Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2018

Information paper
June 2019

National Transport Commission
Leading change

Executive summary

This information paper provides detailed data on the carbon dioxide emissions intensity performance of new passenger and light commercial vehicles sold in Australia during 2018.

This report focuses on vehicle emissions performance, measured in terms of grams of carbon dioxide per kilometre (g/km). This is a measure of vehicle efficiency or intensity rather than a measure of actual vehicle emissions, which depends on many factors such as distance travelled, the nature of the driving and road and traffic conditions.

Fleet-wide vehicle emissions depend on many factors including consumer preference (for example, vehicle type, engine size and power, fuel type and transmission type). Consumer preferences can also be influenced by government policies and regulations, industry influence and fuel prices.

Key findings

- In 2018 the national average carbon dioxide emissions intensity from new passenger and light commercial vehicles was 180.9 g/km. This is a 0.4 per cent improvement from 2017. This is the second lowest annual improvement since records started in 2002.
- Consumer preferences are an important factor affecting the national average of carbon dioxide emissions intensity for new vehicles. If all Australians who purchased new vehicles in 2018 had purchased vehicles with best-in-class emissions, the national average carbon dioxide emissions intensity would have been reduced to 73 g/km, a 60 per cent reduction.
- About 91 per cent of all new vehicle sales in 2018 were from 15 makes. Of these 15 makes, Audi had the lowest corporate average emissions intensity (148 g/km), and Ford had the highest (216 g/km).
- Private buyers purchased vehicles with the lowest average emissions intensity (174 g/km) in 2018, followed by business buyers (186 g/km) and government buyers (195 g/km).
- There were 93 'green' car model variants available in Australia in 2018 (compared with 97 in 2017), which represented 4.1 per cent of total sales (compared with 3.8 per cent in 2017). A 'green' car is defined as a vehicle with emissions intensity that does not exceed 120 g/km.
- The number of electric vehicles sold by FCAI members and Tesla in 2018 was 2,357 compared with 2,424 vehicles sold in 2017. This is a 3 per cent decrease.
- The average emissions intensity for new passenger vehicles in European countries was 118.5 g/km in 2017. In the same year, Australia's average emissions intensity for passenger vehicles was 171.5 g/km, 45 per cent higher.
- There are many reasons why Australian light vehicle emissions intensity are higher than in Europe. Some of the reasons include:
  - Australian consumer preferences for heavier vehicles with larger and more powerful engines
  - Australia has a lower proportion of diesel-powered engines
  - Australia has fewer government incentives for lower emissions vehicles
  - relatively lower fuel prices in Australia compared with Europe.

Contents

Executive summary 2

Abbreviations 5

1. Introduction 6

2. Methodology 7

3. Australian emissions intensity 11

3.1 Vehicle manufacturers 11

3.2 Segment type 13

3.3 Buyer type 16

3.4 Fuel type 18

3.5 Electric vehicles 19

3.6 Green vehicles 21

4. Comparison of Australian and European data 22

4.1 Passenger vehicles: average emissions intensity for the European Union and Australia for 2017 24

4.2 Passenger vehicles: average emissions intensity by country for 2017 24

4.3 Light commercial vehicles: average emissions intensity by country for 2017 25

References 26

Appendix 27

List of tables

Table 1: FCAI motor vehicle classifications and definitions 8

Table 2: Fuel consumption and corresponding average emissions intensity 9

Table 3: Best-in-class vehicles for carbon dioxide emissions intensity for each segment, 2018 15

Table 4: Emissions intensity and annual sales by electric vehicle type, 2017 and 2018 19

Table 5. Electric vehicle sales, 2017 and 2018 19

Table 6: Electric vehicle sales and Tesla registrations by state and territory 20

Table 7: European measures that have reduced carbon dioxide emissions from motor vehicles 23

Table 8: Average emissions intensity for new passenger and light commercial vehicles, 2017 and 2018 for Australia 23

Table 9: National average emissions intensity for new passenger and light commercial vehicles, 2002–2018 27

Table 10: Corporate average emissions intensity and annual sales by make, 2017 and 2018 28

Table 11: Average emissions intensity and annual sales by segment, 2017 and 2018 30

Table 12: Top selling models within segments and comparison with best-in-class model, 2018 31

Table 13: Average emissions intensity for models with a sales volume greater than 1,000 vehicles, 2018 37

Table 14: Average emissions intensity and annual sales by buyer type, 2017 and 2018 41

Table 15: Average emissions intensity and annual sales by detailed buyer type, 2017 and 2018 42

Table 16: Average emissions intensity and annual sales by fuel type, 2017 and 2018 42

Table 17: Electric vehicle sales by model for FCAI data, 2017 and 2018 43

Table 18: Electric vehicle sales by state for FCAI data, 2017 and 2018 44

Table 19: Electric vehicle sales by buyer type for FCAI data, 2017 and 2018 44

Table 20: 'Green' vehicle average emissions intensity and sales by segment, 2018 45

Table 21: Corporate average emissions intensity for new passenger vehicles for Australia, 2017 48

Table 22: Average emissions intensity for new light commercial vehicles for Australia by make, 2017 49

Table 23: Average emissions intensity and annual registrations for new passenger vehicles by country, 2016 and 2017 50

Table 24: Average emissions intensity and annual registrations for new light commercial vehicles by country, 2016 and 2017 51

List of figures

Figure 1: Average emissions intensity for top 10 selling vehicles in Australia plus other selected models, 2018 10

Figure 2: National average emissions intensity for new passenger and light commercial vehicles, 2002–2018 11

Figure 3: Corporate average emissions intensity for the top 15 makes by volume, 2018 12

Figure 4: Change in corporate average emissions intensity between 2017 and 2018 for the top 15 makes by volume 12

Figure 5: Average emissions intensity by segment, 2018 13

Figure 6: Change in average emissions intensity by segment between 2017 and 2018 14

Figure 7: Range and average emissions intensity by segment, 2018 14

Figure 8: Average emissions intensity by buyer type, 2018 16

Figure 9: Change in average emissions intensity by buyer type between 2017 and 2018 16

Figure 10: Average emissions intensity by detailed buyer type, 2018 17

Figure 11: Change in average emissions intensity between 2017 and 2018 by detailed buyer type 17

Figure 12: Average emissions intensity by fuel type, 2018 18

Figure 13: Change in average emissions intensity for new passenger and light commercial vehicles between 2017 and 2018 by fuel type 18

Figure 14: Sales of selected electric vehicles, 2017 and 2018 20

Figure 15: 'Green' vehicles sales as a percentage of total new light vehicles sold, 2008–2018 21

Figure 16: 'Green' vehicle model variants sold, 2008–2018 21

Figure 17: Average emissions intensity for new passenger vehicles by country, 2017 24

Figure 18: Average emissions intensity for light commercial vehicles by country, 2017 25

Abbreviations

FCAI Federal Chamber of Automotive Industries

g/km grams per kilometre

GVM gross vehicle mass

LPG liquefied petroleum gas

NTC National Transport Commission

SUV sports utility vehicle

1. Introduction

Each year since 2009, the National Transport Commission (NTC) has published an information paper about carbon dioxide emissions intensity for new Australian light vehicles. This information paper is the latest in this series and provides data for 2018.

The paper focuses on vehicle emissions intensity and is a measure of vehicle efficiency. It is not a measurement of actual vehicle emissions, which depends 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) is the peak industry organisation representing the manufacturers and importers of passenger vehicles, light commercial vehicles and motorcycles in Australia. FCAI collates carbon dioxide emissions intensity data from vehicle manufacturers. We use the FCAI data to prepare this information paper and we would like to thank the FCAI for making this data available for use in this report.

This information paper is divided into three main sections:

- Section 2 describes the methodology used
- Section 3 presents the results of the analysis
- Section 4 compares Australian data with European 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. They provided this data to the NTC. We entered the FCAI data into a database and analysed it. These records consisted of:

- **vehicle attributes:** including make, model, vehicle generation, body style, engine capacity, number of cylinders, engine power, transmission type, gears, number of seats, gross vehicle mass (GVM), driven wheels, country of origin, fuel type, carbon dioxide emissions intensity and fuel economy
- **vehicle category:** 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 labeling for light vehicles) and expressed in grams of carbon dioxide per kilometre (g/km).

The NTC calculated the 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.

Battery electric vehicles with no secondary engine and emissions of 0 g/km have been excluded when calculating sales weighted averages in most tables and figures in this report. Although vehicles operating on their electric engine may have no tailpipe emissions, the electricity may produce carbon dioxide emissions depending on its source.

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.

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 small, medium, large and upper large. Table 1 presents the classifications and definitions.

