National Transport Commission

Leading change

Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2021

Executive summary

The National Transport Commission reports each year on the carbon dioxide intensity performance of new passenger and light commercial vehicles sold in Australia. The report highlights the collective impacts on carbon dioxide emissions intensity from the range of vehicles sold to Australians.

The Carbon Dioxide Emissions Intensity for New Australian Light Vehicles Report for 2021 shows Australia is falling behind other countries when it comes to driving down emissions.

Of all new passenger cars sold in Australia last year around 45 per cent had an emissions intensity of 160 g/km or less, compared with Europe where almost 90 per cent of cars sold did.

The report found that Australia recorded a 179 per cent increase in sales of battery and plug-in hybrid electric vehicles between 2020 and 2021, however the overall emissions intensity of all new cars sold in this period fell by just 2 per cent.

Transport accounts for 18 per cent of Australia's CO_2 emissions and the cars we drive are the largest contributor.

Increased sales of SUVs and utes, where there are fewer choices for cleaner vehicles, are tempering Australia's improvement in transport emissions.

The sale of 4x4 and 4x2 utes increased by more than 43,000 between 2020 and 2021, and large SUV sales increased by around 25,000. The emissions intensity for many of these popular vehicles exceeds 210 g/km, with no option yet in Australia to purchase an electric ute.

In 2021, half of all new car sales were SUVs, up from a quarter of all sales a decade ago. Similarly, the small vehicle segment once accounted for a quarter of all sales but today is one in 10.

However, there is a strong trend towards electric vehicles, despite the price differential and more limited choice of vehicles.

Battery electric vehicles (BEV) sales nearly tripled between 2020 and 2021 and plug-in hybrid electric vehicles (PHEV) sales doubled over the same period.

EV range anxiety is reducing with significant improvement in battery range from 200 km in 2011 to a maximum of nearly 600 km in 2021. Based on trends observed in other countries, increasing investment in public recharging stations, preferential tax arrangements and other incentives, and the adoption of emissions standards can lead to significant uptake in greener vehicles.

Today in Australia, battery and plug-in hybrid electric vehicles represent just 0.23 per cent of the nation's 18.4 million cars and light commercial vehicles.

According to the International Energy Agency (2022), 2.8 per cent of 2021 car sales in Australia were electric. Around the world, this figure was 17 per cent in Europe, 16 per cent in China, 5 per cent in the United States and 4.4 per cent in New Zealand.

The National Transport Commission continues to collaborate with governments and industry to develop the data needed to support the commitment of all jurisdictions to transition to a zero emissions fleet.

Key findings

- Data from the Federal Chamber of Automotive Industries (FCAI) voluntary CO_2 Emissions Standard shows that the 2021 average emissions intensity for passenger cars and light SUVs (MA category) was 146.5 g/km. By contrast, the average emissions intensity of heavy SUVs and light commercial vehicles (MC+NA category) was 212.5 g/km. Both figures represent a 2 per cent decrease from the previous year.
- If Australian consumers had purchased vehicles with best-in-class carbon dioxide emissions in 2021, the national average carbon dioxide emissions intensity from these new car sales would have been reduced by 91 per cent for the MA category and 47 per cent for the MC+NA category.

- There has been a large shift of sales away from passenger motor vehicles' segments towards SUVs and light trucks.
  - Sales in the small vehicle segment represented one quarter of all sales in 2011 but decreased to 11 per cent by 2021.
  - Sales in the light vehicle segment decreased from 14 per cent in 2011 to 5 per cent in 2021.
- Sales of hybrid vehicles increased by 20 per cent in 2021 compared with 2020, with 70,506 hybrid vehicles sold in 2021.
- Electric vehicles are becoming more popular, although off a low base, with 20,579 battery or plug-in hybrid electric vehicles sold by FCAI members, including Tesla, in 2021 compared with 7,388 vehicles sold in 2020 – a 179 per cent increase.
- As a result of these sales the total number of electric vehicles within the estimated Australian vehicle fleet grew by 93 per cent within the year.
- Across the states and territories, the percentage increase in the estimated total electric vehicle fleet was greatest for Western Australia (136 per cent) and lowest for South Australia (46 per cent).
- The average emissions intensity for the MA category was lowest for government car fleets (129 g/km), followed by business buyers (152 g/km) and private buyers (153 g/km). For the MC+NA category, the emissions intensity was relatively similar for all buyer types, with government buyers having the lowest (214 g/km) and business buyers having the highest (217 g/km).

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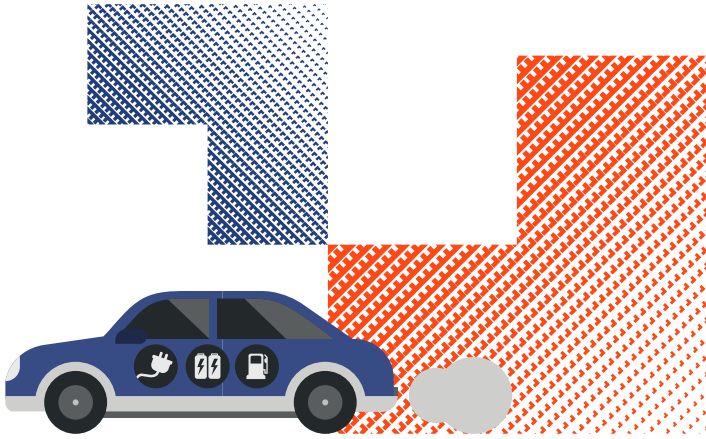

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Abbreviations

BEV	battery electric vehicle
EEA	European Environment Agency
FCAI	Federal Chamber of Automotive Industries
g/km	grams per kilometre
GVM	gross vehicle mass
HEV	hybrid electric vehicle
ICCT	International Council on Clean Transportation
IEA	International Energy Agency
MA	passenger cars and light SUVs
MC+NA	heavy SUVs and light commercial vehicles
NTC	National Transport Commission
PHEV	plug-in hybrid electric vehicle
SUV	sports utility vehicle

1. Introduction

Each year since 2009, the National Transport Commission (NTC) has published a carbon dioxide emissions intensity report on new Australian light vehicles. This is the latest in this series and provides data for 2021.

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. We use the FCAI data to prepare this report and we would like to thank the FCAI for making this data available for use in this report.

This report is divided into three main sections:

2

Section 2

Describes the methodology used.

3

Section 3

Presents the results of the analysis.

4

Section 4

Compares Australian data with international data.

2. Methodology

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

The FCAI and its members collate data on the sales of new vehicles each year. It provided data on 2021 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, 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). 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.

In previous years of this report, until the report on 2019 vehicle sales, the NTC calculated 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 was weighted to vehicle sales.

However, for the past two years of reporting the NTC has made changes to this methodology based on updates to how carbon dioxide emission data is reported in Australia by the FCAI, which provides the data to the NTC.

In early 2021, the FCAI released the inaugural results of its voluntary industry-led emissions standard (FCAI, 2021b). The results of the FCAI's standard are reported in two categories: an MA category (comprising passenger cars and light SUVs) and an MC+NA category (comprising heavy SUVs and light commercial vehicles). The NTC's report provides results aligned with these categories.

The FCAI's voluntary standard is based on a number of internationally mandated practices, including from Europe and the USA. These practices include the use of super-credits, air-conditioning credits and off-cycle credits (FCAI, 2021c).

To ensure consistency with this reporting, the NTC has adopted the use of super-credits when calculating weighted average emission values. This means that while the majority of vehicle sales still have a weighting of 1 when calculating a weighted average, some low emissions vehicles will have weightings of 1.5, 2 or 3, depending on their emissions values (see details in FCAI, 2021c).[1]

The data needed to calculate air-conditioning credits and off-cycle credits was not available to the NTC and therefore has not been included in the results reported in this document (with the exception of **Figures 3**, **5**, **6**, **7**, and **8** and **Table 9**, where the NTC has used the numerical results reported by the FCAI in its standard (FCAI, 2022a) to report them in a graphical format).

1 The super-credit weights were not available in the dataset provided by the FCAI to the NTC. The NTC has therefore calculated the super-credits in line with the methodology detailed in FCAI, 2021c. In a relatively small number of cases – 579 records in the dataset, comprising 10,007 sales – there was no data provided in the dataset on the unladen (kerb) mass. The NTC entered the tare mass as the unladen mass for these records.

A further change to the methodology in the past two years of reporting is that battery electric 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.[2] Although vehicles operating on their electric engine may have no tailpipe emissions, the electricity may produce carbon dioxide emissions depending on its source.

Given the changes to the methodology outlined in the previous paragraphs, it is not possible to report on some of the longer-term year-on-year changes in emissions intensity that were included in previous years' reports. However, with two years of data under the new methodology available, it is again possible to do some year-on-year comparisons on a consistent basis over this time period, and various graphs and tables throughout the report and appendix provide these comparisons.

Tesla sales data and other vehicle information is not included in the FCAI database, and as a result most tables and figures in this report do not include Tesla. However, certain tables and figures in the electric vehicles section do include estimated Tesla sales (these tables and figures specifically mention Tesla).

The 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.

2 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).

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

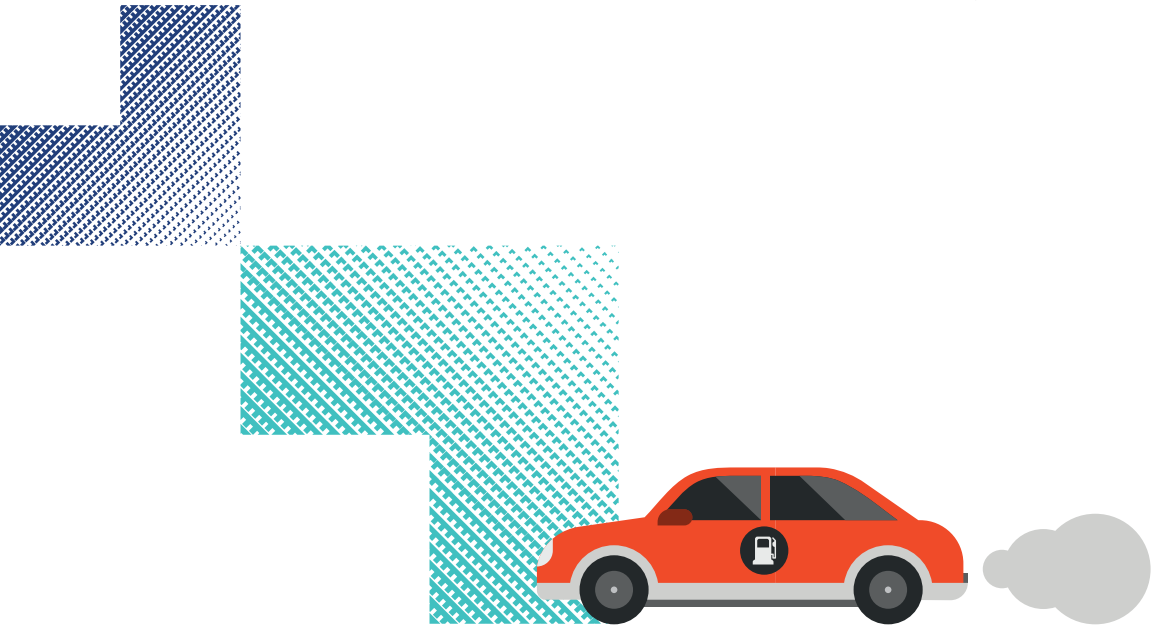
Carbon dioxide emissions intensity per kilometre is directly related to vehicle fuel consumption values. **Table 2** provides fuel consumption figures and the corresponding carbon dioxide emissions intensity for petrol and diesel.

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 (litres per 100 kilometres)	Average emissions intensity (g/km)	
	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



To help get a frame of reference for carbon dioxide emissions intensity from vehicles, **Figure 1** and **Figure 2** show the emissions intensity from the top 10 selling vehicle models in Australia during 2021, for the Passenger Cars and Light SUVs (MA) and the Heavy SUVs and Light Commercial Vehicle (MC+NA) categories, respectively. **Figures 1** and **2** also contain four low emitting vehicle models[3] and the highest emitting model in each category.

Figure 1: Average emissions intensity for top 10 selling vehicles in Australia in the MA category plus other selected models, 2021

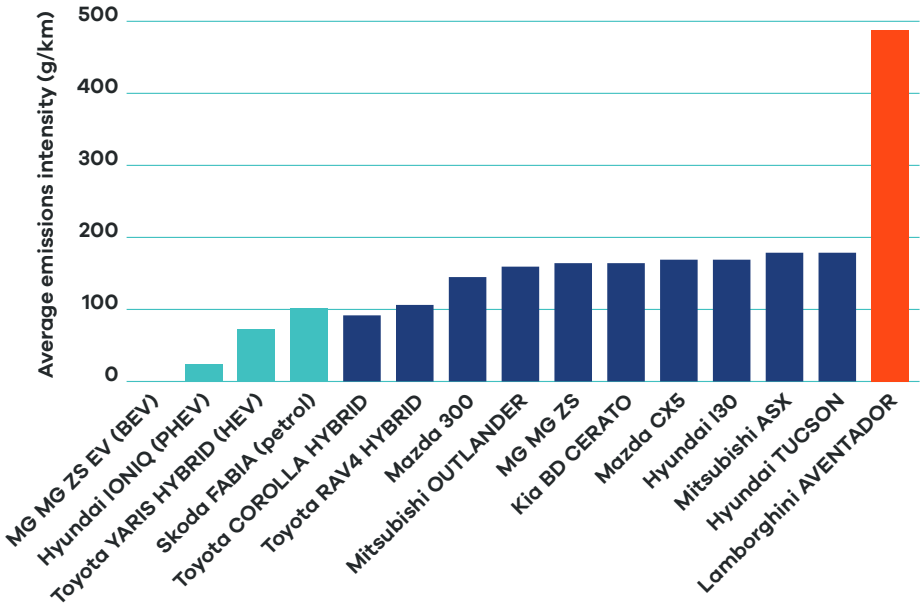
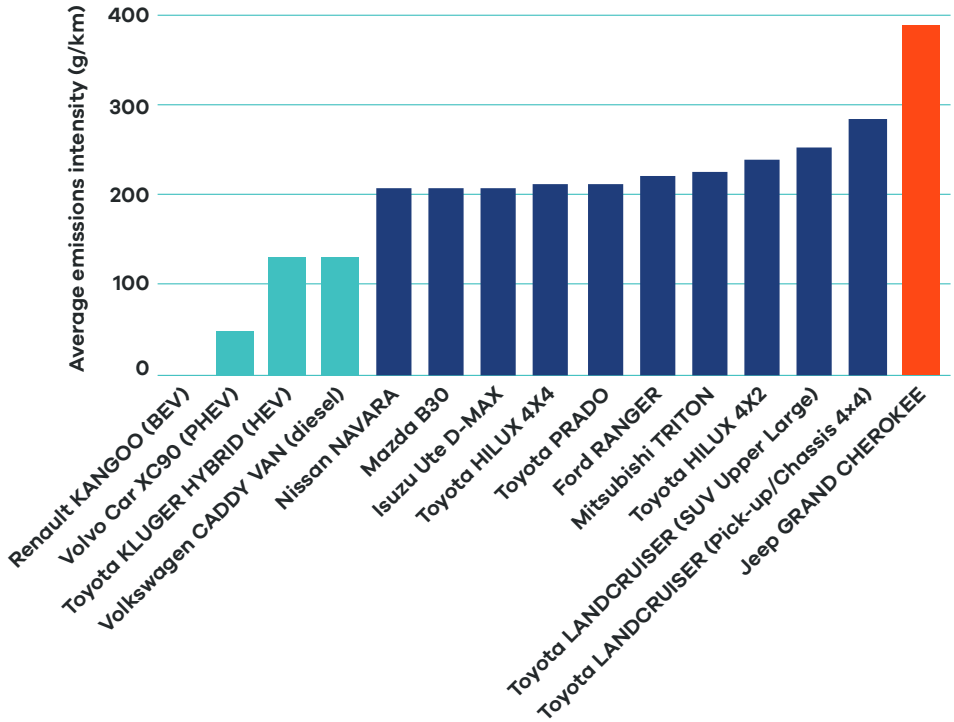


Figure 2: Average emissions intensity for top 10 selling vehicles in Australia in the MC+NA category plus other selected models, 2021



3 In this case, 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.

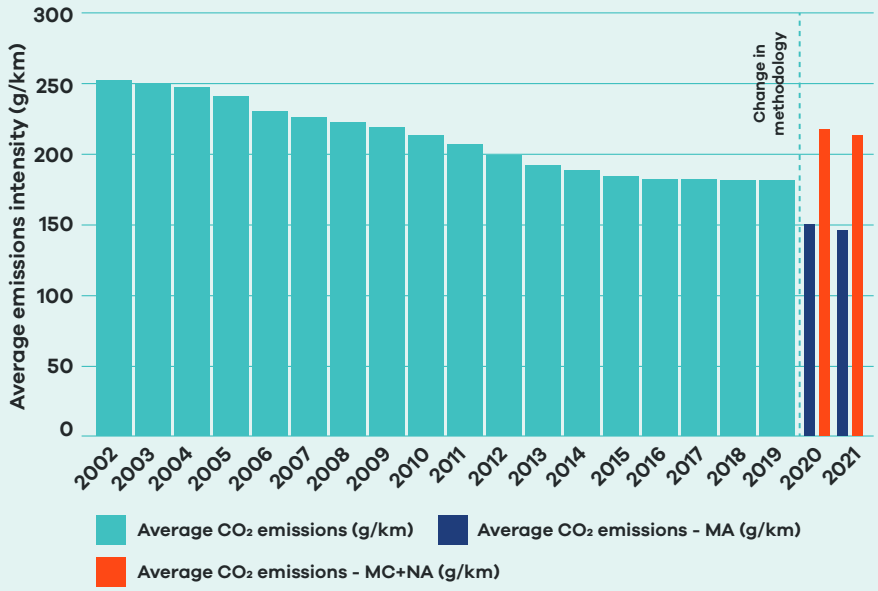
3. Australian emissions intensity

This section contains Australian data about the carbon dioxide emissions intensity for new passenger vehicles and light commercial vehicles in 2021.

As noted in Chapter 2, the methodology used to report emissions intensity has recently changed in several ways from historical NTC reports. The largest changes are to report separate emissions intensity figures for the MA and MC+NA categories – rather than a single national average – and the use of super-credits when calculating sales-weighted average emissions. **Figure 3** shows the emissions intensity values for the MA and MC+NA categories, as reported by the FCAI in the results for its standard (FCAI, 2021b; FCAI, 2022a), and the national average emissions intensity from previous NTC reports.[4] Given the change in methodology, it is not possible to directly compare the emissions intensity results for 2020 and 2021 with those in previous years.

Under the previous methodology used by the NTC, there had been an overall reduction of 28 per cent in carbon dioxide emissions intensity between 2002 and 2019, although the annual reductions were relatively small between 2016 and 2019. The data from the FCAI's voluntary standard shows that there was a fall in emissions intensity by around 2 per cent in both the MA and MC+NA categories between 2020 and 2021. Additional data on the annual average emissions intensity is provided in **Table 9** in the appendix.

Figure 3: National average emissions intensity for new passenger and light commercial vehicles, 2002–2021



Note: The data in this graph for 2020 and 2021 is sourced from the FCAI's voluntary emissions standard (FCAI, 2021b; FCAI, 2022a), and therefore includes the impacts of air-conditioning credits and off-cycle credits.

Over 91%

of all new vehicle sales in 2021 were from 15 makes.

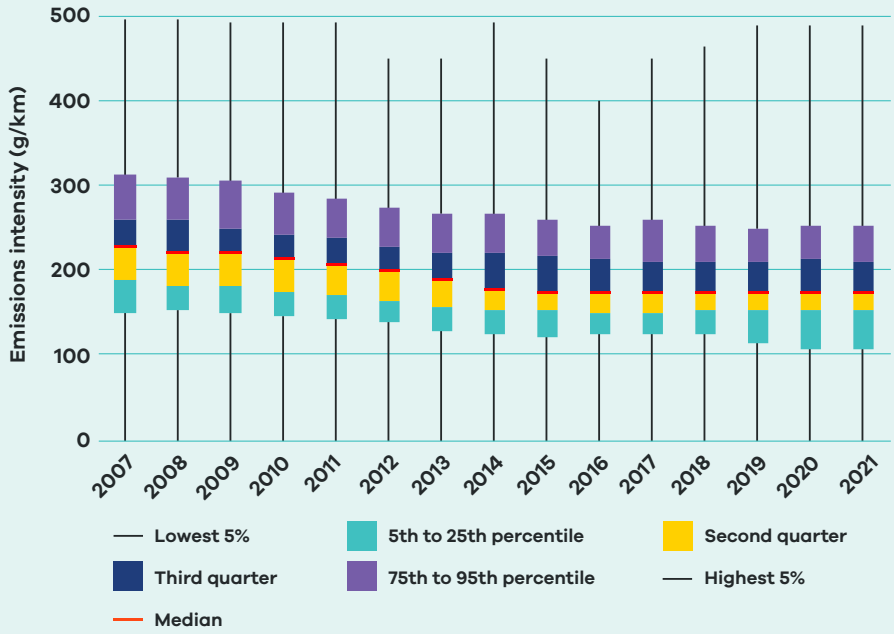
4 These numbers include the air-conditioning credits and off-cycle credits used by the FCAI but are not used elsewhere in the report (with the exception of **Figures 3**, **5**, **6**, **7**, and **8** and **Table 9**).

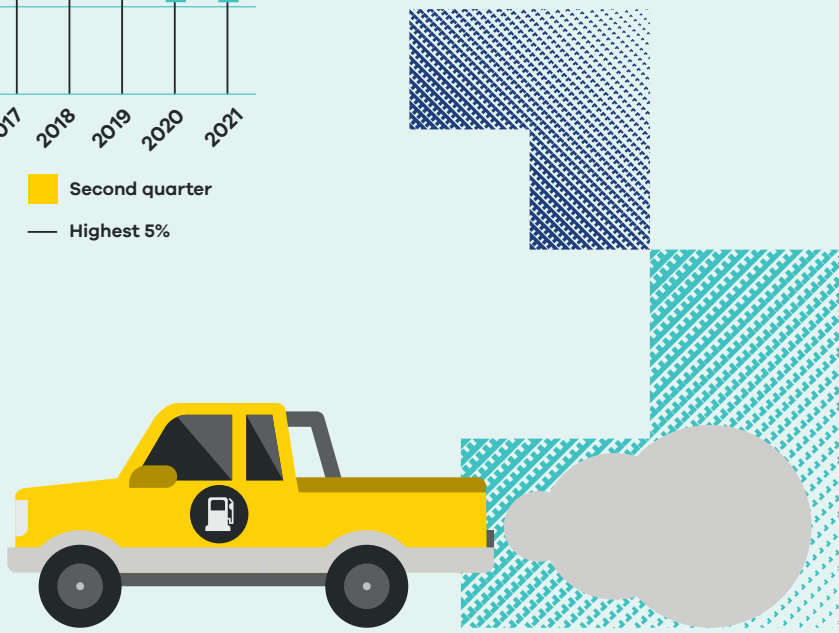
It is also possible to graph the distribution of emissions intensity for all vehicles sold in each year, when vehicle sales are ranked from lowest emitting to highest emitting, without calculating any sales-weighted average. **Figure 4** includes the following:

- 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 yellow shaded area to the top of the blue shaded area reflects the 'middle 50 per cent' of vehicles sold.

