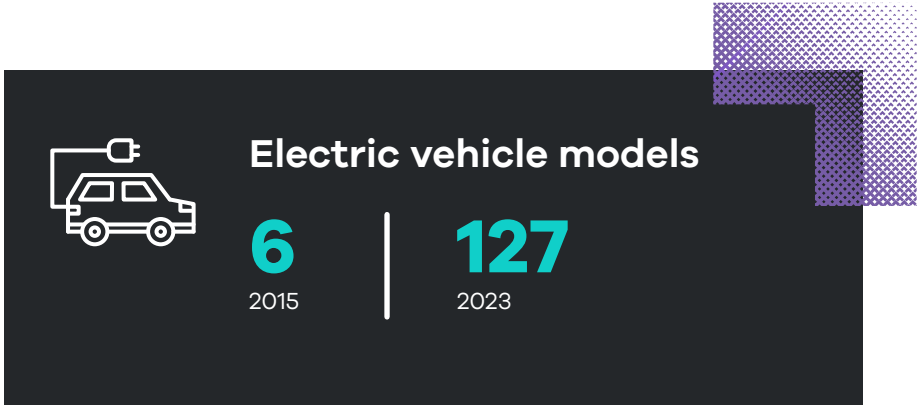


Figure 45: Percentage of total sales that were electric, hybrid or hydrogen vehicles by buyer type, 2023

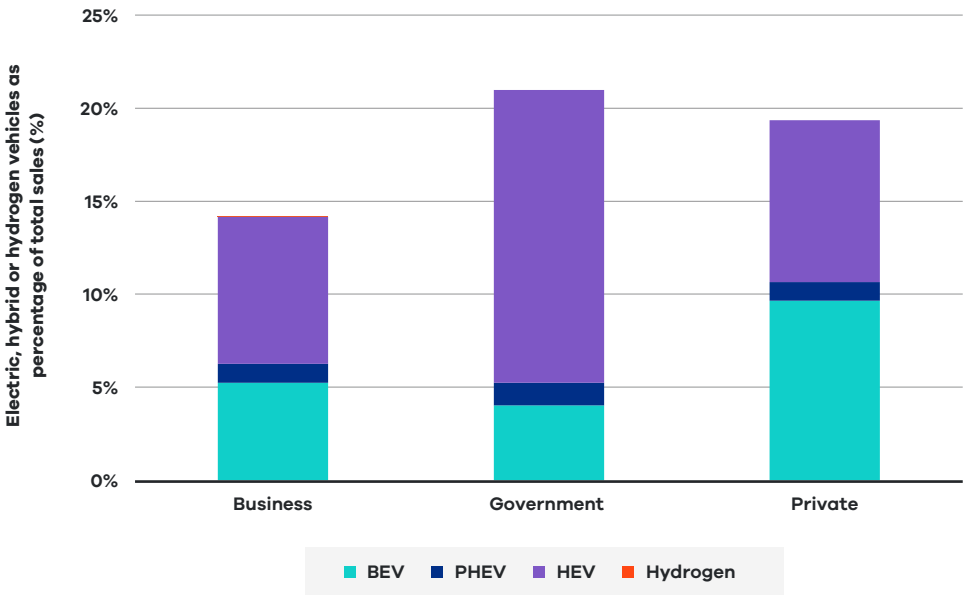
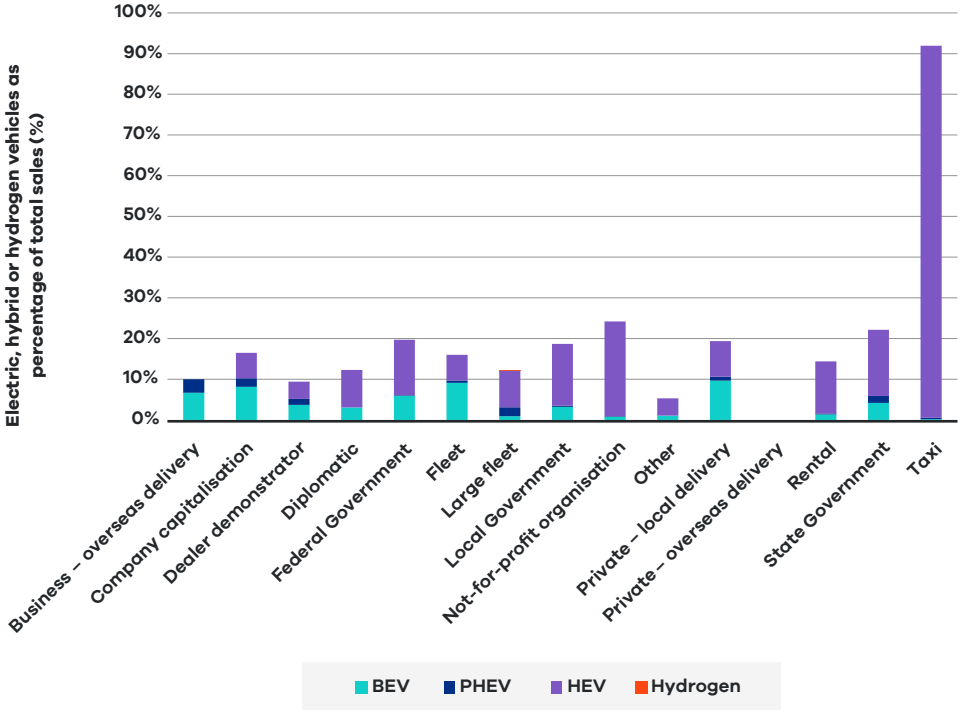


Figure 46: Percentage of total sales that were electric, hybrid or hydrogen vehicles by detailed buyer type, 2023



3.6 Electric and hybrid vehicles (continued)

Figure 47 compares the percentages of electric and hybrid vehicles for each state and territory government, as well as the federal government and all local governments. The ACT government had by far the highest share of electric vehicles as a proportion of total sales, with almost 40 per cent of its vehicle purchases being electric; however, the total number of vehicles it purchased in 2023 was relatively small at 355 vehicles. The Northern Territory government had the second highest share of BEV sales at 7.8 per cent, followed by Queensland with 7.5 per cent. All governments purchased at least 11 per cent of their fleet as either electric or hybrid vehicles in 2023, but for most governments most of these were hybrid vehicles. **Table 22** in the appendix provides further detail on the powertrain/fuel type of vehicle purchases by governments.

Although sales of BEVs and PHEVs, and to a lesser extent HEVs, remain relatively low overall, they have increased significantly in recent years, as demonstrated in **Figure 48**, which shows the share of total sales by powertrain and fuel type from 2014 to 2023.[30] In 2022, the share of petrol- or diesel-only vehicles was below 90 per cent for the first time (88 per cent), while in 2023 it fell further to 83 per cent. The diesel share of vehicle sales fell by 3 percentage points in 2023, although the overall number of diesel vehicles sold was slightly higher than in 2022.

Figure 47: Percentage of total sales that were electric or hybrid vehicles by government, 2023

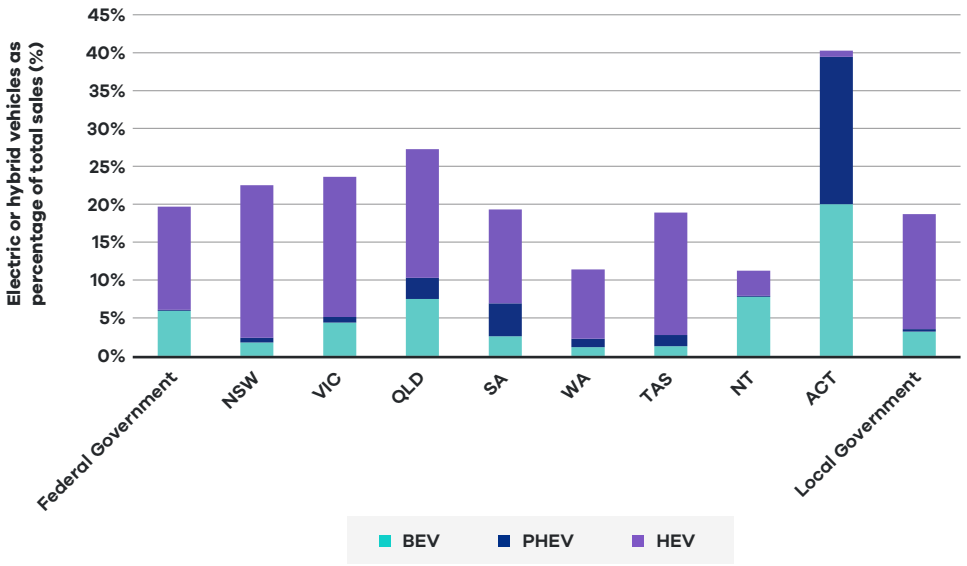
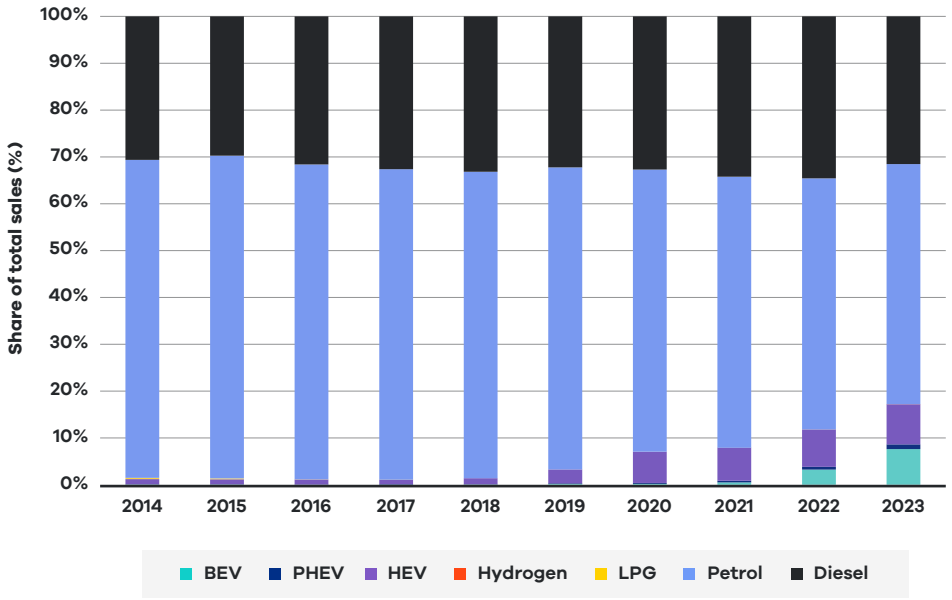


Figure 48: Share of total sales by powertrain/fuel type, 2014-2023

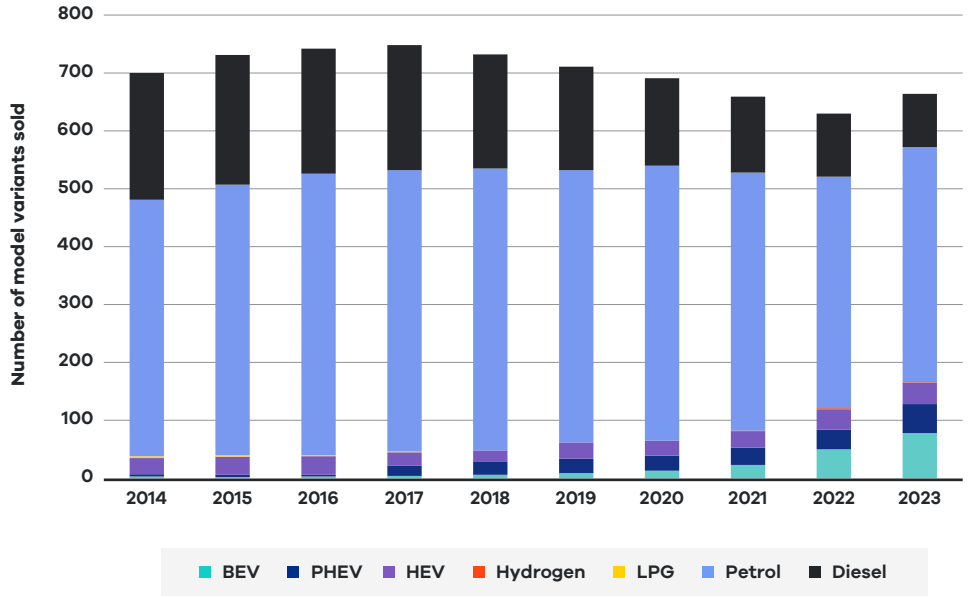


30 2014 was chosen as the starting point as it is the first year for which we have data available on the secondary fuel type, needed to distinguish between BEVs and PHEVs, and between HEVs and internal combustion engine-only vehicles.

3.6 Electric and hybrid vehicles (continued)

This result in part reflects the increased availability of BEV, PHEV and HEV model variants in the Australian market over time. **Figure 49** shows that the number of PHEV model variants sold in the Australian market increased significantly in 2017, when it reached 18, and has increased further since then to 50 variants in 2023. BEV model variants sold have also increased from just 2 in 2015 to 50 in 2022 and 78 in 2023. The overall number of model variants sold in Australia peaked in 2017, with the subsequent decline primarily due to diesel variants (which have declined in each year since 2017), although petrol variants also decreased significantly after 2020. Overall, 2023 saw a slight increase in the number of variants sold – reversing a trend for the previous few years – primarily due to the increased availability of electric and hybrid vehicles (with a small increase in petrol model variants as well).

Figure 49: Number of model variants sold in Australia by powertrain/fuel type, 2014-2023



3.6 Electric and hybrid vehicles (continued)

While the overall sales and availability of electric and hybrid models have increased significantly, albeit from a low base, this has been concentrated in certain vehicle segments. **Figure 50** shows that these types of vehicles were primarily sold in the 'SUV Medium', 'Medium', 'SUV Small' and 'Small' segments in 2023, while many segments had either no or very few sales of electric or hybrid vehicles. As a share of total sales, the 'Large' and 'Upper Large' segments also had relatively high shares of electric vehicles in 2023, but with relatively low sales overall compared with most other segments. **Figure 50** also demonstrates the decline in sales between 2014 and 2023 for most of the passenger vehicles segments towards the left of the graph, and corresponding increase in the SUV and ute segments.

Figure 50: Comparison of vehicle sales by powertrain/fuel type in different segments, 2014 and 2023

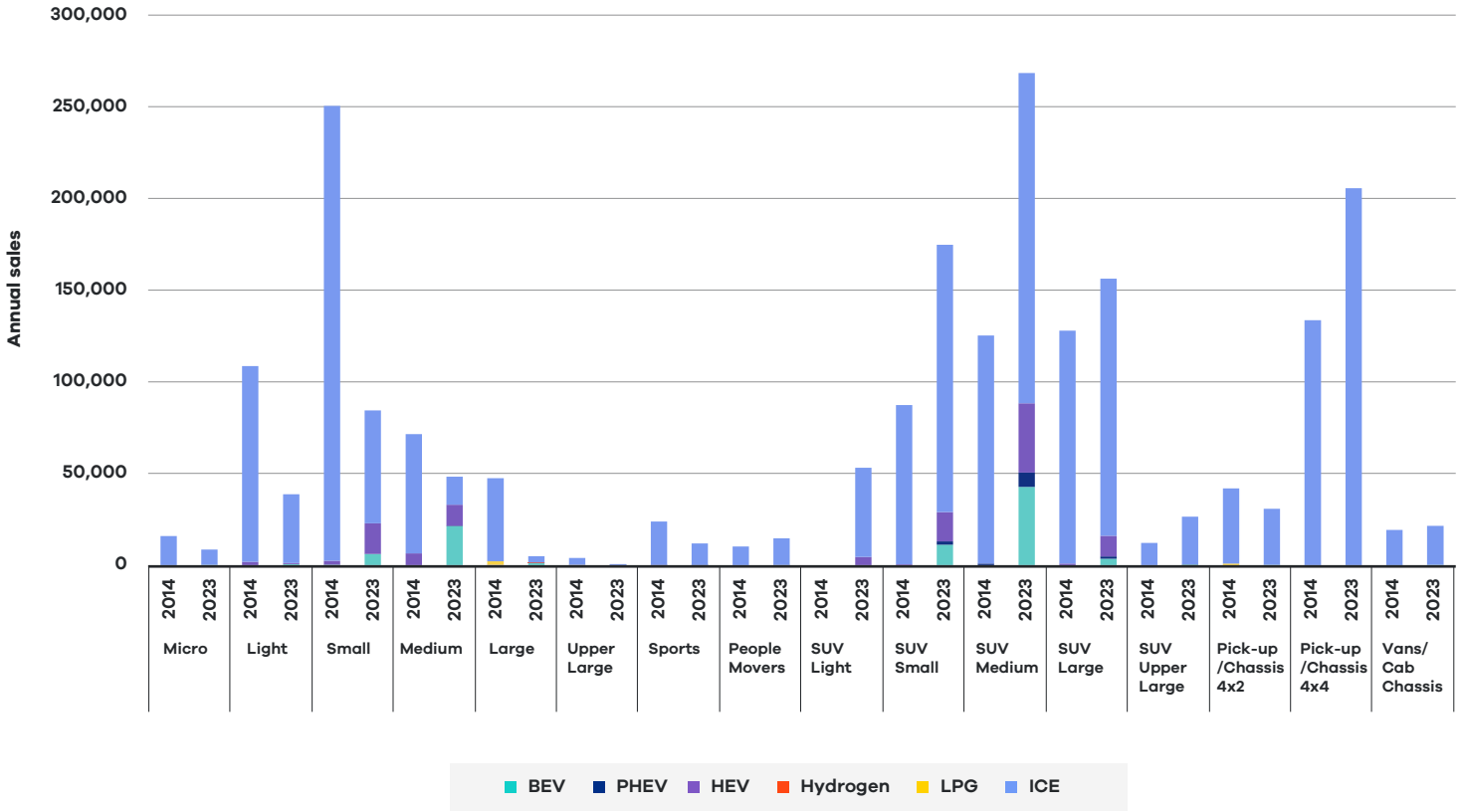


Figure 50 also demonstrates the decline in sales between 2014 and 2023 for most of the passenger vehicles segments towards the left of the graph, and corresponding increase in the SUV and ute segments.

3.6 Electric and hybrid vehicles (continued)

Improved battery technology and the increased number of BEV models available in Australia has improved the driving range of these vehicles in recent years. **Figure 51** shows the minimum, maximum and sales-weighted average driving range of BEVs sold in Australia (with data prior to 2022 not including Tesla as no sales data by Tesla model or variant was available).

Since 2016 there has been a significant increase in the average driving range of BEVs sold in Australia, with the average rising by 28 per cent in 2022 (increasing from 370 km in 2021 to 473 km in 2022). This increase may be slightly overstated because data on Teslas sold was not available for most of the time period shown – which may otherwise have raised the average driving range for earlier years. The average driving range in 2023 fell slightly to 470.7 km. This result may in part be due to the high sales share of the Tesla MODEL Y in 2023, which tends to have a lower driving range than the Tesla MODEL 3 (on a like-with-like basis for the different model variants).[31] The average driving range for all non-Tesla BEVs – the basis on which all years prior to 2022 are calculated in **Figure 51** – continued to increase in 2023, reaching 451.7 km (the highest of any year in the time period covered by the graph). The maximum range across all models sold has also increased quickly, from below 200 km in 2016 to above 650 km in 2023.

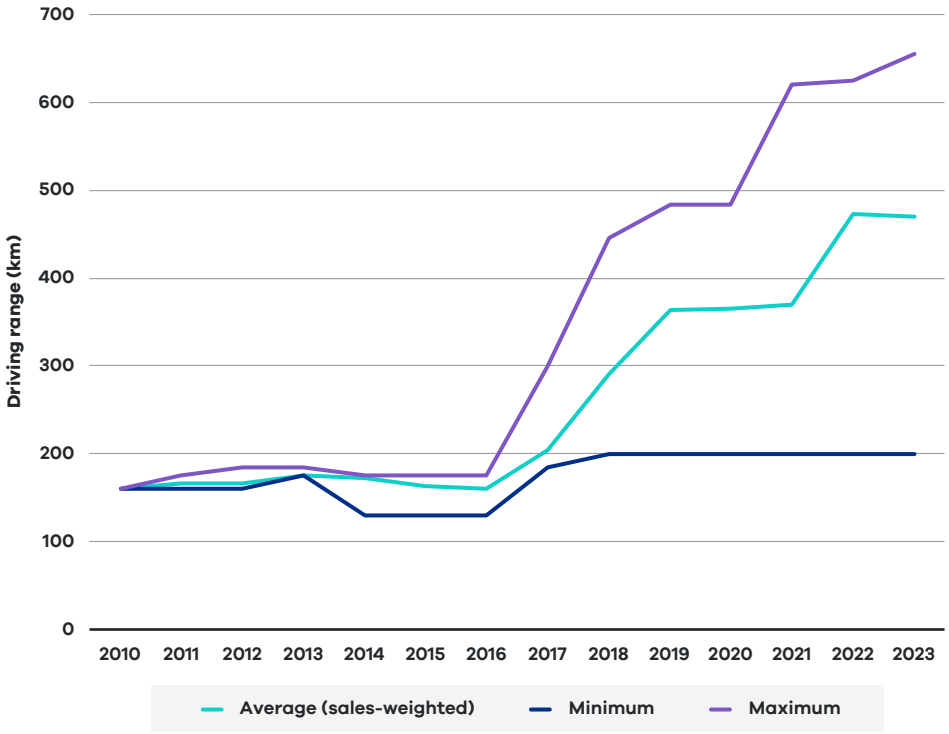
The average battery electric vehicle driving range is improving.

For 2023 it was

470 km

100 km higher than in 2021.

Figure 51: Driving range for BEV models sold in Australia, 2010-2023



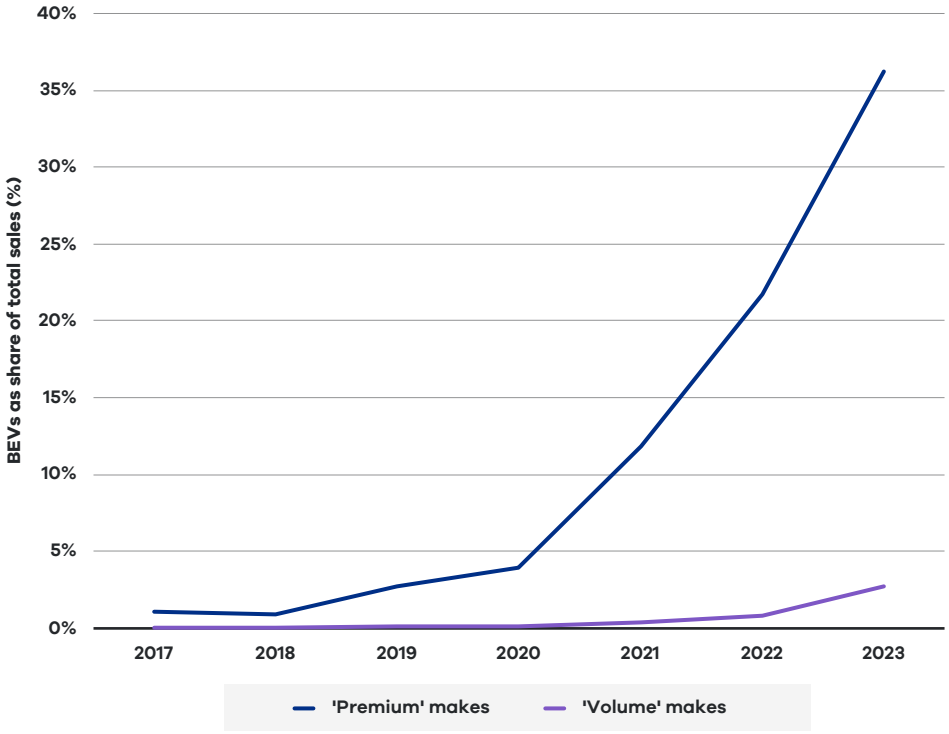
Source: NTC analysis based on FCAI sales data and driving ranges collected from a variety of sources including manufacturers' websites, the *Vehicle Emission Star Rating* tool, Electric Vehicle Council *State of Electric Vehicles* reports and other websites for historical models.

31 In 2023, the Tesla MODEL Y outsold the Tesla MODEL 3, whereas the opposite was true in 2022. Given the high sales share of Tesla models among all BEVs, this is enough to influence the results for the weighted average driving range.

3.6 Electric and hybrid vehicles (continued)

The share of BEV sales as a proportion of total sales varies between manufacturers. 'Premium' makes have tended to lead in electric vehicle sales, in part due to the relatively higher cost of manufacturing electric vehicles and their batteries and the typically higher prices that these makes can charge (ABC, 2021). In research by S&P Global published by the FCAI, 'premium' makes are forecast to have 77 per cent of their sales as BEVs by 2033 compared with 21 per cent for volume makes (FCAI, 2022). Using the same categorisation of 'premium' and 'volume' makes, based on a list provided by the FCAI to the NTC, **Figure 52** shows that this trend has already begun, with 'premium' makes having 36.2 per cent of their total sales as BEVs in 2023 compared with 2.7 per cent for 'volume' makes (which sold around 85 per cent of all vehicles in 2023). For the purposes of this analysis, all vehicles sold by 'volume' makes were classified as 'volume' sales (even though some vehicle models or model variants sold by these makes may be considered 'premium' vehicles); and similarly, all sales by 'premium' makes were classified as 'premium'.

Figure 52: Share of total sales that are BEVs for 'premium' and 'volume' makes, 2017–2023



Source: NTC analysis based on classification of 'premium' and 'volume' makes provided by the FCAI, VFACTS sales data, and Tesla data from VFACTS and state- and territory-based registration systems (with Tesla 'sales', calculated based on the annual difference in the number of registered vehicles for all years prior to 2022, included among the 'premium' makes).

3.6 Electric and hybrid vehicles (continued)

3.6.2 Electric and hybrid vehicle analysis – January 2024 registered vehicles

Figure 53 shows the number of registered electric vehicles – distinguished by BEVs (shown in green) and PHEVs (shown in dark blue) – in January 2024, focusing in particular on the 15 most common vehicle models. The number of registered vehicles for these 15 models collectively comprised around 78 per cent of all registered electric vehicles. Tesla's MODEL 3 (45,622 vehicles) and MODEL Y (37,499 vehicles) were the clear leaders, with the BYD ATTO 3 the third most common model. The Mitsubishi OUTLANDER was the most common PHEV model, with almost 6,500 vehicles. Overall, ten different vehicle makes were represented among the 15 most common vehicle models shown. There were 21 BEV models which had at least 1,000 registrations nationally (see **Table 28** in the appendix).

The number of registered BEVs by make, shown for each state or territory, is shown in **Figure 54**. As expected, NSW (47,971), Victoria (38,875) and Queensland (32,610) had the highest number of registered BEVs. Tesla was the leading make of BEVs in all states and territories, with more than 50 per cent of registered BEVs in five of the 8 jurisdictions (although it was still the most common make in each of the other three). The states/territories with the lowest Tesla shares were Tasmania (34 per cent) and the NT (43 per cent).

In these jurisdictions, other makes such as MG, Kia, Hyundai and Nissan also had significant shares of registered BEVs – albeit with relatively few vehicles overall since these two jurisdictions had the fewest registered BEVs. Detailed data on the number of BEVs registered by state/territory, including all vehicle makes and models, is available in **Table 28** in the appendix.

Figure 53: Number of electric vehicles (top 15 models), January 2024 registered vehicles

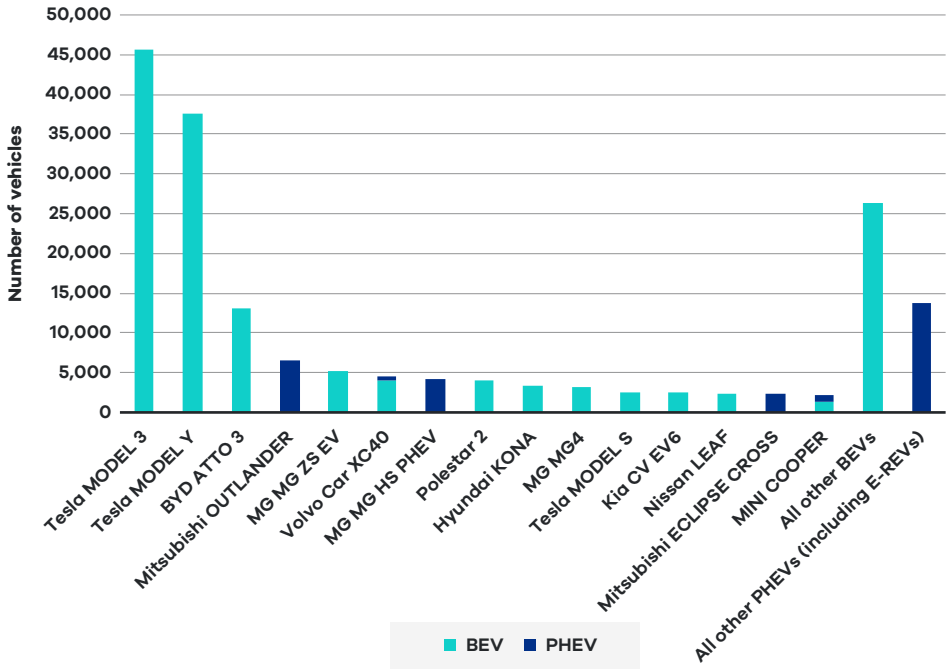
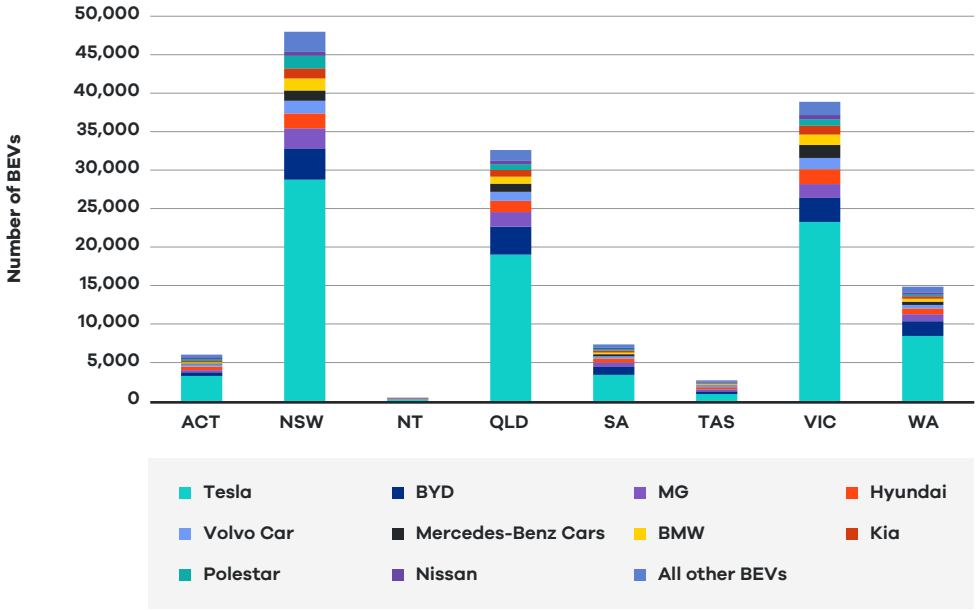


Figure 54: Number of battery electric vehicles by make and state or territory, January 2024 registered vehicles



3.6 Electric and hybrid vehicles (continued)

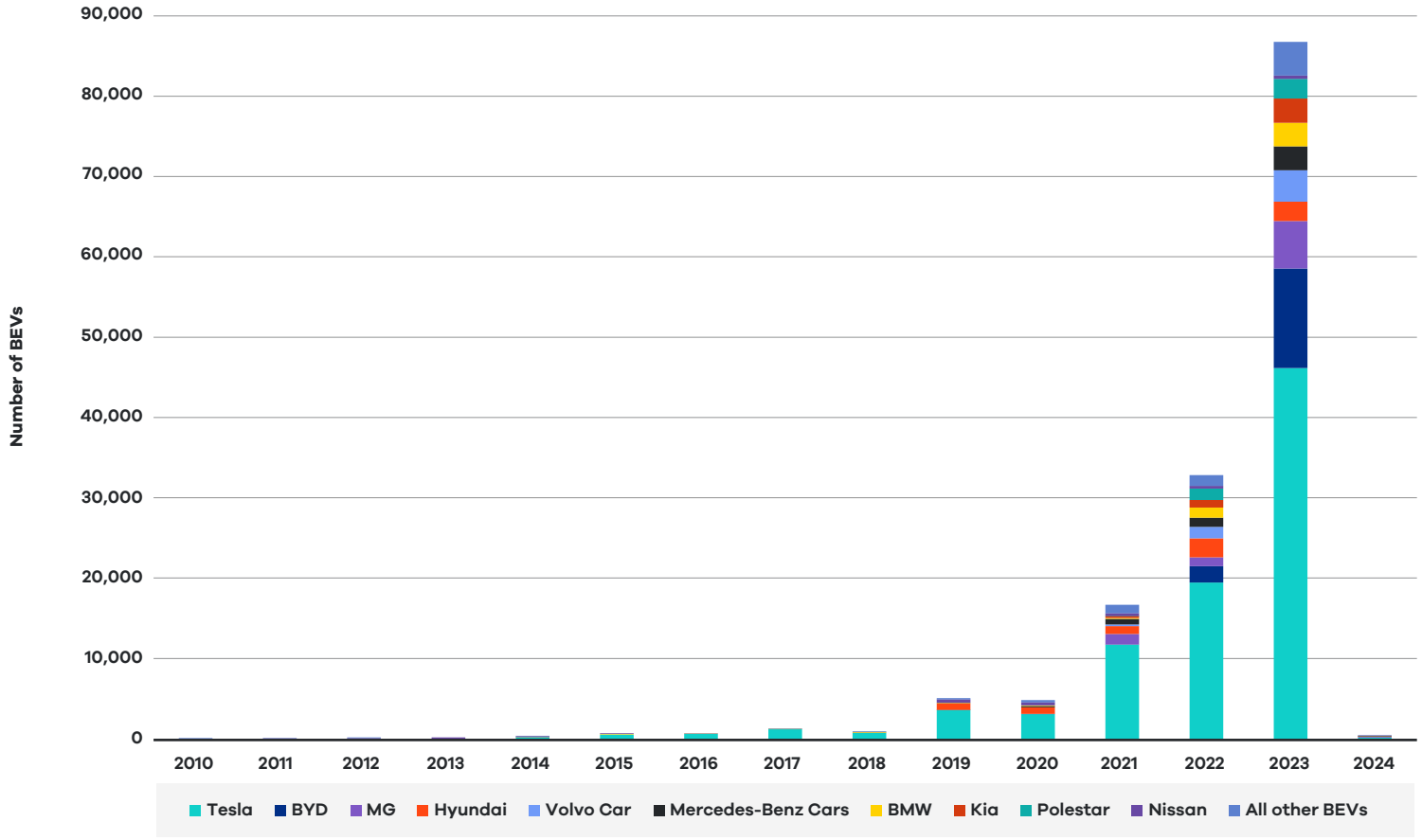
Tesla accounted for more than

50%

of registered BEVs in five out of Australia's eight state and territories

The number of BEVs registered, distinguished by the year that they entered the fleet, is shown in **Figure 55**. The vast majority (around 91 per cent) of registered BEVs in January 2024 entered the fleet since the beginning of 2021. In each year between 2014 and 2023 (inclusive), more than half of BEVs entering the fleet were Teslas. However, makes such as BYD, MG and Hyundai have also had significant numbers of BEVs entering the fleet in recent years.