This information paper uses the following definitions:

- **passenger vehicles:** passenger motor vehicles and SUVs
- **light commercial vehicles:** light trucks.

Table 1: FCAI motor vehicle classifications and definitions

Passenger motor vehicles	Passenger vehicles are classified dependent on size, specification and average retail pricing. Selected vehicle types will be assessed on footprint* defined as length (m) x width (m), rounded, as follows:
Micro	Hatch, sedan or wagon with a footprint < 6.3 m^2
Light	Hatch, sedan or wagon with a footprint range 6.301–7.5 m^2
Small	Hatch, sedan or wagon with a footprint range 7.501–8.3 m^2
Medium	Hatch, sedan or wagon with a footprint range 8.301–9.0 m^2
Large	Hatch, sedan or wagon with a footprint range 9.001–9.5 m^2
Upper Large	Hatch, sedan or wagon with a footprint range > 9.501 m^2
People Movers	Wagon for passenger usage, seating capacity > 5 people
Sports	Car, coupe, convertible or roadster
Sports utility vehicles	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 (m) x width (m), rounded, as follows:
Small	< 8.1 m^2
Medium	8.101–8.8 m^2
Large	8.801–9.8 m^2
Upper Large	> 9.801 m^2
Light trucks	Vehicles designed principally for commercial use but may include designs intended for non-commercial applications.
Light Bus < 20 seats	8+ seats, but less than 20 seats
Light Bus ≥ 20 seats	20+ seats
Van/Cab Chassis ≤ 2.5t	Blind/window vans and cab chassis 2.5–3.5 t GVM
Van/Cab Chassis > 2.5–3.5t	Blind/window vans and cab chassis 2.5–3.5 t GVM
Pick-up/Chassis 4×2	Two driven wheels, normal control (bonnet), utility, cab chassis, one and a half cab and crew cab
Pick-up/Chassis 4×4	Four driven wheels, normal control (bonnet), utility, cab chassis, one and a half cab and crew cab

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 2019.

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.

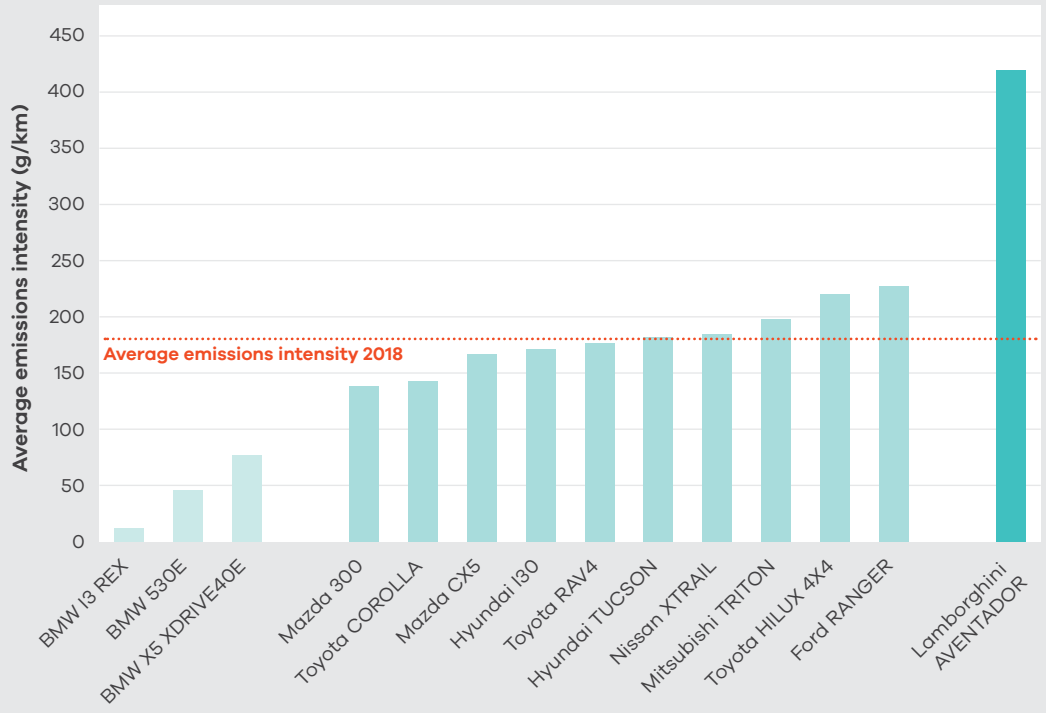
Another way to relate carbon dioxide emissions intensity to fuel is per litre of fuel consumed. For example, 1 litre of petrol will produce about 2.3 kg of carbon dioxide and 1 litre of diesel will produce about 2.7 kg of carbon dioxide.

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

To help get a frame of reference for carbon dioxide emissions intensity from vehicles, Figure 1 shows carbon dioxide emissions from the top 10 selling vehicle models in Australia during 2018. Figure 1 also contains three low emitting vehicle models[1] (excluding zero emission vehicles) and the highest emitting model. Also shown is the average emissions intensity for all Australian vehicles sold in 2018.

Figure 1: Average emissions intensity for top 10 selling vehicles in Australia plus other selected models, 2018



1 In this case, the models selected are the lowest emitting model overall; the lowest emitting model from the medium, large, or upper large segments; and the lowest emitting SUV.

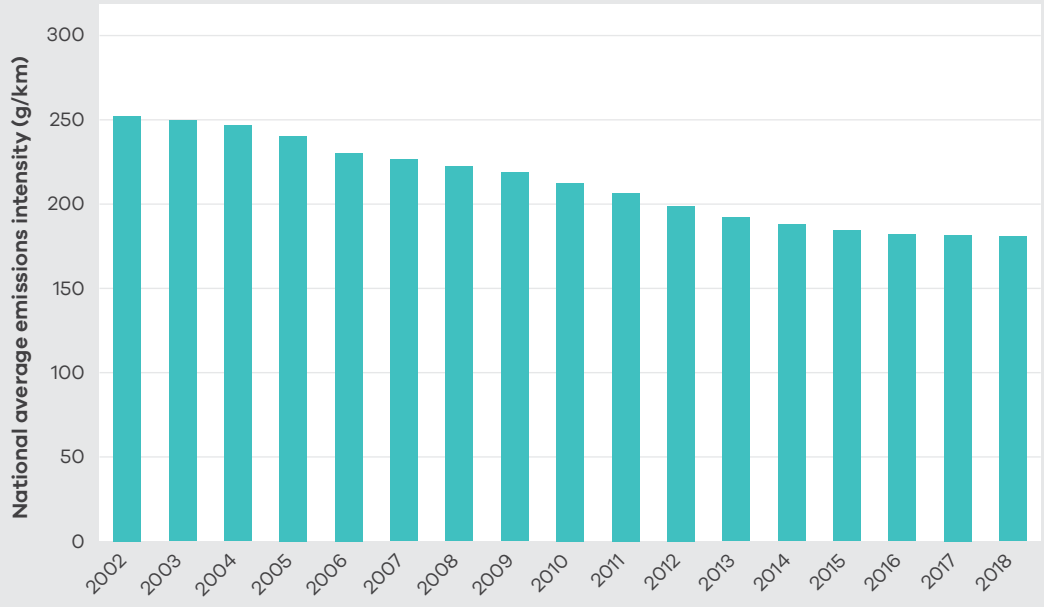
3. Australian emissions intensity

This section contains the Australian data about the carbon dioxide emissions intensity for new passenger vehicles and light commercial vehicles in 2018.

Across all new passenger and light commercial vehicles sold in 2018, the national average carbon dioxide emissions intensity was 180.9 g/km (Figure 2). This is a 0.4 per cent improvement from the previous year. This is the second lowest annual improvement since records started in 2002 (only the 2017 improvement of 0.3 per cent was smaller).

Since 2002 there has been an overall reduction of 28 per cent in carbon dioxide emissions intensity. Additional data on the annual average emissions intensity is provided in Table 9 in the appendix.

Figure 2: National average emissions intensity for new passenger and light commercial vehicles, 2002–2018



3.1 Vehicle manufacturers

In 2018 there were 53 makes of new vehicles sold to Australian consumers. Ninety one per cent of all new vehicle sales were from 15 makes. The average corporate carbon dioxide emissions intensity of these market-leading makes largely determines the national average emissions intensity.

Figure 3 shows the corporate average carbon dioxide emissions intensity for the top 15 makes in 2018 (data for all vehicle makes is provided in Table 10 in the appendix). Audi had the lowest corporate average carbon dioxide emissions intensity (148 g/km), and Ford had the highest (216 g/km).