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 2007, 90 per cent of vehicles sold had an emissions intensity value between 151 and 311 g/km, whereas by 2021 the corresponding range was 107 to 252 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 the past two years has reached 107 g/km (which is a lower emissions intensity than almost all petrol- or diesel-only vehicles sold). However, the bounds of the blue and purple shaded areas have had relatively little change since 2016, and this likely reflects the increasing prevalence of SUVs and utes in new vehicle sales (as discussed in more detail later in the report).

Figure 4: Distribution of emissions intensity of vehicles sold, 2007–2021





Vehicle manufacturers

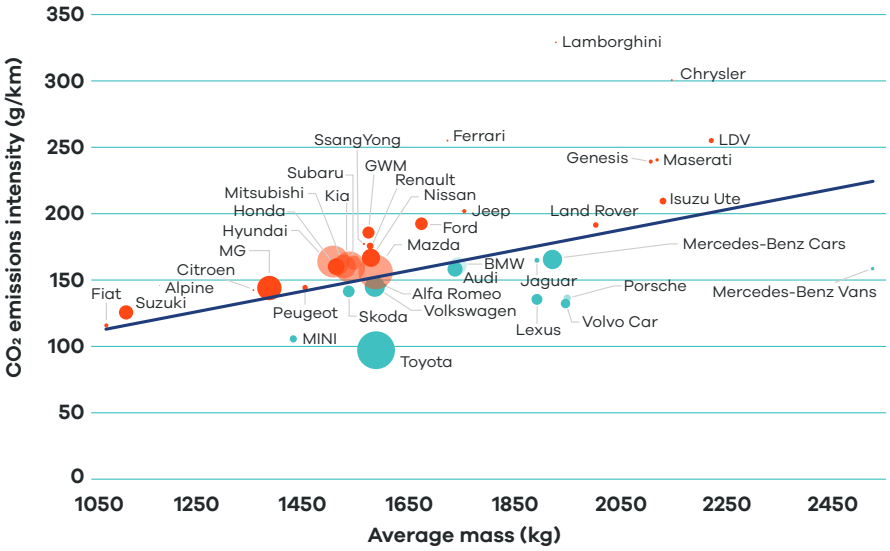
In 2021 there were 45 makes of new vehicles sold to Australian consumers in the MA category and 27 in the MC+NA category (with 25 of the 27 MC+NA category makes also appearing in the MA category). Around 91 per cent of all new vehicle sales were from the 15 highest selling makes in the MA category, while the corresponding figure for the MC+NA category is 95 per cent. The average carbon dioxide emissions intensity of these market-leading makes largely determines the overall average emissions intensity for each category.

Figure 5 provides a graphical representation of the data released by the FCAI in its voluntary emissions standard (FCAI, 2022a). The limit curve line illustrated in the figure represents the mathematical relationship between the sales-weighted mass of a brand's vehicles sold within Australia and its applicable emission targets. Simply put, the lower a brand's average sales-weighted mass is, the lower its emissions target and vice versa.

Each brand is represented by a circle, with the size of each circle representing the relative number of sales (Toyota had the highest sales with 100,448). Brands shown in green achieved results below the limit curve, meaning they beat their brand-specific target, while other brands that were above the limit curve are represented in red. Thirteen brands achieved results in 2021 below the limit curve.

For the MA category, Toyota had the lowest emissions (96.7 g/km) while Mercedes-Benz Vans was furthest below its brand-specific target (beating it by 65.7 g/km), albeit with just 588 sales. Lamborghini had both the highest emissions (328.9 g/km) and the largest distance above its target (151.0 g/km), but with just 131 sales during 2021. Full details on the sales and emissions intensity of each brand can be found in the FCAI's voluntary standard (FCAI, 2022a).

Figure 5: Average emissions intensity, average mass and limit curve for brands in the MA category, 2021



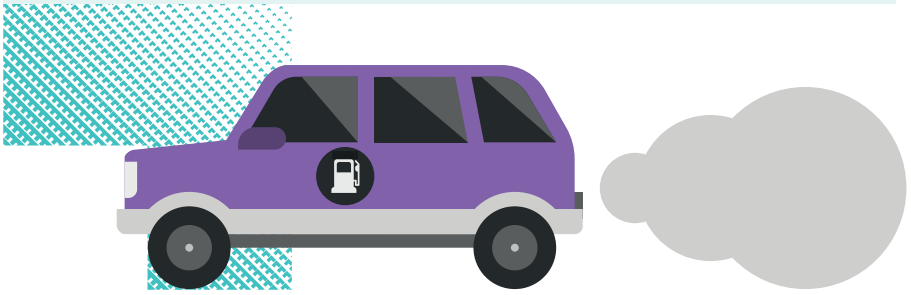
Note: The data in this graph is sourced from the FCAI's voluntary emissions standard (FCAI, 2022a), and therefore includes the impacts of air-conditioning credits and off-cycle credits.

The 2021 average emissions intensity for passenger cars and light SUVs was

146.5 g/km.

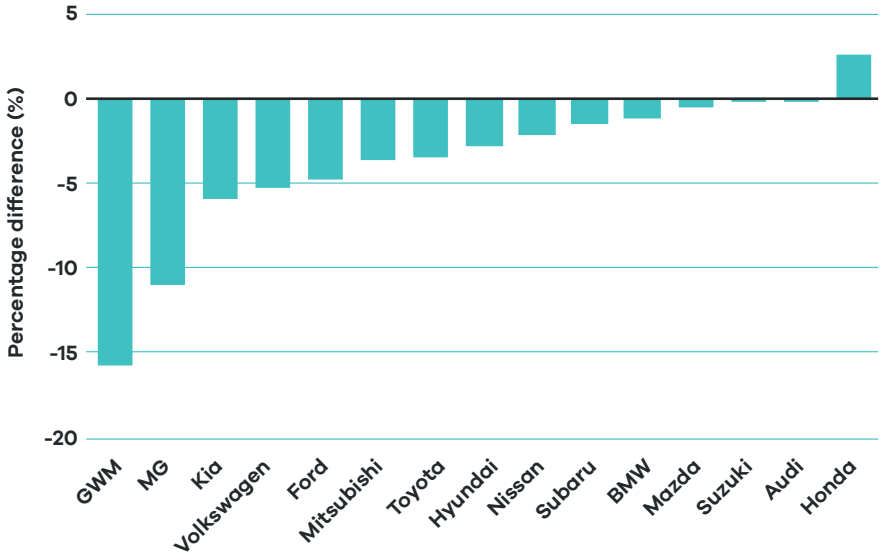
By contrast, the average emissions intensity of heavy SUVs and light commercial vehicles was

212.5 g/km.



With two years of data now reported by the FCAI through its voluntary standard, it is possible to compare the percentage change in emissions intensity between 2020 and 2021. **Figure 6** shows this information for the top 15 selling brands in the MA category in 2021,[5] with GWM's emissions intensity decreasing by almost 16 per cent, while Honda's increased by around 2.6 per cent.

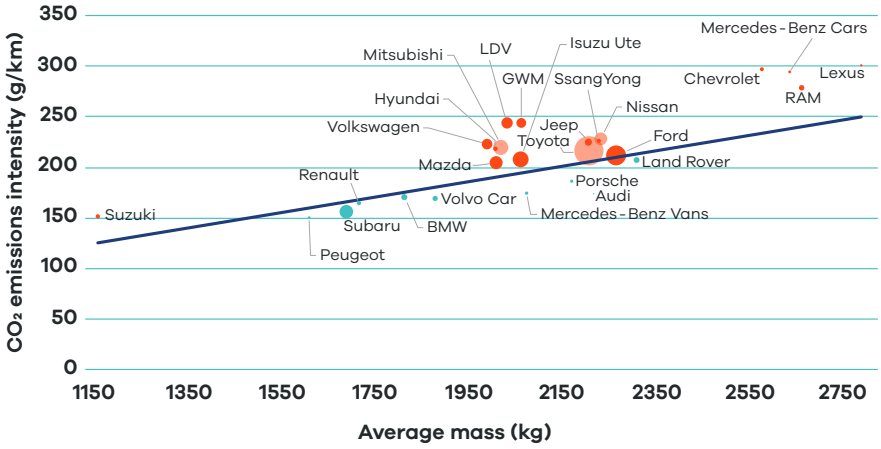
Figure 6: Percentage change in average emissions intensity between 2020 and 2021 for the top 15 makes by volume in the MA category (%)



Note: The data for this graph is sourced from the FCAI's voluntary emissions standard (FCAI, 2021b; FCAI, 2022a), and therefore includes the impacts of air-conditioning credits and off-cycle credits.

Figure 7 shows the corresponding analysis for the MC+NA category. Toyota had the highest sales of all brands (120,517), reflected by the largest circle, and its emissions intensity was 11.6 g/km above its brand-specific target. Nine brands were below the limit curve. Peugeot had the lowest average emissions (150.5 g/km) and Audi was the brand that was furthest below its brand-specific target, beating its target by 32.1 g/km. Lexus had the highest average emissions intensity (301.5 g/km) and Chevrolet was the brand furthest above its specific emissions target (exceeding it by 63.9 g/km).

Figure 7: Average emissions intensity, average mass and limit curve for brands in the MC+NA category, 2021

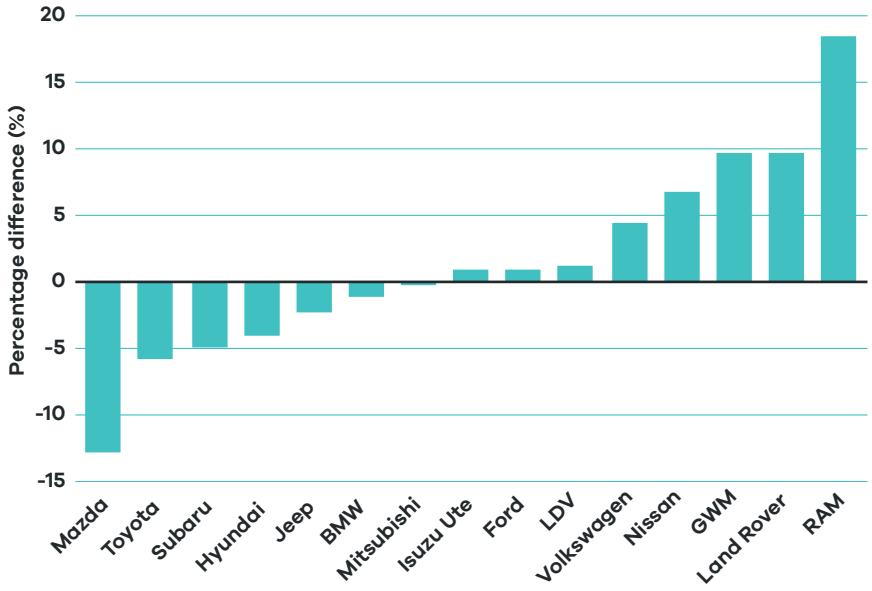


Note: The data in this graph is sourced from the FCAI's voluntary emissions standard (FCAI, 2022a), and therefore includes the impacts of air-conditioning credits and off-cycle credits.

5 Mercedes-Benz Cars was among the top 15 makes in 2021 but has not been included in the comparison because directly comparable data was not reported in the FCAI's voluntary standard results for 2020 (only a single Mercedes-Benz entry was provided, rather than separate entries for Mercedes-Benz Cars and Mercedes-Benz Vans).

As above, it is possible to assess the percentage change in emissions intensity between 2020 and 2021 for each brand in the MC+NA category. This information is shown for the top 15 selling brands in 2021 in **Figure 8**.[6] Mazda saw the largest reduction in emissions intensity (13 per cent), while RAM's increased by around 18 per cent.

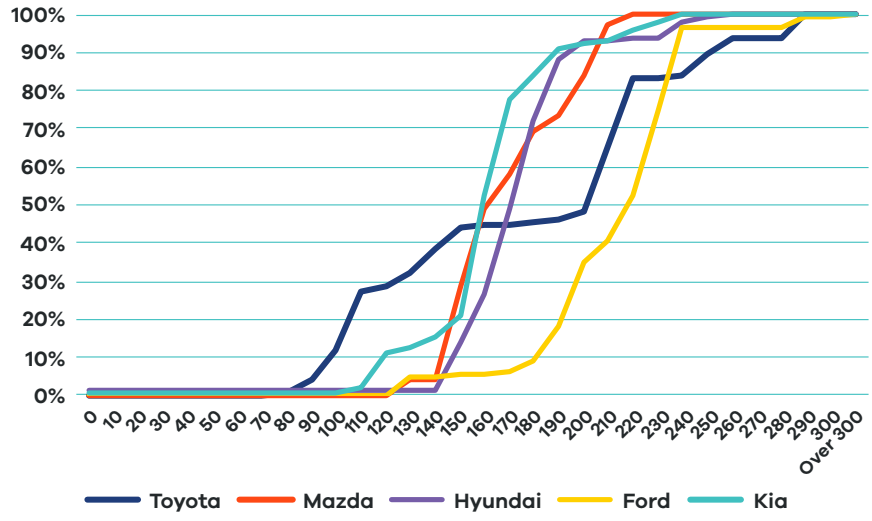
Figure 8: Percentage change in average emissions intensity between 2020 and 2021 for the top 15 makes by volume in the MC+NA category (%)



Note: The data for this graph is sourced from the FCAI's voluntary emissions standard (FCAI, 2021b; FCAI, 2022a), and therefore includes the impacts of air-conditioning credits and off-cycle credits.

Figure 9 shows the distribution of emissions intensity for the top 5 selling manufacturers in 2021 when assessing all sales (that is, in both the MA and MC+NA categories). 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 28 per cent of Toyota's vehicles sold in 2021 had an emissions intensity of 120 g/km or less; however, around 17 per cent of Toyota's sales had an emissions intensity above 220 g/km. Some of the other major manufacturers had most of their sales in relatively narrower ranges: both Mazda and Hyundai sold over 90 per cent of their vehicles with emissions intensities in the range of 140 to 210 g/km. Almost two-thirds of Ford's sales had an emissions intensity above 200 g/km.

Figure 9: Cumulative percentage of passenger vehicle sales relative to emissions intensity for top 5 selling manufacturers, 2021



6 Volvo Car was among the top 15 makes in 2021, but no data was available for 2020 in the FCAI's voluntary standard, so it has not been included in this graph.

Segment type

A segment analysis was conducted using the categories shown in **Table 1** and split into the MA and MC+NA categories.

Figure 10 shows the average carbon dioxide emissions intensity by segment during 2021.[7] The lowest emitting segment was 'Micro' (116 g/km); 'SUV Upper Large' in the MC+NA category (269 g/km) was the highest. Additional segment data, including the top 10 selling models for each segment, is provided in **Tables 10**, **11** and **12** in the appendix.

Figure 10: Average emissions intensity by segment, 2021

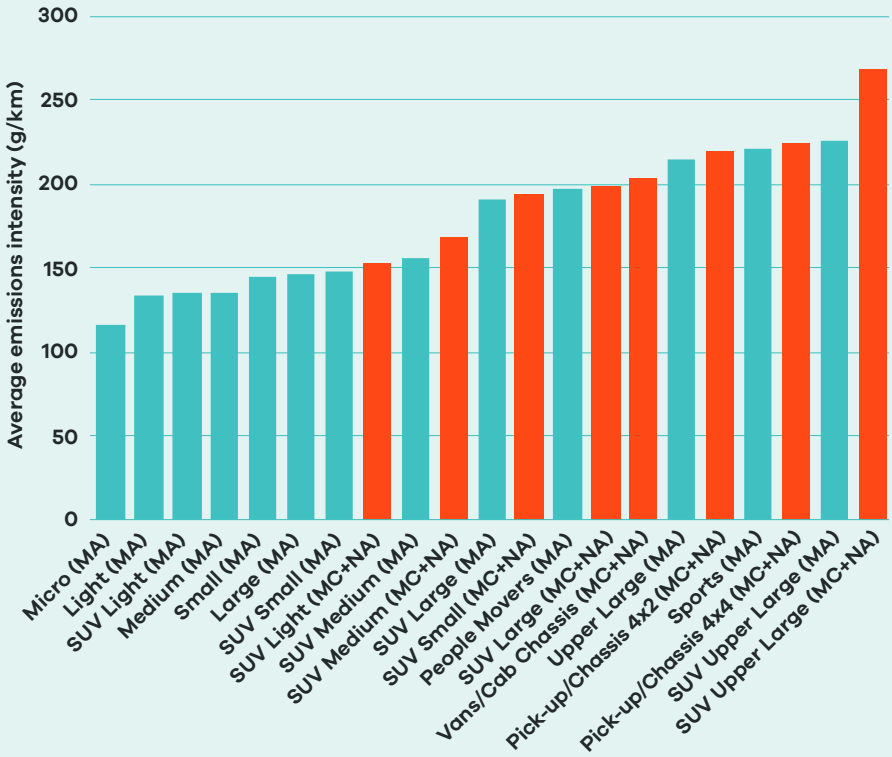
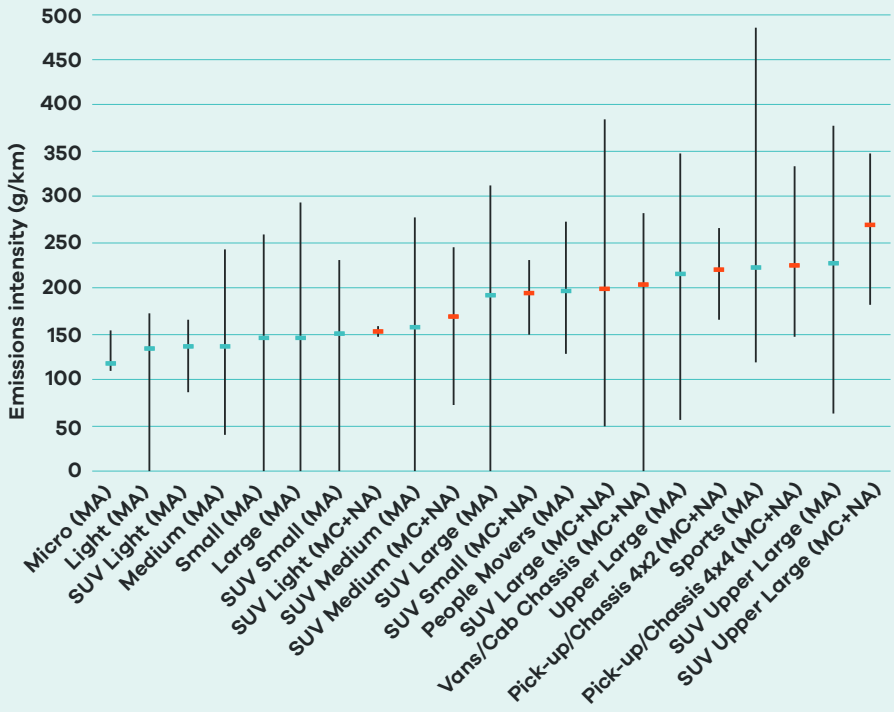


Figure 11 shows the average and the range in carbon dioxide emissions intensity for the segments during 2021. The average emissions are represented by the horizontal bars, and the ranges are represented by the vertical lines. As noted in chapter 2, battery electric vehicles with zero emissions are included in the analysis for this report, meaning that the range reaches down to zero for seven of the segments.

Figure 11: Range and average emissions intensity by segment, 2021



7 SUVs, and the five associated SUV segments from Light through to Upper Large, may appear as either MA or MC (and therefore within the MC+NA category). This will depend on whether the SUV is considered an 'off-road passenger vehicle' (the MC category), as defined under the Australian Design Rules (Australian Government, 2021), and whether or not the vehicle manufacturer has chosen to apply for MC categorisation for the relevant model variant.

If Australian consumers had purchased vehicles with best-in-class carbon dioxide emissions in 2021, the national average carbon dioxide emissions would have been reduced by 91 per cent for the MA category and 47 per cent for the MC+NA category. These figures reflect the fact that six of the 13 segments in the MA category had battery electric vehicles available, most of which were among the highest selling segments (in total, these six segments comprised around 82 per cent of total sales in the MA category). This shows the potential emissions reduction with currently available vehicles and technologies.

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.

Table 3: Best-in-class vehicles for carbon dioxide emissions intensity for each segment, 2021

Segment	Make and model (fuel source/s)*	Best-in-class vehicle emissions intensity (g/km)
Micro (MA)	Mitsubishi MIRAGE (petrol)	109
Light (MA)	MINI COOPER (electric) Toyota YARIS HYBRID (petrol-electric)	0 76
Small (MA)	Nissan LEAF (electric)^ Hyundai IONIQ (petrol-electric)	0 79
Medium (MA)	Peugeot 508 (electric-petrol) Toyota CAMRY HYBRID (petrol-electric)	40 96
Large (MA)	Porsche TAY (electric)^ BMW 530D (diesel)	0 134
Upper Large (MA)	Porsche 97A (electric-petrol)^ BMW 620D GT (diesel)	56 122
Sports (MA)	Audi A3 (petrol)	120
People Movers (MA)	Volkswagen CADDY (diesel)	129
SUV Light (MA)	Toyota YARIS CROSSHV (petrol-electric)	86
SUV Small (MA)	MG MG ZS EV (electric)^ Kia DE NIRO (petrol-electric)	0 88
SUV Medium (MA)	Mercedes-Benz Cars EQC 400 4M (electric)^ Toyota RAV4 HYBRID (petrol-electric)	0 107
SUV Large (MA)	Audi EB (electric)^ Lexus RX450H (petrol-electric)	0 131
SUV Upper Large (MA)	Land Rover RANGE ROVER (electric-petrol) Audi Q8 (diesel)	64 181
SUV Light (MC+NA)	Suzuki JIMNY (petrol)	146

Additional data comparing the top 10 highest selling models[8] in each segment against best-in-class vehicles is provided in **Table 12** in the appendix. Additional average emissions intensity data for all models that sold more than 1,000 vehicles is provided in **Table 13** in the appendix.

Segment	Make and model (fuel source/s)*	Best-in-class vehicle emissions intensity (g/km)
SUV Small (MC+NA)	Jeep COMPASS (diesel)	150
SUV Medium (MC+NA)	BMW X3 XDRIVE30E (electric-petrol) Land Rover DISCOVERY SPORT (diesel)	73 148
SUV Large (MC+NA)	Volvo Car XC90 (electric-petrol) Toyota KLUGER HYBRID (petrol-electric)	49 128
SUV Upper Large (MC+NA)	Audi Q8 (diesel)	181
Pick-up/Chassis 4×2 (MC+NA)	Nissan NAVARA (diesel)	166
Pick-up/Chassis 4×4 (MC+NA)	Nissan NAVARA (diesel)	147
Vans/Cab Chassis (MC+NA)	Renault KANGOO (electric) Volkswagen CADDY VAN (diesel)	0 129

* 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.

If people who purchased new vehicles in 2021 had chosen the best-in-class for emissions performance, Australia's average carbon emissions intensity would have dropped by

91% for passenger cars and light SUVs, and by

47% for heavy SUVs and light commercial vehicles.