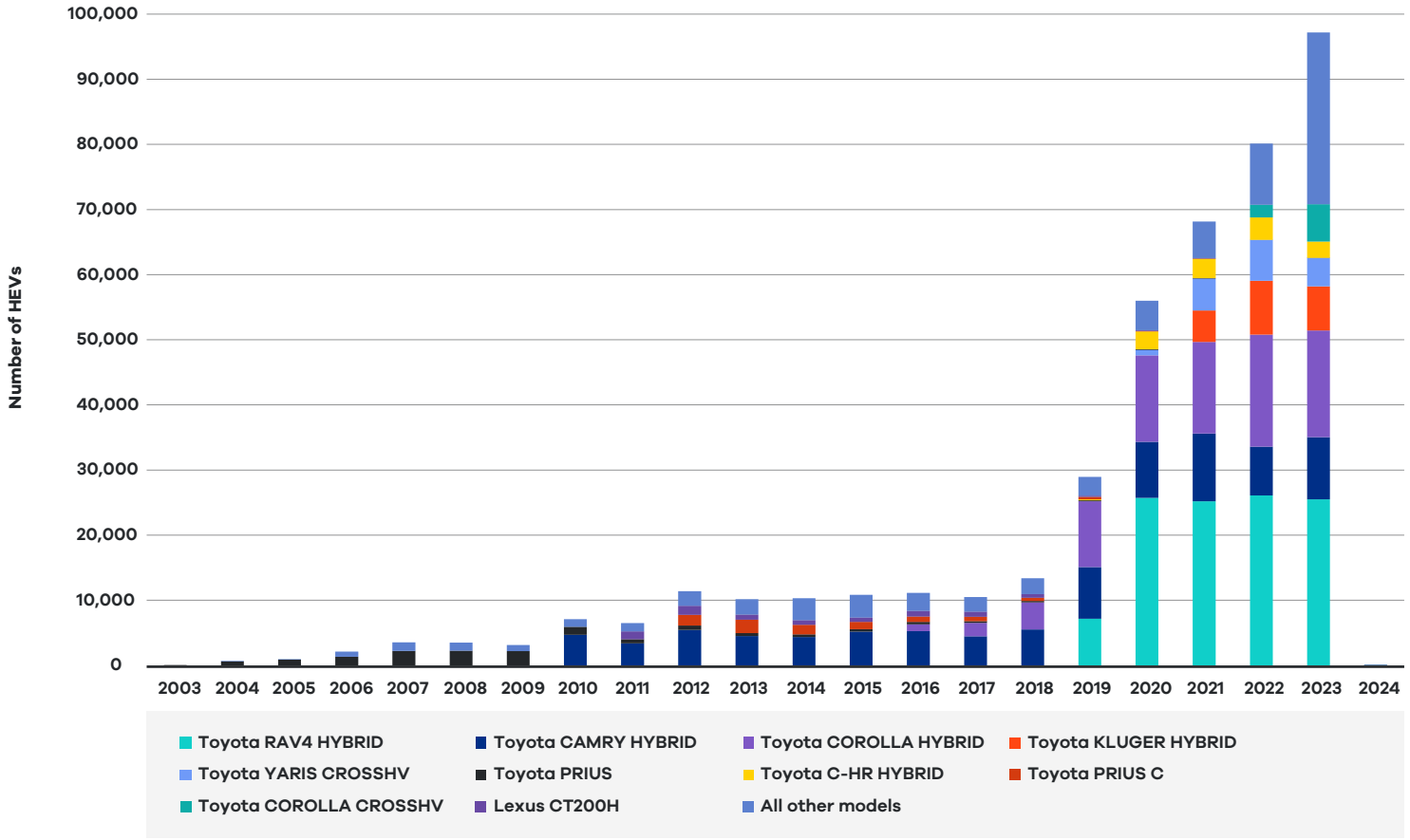
Figure 55: Number of battery electric vehicles by year first registered, January 2024 registered vehicles



3.6 Electric and hybrid vehicles (continued)

Figure 56 shows the number of HEVs registered as at January 2024, which totalled 435,887 vehicles. Toyota was the clear leader: nine of the top 10 most common HEV models were made by Toyota, and around 83 per cent of all registered HEVs were Toyotas. However, over time, the most common models of HEVs entering the fleet in each year changed as shown in **Figure 56**. There were almost 110,000 Toyota RAV4 HYBRIDs registered in January 2024, and all entered the fleet since 2019. By contrast, the second most common hybrid vehicle, the Toyota CAMRY HYBRID (with 86,837 vehicles) first entered the fleet in 2010, and was the most common model in each year until 2018.

Figure 56: Number of hybrid vehicles by year first registered, January 2024 registered vehicles



3.6 Electric and hybrid vehicles (continued)

Despite the strong growth of electric and hybrid vehicles in recent years, the registered light vehicle fleet in January 2024 was still almost entirely made up of internal combustion engine vehicles, as shown in the right-most column in **Figure 57**. Around 96 per cent of registered vehicles were petrol, diesel, LPG or dual fuel. However, around 9 per cent of registered vehicles that entered the fleet since 2018 were electric or hybrid vehicles. Around 2 per cent of January 2024-registered vehicles which entered the fleet between 2003 and 2007 were LPG or dual fuel vehicles.

An analysis of powertrain/fuel type by vehicle segment in **Figure 58** shows that there was significant variation across the different segments. The 'Medium' and 'SUV Medium' segments both had relatively high shares of electric and hybrid vehicles. The 'Upper Large' segment also had a relatively significant share of BEVs, albeit there were only around 55,000 vehicles registered in this segment overall. Diesel vehicles were most common for light commercial vehicles segments (utes, vans and light buses), as well as larger SUVs and people movers. Most LPG and dual fuel vehicles were in the 'Large' and 'Pick-up/Chassis 4×2' segments.

Figure 57: Share of total vehicles by powertrain and fuel type by time period of year first registered, January 2024 registered vehicles

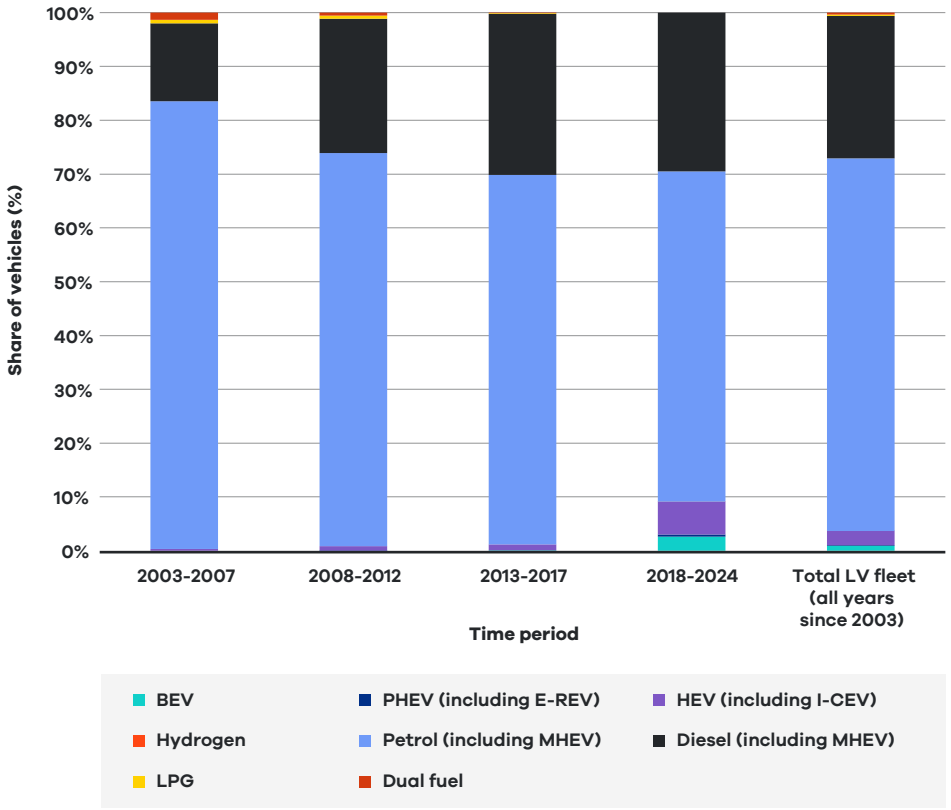
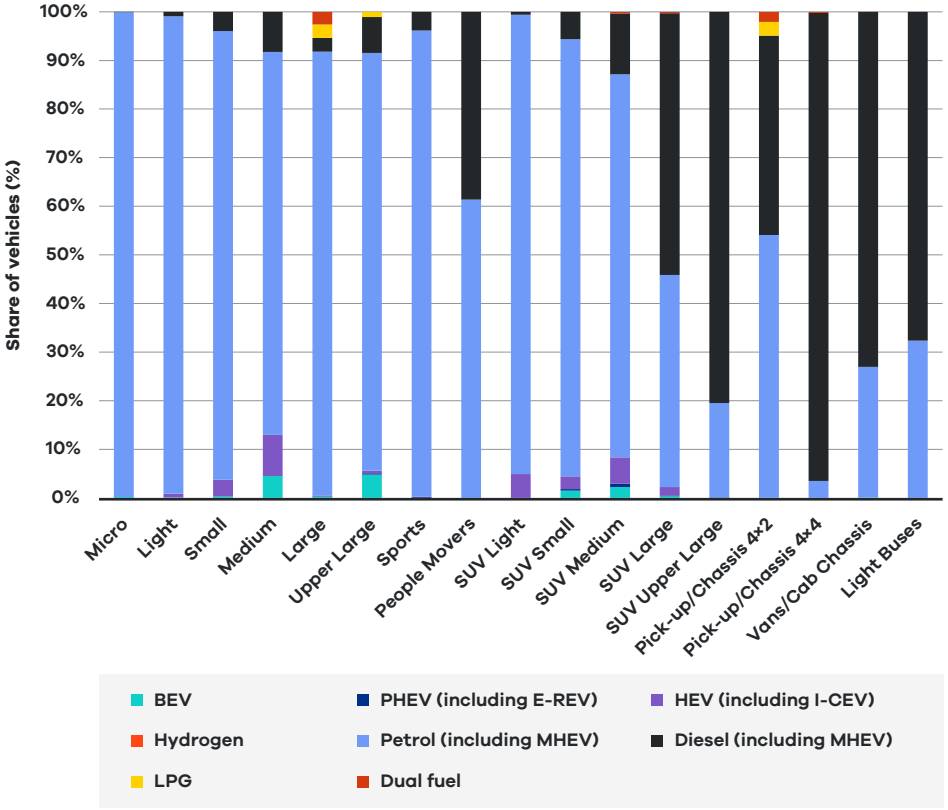


Figure 58: Share of total vehicles by powertrain and fuel type by segment, January 2024 registered vehicles



3.6 Electric and hybrid vehicles (continued)

This section concludes with an analysis of driving range for electric vehicles registered in January 2024, building on the analysis from **Figure 51** earlier in the report. **Figure 59** shows the range – that is, minimum and maximum among all models/variants of BEVs, depicted by the vertical line – of electric driving ranges for BEVs in each segment, as well as the weighted average value among all vehicles in that segment (shown as the green bar for each segment). Nine segments had an average electric driving range exceeding 400 km, with several of these being above 500 km. Average driving ranges tended to be lower for smaller passenger cars and for light commercial vehicles. Six segments also had a vehicle model with a driving range above 600 km. Three segments – 'SUV Light', 'Pick-up/Chassis 4×4' and 'Light Buses' – did not have any registered BEVs, and therefore have driving ranges displayed as zero.

While **Figure 59** focused on BEVs, **Figure 60** focuses on the electric driving range of PHEVs. PHEVs serve a different purpose and market to BEVs, with the electric power in a PHEV typically suitable for short daily trips. This is evidenced in the data shown in **Figure 60**, with driving ranges well below what is shown in **Figure 59**. The data in this graph begins in 2013, when the first PHEVs (that remained registered in January 2024) entered the Australian fleet. The minimum electric driving range among all models was below 40 km for all years (except 2024, which had very few vehicles). The maximum driving range was generally above 80 km in most years, while the average driving range among vehicles in each year was generally around 50 km before increasing in recent years. The average electric driving range for all PHEVs registered in January 2024 was 60.2 km.

Figure 59: Range and average BEV driving range by segment, January 2024 registered vehicles

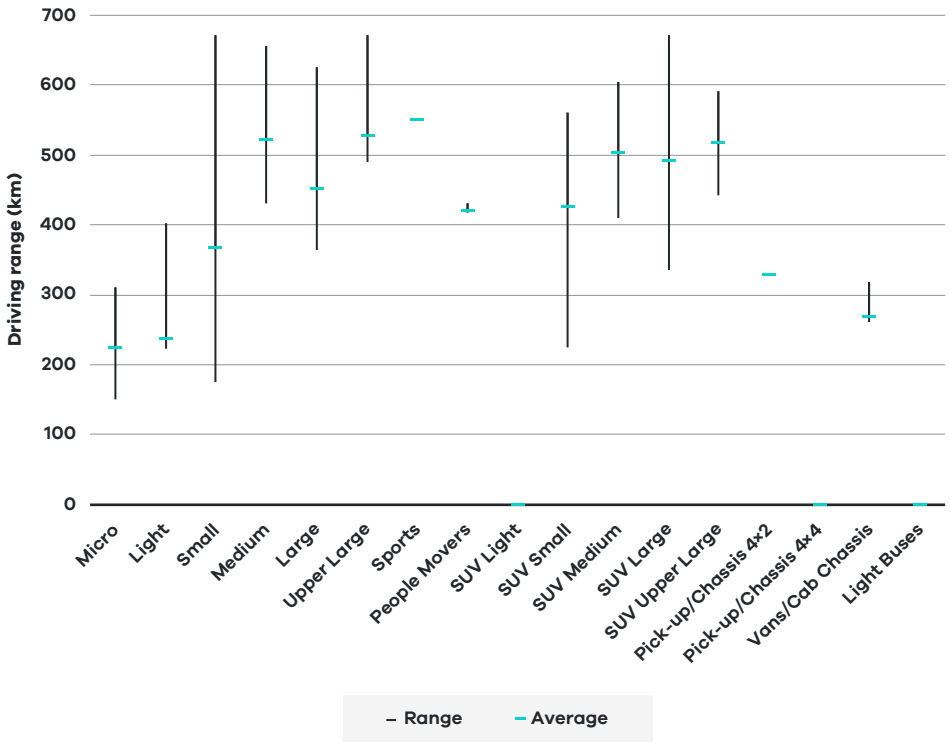
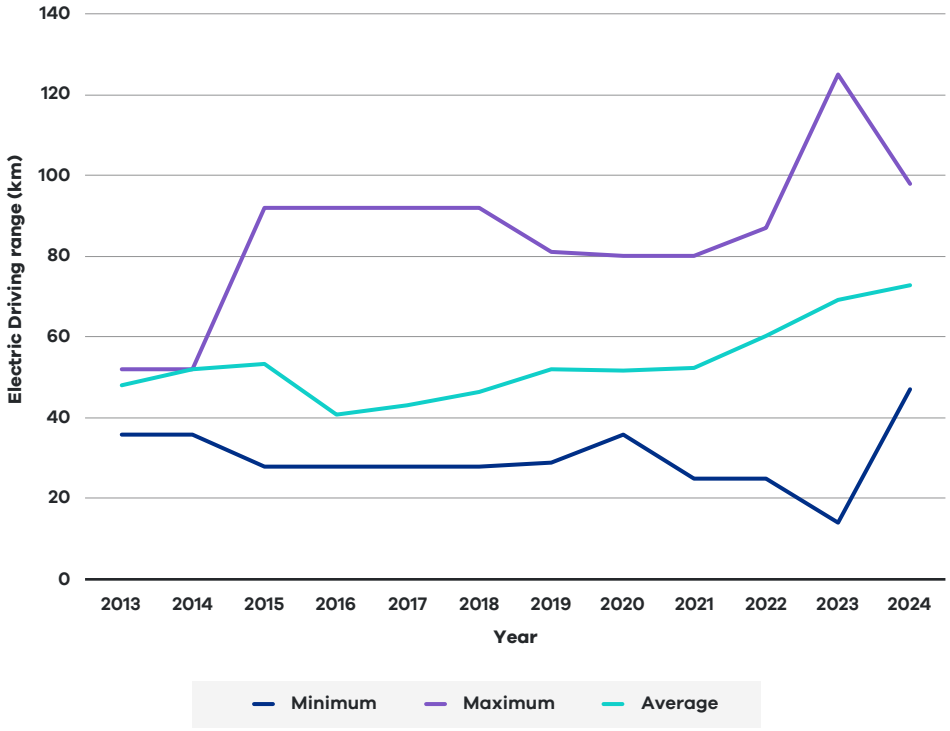


Figure 60: Driving range for PHEV models by year of first registration, January 2024 registered vehicles



3.7 Green vehicles

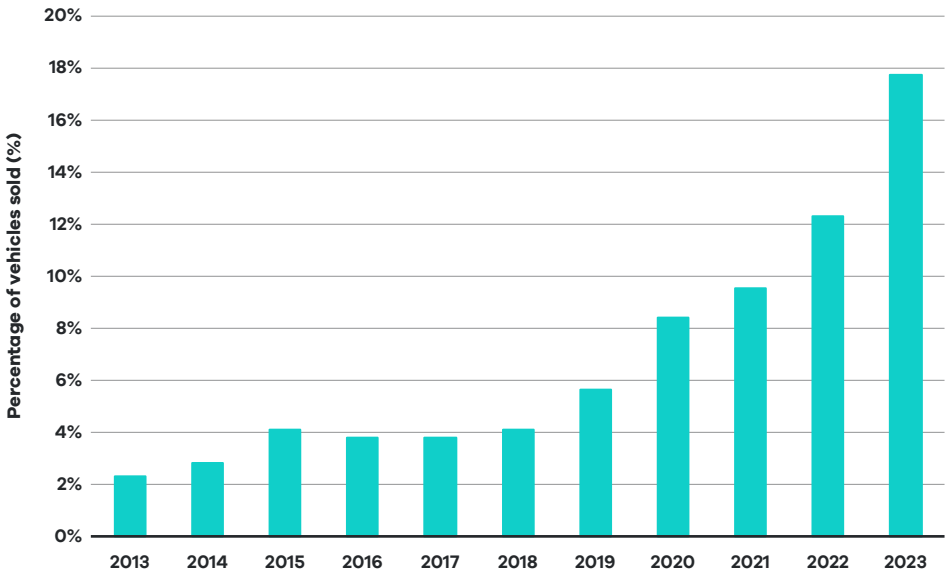
For the purpose of this analysis, the NTC has defined a 'green' vehicle as one whose carbon dioxide emissions intensity does not exceed 120 g/km.

3.7.1 Green vehicles analysis – 2023 sales

The proportion of green vehicles sold in 2023 was 17.8 per cent of total sales (compared with 12.3 per cent in 2022). **Figure 61** shows 'green' vehicle sales as a proportion of total new light vehicle sales between 2013 and 2023.

Table 23 in the appendix provides more detail on green vehicles sold in Australia in 2023.

Figure 61: 'Green' vehicles sales as a percentage of total new light vehicles sold, 2013–2023

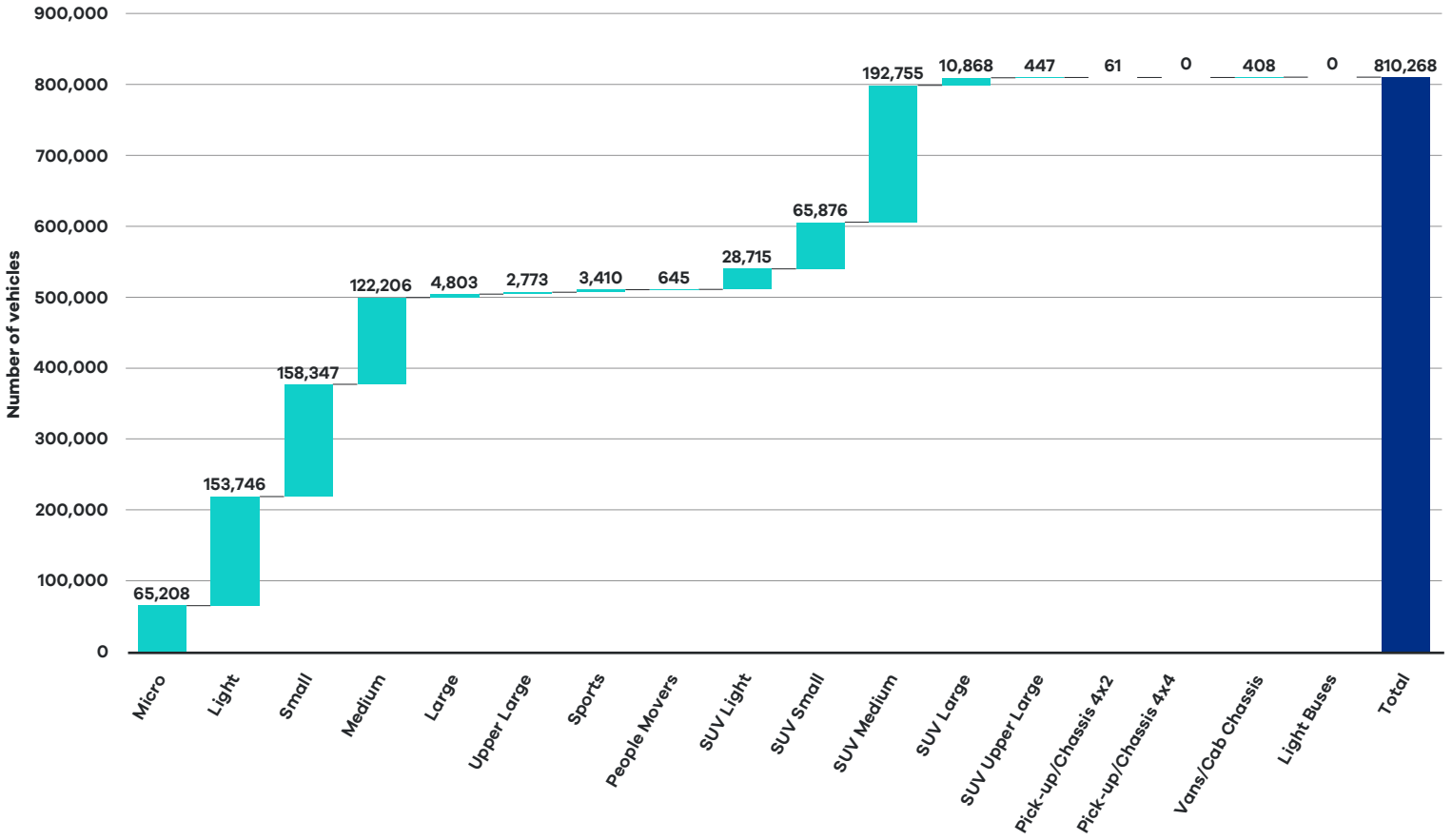


3.7 Green vehicles (continued)

3.7.2 Green vehicles analysis – January 2024 registered vehicles

Using the January 2024 registered vehicles dataset, it also possible to determine the number of green vehicles in the Australian fleet. **Figure 62** shows the total number of green vehicles (810,268) in January 2024, and which segments they came from. The three smallest passenger vehicle segments all had significant numbers of green vehicles, as did 'Medium' and 'SUV Medium' (due to sales of popular electric and hybrid vehicle models from vehicle makes such as Tesla and Toyota).

Figure 62: Number of 'green' vehicles by segment, January 2024 registered vehicles

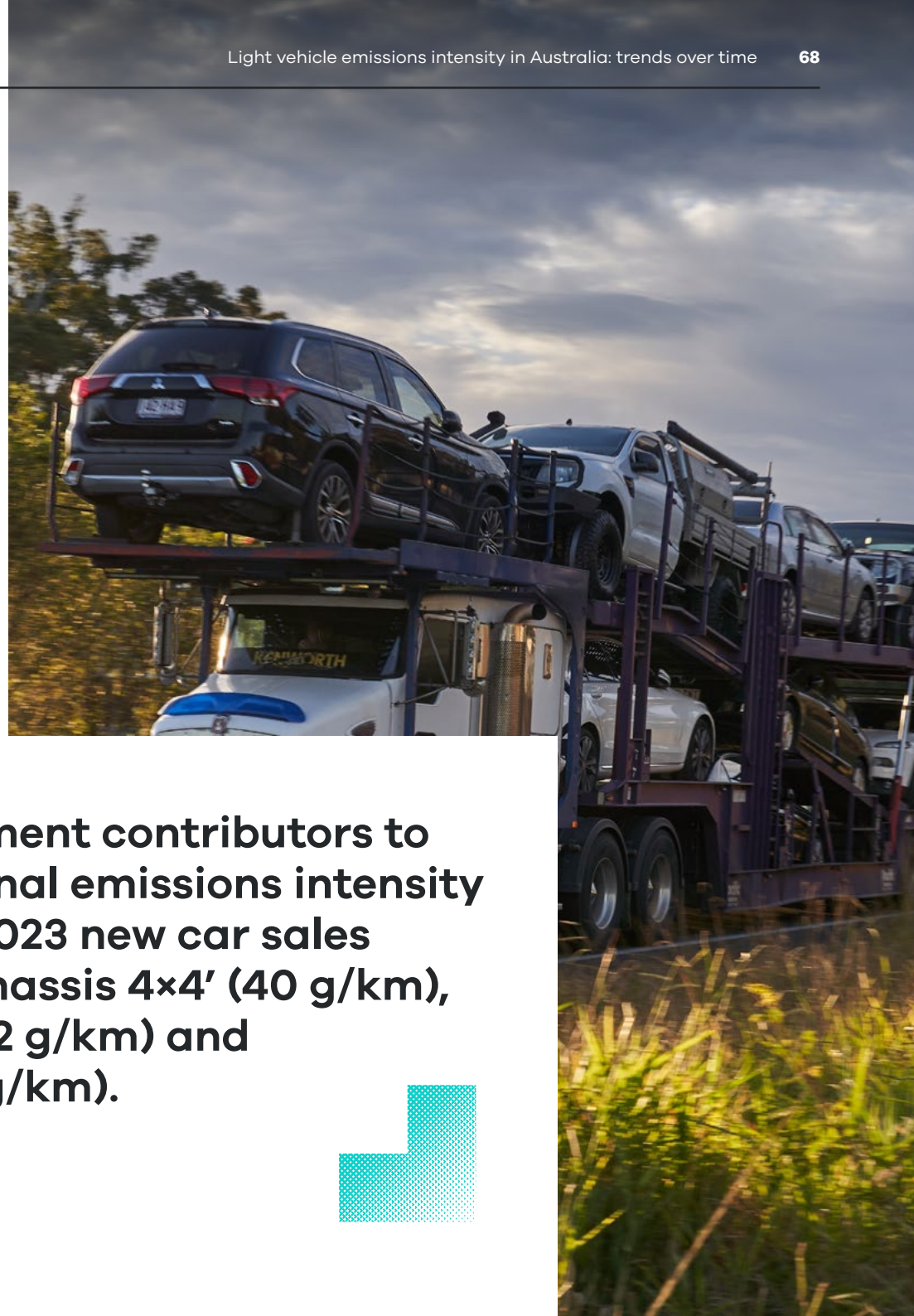


3.8 Contribution of each segment to the average emissions intensity

This section shows the percentage contribution of each segment to the average vehicle emissions intensity figure.

The 'contribution' for a segment is calculated as: the number of vehicle sales in the segment, multiplied by the weighted average emissions intensity figure for that segment (as reported in **Table 10** in the appendix), divided by total vehicle sales. The sum of the 'contributions' from each segment is the overall average emissions intensity.

A segment will make a larger contribution to the overall average emissions intensity the higher the number of vehicle sales in that segment and/or the higher the average emissions intensity of vehicles in that segment.



The biggest segment contributors to the overall national emissions intensity of 165 g/km for 2023 new car sales were 'Pick-up/Chassis 4×4' (40 g/km), 'SUV Medium' (32 g/km) and 'SUV Large' (26 g/km).

3.8 Contribution of each segment to the average emissions intensity (continued)

3.8.1 Contribution to average emissions intensity – 2023 sales

Figure 63 and **Figure 64** show the contributions by each segment to the overall national average emissions intensity in 2014 and 2023, respectively. In 2014, the three biggest contributors to the overall national average emissions intensity of 188 g/km were the 'Small' (36 g/km), 'Pick-up/Chassis 4×4' (29 g/km) and 'SUV Large' (27 g/km) segments.

By 2023, the overall national emissions intensity had decreased to 165 g/km. The biggest segment contributors to this number were 'Pick-up/Chassis 4×4' (40 g/km), 'SUV Medium' (32 g/km) and 'SUV Large' (26 g/km).

Collectively, the eight passenger vehicle segments (shown to the left of SUVs in the graphs) contributed 80 g/km (or 43 per cent) to the total in 2014. By 2023, these eight segments collectively contributed just 24 g/km (or 14 per cent) to the total, with the overall emissions intensity number being almost entirely determined by SUVs and utes.

Figure 63: Contribution by segment to overall average emissions intensity, 2014

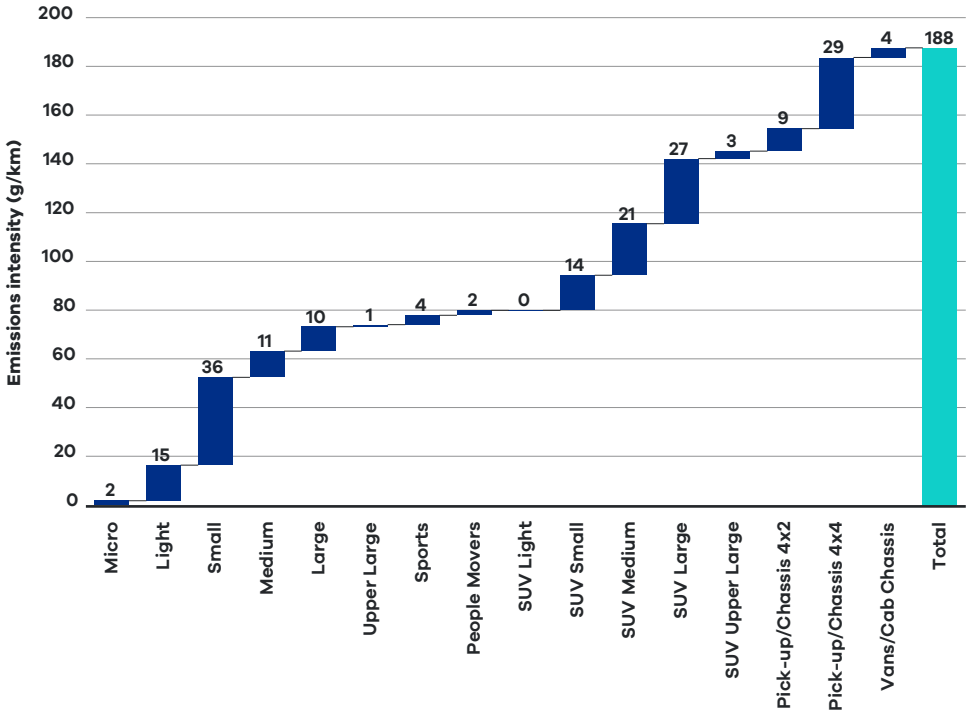
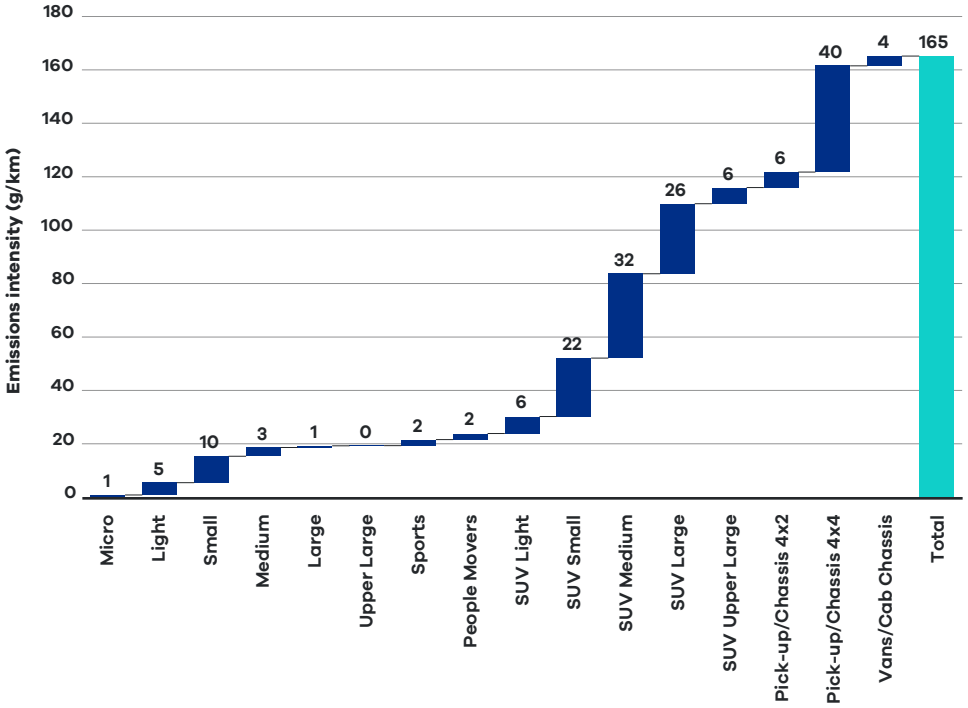


Figure 64: Contribution by segment to overall average emissions intensity, 2023

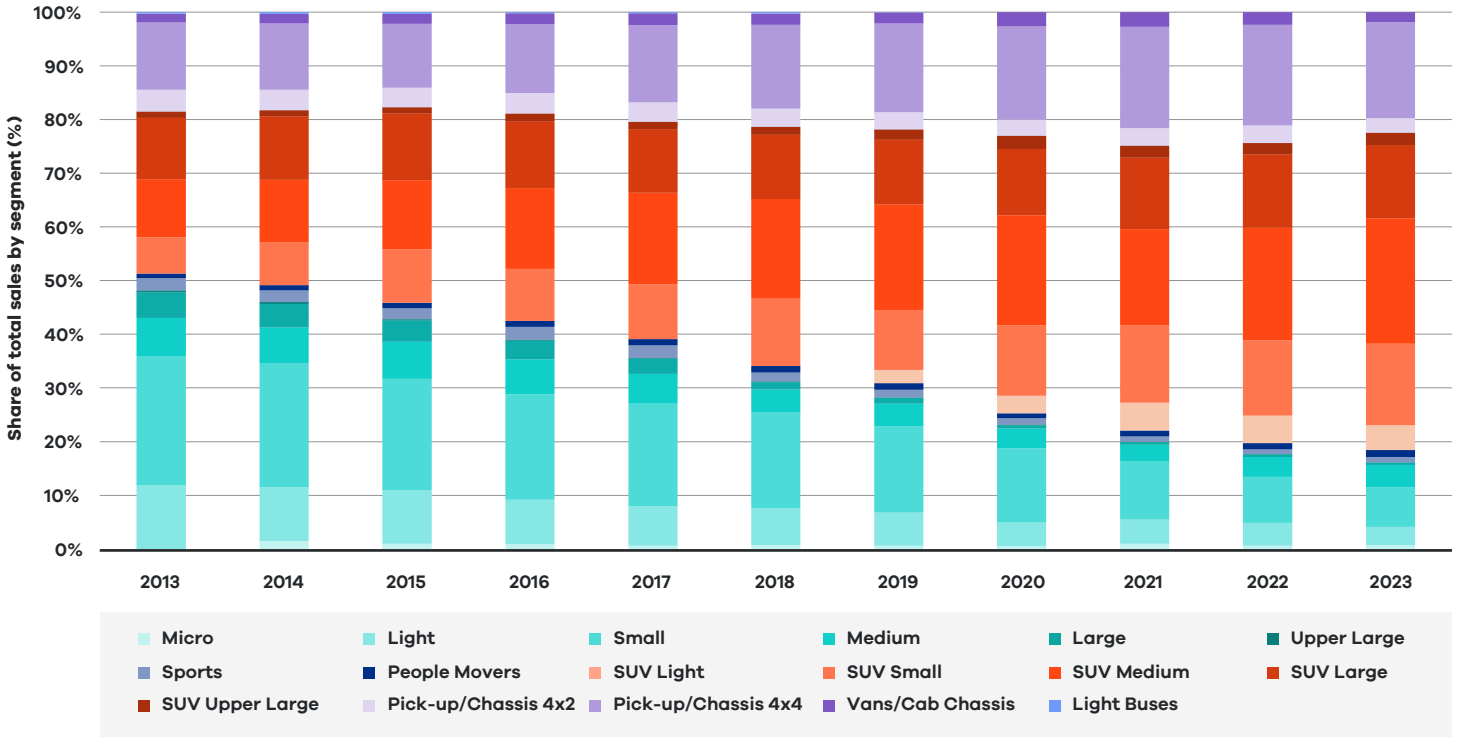


3.8 Contribution of each segment to the average emissions intensity (continued)

To a large extent, this increased contribution of SUVs and utes is a result of increased sales in these segments. There has been a significant transition in sales for different segments of Australia's vehicle fleet since 2013, as shown in **Figure 65**. There has been a large shift of sales away from segments in the 'Passenger motor vehicles' section of **Table 1**, and a shift towards SUVs and light trucks. While sales of the five segments of SUVs represented 30 per cent of total sales in 2013, this share had almost doubled to 59 per cent of total sales in 2023. Among the 'Passenger motor vehicles' segments, the share of total sales in the 'Light' and 'Small' segments decreased fairly consistently over the same time period. Sales in the 'Small' segment represented 24 per cent of all sales in 2013 but had decreased to 7 per cent by 2023; the 'Light' segment's share of total sales decreased from 12 per cent in 2013 to 3 per cent in 2023.