Figure 3: Corporate average emissions intensity for the top 15 makes by volume, 2018

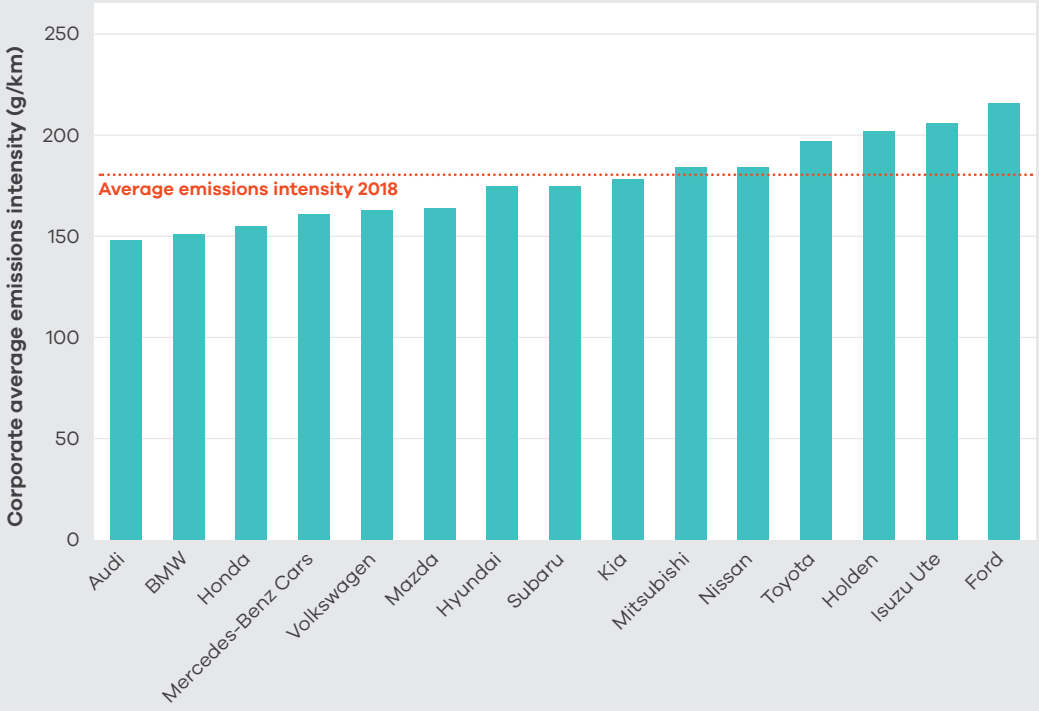
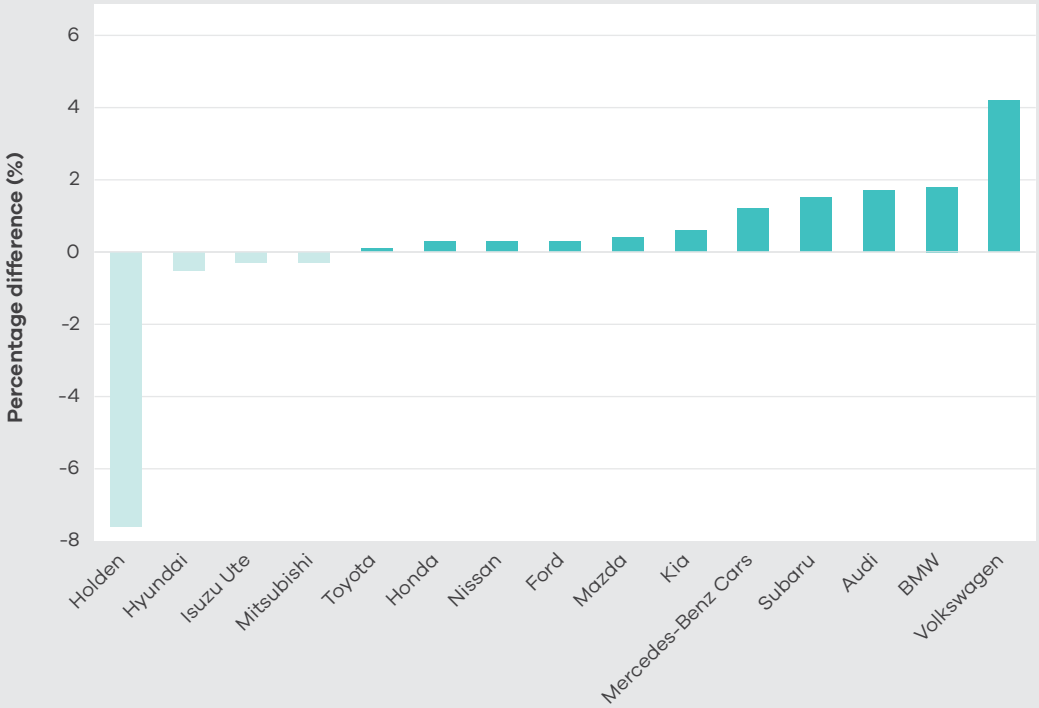


Figure 4 shows the change in corporate average carbon dioxide emissions intensity between 2017 and 2018 for the highest selling 15 makes. Holden had a 7.6 per cent reduction in average corporate emissions intensity. Volkswagen's average carbon dioxide emissions intensity increased by 4.2 per cent.

Figure 4: Change in corporate average emissions intensity between 2017 and 2018 for the top 15 makes by volume



3.2 Segment type

A segment analysis was conducted using the categories shown in Table 1.

Figure 5 shows the average carbon dioxide emissions intensity by segment during 2018. The lowest emitting segment was 'micro' (129 g/km); 'SUV upper large' (259 g/km) was the highest. Additional segment data, including the top 10 selling models for each segment, is provided in Tables 11 and 12 in the appendix.

SUVs as a segment grouping had a reduction of 0.4 per cent in average emissions intensity during 2018 (181 g/km) when compared with 2017 (182 g/km).

Figure 5: Average emissions intensity by segment, 2018

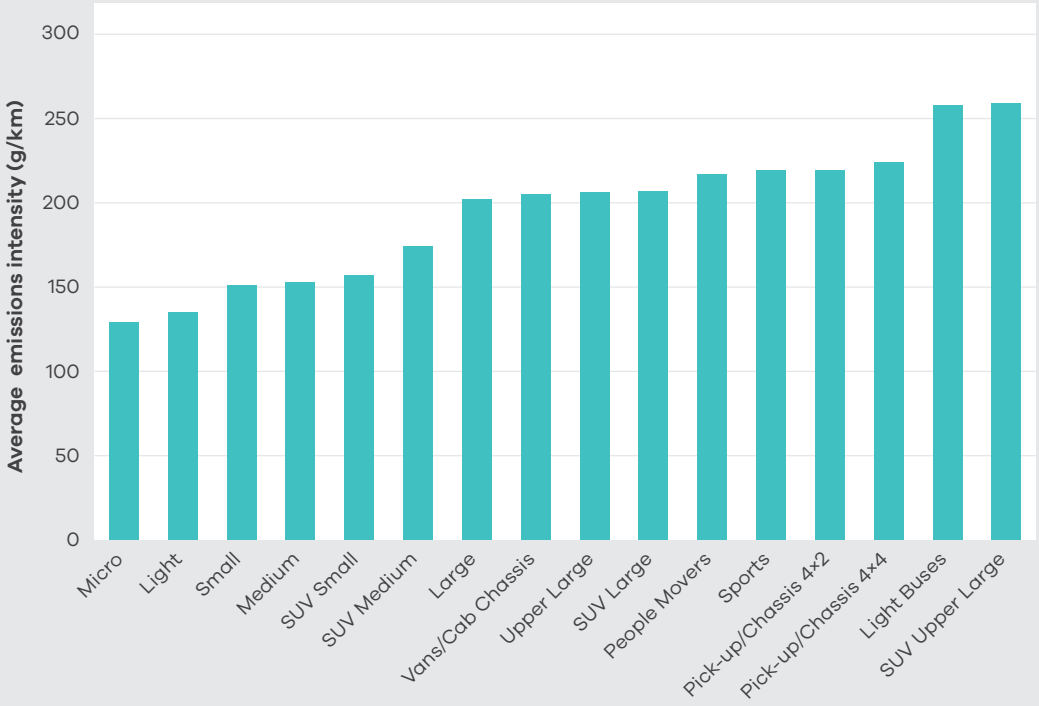


Figure 6 shows the change in average carbon dioxide emissions intensity by segment between 2017 and 2018. In 2018 the 'upper large' segment had the largest reduction of 18 per cent, while the 'sports' segment had the largest increase of average emissions intensity at 2.9 per cent.