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

Buyer type

Figure 12 shows the average carbon dioxide emissions intensity by buyer type in 2021 for vehicles sold in the MA category. Vehicles bought by government buyers had the lowest average carbon dioxide emissions intensity (129 g/km), followed by business buyers (152 g/km) and private buyers (153 g/km). All three buyer types had lower emissions intensities in 2021 than the previous year, with government buyers having the largest reduction (more than 4 per cent) as shown in **Figure 13**. Additional data on buyer types is provided in **Tables 14** and **15** in the appendix.

Figure 12: Average emissions intensity by buyer type for the MA category, 2021

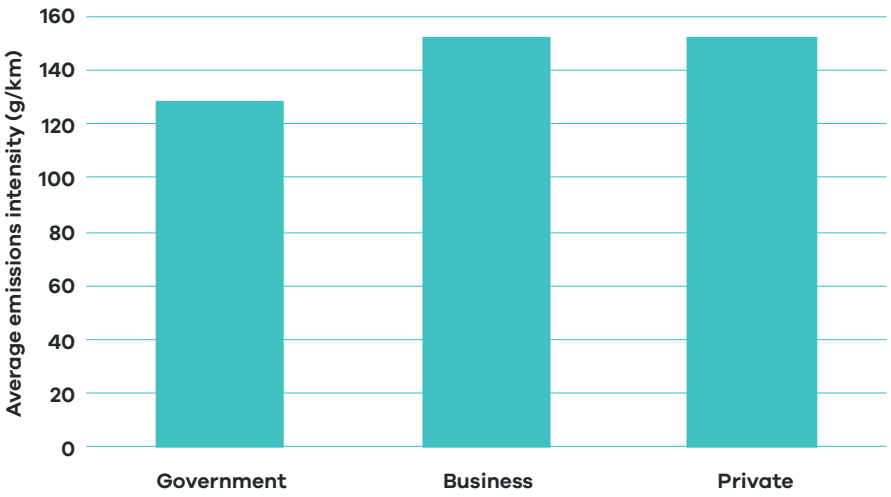
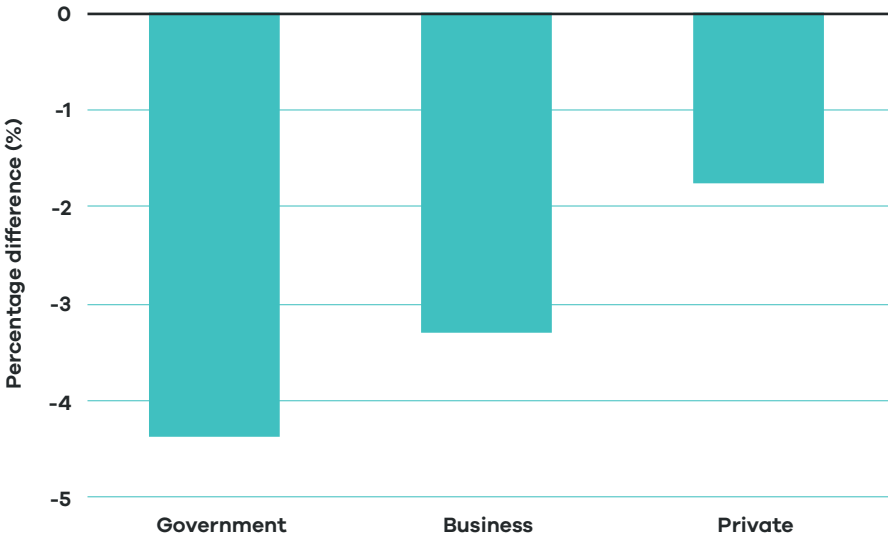


Figure 13: Percentage change in average emissions intensity by buyer type for the MA category between 2020 and 2021 (%)



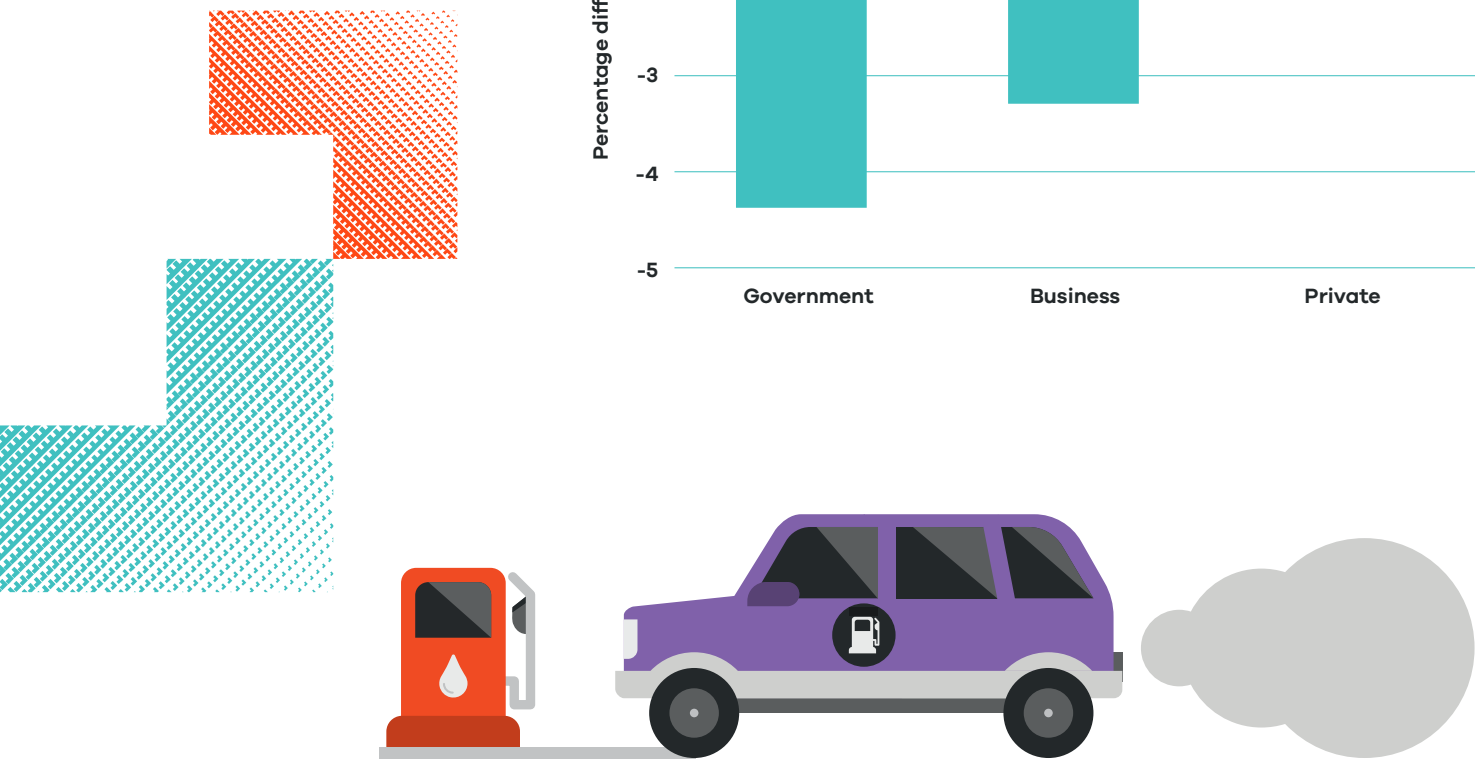


Figure 14 shows the average carbon dioxide emissions intensity by buyer type in 2021 for vehicles sold in the MC+NA category. Overall, the average emissions intensity was relatively similar across the three buyer types, although it was lowest for government buyers and private buyers (both 214 g/km) and highest for business buyers (217 g/km). **Figure 15** shows that all three buyer types in the MC+NA category saw reductions in emissions intensity in 2021 relative to the previous year, with government buyers having the largest reduction (as was the case for the MA category).

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 14: Average emissions intensity by buyer type for the MC+NA category, 2021

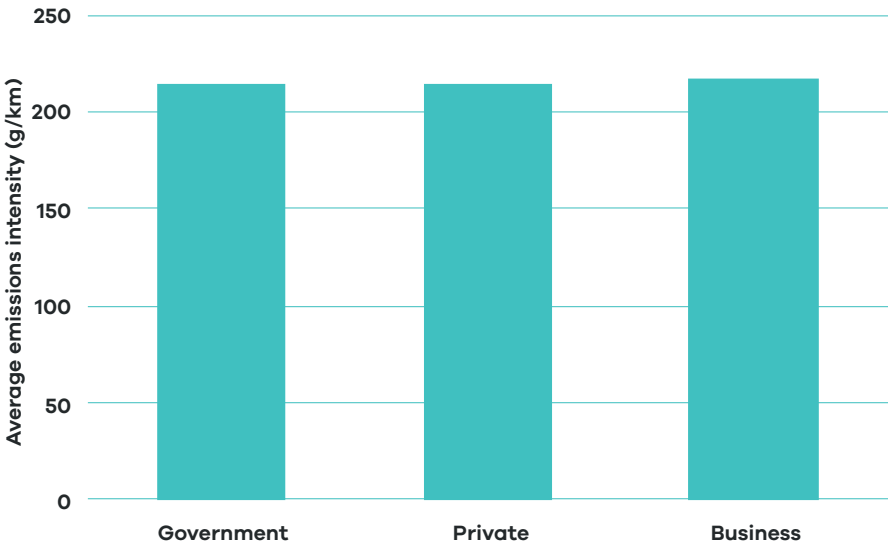
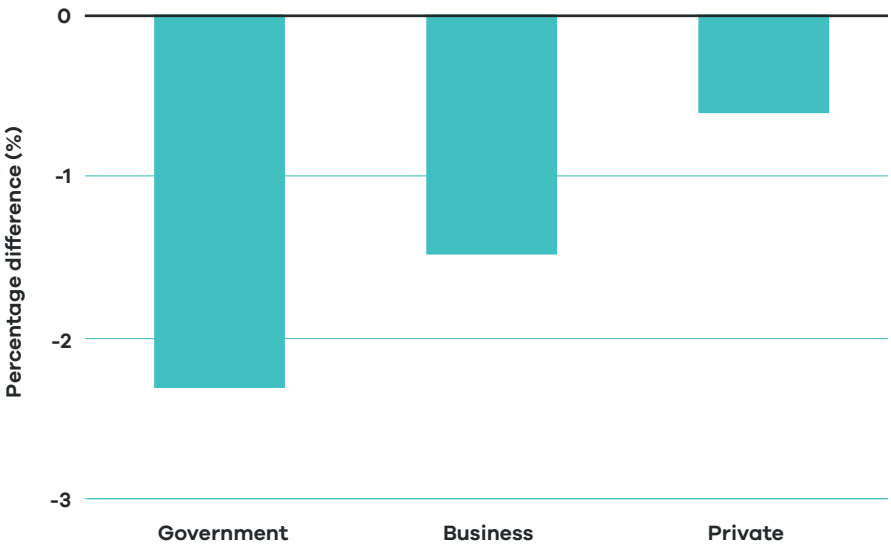


Figure 15: Percentage change in average emissions intensity by buyer type for the MC+NA category between 2020 and 2021 (%)



The average emissions intensity for passenger cars and light SUVs was lowest for government car fleets (129 g/km), followed by business buyers (152 g/km) and private buyers (153 g/km).

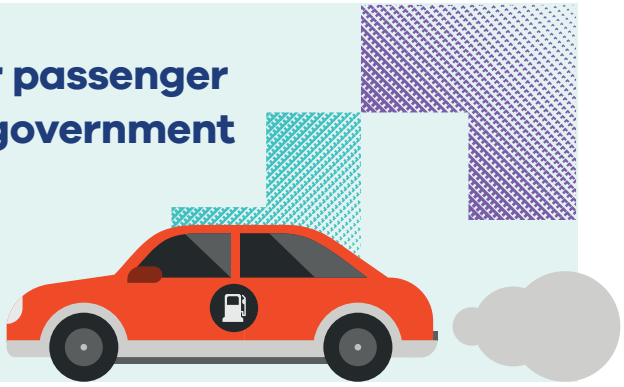


Figure 16 shows the average carbon dioxide emissions intensity for these buyers, for vehicles sold in the MA category, while **Figure 17** displays the annual percentage change in emissions intensity for each of these buyer types. Taxi buyers had the lowest average emissions intensity levels in 2021 and the three levels of government were the next three lowest.

Figure 16: Average emissions intensity by detailed buyer type for the MA category, 2021

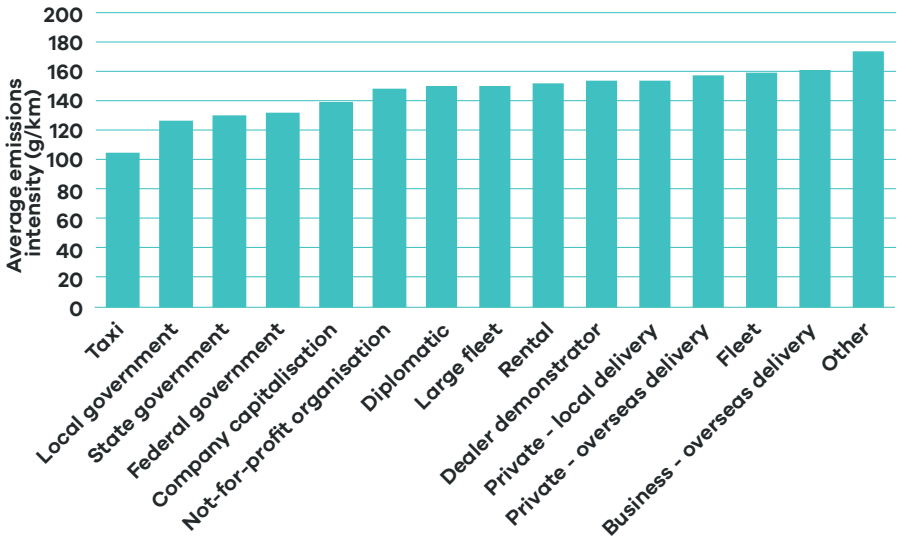
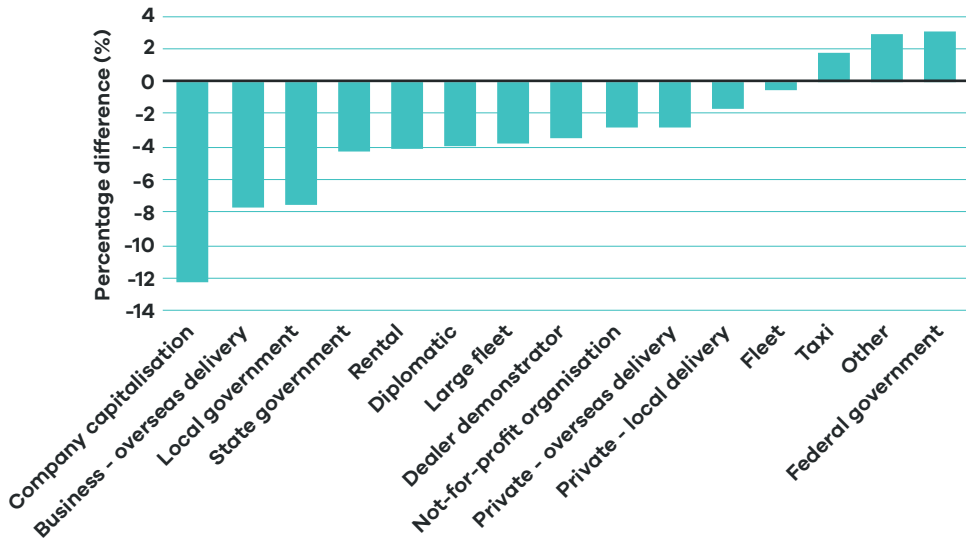
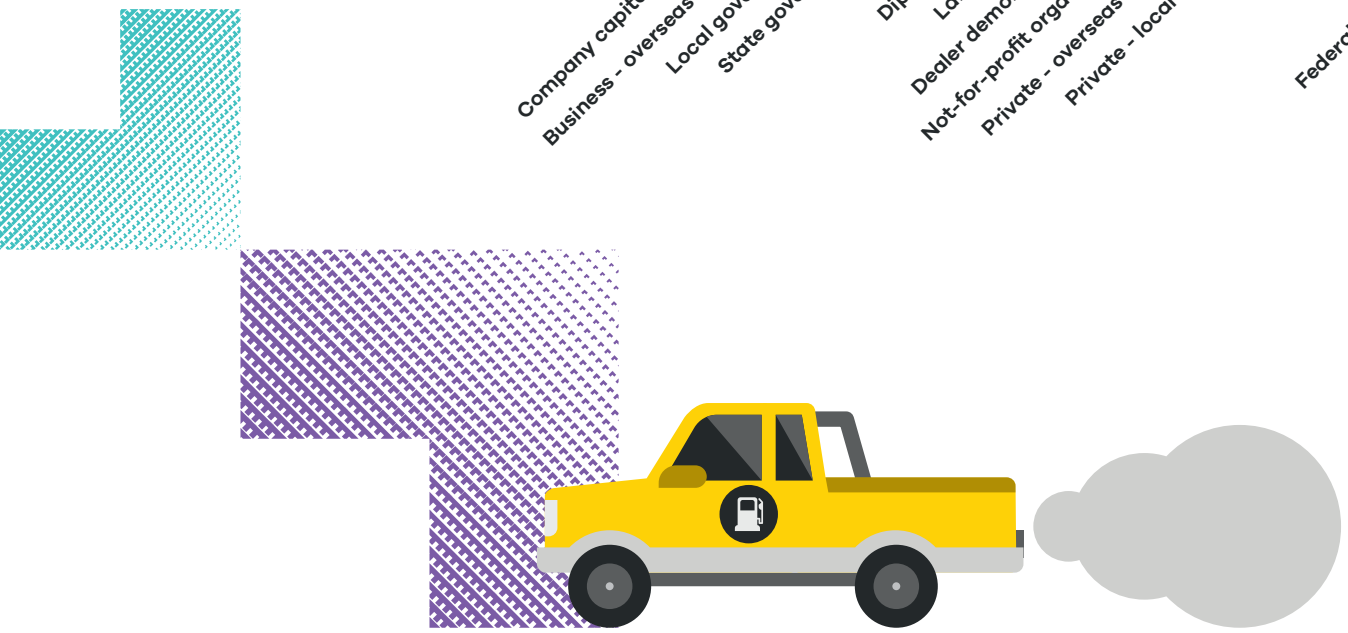


Figure 17: Percentage change in average emissions intensity by detailed buyer type for the MA category between 2020 and 2021 (%)





Figures 18 and **19** show the corresponding information for the MC+NA category. There was a very large decrease in average emissions intensity for taxi buyers – going from the highest average emissions intensity in 2020 to the lowest in 2021 – but there were very few vehicles sold to this buyer type in the MC+NA category in either year. Additional data on the detailed buyer types is provided in **Tables 16** and **17** in the appendix.

Figure 18: Average emissions intensity by detailed buyer type for the MC+NA category, 2021

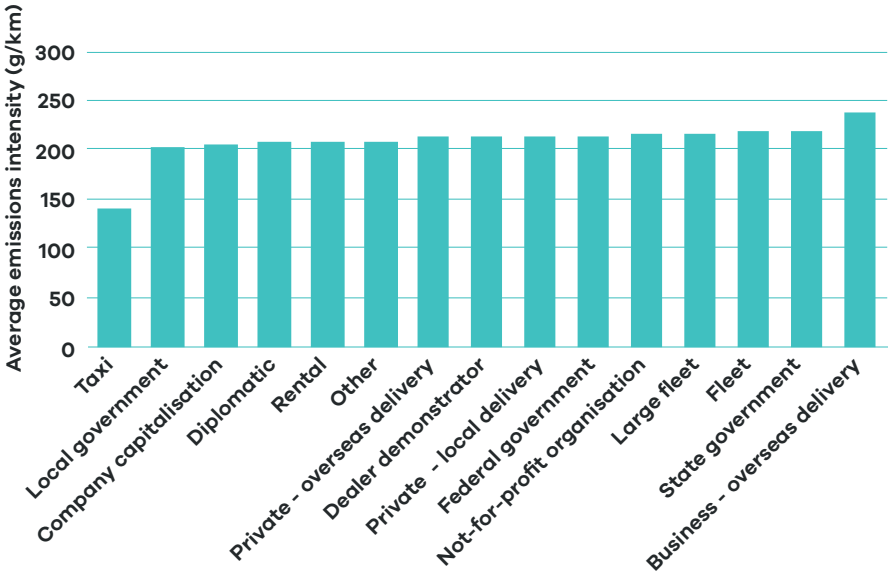
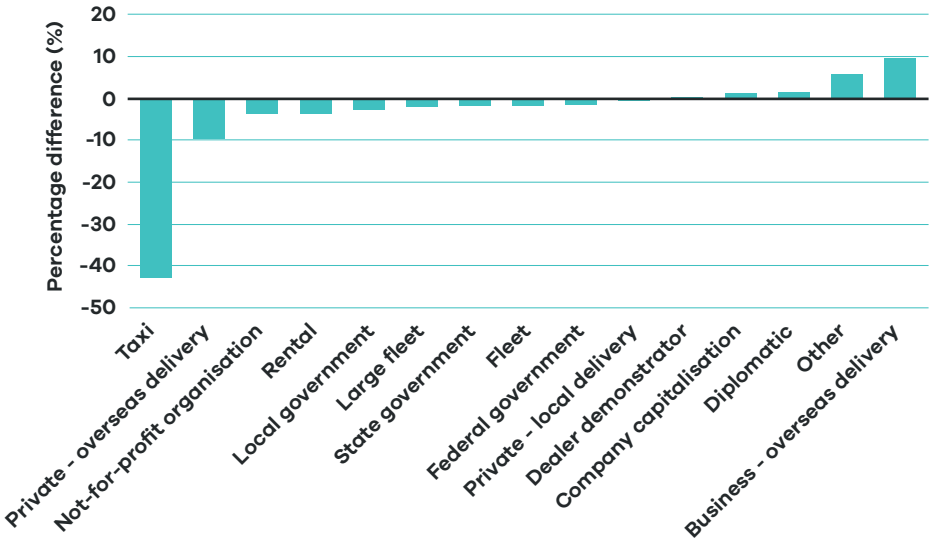


Figure 19: Percentage change in average emissions intensity by detailed buyer type for the MC+NA category between 2020 and 2021 (%)



A further comparison of the emissions intensity for governments' vehicle purchases is possible by breaking down 'State government' into each of the state and territory governments, while reporting 'Federal government' and 'Local government' alongside. **Figure 20** compares the emissions intensity for the MA category and shows that the ACT had the lowest emissions intensity while the Northern Territory Government had the highest.[9]

Figure 20: Average emissions intensity by government for the MA category, 2021

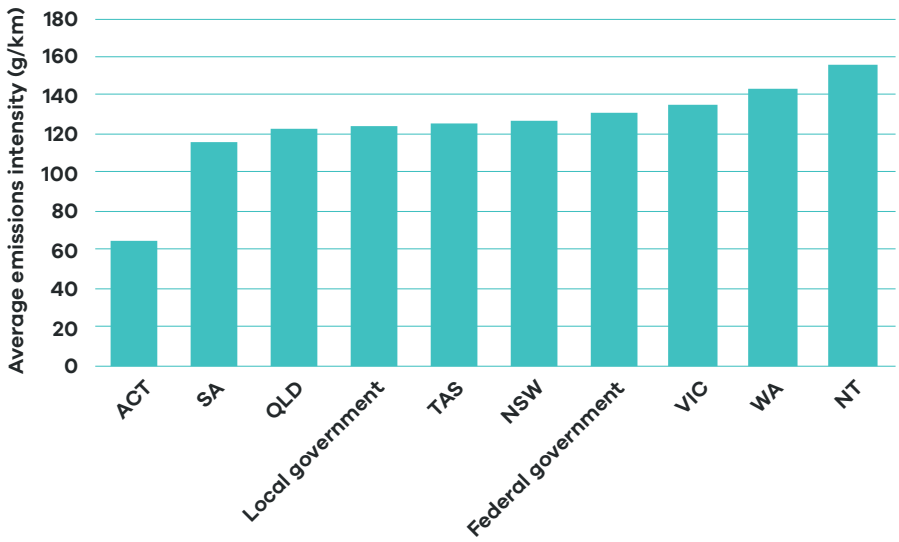
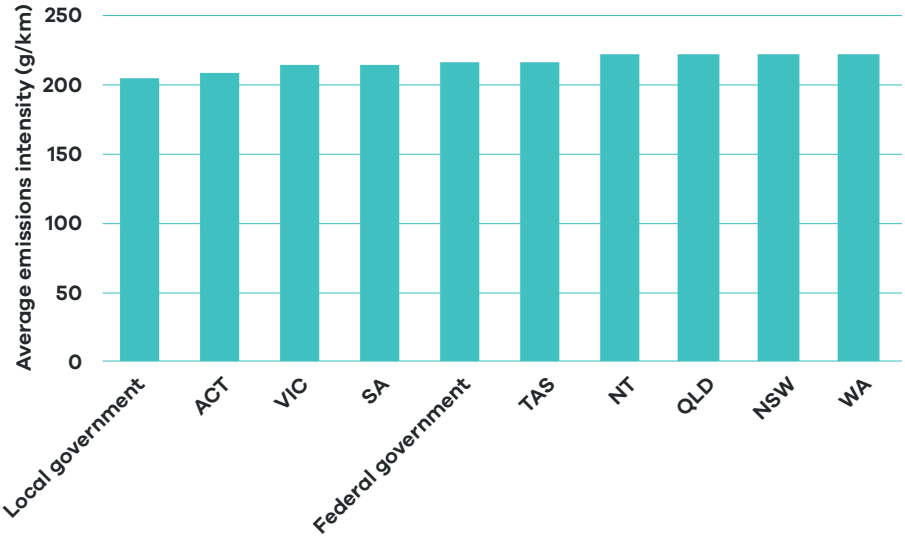


Figure 21 provides the same comparison for the MC+NA category. Local governments had the lowest emissions intensity, with the ACT Government again having the lowest emissions intensity among states and territories, while WA had the highest. Overall, the differences in emissions intensity were much smaller for the MC+NA category than the MA category.