Between 2013 and 2023, the average emissions intensity decreased in all segments except 'Sports' (which comprised just 1 per cent of total vehicle sales in 2023). In most segments there was a decrease in emissions intensity of at least 10 per cent over this time period, with five segments having improvements of more than 20 per cent. However, the shift in the mix of the fleet towards SUVs and the 'Pick-up/Chassis 4×4' segment (where there has been just a 6 per cent improvement in emissions intensity between 2013 and 2023, but a large increase in sales volume) may help explain why the national average emissions intensity declined relatively slowly for several years (as shown in **Figure 3**), despite the relative emissions intensity improving in most segments. The significant improvements to emissions intensity brought about by newer technologies such as BEVs, PHEVs and HEVs have to some extent been offset by the shift in sales from light/small vehicles (and their SUV counterparts) to larger, generally higher emitting, vehicle segments.

Figure 65: Share of total vehicle sales by segment, 2013-2023



3.8 Contribution of each segment to the average emissions intensity (continued)

3.8.2 Contribution to average emissions intensity – January 2024 registered vehicles

The contribution of each segment to the average emissions intensity using the January 2024 registered vehicles dataset is shown in **Figure 66**. Overall, the single largest contribution was from the 'Small' segment, with 31 g/km out of the 194 g/km fleet-wide average. Three segments each contributed 27 g/km: 'SUV Medium', 'SUV Large' and 'Pick-up/Chassis 4×4'.

The contributions of segments in **Figure 66** were more evenly spread compared with the corresponding graph for new vehicle sales in 2023 (**Figure 64**), where SUVs and utes contributed most of the overall average emissions intensity.

This result reflects the still significant amount of passenger vehicles in the January 2024 registered vehicles dataset, particularly in the 'Small', 'Light' and 'Medium' segments. This is primarily due to the high share of passenger vehicles which entered the fleet prior to 2018. **Figure 67** shows that around 60 per cent of vehicles first registered between 2003 and 2012 (and still registered in January 2024) were passenger vehicles, but only around 25 per cent were passenger vehicles in the period after 2018. Overall, however, the final data series in the graph shows that more passenger vehicles than SUVs remained on Australian roads: 7.39 million passenger vehicles (44 per cent of the fleet) compared with 6.48 million SUVs (39 per cent of the fleet).

Figure 66: Contribution to overall emissions intensity value by segment, January 2024 registered vehicles

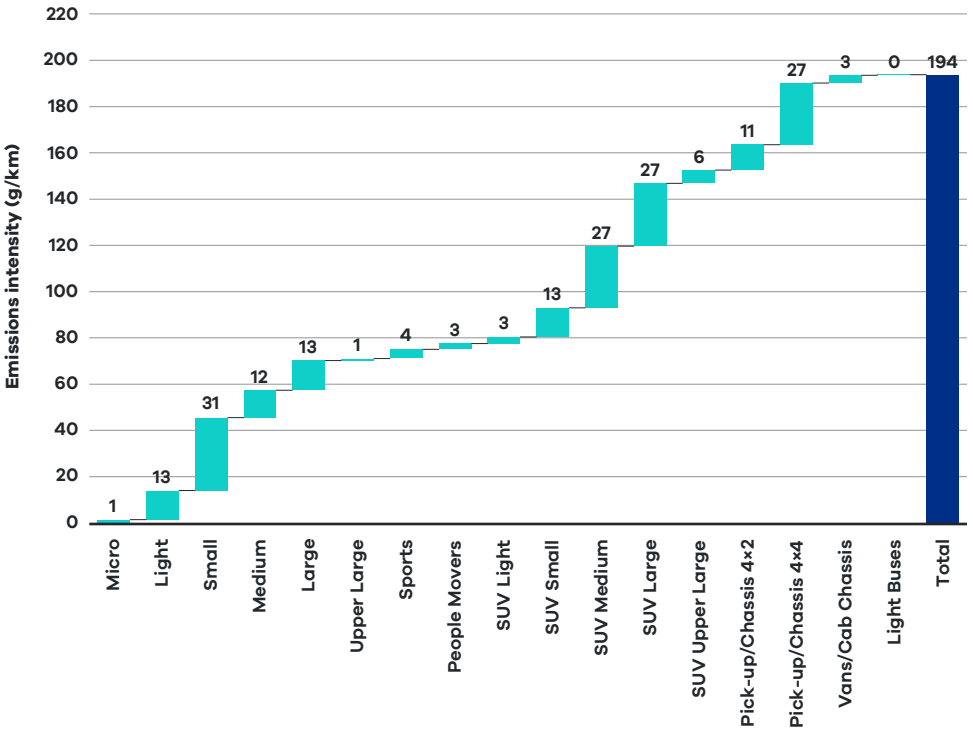
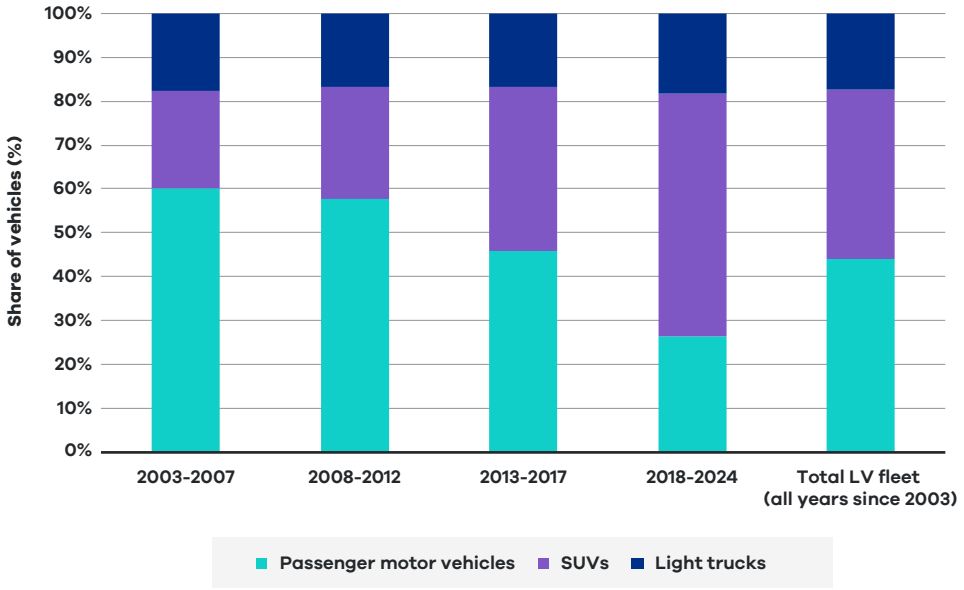


Figure 67: Share of vehicles by segment grouping and time period, January 2024 registered vehicles



3.9 Metropolitan and rural sales

Buyers in different locations may have differing requirements for their vehicles, based on factors such as the nature of their work or hobbies, or the quality of roads they travel on.

This year, for the first time, we have analysed sales data on the location of the buyer, classified into metropolitan or rural, to assess differences in the emissions intensity and types of vehicles purchased.[32]

Figure 68 shows the average emissions intensity of vehicles sold in metropolitan and rural areas of each state and territory in 2023. Vehicles sold to rural buyers had consistently higher emissions intensities, exceeding the metropolitan values by a range of 11 g/km (NT) to 25 g/km (WA).

Emissions intensities in metropolitan areas were generally relatively similar across the six Australian states, with the ACT being significantly lower and the NT significantly higher. Rural emissions intensities were highest in WA and the NT (189 g/km) followed by SA (185 g/km).

Buyer location data is also available for previous years. **Figure 69** shows the average emissions intensity over time in metropolitan and rural areas (aggregated together across states and territories). The rural emissions intensity was consistently above the metropolitan value, but with the gap growing over time. The gap between the values increased gradually at first – from 9.4 g/km in 2013 to 12.0 g/km in 2021 – before growing significantly in 2023, where the gap reached 19.6 g/km (159.6 g/km in metropolitan areas compared with 179.2 g/km in rural areas). Both series exhibited a similar pattern over time, with a steeper initial decline phase, very gradual decrease in the middle, and a steeper decline towards the end (caused in part by the inclusion of Tesla in the data from 2022 onwards, and more EV sales generally).

Figure 68: Average emissions intensity of metropolitan and rural sales by state or territory, 2023

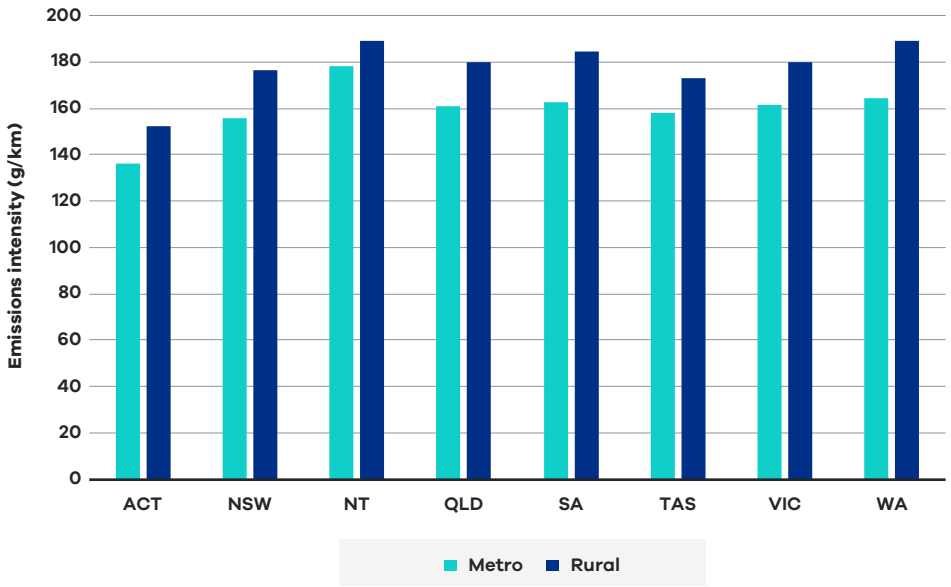
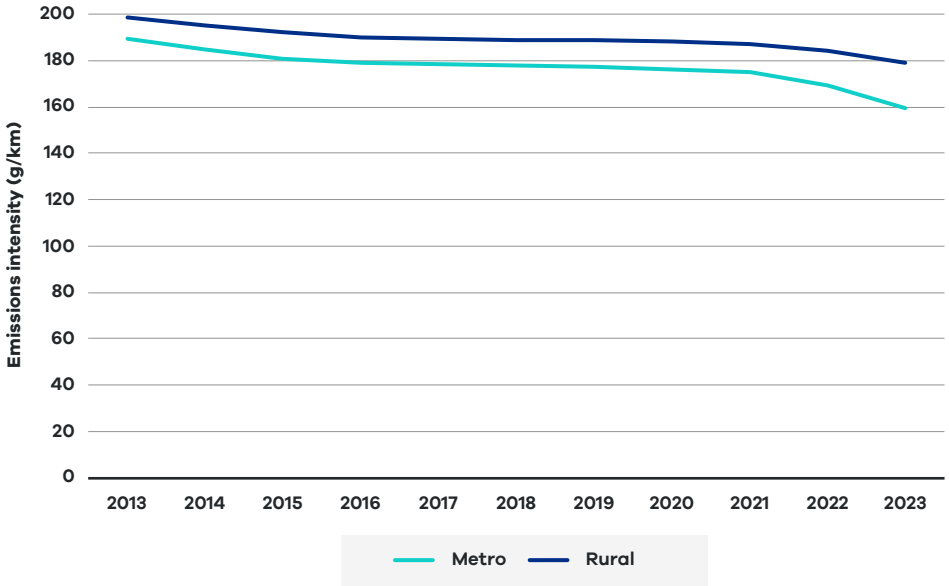


Figure 69: Average emissions intensity of metropolitan and rural sales, 2013-2023

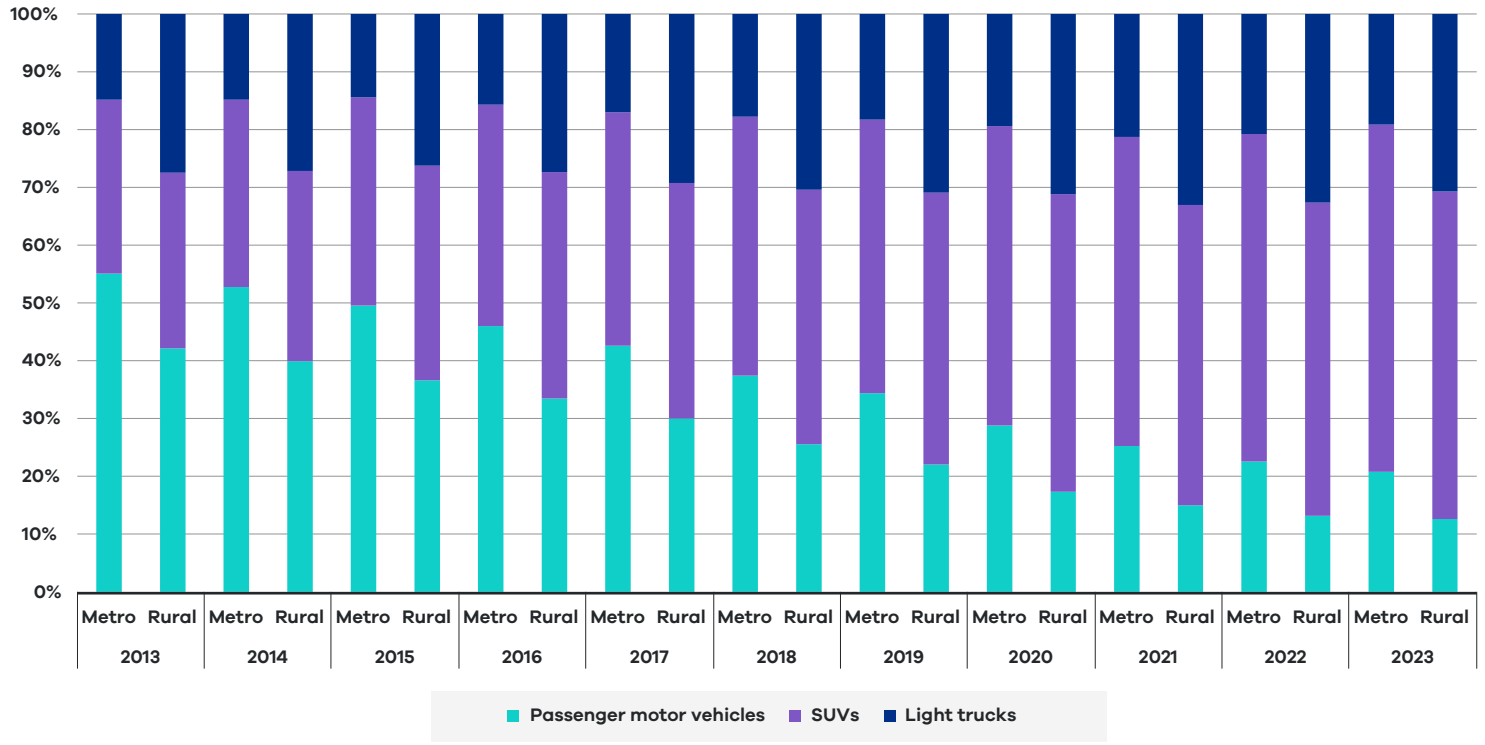


32 Some caution is needed in interpreting these results. Certain categories of buyers – such as car rental companies, large businesses and governments – may record all sales against a central office location rather than the ultimate destination of the buyer/user of the vehicle. Similarly, dealer demonstrator vehicles are based on the location of the dealer, which may differ to the eventual buyer of that vehicle.

3.9 Metropolitan and rural sales (continued)

The differences in emissions intensity values between metropolitan and rural areas reflects differences in the types of vehicles and their powertrains. **Figure 70** shows the trends over time in the types of vehicles sold in metropolitan areas, using the segment groupings from **Table 1**. The graph shows that the share of SUVs was relatively similar in metropolitan and rural areas in each year throughout the time period, with the SUV share initially being slightly higher in rural areas in the early years of the time period, before the metropolitan SUV share surpassed the rural share in 2018 and the subsequent years. The main difference between metropolitan and rural areas was a higher share of light trucks (utes and vans) in rural areas instead of passenger motor vehicles. In both metropolitan and rural areas the share of total vehicles that were utes or vans increased by around five percentage points between the early and late years of the time period, with the shares at the end of the time period being around one-fifth in metropolitan areas and one-third in rural areas.

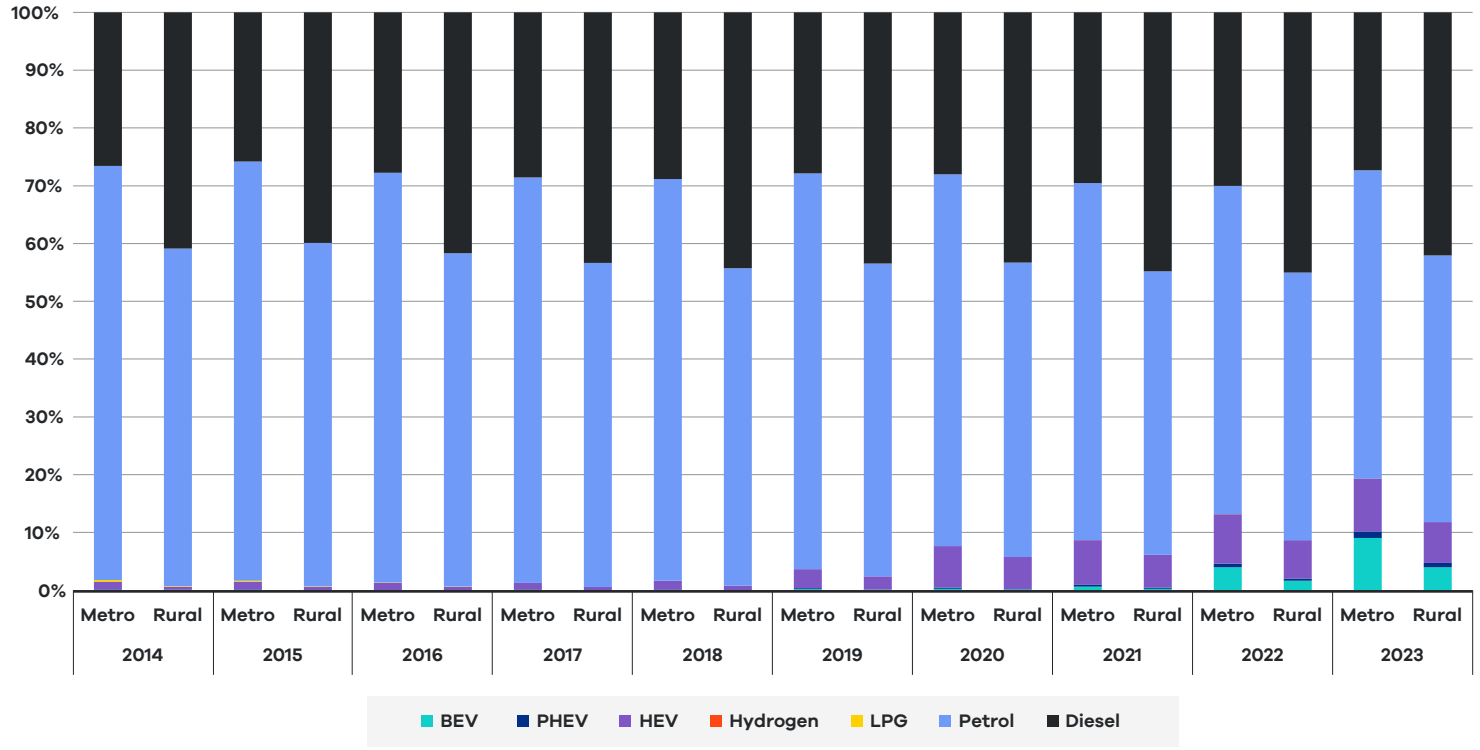
Figure 70: Share of sales by segment grouping in metropolitan and rural areas, 2013-2023



3.9 Metropolitan and rural sales (continued)

Figure 71 shows the share of sales by powertrain and fuel type to buyers in metropolitan and rural areas for each year from 2014 to 2023. The share of electric and hybrid vehicles was consistently higher in metropolitan areas throughout the time period. However, sales of these types of vehicles grew strongly in both geographic areas, with the combined BEV and PHEV share reaching close to 5 per cent in rural areas in 2023. Sales of diesel vehicles were consistently higher in rural areas – typically around 15 percentage points above the metro diesel share – and this may be aligned to the type of vehicles (such as utes) that tended to be purchased in rural areas, as highlighted in **Figure 70**.

Figure 71: Share of sales by powertrain/fuel type in metropolitan and rural areas, 2014-2023



3.10 State and territory analysis of January 2024 registered vehicles

This section analyses and compares the vehicle fleets of states and territories in various ways, using the January 2024 registered vehicles data.

Figure 72 shows the average mass and average emissions intensity for each state or territory, with the size of the circle determined by the number of vehicles registered in that state/territory. Vehicles registered in the ACT were on average the lowest emitting (174 g/km) and lightest (1,608 kg), while those in the NT were on average the highest emitting (204 g/km) and heaviest (1,799 kg). Vehicles registered in Victoria and NSW were very similar in average mass and average emissions intensity, with other states generally quite close in average mass (although Queensland-registered vehicles were around 16 kg lighter than those in NSW, on average).

The average mass and emissions intensity results in each state/territory are influenced by the types of vehicles registered there. **Figure 73** shows the share of registrations in each state/territory by segment grouping. There was considerable variation between jurisdictions. The ACT had the highest share of passenger vehicles (58 per cent), by a large margin, and a very low share in the light trucks segment grouping (comprising utes and vans). The NT had one-third of its registered vehicles in the light trucks segment grouping, and a slightly higher share of SUVs. As noted in **chapter 2** of the report, some caution is necessary in interpreting these results, since it is possible that some vehicles may be registered to a corporate headquarters or other business address rather than necessarily their location of use. This may explain some of the surprising results seen in the graph, such as the very low number of vehicles from the light trucks segment grouping in the ACT, and in Victoria compared with NSW.

Figure 72: Average emissions intensity and average mass by state/territory, January 2024 registered vehicles

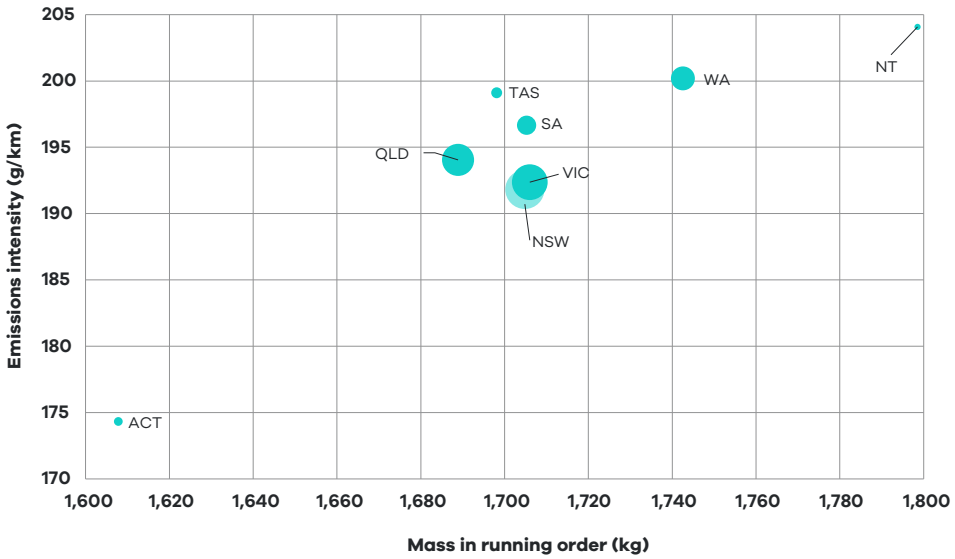
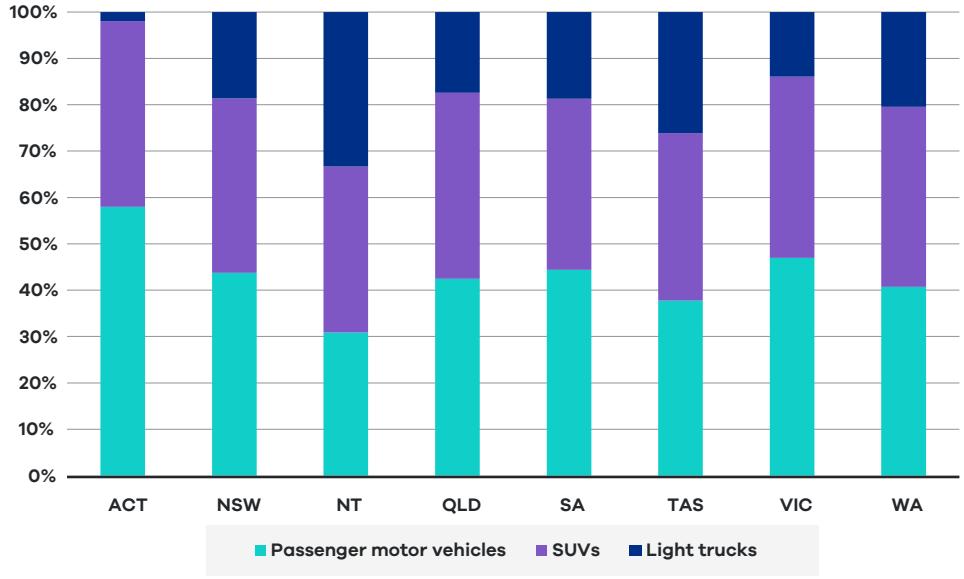


Figure 73: Share of vehicles by segment grouping and state/territory, January 2024 registered vehicles



3.10 State and territory analysis of January 2024 registered vehicles (continued)

The mix of vehicles' powertrains and fuel types also varies across states and territories. The ACT had the highest share of BEVs (2.3 per cent), PHEVs (0.5 per cent) and HEVs (3.8 per cent) out of any state or territory. However, given the relatively small vehicle fleet overall, other states and territories had much higher absolute numbers of these types of vehicles registered. Most states and territories had hybrid vehicle shares of between 2 and 3 per cent of all registered vehicles, and the states on the east coast had BEV shares of slightly below 1 per cent of total light vehicle registrations. Victoria had the highest share of LPG and dual fuel vehicles, with almost 1 per cent of its fleet having these fuel types.[33] Around 96 per cent of vehicles were single fuel, petrol or diesel, vehicles, with the mix between the two fuel types varying somewhat across states and territories based on the types of vehicles in their fleets.

To some extent, differences in emissions intensity results may also reflect differences in vehicles' age. **Figure 75** shows the average age of registered vehicles in each state and territory, based on January 2024 registered vehicles that have entered the fleet since 2003. The NT had the youngest vehicle fleet on average (8.9 years), while Tasmania had the oldest fleet (10.4 years). These findings are broadly consistent – in terms of the relative ranking of states and territories' fleet ages – with data from the *Road Vehicles Australia* report published by the Bureau of Infrastructure and Transport Research Economics (BITRE), particularly for the states with older fleets (BITRE, 2024). However, the average fleet ages for each state/territory in BITRE's data are higher, due to the fact that BITRE's dataset includes vehicles from prior to 2003 (which may also explain the different ranking order of the three youngest fleets – ACT, NSW and NT – in this report relative to BITRE's).

Figure 74: Share of vehicles by powertrain/fuel type and state/territory, January 2024 registered vehicles

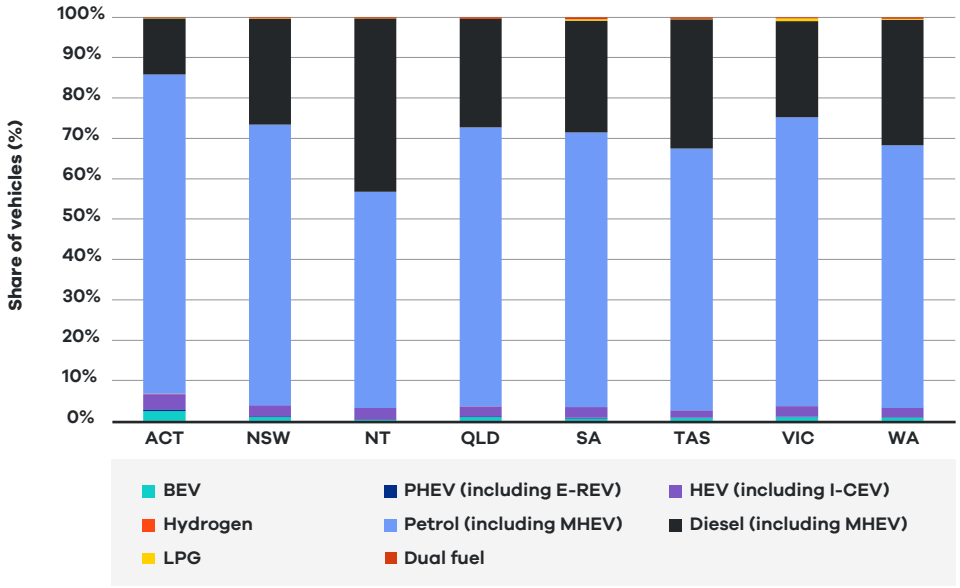


Figure 75: Average age of vehicles that have entered the fleet since 2003 by state/territory, January 2024 registered vehicles

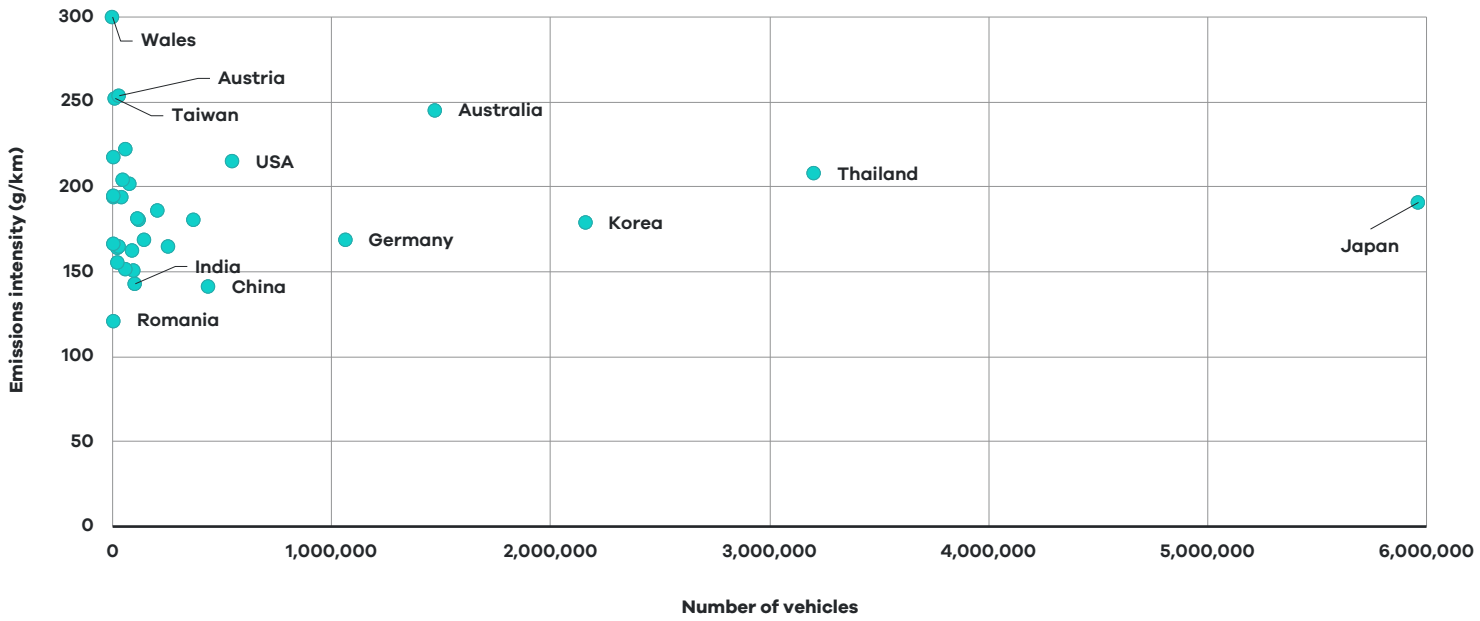
33 As noted in **chapter 2**, these numbers exclude any aftermarket conversions to LPG.