Figure 6: Change in average emissions intensity by segment between 2017 and 2018

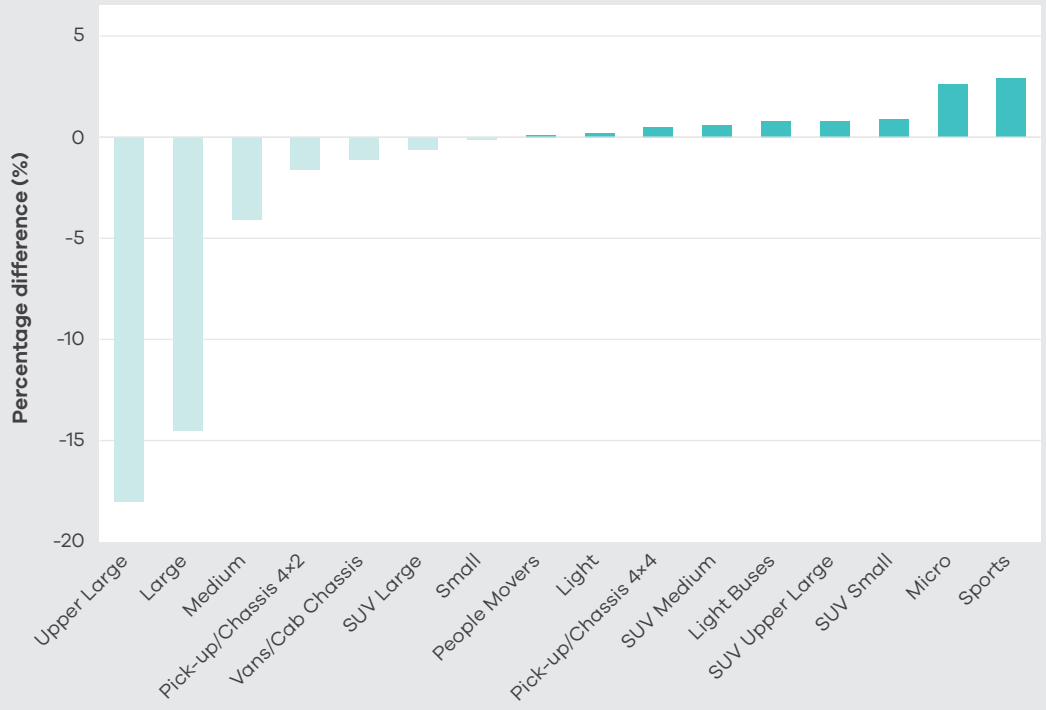
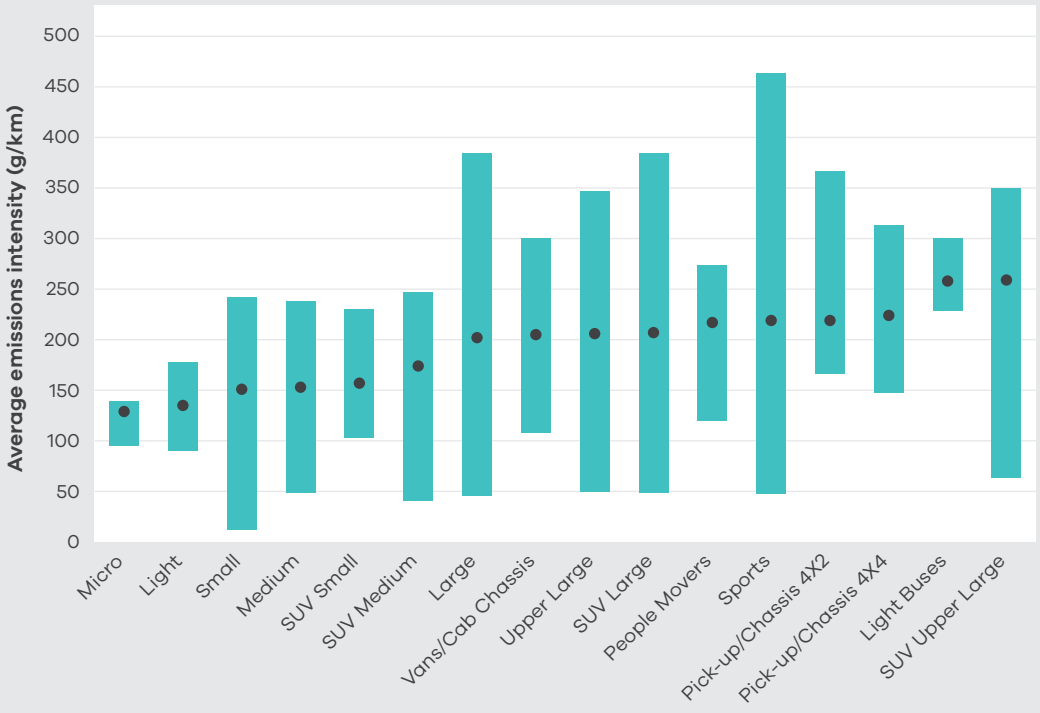


Figure 7 shows the average and the range in carbon dioxide emissions intensity for the segments during 2018. The average emissions are represented by the black dots, and the ranges are represented by the bars.

The 'small' segment had the lowest minimum emissions intensity with the BMW i3 REx emitting 12 g/km.

Figure 7: Range and average emissions intensity by segment, 2018



If Australian consumers had purchased vehicles with best-in-class carbon dioxide emissions in 2018, the national average carbon dioxide emissions would have been reduced to 73 g/km, a 60 per cent reduction. This shows the potential emissions reduction with currently available vehicles and technologies. It is important to note that fully electric vehicles with zero tailpipe emissions were excluded from this analysis to prevent the results being distorted.

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, 2018

Segment	Make and model (fuel source/s)*	Best-in-class vehicle emissions intensity (g/km)
Micro	Fiat PANDA (petrol)	95
Light	Toyota PRIUS C (petrol-electric)	90
Small	BMW I3 REX (electric-petrol)	12
	Hyundai IONIQ (petrol-electric)	79
Medium	BMW 330E (electric-petrol)	49
	Toyota CAMRY HYBRID (petrol-electric)	96
Large	BMW 530E (electric-petrol)	46
	Mercedes-Benz Cars E220D (diesel)	108
Upper Large	BMW 740E (electric-petrol)	50
	BMW 730D (diesel)	129
Sports	BMW I8 ROADSTER (electric-petrol)	48
	BMW 420D COUPE (diesel)	114
People Movers	Citroen C4 GRD PICASSO (diesel)	120
SUV Small	Lexus UX250H (petrol-electric)	103
SUV Medium	Mitsubishi OUTLANDER (electric-petrol)	41
	Peugeot 5008 (diesel)	124
SUV Large	Audi Q7 (electric-diesel)	49
	Lexus RX450H (petrol-electric)	131
SUV Upper Large	Land Rover RANGE ROVER (electric-petrol)	64
	Land Rover RANGE ROVER (diesel)	182
Pick-up/Chassis 4×2	Nissan NAVARA (diesel)	166
Pick-up/Chassis 4×4	Nissan NAVARA (diesel)	147
Vans/Cab Chassis	Citroen BERLINGO (diesel)	108
Light Buses	Toyota HIACE (diesel)	228

* If two fuel sources are shown, the first is the primary engine.

Additional data comparing the top 10 highest selling models[2] 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.

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

3.3 Buyer type

Figure 8 shows the average carbon dioxide emissions intensity by buyer type. Vehicles bought by private buyers had the lowest average carbon dioxide emissions intensity (174 g/km), followed by business buyers (186 g/km) and government buyers (195 g/km). Additional data on buyer types is provided in Table 14 in the appendix.