Figure 21: Average emissions intensity by government for the MC+NA category, 2021



9 The ACT Government recorded a bit over half the emissions intensity for the MA category than the government fleet with the next lowest emissions intensity. This is largely attributable to the higher percentage of PHEVs and BEVs within its purchased vehicle fleet (see **Figure 30**), in combination with the resulting super-credit weighting applied to these purchases.

Powertrain and fuel type

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

Figure 22 shows the average carbon dioxide emissions intensity by powertrain and fuel type for 2021 for the MA category. 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 in the MA category had an average emissions intensity of 164 g/km, while diesel vehicles' average emissions intensity was 176 g/km; this was significantly higher than the emissions intensity of HEVs (102 g/km). There were also two models of hydrogen vehicles sold in 2021 (the Hyundai NEXO and Toyota MIRAI), with a total of 38 vehicles sold.

Additional data on fuel types is provided in **Tables 18** and **19** in the appendix.

Figure 22: Average emissions intensity by powertrain and fuel type for the MA category, 2021

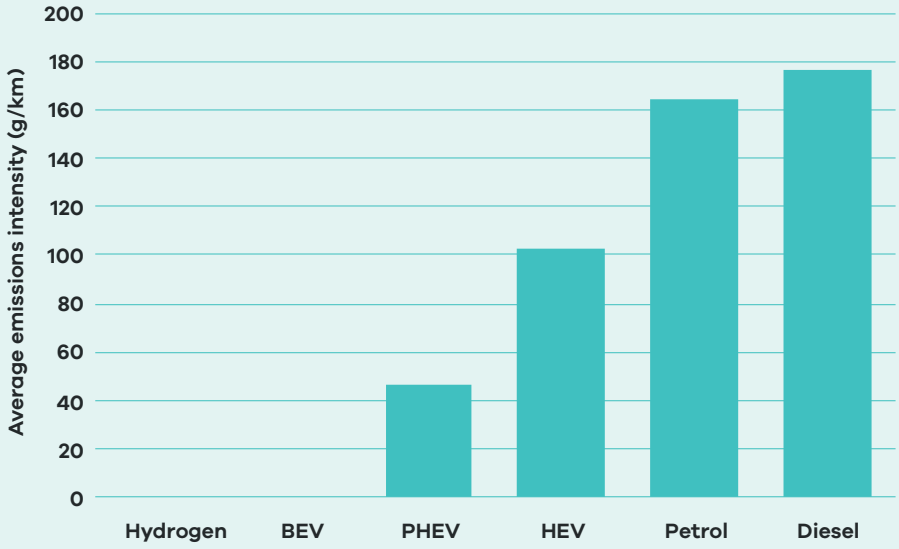
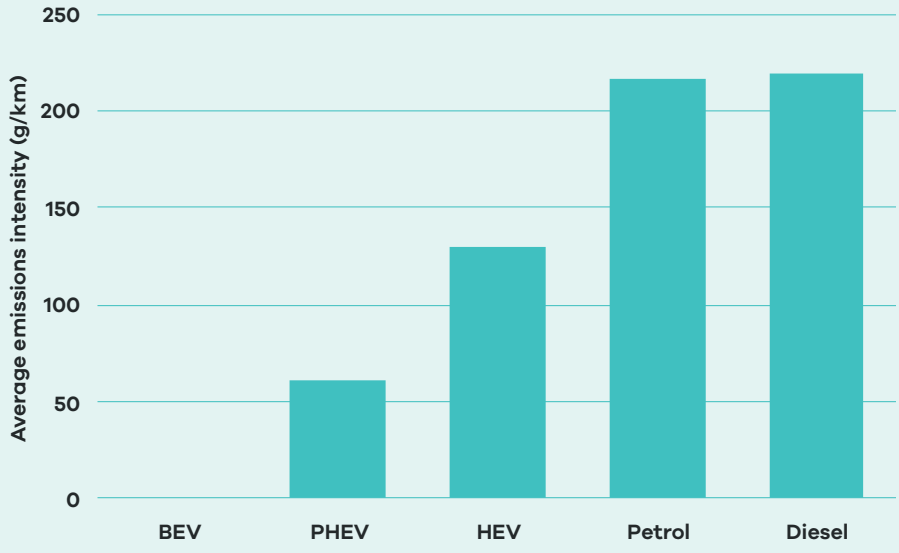


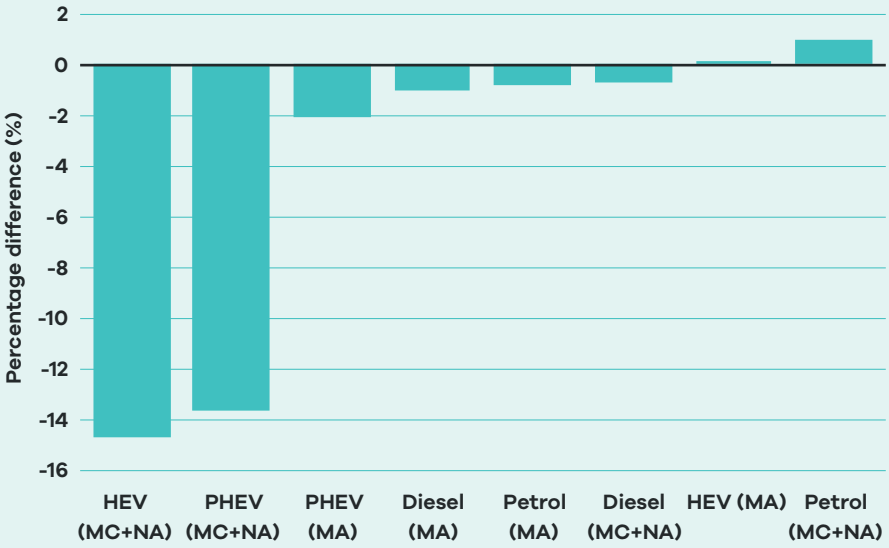
Figure 23 shows the average carbon dioxide emissions intensity by powertrain and fuel type for the MC+NA category. Petrol-only vehicles also had lower emissions intensity than diesel-only vehicles for the MC+NA category: 216 g/km compared with 218 g/km. This was again significantly higher than the emissions intensity of MC+NA category HEVs (129 g/km).

Figure 23: Average emissions intensity by powertrain and fuel type for the MC+NA category, 2021



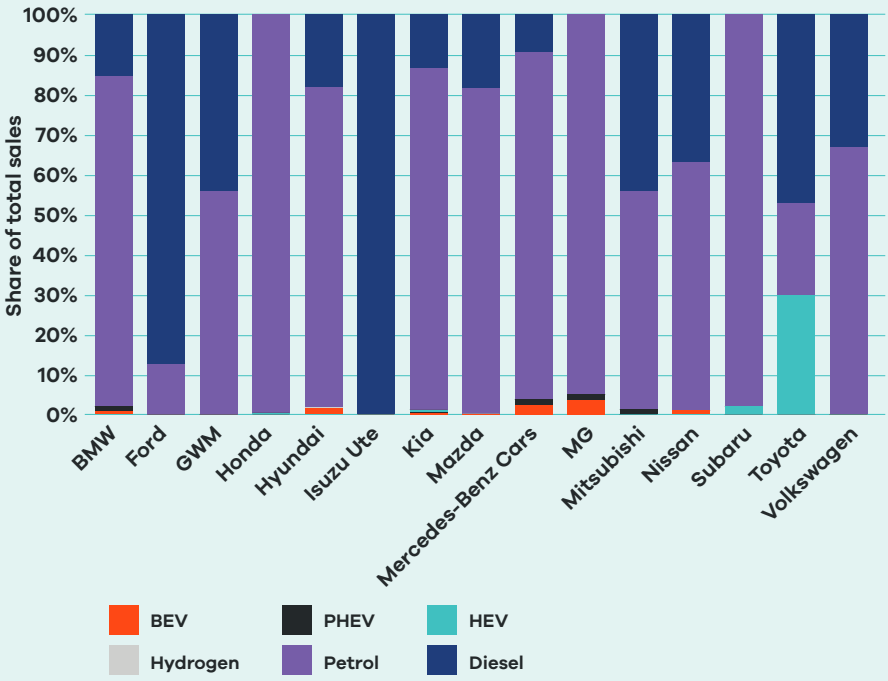
There were reductions in the emissions intensity for most powertrains and fuel types in 2021 compared with the previous year, as shown in **Figure 24**.[10] The largest reductions were for HEVs and PHEVs in the MC+NA category, albeit these two groups had relatively low sales figures. The emissions intensity of petrol MC+NA vehicles increased by 1 per cent.

Figure 24: Percentage change in average emissions intensity by powertrain and fuel type between 2020 and 2021 (%)



Among the top 15 selling manufacturers, there is some variation in the adoption of different technologies. **Figure 25** shows the differing mixes of petrol and diesel vehicles sold among the top 15 selling manufacturers. Relative to their total sales, MG and Mercedes-Benz Cars had the highest proportion of electric vehicle sales, while Toyota had the highest proportion of hybrid vehicle sales.

Figure 25: Share of total sales by powertrain and fuel type for top 15 selling manufacturers, 2021



10 BEVs and hydrogen vehicles are not shown in the graph since they are zero emission vehicles.

Electric and hybrid vehicles

This year's report 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).[11]

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, but which have a secondary engine/fuel type (that is, petrol or diesel) and have a non-zero emissions figure in the FCAI data. Battery electric vehicles have no secondary engine/fuel type, and therefore no (tailpipe) emissions listed in the FCAI data. Sales of PHEVs were nearly twice as high in 2021 compared with the previous year, while BEV sales almost tripled.

Table 4: Emissions intensity and annual sales by electric vehicle type, 2020 and 2021

Electric vehicle type	Average emissions intensity (g/km)	Average emissions intensity (g/km)	Change from 2020 to 2021 (%)	Sales	
	2020	2021		2020	2021
Plug-in Hybrid Electric Vehicles (PHEV)	51[a]	48[a]	-5.9	1,692	3,372
Battery Electric Vehicles (BEV)	0	0	N/A	1,778	5,149
Total	**N/A**	**N/A**	**N/A**	**3,470**	**8,521**

a This figure is the combined figure for MA and MC+NA

The FCAI data does not include Tesla vehicles. **Table 5** includes the FCAI data on electric vehicle sales and the NTC's estimates of the number of Tesla vehicles sold to determine total electric vehicle sales in Australia using state- and territory-based registration systems for the number of Tesla vehicles for 2020 and 2021. Note that the Tesla 'sales' figure of 3,918 for 2020 is higher than reported in last year's report (3,430). This reflects both a slightly longer reporting period (December 2019 to January 2021), and a modification to the original registration data query used in last year's report, in order to ensure that Teslas from all manufacturing sites around the world are captured within the registration data snapshot used to produce these figures. The total number of electric vehicles sold in 2021 was 20,579 compared to 7,388 vehicles sold in 2020. This is a 179 per cent increase.

Table 5: Electric vehicle sales, 2020 and 2021

Make	2020	2021	% change between 2020 and 2021
Tesla	3,918[a]	12,058[b]	208%
All other makes[c]	3,470	8,521	146%
Total	**7,388**	**20,579**	**179%**

a New registrations from state- and territory-based registration systems for December 2019 to January 2021.

b New registrations from state- and territory-based registration systems for January 2021 to January 2022

c FCAI data

The total number of registered Tesla electric vehicles in the Australian fleet in January 2022 was 22,134.

11 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.

There were 49 models of electric vehicles sold in 2021 compared with 37 models in 2020 (excluding Tesla models). **Figure 26** shows the sales of the more popular electric vehicle models in 2020 and 2021. The first five models in the graph were the top selling BEVs in 2021, the next five are the top selling PHEVs, followed by Teslas and then the combined total of all other electric vehicles in the FCAI's data. Additional data on sales by model, state and buyer type for 2020 and 2021 for the FCAI data are provided in **Tables 20**, **21** and **22** in the appendix.

Figure 26: Sales of selected electric vehicles, 2020 and 2021

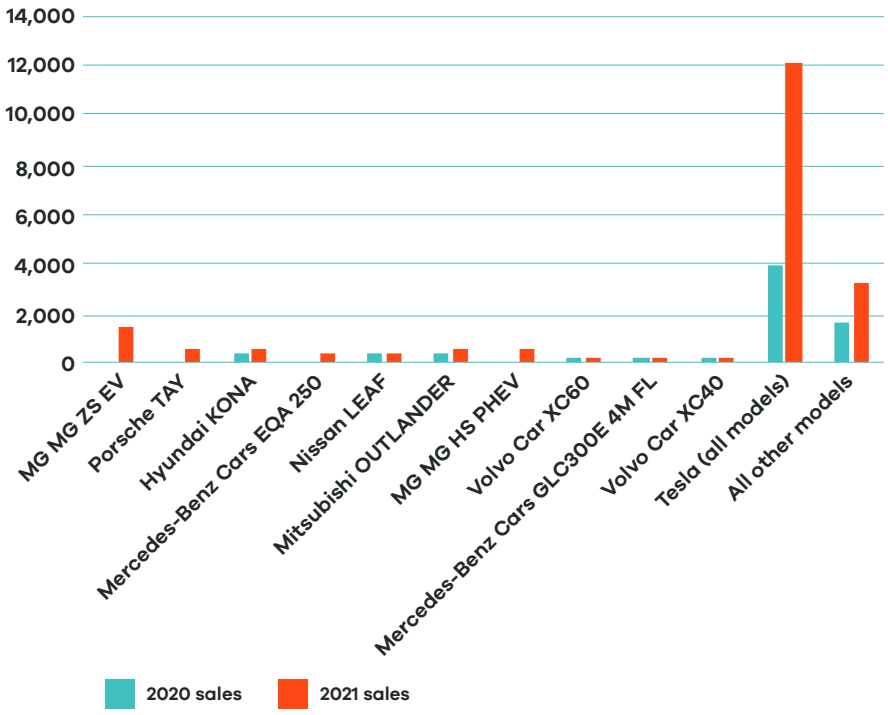


Table 6 summarises various types of electric vehicle data by state and territory. The first row of data summarises electric vehicle sales in 2021 from the FCAI data. The second row of data shows all electric vehicle sales between 2010 and 2021 in each state and territory, and again relies on the FCAI data. The final row of data shows the number of Tesla vehicles registered in each state and territory as at 21 January 2022. Although the second and third rows of data to some extent show the total (cumulative) vehicle fleet for non-Tesla and Tesla electric vehicles, respectively, they are not directly comparable.[12]

The NTC estimates there were around 42,500 electric vehicles in the Australian vehicle fleet at the end of 2021. The total number of passenger vehicles and light commercial vehicles in Australia as at 31 January 2021 was 18.4 million (ABS, 2021), meaning that electric vehicles represent around 0.23 per cent of the nation's 18.4 million cars and light commercial vehicles (see details in **Table 23** in the appendix, which also includes the estimated share of electric vehicles in the total fleet in each state and territory). **Table 24** in the appendix contains more detailed information on BEV sales by state and model.

Table 6: Electric vehicle sales and Tesla registrations by state and territory

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Australia
Electric vehicle sales in 2021 (excluding Tesla)	349	2,597	24	1,605	570	239	2,483	654	8,521
Total electric vehicle sales from 2010 to 2021 (excluding Tesla)	917	5,966	50	3,464	2,382	460	5,725	1,596	20,560
Tesla registrations as at 21 January 2022*	819	7,236	37	4,992	768	229	5,935	2,118	22,134

* Registrations from state- and territory-based registration systems as at 21 January 2022

12 For example, it is possible that an electric vehicle could be sold in one state or territory and subsequently transferred to a different one. Additionally, a vehicle may be sold but subsequently written off as a result of a crash.

Table 7 reports on the sales and emissions intensity for hybrid electric vehicles (HEVs). Sales of these vehicles were around 20 per cent higher in 2021 than the previous year, while their average emissions intensity increased by around 2 per cent.

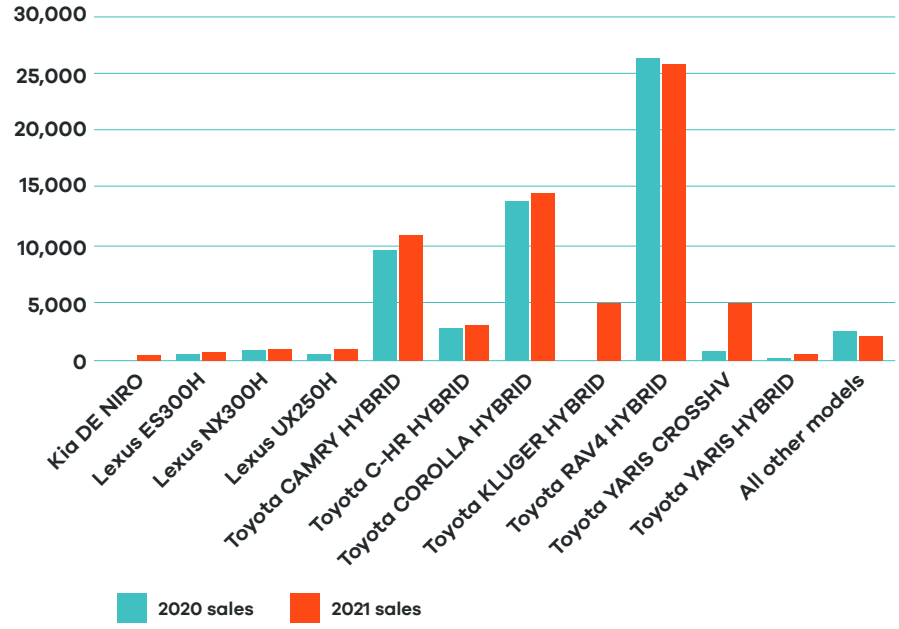
Table 7: Emissions intensity and annual sales for hybrid vehicles, 2020 and 2021

Hybrid vehicle type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Percentage difference (%)	Sales 2020	Sales 2021
Hybrid Electric Vehicle (HEV)	103[a]	105[a]	1.8	58,595	70,506

a This figure is the combined figure for MA and MC+NA

There were 27 models of hybrid vehicles sold in 2021 compared with 26 models in 2020. **Figure 27** shows the sales of the most popular hybrid vehicle models in 2020 and 2021. Toyota sold around 93 per cent of all hybrids in 2021. Additional data on hybrid vehicle sales by model for 2020 and 2021 is provided in **Table 25** in the appendix.

Figure 27: Sales of selected hybrid vehicles, 2020 and 2021



Electric and hybrid vehicles have been purchased to varying degrees by different buyer types. **Figure 28** shows the percentage of total sales made up of BEVs, PHEVs, HEVs and hydrogen vehicles for various buyer types. Overall, governments had the highest or second highest shares of electric and hydrogen vehicles in the graph, as a proportion of total sales. However, in terms of the absolute number of sales, private buyers were by far the biggest purchasers of electric and hybrid vehicles.

Figure 28: Percentage of total sales that were electric, hybrid or hydrogen vehicles by buyer type, 2021

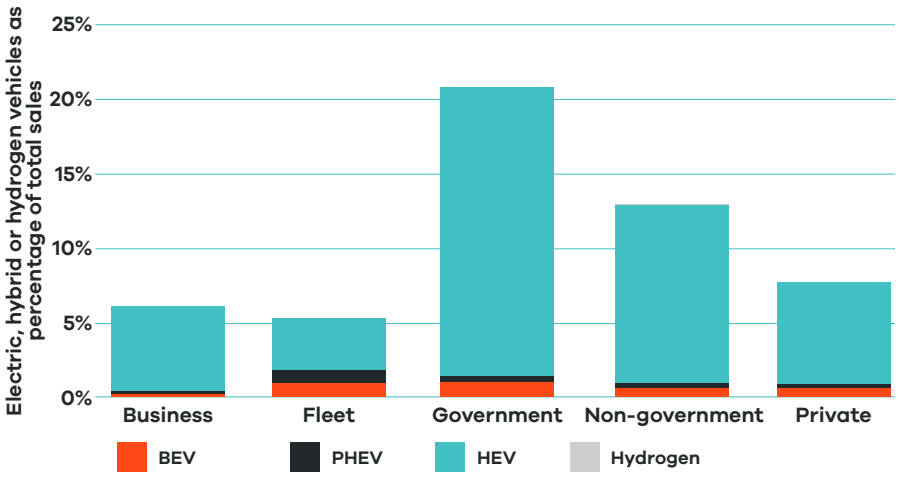


Figure 29 shows similar information by detailed buyer type. Over 90 per cent of taxi purchases in 2021 were hybrid vehicles, albeit this represented around 900 vehicles.