3.11 Country of manufacture analysis of January 2024 registered vehicles

The January 2024 registered vehicles dataset includes data on the country of manufacture for each vehicle. This section analyses this data in several graphs.

Figure 76 plots the average emissions intensity (along the vertical axis) and number of vehicles (along the horizontal axis) by country of manufacture, with one dot for each of the 32 countries where Australia's light vehicle fleet has been manufactured. While there is not necessarily any expected theoretical relationship between the number of vehicles produced and their emissions intensity, we have chosen to graph the data in this way to be able to depict both variables together on a single graph rather than analysing them in isolation (since, for example, a very low or high emissions intensity value may not mean very much if the country has produced very few vehicles). Due to the clustering of dots at moderate emissions intensity levels and relatively few vehicles produced, we have only labelled the dots of the countries with the three highest emissions intensities, three lowest emissions intensities, and those that manufactured a relatively high number of vehicles in Australia's fleet. Detailed data on the number of vehicles and average emissions intensity from each country is available in **Table 29** in the appendix.

Figure 76: Average emissions intensity and number of vehicles by country of manufacture, January 2024 registered vehicles



Japan produced by far the largest number of vehicles, with 5.96 million vehicles out of the 16.8 million vehicles in the dataset. The average emissions intensity of Japanese-produced vehicles was 190.7 g/km, which was slightly below the fleet-wide average. The 3.21 million vehicles produced in Thailand had an average emissions intensity of 208.0 g/km, while the third largest manufacturer was Korea, whose 2.16 million vehicles had an average emissions intensity of 179.0 g/km. Australian-made vehicles were the fourth most common, with the 1.48 million vehicles also having the fourth highest average emissions intensity (245.1 g/km).

Vehicles manufactured in Wales had the highest average emissions intensity (299.9 g/km), but with just 117 registered vehicles in total (two models of Aston Martin). Vehicles manufactured in Austria and Taiwan also had average emissions intensities above 250 g/km, but also with relatively few vehicles. Vehicles manufactured in Romania had the lowest emissions intensity on average (121.0 g/km); this is due to Romania having produced a single vehicle model (Ford PUMA), which only began entering Australia's fleet in recent years, and there were fewer than 8,000 such vehicles in January 2024. China, with almost 440,000 vehicles had the second lowest average emissions intensity (140.9 g/km). This is due to China producing a relatively high number of BEVs (more than 105,000), which resulted in a low emissions intensity value despite it also producing a large number of SUVs and utes with internal combustion engines from vehicle makes such as MG, GWM and LDV.

3.11 Country of manufacture analysis of January 2024 registered vehicles (continued)

Japan produced the largest share of light vehicles currently on Australian roads, accounting for

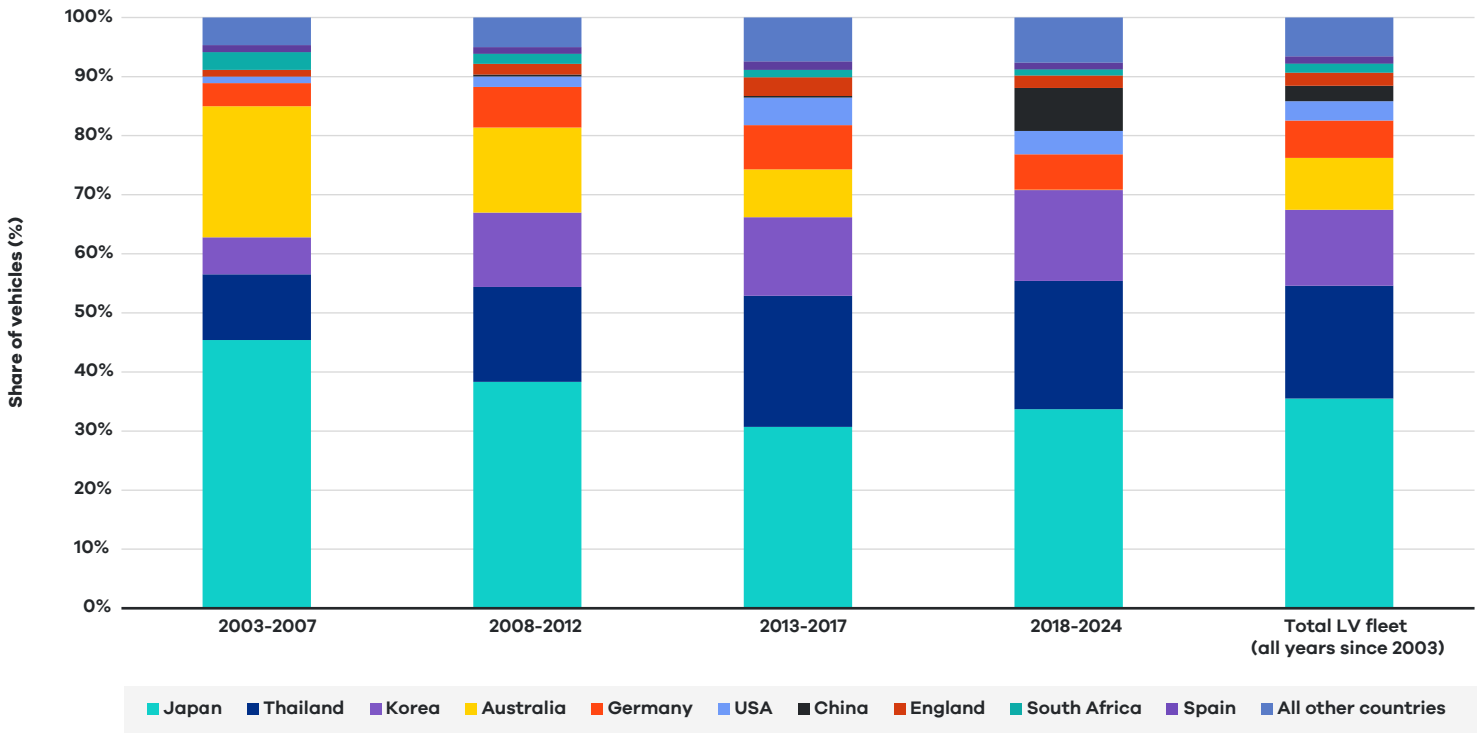
5.96 million

vehicles

These had an average emissions intensity of

190.7 g/km

Figure 77: Share of vehicles by country of manufacture over time, January 2024 registered vehicles



Japan has produced a large share of vehicles in the Australian fleet throughout the time period since 2003. However, its share of vehicles produced, and the share of other countries, has changed over time. **Figure 77** shows that 35.5 per cent of all registered Australian light vehicles were produced in Japan; however, among January 2024 registered vehicles which entered the fleet between 2003 and 2007, the share produced in Japan was around 45 per cent. The share of registered vehicles from Thailand and Korea was significantly higher for vehicles entering the fleet in the most recent decade than the decade prior. China produced around 7.3 per cent of registered vehicles that entered the fleet since 2018, a significant increase compared with the earlier time periods shown, where its share of vehicles was less than 0.5 per cent. Australian-produced vehicles represented 8.8 per cent of the light vehicle fleet in January 2024, but the share produced in Australia declined during each five-year period shown in **Figure 77**.

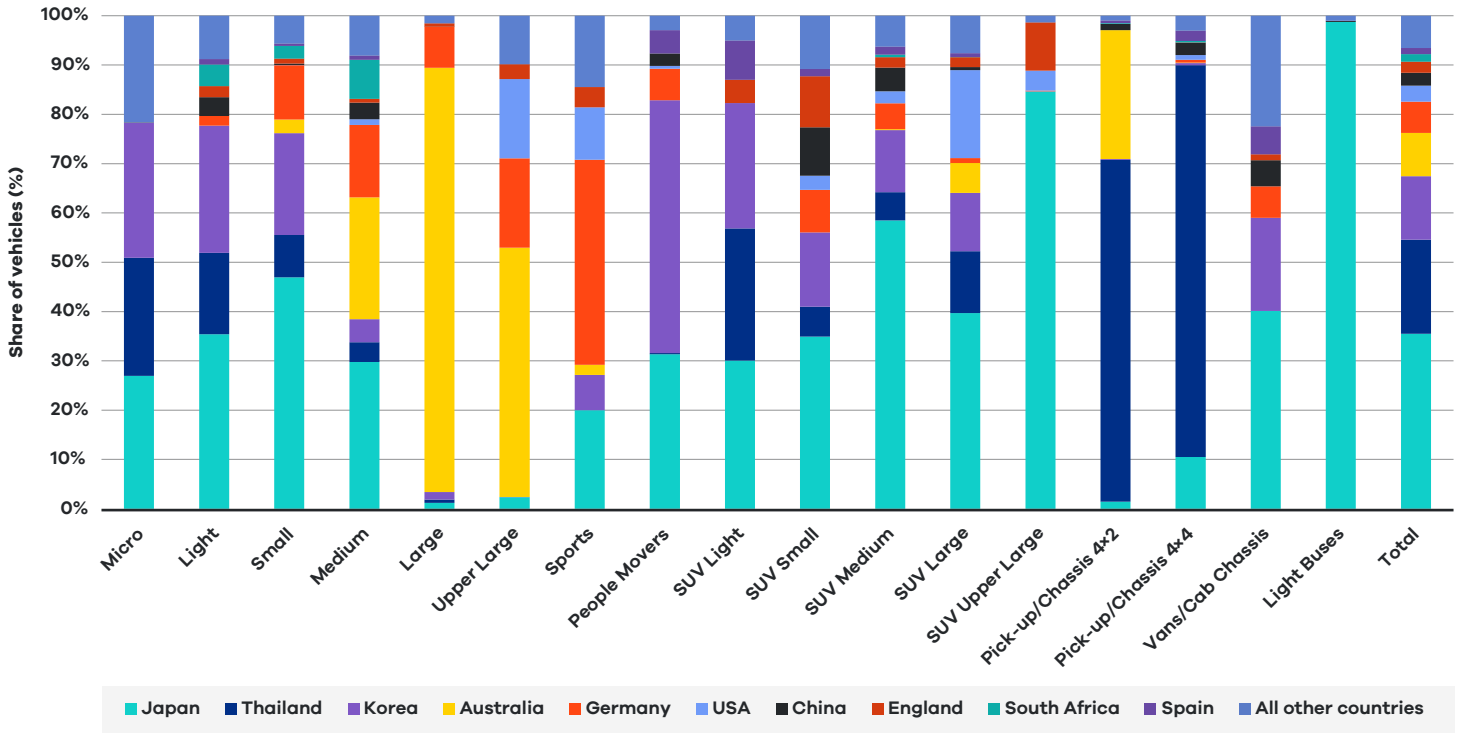
3.11 Country of manufacture analysis of January 2024 registered vehicles (continued)

One of the key factors that may explain manufacturing countries' average emissions intensity in **Figure 76** is the types of vehicles produced. **Figure 78** shows the share of vehicles produced in each segment by each manufacturing country, and highlights significant differences across vehicle segments.[34] Certain segments were dominated by a single country, with some countries producing more than 50 per cent of all vehicles in a segment including:

- Australia in the 'Large' and 'Upper Large' segments.[35]
- Japan in the 'SUV Medium', 'SUV Upper Large' and 'Light Buses' segments.
- Korea in the 'People Movers' segment.
- Thailand in the 'Pick-up/Chassis 4×2' and 'Pick-up/Chassis 4×4' segments.

Other segments tended to have more evenly distributed manufacturing shares between countries, although most still had the top manufacturing country with a production share above 30 per cent. The relatively high production shares of Australia and the USA in the 'Large' and 'Upper Large' segments (and corresponding SUV segments) – as well as Thailand's high production share in the two ute segments – helps to explain those countries' relatively high emissions intensity results in **Figure 76**.

Figure 78: Share of vehicles by country of manufacture by segment, January 2024 registered vehicles



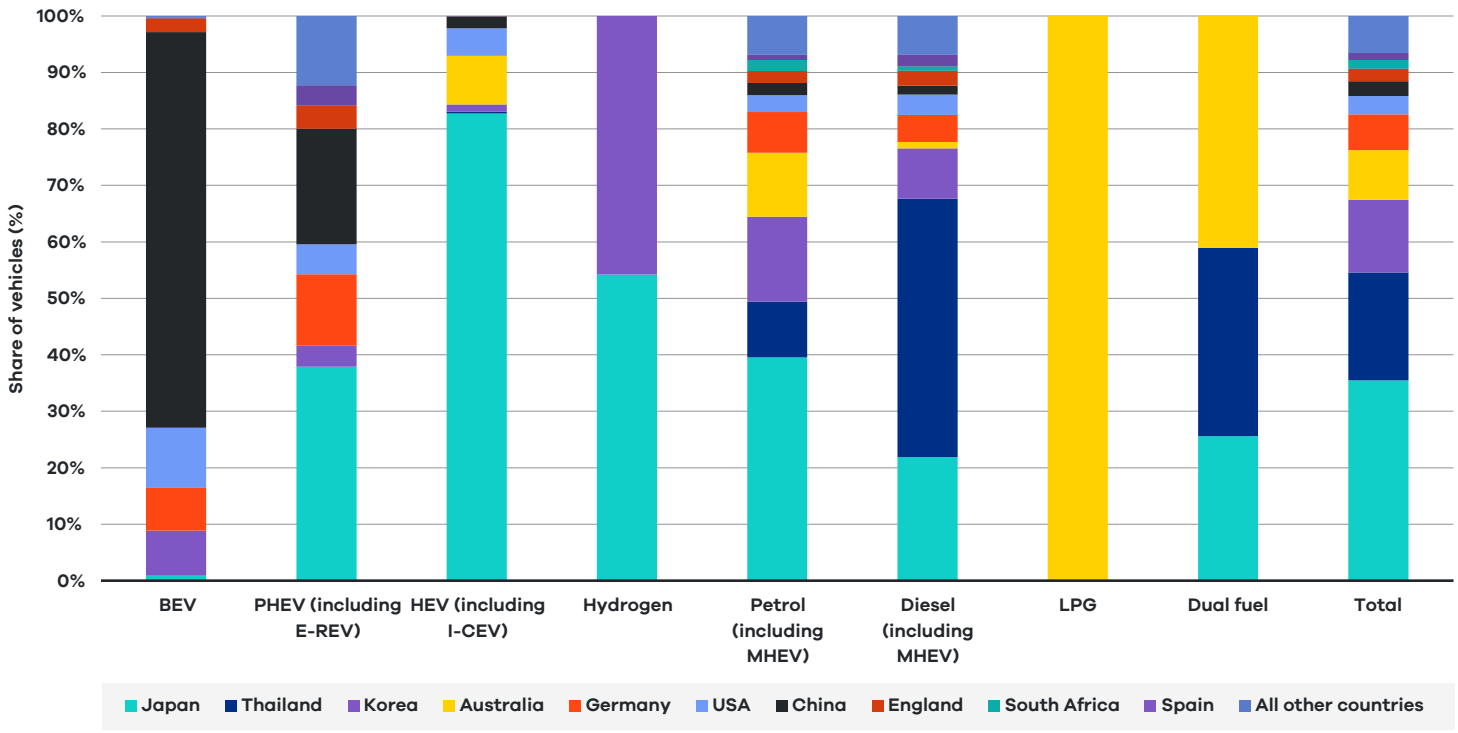
34 As with **Figure 77**, only the top ten countries are shown individually, with other manufacturing countries grouped into 'All other countries'.

35 Australia also had a relatively high manufacturing share for the 'Pick-up/Chassis 4×2' segment.

3.11 Country of manufacture analysis of January 2024 registered vehicles (continued)

Another factor that helps explain countries' emissions intensity results in **Figure 76** is the types of powertrains and fuel types of the vehicles they produced. **Figure 79** shows each country's manufacturing share for the different types of vehicle powertrain and fuel type. Despite producing just 2.6 per cent of all light vehicles registered in January 2024, China produced 70.1 per cent of all registered BEVs and 20.5 per cent of all registered PHEVs (Japan had the highest PHEV share with 37.9 per cent). Production of HEVs was dominated by Japan, which made around 83 per cent of all registered HEVs. A large share of registered diesel vehicles was manufactured in Thailand (45.8 per cent), with Japan also producing around 22 per cent of diesel vehicles. Australia produced all the fleet's LPG-only vehicles and a large share of dual fuel vehicles as well.

Figure 79: Share of vehicles by country of manufacture and powertrain/fuel type, January 2024 registered vehicles



Vehicles manufactured in China accounted for

17%

of all new vehicle registrations in 2023.

These had an average emissions intensity of

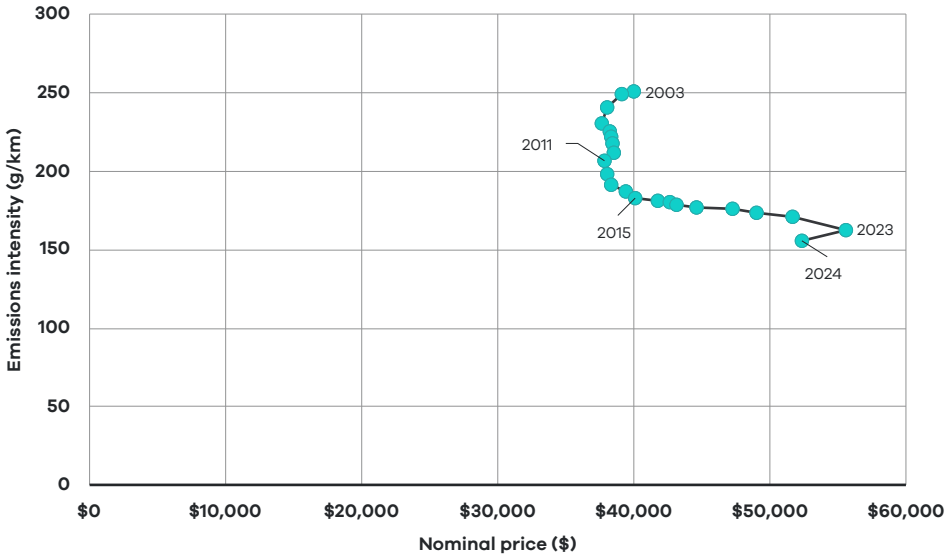
105 g/km

3.12 Price analysis of January 2024 registered vehicles

The January 2024 registered vehicles dataset includes data on vehicle prices. This section analyses the price data with other vehicle attributes in a series of graphs.

Figure 80 shows the average nominal price – that is, the original price that was charged at the time of sale, without adjusting for inflation – and average emissions intensity of January 2024 registered vehicles based on the year they were first registered. We have labelled selected years in **Figure 80**, and the values for other years can be easily determined by following the line from the previous year. The data shows that vehicles first registered in 2003 had an average emissions intensity of 250.7 g/km and an average nominal price of just under $40,000. Registered vehicles that first entered the fleet in 2011 had a significantly lower average emissions intensity (206.3 g/km), while the average nominal price had also fallen slightly to $37,876. The average nominal price of vehicles entering the fleet was higher in each of the following years until 2023, with average price increases relatively small in the initial years but increasing significantly from 2015 onwards. The years immediately following 2015 saw relatively small improvements in average emissions intensity among vehicles entering the fleet, although this began to improve more quickly after 2020. As mentioned elsewhere in the report, the 2024 data point is based on very few vehicles (due to the timing of the data extract), meaning that meaningful conclusions cannot be drawn from it.

Figure 80: Average nominal price and average emissions intensity by year first registered, January 2024 registered vehicles

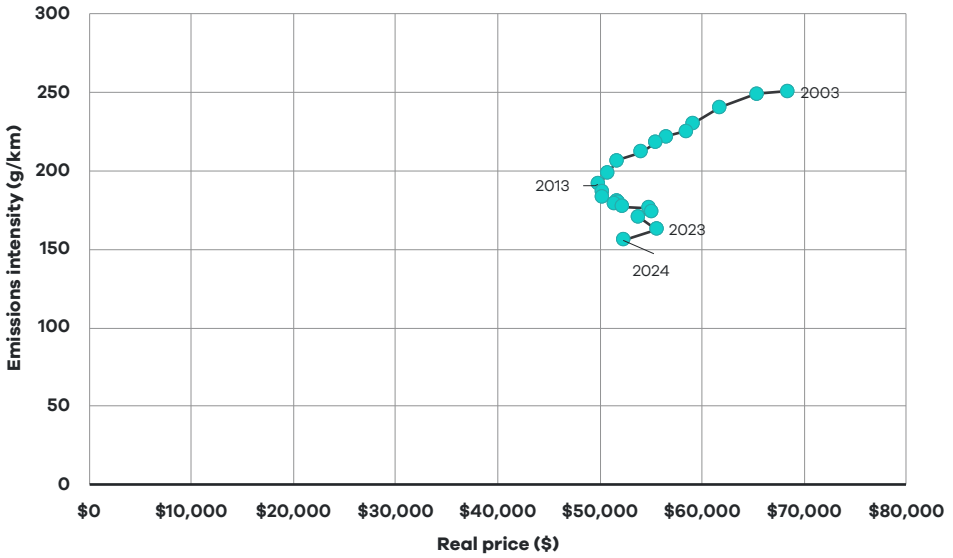


3.12 Price analysis of January 2024 registered vehicles (continued)

While nominal prices are easy to understand, for comparing vehicle prices over time it is perhaps more useful to use real prices (that is, indexing the original nominal prices to real prices in 2024 dollars using the CPI). Using real prices helps to provide a fairer comparison of the value of money over time.[36]

Figure 81 converts vehicle prices for each year to real terms (2024 dollars), and shows the corresponding analysis. The 2023 data point is at the same value as it was in **Figure 80**: an average emissions intensity of 162.8 g/km and average price of $55,575. However, the average prices in the early years of the time period are all significantly higher than this, and the pattern/shape of the earlier years' data points is very different. The data points trend towards the bottom-left corner of the graph between 2003 and 2013, suggesting that along with the improvements in emissions intensity, vehicles were on average becoming cheaper in real terms. While the average nominal price of vehicles fell slightly between vehicles entering the fleet in 2003 and those entering the fleet in 2013 (as seen in **Figure 79**), the prices of goods and services generally were rising, meaning that the real price of vehicles fell by a significant amount over this time period. After 2013, real prices of vehicles began to increase, initially slowly but by larger amounts in the later years. That is, since 2013 vehicle prices have on average risen at a faster rate than CPI, reversing the trend of the earlier years. To some extent, this may reflect changes in vehicle buying patterns, with increasing sales in recent years of more expensive vehicles such as SUVs and utes instead of smaller passenger vehicles (as discussed elsewhere in the report).

Figure 81: Average real price (2024 dollars) and average emissions intensity by year first registered, January 2024 registered vehicles

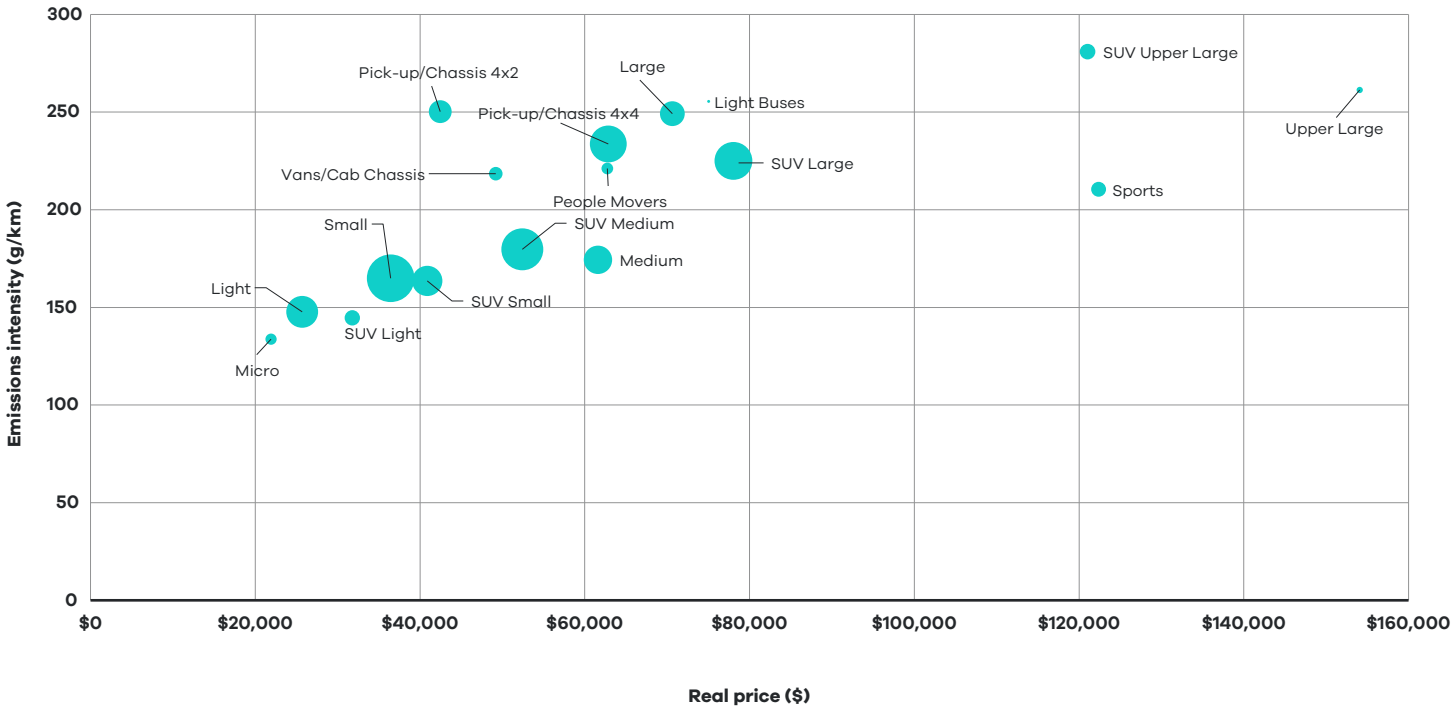


36 For example, $39,968 in 2003 (the average vehicle price of vehicles entering the fleet in that year) would buy significantly more of other goods and services than $39,968 would be able to purchase in 2024, due to the general rise in prices of goods and services over that time period. Indexing the 2003 price to 2024 dollars – by multiplying it by 1.71, reflecting the 71 per cent cumulative amount of inflation over that time period (using the CPI) – helps to account for this (and would result in a real price in 2024 dollars of $68,423).

3.12 Price analysis of January 2024 registered vehicles (continued)

The average price varies significantly across vehicle segments. **Figure 82** plots vehicles' real price (in 2024 dollars) against the average emissions intensity for each segment, with the size of each circle reflecting the relative number of vehicles. The data shows that in general, both the average (real) price and average emissions intensity increased with vehicle size. Vehicles in the 'Sports' and the two 'Upper Large' segments had an average real price above $120,000 and relatively high average emissions intensities (above 200 g/km). By contrast the 'Micro' and 'Light' passenger vehicle segments both had average real prices well below $30,000, and average emissions intensities below 150 g/km. When comparing vehicles from the passenger vehicles and SUV segments of a given size (for example, 'Light' and 'SUV Light'), the SUV segment had higher real prices on average for three of the sizes but lower real prices for the other two ('Medium' and 'Upper Large').

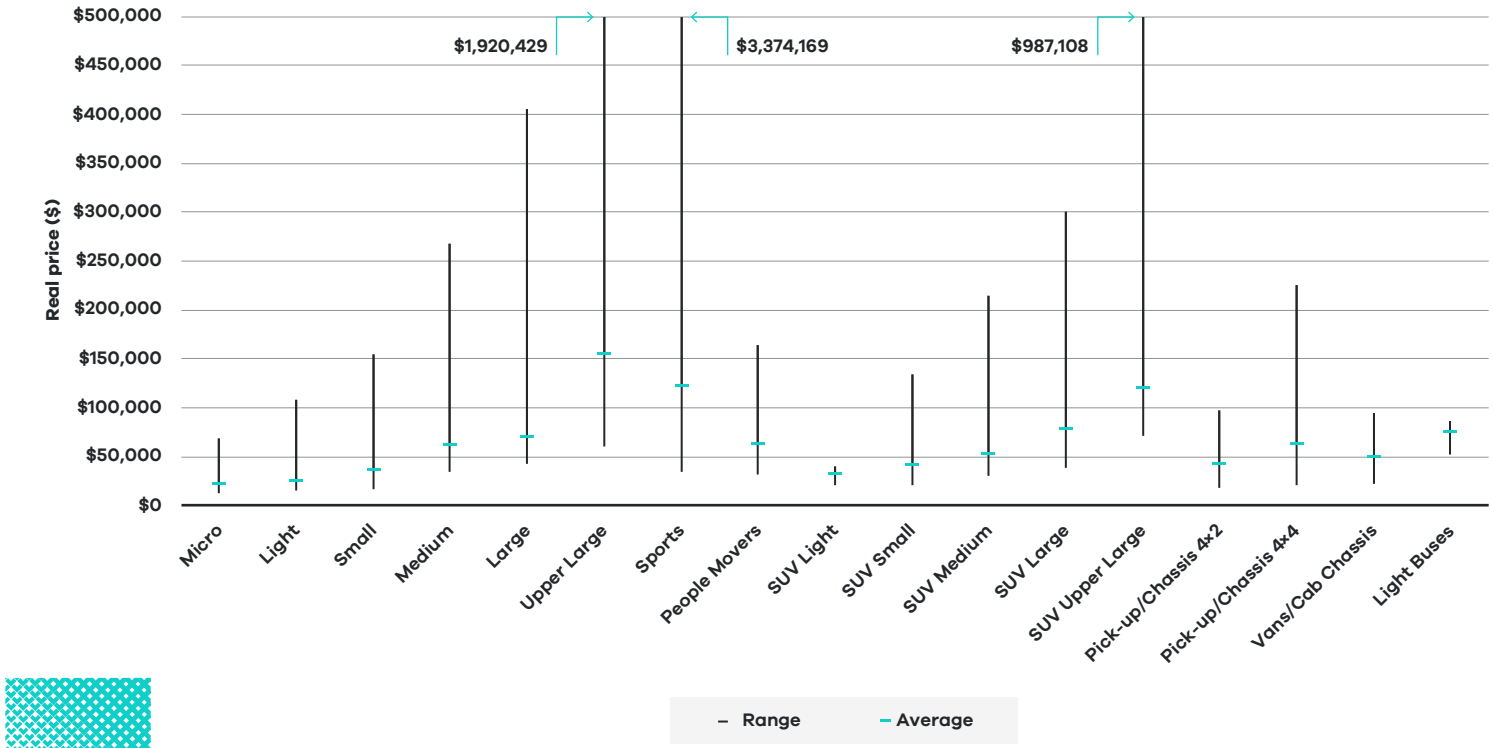
Figure 82: Average real price (2024 dollars) and average emissions intensity by segment, January 2024 registered vehicles



3.12 Price analysis of January 2024 registered vehicles (continued)

The average real price provides some context for each vehicle segment. However, in certain segments there is considerable variation in the prices of different vehicle models. **Figure 83** shows the minimum and maximum real prices (in 2024 dollars) for vehicles in each vehicle segment – represented by the range of the vertical black bars – as well as the average real price in the segment (represented by the horizontal green bar).[37] There was a considerable range in vehicle prices, particularly for larger vehicle segments. In most segments, the maximum vehicle price was less than 8 times the value of the minimum vehicle price (in real terms). However, in segments such as 'Upper Large' and 'Sports' the most expensive vehicle was around 32 and 98 times as expensive as the cheapest vehicle in that segment. The average price was generally relatively close to the minimum price for most vehicle segments.

Figure 83: Range of and average real price (2024 dollars) by segment, January 2024 registered vehicles



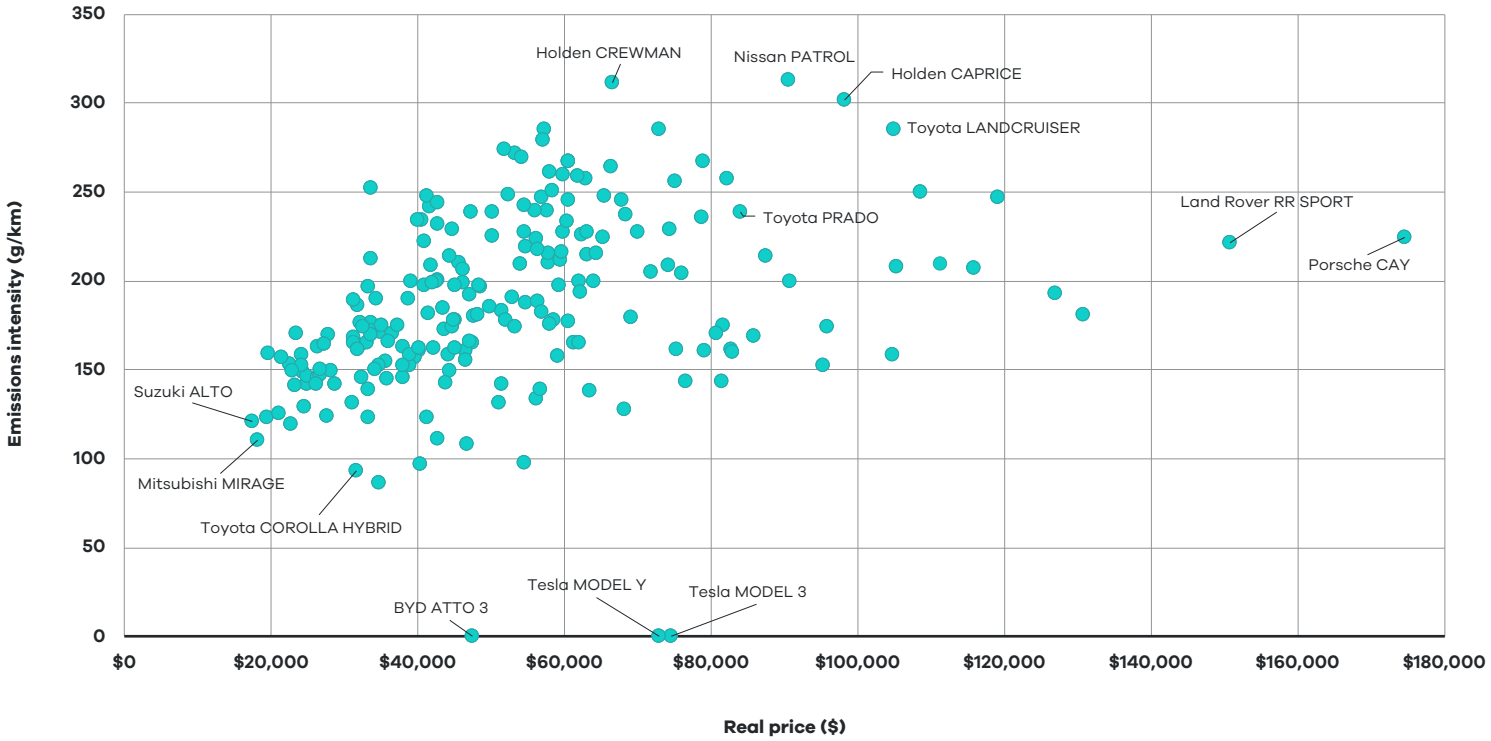
37 We stopped the vertical axis at $500,000 to allow for ease of readability, given the very high maximum prices for the 'Upper Large', 'Sports' and 'SUV Upper Large' segments. The maximum prices for these segments have been labelled on the graph. The most expensive vehicle in the January 2024 registered vehicles dataset was the McLaren ELVA in the 'Sports' segment, which had a nominal price in 2021 of $3,007,250, or a real price of $3,374,169 when converted to 2024 dollars using the CPI.