Figure 8: Average emissions intensity by buyer type, 2018

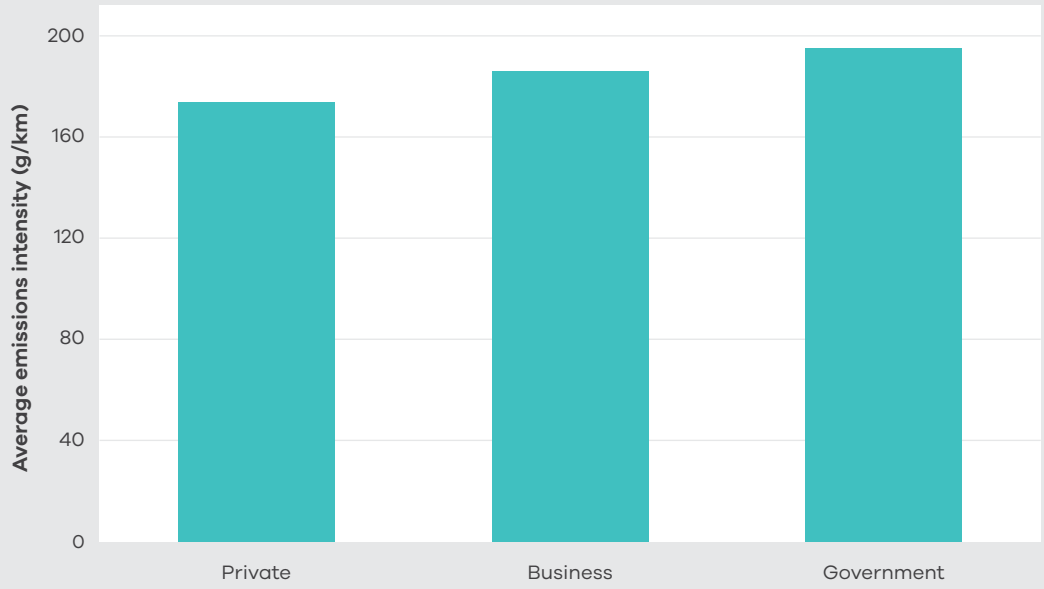


Figure 9 shows the change in average emissions intensity between 2017 and 2018. Government buyers purchased vehicles representing a 2.1 per cent reduction in average emissions, while average emissions for vehicles purchased by business buyers increased by 0.1 per cent.

Figure 9: Change in average emissions intensity by buyer type between 2017 and 2018

The three buyer types can be broken down further:

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

Figure 10 shows the average carbon dioxide emissions intensity for these buyers. The change in average emissions intensity from 2017 to 2018 is shown in Figure 11. Additional data on the detailed buyer types is provided in Table 15 in the appendix.

Figure 10: Average emissions intensity by detailed buyer type, 2018

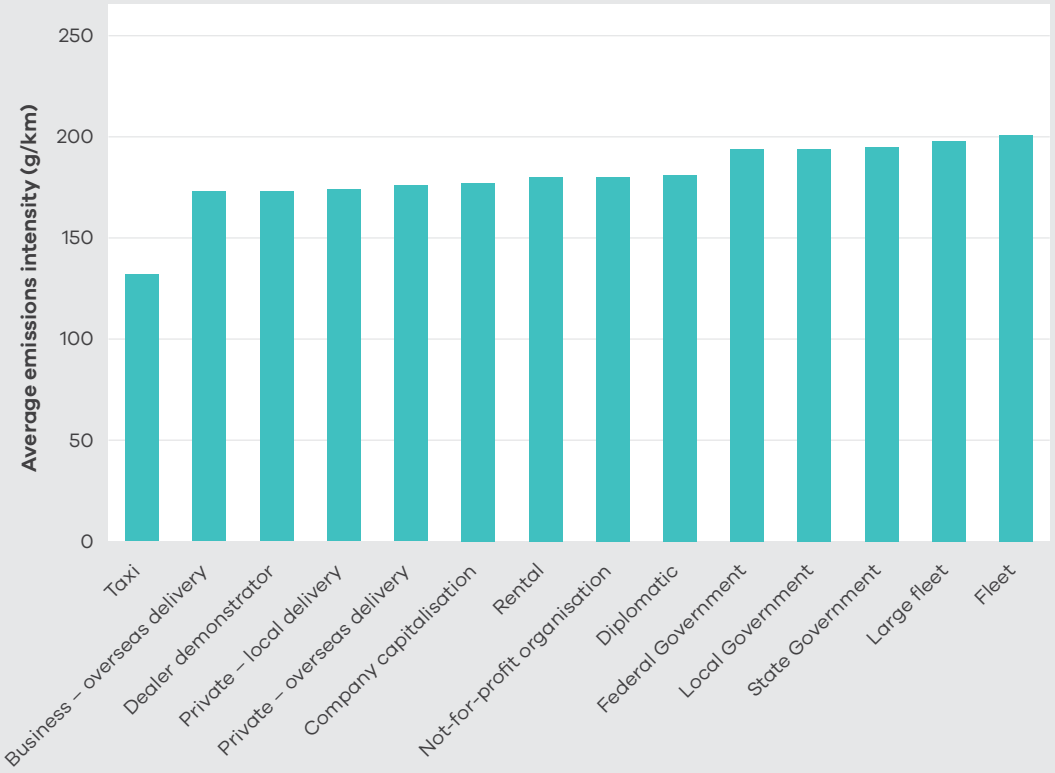
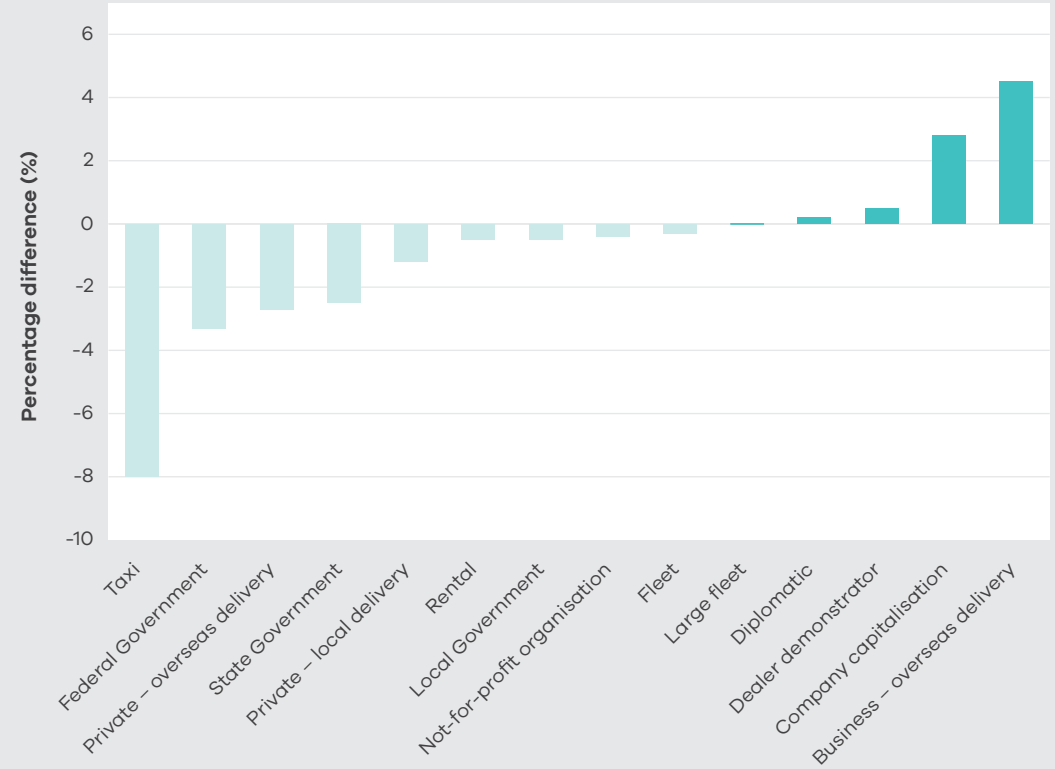


Figure 11: Change in average emissions intensity between 2017 and 2018 by detailed buyer type



3.4 Fuel type

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

Figure 12 shows the average carbon dioxide emissions intensity by fuel type for 2018 for petrol and diesel vehicles[3]. The format of this graph has changed relative to previous years because there were no liquefied petroleum gas (LPG) vehicles sold in 2018, and information about electric vehicles is reported separately in Table 4. Petrol vehicles had an average emissions intensity of 167 g/km, while diesel vehicles' average emissions intensity was 208 g/km.

Figure 13 shows that petrol vehicles had a reduction in emissions intensity of 1.5 per cent between 2017 and 2018, while the emissions intensity of diesel vehicles increased by 1.1 per cent. Additional data on fuel types is provided in Table 16 in the appendix.