Figure 29: Percentage of total sales that were electric, hybrid or hydrogen vehicles by detailed buyer type, 2021

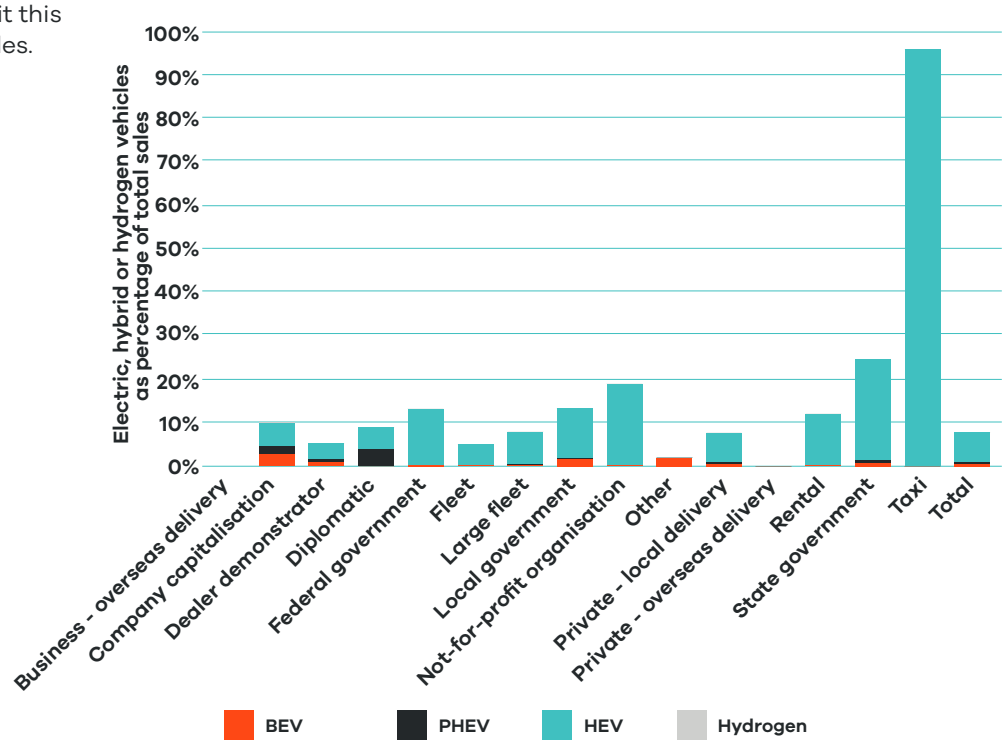
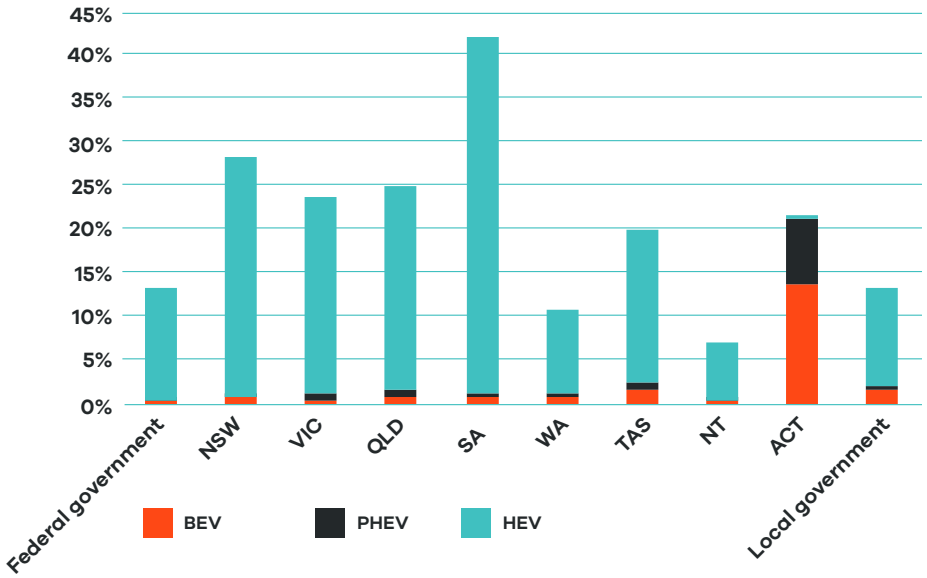


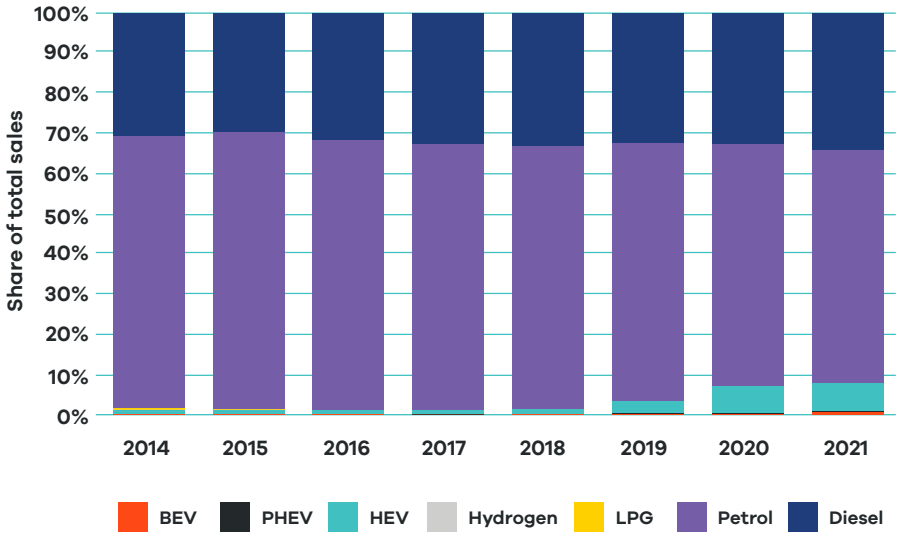
Figure 30 compares the percentages of electric and hybrid vehicles for each state and territory government, as well as the federal government and all local governments. The ACT Government had by far the highest shares of BEVs and PHEVs as a proportion of total sales, with around 21 per cent of its vehicle purchases being electric; however, the total number of vehicles it purchased in 2021 was relatively small at 166 vehicles. Almost all governments purchased at least 10 per cent of their fleet as either electric or hybrid vehicles in 2021, but for most governments most of these were hybrid vehicles. **Table 26** in the appendix provides further detail on the powertrain and fuel type of vehicle purchases by governments.

Figure 30: Percentage of total sales that were electric or hybrid vehicles by government, 2021



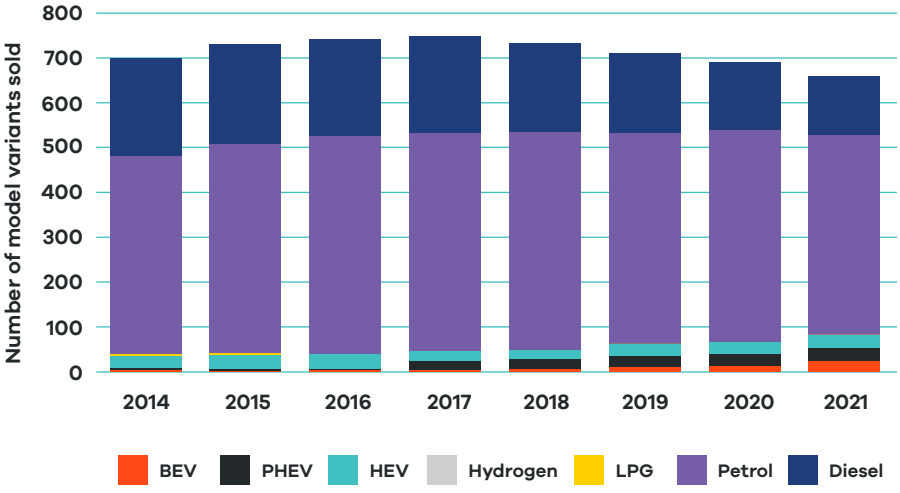
Although sales of BEVs and PHEVs, and to a lesser extent HEVs, remain relatively low overall, they have increased significantly in recent years, as demonstrated in **Figure 31**, which shows the share of total sales by powertrain and fuel type from 2014 to 2021.[13]

Figure 31: Share of total sales by powertrain and fuel type, 2014–2021



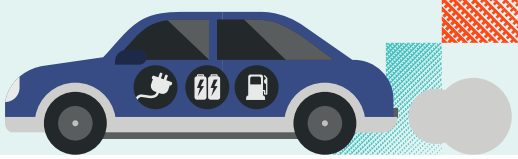
This result in part reflects the increased availability of BEVs, PHEVs and HEVs model variants in the Australian market over time. **Figure 32** shows that the number of PHEV model variants sold in the Australian market increased significantly in 2017, when it reached 18, and has increased further since then to 30 variants in 2021. BEV model variants sold have also increased from just 2 in 2015 to 23 in 2021. The overall number of model variants sold in Australia peaked in 2017, with the subsequent decline primarily due to diesel variants.

Figure 32: Number of model variants sold in Australia by powertrain and fuel type, 2014–2021



Sales of hybrid vehicles increased by 20% in 2021 compared with 2020, with

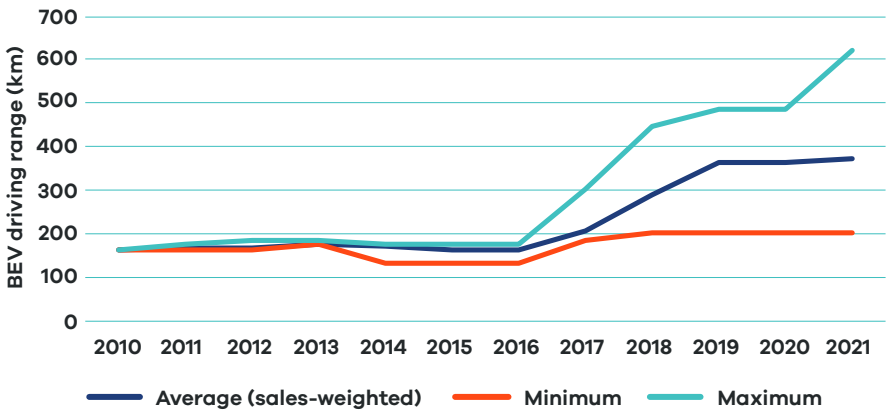
70,506 **hybrid vehicles sold in 2021.**



13 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.

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 33** shows that since 2016 there has been a significant increase in the average driving range of BEVs sold in Australia. The maximum range across all models sold has increased even more quickly, from below 200 km in 2016 to above 600 km in 2021. Note that the analysis in **Figure 33** does not include Tesla vehicles as we do not have data on sales by Tesla model or variant.

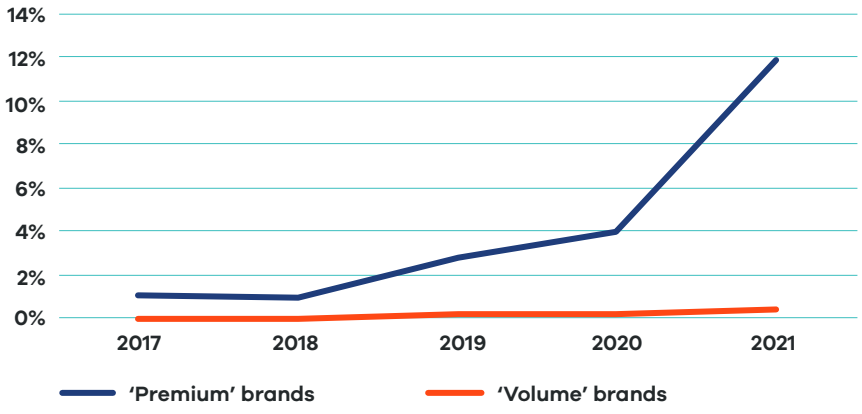
Figure 33: Driving range for BEV models sold in Australia, 2010–2021



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

The share of BEV sales as a proportion of total sales varies between manufacturers. 'Premium' brands 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 brands can charge (ABC, 2021). In research by S&P Global published by the FCAI, 'premium' brands are forecast to have 77 per cent of their sales as BEVs by 2033 compared with 21 per cent for volume brands (FCAI, 2022b). Using the same categorisation of 'premium' and 'volume' brands, based on a list provided by the FCAI to the NTC, **Figure 34** shows that this trend has already begun, with 'premium' brands having 11.9 per cent of their total sales as BEVs in 2021 compared with 0.3 per cent for 'volume' brands (which sold around 88 per cent of all vehicles in 2021). For the purposes of this analysis, all vehicles sold by 'volume' brands were classified as 'volume' sales (even though some vehicle models or model variants sold by these brands may be considered 'premium' vehicles); and similarly, all sales by 'premium' brands are classified as 'premium'.

Figure 34: Share of BEV sales for 'premium' and 'volume' brands, 2017–2021



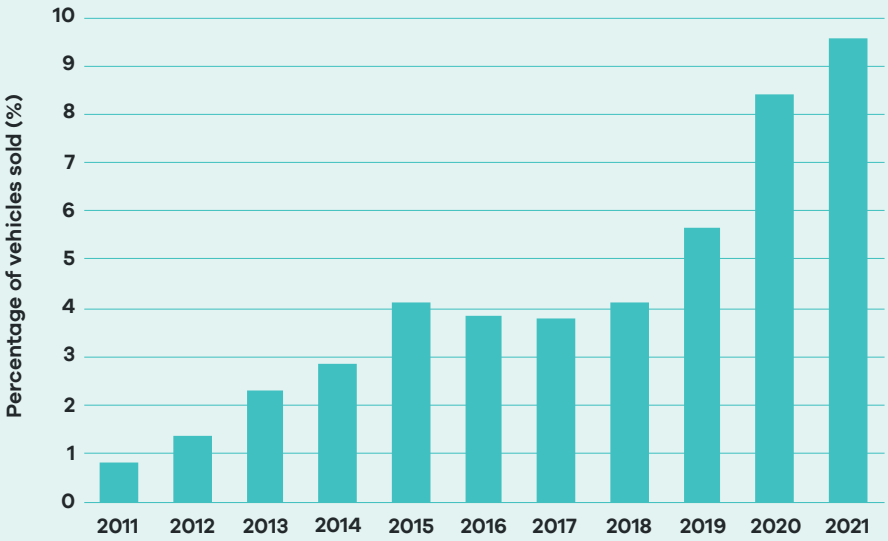
Source: NTC analysis based on classification of 'premium' and 'volume' brands provided by the FCAI, VFACTS sales data, and Tesla data from state- and territory-based registration systems (with Tesla 'sales', calculated based on the annual difference in the number of registered vehicles, included among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

Green vehicles

Two alternative measures of 'green' vehicles are reported on. The first continues the approach of previous reports, where a 'green' vehicle has been defined as a vehicle whose carbon dioxide emissions intensity does not exceed 120 g/km. In Australia, the proportion of green cars sold in 2021 was 9.6 per cent of total sales (compared with 8.4 per cent in 2020). **Figure 35** shows 'green' vehicle sales as a proportion of total new light vehicle sales between 2011 and 2021.

Table 27 in the appendix provides more detail on 'green' vehicles sold in Australia in 2021, based on this measure of 'green' vehicles.

Figure 35: 'Green' vehicle sales as a percentage of total new light vehicles sold, 2011–2021



Electric vehicles make up an estimated

0.23% **of the nation's 18.4 million cars and light commercial vehicles.**

An alternative measure of 'green' vehicles is to compare each vehicle model's emissions intensity to its limit curve and record the share of vehicles receiving the different super-credit weightings under the FCAI's voluntary emissions standard methodology, as shown in **Figures 36** and **37**, for MA and MC+NA, respectively. Around 8 per cent of all vehicles in the MA category received a super-credit weighting above 1 in 2021 – which is down by around 2 percentage points compared with the previous year – with a large majority of these receiving the 1.5 super-credit weighting (where emissions are between one-third and two-thirds of the limit curve). Super-credit weightings of 2 and 3 were attained by 0.5 per cent and 0.8 per cent of sales, respectively, in the MA category. For the MC+NA category, 98.6 per cent of vehicle sales did not have a super-credit weighting of above 1 in 2021 (that is, the emissions intensity was above two-thirds of the limit curve), whereas in 2020 this figure was 99.9 per cent.

Figure 36: Alternative measure of 'green' vehicles using the FCAI super-credits for the MA category, 2020 and 2021

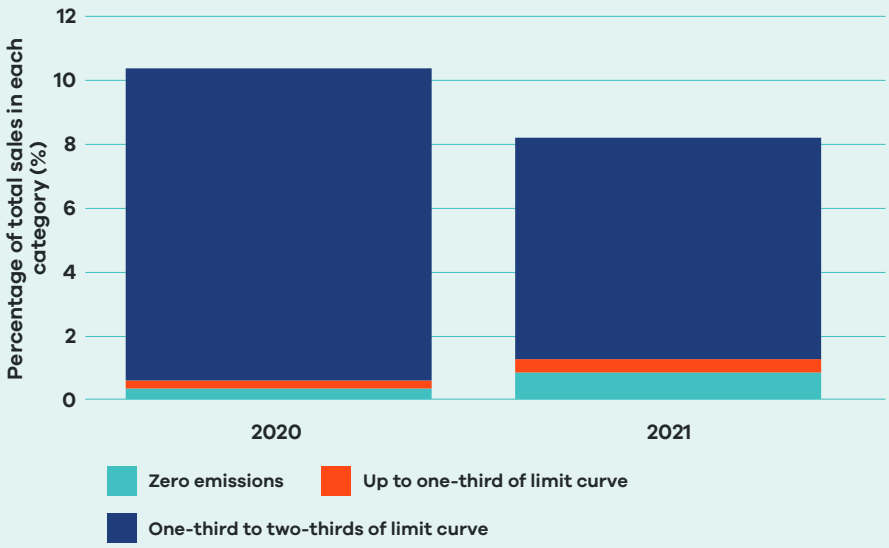
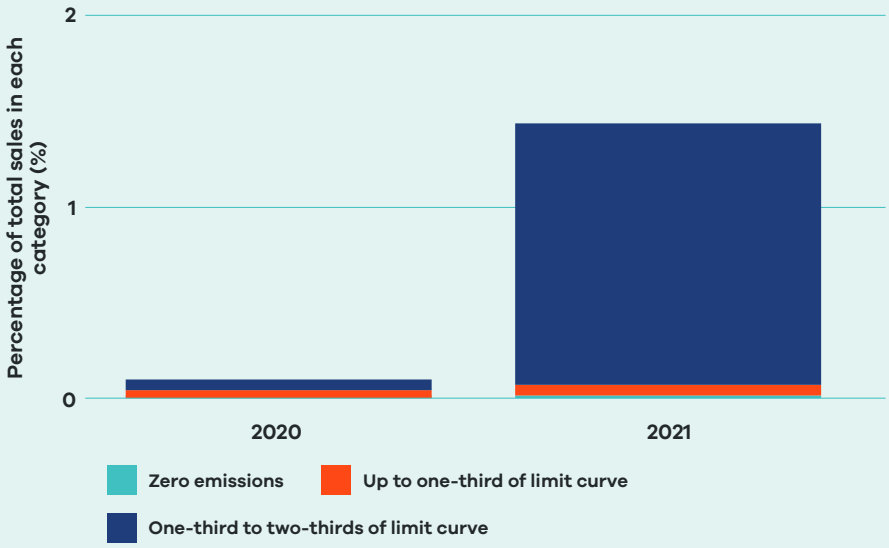
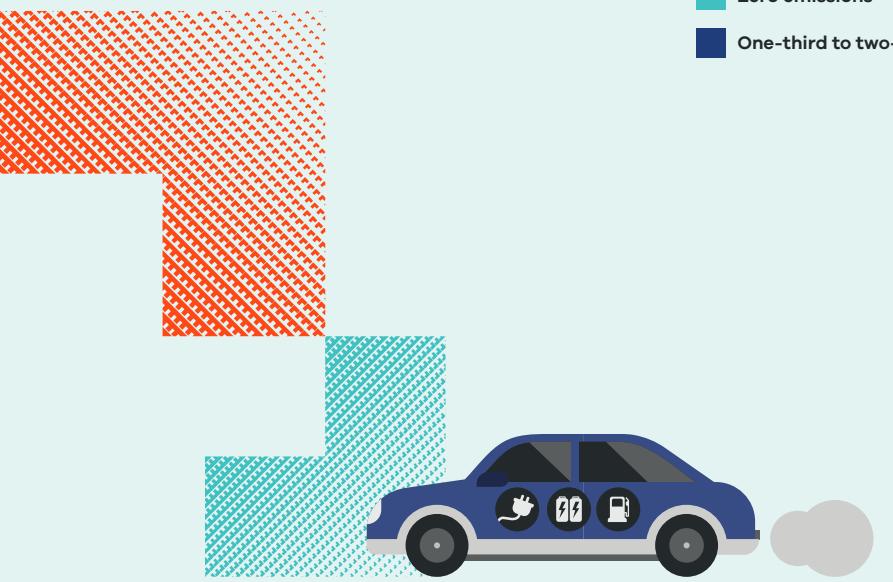


Figure 37: Alternative measure of 'green' vehicles using the FCAI super-credits for the MC+NA category, 2020 and 2021





Contribution of each segment to the average emissions intensity in each category

This section shows the percentage contribution of each segment to the average vehicle emissions intensity figure in both the MA and MC+NA categories. 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 **Tables 10** and **11** in the appendix), divided by total vehicle sales.[14] The sum of the 'contributions' from each segment is the overall average emissions intensity in each category. 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.

Figure 38 displays the percentage 'contributions' for the MA category and shows that the five segments of SUVs contributed slightly less than two-thirds of the overall emissions intensity for the MA category.

SUV Medium was the segment with the largest contribution (28 per cent), with SUV Small second largest with 22 per cent, ahead of the Small segment which contributed 16 per cent.