3.12 Price analysis of January 2024 registered vehicles (continued)

The relationship between vehicle price and emissions intensity can also be analysed by vehicle model.[38] **Figure 84** plots the average emissions intensity and average real price (in 2024 dollars) for the most common vehicle models in Australia: those with at least 10,000 registered vehicles. There were 219 vehicle models with at least 10,000 registered vehicles (out of 1,690 vehicle models in total in the light vehicle fleet); collectively, these 219 vehicle models had 15.1 million registered vehicles, or 90 per cent of the January 2024 registered vehicles dataset.

Overall, the data in **Figure 84** indicates that there was a generally positive relationship between average price and average emissions intensity.[39] Almost all of the most common vehicles with a real price above $80,000 (in 2024 dollars) had an average emissions intensity above 160 g/km and many had an emissions intensity of above 200 g/km. The most common of these were the Toyota LANDCRUISER (with an average real price of almost $105,000 and an average emissions intensity of 284.9 g/km) and the Toyota PRADO (with an average real price of almost $84,000 and an average emissions intensity of 239.0 g/km); both models had more than 300,000 registered vehicles. Almost all common models with an average real price below $30,000 had an average emissions intensity below 160 g/km. Three BEV models had more than 10,000 registered vehicles: Tesla MODEL 3, Tesla MODEL Y and BYD ATTO 3. Three vehicle models had an average emissions intensity above 300 g/km and more than 10,000 registered vehicles: Nissan PATROL; Holden CREWMAN; and Holden CAPRICE. The two most expensive vehicle models in the graph were the Porsche CAY (with an average real price of $174,585 and average emissions intensity of 224.1 g/km) and the Land Rover RR SPORT (with an average real price of $150,749 and average emissions intensity of 221.4 g/km).

Figure 84: Average emissions intensity and average real price (2024 dollars) for most common vehicle models, January 2024 registered vehicles



38 Data on price and emissions intensity for a vehicle model is an average among all January 2024 registered vehicles of that vehicle model. This means that some common vehicles that have been produced throughout the time period – such as the Toyota COROLLA, Mazda 300, and Toyota HILUX 4X4 – may be a weighted average of vehicles from more than 20 years of data into a single data point on price or emissions intensity.

39 A line of best fit (trend line) drawn through the data points had an equation of y=147.77+0.00074x.

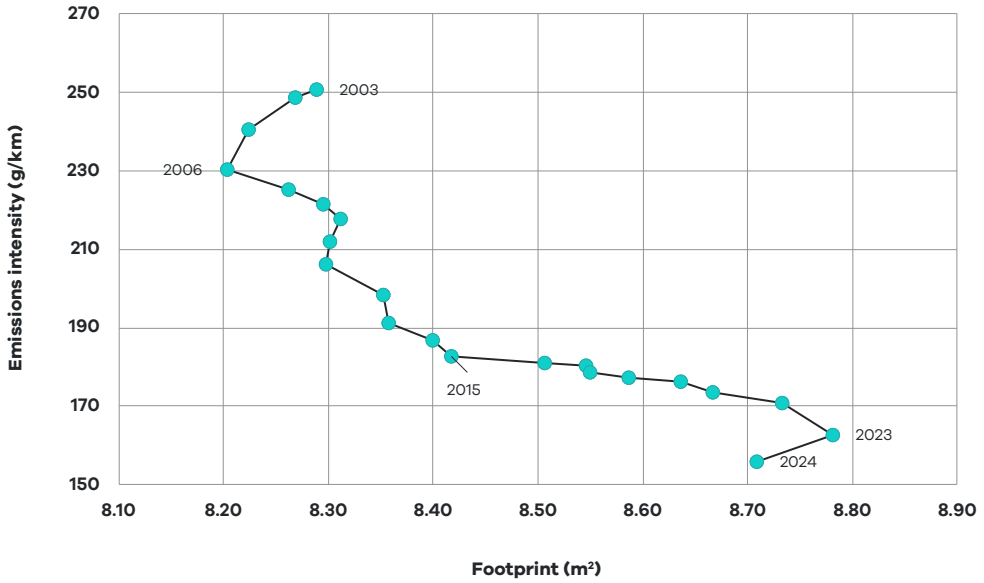
3.13 Vehicle dimensions and mass analysis of January 2024 registered vehicles

The January 2024 registered vehicles dataset includes data on vehicle dimensions – length, width and footprint (calculated for the purposes of this report as the vehicle's length multiplied by its width[40]) – and vehicle mass. This section analyses the vehicle dimension and mass data with other vehicle attributes in a series of graphs.

Figure 85 shows the average emissions intensity and average footprint (in square metres) of January 2024 registered vehicles based on the year the vehicles were first registered. While only certain data points are labelled with the relevant year in the graph, the line shows the direction between one year's data point and the next, so years in between can also be readily determined. Vehicles first registered in 2003 had an average footprint of 8.29 m^2 and vehicles entering in the following years had both a lower average emissions intensity and lower average footprint (with the smallest footprint occurring for vehicles first registered in 2006, at 8.20 m^2).

For years between 2006 and 2015, the average emissions intensity continued to fall each year, while the footprint generally became larger from year to year, albeit with two consecutive years in the middle where the average footprint declined very slightly relative to the previous year. However, between 2015 and 2023, the average footprint increased significantly, from 8.42 m^2 in 2015 to 8.78 m^2 in 2023. While the average footprint was growing strongly this time period, there were relatively small improvements in average emissions intensity. Overall, the average footprint of registered vehicles entering the fleet in 2023 was around 0.5 m^2 higher than it had been for registered vehicles which first entered the fleet between 2003 and 2008.

Figure 85: Average vehicle footprint and average emissions intensity by year first registered, January 2024 registered vehicles

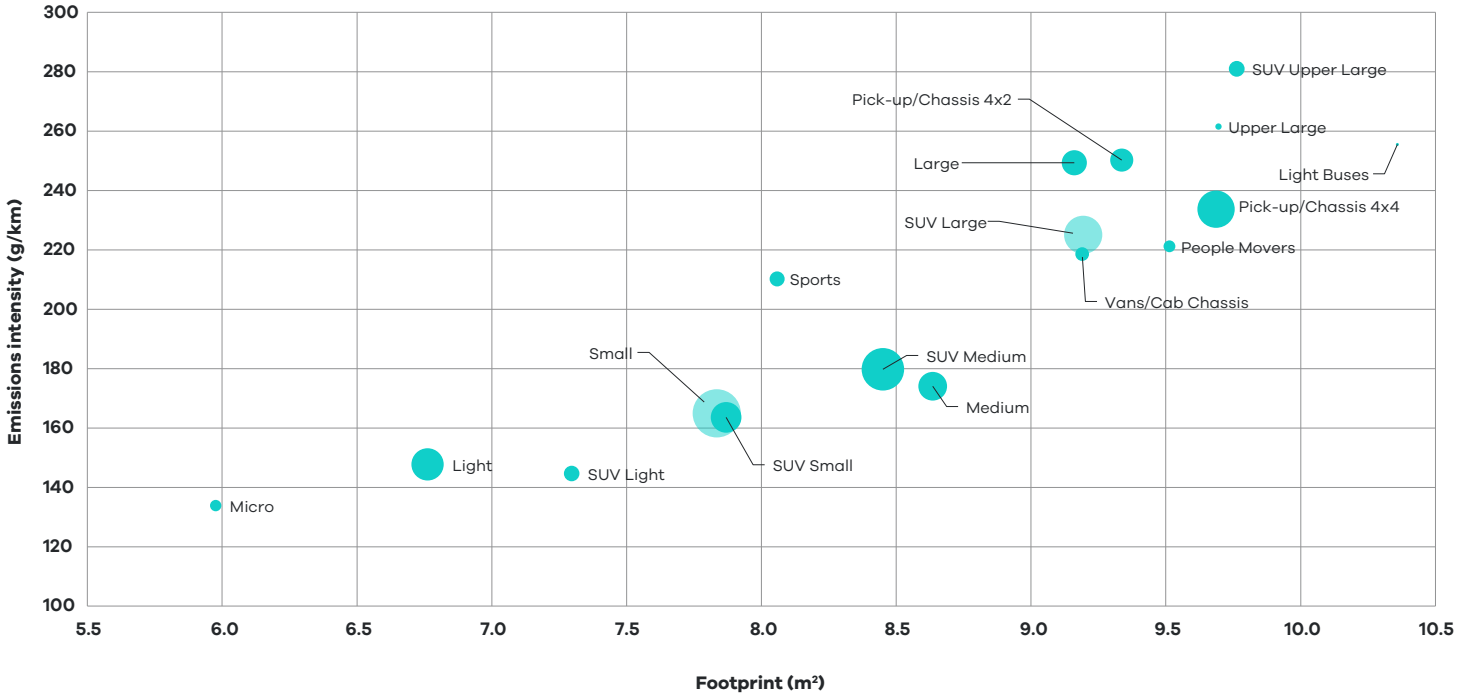


40 Other definitions of vehicle footprint also exist, such as the area where the four tyres touch the ground.

3.13 Vehicle dimensions and mass analysis of January 2024 registered vehicles (continued)

The average footprint of vehicles varied significantly by vehicle segment (which is unsurprising, since footprint is used as a criterion for determining segment boundaries for many – although not all – of the vehicle segments). **Figure 86** plots the average vehicle footprint and average emissions intensity for each segment for January 2024 registered vehicles, with circle sizes reflecting the relative number of vehicles in each segment. Unsurprisingly, the data in **Figure 86** showed a strong positive relationship between average footprint and average emissions intensity. The 'Micro' segment had an average footprint of 5.98 m^2, the lowest by a considerable margin, and the lowest average emissions intensity. Five segments had an average footprint above 9.5 m^2 with 'Light Buses' having the largest footprint (10.36 m^2), albeit with just 12,260 registered vehicles. These five segments all had some of the highest average emissions intensities.

Figure 86: Average footprint and average emissions intensity by segment, January 2024 registered vehicles



3.13 Vehicle dimensions and mass analysis of January 2024 registered vehicles (continued)

In January 2024, the average footprint of light vehicles first registered in 2023 in Australia was

8.78 m²

Up from

8.29 m²

for vehicles first registered in 2003.

Figure 87: Average emissions intensity and average footprint for most common vehicle models, January 2024 registered vehicles

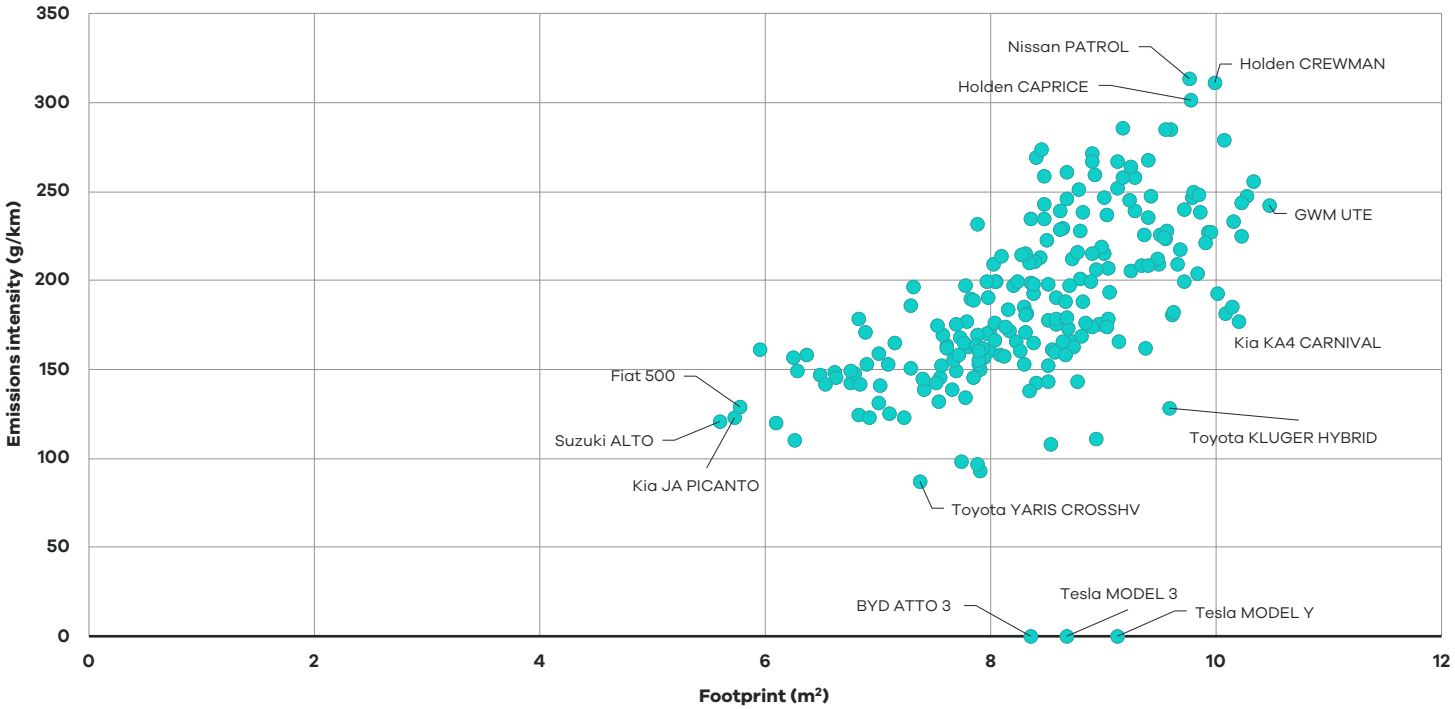


Figure 87 provides a similar analysis but focusing on common vehicle models rather than vehicle segments. The same definition of common model has been used as in **Figure 84**, with 219 vehicle models included that each had at least 10,000 registered vehicles. Overall, a clear positive relationship was evident in the data, as expected. A small number of vehicle models had an average footprint below 6 m², and most of these had emissions intensities below 150 g/km. The vast majority of vehicles had an average footprint between 6.5 m² and 9.5 m², with the average emissions intensity generally being higher for larger vehicles. 11 vehicle models (with at least 10,000 registered vehicles) had an average footprint above 10 m². The vehicle model with the largest average footprint in **Figure 87** was the GWM UTE (10.47 m²) with an average emissions intensity of 241.9 g/km; the vehicle model with the smallest average footprint was the Suzuki ALTO (5.6 m²), which had an average emissions intensity of 120.8 g/km.

3.13 Vehicle dimensions and mass analysis of January 2024 registered vehicles (continued)

A vehicle segment that has seen significant change over the time period analysed is the ute segment, 'Pick-up/Chassis 4×4'. **Figure 88** shows that for January 2024 registered vehicles in this segment, utes which were first registered in 2003 had an average footprint 8.69 m^2. In 2023, 'Pick-up/Chassis 4×4' vehicles entering the fleet for the first time had an average footprint of 10.19 m^2, a full 1.5 m^2 larger than two decades earlier.

The minimum and maximum footprints among all models in the 'Pick-up/Chassis 4×4' also showed significant increases. The minimum footprint was typically around 8.5 m^2 to 8.7 m^2 in the years until 2010,[41] but generally exceeded 9 m^2 in the following years. The minimum footprint reached 9.62 m^2 in 2023; this value was slightly higher than the *maximum* footprint among any of the 24,251 utes in this segment which were first registered during 2003.

The maximum footprint saw even larger increases, particularly in recent years. Until 2017, the maximum footprint was at or below 10.4 m^2. However, it steadily increased since then, reaching 13.25 m^2 in 2023. This 13.25 m^2 footprint was for the RAM 1500 TRX which had an average emissions intensity of 475.7 g/km.

Figure 89 shows the average footprint data for the 'Pick-up/Chassis 4×4' segment again, but this time compares it with average emissions intensity, based on the year the vehicles were first registered. The data shows that there was a significant improvement in emissions intensity between utes that were first registered in 2003 (which had an average emissions intensity of 279.9 g/km), and 2016, where the average emissions intensity was 222.1 g/km. After 2016, the average emissions intensity increased slightly, and remained relatively stable at that level for the following years (disregarding 2024, since there were so few vehicles due to the timing of the data extract). The average footprint increased year-on-year throughout the time period, with the exception of 2009. In some cases, the average footprint increased by more than 0.1 m^2 within the space of a single year.

Figure 88: Average footprint by year first registered for the Pick-up/Chassis 4×4 segment, January 2024 registered vehicles

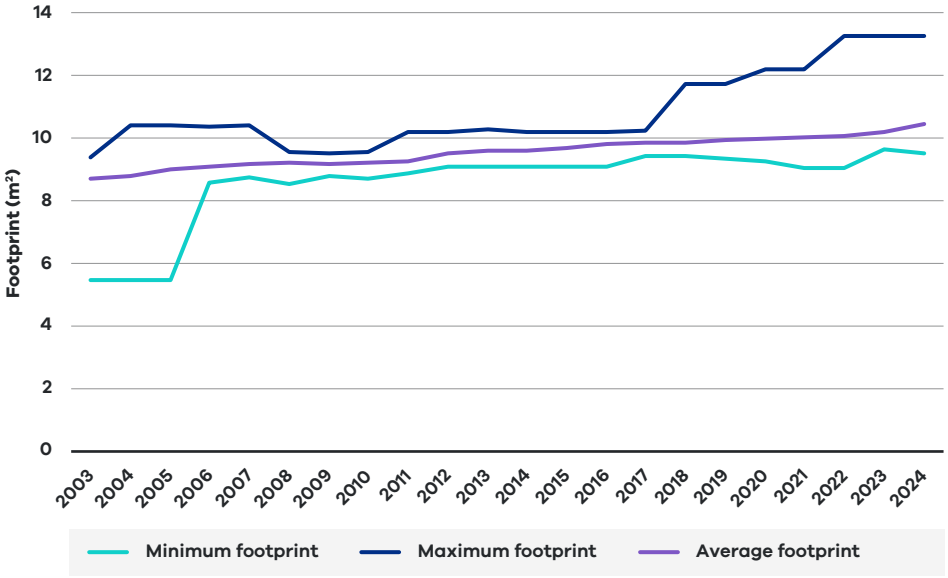
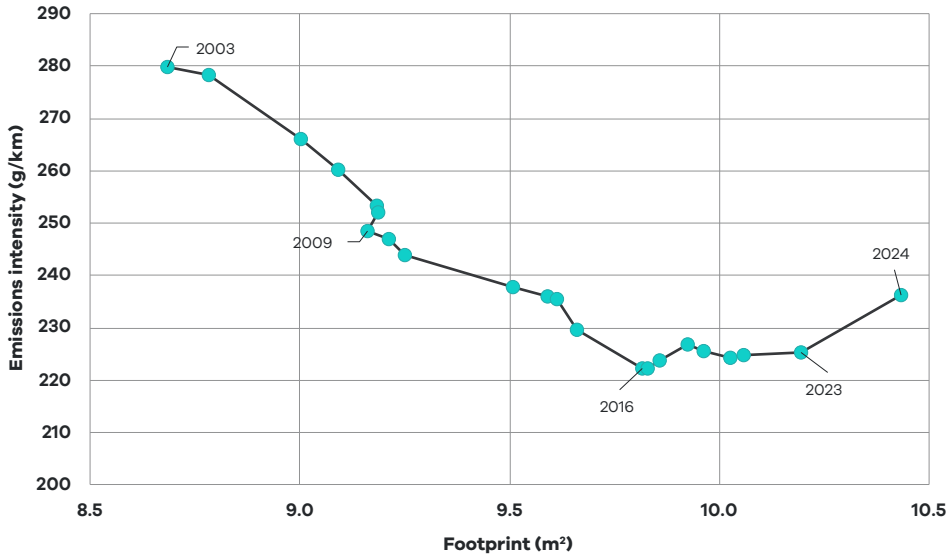


Figure 89: Average footprint and average emissions intensity by year first registered for the Pick-up/Chassis 4×4 segment, January 2024 registered vehicles



41 Disregarding the Suzuki CARRY, with an average footprint of 5.46 m^2, which had a small number of registered vehicles from the first few years (66 registered vehicles in total in January 2024).

3.13 Vehicle dimensions and mass analysis of January 2024 registered vehicles (continued)

Finally, it is possible to compare longer term trends in the average mass of vehicles over time. **Figure 90** compares average emissions intensity and average mass for January 2024 registered vehicles based on the year of first registration. The average mass of vehicles first registered in 2003 was 1,626 kg, and by 2005 vehicles' average mass had declined to 1,600 kg. However, from 2005 onwards the average mass increased in almost every year,[42] and in several cases by more than 20 kg. Overall, the average mass of vehicles first registered in 2023 (1,851 kg) was around 14 per cent more than the average mass of vehicles first registered in 2003. Since 2015, the average mass increase from year to year has been quite large, while the average emissions intensity had relatively little change for several years, before decreasing more significantly after 2020.

42 The exceptions were 2011 and 2013, where average mass declined slightly.

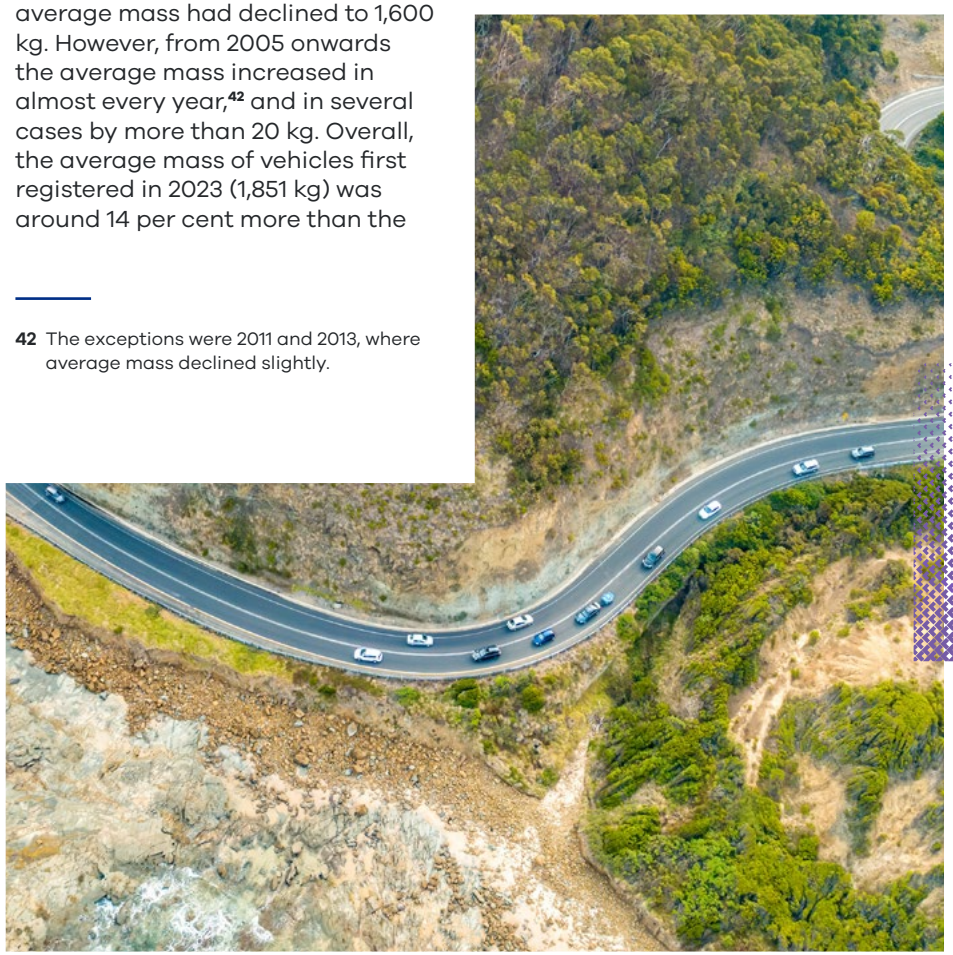
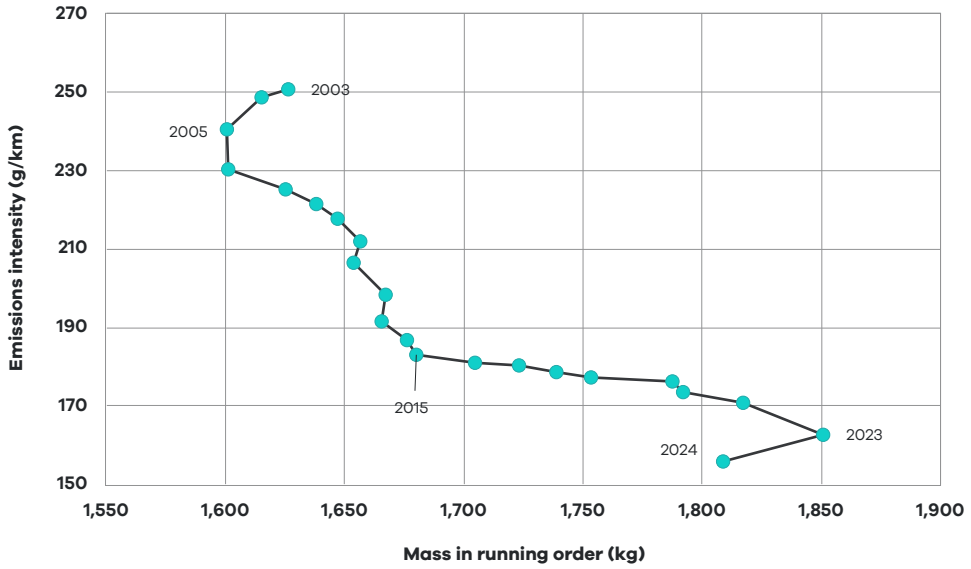


Figure 90: Average mass and average emissions intensity by year first registered, January 2024 registered vehicles



Until 2017, the maximum footprint among all models in the 'Pick-up/ Chassis 4×4' segment was at or below 10.4 m². However, it steadily increased since then, reaching 13.25 m² in 2023.

(pg.89)

4. Emissions intensity in Australia and other countries

This section compares data from Australia and other countries.

The overall weighted average emissions intensity for new passenger vehicles and SUVs (not including utes and vans) in 29 European countries was

107 g/km

In comparison, Australia's emissions intensity for the same type of new vehicles was

150 g/km

Different methods have been used worldwide to calculate vehicle emissions which makes direct comparisons difficult. The three main methods are from Europe, Japan and the United States. Each method can give a different emissions result when applied to the same vehicle.

An international test method, called the Worldwide Harmonised Light Vehicle Test Procedure (WLTP), has been developed to replace these three different regional test methods and to better reflect on-road emissions performance. The WLTP began to be used in Europe from 2019.

Australia currently uses the previous European method, the New European Driving Cycle (NEDC). However, the Australian Government implemented new Australian Design Rules in April 2024 that adopt the WLTP test; the application will be phased in, applying to newly approved vehicle models supplied from December 2025 and new units of existing vehicle models supplied from July 2028 (Green Vehicle Guide, 2024b).

The WLTP methodology has been noted to provide consumers with 'a more realistic overview of vehicle emissions because the testing conditions are based on a closer representation of actual driving conditions' (Stellantis, 2020), with WLTP estimated to increase type-approval emissions results by approximately 25 per cent compared with NEDC (Pavlovic, et al., 2018).

The discussion in the previous paragraphs means that some caution should be exercised when comparing the results for Australia and Europe in this chapter, as the results are based on two different testing regimes. Another reason for caution is that the 2023 European data used in the graphs is provisional rather than final data.[43]

The published data from Europe separates passenger cars from light commercial vehicles.[44] To enable comparisons between Australian and European data, we also separated the Australian data into passenger vehicle and light commercial vehicle groups. The Australian groupings are consistent with the European Commission Regulation (No 443/2009, Annex II).

Emissions from new vehicles in European countries tend to be lower than Australia. There are a number of reasons for this, including fewer measures in Australia to reduce carbon dioxide emissions and emissions intensity. Some of the measures that have been used in Europe are shown in **Table 7**. Governments in a number of European countries have provided incentives or levied taxes to try to reduce carbon dioxide emissions from road transport, which has been summarised in a report to the EEA (German, et al., 2018).[45] Different levels of government in Australia have also implemented policies to encourage electric vehicle sales, as summarised in the Electric Vehicle Council's *State of Electric Vehicles* report (Electric Vehicle Council, 2023).

Consumer preferences also contribute to the difference in emissions performance between Australia and Europe. For example, European consumers tend to purchase smaller, lighter and less powerful vehicles compared with Australian consumers.[46]

43 Historically, the NTC tended to use the latest available final dataset published by the EEA (which was typically available by the end of June) for the international comparisons – albeit comparing with the Australian data one year behind the latest year. However, at the time of publication of this report the EEA has not yet published the final European data for 2023, so the comparison uses the latest provisional data in Europe (as has been the case in recent years).

44 In Europe, the passenger cars category includes SUVs. The EEA dataset has data for 29 European countries, including the 27 European Union member states and Norway and Iceland. The United Kingdom is not included.

45 The impact of incentives and taxes on encouraging electric vehicle uptake is probably most evident by examining PHEV sales within the Netherlands between 2010 and 2017. From 2010 to 2013 they exempted PHEVs from taxation, before increasing the tax to the still reduced rate of 7 per cent. This encouraged PHEV sales to increase to 9.2 per cent of all new vehicle sales by 2015. However, by 2017 they had removed this incentive, taxing PHEVs at the same rate (22 per cent) as other conventional vehicles. As a consequence, by 2017 PHEVs had reduced to just 0.3 per cent of all new sales within the Netherlands (EEA, 2019).

46 The average kerb mass of passenger cars and SUVs in Australia is 1,681 kg. Despite the higher share of electric vehicles in Europe and the tendency for these vehicles to weigh more (all else constant) due to battery's weight, data from the EEA's dashboard indicates an average mass of 1,545 kg and average test mass of 1,656 kg (EEA, 2024a).

Table 7: European measures that have reduced carbon dioxide emissions from motor vehicles

European measure	Intent of measure
High fuel prices through higher fuel taxes	Encourages consumers to purchase fuel-efficient vehicles to lower running costs
Regulating carbon dioxide emissions from motor vehicles (passenger vehicle standards were phased in from 2012, with full implementation from 2015)	Provides manufacturers with targets for emissions reductions
Vehicle excise duties	Encourages consumers to purchase low carbon dioxide-emitting vehicles
Direct cash incentives for consumers to purchase low carbon dioxide-emitting vehicles	Encourages consumers to purchase low carbon dioxide-emitting vehicles as it lowers the purchase price of the vehicle
Consumer information on vehicles	Provides information to consumers about relative carbon dioxide efficiency and the annual running costs of new vehicles
Consumer information in printed advertisements	Provides information to consumers about relative carbon dioxide efficiency and the annual running costs of new vehicles

The next two parts of this section compare Australian and other countries' carbon dioxide emissions intensity data for passenger and light commercial vehicles separately. These international comparisons use European data from the European Environment Agency (EEA, 2024a). The remaining sections of the chapter provide a broader international comparison beyond Europe, using data from the Global Fuel Economy Initiative (GFEI) and International Energy Agency (IEA).

4.1 Passenger vehicles: average emissions intensity by country for 2023

The breakdown for average carbon dioxide emissions intensity for new passenger vehicles by country for 2023 is shown in **Figure 91**. As noted above, key caveats in interpreting this and the following graphs are that the European emissions data is based on the WLTP methodology, and the European data for 2023 is provisional data. Another difference is that the Australian data reflects new vehicle sales, while the European data reflects new vehicle registrations.

In 2023, emissions intensity for passenger cars in European countries ranged from 15 g/km in Norway to 138 g/km in Slovakia. The overall weighted average emissions intensity for the 29 European countries was 107 g/km. Australia's emissions intensity was significantly higher at 150 g/km (for passenger vehicles and SUVs).

Figure 92 compares the distribution of the emissions intensity among new passenger car sales in Australia[47] and Europe, in intervals of 10 g/km.[48] Norway is also shown as a comparator. Each line in the graph shows the percentage of vehicles sold with an emissions intensity less than or equal to a given emissions intensity value on the horizonal axis. The graph shows that around 15 per cent of Australia's passenger car sales in 2023 had an emissions intensity of 100 g/km or less, whereas 25 per cent of European and 91 per cent of Norwegian passenger vehicles were at or below this emissions intensity figure. The vast majority of European new passenger cars (91 per cent) had an emissions intensity of 160 g/km or less, whereas in Australia just 47 per cent were below this mark – these numbers are almost unchanged from the previous year (90 per cent and 45 per cent in Europe and Australia, respectively).