Figure 12: Average emissions intensity by fuel type, 2018

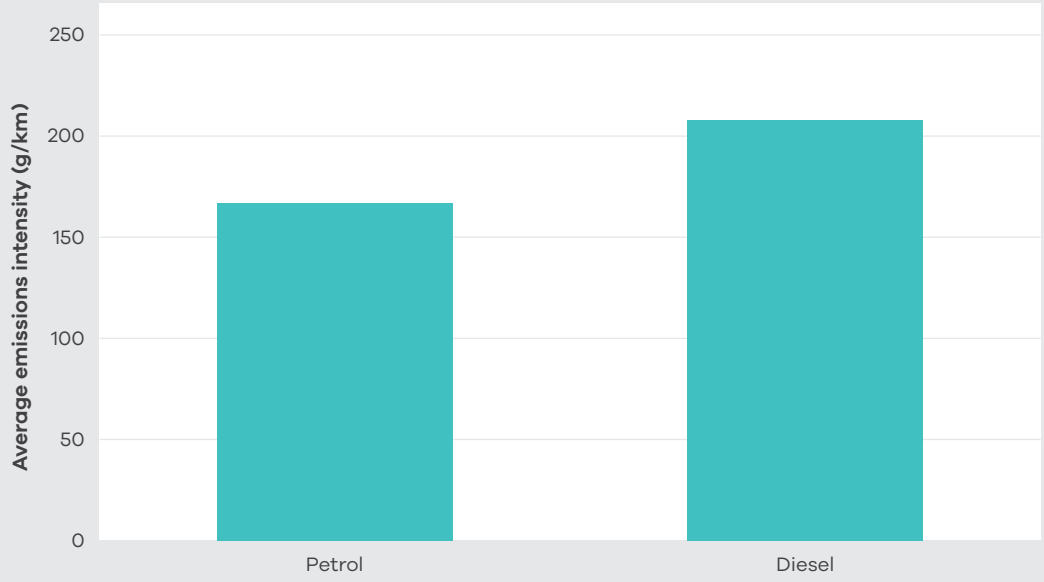
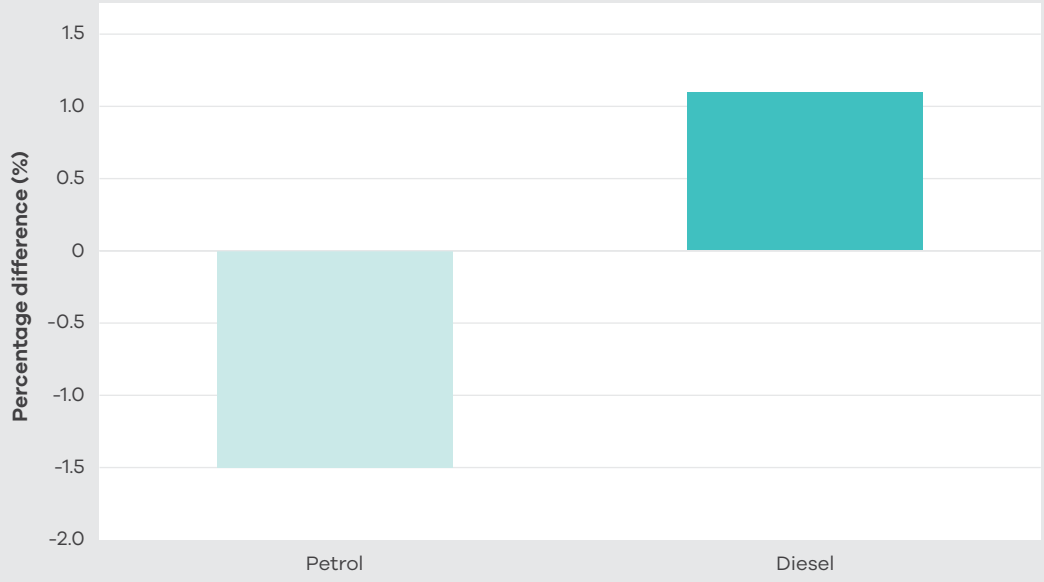


Figure 13: Change in average emissions intensity between 2017 and 201 8 by fuel type



3 Petrol and diesel are the primary fuel type for the data used in the graph. However, the data includes hybrid vehicles, where there is a secondary electric engine.

3.5 Electric vehicles

Using the FCAI data, 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.

Table 4: Emissions intensity and annual sales by electric vehicle type, 2017 and 2018

	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
Electric vehicle type	**2017**	**2018**		**2017**	**2018**
Plug-in Hybrid Electric Vehicles	49	49	-0.6	1,076	1,163
Battery Electric Vehicles	0	0	0	48	189
Total	**47**	**42**	**-10.6**	**1,124**	**1,352**

The FCAI data does not contain data about Tesla vehicles. Table 5 includes the FCAI data on electric vehicles sales and the NTC's estimates of the number of Tesla vehicles sold to determine total electric vehicle sales in Australia. We have used state- and territory-based registration systems for the number of Tesla vehicles for 2017 and 2018. The total number of electric vehicles sold in 2018 was 2,357 compared to 2,424 vehicles sold in 2017. This is a 3 per cent decrease.

Table 5. Electric vehicle sales, 2017 and 2018

	Sales		Change from 2017 to 2018 (%)
Make	**2017**	**2018**	
Tesla	1,300[a]	1,005[b]	-23
All other makes[c]	1,124	1,352	20
Total	**2,424**	**2,357**	**-3**

a. New registrations from state- and territory-based registration systems for May 2017 to May 2018

b. New registrations from state- and territory-based registration systems for December 2017 (estimated using the May 2017 and May 2018 data points) to December 2018

c. FCAI data

The total number of registered Tesla electric vehicles in the Australian fleet in December 2018 was 3,208.

There were 27 models of electric vehicles available in 2018 compared to 22 models in 2017. Figure 14 shows the sales of the more popular electric vehicle models in 2017 and 2018, as well as showing the emissions intensity for each of the models shown (plotted on the secondary axis). Additional data on sales by model, state and buyer type for 2017 and 2018 for the FCAI data are provided in Tables 17, 18 and 19 in the appendix.

Figure 14: Sales of selected electric vehicles, 2017 and 2018

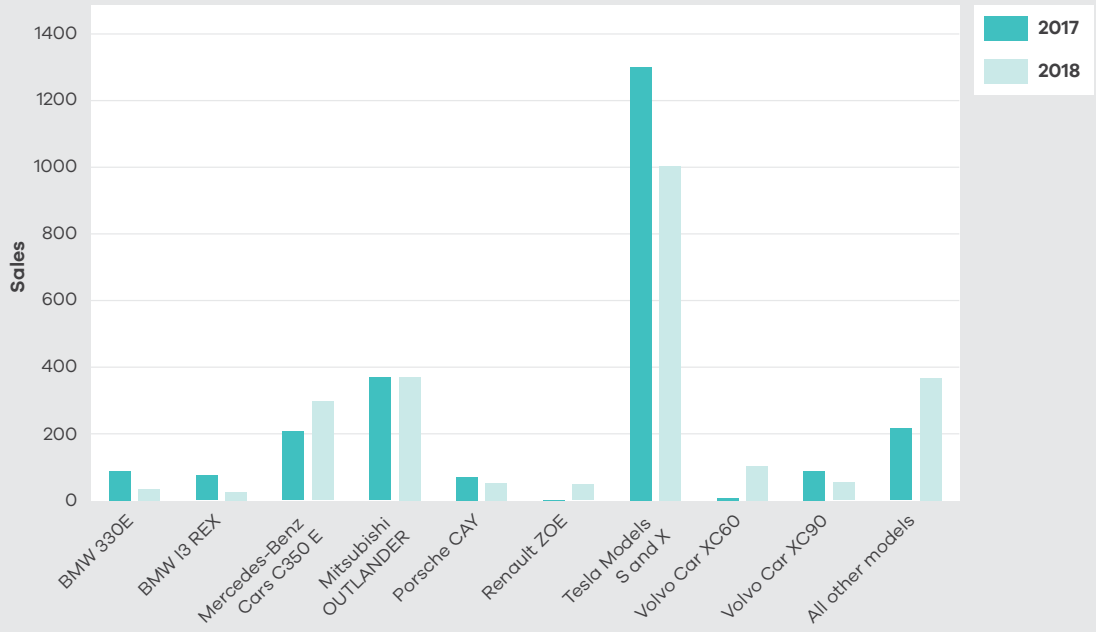


Table 6 summarises various types of electric vehicle data by state and territory. The first row of data summarises electric vehicle sales in 2018 from the FCAI data. The second row of data shows all electric vehicle sales between 2010 and 2018 in each state and territory, and again relies on the FCAI data. The final row of data shows the number of Tesla vehicles registered in each state and territory as at 20 December 2018. 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[4].

The NTC estimates there were around 9,000 electric vehicles in the Australian vehicle fleet at the end of 2018. The total number of passenger vehicles and light commercial vehicles in Australia was 17.5 million (ABS 2018).