Figure 38: Percentage contribution to overall emissions intensity by segment for the MA category, 2021

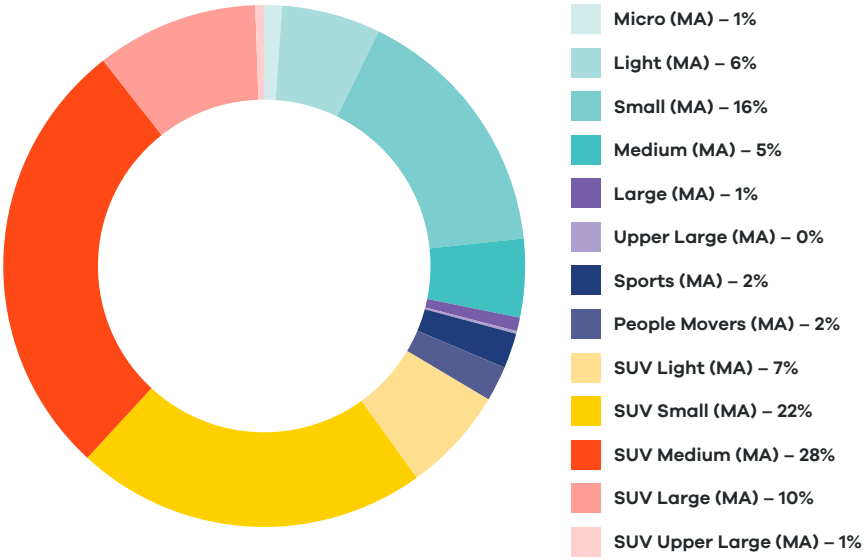
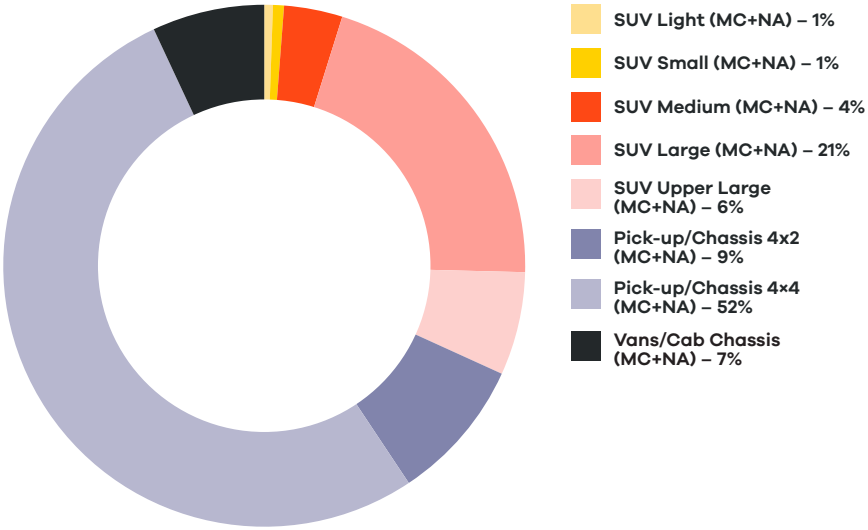


Figure 39 displays the percentage 'contributions' for the MC+NA category. More than half of the contribution for this category came from the Pick-up/Chassis 4×4 segment (52 per cent), while SUV Large was the second highest with 21 per cent. These two segments had the two highest emissions intensities in the MC+NA category, and the Pick-up/Chassis 4×4 segment comprised around half of total sales in the MC+NA category.

Figure 39: Percentage contribution to overall emissions intensity by segment for the MC+NA category, 2021

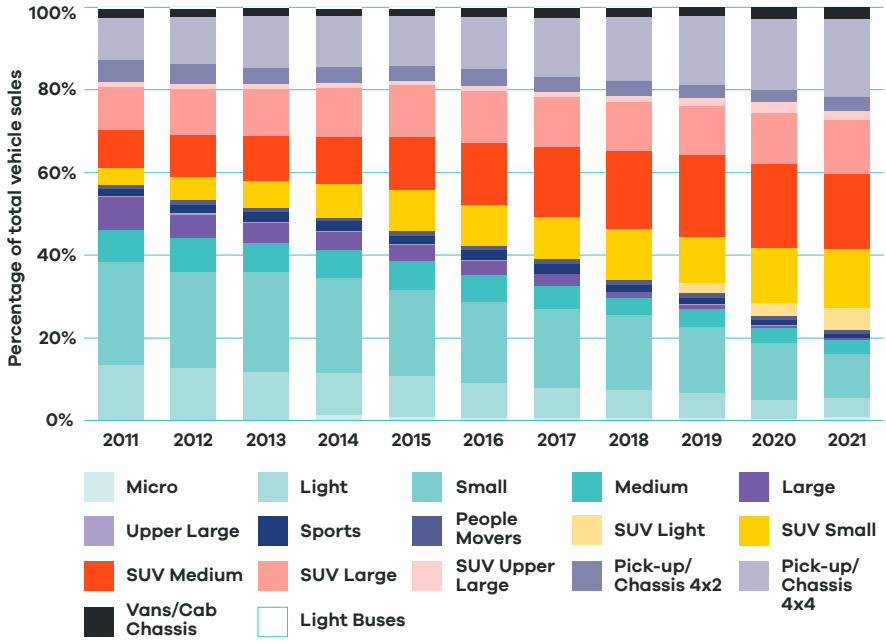


14 Both sales figures in these calculations include the use of super-credits.

There has been a significant transition in sales for different segments of Australia's vehicle fleet since 2011, as shown in **Figure 40**. 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 25 per cent of total sales in 2011, they had increased to over half (53 per cent) of total sales in 2021. 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 one quarter of all sales in 2011 but had decreased to 11 per cent by 2021; the Light segment's share of total sales decreased from 14 per cent in 2011 to 5 per cent in 2021.

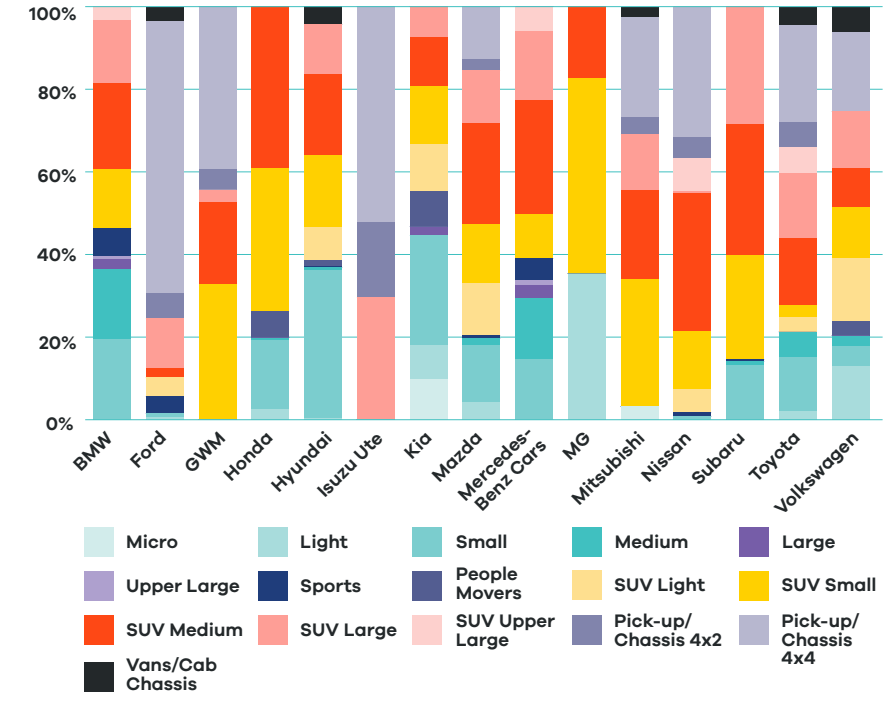
Between 2011 and 2021, the average emissions intensity decreased in all segments except 'Sports', and in most segments there was a decrease by at least 10 per cent. However, the shift in the mix of the fleet may help explain why the national average emissions intensity figure has declined relatively slowly in recent years (as shown in **Figure 3**), despite the relative emissions intensity improving in most segments.

Figure 40: Vehicle sales by segment, 2011–2021



Of the top 15 selling manufacturers in 2021, 14 sold more than half of their vehicles in the SUV or Pick-up/ Chassis segments (the exception was Kia), as shown in **Figure 41**. Five of these manufacturers sold over 90 per cent of their vehicles in these segments.

Figure 41: Share of total sales by segment for top 15 selling manufacturers, 2021



4. Emissions in Australia and other countries

This section compares data from Australia and other countries.

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), and will continue to do so until the United Nations Working Party on Pollution and Energy agrees to adopt the WLTP method.

Beginning in 2019, European vehicle emissions reporting must be done using the WLTP method, but NEDC results were still reported alongside WLTP results during the initial years after implementation. However, the European Environment Agency notes that 'from 2021 onwards, the WLTP will replace fully the NEDC for the purpose of the CO_2 emission standards' (EEA, 2022b), and the published European dataset for 2021 has many records with missing NEDC values. For these reasons, the European data reported in this chapter is based on WLTP emissions results.

The WLTP methodology has been noted to be 'closer to reality and more demanding than the NEDC' (Mercedes-Benz, 2022), 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 two 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 2021 European data used in the graphs is provisional rather than final data.[15]

The published data from Europe separates passenger cars from light commercial vehicles.[16] The Australian information presented in section 3 is combined data covering passenger and light commercial vehicles. To enable comparisons between Australian and European data, we separated the Australian data into passenger vehicle and light commercial vehicle groups as defined in section 1. The Australian groupings are consistent with the European Commission Regulation (No 443/2009, Annex II).

Less than half

of Australian new passenger car sales had an emissions intensity of 160 g/km or less, whereas almost

90% **of new European passenger car registrations were below 160 g/km.**

15 In reporting for previous years, the NTC has generally used the latest available final dataset published by the EEA (which was typically available by the end of June). However, at the time of publication of this report the EEA has not yet published the final European data for 2020.

16 In Europe, the passenger cars category includes SUVs.

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. The European measures are shown in **Table 8**. A summary of the European measures was published by the European Conference of Ministers of Transport (2007). Governments in a number of European countries have provided incentives or levied taxes to try to reduce carbon dioxide emissions from road transport; see ETCAPCCM (2018) for a summary.[17]

Consumer preferences also contribute to the difference in emissions performance between Australia and Europe. For example, European consumers purchase more small vehicles compared with Australian consumers and prefer manual transmission to automatic transmissions.[18]

Table 8: 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
Low diesel taxes compared with petrol taxes	Encourages consumers to purchase diesel vehicles to reduce 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, 2022a). The final part of this section provides an alternative international comparison using data from the International Energy Agency (IEA).

17 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).

18 Data from the International Council on Clean Transportation Europe shows that 50 per cent of new passenger car sales/registrations in the 27 European Union countries in 2020 had automatic transmissions (ICCT, 2021). By contrast, FCAI data shows that around 98 per cent of vehicle sales in the MA and MC categories in Australia in 2021 were either automatic or continuously variable transmission.

Passenger vehicles: average emissions intensity by country for 2021

The breakdown for average carbon dioxide emissions intensity for new passenger vehicles by country for 2021 is shown in **Figure 42**. 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 2021 is provisional data. Another difference is that the Australian data reflects new vehicle sales, while the European data reflects new vehicle registrations.

In 2021, emissions intensity for passenger cars in European countries ranged from 28 g/km in Norway to 146 g/km in Cyprus. The overall average emissions intensity for the 29 European countries was 115 g/km. Australia's emissions intensity was significantly higher at 160 g/km (based on the combined results for the MA and MC categories).

Figure 42: Average emissions intensity of passenger vehicles in Australia and Europe, 2021

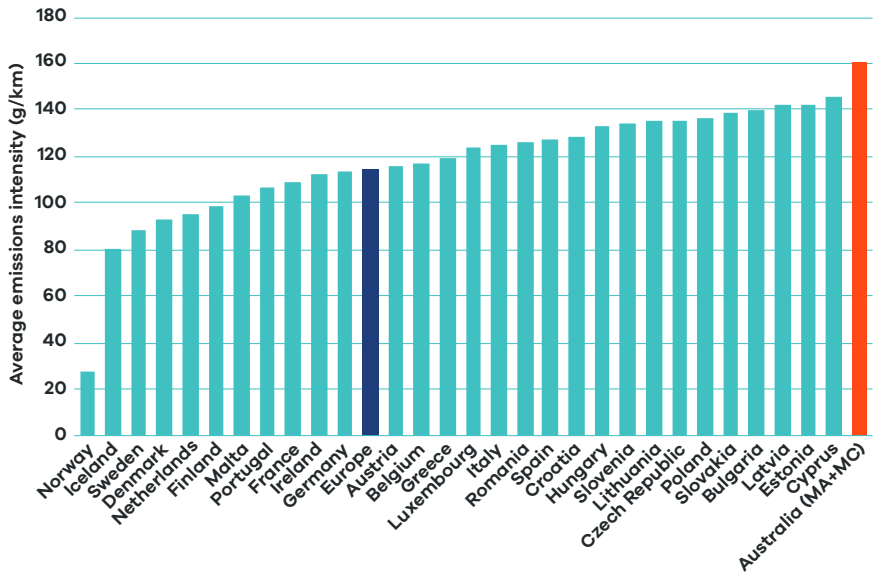
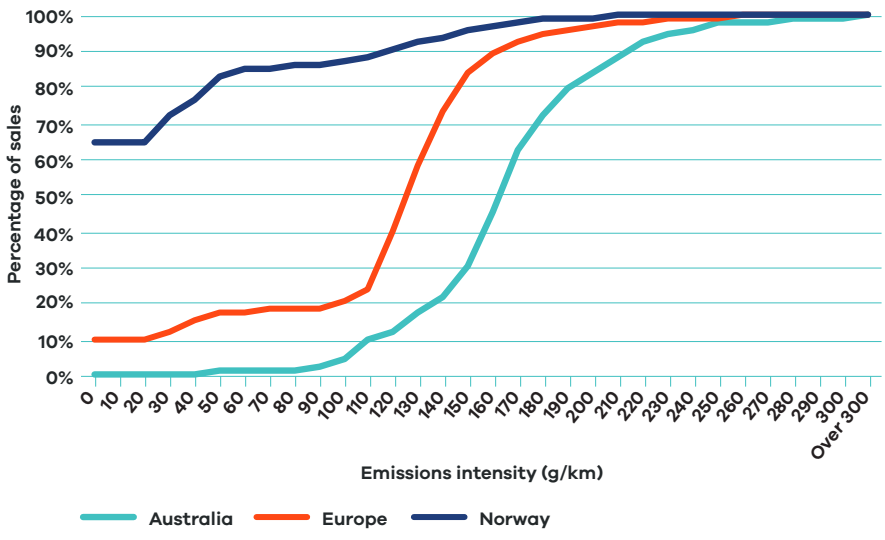


Figure 43 compares the distribution of the emissions intensity among new passenger car sales in Australia[19] and Europe, in intervals of 10 g/km.[20] Norway is also shown as a comparator. Each line in the graph shows the percentage of vehicles sold with an emissions intensity *less than or equal to* a given emissions intensity value on the horizonal axis. The graph shows that around 5 per cent of Australia's passenger car sales in 2020 had an emissions intensity of 100 g/km or less, whereas 20 per cent of European and 87 per cent of Norwegian passenger vehicles were at or below this emissions intensity figure. The vast majority of European new passenger cars (89 per cent) had an emissions intensity of 160 g/km or less, whereas in Australia just 45 per cent were below this mark.

Figure 43: Cumulative percentage of passenger vehicle sales relative to emissions intensity in Australia and Europe, 2021



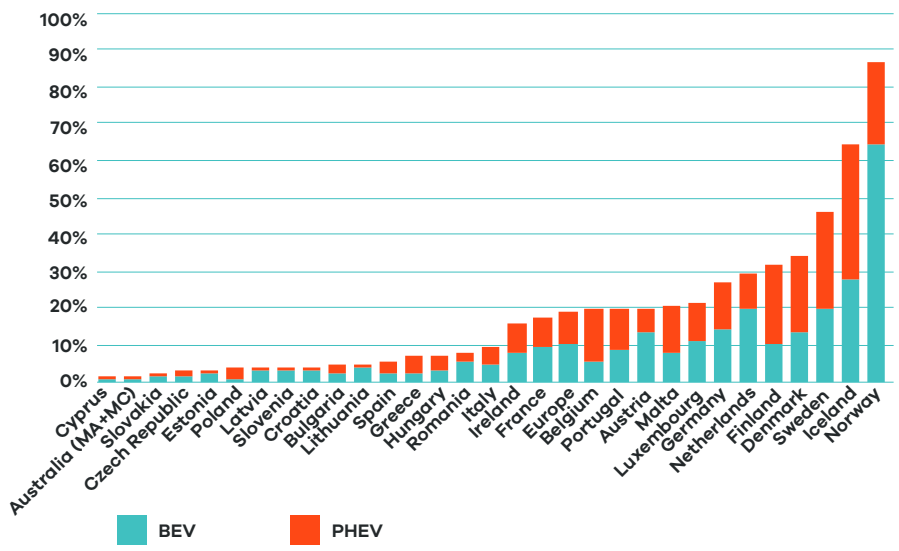
19 For the MA and MC categories combined.

20 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 486 g/km for Australia, 572 g/km for Europe and 374 g/km for Norway.

The share of electric vehicles sold, relative to total sales, varies considerably across countries in Europe. **Figure 44** 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[21]. In Norway, more than 85 per cent of new passenger vehicles are electric vehicles, with BEVs representing almost 65 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).

Cyprus had the lowest share of new electric passenger vehicles at 0.8 per cent, with Australia's figure slightly higher at 1.1 per cent. Overall, the share of electric vehicles in new passenger car registrations remains below 10 per cent in around half of the European countries shown in the graph.

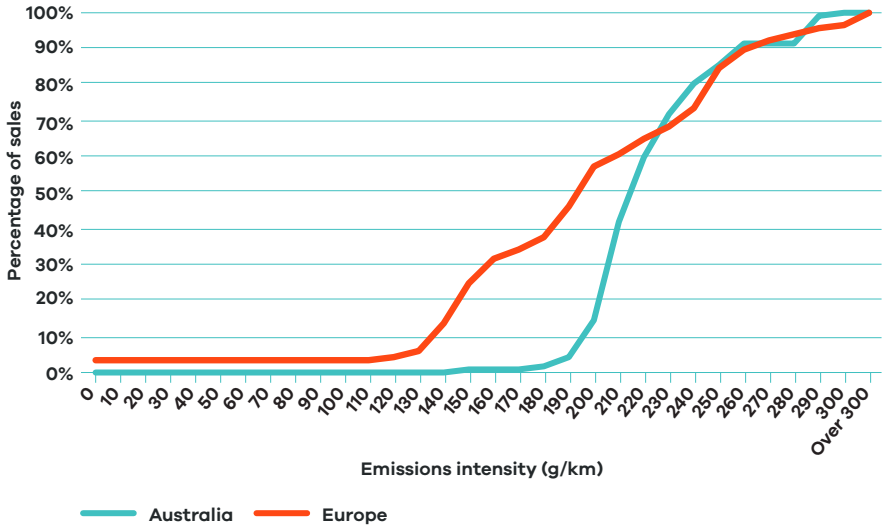
Figure 44: Electric vehicle share of new passenger car registrations/sales (%) in Australia and Europe, 2021



Light commercial vehicles: emissions intensity for 2021

Figure 45 compares the distribution of the emissions intensity among new light commercial vehicle sales in Australia[22] and Europe, in intervals of 10 g/km.[23] The graph shows that around 14 per cent of Australia's light commercial vehicle sales in 2021 had an emissions intensity of 200 g/km or less, whereas around 57 per cent of new European light commercial vehicles were at or below this emissions intensity.

Figure 45: Cumulative percentage of light commercial vehicles sales relative to emissions intensity in Australia and Europe, 2021



21 Using the MA and MC categories.

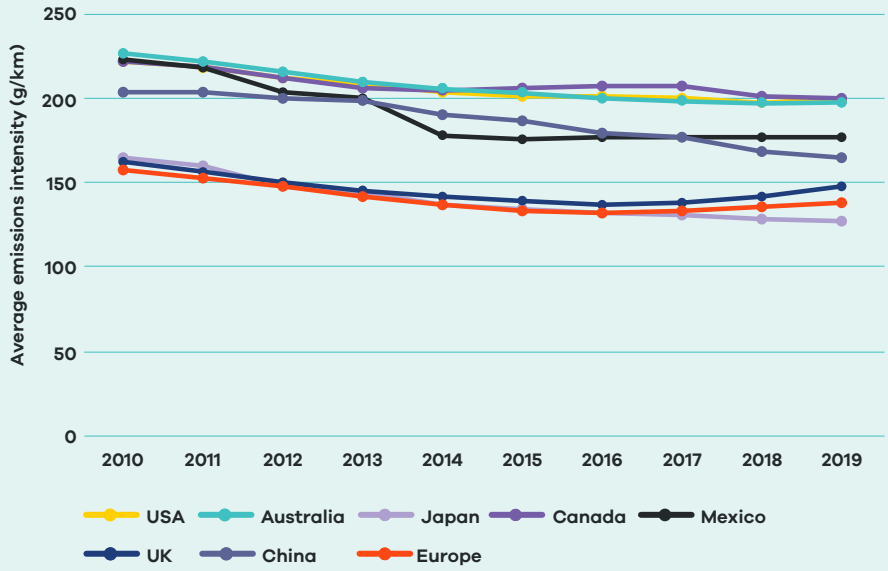
22 For the NA category.

23 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 898 g/km for Europe.

International comparison of average emissions intensity using IEA data

The NTC has compared the average emissions intensity for new vehicle sales in various countries from 2010 to 2019 (the latest available year of data), using data published as part of the IEA's *Global Fuel Economy Initiative 2021* (IEA, 2021a; IEA, 2021b). Due to the various testing regimes in place in different regions of the world, the IEA converted each country's emissions intensity results in its database to WLTP (IEA, 2021a). **Figure 46** compares the average emissions intensities for selected countries; it shows that all countries' new vehicle sales had a lower average emissions intensity in 2019 than 2010. However, most countries saw the emissions intensity reductions achieved during the early years stabilise towards the end of this time period, and emissions intensity actually increased in European Union (EU) countries.[24] The emissions intensity for Australia was broadly comparable with Canada and the USA, and among the highest of all countries in the IEA's dataset. Japan and European Union countries tended to have the lowest emissions intensities, with Japan's emissions intensity around 36 per cent below Australia's in 2019.

Figure 46: International comparison of emissions intensity of light-duty vehicle sales using IEA data, 2010-2019



Source: NTC analysis based on IEA data (IEA, 2021a; IEA, 2021b).

24 The IEA attributes this result to: 'A peculiarity of the EU CO_2 emissions standards is that the targets are set at five-year intervals. Manufacturers have taken advantage of this leeway, which resulted in three consecutive years of increased average emissions intensity in vehicle sales (2017-2019).' (IEA, 2021a, p. 30)

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Appendix

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

Table 9: National average emissions intensity for new passenger and light commercial vehicles, 2002–2021

Year	Average CO_2 emissions (g/km)	Annual change (%)	Average CO_2 emissions - MA (g/km)	Annual change (%)	Average CO_2 emissions - MC+NA (g/km)	Annual change (%)
2002	252.4	N/A		N/A		N/A
2003	249.5	-1.1		N/A		N/A
2004	246.5	-1.2		N/A		N/A
2005	240.5	-2.4		N/A		N/A
2006	230.3	-4.2		N/A		N/A
2007	226.4	-1.7		N/A		N/A
2008	222.4	-1.8		N/A		N/A
2009	218.6	-1.7		N/A		N/A
2010	212.6	-2.7		N/A		N/A
2011	206.6	-2.8		N/A		N/A
2012	199.0	-3.7		N/A		N/A
2013	192.2	-3.4		N/A		N/A
2014	187.8	-2.3		N/A		N/A
2015	184.2	-1.9		N/A		N/A
2016	182.1	-1.1		N/A		N/A
2017	181.7	-0.3		N/A		N/A
2018	180.9	-0.4		N/A		N/A
2019	180.5	-0.2		N/A		N/A
2020	N/A	N/A	149.5	N/A	216.7	N/A
2021	N/A	N/A	146.5	-2.0	212.5	-1.9

N/A – not applicable

Note: 2020 and 2021 figures are sourced from the FCAI's voluntary emissions standard (FCAI, 2021b; FCAI, 2022a), and therefore include the impacts of air-conditioning credits and off-cycle credits.