Figure 91: Average emissions intensity of passenger vehicles in Australia and Europe, 2023

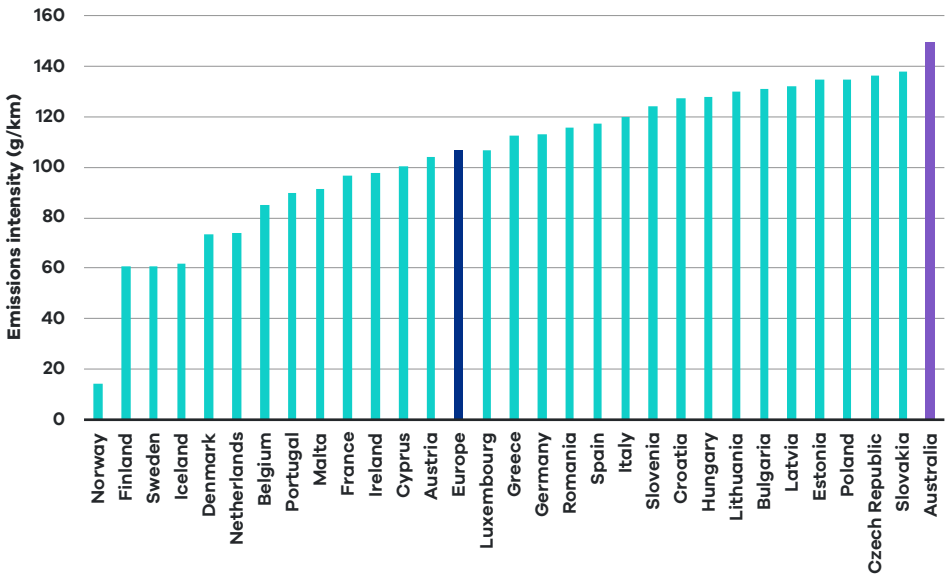
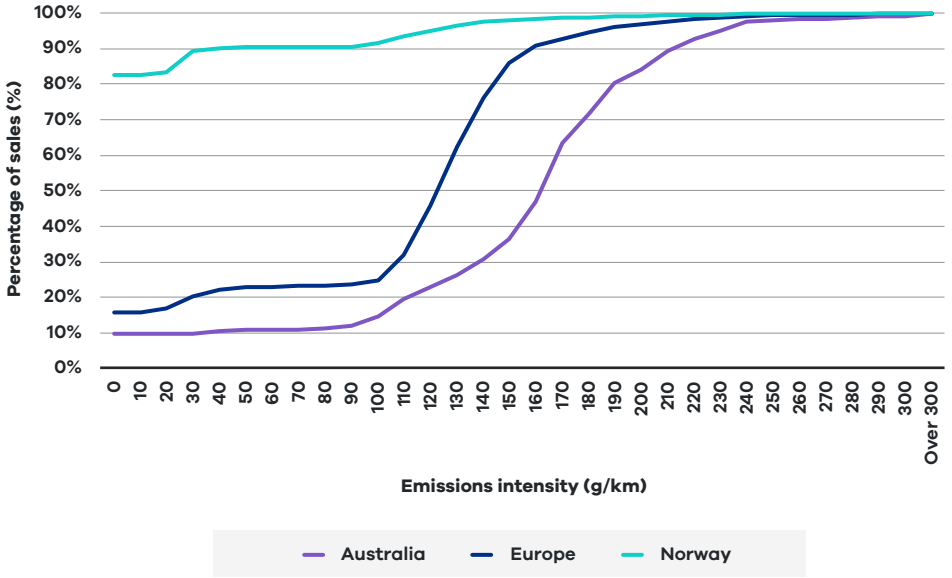


Figure 92: Cumulative percentage of passenger vehicle sales relative to emissions intensity in Australia and Europe, 2023



47 For passenger vehicles and SUVs combined.

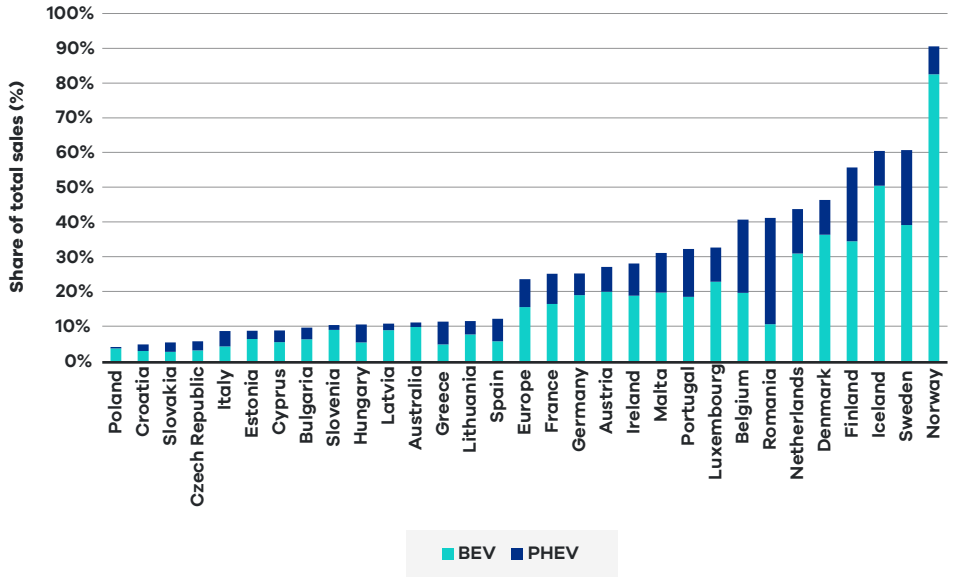
48 Vehicles sold with an emissions intensity above 300 g/km have been grouped into a single 'Over 300' category. This is due to the relatively small number of vehicles in this emissions range and the long 'tail' of the distribution, reaching 442 g/km for Australia, 543 g/km for Europe and 393 g/km for Norway.

4.1 Passenger vehicles: average emissions intensity by country for 2023 (continued)

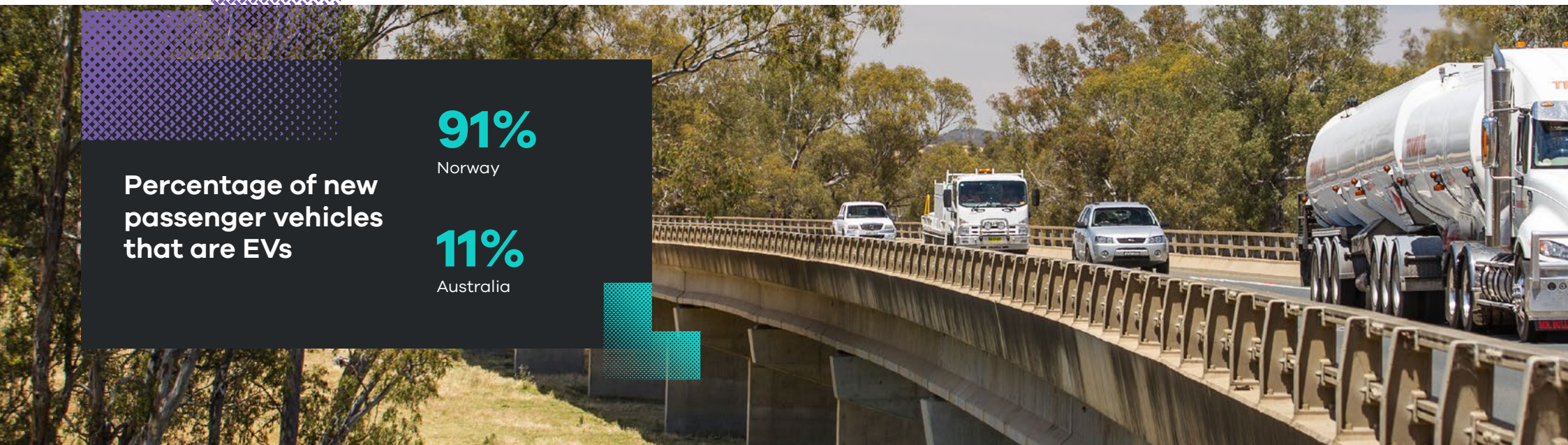
The share of electric vehicles sold, relative to total sales, varies considerably across countries in Europe. **Figure 93** plots the share of electric vehicles – separately for BEVs and PHEVs – in each European country, as well as the average across the 29 European countries and in Australia[49]. In Norway, around 91 per cent of new passenger vehicles were electric vehicles, with BEVs representing almost 83 per cent of total new registrations. The uptake of electric vehicles within Norway has been encouraged by exempting electric vehicles from registration and circulation taxes that apply to other conventional vehicles (EEA, 2019).

Poland had the lowest share of new electric passenger vehicles in Europe at 4.1 per cent, with Australia's share of 11.1 per cent being similar to several eastern European countries. Australia's electric vehicle share was higher than around one-third of European countries but lower than most countries in western and northern Europe which generally had electric vehicle shares above 25 per cent.

Figure 93: Electric vehicle share of new passenger car registrations/sales in Australia and Europe, 2023



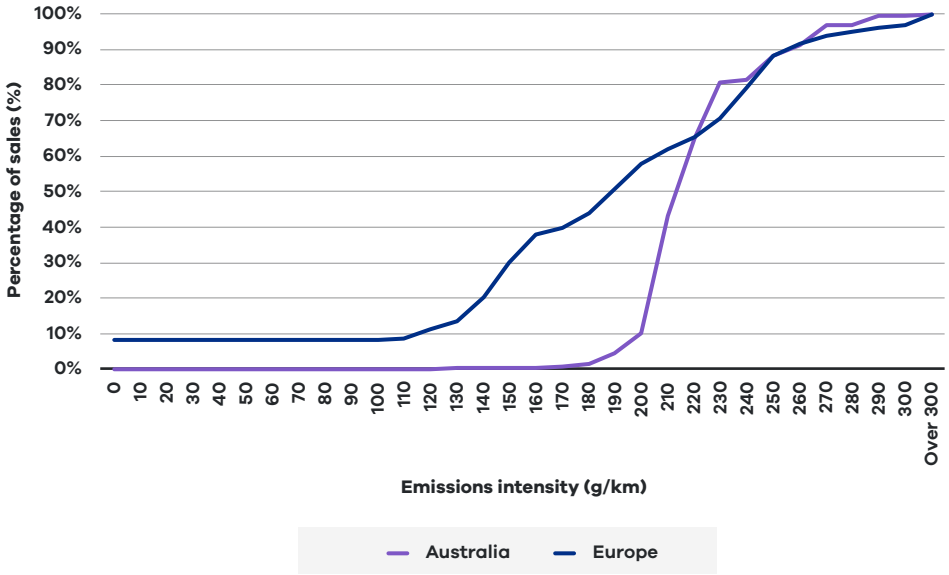
49 For passenger vehicles and SUVs.



4.2 Light commercial vehicles: emissions intensity for 2023

Figure 94 compares the distribution of the emissions intensity among new light commercial vehicle sales in Australia and Europe, in intervals of 10 g/km.[50] The graph shows that around 10 per cent of Australia's light commercial vehicle sales in 2023 had an emissions intensity of 200 g/km or less, whereas around 58 per cent of new European light commercial vehicles were at or below this emissions intensity. Australia had a lower share of vehicles with relatively high emissions intensity levels (above 230 g/km) than Europe.[51]

Figure 94: Cumulative percentage of light commercial vehicles sales relative to emissions intensity in Australia and Europe, 2023



50 Vehicles sold with an emissions intensity above 300 g/km have been grouped into a single 'Over 300' category. This is due to the relatively small number of vehicles in this emissions range and the long 'tail' of the distribution, reaching 333 g/km for Australia and 543 g/km for Europe.

51 The vehicles with high emissions intensities in Europe are in many cases vans (albeit with some utes). To some extent this may reflect differences in the types of vehicles used for local deliveries in Australia and Europe – for example, vans or light trucks – as well as potential differences in the scope of the types of vehicles comprising the Australian and European datasets.

4.3 International comparison of average emissions intensity using GFEI data

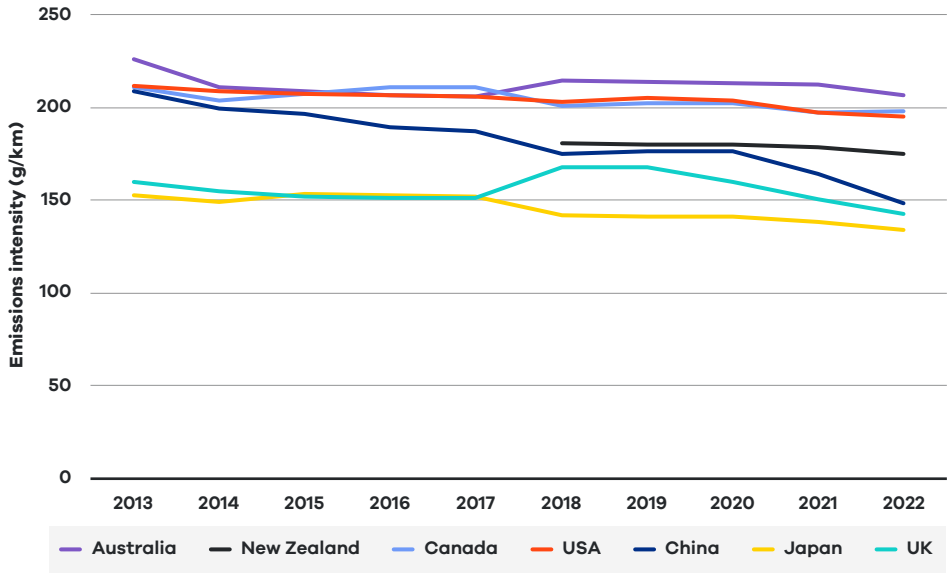
The NTC has compared the average emissions intensity for new vehicle sales in various countries from 2013 to 2022 (the latest available year of data), using data published as part of the Global Fuel Economy Initiative (GFEI, 2023; Cazzola, et al., 2023). For a number of reasons, the GFEI data is not directly comparable to data elsewhere in this report, including:

- The GFEI's results are reported by the GFEI in units of energy consumption (in litres of gasoline equivalent per 100 km); therefore, we have converted these results to carbon dioxide emissions intensity (in grams/km) using a conversion factor of 0.0431 (IEA, 2015, p. 19).
- Due to the various emissions/efficiency testing regimes in place in different regions of the world, the GFEI needed to convert each country's results in its database to a standardised approach, and it used WLTP (GFEI, 2023, p. 10).
- Given the GFEI study's focus on energy consumption/fuel efficiency, its approach leads to BEVs having a non-zero energy consumption – albeit still significantly lower than internal combustion engine vehicles (by more than 70 per cent) – and therefore a non-zero carbon dioxide emissions intensity (when converted by the NTC using the conversion factor of 0.0431 mentioned in the first dot point).

Figure 95 shows the emissions intensity of vehicles sold in Australia and various other countries using the GFEI data. Given the caveats mentioned in the second and third dot points above, the emissions intensity values appear somewhat higher in **Figure 95** than elsewhere in the report. However, the data has been prepared using an internally consistent methodology and is therefore suitable for comparison within the context of the graph.

From 2018 onwards, Australia had the highest emissions intensity among these comparator countries, generally exceeding the emissions intensities in the USA and Canada by around 10 g/km (or 5 per cent). New Zealand, which only had data available from 2018 onwards, was towards the middle of these comparator countries in the graph. China had the largest decline in emissions intensities among these countries, starting at a level close to the USA and Canada in 2013 but decreasing to a level approaching the best performing countries in the graph, Japan and the UK, by 2022.

Figure 95: International comparison of emissions intensity of light-duty vehicle sales using GFEI data for selected countries, 2013-2022



Source: NTC analysis based on GFEI data (GFEI, 2023; Cazzola, et al., 2023)

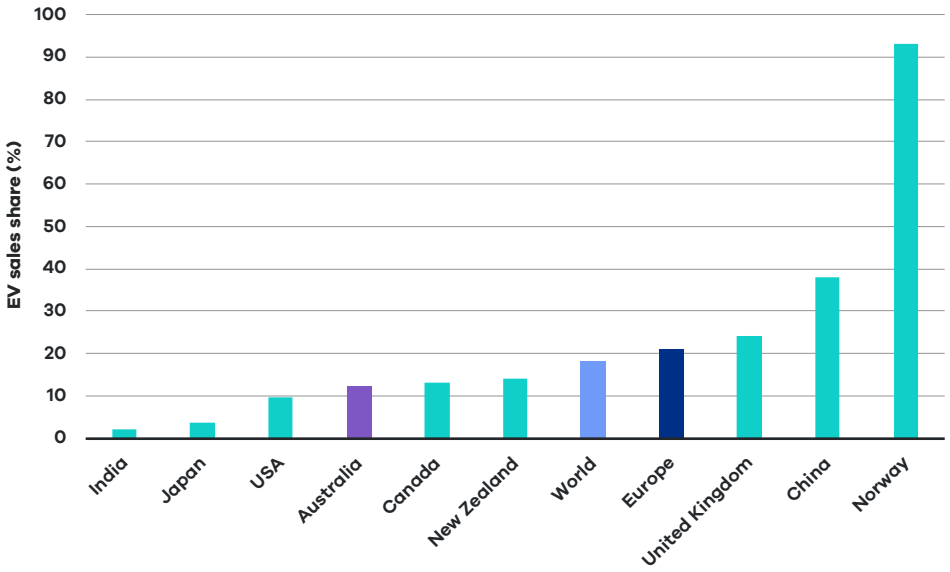
4.4 International comparison of EV sales and stock shares using IEA data

The NTC has compared electric vehicle passenger car data for Australia and several other countries using data from the IEA's Global EV Outlook 2024 (IEA, 2024). We have chosen countries as comparator countries for the graphs based on some of the following factors: the market size; being a developed economy; being a large country geographically, being a right-hand drive market; and/or being a leader in the EV transition. The IEA's data enables comparisons of both annual EV sales, and the stock of EVs (that is, the total number of them on the road).

Figure 96 compares electric vehicle sales as a share of total sales in 2023 for selected countries using the IEA's data. Australia's EV sales share of 12 per cent was higher than those in India (2 per cent) and Japan (3.6 per cent) and USA (9.5 per cent). However, it was slightly below countries such as Canada (13 per cent) and New Zealand (14 per cent) and significantly below the world average of 18 per cent. China's share of 38 per cent was more than twice the world average, although below leading European countries such as Norway (and several other European countries that are shown separately in **Figure 93**).

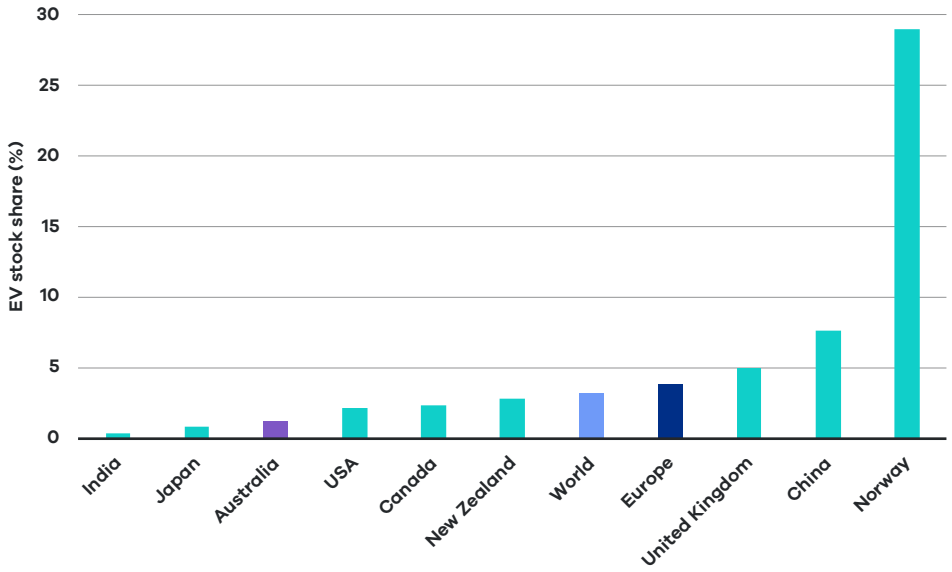
Figure 97 compares the stock of electric vehicles as a share of the total vehicle stock (or entire passenger car parc) in 2023 in selected countries. Australia's EV stock share was 1.2 per cent, which was lower than all of the other comparator countries shown with the exception of India (0.31 per cent) and Japan (0.84 per cent). The world average was 3.2 per cent and Europe's average was 3.8 per cent, with the USA (2.1 per cent), Canada (2.3 per cent) and New Zealand (2.8 per cent) being comparator countries with higher EV stock shares than Australia. In China around one in 13 cars (7.6 per cent) on the road were electric, while in Norway this figure was around 3 in 10 cars (29 per cent).

Figure 96: International comparison of share of electric passenger car sales in selected countries (%), 2023



Source: NTC analysis based on IEA data (IEA, 2024)

Figure 97: International comparison of share of electric passenger car stock in selected countries (%), 2023



Source: NTC analysis based on IEA data (IEA, 2024)

Appendix A: Data tables

This appendix provides tables containing the data used in this report.

Table 8: National average emissions intensity for new passenger and light commercial vehicles, 2002-2023

Year	Average CO_2 emissions (g/km)	Annual change
2002	252.4	n/a
2003	249.5	-1.1%
2004	246.5	-1.2%
2005	240.5	-2.4%
2006	230.3	-4.2%
2007	226.4	-1.7%
2008	222.4	-1.8%
2009	218.6	-1.7%
2010	212.6	-2.7%
2011	206.6	-2.8%
2012	199.0	-3.7%
2013	192.2	-3.4%
2014	187.8	-2.3%
2015	184.2	-1.9%
2016	182.1	-1.1%
2017	181.7	-0.3%
2018	180.9	-0.4%
2019	180.5	-0.2%
2020	179.6	-0.5%
2021	178.9	-0.4%
2022	173.8	-2.8%
2023	165.2	-5.0%

Table 9: Average emissions intensity and annual sales by make, 2022 and 2023

Make	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Toyota	174	170	-2.5%	226,688	199,772
Mazda	167	166	-0.4%	95,718	100,008
Ford	212	214	1.1%	66,231	87,483
Kia	160	155	-3.2%	78,330	76,120
Hyundai	166	166	0.2%	73,345	75,215
Mitsubishi	195	184	-5.6%	76,986	63,534
MG	157	141	-10.1%	49,073	58,359
Tesla	0	0	N/A	19,594	46,116
Subaru	168	172	2.6%	36,035	46,114
Isuzu Ute	209	210	0.0%	35,317	45,342
Volkswagen	173	177	2.7%	29,905	42,651
Nissan	224	208	-7.1%	26,161	40,165
GWM	196	182	-6.8%	25,052	36,491
BMW	161	155	-3.6%	22,696	26,184
Mercedes-Benz Cars	170	160	-5.3%	26,837	24,253
Audi	171	162	-5.1%	14,732	19,039
Suzuki	135	130	-3.1%	21,579	17,153
LDV	238	236	-0.6%	13,088	17,145
Lexus	146	134	-8.0%	7,089	15,191

Make	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Honda	156	156	-0.5%	14,214	13,734
BYD	0	0	N/A	2,113	12,439
Volvo Car	139	97	-30.2%	10,715	11,128
Land Rover	209	207	-0.7%	4,348	8,448
Skoda	150	144	-3.5%	6,502	8,004
Renault	167	167	0.2%	7,216	6,673
Porsche	210	211	0.7%	5,605	6,053
SsangYong	221	223	0.9%	3,948	5,961
Chery	N/A	165	N/A	0	5,904
RAM	283	277	-2.1%	5,332	5,511
Jeep	236	235	-0.5%	6,663	4,633
MINI	116	116	-0.5%	3,002	4,289
CUPRA	160	111	-30.4%	1,113	3,763
Chevrolet	306	299	-2.4%	2,048	2,598
Peugeot	140	128	-8.4%	2,010	2,468
Polestar	0	0	N/A	1,480	2,463
Genesis	199	203	2.1%	1,039	1,916
Mercedes-Benz Vans	175	173	-0.8%	1,738	1,430
Fiat	121	94	-22.0%	365	757

Table 9 (continued)

Make	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Alfa Romeo	160	136	-15.5%	567	740
Maserati	240	224	-6.7%	594	638
Jaguar	194	186	-4.2%	700	582
Lamborghini	331	328	-0.7%	176	241
Bentley	267	275	3.0%	203	229
Citroen	138	127	-8.3%	272	225
Ferrari	260	215	-17.0%	210	216
Lotus	227	258	13.5%	62	183
Aston Martin	269	286	6.2%	132	157
McLaren	263	211	-19.9%	60	85
Rolls-Royce	343	323	-5.8%	60	49
Chrysler	301	N/A	N/A	78	0
Alpine	148	N/A	N/A	4	0
Caterham	162	N/A	N/A	2	0
Total	**174**	**165**	**-5.0%**	**1,027,027**	**1,147,852**

Table 10: Average emissions intensity and annual sales by segment, 2022 and 2023

Segment	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
SUV Medium	153	135	-11.7%	215,883	268,383
Pick-up/Chassis 4×4	224	222	-1.0%	192,433	205,578
SUV Small	151	144	-4.9%	143,544	174,660
SUV Large	193	192	-0.3%	140,473	156,248
Small	144	135	-6.3%	88,244	84,364
SUV Light	137	138	0.5%	52,729	53,066
Medium	95	77	-18.8%	38,085	48,243
Light	137	136	-0.5%	43,520	38,675
Pick-up/Chassis 4×2	222	215	-3.0%	33,405	30,689
SUV Upper Large	267	265	-0.7%	21,613	26,376
Vans/Cab Chassis	199	199	-0.4%	24,418	21,444
People Movers	183	181	-1.0%	12,029	14,553
Sports	222	219	-1.1%	8,749	11,753
Micro	116	115	-0.4%	6,423	8,464
Large	193	154	-20.2%	4,872	4,824
Upper Large	190	154	-18.8%	607	532
Total	**174**	**165**	**-5.0%**	**1,027,027**	**1,147,852**

Table 11: Top selling models within segments and comparison with best-in-class model, 2023

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
Micro	1	Kia	JA PICANTO	7,706	117	N/A	0
	2	Fiat	ABARTH	303	136	N/A	Fiat 500E (electric)
	3	Fiat	500	270	111	N/A	
	4	Fiat	500E	171	0	N/A	
	5	Fiat	ABARTH 500E	13	0	N/A	
	6	Mitsubishi	MIRAGE	1	109	N/A	
Light	1	MG	MG3	15,431	159	N/A	0
	2	Suzuki	SWIFT	6,953	116	N/A	MINI COOPER (electric)
	3	Mazda	200	5,181	121	N/A	
	4	Kia	YB RIO	4,067	137	N/A	
	5	MINI	COOPER	2,011	97	N/A	
	6	Toyota	YARIS	1,388	114	N/A	
	7	Volkswagen	POLO	928	134	N/A	
	8	Hyundai	I20	637	157	N/A	
	9	Toyota	YARIS HYBRID	547	76	N/A	
	10	Audi	A1	462	133	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
Small	1	Hyundai	I30	20,631	173	N/A	0
	2	Toyota	COROLLA HYBRID	16,455	91	N/A	MG MG4 (electric)
	3	Mazda	300	9,079	148	N/A	
	4	Kia	BD CERATO	5,795	163	N/A	
	5	Volkswagen	GOLF	3,591	143	N/A	
	6	MG	MG4	3,134	0	N/A	
	7	Toyota	COROLLA	2,907	136	N/A	
	8	Subaru	WRX	2,743	203	N/A	
	9	MG	MG5	2,398	138	N/A	
	10	Subaru	IMPREZA	2,081	160	N/A	
Medium	1	Tesla	MODEL 3	17,347	0	N/A	0
	2	Toyota	CAMRY HYBRID	9,772	102	N/A	Tesla MODEL 3 (electric)
	3	Polestar	2	2,463	0	N/A	
	4	Mazda	600	1,528	171	N/A	
	5	Lexus	ES300H	1,527	109	N/A	
	6	Skoda	OCTAVIA	1,398	143	N/A	
	7	Mercedes-Benz Cars	C200	983	157	N/A	
	8	BMW	330I	852	149	N/A	
	9	BMW	320I	839	147	N/A	
	10	Toyota	CAMRY	810	155	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
Large	1	Kia	CK STINGER	1,806	238	N/A	0
	2	Porsche	TAY	536	0	N/A	Porsche TAY (electric)
	3	Skoda	SUPERB	278	180	N/A	
	4	BMW	530D	237	145	N/A	
	5	Mercedes-Benz Cars	E200 FL	224	180	N/A	
	6	Audi	RS E-TRON GT	215	0	N/A	
	7	Mercedes-Benz Cars	EQE 350	200	0	N/A	
	8	Audi	A6	156	157	N/A	
	9	Mercedes-Benz Cars	EQE 300	140	0	N/A	
	10	Mercedes-Benz Cars	M-AMG E63S FL	127	280	N/A	
Upper Large	1	BMW	740I	81	179	N/A	0
	2	Mercedes-Benz Cars	S450 4M	71	193	N/A	BMW I7 XDRIVE60 (electric)
	3	Porsche	97A	70	209	N/A	
	4	BMW	I7 XDRIVE60	62	0	N/A	
	5	Mercedes-Benz Cars	EQS 53 4M	36	0	N/A	
	6	Mercedes-Benz Cars	EQS 450 4M	30	0	N/A	
	7	BMW	840I GC	24	180	N/A	
	8	Mercedes-Benz Cars	M-AMG GT63SEPER	23	175	N/A	
	9	Bentley	FLYING SPUR	17	248	N/A	
	10	Audi	A8	14	175	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
Sports	1	Subaru	BRZ	1,574	210	N/A	0
	2	Ford	MUSTANG	1,475	285	N/A	Rolls-Royce SPECTRE (electric)
	3	Toyota	GR86	1,144	209	N/A	
	4	Mazda	MX5	653	163	N/A	
	5	Porsche	911	558	251	N/A	
	6	BMW	M2	479	223	N/A	
	7	Nissan	Z	444	243	N/A	
	8	Mercedes-Benz Cars	M-AMG C63S CPFL	427	234	N/A	
	9	Porsche	982	418	238	N/A	
	10	MINI	COOPER	390	143	N/A	
People Movers	1	Kia	KA4 CARNIVAL	11,312	176	N/A	0
	2	Hyundai	STARIA	1,142	226	N/A	Mercedes-Benz Vans EVITO TOURER (electric)
	3	Volkswagen	MULTIVAN	710	179	N/A	
	4	LDV	MIFA	452	214	N/A	
	5	Mercedes-Benz Vans	V-CLASS	379	186	N/A	
	6	Toyota	GRANVIA	112	211	N/A	
	7	Mercedes-Benz Vans	VITO	108	181	N/A	
	8	Volkswagen	CALIFORNIA	108	196	N/A	
	9	Volkswagen	CADDY	72	131	N/A	
	10	Lexus	LM350H	41	123	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
SUV Light	1	Mazda	CX3	15,776	143	67%	86
	2	Kia	YB STONIC	6,983	150	74%	Toyota YARIS CROSSHV (petrol-electric)
	3	Hyundai	VENUE	6,152	165	92%	
	4	Volkswagen	T-CROSS	5,761	123	43%	
	5	Suzuki	JIMNY	5,035	153	78%	
	6	Toyota	YARIS CROSSHV	4,387	87	1%	
	7	Suzuki	IGNIS	2,281	113	32%	
	8	Toyota	YARIS CROSS	2,127	124	44%	
	9	Ford	PUMA	2,027	121	41%	
	10	Nissan	JUKE	1,598	136	58%	
SUV Small	1	MG	MG ZS	26,473	163	N/A	0
	2	Mazda	C30	13,115	153	N/A	Volvo Car XC40 (electric)
	3	GWM	HAVAL JOLION	11,279	166	N/A	
	4	Hyundai	KONA	11,191	141	N/A	
	5	Kia	SP2 SELTOS	10,473	165	N/A	
	6	Mitsubishi	ASX	9,176	178	N/A	
	7	Subaru	CROSSTREK	8,991	158	N/A	
	8	Volkswagen	T-ROC	8,942	160	N/A	
	9	Mitsubishi	ECLIPSE CROSS	7,789	145	N/A	
	10	Nissan	QASHQAI	6,716	138	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
SUV Medium	1	Tesla	MODEL Y	28,769	0	N/A	0
	2	Toyota	RAV4 HYBRID	25,666	108	N/A	Tesla MODEL Y (electric)
	3	Mitsubishi	OUTLANDER	24,273	164	N/A	
	4	Mazda	CX5	23,083	172	N/A	
	5	Hyundai	TUCSON	21,232	175	N/A	
	6	Subaru	FORESTER	16,381	167	N/A	
	7	Kia	NQ5 SPORTAGE	15,747	175	N/A	
	8	Nissan	XTRAIL	13,010	173	N/A	
	9	BYD	ATTO 3	11,042	0	N/A	
	10	GWM	HAVAL H6	8,992	146	N/A	
SUV Large	1	Toyota	PRADO	20,710	209	N/A	0
	2	Ford	EVEREST	15,071	210	N/A	Kia CV EV6 (electric)
	3	Isuzu Ute	MU-X	14,139	219	N/A	
	4	Subaru	OUTBACK	12,902	182	N/A	
	5	Kia	MQ4 SORENTO	8,366	161	N/A	
	6	Toyota	KLUGER HYBRID	6,966	128	N/A	
	7	Hyundai	SANTA FE	6,034	167	N/A	
	8	Mitsubishi	PAJERO SPORT	5,549	212	N/A	
	9	Mazda	CX8	5,409	182	N/A	
	10	Mazda	CX9	4,696	203	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
SUV Upper Large	1	Toyota	LANDCRUISER	13,454	235	N/A	0
	2	Nissan	PATROL	7,923	343	N/A	Kia MV EV9 (electric)
	3	BMW	X7 XDRIVE40D	804	210	N/A	
	4	Land Rover	RANGE ROVER	715	244	N/A	
	5	Land Rover	DISCOVERY	534	202	N/A	
	6	Lexus	LX600	527	275	N/A	
	7	Lexus	LX500D	455	235	N/A	
	8	Mercedes-Benz Cars	M-AMG G63 FL	394	299	N/A	
	9	Mercedes-Benz Cars	GLS400D 4M	281	202	N/A	
	10	Mercedes-Benz Cars	GLS450 4M	247	210	N/A	
Pick-up/ Chassis 4×2	1	Toyota	HILUX 4X2	12,116	235	N/A	0
	2	Isuzu Ute	D-MAX	5,761	199	N/A	LDV T60 (electric)
	3	Ford	RANGER	5,095	200	N/A	
	4	Mazda	B30	3,125	204	N/A	
	5	Mitsubishi	TRITON	2,909	220	N/A	
	6	Nissan	NAVARA	993	199	N/A	
	7	Mazda	B19	358	182	N/A	
	8	GWM	UTE	253	246	N/A	
	9	LDV	T60	79	0	N/A	

Table 11 (continued)

Segment	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best-in-class model (%)*	Best-in-class emissions intensity (g/km)*
Pick-up/ Chassis 4×4	1	Ford	RANGER	58,261	221	23%	180
	2	Toyota	HILUX 4X4	48,995	215	20%	Isuzu Ute D-MAX (diesel)
	3	Isuzu Ute	D-MAX	25,442	207	15%	
	4	Mazda	B30	13,971	206	14%	
	5	Mitsubishi	TRITON	13,740	224	24%	
	6	GWM	UTE	9,383	236	31%	
	7	LDV	T60 MAX	9,027	244	36%	
	8	Nissan	NAVARA	7,608	209	16%	
	9	Volkswagen	AMAROK	6,620	250	39%	
	10	Chevrolet	SILVERADO	2,260	297	65%	
Vans/Cab Chassis	1	Toyota	HIACE	7,133	214	N/A	0
	2	LDV	G10+	3,638	221	N/A	Peugeot PAR (electric)
	3	Ford	TRANSIT CUSTOM	2,843	187	N/A	
	4	Hyundai	STARIA LOAD	2,499	183	N/A	
	5	Renault	TRAFIC	1,296	173	N/A	
	6	Volkswagen	TRANSPORTER	968	206	N/A	
	7	Mercedes-Benz Vans	VITO	834	181	N/A	
	8	Volkswagen	CADDY VAN	625	136	N/A	
	9	LDV	V80	596	249	N/A	
	10	Peugeot	PAR	562	119	N/A	

* Best-in-class is the lowest emissions model variant and includes battery electric vehicles with emissions of 0 g/km. For segments where the best-in-class vehicle is a battery electric vehicle, it is not possible to do a percentage difference for the top-selling models.