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 2018 (excluding Tesla)	37	461	1	210	147	14	401	81	**1,352**
Total electric vehicle sales from 2010 to 2018 (excluding Tesla)	187	1,440	15	799	1,193	73	1,510	427	**5,644**
Tesla registrations as at 20 December 2018*	66	1,272	3	541	87	21	1,059	159	**3,208**

* Registrations from state- and territory-based registration systems as at 20 December 2018

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

3.6 Green vehicles

As in previous reports, 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 2018 was 4.1 per cent of total sales (compared with 3.8 per cent in 2017). Figure 15 shows 'green' vehicle sales as a proportion of total new light vehicle sales between 2008 and 2018.[5]

There were 93 green car model variants[6] available in Australia in 2018 (compared with 97 in 2017). This includes electric vehicles with zero emissions. Figure 16 shows the number of green vehicle model variants sold in Australia for each year from 2008 and 2018.

Table 20 in the appendix provides more detail on green vehicles sold in Australia in 2018.

Figure 15: 'Green' vehicles sales as a percentage of total new light vehicles sold, 2008–2018

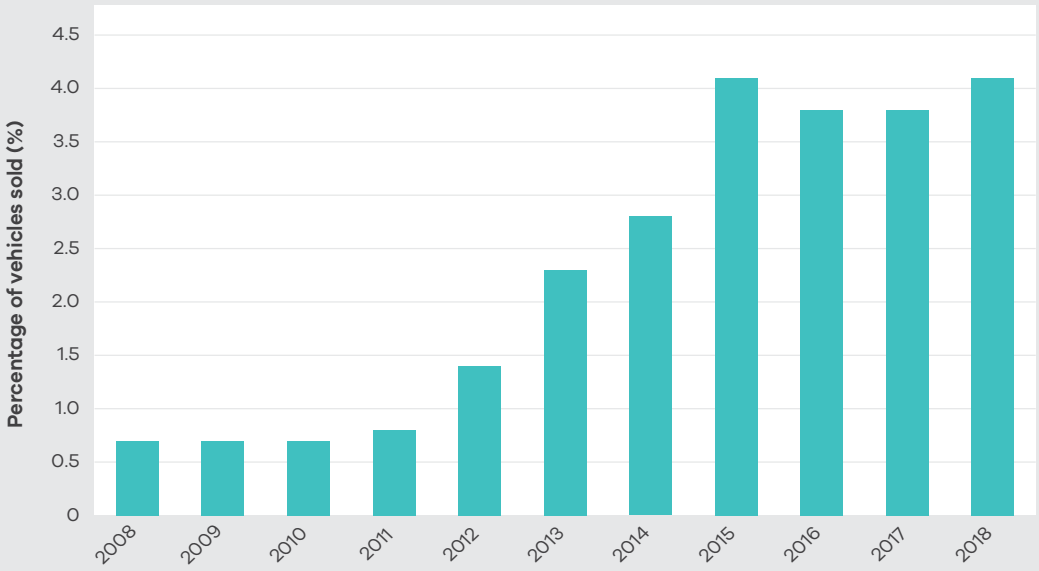
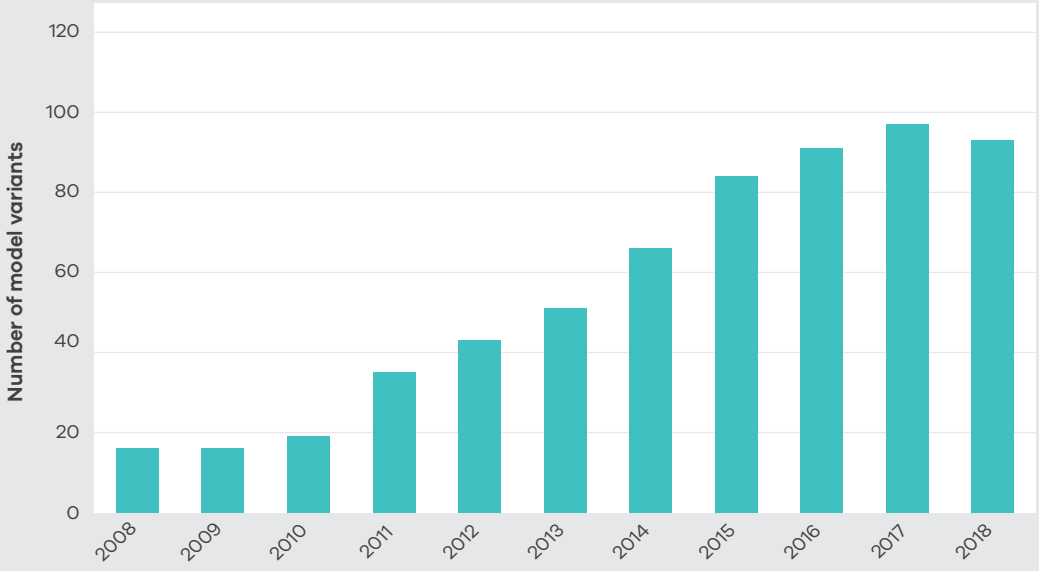


Figure 16: 'Green' vehicle model variants sold, 2008–2018



5 We have identified slight inconsistencies in the way that green vehicles sales were calculated in previous years. The time series shown in Figures 15 and 16 are now determined on a consistent basis throughout the period shown; however, the numbers shown for historical years may be slightly different than what has been published in previous reports.

6 In the context of this table, a 'variant' generally means that each vehicle model name appears once only, even if under that one vehicle model 'variant' there are differences in attributes such as fuel types or emissions. However, there are certain exceptions such as the Audi A3 and MINI Cooper—which both appear as two 'variants' in 2018—as a result of having a listing in two market 'segments' (small or light, and sports).

4. Comparison of Australian and European data

This section compares Australian and European data.

In the past different methods were used worldwide to calculate vehicle emissions. The three main methods were 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 will progressively be used around the world from 2019. Australia has not yet made a decision about the timing for adopting the WLTP.

Australia currently uses the European method. This makes the Australian data directly comparable with European data. However, the published data from Europe separates passenger vehicles from light commercial vehicles. 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).

We sourced the European data from the European Environment Agency (2019). As the data illustrates, emissions from new vehicles in the European countries analysed are 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 7. A summary of the European measures was published by the European Conference of Ministers of Transport (2007).

There are also other consumer preferences that contribute to the difference emissions performance between Australia and Europe. For example, European consumers purchase more small vehicles compared with Australian consumers. In addition, European consumers prefer manual transmission vehicles, whereas Australian consumers prefer automatic transmissions.

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

European measure	Intent of measure
High fuel prices through higher fuel taxes	Encourages consumers to purchase fuel-efficient vehicles to lower running costs.
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 vehicles	Encourages consumers to purchase low carbon dioxide 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.

Table 8 gives separated emissions data for passenger and light commercial vehicles. The average carbon dioxide emissions intensity for passenger vehicles and light commercial vehicles sold in Australia during 2018 was 169.8 g/km and 221.5 g/km respectively.

Table 8: Average emissions intensity for new passenger and light commercial vehicles, 2017 and 2018 for Australia

Groupings	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)
	2017	2018	
Passenger vehicles	171.5	169.8	-1.0
Light commercial vehicles	221.2	221.5	0.1

The rest of this section compares Australian and European carbon dioxide emissions intensity data for passenger and light commercial vehicles separately.

In past reports we have included comparisons for manufacturers between Australia and Europe. We have not included these comparisons in the past two years' reports as we have found it difficult to undertake these comparisons because the European data is now much more disaggregated. However, we have included the Australian data in Tables 21 and 22 in the appendix for those that wish to undertake these manufacturer comparisons.

4.1 Passenger vehicles: average emissions intensity for the European Union and Australia for 2017

The average carbon dioxide emissions intensity of a new car sold in the European Union rose in 2017. The average carbon dioxide emissions intensity was 118.5 g/km in 2017, 0.4 per cent higher than in 2016. This was the first time the emissions intensity has risen since monitoring started in 2010 under the current European Union laws. According to the European Federation for Transport and Environment (2018), the main reasons for this rise are increasing sales of SUVs and more powerful vehicles.