Table 10: Average emissions intensity and annual sales by segment for the MA category, 2020 and 2021

Segment	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
SUV Medium	157	156	-0.9	159,368	162,777
SUV Small	156	148	-4.9	114,658	141,410
Small	142	144	1.7	121,151	109,064
SUV Large	195	190	-2.2	54,229	52,441
SUV Light	142	135	-4.9	26,425	48,894
Light	132	133	0.8	38,545	45,732
Medium	137	136	-1.2	32,852	30,601
People Movers	212	196	-7.4	7,733	11,202
Sports	214	221	3.4	10,674	9,939
Micro	123	116	-5.9	5,008	9,528
Large	198	146	-26.5	5,353	4,689
SUV Upper Large	213	226	6.1	2,149	2,459
Upper Large	212	214	1.1	858	798
Total	**N/A**	**N/A**	**N/A**	**579,003**	**629,534**

Table 11: Average emissions intensity and annual sales by segment for the MC+NA category, 2020 and 2021

Segment	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Pick-up/Chassis 4×4	224	224	0.2	152,145	189,400
SUV Large	212	198	-6.2	54,611	81,307
Pick-up/Chassis 4×2	223	220	-1.7	26,614	32,731
Vans/Cab Chassis	204	203	-0.1	23,646	27,665
SUV Upper Large	265	269	1.4	19,523	19,308
SUV Medium	170	169	-0.5	20,592	17,388
SUV Small	189	193	2.4	1,161	2,860
SUV Light	152	152	0.0	2,368	2,856
Total	**N/A**	**N/A**	**N/A**	**300,660**	**373,515**

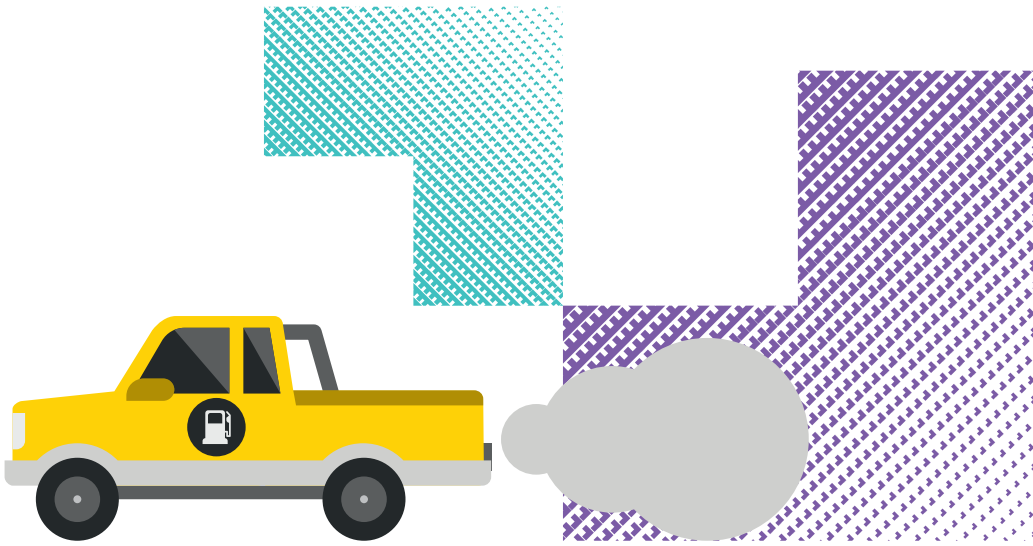
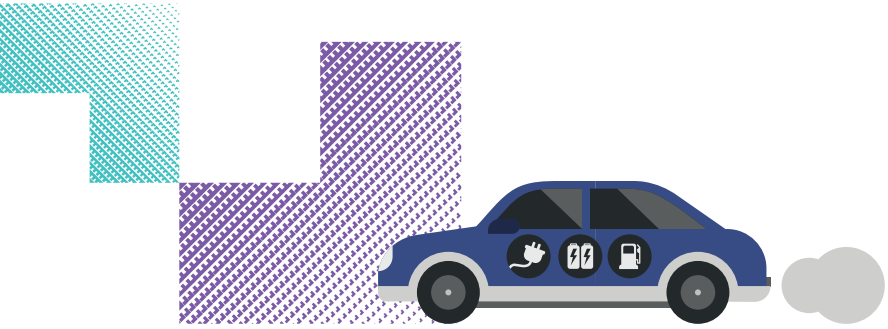


Table 12: Top selling models within segments and comparison with best-in-class model, 2021

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 (MA)	1	Kia	JA PICANTO	6,591	117	7	109
	2	Mitsubishi	MIRAGE	2,198	110	1	Mitsubishi MIRAGE (petrol)
	3	Fiat	ABARTH	401	139	27	
	4	Fiat	500	338	112	2	
Light (MA)	1	MG	MG3	13,774	159	N/A	0
	2	Kia	YB RIO	5,644	140	N/A	MINI COOPER (electric)
	3	Volkswagen	POLO	5,125	116	N/A	
	4	Mazda	200	4,183	123	N/A	
	5	Suzuki	SWIFT	4,131	115	N/A	
	6	Suzuki	BALENO	3,896	125	N/A	
	7	Toyota	YARIS	2,357	114	N/A	
	8	MINI	COOPER	1,866	84	N/A	
	9	Toyota	GR YARIS	1,533	172	N/A	
	10	Skoda	FABIA	813	108	N/A	
Small (MA)	1	Hyundai	I30	25,575	172	N/A	0
	2	Kia	BD CERATO	18,114	165	N/A	Nissan LEAF (electric)
	3	Toyota	COROLLA HYBRID	14,657	91	N/A	
	4	Mazda	300	14,126	147	N/A	
	5	Toyota	COROLLA	14,111	139	N/A	
	6	Subaru	IMPREZA	3,642	157	N/A	
	7	Honda	CIVIC 5D	1,964	148	N/A	
	8	Volkswagen	GOLF	1,926	138	N/A	
	9	BMW	118I	1,543	135	N/A	
	10	Subaru	WRX	1,261	228	N/A	



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)*
Medium (MA)	1	Toyota	CAMRY HYBRID	10,979	102	154	40
	2	BMW	330I	2,082	160	300	Peugeot 508 (electric-petrol)
	3	Toyota	CAMRY	1,886	169	322	
	4	Mazda	600	1,491	170	326	
	5	Skoda	OCTAVIA	1,279	143	258	
	6	Mercedes-Benz Cars	C200 FL	1,231	159	298	
	7	Volkswagen	PASSAT	948	162	305	
	8	Mercedes-Benz Cars	C300 FL	872	159	298	
	9	BMW	320I	747	144	260	
	10	Lexus	ES300H	700	109	173	
Large (MA)	1	Kia	CK STINGER	1,407	236	N/A	0
	2	Skoda	SUPERB	597	174	N/A	Porsche TAY (electric)
	3	Porsche	TAY	531	0	N/A	
	4	Mercedes-Benz Cars	E200 FL	477	180	N/A	
	5	Maserati	GHIBLI	152	210	N/A	
	6	BMW	530D	148	144	N/A	
	7	Audi	A6	140	164	N/A	
	8	Mercedes-Benz Cars	E350 FL	133	175	N/A	
	9	BMW	520I	116	156	N/A	
	10	Mercedes-Benz Cars	M-AMG E63S FL	109	280	N/A	

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)*
Upper Large (MA)	1	Mercedes-Benz Cars	S450 4M	171	188	235	56
	2	Chrysler	300 LX	170	305	445	Porsche 97A (electric-petrol)
	3	Mercedes-Benz Cars	S450 4M L	65	191	241	
	4	BMW	620D GT	64	126	125	
	5	Porsche	97A	48	187	235	
	6	BMW	740I	33	177	216	
	7	BMW	840I GC	28	180	221	
	8	Lexus	LS500	26	217	288	
	9	Mercedes-Benz Cars	M-AMG GT 63S 4M	22	258	361	
	10	Bentley	FLYING SPUR	21	327	484	
Sports (MA)	1	Ford	MUSTANG	2,827	282	135	120
	2	Mazda	MX5	744	161	34	Audi A3 (petrol)
	3	Porsche	911	428	238	99	
	4	Mercedes-Benz Cars	C200 CPE FL	325	159	32	
	5	BMW	M2	295	207	73	
	6	Mercedes-Benz Cars	M-AMG C63S CPFL	279	234	95	
	7	BMW	420I COUPE	261	146	22	
	8	Nissan	370Z	260	248	107	
	9	Porsche	982	256	215	79	
	10	BMW	430I COUPE	249	151	26	
People Movers (MA)	1	Kia	KA4 CARNIVAL	5,493	186	44	129
	2	Honda	ODYSSEY	1,143	183	42	Volkswagen CADDY (diesel)
	3	LDV	G10	1,064	263	104	
	4	Volkswagen	MULTIVAN	936	182	41	
	5	Hyundai	STARIA	628	224	74	
	6	Kia	YP CARNIVAL	369	232	79	
	7	Hyundai	IMAX	353	231	79	
	8	Mercedes-Benz Vans	V-CLASS	330	156	21	
	9	Mercedes-Benz Vans	VALENTE	208	172	33	
	10	Toyota	GRANVIA	194	211	64	

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 (MA)	1	Mazda	CX3	12,873	144	67	86
	2	Kia	YB STONIC	7,645	150	74	Toyota YARIS CROSSHV (petrol-electric)
	3	Volkswagen	T-CROSS	6,104	123	43	
	4	Hyundai	VENUE	5,854	165	92	
	5	Toyota	YARIS CROSSHV	5,052	87	1	
	6	Ford	PUMA	3,218	121	41	
	7	Toyota	YARIS CROSS	2,776	124	44	
	8	Nissan	JUKE	2,362	136	58	
	9	Suzuki	IGNIS	1,979	113	32	
	10	Renault	CAPTUR	533	149	73	
SUV Small (MA)	1	MG	MG ZS	17,035	163	N/A	0
	2	Mitsubishi	ASX	14,764	177	N/A	MG MG ZS EV (electric)
	3	Mazda	C30	13,309	153	N/A	
	4	Hyundai	KONA	12,748	135	N/A	
	5	Subaru	XV	9,342	158	N/A	
	6	Kia	SP2 SELTOS	8,884	161	N/A	
	7	Mitsubishi	ECLIPSE CROSS	6,132	157	N/A	
	8	Honda	HR-V	6,069	156	N/A	
	9	Nissan	QASHQAI	5,750	159	N/A	
	10	Volkswagen	T-ROC	4,838	154	N/A	
SUV Medium (MA)	1	Toyota	RAV4 HYBRID	25,850	108	N/A	0
	2	Mazda	CX5	24,968	171	N/A	Mercedes-Benz Cars EQC 400 4M (electric)
	3	Mitsubishi	OUTLANDER	14,572	158	N/A	
	4	Hyundai	TUCSON	14,194	178	N/A	
	5	Nissan	XTRAIL	13,860	186	N/A	
	6	Toyota	RAV4	9,901	150	N/A	
	7	Honda	CR-V	6,875	166	N/A	
	8	Kia	QL SPORTAGE	6,659	183	N/A	
	9	MG	MG HS	6,248	176	N/A	
	10	Volkswagen	TIGUAN	3,772	186	N/A	

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 Large (MA)	1	Mazda	CX8	6,119	177	N/A	0
	2	Kia	MQ4 SORENTO	5,103	177	N/A	Audi EB (electric)
	3	Hyundai	SANTA FE	5,048	177	N/A	
	4	Volkswagen	TIGUAN ALLSPACE	3,966	194	N/A	
	5	Mazda	CX9	3,884	197	N/A	
	6	Hyundai	PALISADE	3,720	204	N/A	
	7	Toyota	KLUGER	3,085	206	N/A	
	8	Isuzu Ute	MU-X	2,794	209	N/A	
	9	BMW	X5 XDRIVE30D	2,194	189	N/A	
	10	Skoda	KODIAQ	1,694	174	N/A	
SUV Upper Large (MA)	1	BMW	X7 XDRIVE30D	622	191	198	64
	2	Mercedes-Benz Cars	GLS450 4M	432	210	228	Land Rover RANGE ROVER (electric-petrol)
	3	Mercedes-Benz Cars	GLS400D 4M	380	202	216	
	4	Mercedes-Benz Cars	M-AMG GLS63	273	296	363	
	5	BMW	X7 M50I	168	265	314	
	6	Audi	RSQ8	129	276	331	
	7	Audi	SQ8	115	205	220	
	8	Bentley	BENTAYGA	98	265	314	
	9	Audi	Q8	84	193	202	
	10	Lamborghini	URUS	64	279	336	
SUV Light (MC+NA)	1	Suzuki	JIMNY	2,856	152	4	146 Suzuki JIMNY (petrol)
SUV Small (MC+NA)	1	Volvo Car	XC40	2,034	182	21	150
	2	Jeep	COMPASS	826	221	47	Jeep COMPASS (diesel)

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 (MC+NA)	1	Subaru	FORESTER	11,810	168	129	73
	2	BMW	X3 XDRIVE30I	2,664	170	133	BMW X3 XDRIVE30E (electric-petrol)
	3	BMW	X3 SDRIVE20I	794	163	124	
	4	BMW	X4 XDRIVE30I	438	169	132	
	5	BMW	X3 M40I	333	199	173	
	6	BMW	X4 XDRIVE20I	242	167	129	
	7	Land Rover	RR EVOQUE	225	165	126	
	8	Land Rover	DISCOVERY SPORT	209	158	116	
	9	BMW	X4 M40I	150	199	173	
	10	BMW	X3 XDRIVE30D	138	159	118	
SUV Large (MC+NA)	1	Toyota	PRADO	21,299	211	330	49
	2	Subaru	OUTBACK	10,490	169	244	Volvo Car XC90 (electric-petrol)
	3	Isuzu Ute	MU-X	7,824	213	335	
	4	Ford	EVEREST	7,465	195	299	
	5	Mitsubishi	PAJERO SPORT	6,804	212	333	
	6	Toyota	KLUGER HYBRID	4,985	128	161	
	7	Toyota	FORTUNER	3,822	201	310	
	8	Jeep	GRAND CHEROKEE	3,009	231	372	
	9	Mazda	CX9	2,746	211	331	
	10	Mitsubishi	PAJERO	2,250	240	390	
SUV Upper Large (MC+NA)	1	Toyota	LANDCRUISER	14,356	253	40	181
	2	Nissan	PATROL	3,333	343	90	Audi Q8 (diesel)
	3	Mercedes-Benz Cars	M-AMG G63 FL	568	299	65	
	4	Land Rover	DISCOVERY	533	202	11	
	5	Lexus	LX570	189	334	85	
	6	Lexus	LX450D	111	250	38	
	7	Land Rover	RANGE ROVER	110	257	42	
	8	Aston Martin	DBX	61	269	49	
	9	Mercedes-Benz Cars	G400D	26	252	39	
	10	Audi	Q8	21	198	9	

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 4×2 (MC+NA)	1	Toyota	HILUX 4X2	13,214	239	44	166
	2	Isuzu Ute	D-MAX	6,478	205	23	Nissan NAVARA (diesel)
	3	Ford	RANGER	4,293	202	22	
	4	Mitsubishi	TRITON	2,899	225	35	
	5	Mazda	B30	2,823	204	23	
	6	Nissan	NAVARA	2,069	195	18	
	7	GWM	STEED	738	213	28	
	8	GWM	UTE	164	246	48	
	9	Mazda	B19	41	180	8	
	10	Mazda	B32	11	243	46	
Pick-up/ Chassis 4×4 (MC+NA)	1	Ford	RANGER	45,986	220	50	147
	2	Toyota	HILUX 4X4	39,587	210	43	Nissan NAVARA (diesel)
	3	Isuzu Ute	D-MAX	18,639	207	41	
	4	Mitsubishi	TRITON	16,333	223	52	
	5	Nissan	NAVARA	13,044	204	39	
	6	Mazda	B30	12,738	206	40	
	7	Toyota	LANDCRUISER	12,277	281	91	
	8	Volkswagen	AMAROK	7,659	244	66	
	9	GWM	UTE	6,742	246	67	
	10	LDV	T60	6,307	254	73	
Vans/Cab Chassis (MC+NA)	1	Toyota	HIACE	9,726	217	N/A	0
	2	Ford	TRANSIT CUSTOM	2,488	186	N/A	Renault KANGOO (electric)
	3	Hyundai	ILOAD	2,446	229	N/A	
	4	Renault	TRAFIC	2,093	183	N/A	
	5	LDV	G10	1,829	230	N/A	
	6	Mitsubishi	EXPRESS	1,780	187	N/A	
	7	Volkswagen	TRANSPORTER	1,727	206	N/A	
	8	LDV	G10+	1,477	220	N/A	
	9	Mercedes-Benz Vans	VITO	996	176	N/A	
	10	Renault	KANGOO	732	118	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 13: Average emissions intensity for models with a sales volume greater than 1,000 vehicles, 2021

Rank	Make	Model	Average emissions intensity (g/km)	Sales
1	Ford	RANGER	218	50,279
2	Toyota	HILUX 4X4	210	39,587
3	Toyota	LANDCRUISER	266	26,633
4	Toyota	RAV4 HYBRID	108	25,850
5	Hyundai	I30	172	25,575
6	Isuzu Ute	D-MAX	206	25,117
7	Mazda	CX5	171	24,968
8	Toyota	PRADO	211	21,299
9	Mitsubishi	TRITON	223	19,232
10	Kia	BD CERATO	165	18,114
11	MG	MG ZS	163	17,035
12	Mazda	B30	206	15,561
13	Nissan	NAVARA	203	15,113
14	Mitsubishi	ASX	177	14,764
15	Toyota	COROLLA HYBRID	91	14,657
16	Mitsubishi	OUTLANDER	158	14,572
17	Hyundai	TUCSON	178	14,194
18	Mazda	300	147	14,126
19	Toyota	COROLLA	139	14,111
20	Nissan	XTRAIL	186	13,860
21	MG	MG3	159	13,774
22	Mazda	C30	153	13,309
23	Toyota	HILUX 4X2	239	13,214
24	Mazda	CX3	144	12,873
25	Hyundai	KONA	135	12,748
26	Subaru	FORESTER	168	11,810
27	Toyota	CAMRY HYBRID	102	10,979
28	Isuzu Ute	MU-X	212	10,618
29	Subaru	OUTBACK	169	10,490
30	Toyota	RAV4	150	9,901

Rank	Make	Model	Average emissions intensity (g/km)	Sales
31	Toyota	HIACE	217	9,726
32	Subaru	XV	158	9,342
33	Kia	SP2 SELTOS	161	8,884
34	Ford	EVEREST	195	8,359
35	Volkswagen	AMAROK	244	7,659
36	Kia	YB STONIC	150	7,645
37	GWM	UTE	246	6,906
38	Honda	CR-V	166	6,875
39	Mitsubishi	PAJERO SPORT	212	6,804
40	Kia	QL SPORTAGE	183	6,659
41	Mazda	CX9	203	6,630
42	Kia	JA PICANTO	117	6,591
43	LDV	T60	254	6,307
44	MG	MG HS	176	6,248
45	Mitsubishi	ECLIPSE CROSS	157	6,132
46	Mazda	CX8	177	6,119
47	Volkswagen	T-CROSS	123	6,104
48	Honda	HR-V	156	6,069
49	Hyundai	VENUE	165	5,854
50	Nissan	QASHQAI	159	5,750
51	Kia	YB RIO	140	5,644
52	Kia	KA4 CARNIVAL	186	5,493
53	Volkswagen	POLO	116	5,125
54	Kia	MQ4 SORENTO	177	5,103
55	Toyota	YARIS CROSSHV	87	5,052
56	Hyundai	SANTA FE	177	5,048
57	Toyota	KLUGER HYBRID	128	4,985
58	Volkswagen	T-ROC	154	4,838
59	Toyota	KLUGER	206	4,335
60	Mazda	200	123	4,183
61	Suzuki	SWIFT	115	4,131
62	GWM	HAVAL JOLION	186	4,069

Rank	Make	Model	Average emissions intensity (g/km)	Sales
63	Volkswagen	TIGUAN ALLSPACE	194	3,966
64	Suzuki	BALENO	125	3,896
65	Toyota	FORTUNER	201	3,822
66	Volkswagen	TIGUAN	186	3,772
67	Suzuki	VITARA	139	3,745
68	Hyundai	PALISADE	204	3,720
69	Volvo Car	XC60	156	3,688
70	Volvo Car	XC40	137	3,687
71	Subaru	IMPREZA	157	3,642
72	GWM	HAVAL H6	173	3,635
73	MINI	COOPER	108	3,579
74	Toyota	C-HR	147	3,503
75	Suzuki	JIMNY	153	3,350
76	Nissan	PATROL	343	3,333
77	Ford	PUMA	121	3,218
78	Toyota	C-HR HYBRID	97	3,075
79	Jeep	GRAND CHEROKEE	231	3,010
80	Audi	Q5	168	2,945
81	LDV	G10	242	2,893
82	Ford	MUSTANG	282	2,827
83	Toyota	YARIS CROSS	124	2,776
84	BMW	X3 XDRIVE30I	170	2,664
85	Audi	Q3 SPORTBACK	176	2,628
86	Audi	Q3	173	2,507
87	Ford	TRANSIT CUSTOM	186	2,488
88	Hyundai	ILOAD	229	2,446
89	Nissan	JUKE	136	2,362
90	Toyota	YARIS	114	2,357
91	Porsche	95B	218	2,328
92	Mitsubishi	PAJERO	240	2,250
93	Mitsubishi	MIRAGE	110	2,198
94	Skoda	KAMIQ	125	2,197

Rank	Make	Model	Average emissions intensity (g/km)	Sales
95	BMW	X5 XDRIVE30D	189	2,194
96	Chevrolet	SILVERADO	297	2,114
97	Lexus	NX300	179	2,099
98	Renault	TRAFIC	183	2,093
99	BMW	330I	160	2,082
100	GWM	HAVAL H2	208	1,979
101	Suzuki	IGNIS	113	1,979
102	Honda	CIVIC 5D	148	1,964
103	Renault	KOLEOS	189	1,937
104	Volkswagen	GOLF	138	1,928
105	Toyota	CAMRY	169	1,886
106	RAM	EXPRESS 1500	283	1,841
107	Mitsubishi	EXPRESS	187	1,780
108	Jeep	WRANGLER	228	1,734
109	Volkswagen	TRANSPORTER	206	1,727
110	Skoda	KAROQ	155	1,709
111	Skoda	KODIAQ	174	1,694
112	Ford	ESCAPE	199	1,673
113	Mercedes-Benz Cars	GLB250 4M	173	1,605
114	LDV	D90	240	1,576
115	BMW	118I	135	1,543
116	Toyota	GR YARIS	172	1,533
117	Land Rover	DEFENDER 110	218	1,531
118	Mazda	600	170	1,491
119	LDV	G10+	220	1,477
120	Audi	Q2	126	1,475