Table 12: Average emissions intensity for models with a sales volume greater than 1,000 vehicles, 2023

Rank	Make	Model	Average emissions intensity (g/km)	Sales
1	Ford	RANGER	221	58,261
2	Toyota	HILUX 4X4	215	48,995
3	Tesla	MODEL Y	0	28,769
4	MG	MG ZS	163	26,473
5	Toyota	RAV4 HYBRID	108	25,666
6	Isuzu Ute	D-MAX	207	25,442
7	Mitsubishi	OUTLANDER	164	24,273
8	Mazda	CX5	172	23,083
9	Hyundai	TUCSON	175	21,232
10	Toyota	PRADO	209	20,710
11	Hyundai	I30	173	20,631
12	Tesla	MODEL 3	0	17,347
13	Toyota	COROLLA HYBRID	91	16,455
14	Subaru	FORESTER	167	16,381
15	Mazda	CX3	143	15,776
16	Kia	NQ5 SPORTAGE	175	15,747
17	MG	MG3	159	15,431
18	Ford	EVEREST	210	15,071
19	Isuzu Ute	MU-X	219	14,139
20	Mazda	B30	206	13,971
21	Mitsubishi	TRITON	224	13,740
22	Toyota	LANDCRUISER	235	13,454
23	Mazda	C30	153	13,115
24	Nissan	XTRAIL	173	13,010
25	Subaru	OUTBACK	182	12,902
26	Toyota	HILUX 4X2	235	12,116
27	Kia	KA4 CARNIVAL	176	11,312
28	GWM	HAVAL JOLION	166	11,279
29	Hyundai	KONA	141	11,191
30	BYD	ATTO 3	0	11,042
31	Kia	SP2 SELTOS	165	10,473
32	Toyota	CAMRY HYBRID	102	9,772
33	GWM	UTE	236	9,383
34	Mitsubishi	ASX	178	9,176
35	Mazda	300	148	9,079
36	LDV	T60 MAX	244	9,027
37	GWM	HAVAL H6	146	8,992
38	Subaru	CROSSTREK	158	8,991
39	Volkswagen	T-ROC	160	8,942
40	Kia	MQ4 SORENTO	161	8,366
41	Nissan	PATROL	343	7,923
42	Honda	CR-V	164	7,808
43	Mitsubishi	ECLIPSE CROSS	145	7,789
44	Kia	JA PICANTO	117	7,706

Table 12 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
45	Nissan	NAVARA	209	7,608
46	Volkswagen	TIGUAN	190	7,297
47	Toyota	HIACE	214	7,133
48	Kia	YB STONIC	150	6,983
49	Toyota	KLUGER HYBRID	128	6,966
50	Suzuki	SWIFT	116	6,953
51	Nissan	QASHQAI	138	6,716
52	Volkswagen	AMAROK	250	6,620
53	Hyundai	VENUE	165	6,152
54	Hyundai	SANTA FE	167	6,034
55	MG	MG HS	174	5,957
56	Volvo Car	XC40	83	5,837
57	Kia	BD CERATO	163	5,795
58	Isuzu Ute	D-MAX	199	5,761
59	Volkswagen	T-CROSS	123	5,761
60	Toyota	COROLLA CROSSHV	98	5,734
61	Mitsubishi	PAJERO SPORT	212	5,549
62	Mazda	CX8	182	5,409
63	Chery	OMODA 5	164	5,378
64	Mazda	200	121	5,181
65	Ford	RANGER	200	5,095
66	Suzuki	JIMNY	153	5,035
67	Mazda	CX9	203	4,696
68	Volkswagen	TIGUAN ALLSPACE	192	4,539
69	Toyota	YARIS CROSSHV	87	4,387
70	GWM	HAVAL H6GT	188	4,109
71	Kia	YB RIO	137	4,067
72	Toyota	RAV4	139	3,961
73	Hyundai	PALISADE	202	3,770
74	LDV	G10+	221	3,638
75	Toyota	FORTUNER	201	3,619
76	Volkswagen	GOLF	143	3,591
77	Toyota	KLUGER	196	3,464
78	LDV	D90	240	3,341
79	Land Rover	DEFENDER 110	218	3,217
80	MG	MG4	0	3,134
81	Mazda	B30	204	3,125
82	Lexus	NX350H	113	3,002
83	Porsche	95B	225	2,926
84	Mitsubishi	TRITON	220	2,909
85	Toyota	COROLLA	136	2,907
86	Ford	TRANSIT CUSTOM	187	2,843
87	MG	MG ZS EV	0	2,794
88	Mazda	C60	114	2,779

Table 12 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
89	Renault	KOLEOS	189	2,776
90	Subaru	WRX	203	2,743
91	Audi	Q5	156	2,729
92	BMW	X5 XDRIVE30D	197	2,670
93	Volvo Car	XC60	143	2,542
94	Toyota	C-HR HYBRID	97	2,537
95	Hyundai	STARIA LOAD	183	2,499
96	Lexus	NX250	158	2,495
97	Polestar	2	0	2,463
98	MG	MG5	138	2,398
99	Ford	ESCAPE	180	2,336
100	Honda	HZV	155	2,282
101	Suzuki	IGNIS	113	2,281
102	Chevrolet	SILVERADO	297	2,260
103	Toyota	C-HR	148	2,249
104	Land Rover	RR SPORT	186	2,232
105	Toyota	COROLLA CROSS	136	2,198
106	Honda	HR-V	117	2,182
107	MG	MG HS PHEV	39	2,172
108	Toyota	YARIS CROSS	124	2,127
109	CUPRA	FORMENTOR	143	2,107
110	Subaru	IMPREZA	160	2,081
111	BMW	X3 XDRIVE30I	180	2,048
112	Ford	PUMA	121	2,027
113	Audi	Q3	168	2,027
114	Mercedes-Benz Cars	GLC300 4M SUV	175	2,021
115	Suzuki	VITARA	139	2,019
116	MINI	COOPER	97	2,011
117	Audi	A3	125	1,996
118	Audi	Q3 SPORTBACK	171	1,986
119	Skoda	KAMIQ	122	1,986
120	SsangYong	MUSSO XLV	235	1,976
121	Lexus	RX350H	120	1,959
122	GWM	TANK 300	216	1,945
123	BMW	X1 SDRIVE18I	148	1,882
124	SsangYong	REXTON	223	1,843
125	Kia	CV EV6	0	1,831
126	Kia	CK STINGER	238	1,806
127	RAM	EXPRESS 1500	283	1,775
128	BMW	X1 XDRIVE20I	164	1,775
129	Audi	Q7	193	1,690
130	Kia	SG2 NIRO	38	1,677
131	RAM	1500 LIMITED	275	1,666

Table 12 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
132	Nissan	JUKE	136	1,598
133	Subaru	BRZ	210	1,574
134	Renault	ARKANA	137	1,572
135	MINI	COOPER	126	1,567
136	Skoda	KODIAQ	180	1,556
137	Porsche	CAY	236	1,545
138	Mazda	600	171	1,528
139	Lexus	ES300H	109	1,527
140	SsangYong	MUSSO	225	1,511
141	Ford	MUSTANG	285	1,475
142	Lexus	UX250H	103	1,463
143	Jeep	COMPASS	207	1,457
144	Subaru	XV	158	1,442
145	Skoda	KAROQ	155	1,405
146	Skoda	OCTAVIA	143	1,398
147	Toyota	YARIS	114	1,388
148	Nissan	PATHFINDER	243	1,387
149	Volvo Car	XC90	132	1,299
150	Renault	TRAFIC	173	1,296
151	Jeep	GRAND CHEROKEE	235	1,253
152	BMW	118I	135	1,233
153	Mercedes-Benz Cars	GLC300 4MFL CPE	184	1,216
154	Genesis	GV70	219	1,190
155	Toyota	GR86	209	1,144
156	Hyundai	STARIA	226	1,142
157	Audi	Q2	126	1,106
158	Volvo Car	C40	0	1,103
159	Jeep	WRANGLER	233	1,101
160	Audi	Q5 SPORTBACK	162	1,078
161	RAM	LARAMIE 1500	283	1,064
162	Mercedes-Benz Cars	EQA 250	0	1,021
Total*			**N/A**	**1,056,157**

* The totals shown in this row differ to the national totals shown in other tables as they only include vehicle models with sales of at least 1,000.

Table 13: Average emissions intensity and annual sales by buyer type, 2022 and 2023

Buyer type	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Private	168	158	-5.9%	578,551	622,384
Business	182	174	-4.4%	421,656	492,468
Government	175	171	-2.1%	26,820	33,000
Total	**174**	**165**	**-5.0%**	**1,027,027**	**1,147,852**

Table 14: Average emissions intensity and annual sales by detailed buyer type, 2022 and 2023

Buyer type	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Private – local delivery	168	158	-5.9%	578,446	622,338
Fleet	194	180	-7.4%	177,559	206,260
Dealer demonstrator	172	168	-2.3%	80,028	104,507
Large fleet	189	184	-2.6%	74,210	79,898
Rental	164	162	-1.1%	62,617	70,848
State government	172	168	-1.9%	18,220	21,005
Company capitalisation	158	157	-0.9%	12,471	16,037
Not-for-profit organisation	155	160	3.5%	13,908	13,764
Local government	181	175	-3.2%	6,628	9,498
Federal government	181	177	-2.4%	1,972	2,497
Taxi	113	112	-1.2%	585	965
Other	160	155	-2.9%	180	94
Diplomatic	166	166	0.3%	66	65
Private – overseas delivery	173	175	1.4%	105	46
Business – overseas delivery	211	171	-18.6%	32	30
Total	**174**	**165**	**-5.0%**	**1,027,027**	**1,147,852**

Table 15: Average emissions intensity and annual sales by powertrain and fuel type, 2022 and 2023

Powertrain and fuel type	Average emissions intensity (g/km) in 2022	Average emissions intensity (g/km) in 2023	Change from 2022 to 2023 (%)	Sales in 2022	Sales in 2023
Petrol	173	175	1.1%	550,706	588,979
Diesel	209	208	-0.3%	355,158	361,898
HEV	105	107	2.2%	81,825	98,172
BEV	0	0	N/A	33,393	87,215
PHEV	44	44	-0.9%	5,930	11,582
Hydrogen	0	0	N/A	15	6
Total	**174**	**165**	**-5.0%**	**1,027,027**	**1,147,852**

Table 16: Electric vehicle sales by model, 2022 and 2023

Make and Model	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Alfa Romeo TONALE	0	0	**0**	0	58	**58**
Audi E7	21	0	**21**	4	0	**4**
Audi EA	13	0	**13**	0	0	**0**
Audi EB	44	0	**44**	30	0	**30**
Audi E-TRON GT	0	0	**0**	124	0	**124**
Audi ETRON S	27	0	**27**	24	0	**24**
Audi ETRON S SB	37	0	**37**	33	0	**33**
Audi Q5	0	0	**0**	0	89	**89**
Audi Q5 SPORTBACK	0	0	**0**	0	48	**48**
Audi Q8	0	0	**0**	0	16	**16**
Audi Q8 E-TRON	0	0	**0**	51	0	**51**
Audi Q8 E-TRON SB	0	0	**0**	58	0	**58**
Audi RS E-TRON GT	0	0	**0**	215	0	**215**
Bentley BENTAYGA	0	0	**0**	0	7	**7**
Bentley FLYING SPUR	0	0	**0**	0	3	**3**
BMW 330E	0	166	**166**	0	174	**174**
BMW 530E	0	4	**4**	0	4	**4**
BMW 745E	0	1	**1**	0	0	**0**
BMW I3S	3	0	**3**	0	0	**0**

Table 16 (continued)

Make and Model	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
BMW I4 EDRIVE35	0	0	**0**	167	0	**167**
BMW I4 EDRIVE40 GC	113	0	**113**	127	0	**127**
BMW I4 M50 GC	94	0	**94**	59	0	**59**
BMW I5 EDRIVE40	0	0	**0**	27	0	**27**
BMW I5 M60	0	0	**0**	17	0	**17**
BMW I7 M70	0	0	**0**	1	0	**1**
BMW I7 XDRIVE60	13	0	**13**	62	0	**62**
BMW IX M60	38	0	**38**	43	0	**43**
BMW IX XDRIVE40	382	0	**382**	671	0	**671**
BMW IX XDRIVE50	57	0	**57**	108	0	**108**
BMW IX1 XDRIVE30	0	0	**0**	936	0	**936**
BMW IX3 MSPORT	593	0	**593**	772	0	**772**
BMW X3 XDRIVE30E	0	230	**230**	0	132	**132**
BMW X5 XDRIVE45E	0	176	**176**	0	50	**50**
BMW X5 XDRIVE50E	0	0	**0**	0	46	**46**
BMW XM	0	0	**0**	0	143	**143**
BMW XM LABEL	0	0	**0**	0	7	**7**
BYD ATTO 3	2,113	0	**2,113**	11,042	0	**11,042**
BYD DOLPHIN	0	0	**0**	926	0	**926**
BYD SEAL	0	0	**0**	471	0	**471**

Make and Model	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Citroen C5 X	0	0	**0**	0	9	**9**
CUPRA BORN	1	0	**1**	887	0	**887**
CUPRA FORMENTOR	0	55	**55**	0	484	**484**
CUPRA LEON	0	25	**25**	0	60	**60**
Ferrari 296 GTB	0	6	**6**	0	72	**72**
Ferrari 296 GTS	0	1	**1**	0	30	**30**
Ferrari SF90 SPIDER	0	11	**11**	0	22	**22**
Ferrari SF90 STRADALE	0	16	**16**	0	10	**10**
Fiat 500E	0	0	**0**	171	0	**171**
Fiat ABARTH 500E	0	0	**0**	13	0	**13**
Ford ESCAPE	0	139	**139**	0	263	**263**
Ford MUSTANG MACH-E	0	0	**0**	51	0	**51**
Genesis G80	16	0	**16**	11	0	**11**
Genesis GV60	114	0	**114**	191	0	**191**
Genesis GV70	44	0	**44**	78	0	**78**
GWM ORA	0	0	**0**	529	0	**529**
Hyundai IONIQ	580	98	**678**	0	1	**1**
Hyundai IONIQ 5	756	0	**756**	954	0	**954**

Table 16 (continued)

Make and Model	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Hyundai IONIQ 6	0	0	**0**	634	0	**634**
Hyundai KONA	1,096	0	**1,096**	836	0	**836**
Jaguar I-PACE	23	0	**23**	35	0	**35**
Jeep GRAND CHEROKEE	0	0	**0**	0	40	**40**
Kia CV EV6	564	0	**564**	1,831	0	**1,831**
Kia DE NIRO	152	49	**201**	15	0	**15**
Kia MQ4 SORENTO	0	62	**62**	0	490	**490**
Kia MV EV9	0	0	**0**	208	0	**208**
Kia SG2 NIRO	233	15	**248**	985	0	**985**
Land Rover DEFENDER 110	0	0	**0**	0	11	**11**
Land Rover RANGE ROVER	0	0	**0**	0	10	**10**
Land Rover RR EVOQUE	0	13	**13**	0	63	**63**
Land Rover RR SPORT	0	5	**5**	0	80	**80**
Land Rover RR VELAR	0	0	**0**	0	5	**5**
LDV MIFA9	2	0	**2**	12	0	**12**
LDV T60	2	0	**2**	79	0	**79**
Lexus NX450H	0	230	**230**	0	415	**415**
Lexus RZ450E	0	0	**0**	265	0	**265**
Lexus UX300E	82	0	**82**	113	0	**113**
Mazda C60	0	0	**0**	0	1,139	**1,139**
Mazda M30	55	0	**55**	13	0	**13**
McLaren ARTURA	0	0	**0**	0	26	**26**
Mercedes-Benz Cars A250E	0	29	**29**	0	10	**10**
Mercedes-Benz Cars A250E SEDAN	0	7	**7**	0	3	**3**
Mercedes-Benz Cars E300E FL	0	22	**22**	0	6	**6**
Mercedes-Benz Cars EQA 250	547	0	**547**	1,021	0	**1,021**
Mercedes-Benz Cars EQA 350 4MATIC	75	0	**75**	177	0	**177**
Mercedes-Benz Cars EQB 250	138	0	**138**	647	0	**647**
Mercedes-Benz Cars EQB 350	37	0	**37**	101	0	**101**
Mercedes-Benz Cars EQC 400 4M	144	0	**144**	80	0	**80**
Mercedes-Benz Cars EQC 400 4M EAL	73	0	**73**	0	0	**0**

Table 16 (continued)

Make and Model	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Mercedes-Benz Cars EQC 400 4M SPRT	95	0	**95**	239	0	**239**
Mercedes-Benz Cars EQE 300	0	0	**0**	140	0	**140**
Mercedes-Benz Cars EQE 300 SUV	0	0	**0**	104	0	**104**
Mercedes-Benz Cars EQE 350	0	0	**0**	200	0	**200**
Mercedes-Benz Cars EQE 350 4M SUV	0	0	**0**	97	0	**97**
Mercedes-Benz Cars EQE 500 4M SUV	0	0	**0**	36	0	**36**
Mercedes-Benz Cars EQS 450 4M	0	0	**0**	30	0	**30**
Mercedes-Benz Cars EQS 450 4M SUV	0	0	**0**	60	0	**60**
Mercedes-Benz Cars EQS 53 4M	69	0	**69**	36	0	**36**
Mercedes-Benz Cars GLC300E 4M FL	0	361	**361**	0	42	**42**
Mercedes-Benz Cars M-AMG C63S EPER	0	0	**0**	0	14	**14**
Mercedes-Benz Cars M-AMG EQE 53 4M	0	0	**0**	98	0	**98**
Mercedes-Benz Cars M-AMG EQE53 SUV	0	0	**0**	16	0	**16**
Mercedes-Benz Cars M-AMG GT63SEPER	0	0	**0**	0	23	**23**
Mercedes-Benz Vans EQV	10	0	**10**	13	0	**13**
Mercedes-Benz Vans EVITO	2	0	**2**	40	0	**40**
Mercedes-Benz Vans EVITO TOURER	1	0	**1**	18	0	**18**
MG MG HS PHEV	0	1,549	**1,549**	0	2,172	**2,172**
MG MG ZS EV	1,119	0	**1,119**	2,794	0	**2,794**
MG MG4	0	0	**0**	3,134	0	**3,134**
MINI COOPER	455	189	**644**	551	469	**1,020**
Mitsubishi ECLIPSE CROSS	0	926	**926**	0	1,296	**1,296**
Mitsubishi OUTLANDER	0	303	**303**	0	2,276	**2,276**
Nissan LEAF	335	0	**335**	486	0	**486**
Peugeot 2008	0	0	**0**	59	0	**59**

Table 16 (continued)

Make and Model	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Peugeot 3008	0	59	**59**	0	57	**57**
Peugeot 308	0	0	**0**	0	41	**41**
Peugeot 408	0	0	**0**	0	1	**1**
Peugeot 508	0	19	**19**	0	25	**25**
Peugeot PAR	0	0	**0**	71	0	**71**
Polestar 2	1,480	0	**1,480**	2,463	0	**2,463**
Porsche 97A	0	7	**7**	0	7	**7**
Porsche CAY	0	152	**152**	0	55	**55**
Porsche TAY	428	0	**428**	536	0	**536**
Renault KANGOO	49	0	**49**	18	0	**18**
Renault MEGANE E-TECH	0	0	**0**	3	0	**3**
Rolls-Royce SPECTRE	0	0	**0**	3	0	**3**
Tesla MODEL 3	10,877	0	**10,877**	17,347	0	**17,347**
Tesla MODEL Y	8,717	0	**8,717**	28,769	0	**28,769**
Volvo Car C40	491	0	**491**	1,103	0	**1,103**
Volvo Car XC40	983	147	**1,130**	2,846	0	**2,846**
Volvo Car XC60	0	591	**591**	0	599	**599**
Volvo Car XC90	0	267	**267**	0	479	**479**
Total	**33,393**	**5,930**	**39,323**	**87,215**	**11,582**	**98,797**

Table 17: Electric vehicle sales by state, 2022 and 2023

State	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Australian Capital Territory	1,281	222	**1,503**	3,395	561	**3,956**
New South Wales	10,758	2,004	**12,762**	28,870	3,497	**32,367**
Northern Territory	70	23	**93**	280	36	**316**
Queensland	6,704	1,241	**7,945**	18,551	2,244	**20,795**
South Australia	1,429	342	**1,771**	4,330	827	**5,157**
Tasmania	572	111	**683**	1,371	219	**1,590**
Victoria	9,498	1,576	**11,074**	22,104	3,158	**25,262**
Western Australia	3,081	411	**3,492**	8,314	1,040	**9,354**
Total	**33,393**	**5,930**	**39,323**	**87,215**	**11,582**	**98,797**

Table 18: Electric vehicle sales by buyer type, 2022 and 2023

Buyer type	2022 BEV sales	2022 PHEV sales	2022 total EV sales	2023 BEV sales	2023 PHEV sales	2023 total EV sales
Private – local delivery	24,530	3,477	**28,007**	60,099	6,182	**66,281**
Fleet	5,467	482	**5,949**	18,798	1,175	**19,973**
Dealer demonstrator	1,349	1,041	**2,390**	3,874	1,537	**5,411**
Large fleet	548	221	**769**	734	1,746	**2,480**
Company capitalisation	717	354	**1,071**	1,307	335	**1,642**
State government	373	76	**449**	875	367	**1,242**
Rental	269	254	**523**	966	176	**1,142**
Local government	102	10	**112**	303	32	**335**
Federal government	14	2	**16**	149	3	**152**
Not-for-profit organisation	22	8	**30**	103	25	**128**
Taxi	0	0	**0**	2	3	**5**
Business – overseas delivery	0	0	**0**	2	1	**3**
Diplomatic	1	1	**2**	2	0	**2**
Other	1	4	**5**	1	0	**1**
Total	**33,393**	**5,930**	**39,323**	**87,215**	**11,582**	**98,797**

Table 19: Battery electric vehicle sales by model and jurisdiction, 2023

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Audi E7	0	2	0	2	0	0	0	0	**4**
Audi EB	2	16	0	4	5	1	1	1	**30**
Audi E-TRON GT	6	47	0	25	2	4	25	15	**124**
Audi ETRON S	1	9	0	3	3	1	5	2	**24**
Audi ETRON S SB	0	11	0	6	1	0	9	6	**33**
Audi Q8 E-TRON	1	20	0	13	1	1	11	4	**51**
Audi Q8 E-TRON SB	1	27	0	11	1	2	11	5	**58**
Audi RS E-TRON GT	4	97	0	41	9	2	43	19	**215**
BMW I4 EDRIVE35	3	30	0	24	8	1	98	3	**167**
BMW I4 EDRIVE40 GC	4	35	0	27	10	1	36	14	**127**
BMW I4 M50 GC	2	14	0	19	4	0	14	6	**59**
BMW I5 EDRIVE40	0	10	0	4	1	0	11	1	**27**
BMW I5 M60	0	8	0	0	1	0	8	0	**17**
BMW I7 M70	0	0	0	0	0	0	1	0	**1**
BMW I7 XDRIVE60	1	17	0	10	1	0	30	3	**62**
BMW IX M60	0	14	0	5	5	1	12	6	**43**
BMW IX XDRIVE40	13	216	0	112	24	4	255	47	**671**

Table 19 (continued)

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
BMW IX XDRIVE50	4	34	0	20	5	2	33	10	**108**
BMW IX1 XDRIVE30	39	304	1	205	30	12	241	104	**936**
BMW IX3 MSPORT	31	202	2	112	27	4	357	37	**772**
BYD ATTO 3	290	3,227	25	2,653	781	255	2,389	1,422	**11,042**
BYD DOLPHIN	38	291	0	237	59	20	157	124	**926**
BYD SEAL	12	182	0	91	22	1	106	57	**471**
CUPRA BORN	121	248	0	126	63	12	223	94	**887**
Fiat 500E	17	58	0	14	20	3	45	14	**171**
Fiat ABARTH 500E	0	0	0	0	0	0	12	1	**13**
Ford MUSTANG MACH-E	2	4	0	1	2	0	42	0	**51**
Genesis G80	0	8	0	2	0	1	0	0	**11**
Genesis GV60	5	93	0	31	4	3	38	17	**191**
Genesis GV70	1	42	0	13	3	0	13	6	**78**
GWM ORA	24	172	5	161	20	12	83	52	**529**
Hyundai IONIQ 5	40	374	7	152	46	32	224	79	**954**
Hyundai IONIQ 6	33	299	3	83	20	10	133	53	**634**
Hyundai KONA	75	192	6	185	51	30	233	64	**836**
Jaguar I-PACE	1	10	0	13	2	1	5	3	**35**
Kia CV EV6	43	606	19	366	141	31	476	149	**1,831**
Kia DE NIRO	0	8	1	4	0	0	2	0	**15**
Kia MV EV9	8	74	1	38	15	3	52	17	**208**
Kia SG2 NIRO	56	317	17	186	76	24	258	51	**985**
LDV MIFA9	0	8	0	2	0	0	0	2	**12**
LDV T60	2	27	0	6	9	0	19	16	**79**
Lexus RZ450E	7	108	2	54	7	4	59	24	**265**
Lexus UX300E	2	44	0	25	6	2	26	8	**113**
Mazda M30	0	1	0	0	1	0	5	6	**13**
Mercedes-Benz Cars EQA 250	33	250	1	199	63	23	345	107	**1,021**
Mercedes-Benz Cars EQA 350 4MATIC	0	67	0	30	6	3	59	12	**177**
Mercedes-Benz Cars EQB 250	24	173	0	148	32	4	210	56	**647**
Mercedes-Benz Cars EQB 350	5	24	0	28	4	0	36	4	**101**
Mercedes-Benz Cars EQC 400 4M	2	29	0	6	6	0	34	3	**80**
Mercedes-Benz Cars EQC 400 4M SPRT	3	56	0	41	13	9	95	22	**239**
Mercedes-Benz Cars EQE 300	6	45	0	23	13	0	46	7	**140**

Table 19 (continued)

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Mercedes-Benz Cars EQE 300 SUV	2	21	0	17	3	0	53	8	**104**
Mercedes-Benz Cars EQE 350	4	51	0	34	6	3	97	5	**200**
Mercedes-Benz Cars EQE 350 4M SUV	1	23	0	18	4	2	42	7	**97**
Mercedes-Benz Cars EQE 500 4M SUV	0	11	0	3	1	0	15	6	**36**
Mercedes-Benz Cars EQS 450 4M	0	7	0	5	3	0	15	0	**30**
Mercedes-Benz Cars EQS 450 4M SUV	2	11	0	8	5	0	30	4	**60**
Mercedes-Benz Cars EQS 53 4M	0	4	0	8	2	0	20	2	**36**
Mercedes-Benz Cars M-AMG EQE 53 4M	2	19	0	27	6	0	33	11	**98**
Mercedes-Benz Cars M-AMG EQE53 SUV	0	3	0	4	0	0	9	0	**16**
Mercedes-Benz Vans EQV	1	4	0	4	0	0	3	1	**13**
Mercedes-Benz Vans EVITO	2	15	0	9	1	2	9	2	**40**
Mercedes-Benz Vans EVITO TOURER	0	5	0	2	0	2	4	5	**18**
MG MG ZS EV	93	862	11	576	209	70	645	328	**2,794**
MG MG4	96	1,060	11	724	219	57	568	399	**3,134**
MINI COOPER	19	160	0	124	42	8	156	42	**551**
Nissan LEAF	69	88	44	109	31	14	94	37	**486**
Peugeot 2008	1	24	0	7	2	1	19	5	**59**
Peugeot PAR	1	21	0	12	4	3	16	14	**71**
Polestar 2	106	1,062	0	308	49	26	842	70	**2,463**
Porsche TAY	13	179	0	78	20	6	204	36	**536**
Renault KANGOO	0	5	0	7	1	0	5	0	**18**
Renault MEGANE E-TECH	0	0	0	0	0	0	3	0	**3**
Rolls-Royce SPECTRE	0	0	0	1	0	0	1	1	**3**
Tesla MODEL 3	761	6,118	57	3,723	887	182	4,074	1,545	**17,347**
Tesla MODEL Y	1,041	9,836	67	6,373	1,040	290	7,443	2,679	**28,769**
Volvo Car C40	46	310	0	269	38	40	308	92	**1,103**
Volvo Car XC40	173	821	0	540	134	146	770	262	**2,846**
Total	**3,395**	**28,870**	**280**	**18,551**	**4,330**	**1,371**	**22,104**	**8,314**	**87,215**

Table 20: Electric vehicle sales by buyer type and year, 2013–2023

Buyer type	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Business – overseas delivery	0	0	20	0	0	0	0	0	0	0	3
Company capitalisation	42	363	599	74	299	304	518	450	658	1,071	1,642
Dealer demonstrator	48	379	143	51	279	381	456	537	1,613	2,390	5,411
Diplomatic	0	0	0	0	0	1	1	1	3	2	2
Federal government	0	0	0	11	1	1	16	16	8	16	152
Fleet	32	10	10	0	53	111	146	314	682	5,949	19,973
Large fleet	25	39	13	7	56	36	215	173	290	769	2,480
Local government	37	7	9	1	5	16	136	106	134	112	335
Not-for-profit organisation	1	0	0	0	2	3	19	25	25	30	128
Other	0	0	0	0	0	0	0	1	1	5	1
Private – local delivery	95	298	298	72	377	442	1,293	1,643	4,733	28,007	66,281
Private – overseas delivery	0	23	4	0	0	0	0	1	0	0	0
Rental	0	0	0	0	21	23	2	1	125	523	1,142
State government	12	16	12	3	31	34	123	202	249	449	1,242
Taxi	0	0	0	0	0	0	0	0	0	0	5
Total	**292**	**1,135**	**1,108**	**219**	**1,124**	**1,352**	**2,925**	**3,470**	**8,521**	**39,323**	**98,797**

Table 21: Hybrid vehicle sales by model, 2022 and 2023

Make and model	2022 sales	2023 sales
GWM HAVAL H6	1,194	4,174
GWM HAVAL JOLION	755	3,027
GWM TANK 300	3	248
GWM TANK 500	0	1
Honda ACCORD	50	107
Honda CIVIC 5D	71	244
Honda CR-V	0	502
Honda HR-V	416	1,001
Honda HZV	0	739
Hyundai IONIQ	60	0
Hyundai KONA	0	683
Hyundai SANTA FE	315	1,353
Kia DE NIRO	656	134
Kia MQ4 SORENTO	123	338
Kia SG2 NIRO	497	692
Lexus ES300H	543	1,527
Lexus IS300H	3	0
Lexus LC500H	1	7
Lexus LM350H	0	41
Lexus LS500H	9	11
Lexus NX300H	9	0
Lexus NX350H	1,389	3,002
Lexus RX350H	0	1,959
Lexus RX450H	341	0
Lexus RX450HL	154	0
Lexus RX500H	0	367
Lexus UX250H	519	1,463
Maserati GHIBLI	32	4
Maserati LEVANTE	181	18
Nissan XTRAIL	122	2,337
Subaru CROSSTREK	0	587
Subaru FORESTER	882	1,400
Subaru XV	685	141
Toyota CAMRY HYBRID	7,654	9,772
Toyota C-HR HYBRID	3,517	2,537
Toyota COROLLA CROSSHV	1,984	5,734
Toyota COROLLA HYBRID	17,585	16,455
Toyota KLUGER HYBRID	8,413	6,966
Toyota PRIUS	44	1
Toyota PRIUS V	1	0
Toyota RAV4 HYBRID	26,547	25,666
Toyota YARIS CROSSHV	6,394	4,387
Toyota YARIS HYBRID	676	547
Total	**81,825**	**98,172**

Table 22: Sales of vehicles by powertrain/fuel type and government, 2022 and 2023

Government	2022 BEV sales	2023 BEV sales	2022 PHEV sales	2023 PHEV sales	2022 HEV sales	2023 HEV sales	2022 ICE vehicle sales	2023 ICE vehicle sales	2022 Total sales	2023 Total sales
Federal Government	14	149	2	3	347	340	1,609	2,005	**1,972**	**2,497**
NSW	38	95	1	33	1,289	1,090	3,126	4,192	**4,454**	**5,410**
VIC	84	232	5	39	1,242	974	3,628	4,029	**4,959**	**5,274**
QLD	186	349	7	130	738	789	2,376	3,383	**3,307**	**4,651**
SA	7	32	7	54	611	154	995	1,003	**1,620**	**1,243**
WA	20	27	7	26	264	213	1,735	2,066	**2,026**	**2,332**
TAS	9	13	11	15	213	165	723	827	**956**	**1,020**
NT	12	56	1	1	29	24	531	639	**573**	**720**
ACT	17	71	37	69	4	3	267	212	**325**	**355**
Local Government	102	303	10	32	924	1,441	5,592	7,722	**6,628**	**9,498**
Total	**489**	**1,327**	**88**	**402**	**5,661**	**5,193**	**20,582**	**26,078**	**26,820**	**33,000**