Rank	Make	Model	Average emissions intensity (g/km)	Sales
121	Land Rover	RR SPORT	219	1,475
122	BMW	X1 SDRIVE20I	149	1,444
123	Audi	Q7	183	1,418
124	Kia	CK STINGER	236	1,407
125	MG	MG ZS EV	0	1,388
126	Jeep	COMPASS	211	1,363
127	Mercedes-Benz Cars	GLC300 4M FL	181	1,335
128	Volvo Car	XC90	158	1,323
129	Kia	NQ5 SPORTAGE	171	1,290
130	Skoda	OCTAVIA	143	1,279
131	Jeep	GLADIATOR	281	1,273
132	Subaru	WRX	228	1,261
133	Volkswagen	TOUAREG	181	1,261
134	Mercedes-Benz Cars	GLB200	148	1,257
135	GWM	STEED	217	1,252
136	Mercedes-Benz Cars	C200 FL	159	1,231
137	Mercedes-Benz Cars	GLE300D 4M	182	1,222
138	Peugeot	3008	147	1,172
139	Volkswagen	PASSAT	167	1,169
140	Honda	ODYSSEY	183	1,143
141	Land Rover	RR EVOQUE	180	1,143
142	SsangYong	MUSSO XLV	230	1,026
143	Mercedes-Benz Cars	GLE400D 4M	202	1,024
144	Mercedes-Benz Cars	GLA250 4M	170	1,017
145	Mazda	M30	125	1,014
Total*			**N/A**	**919,370**

* 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 14: Average emissions intensity and annual sales by buyer type for the MA category, 2020 and 2021

Buyer type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Private	155	153	-1.8	342,422	391,111
Business	158	152	-3.3	220,226	225,503
Government	134	129	-4.4	16,355	12,920
Total	**N/A**	**N/A**	**N/A**	**579,003**	**629,534**

Table 15: Average emissions intensity and annual sales by buyer type for the MC+NA category, 2020 and 2021

Buyer type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Business	220	217	-1.5	183,598	210,467
Private	216	214	-0.6	103,004	147,876
Government	219	214	-2.3	14,058	15,172
Total	**N/A**	**N/A**	**N/A**	**300,660**	**373,515**

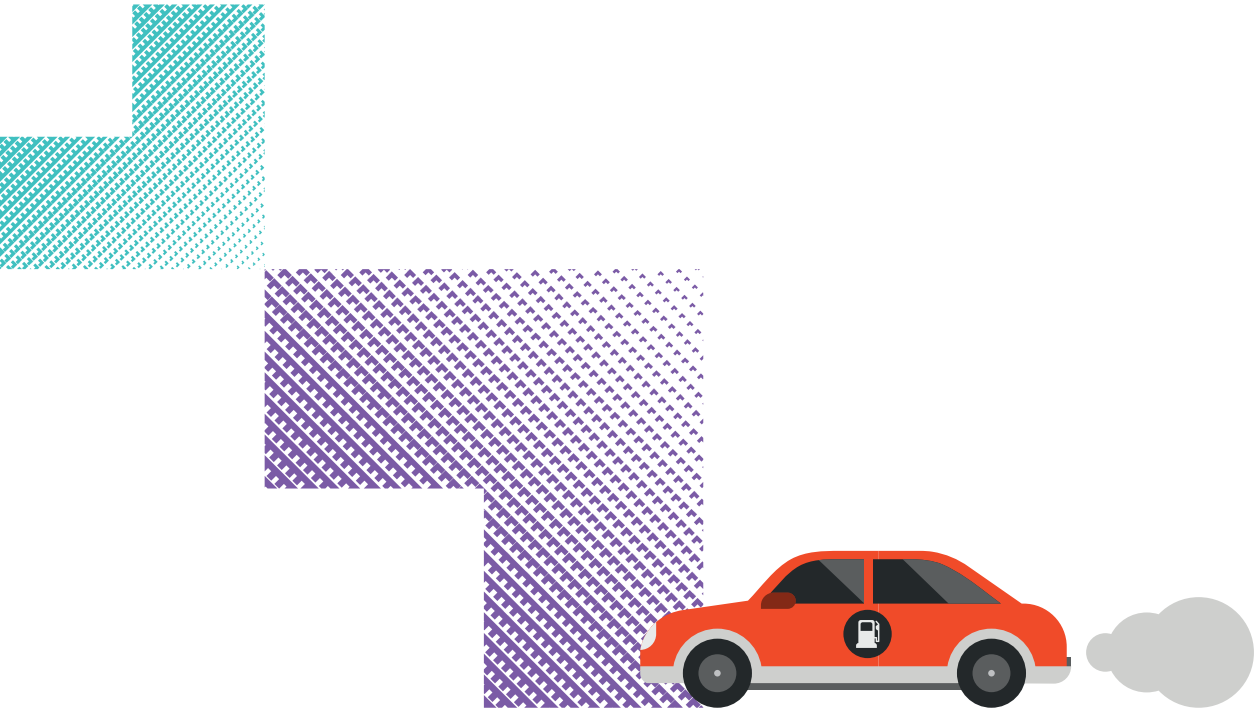


Table 16: Average emissions intensity and annual sales by detailed buyer type for the MA category, 2020 and 2021

Buyer type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Private – local delivery	155	153	-1.8	342,310	390,960
Dealer demonstrator	158	152	-3.4	80,463	68,641
Fleet	160	159	-0.5	59,014	59,470
Rental	157	151	-4.1	27,212	45,311
Large fleet	156	150	-3.8	25,920	28,272
Not-for-profit organisation	152	147	-2.9	12,401	12,319
Company capitalisation	159	139	-12.3	14,305	10,389
State government	135	129	-4.3	12,034	9,947
Local government	135	125	-7.6	3,085	2,233
Taxi	102	104	1.8	746	905
Federal government	127	131	3.1	1,236	740
Private – overseas delivery	162	157	-2.8	112	151
Business – overseas delivery	174	161	-7.6	48	92
Diplomatic	156	150	-3.9	49	58
Other	168	173	2.9	68	46
Total	**N/A**	**N/A**	**N/A**	**579,003**	**629,534**

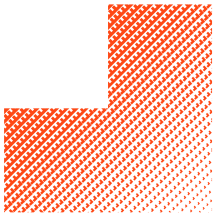


Table 17: Average emissions intensity and annual sales by detailed buyer type for the MC+NA category, 2020 and 2021

Buyer type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Private – local delivery	216	214	-0.6	102,965	147,808
Fleet	223	219	-1.7	104,257	126,657
Large fleet	221	216	-2.1	34,891	40,116
Dealer demonstrator	213	213	0.1	30,152	22,835
Rental	216	208	-3.6	7,114	14,254
State government	223	219	-1.8	8,722	8,587
Local government	209	203	-2.8	4,089	4,803
Company capitalisation	203	206	1.2	4,873	3,939
Not-for-profit organisation	224	215	-3.9	2,238	2,543
Federal government	218	215	-1.4	1,247	1,782
Business – overseas delivery	218	239	9.5	47	82
Private – overseas delivery	236	213	-9.5	39	68
Diplomatic	204	207	1.4	9	20
Taxi	248	142	-42.8	3	15
Other	197	208	5.9	14	6
Total	**N/A**	**N/A**	**N/A**	**300,660**	**373,515**

Table 18: Average emissions intensity and annual sales by powertrain and fuel type for the MA category, 2020 and 2021

Powertrain and fuel type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Petrol	166	164	-0.9	480,925	514,418
HEV	102	102	0.1	57,724	65,165
Diesel	178	176	-1.1	37,185	41,766
BEV	0	0	N/A	1,764	5,104
PHEV	47	46	-2.1	1,405	3,043
Hydrogen	0	0	N/A	0	38
Total	**N/A**	**N/A**	**N/A**	**579,003**	**629,534**

Table 19: Average emissions intensity and annual sales by powertrain and fuel type for the MC+NA category, 2020 and 2021

Powertrain and fuel type	Average emissions intensity (g/km) 2020	Average emissions intensity (g/km) 2021	Annual change (%)	Sales 2020	Sales 2021
Diesel	220	218	-0.7	250,635	301,767
Petrol	214	216	1.0	48,853	66,033
HEV	151	129	-14.7	871	5,341
PHEV	70	60	-13.6	287	329
BEV	0	0	N/A	14	45
Total	**N/A**	**N/A**	**N/A**	**300,660**	**373,515**

Table 20: Electric vehicle sales by model for FCAI data, 2020 and 2021

Make and Model	2020	2021
Audi E7	31	34
Audi EB	33	74
BMW 330E	91	150
BMW 530E	14	22
BMW 745E	5	6
BMW I3	1	0
BMW I3 REX	1	0
BMW I3S	52	67
BMW I8	1	0
BMW I8 ROADSTER	13	0
BMW IX XDRIVE40	0	23
BMW IX XDRIVE50	0	12
BMW IX3	0	50
BMW IX3 MSPORT	0	12
BMW X3 XDRIVE30E	1	37
BMW X5 XDRIVE45E	46	118
Ferrari SF90 SPIDER	0	1
Ferrari SF90 STRADALE	0	24
Hyundai IONIQ	454	407
Hyundai IONIQ 5	0	172
Hyundai KONA	488	505
Jaguar I-PACE	70	44
Kia DE NIRO	0	277
Kia MQ4 SORENTO	0	15
Land Rover RANGE ROVER	4	1
Land Rover RR SPORT	13	11
Lexus UX300E	0	43
Mazda M30	0	63
Mercedes-Benz Cars A250E	18	49

Make and Model	2020	2021
Mercedes-Benz Cars A250E SEDAN	5	17
Mercedes-Benz Cars C300E FL	71	13
Mercedes-Benz Cars E300E	20	2
Mercedes-Benz Cars E300E FL	9	18
Mercedes-Benz Cars EQA 250	0	367
Mercedes-Benz Cars EQC 400 4M	163	174
Mercedes-Benz Cars EQC 400 4M EAL	31	124
Mercedes-Benz Cars GLC300E 4M FL	274	307
Mercedes-Benz Cars GLC300E 4MFL CP	0	1
MG MG HS PHEV	0	580
MG MG ZS EV	0	1,388
MINI COOPER	150	432
Mitsubishi ECLIPSE CROSS	0	229
Mitsubishi OUTLANDER	440	592
Nissan LEAF	380	367
Peugeot 3008	0	11
Peugeot 508	0	5
Porsche 97A	6	6
Porsche CAY	205	122
Porsche TAY	0	531
Renault KANGOO	14	45
Renault ZOE	77	0
Volvo Car S60	14	0
Volvo Car V60	24	0
Volvo Car XC40	67	495
Volvo Car XC60	120	308
Volvo Car XC90	64	170
Total	**3,470**	**8,521**

Table 21: Electric vehicle sales by state for FCAI data, 2020 and 2021

State	2020	2021
Australian Capital Territory	247	349
New South Wales	1,097	2,597
Northern Territory	6	24
Queensland	610	1,605
South Australia	207	570
Tasmania	83	239
Victoria	917	2,483
Western Australia	303	654
Total	**3,470**	**8,521**

Table 22: Electric vehicle sales by buyer type for FCAI data, 2020 and 2021

Buyer type	2020	2021
Company capitalisation	450	658
Dealer demonstrator	537	1,613
Diplomatic	1	3
Federal government	16	8
Fleet	314	682
Large fleet	173	290
Local government	106	134
Not-for-profit organisation	25	25
Other	1	1
Private – local delivery	1,643	4,733
Private – overseas delivery	1	0
Rental	1	125
State government	202	249
Total	**3,470**	**8,521**

Table 23: Estimated electric vehicle fleet (including Tesla) by state and territory

	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Australia
Total electric vehicle sales from 2010 to 2021 (excluding Tesla)	917	5,966	50	3,464	2,382	460	5,725	1,596	20,560
Tesla registrations as at 21 January 2022	819	7,236	37	4,992	768	229	5,935	2,118	22,134
Total estimated electric vehicles as at 2021 (including Tesla)	1,736	13,202	87	8,456	3,150	689	11,660	3,714	42,694
Total passenger and light commercial vehicle fleet in 2021	299,582	5,380,182	146,178	3,892,775	1,366,865	468,860	4,745,233	2,070,457	18,370,132
Estimate of electric vehicles as percentage of total fleet in 2021	0.58%	0.25%	0.06%	0.22%	0.23%	0.15%	0.25%	0.18%	0.23%
Total estimated electric vehicles as at 2020 (including Tesla)	928	6,997	43	3,905	2,151	323	6,197	1,571	22,115
Change in estimated total electric vehicle fleet between 2020 and 2021	87%	89%	102%	117%	46%	113%	88%	136%	93%

Sources: VFACTS data on electric vehicles from 2010 to 2021; ABS (2021); Registrations from state- and territory-based registration systems as at 21 December 2020 and 21 January 2022 for Tesla data.

Note: Numbers in the table should be treated as indicative estimates, as they are based on a combination of cumulative VFACTS sales data and registration data (for Teslas). As a result, there is potential for electric vehicles to in some cases be under-counted and in others over-counted, as well as variation between jurisdictions. For example, electric vehicles sold early in the period of analysis (for example, 2010 or 2011) may no longer be in the fleet due to an accident or the vehicle or battery reaching the end of its life. By contrast, any 'grey imports' of electric vehicles from overseas markets would not be captured in the above data sources. Finally, transfers of vehicles between jurisdictions mean that there is potential for some discrepancies in the comparisons between states and territories, as a vehicle may have been sold in one jurisdiction but be currently registered in a different one. The estimated number of electric vehicles as at 2020, shown in the second last row of the table, is slightly higher than the corresponding figure in last year's report, reflecting the amended Tesla registration data for this time period, as described in more detail in the text near **Table 5**.

Table 24: Battery electric vehicle sales by model and jurisdiction, 2021

Make and model	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	Total
Audi E7	1	9	0	6	4	2	8	4	**34**
Audi EB	0	33	0	12	2	3	12	12	**74**
BMW I3S	0	23	0	9	4	0	23	8	**67**
BMW IX XDRIVE40	1	8	0	3	0	0	11	0	**23**
BMW IX XDRIVE50	1	2	0	1	0	0	8	0	**12**
BMW IX3	0	0	0	1	0	0	49	0	**50**
BMW IX3 MSPORT	0	4	0	1	0	0	7	0	**12**
Hyundai IONIQ	11	60	0	59	37	14	109	49	**339**
Hyundai IONIQ 5	13	68	0	22	7	3	46	13	**172**
Hyundai KONA	29	125	0	87	51	34	136	43	**505**
Jaguar I-PACE	1	16	0	12	2	1	9	3	**44**
Kia DE NIRO	3	87	0	47	14	4	50	12	**217**
Lexus UX300E	1	11	1	10	1	0	16	3	**43**
Mazda M30	0	8	3	14	7	1	27	3	**63**
Mercedes-Benz Cars EQA 250	6	98	0	93	27	7	113	23	**367**
Mercedes-Benz Cars EQC 400 4M	4	34	0	29	10	3	88	6	**174**
Mercedes-Benz Cars EQC 400 4M EAL	3	41	0	17	3	2	52	6	**124**
MG MG ZS EV	50	427	6	321	72	68	355	89	**1,388**
MINI COOPER	13	95	0	62	16	10	78	17	**291**
Nissan LEAF	51	58	3	40	14	16	156	29	**367**
Porsche TAY	16	200	0	76	26	9	161	43	**531**
Renault KANGOO	0	18	1	6	1	0	17	2	**45**
Volvo Car XC40	9	74	0	35	16	10	41	22	**207**
Total	**213**	**1,499**	**14**	**963**	**314**	**187**	**1,572**	**387**	**5,149**

Table 25: Hybrid vehicle sales by model, 2020 and 2021

Make and model	2020	2021
Honda ACCORD	70	54
Hyundai IONIQ	72	77
Kia DE NIRO	0	465
Land Rover RR SPORT	3	0
Lexus CT200H	112	77
Lexus ES300H	586	700
Lexus GS450H	4	0
Lexus IS300H	83	211
Lexus LC500H	3	1
Lexus LS500H	5	8
Lexus NX300H	943	992
Lexus RX450H	391	420
Lexus RX450HL	193	220
Lexus UX250H	608	975
Maserati GHIBLI	0	40
Maserati LEVANTE	0	13
McLaren SPEEDTAIL	1	0
Nissan PATHFINDER	22	4
Subaru FORESTER	868	356
Subaru XV	296	402
Toyota CAMRY HYBRID	9,615	10,979
Toyota C-HR HYBRID	2,810	3,075
Toyota COROLLA HYBRID	13,943	14,657
Toyota KLUGER HYBRID	0	4,985
Toyota PRIUS	95	77
Toyota PRIUS C	83	1
Toyota PRIUS V	272	210
Toyota RAV4 HYBRID	26,400	25,850
Toyota YARIS CROSSHV	857	5,052
Toyota YARIS HYBRID	260	605
Total	**58,595**	**70,506**

Table 26: Sales of vehicles by powertrain and fuel type and government, 2020 and 2021

	BEV	BEV	PHEV	PHEV	HEV	HEV	ICE	ICE	Total	Total
Government	**2020 sales**	**2021 sales**	**2020 sales**	**2021 sales**	**2020 sales**	**2021 sales**	**2020 sales**	**2021 sales**	**2020 sales**	**2021 sales**
Federal government	13	6	3	2	652	325	1,815	2,189	**2,483**	**2,522**
NSW	21	29	13	7	1,813	1,209	4,219	3,153	**6,066**	**4,398**
VIC	11	23	8	29	932	1,099	3,629	3,682	**4,580**	**4,833**
QLD	36	29	9	33	1,242	972	3,440	3,114	**4,727**	**4,148**
SA	8	14	1	7	479	666	1,360	945	**1,848**	**1,632**
WA	12	12	9	6	156	175	1,825	1,632	**2,002**	**1,825**
TAS	2	15	3	7	136	166	637	756	**778**	**944**
NT	0	2	0	1	58	37	481	548	**539**	**588**
ACT	32	23	37	12	20	1	127	130	**216**	**166**
Local government	93	121	13	13	923	802	6,145	6,100	**7,174**	**7,036**
Total	**228**	**274**	**96**	**117**	**6,411**	**5,452**	**23,678**	**22,249**	**30,413**	**28,092**

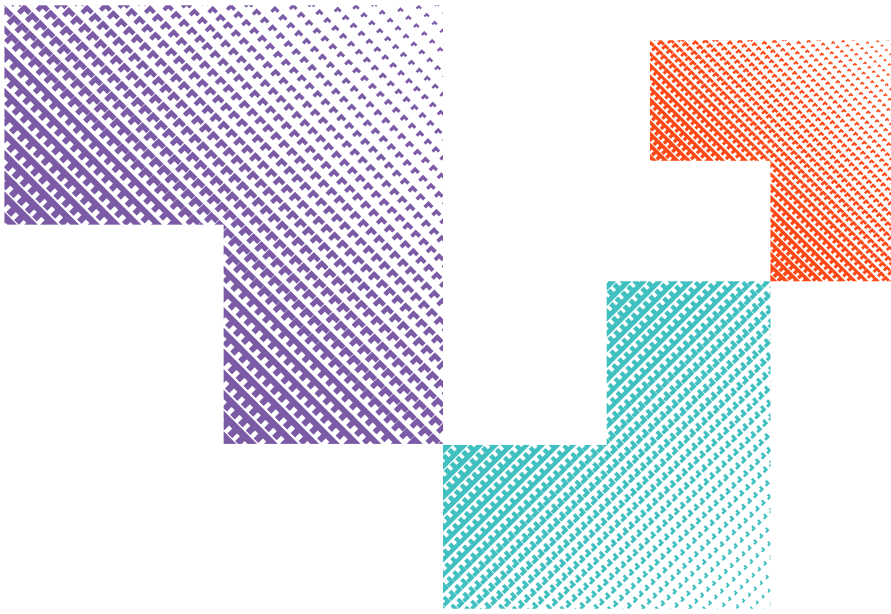
Table 27: 'Green' vehicle average emissions intensity and sales by segment, 2021

Segment	Make	Model	Average emissions intensity (g/km)	Sales
Micro	Mitsubishi	MIRAGE	110	2,198
	Fiat	500	112	338
	Kia	JA PICANTO	117	6,581
Light	MINI	COOPER	0	291
	Toyota	YARIS HYBRID	76	605
	Toyota	PRIUS C	90	1
	Skoda	FABIA	108	813
	Suzuki	SWIFT	110	3,558
	Volkswagen	POLO	114	4,593
	Toyota	YARIS	114	2,271
	Citroen	C3	118	88
	Suzuki	BALENO	118	246
Small	Nissan	LEAF	0	367
	BMW	I3S	0	67
	Hyundai	IONIQ	11	484
	Mercedes-Benz Cars	A250E	34	49
	Mercedes-Benz Cars	A250E SEDAN	34	17
	Toyota	PRIUS	80	77
	Toyota	COROLLA HYBRID	91	14,657
	Lexus	CT200H	95	77
	Toyota	PRIUS V	101	210
	Skoda	SCALA	113	76
	Alfa Romeo	GIULIETTA	114	6
	Peugeot	308	115	15
	Audi	A3	115	147
Medium	Peugeot	508	40	5
	Mercedes-Benz Cars	C300E FL	46	13
	BMW	330E	48	150
	Honda	ACCORD	98	54
	Toyota	CAMRY HYBRID	102	10,979
	Lexus	ES300H	109	700
	Lexus	IS300H	116	211

Segment	Make	Model	Average emissions intensity (g/km)	Sales
Large	Porsche	TAY	0	531
	Toyota	MIRAI	0	12
	Mercedes-Benz Cars	E300E	50	2
	Mercedes-Benz Cars	E300E FL	50	18
	BMW	530E	52	22
Upper Large	BMW	745E	56	6
	Porsche	97A	59	6
Sports	Audi	A3	120	2
SUV Light	Toyota	YARIS CROSSHV	87	5,052
	Suzuki	IGNIS	113	1,979
SUV Small	Lexus	UX300E	0	43
	MG	MG ZS EV	0	1,388
	Mazda	M30	0	63
	Hyundai	KONA	0	505
	Mercedes-Benz Cars	EQA 250	0	367
	Volvo Car	XC40	24	495
	Kia	DE NIRO	42	742
	Mitsubishi	ECLIPSE CROSS	43	229
	MINI	COOPER	54	141
	Toyota	C-HR HYBRID	97	3,075
	Lexus	UX250H	103	975
	Skoda	KAMIQ	113	505
	Audi	Q2	119	858
SUV Medium	BMW	IX3 MSPORT	0	12
	Hyundai	IONIQ 5	0	172
	Hyundai	NEXO	0	26
	Mercedes-Benz Cars	EQC 400 4M	0	174
	Mercedes-Benz Cars	EQC 400 4M EAL	0	124
	BMW	IX3	0	50
	Peugeot	3008	37	11
	MG	MG HS PHEV	39	580
	Mitsubishi	OUTLANDER	43	592
	Volvo Car	XC60	50	308

Segment	Make	Model	Average emissions intensity (g/km)	Sales
	Mercedes-Benz Cars	GLC300E 4MFL CP	57	1
	Mercedes-Benz Cars	GLC300E 4M FL	59	307
	BMW	X3 XDRIVE30E	73	37
	Toyota	RAV4 HYBRID	108	25,850
SUV Large	BMW	IX XDRIVE50	0	12
	Audi	E7	0	34
	Audi	EB	0	74
	Jaguar	I-PACE	0	44
	BMW	IX XDRIVE40	0	23
	Kia	MQ4 SORENTO	36	15
	Volvo Car	XC90	50	170
	BMW	X5 XDRIVE45E	56	118
	Land Rover	RR SPORT	64	11
	Porsche	CAY	74	122
SUV Upper Large	Land Rover	RANGE ROVER	64	1
Vans/Cab Chassis	Renault	KANGOO	0	45
Total*				**95,873**

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



National Transport Commission

Level 3/600 Bourke Street
Melbourne, Victoria, 3000

T: (03) 9236 5000
E: enquiries@ntc.gov.au

www.ntc.gov.au

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