Table 23: 'Green' vehicle average emissions intensity and sales by segment, 2023

Segment	Make	Model	Average emissions intensity (g/km)	Sales
Micro	Fiat	500E	0	171
Micro	Fiat	ABARTH 500E	0	13
Micro	Mitsubishi	MIRAGE	109	1
Micro	Fiat	500	111	270
Micro	Kia	JA PICANTO	117	7,464
Light	MINI	COOPER	0	551
Light	Toyota	YARIS HYBRID	76	547
Light	Suzuki	SWIFT	111	5,789
Light	Toyota	YARIS	114	1,388
Light	Volkswagen	POLO	115	11
Light	Mazda	200	117	1,949
Light	Skoda	FABIA	117	433
Light	Citroen	C3	118	67
Small	BYD	DOLPHIN	0	926
Small	CUPRA	BORN	0	887
Small	GWM	ORA	0	529
Small	MG	MG4	0	3,134
Small	Nissan	LEAF	0	486
Small	Hyundai	IONIQ	26	1
Small	Mercedes-Benz Cars	A250E	34	10
Small	Mercedes-Benz Cars	A250E SEDAN	34	3
Small	CUPRA	LEON	40	60
Small	Toyota	PRIUS	80	1
Small	Toyota	COROLLA HYBRID	91	16,455
Small	Honda	CIVIC 5D	96	244
Small	Peugeot	308	107	278
Small	Audi	A3	112	1,349
Small	Skoda	SCALA	120	679
Medium	Polestar	2	0	2,463
Medium	Tesla	MODEL 3	0	17,347
Medium	BMW	I4 EDRIVE35	0	167
Medium	BMW	I4 EDRIVE40 GC	0	127
Medium	BMW	I4 M50 GC	0	59
Medium	BYD	SEAL	0	471
Medium	Hyundai	IONIQ 6	0	634
Medium	Peugeot	508	37	25
Medium	BMW	330E	57	174
Medium	Honda	ACCORD	98	107
Medium	Toyota	CAMRY HYBRID	102	9,772
Medium	Lexus	ES300H	109	1,527

Table 23 (continued)

Segment	Make	Model	Average emissions intensity (g/km)	Sales
Large	Mercedes-Benz Cars	EQE 300	0	140
Large	Audi	E-TRON GT	0	124
Large	Toyota	MIRAI	0	6
Large	Porsche	TAY	0	536
Large	Mercedes-Benz Cars	EQE 350	0	200
Large	Genesis	G80	0	11
Large	BMW	I5 M60	0	17
Large	BMW	I5 EDRIVE40	0	27
Large	Audi	RS E-TRON GT	0	215
Large	Mercedes-Benz Cars	M-AMG EQE 53 4M	0	98
Large	Citroen	C5 X	35	9
Large	BMW	530E	53	4
Large	Mercedes-Benz Cars	E300E FL	56	6
Upper Large	Mercedes-Benz Cars	EQS 53 4M	0	36
Upper Large	Mercedes-Benz Cars	EQS 450 4M	0	30
Upper Large	BMW	I7 XDRIVE60	0	62
Upper Large	BMW	I7 M70	0	1
Upper Large	Porsche	97A	56	7
Upper Large	Bentley	FLYING SPUR	75	3
Sports	Rolls-Royce	SPECTRE	0	3
Sports	McLaren	ARTURA	104	26
People Movers	Mercedes-Benz Vans	EVITO TOURER	0	18
People Movers	Mercedes-Benz Vans	EQV	0	13
People Movers	LDV	MIFA9	0	12
SUV Light	Toyota	YARIS CROSSHV	87	4,387
SUV Light	Suzuki	IGNIS	113	2,281
SUV Small	Volvo Car	C40	0	1,103
SUV Small	Mercedes-Benz Cars	EQA 350 4MATIC	0	177
SUV Small	Mercedes-Benz Cars	EQA 250	0	1,021
SUV Small	MG	MG ZS EV	0	2,794
SUV Small	Mazda	M30	0	13
SUV Small	Lexus	UX300E	0	113
SUV Small	Peugeot	2008	0	59
SUV Small	Renault	MEGANE E-TECH	0	3

Table 23 (continued)

Segment	Make	Model	Average emissions intensity (g/km)	Sales
SUV Small	Volvo Car	XC40	0	2,846
SUV Small	BMW	IX1 XDRIVE30	0	936
SUV Small	Genesis	GV60	0	191
SUV Small	Alfa Romeo	TONALE	34	58
SUV Small	Kia	SG2 NIRO	38	1,677
SUV Small	Hyundai	KONA	40	1,519
SUV Small	Mitsubishi	ECLIPSE CROSS	43	1,296
SUV Small	MINI	COOPER	54	469
SUV Small	Kia	DE NIRO	87	149
SUV Small	Toyota	C-HR HYBRID	97	2,537
SUV Small	Honda	HR-V	98	1,001
SUV Small	Toyota	COROLLA CROSSHV	98	5,734
SUV Small	Lexus	UX250H	103	1,463
SUV Small	Skoda	KAMIQ	113	75
SUV Small	GWM	HAVAL JOLION	115	3,027
SUV Small	Citroen	C4	116	1
SUV Small	Audi	Q2	119	906
SUV Medium	Mercedes-Benz Cars	EQB 350	0	101
SUV Medium	Mercedes-Benz Cars	EQC 400 4M	0	80
SUV Medium	Mercedes-Benz Cars	EQC 400 4M SPRT	0	239
SUV Medium	Hyundai	IONIQ 5	0	954
SUV Medium	Genesis	GV70	0	78
SUV Medium	Mercedes-Benz Cars	EQB 250	0	647
SUV Medium	Tesla	MODEL Y	0	28,769
SUV Medium	BMW	IX3 MSPORT	0	772
SUV Medium	BYD	ATTO 3	0	11,042
SUV Medium	Lexus	NX450H	29	415
SUV Medium	Peugeot	408	30	1
SUV Medium	Ford	ESCAPE	33	263
SUV Medium	Mitsubishi	OUTLANDER	35	2,276
SUV Medium	Peugeot	3008	36	57
SUV Medium	Volvo Car	XC60	37	599
SUV Medium	MG	MG HS PHEV	39	2,172
SUV Medium	CUPRA	FORMENTOR	43	484
SUV Medium	Audi	Q5	45	89
SUV Medium	Audi	Q5 SPORTBACK	45	48

Table 23 (continued)

Segment	Make	Model	Average emissions intensity (g/km)	Sales
SUV Medium	Land Rover	RR EVOQUE	49	7
SUV Medium	Mazda	C60	49	1,139
SUV Medium	Mercedes-Benz Cars	GLC300E 4M FL	53	42
SUV Medium	BMW	X3 XDRIVE30E	73	132
SUV Medium	Toyota	RAV4 HYBRID	108	25,666
SUV Medium	Lexus	NX350H	113	3,002
SUV Medium	Honda	HZV	115	739
SUV Medium	GWM	HAVAL H6	120	4,174
SUV Large	Ford	MUSTANG MACH-E	0	51
SUV Large	Audi	E7	0	4
SUV Large	Kia	CV EV6	0	1,831
SUV Large	Jaguar	I-PACE	0	35
SUV Large	Lexus	RZ450E	0	265
SUV Large	Mercedes-Benz Cars	EQE 300 SUV	0	104
SUV Large	Mercedes-Benz Cars	EQE 350 4M SUV	0	97
SUV Large	Mercedes-Benz Cars	EQE 500 4M SUV	0	36
SUV Large	Mercedes-Benz Cars	M-AMG EQE53 SUV	0	16
SUV Large	BMW	IX XDRIVE50	0	108
SUV Large	BMW	IX XDRIVE40	0	671
SUV Large	BMW	IX M60	0	43
SUV Large	Audi	Q8 E-TRON SB	0	58
SUV Large	Audi	Q8 E-TRON	0	51
SUV Large	Audi	ETRON S SB	0	33
SUV Large	Audi	EB	0	30
SUV Large	Audi	ETRON S	0	24
SUV Large	Kia	MQ4 SORENTO	36	490
SUV Large	Land Rover	RR SPORT	37	80
SUV Large	Volvo Car	XC90	40	479
SUV Large	BMW	X5 XDRIVE50E	41	46
SUV Large	Land Rover	RR VELAR	51	5
SUV Large	BMW	X5 XDRIVE45E	56	50
SUV Large	Audi	Q8	60	16
SUV Large	Porsche	CAY	72	55
SUV Large	Jeep	GRAND CHEROKEE	74	40
SUV Large	Land Rover	DEFENDER 110	78	11
SUV Large	Lexus	RX350H	114	572

Table 23 (continued)

Segment	Make	Model	Average emissions intensity (g/km)	Sales
SUV Upper Large	Mercedes-Benz Cars	EQS 450 4M SUV	0	60
SUV Upper Large	Kia	MV EV9	0	208
SUV Upper Large	Land Rover	RANGE ROVER	37	10
SUV Upper Large	BMW	XM LABEL	61	7
SUV Upper Large	BMW	XM	61	143
SUV Upper Large	Bentley	BENTAYGA	82	7
Pick-up/ Chassis 4×2	LDV	T60	0	79
Vans/Cab Chassis	Renault	KANGOO	0	18
Vans/Cab Chassis	Mercedes-Benz Vans	EVITO	0	40
Vans/Cab Chassis	Peugeot	PAR	0	71
Total*			**N/A**	**203,940**

* The total shown in this row differs to the national total shown in other tables as it only includes 'green' vehicles.

Table 24: Average emissions intensity and number of vehicles by year first registered, January 2024 registered vehicles

Year	Average CO_2 emissions (g/km)	Annual change	Number of registered vehicles
2003	250.7	N/A	302,996
2004	248.7	-0.8%	414,223
2005	240.4	-3.3%	486,497
2006	230.1	-4.3%	533,814
2007	225.1	-2.2%	641,497
2008	221.6	-1.6%	664,894
2009	217.8	-1.7%	659,203
2010	212.0	-2.7%	761,613
2011	206.3	-2.7%	772,732
2012	198.5	-3.8%	891,666
2013	191.5	-3.5%	943,988
2014	186.9	-2.4%	947,951
2015	183.0	-2.1%	1,005,750
2016	181.0	-1.1%	1,039,099
2017	180.3	-0.4%	1,063,547
2018	178.8	-0.8%	1,003,284
2019	177.2	-0.9%	925,069
2020	176.4	-0.5%	800,167
2021	173.7	-1.6%	921,007
2022	170.7	-1.7%	937,690
2023	162.8	-4.6%	1,079,301
2024	156.1	-4.1%	3,097
Total	**193.7**	**N/A**	**16,799,085**

Table 25: Number of vehicles, average emissions intensity and average mass in running order by make, January 2024 registered vehicles

Make	Vehicles	Average emissions intensity (g/km)	Average mass in running order (kg)
Toyota	3,581,784	202.2	1,786.2
Mazda	1,585,063	177.5	1,518.6
Hyundai	1,274,706	175.8	1,541.5
Holden	1,268,532	233.4	1,726.0
Ford	1,246,293	227.3	1,911.4
Mitsubishi	1,079,462	201.2	1,719.1
Nissan	913,514	210.7	1,777.2
Subaru	699,078	190.6	1,588.1
Kia	679,284	175.5	1,611.7
Volkswagen	669,581	167.3	1,640.3
Honda	661,083	176.6	1,484.9
Mercedes-Benz Cars	425,245	176.3	1,824.1
BMW	363,144	171.3	1,756.0
Suzuki	311,923	156.0	1,186.8
Isuzu Ute	262,153	211.3	2,063.9
Audi	253,661	162.8	1,771.4
MG	167,343	151.9	1,420.4
Jeep	165,746	236.1	2,084.3
Lexus	147,168	189.5	1,901.6
Land Rover	128,736	211.5	2,206.1
Volvo Car	104,469	176.3	1,922.4

Make	Vehicles	Average emissions intensity (g/km)	Average mass in running order (kg)
GWM	96,937	200.3	1,793.7
Tesla	87,223	0.0	1,925.3
Renault	81,959	169.9	1,543.2
Skoda	70,141	145.8	1,554.8
Peugeot	60,186	159.7	1,484.7
Porsche	54,585	213.1	1,939.2
LDV	52,362	242.6	2,189.6
MINI	50,943	141.7	1,338.1
Jaguar	24,121	188.5	1,779.2
Mercedes-Benz Vans	23,574	196.6	2,145.5
Fiat	22,347	148.0	1,269.4
SsangYong	21,881	220.8	2,053.5
Alfa Romeo	18,510	166.4	1,488.5
Chrysler	16,873	260.9	1,902.4
Citroen	15,098	158.1	1,419.6
RAM	14,837	286.7	2,694.7
BYD	14,613	0.0	1,823.5
Dodge	10,881	239.8	1,876.3
Chery	7,443	171.2	1,481.8
Proton	6,848	166.3	1,209.9
Maserati	6,289	257.5	2,034.1

Table 25 (continued)

Make	Vehicles	Average emissions intensity (g/km)	Average mass in running order (kg)
Saab	5,582	226.9	1,653.1
Chevrolet	5,102	300.6	2,511.0
CUPRA	4,812	121.8	1,805.4
Daihatsu	4,501	156.9	979.4
Genesis	3,939	211.3	2,158.1
Polestar	3,935	0.0	2,106.0
Infiniti	3,851	212.3	1,944.3
Ferrari	2,832	330.6	1,674.2
Bentley	2,615	312.1	2,488.4
Smart	2,471	114.1	862.9
Opel	2,332	166.6	1,580.8
Foton Light	2,039	217.8	1,984.3
Aston Martin	2,006	322.8	1,854.8
Lamborghini	1,510	338.6	1,744.9
Hummer	1,247	343.5	2,338.5
Lotus	1,179	211.0	1,194.0
Fiat Professional	1,159	178.4	1,698.3
McLaren	681	256.8	1,503.0
Rolls-Royce	558	338.6	2,574.4
Daewoo	493	172.5	1,061.3
MG Rover	361	201.2	1,307.8
Morgan	139	195.7	994.4
Alpine	97	140.0	1,188.0
Caterham	15	179.2	739.7
Maybach	10	385.1	2,822.0
Total	**16,799,085**	**193.7**	**1,705.3**

Table 26: Average emissions intensity, average mass in running order and number of vehicles by segment, January 2024 registered vehicles

Segment	Vehicles	Average emissions intensity (g/km)	Average mass (kg)
Small	3,205,388	164.9	1,418.4
SUV Medium	2,487,008	179.7	1,719.2
SUV Large	2,024,448	225.0	2,148.8
Pick-up/Chassis 4×4	1,918,801	233.7	2,093.0
Light	1,434,798	147.7	1,187.8
SUV Small	1,294,093	163.6	1,545.6
Medium	1,138,389	174.4	1,628.7
Large	870,513	249.2	1,772.2
Pick-up/Chassis 4×2	738,005	250.2	1,730.2
SUV Upper Large	343,274	281.0	2,681.3
SUV Light	332,734	144.6	1,329.9
Sports	313,087	210.5	1,596.4
Vans/Cab Chassis	260,137	218.5	1,910.3
People Movers	192,754	221.1	2,076.5
Micro	178,296	133.7	1,035.3
Upper Large	55,100	261.3	1,959.6
Light Buses	12,260	255.5	2,280.3
Total	**16,799,085**	**193.7**	**1,705.3**

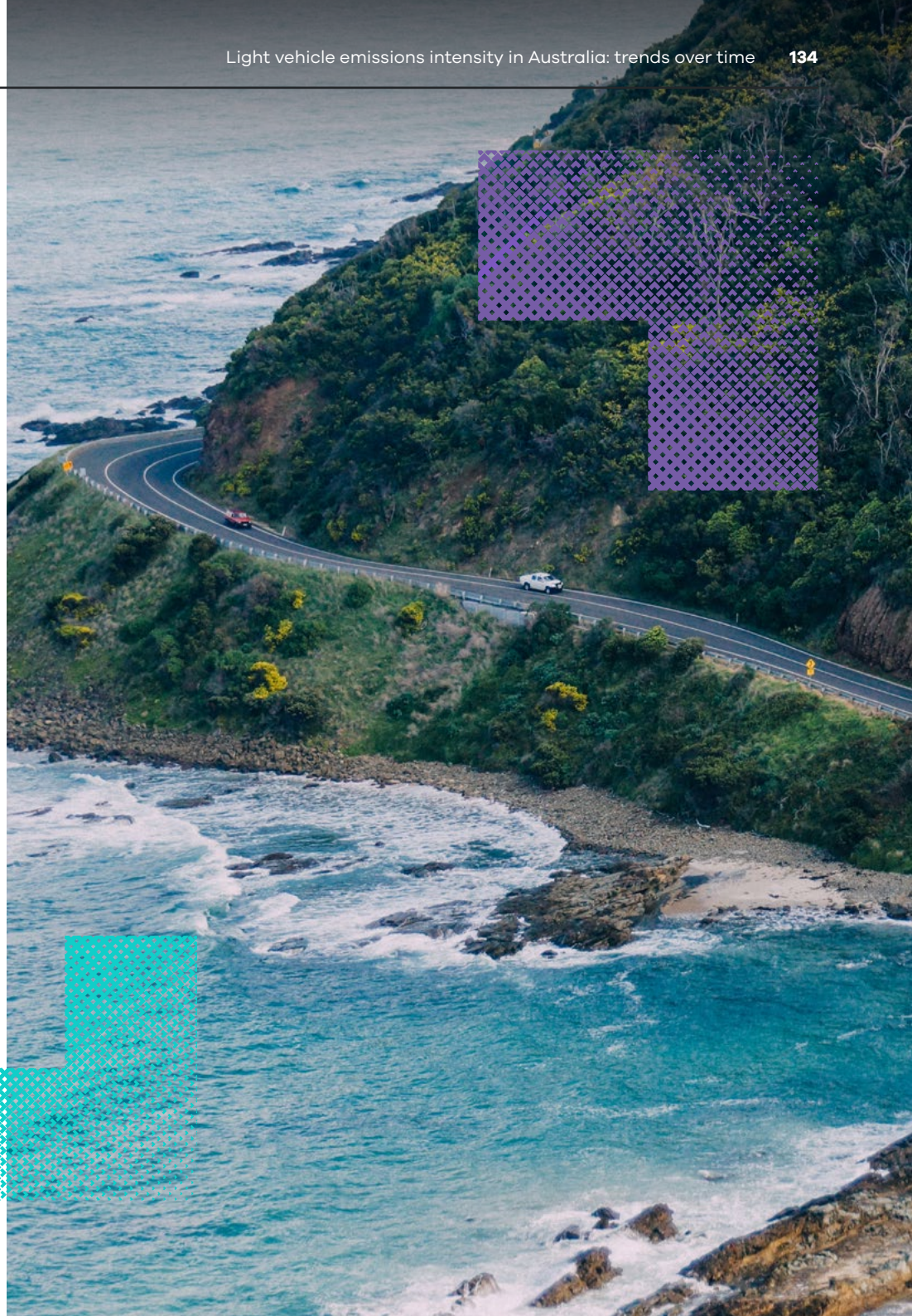


Table 27: Most common vehicles and average emissions intensity by powertrain/fuel type and state/territory, January 2024 registered vehicles

Powertrain/ fuel type	Rank	Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total	Average emissions intensity (g/km)
BEV	1	Tesla MODEL 3	1,838	14,609	102	10,211	1,946	519	11,830	4,567	**45,622**	0.0
BEV	2	Tesla MODEL Y	1,297	12,677	71	8,051	1,306	347	10,135	3,615	**37,499**	0.0
BEV	3	BYD ATTO 3	413	3,522	34	3,281	937	334	2,856	1,708	**13,085**	0.0
BEV	4	MG MG ZS EV	184	1,552	23	1,162	343	195	1,209	516	**5,184**	0.0
BEV	5	Volvo Car XC40	229	1,169	1	775	224	212	1,039	346	**3,995**	0.0
BEV	Other	All other models	2,055	14,442	191	9,130	2,577	1,064	11,806	4,087	**45,352**	0.0
BEV	**Total**	**BEV total**	**6,016**	**47,971**	**422**	**32,610**	**7,333**	**2,671**	**38,875**	**14,839**	**150,737**	**0.0**
PHEV	1	Mitsubishi OUTLANDER	334	1,515	39	1,284	753	204	1,558	807	**6,494**	39.8
PHEV	2	MG MG HS PHEV	114	1,145	20	1,024	234	86	1,187	314	**4,124**	39.0
PHEV	3	Mitsubishi ECLIPSE CROSS	128	577	16	548	269	85	504	254	**2,381**	43.0
PHEV	4	Volvo Car XC60	77	732	0	253	69	27	493	124	**1,775**	41.4
PHEV	5	Volvo Car XC90	50	448	0	184	63	20	352	80	**1,197**	44.1
PHEV	Other	All other models	607	4,069	22	2,184	622	152	3,509	937	**12,102**	52.2
PHEV	**Total**	**PHEV total**	**1,310**	**8,486**	**97**	**5,477**	**2,010**	**574**	**7,603**	**2,516**	**28,073**	**45.6**
HEV	1	Toyota RAV4 HYBRID	2,200	36,215	1,164	22,703	8,927	2,323	24,452	11,743	**109,727**	108.1
HEV	2	Toyota CAMRY HYBRID	1,824	26,433	677	14,542	8,157	1,102	25,166	8,936	**86,837**	111.2
HEV	3	Toyota COROLLA HYBRID	1,949	27,192	813	16,692	5,740	1,276	16,520	8,092	**78,274**	93.1
HEV	4	Toyota KLUGER HYBRID	365	6,717	157	2,932	1,422	250	6,183	1,872	**19,898**	128.0
HEV	5	Toyota YARIS CROSSHV	400	5,135	163	3,907	1,166	314	3,629	1,657	**16,371**	86.8
HEV	Other	All other models	3,038	42,915	639	25,048	7,363	1,870	32,740	11,167	**124,780**	112.5
HEV	**Total**	**HEV total**	**9,776**	**144,607**	**3,613**	**85,824**	**32,775**	**7,135**	**108,690**	**43,467**	**435,887**	**107.4**

Table 27 (continued)

Powertrain/ fuel type	Rank	Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total	Average emissions intensity (g/km)
Hydrogen	1	Toyota MIRAI	2	0	0	1	0	0	28	1	**32**	0.0
Hydrogen	2	Hyundai NEXO	22	0	0	5	0	0	0	0	**27**	0.0
Hydrogen	**Total**	**Hydrogen total**	**24**	**0**	**0**	**6**	**0**	**0**	**28**	**1**	**59**	**0.0**
Petrol	1	Toyota COROLLA	9,773	211,370	5,077	113,997	39,471	12,814	143,631	58,561	**594,694**	163.6
Petrol	2	Mazda 300	11,378	163,166	2,257	107,863	38,620	8,237	135,782	43,824	**511,127**	171.0
Petrol	3	Holden COMMODORE	5,000	102,606	1,769	62,650	45,004	7,429	134,757	45,166	**404,381**	258.6
Petrol	4	Hyundai I30	6,278	110,586	1,419	76,200	20,342	5,860	85,222	44,220	**350,127**	170.8
Petrol	5	Toyota CAMRY	4,390	78,339	2,468	51,755	20,813	4,216	74,315	29,048	**265,344**	200.8
Petrol	Other	All other models	166,337	2,896,726	55,807	1,970,223	677,384	219,845	2,491,283	1,028,760	**9,506,365**	191.2
Petrol	**Total**	**Petrol total**	**203,156**	**3,562,793**	**68,797**	**2,382,688**	**841,634**	**258,401**	**3,064,990**	**1,249,579**	**11,632,038**	**190.8**
Diesel	1	Toyota HILUX 4X4	16	141,476	12,128	72,853	34,619	12,865	82,823	73,808	**430,588**	222.1
Diesel	2	Ford RANGER	14	126,530	4,425	49,714	32,357	15,208	116,872	51,867	**396,987**	226.5
Diesel	3	Toyota LANDCRUISER	1,247	75,198	8,218	85,318	23,208	6,127	48,348	63,271	**310,935**	278.9
Diesel	4	Toyota PRADO	2,121	64,778	5,966	75,854	18,852	3,974	48,639	49,920	**270,104**	227.2
Diesel	5	Mitsubishi TRITON	10	80,716	3,117	45,306	24,136	10,832	58,739	30,425	**253,281**	219.4
Diesel	Other	All other models	32,279	858,433	21,396	597,095	209,123	78,677	662,668	329,166	**2,788,837**	204.9
Diesel	**Total**	**Diesel total**	**35,687**	**1,347,131**	**55,250**	**926,140**	**342,295**	**127,683**	**1,018,089**	**598,457**	**4,450,732**	**215.9**
LPG	1	Ford FALCON	205	7,546	13	2,887	2,714	263	24,334	3,100	**41,062**	241.7
LPG	2	Holden COMMODORE	16	294	2	108	285	8	2,410	143	**3,266**	191.2
LPG	3	Holden CAPRICE	4	72	0	23	13	2	474	7	**595**	194.4

Table 27 (continued)

Powertrain/ fuel type	Rank	Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total	Average emissions intensity (g/km)
LPG	4	Holden HOLDEN UTILITY	0	15	0	14	16	4	110	9	**168**	200.1
LPG	5	Mitsubishi MAGNA	0	8	0	2	59	1	51	13	**134**	252.0
LPG	Other	All other models	0	0	0	0	0	0	0	0	**0**	N/A
LPG	**Total**	**LPG total**	**225**	**7,935**	**15**	**3,034**	**3,087**	**278**	**27,379**	**3,272**	**45,225**	**237.3**
Dual fuel	1	Mitsubishi TRITON	0	4,807	240	6,024	1,155	662	3,022	2,889	**18,799**	272.9
Dual fuel	2	Mitsubishi OUTLANDER	60	1,912	31	1,879	872	386	2,114	1,072	**8,326**	245.6
Dual fuel	3	Mitsubishi 380	127	1,455	28	1,282	1,552	220	2,103	1,452	**8,219**	259.2
Dual fuel	4	Holden COMMODORE	28	551	22	338	2,074	37	3,631	606	**7,287**	245.0
Dual fuel	5	Toyota CAMRY V6	149	2,655	25	932	702	222	1,810	655	**7,150**	268.6
Dual fuel	Other	All other models	50	1,311	40	2,226	507	210	1,081	1,128	**6,553**	314.7
Dual fuel	**Total**	**Dual fuel total**	**414**	**12,691**	**386**	**12,681**	**6,862**	**1,737**	**13,761**	**7,802**	**56,334**	**267.6**
Total	**Total**	**All vehicles**	**256,608**	**5,131,614**	**128,580**	**3,448,460**	**1,235,996**	**398,479**	**4,279,415**	**1,919,933**	**16,799,085**	**193.7**

Note: PHEV includes E-REV; HEV includes I-CEV; and petrol and diesel include MHEV

Table 28: Number of BEVs registered by state/territory and make and model, January 2024 registered vehicles

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Tesla MODEL 3	1,838	14,609	102	10,211	1,946	519	11,830	4,567	**45,622**
Tesla MODEL Y	1,297	12,677	71	8,051	1,306	347	10,135	3,615	**37,499**
BYD ATTO 3	413	3,522	34	3,281	937	334	2,856	1,708	**13,085**
MG MG ZS EV	184	1,552	23	1,162	343	195	1,209	516	**5,184**
Volvo Car XC40	229	1,169	1	775	224	212	1,039	346	**3,995**
Polestar 2	259	1,638	0	734	181	103	811	209	**3,935**
Hyundai KONA	220	839	18	654	243	146	923	302	**3,345**
MG MG4	101	1,045	11	739	235	58	580	405	**3,174**
Tesla MODEL S	79	840	5	441	96	22	785	181	**2,449**
Kia CV EV6	65	769	27	510	147	39	650	215	**2,422**
Nissan LEAF	245	524	56	455	163	126	546	280	**2,395**
Mercedes-Benz Cars EQA 250	51	475	1	417	129	38	570	206	**1,887**
Hyundai IONIQ 5	106	549	10	332	112	56	484	174	**1,823**
Tesla MODEL X	36	640	3	310	49	12	516	87	**1,653**
Hyundai IONIQ	95	376	7	363	132	60	370	202	**1,605**
Volvo Car C40	65	477	1	382	49	56	424	110	**1,564**
Porsche TAY	31	546	0	246	62	21	449	112	**1,467**
MINI COOPER	52	439	0	281	112	27	337	113	**1,361**
BMW IX3 MSPORT	51	441	3	265	59	38	428	73	**1,358**
Kia SG2 NIRO	67	331	22	246	78	32	351	65	**1,192**
BMW IX XDRIVE40	27	356	1	186	52	6	344	72	**1,044**

Table 28 (continued)

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
BMW IX1 XDRIVE30	39	308	1	210	29	12	234	104	**937**
BYD DOLPHIN	39	289	0	242	61	18	159	126	**934**
CUPRA BORN	119	291	0	125	63	14	175	94	**881**
Mercedes-Benz Cars EQB 250	29	197	0	186	43	5	239	61	**760**
Hyundai IONIQ 6	37	182	5	127	30	16	161	67	**625**
Mercedes-Benz Cars EQC 400 4M	10	150	0	119	31	11	190	41	**552**
GWM ORA	23	164	5	160	20	12	83	53	**520**
BYD SEAL	14	186	1	87	23	1	112	60	**484**
Kia DE NIRO	11	120	2	70	26	9	106	31	**375**
Jaguar I-PACE	13	110	0	76	11	11	99	40	**360**
Mercedes-Benz Cars EQC 400 4M SPRT	6	88	0	64	18	10	110	29	**325**
Genesis GV60	7	150	0	57	8	4	50	21	**297**
Lexus RZ450E	7	107	2	52	7	6	56	21	**258**
Mercedes-Benz Cars EQA 350 4MATIC	2	89	0	47	12	3	83	13	**249**
BMW I4 EDRIVE40 GC	7	73	0	46	15	4	69	22	**236**
Lexus UX300E	7	84	1	58	9	4	56	16	**235**
Mercedes-Benz Cars EQC 400 4M EAL	5	81	0	44	7	3	67	19	**226**
Audi RS E-TRON GT	5	99	0	41	10	2	42	20	**219**
Kia MV EV9	7	73	1	40	16	3	52	18	**210**
BMW I3S	1	83	1	28	12	2	57	21	**205**
Mercedes-Benz Cars EQE 350	4	50	0	34	6	3	95	5	**197**

Table 28 (continued)

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Mitsubishi IMIEV	12	37	3	36	27	5	33	43	**196**
Audi EB	3	71	0	27	9	7	30	27	**174**
BMW IX XDRIVE50	9	52	0	38	6	3	48	17	**173**
BMW I4 EDRIVE35	3	82	0	24	8	3	46	5	**171**
Fiat 500E	16	58	0	14	19	3	40	14	**164**
BMW I4 M50 GC	9	39	0	40	7	1	32	23	**151**
BMW I3	9	55	0	21	9	2	33	18	**147**
Mercedes-Benz Cars EQE 300	6	45	0	22	13	0	45	7	**138**
Mercedes-Benz Cars EQB 350	5	34	0	36	4	1	48	7	**135**
Audi E-TRON GT	5	47	0	23	5	5	25	17	**127**
Renault ZOE	2	26	1	21	11	6	36	22	**125**
Genesis GV70	1	57	0	27	3	1	23	9	**121**
Renault KANGOO	4	50	1	42	9	2	0	9	**117**
Mazda M30	2	26	2	21	10	4	32	17	**114**
Mercedes-Benz Cars EQE 300 SUV	2	21	0	17	3	0	50	8	**101**
Mercedes-Benz Cars EQS 53 4M	0	18	0	21	5	3	49	3	**99**
Mercedes-Benz Cars M-AMG EQE 53 4M	2	19	0	26	6	0	32	11	**96**
Mercedes-Benz Cars EQE 350 4M SUV	1	24	0	18	4	2	35	7	**91**
Audi E7	4	29	0	13	7	5	11	15	**84**
BMW IX M60	0	27	0	12	7	1	25	8	**80**
BYD E6	0	49	0	10	5	1	0	11	**76**

Table 28 (continued)

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Audi ETRON S SB	1	24	0	11	2	1	17	13	**69**
BMW I7 XDRIVE60	1	22	0	13	1	0	29	2	**68**
LDV T60	0	19	0	0	9	0	20	13	**61**
Audi Q8 E-TRON SB	1	27	0	11	1	2	11	5	**58**
Mercedes-Benz Cars EQS 450 4M SUV	2	12	0	9	5	0	25	4	**57**
Peugeot 2008	1	23	0	7	2	1	17	5	**56**
Peugeot PAR	1	21	0	12	4	3	0	13	**54**
Ford MUSTANG MACH-E	2	4	0	1	2	0	44	0	**53**
Audi Q8 E-TRON	1	20	0	13	1	1	11	4	**51**
Audi ETRON S	3	15	0	9	5	1	10	8	**51**
BMW IX3	0	18	0	11	2	0	10	9	**50**
Mercedes-Benz Cars EQE 500 4M SUV	0	11	0	3	1	0	15	6	**36**
BYD T3	0	18	0	10	2	2	0	2	**34**
Mercedes-Benz Cars EQS 450 4M	0	7	0	5	3	0	16	0	**31**
Mercedes-Benz Vans EVITO	3	12	0	9	1	2	0	4	**31**
BMW I5 EDRIVE40	0	10	0	4	1	0	12	1	**28**
Genesis G80	0	20	0	3	1	1	1	0	**26**
Mercedes-Benz Vans EQV	2	7	0	6	0	0	2	2	**19**
BMW I5 M60	0	8	0	0	1	0	8	0	**17**
Mercedes-Benz Vans EVITO TOURER	0	5	0	2	0	2	3	5	**17**
LDV MIFA9	0	7	0	3	0	0	0	3	**13**

Table 28 (continued)

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Fiat ABARTH 500E	0	0	0	0	0	0	12	1	**13**
Mercedes-Benz Cars M-AMG EQE53 SUV	0	3	0	4	0	0	2	0	**9**
LDV EDELIVER 7	0	4	0	0	0	0	0	0	**4**
Renault MEGANE E-TECH	0	0	0	0	0	0	3	0	**3**
Rolls-Royce SPECTRE	0	0	0	1	0	0	1	1	**3**
BMW I7 M70	0	0	0	0	0	0	1	0	**1**
Total	**6,016**	**47,971**	**422**	**32,610**	**7,333**	**2,671**	**38,875**	**14,839**	**150,737**

Table 29: Number of vehicles and average emissions intensity by country of manufacture, January 2024 registered vehicles

Country	Number of vehicles	Average emissions intensity (g/km)
Japan	5,963,016	190.7
Thailand	3,206,361	208.0
Korea	2,160,582	179.0
Australia	1,475,708	245.1
Germany	1,064,400	168.5
USA	549,220	215.1
China	439,329	140.9
England	372,193	180.9
South Africa	256,537	164.8
Spain	209,138	186.3
Czech Republic	144,324	168.5
Mexico	121,141	180.5
Belgium	113,843	181.0
India	104,142	142.6
Hungary	97,660	150.6
France	91,539	162.2
Slovak Republic	79,461	201.7
Poland	59,528	151.8
Argentina	57,188	222.4
Sweden	49,491	204.3
Italy	40,758	193.8
Austria	27,917	253.7
Portugal	26,676	164.6
Finland	25,974	155.3
Turkey	23,952	164.2
Taiwan	11,175	252.3
Romania	7,978	121.0
Malaysia	6,848	166.3
Indonesia	5,192	193.8
Canada	4,717	217.8
Brazil	2,980	195.0
Wales	117	299.9
Total	**16,799,085**	**193.7**

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