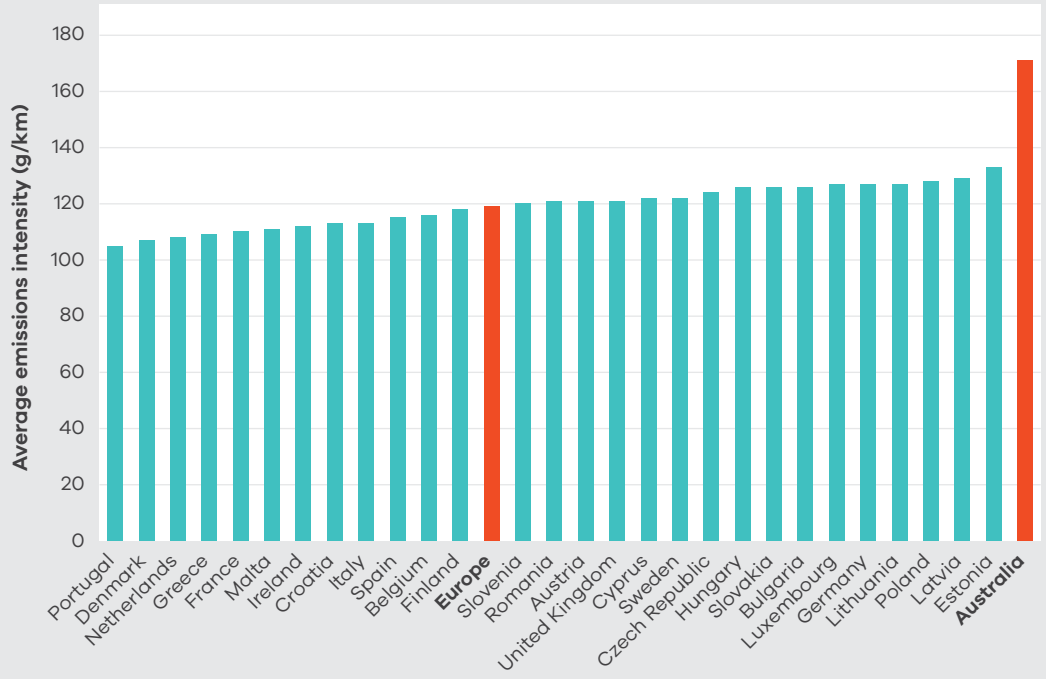
In 2017, Australia's average emissions intensity for passenger vehicles was 171.5 g/km, 45 per cent higher than the European Union.

4.2 Passenger vehicles: average emissions intensity by country for 2017

The breakdown for average carbon dioxide emissions intensity for new passenger vehicles by country for 2017 is shown in Figure 17. In 2017, European emissions intensity ranged from 105 g/km in Portugal to 133 g/km in Estonia (meaning Australia's average emissions intensity is 64 per cent and 29 per cent higher, respectively).

European average emissions intensity increased by 0.4 per cent for 2017 compared with 2016. In the same time, Australia's average emissions intensity fell by 0.7 per cent (see Table 23 in the appendix). The European countries that showed the highest annual reductions were Finland (1.5 per cent), Romania (1.1 per cent) and Malta (1.1 per cent), while the Czech Republic and Greece saw the highest increases (both increasing by 2.4 per cent). Additional European data is provided in Table 23 in the appendix.

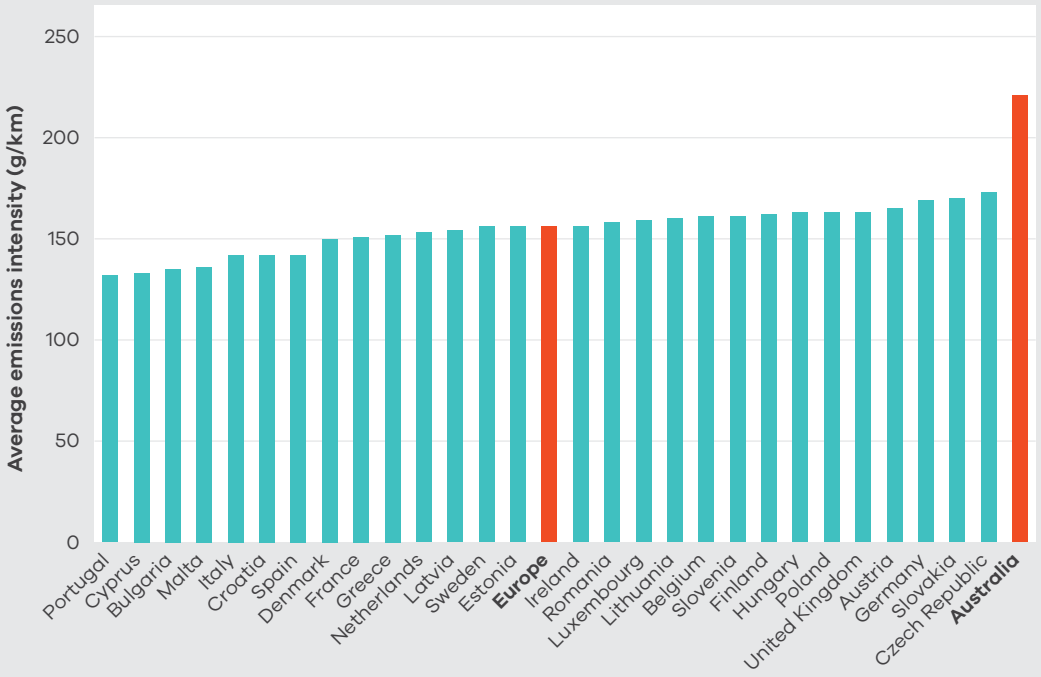
Figure 17: Average emissions intensity for new passenger vehicles by country, 2017



4.3 Light commercial vehicles: average emissions intensity by country for 2017

Figure 18 shows the average carbon dioxide emissions intensity for light commercial vehicles in Europe was 156 g/km in 2017. The average Australian emissions intensity was 221 g/km – which is 42 per cent higher than Europe. European average emissions intensity decreased by 4.6 per cent for 2017 compared with 2016. In the same time, Australia's average emissions intensity fell by 0.4 per cent (see Table 24 in the appendix).

Figure 18: Average emissions intensity for light commercial vehicles by country, 2017



References

Australian Bureau of Statistics (ABS) 2018, *Motor Vehicle Census, Australia, 31 Jan 2018,* July, Canberra.

Department of Climate Change (2009). *National Greenhouse Accounts (NGA) Factors*, June, Canberra.

European Environment Agency (EEA) 2019, *Monitoring CO_2 emissions from new passenger cars and vans in 2017*, EEA, Copenhagen.

European Conference of Ministers of Transport 2007, *Cutting transport CO_2 emissions. What progress?*, Paris.

Federal Chamber of Automotive Industries (FCAI) 2019, FCAI segmentation criteria, viewed on 19 February 2019, www.fcai.com.au/sales/segmentation-criteria

Transport and Environment 2018, Rise in car CO_2 emissions last year due to surging SUV sales, not declining diesel – analysis, viewed on 15 May 2018, www.transportenvironment.org/news/rise-car-co2-emissions-last-year-due-surging-suv-sales-not-declining-diesel-%E2%80%93-analysis

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, 2002–2018

Year	Average emissions intensity (g/km)	Annual change (%)
2002	252.4	n/a*
2003	249.5	-1.1
2004	246.5	-1.2
2005	240.5	-2.4
2006	230.3	-4.2
2007	226.4	-1.7
2008	222.4	-1.8
2009	218.6	-1.7
2010	212.6	-2.7
2011	206.6	-2.8
2012	199.0	-3.7
2013	192.2	-3.4
2014	187.8	-2.3
2015	184.2	-1.9
2016	182.1	-1.1
2017	181.7	-0.3
2018	180.9	-0.4

* n/a – not applicable

Table 10: Corporate average emissions intensity and annual sales by make, 2017 and 2018

Make	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
	2017	2018		2017	2018
Toyota	196	197	0.1	216,256	216,779
Mazda	163	164	0.4	116,349	111,280
Hyundai	176	175	-0.5	97,013	94,153
Mitsubishi	184	184	-0.3*	80,654	84,944
Ford	215	216	0.3	77,212	68,263
Holden	219	202	-7.6	90,306	60,751
Kia	177	178	0.6	54,737	58,815
Nissan	184	184	0.3*	56,594	57,699
Volkswagen	157	163	4.2	57,536	56,115
Honda	155	155	0.3*	46,783	51,525
Subaru	173	175	1.5	52,511	50,015
Mercedes-Benz Cars	159	161	1.2	36,933	32,026
Isuzu Ute	207	206	-0.3	25,804	27,640
BMW	148	151	1.8	23,576	23,003
Audi	145	148	1.7	22,011	19,416
Suzuki	133	129	-2.7	19,256	17,601
Land Rover	167	169	1.1	13,112	10,089
Lexus	177	178	0.4	8,800	8,819
Renault	159	160	0.6	8,902	8,225
Jeep	221	227	2.6	8,270	7,326
Volvo Car	155	157	0.8	4,681	6,693
LDV	248	247	-0.2	2,580	6,064
Skoda	137	139	2.0	5,350	5,807
Porsche	187	197	5.3	4,484	3,909
Mercedes-Benz Vans	166	183	10.6	2,213	3,894
MINI	130	133	2.5	3,712	3,590
MG	175	166	-5.7	600	3,007
Peugeot	132	138	4.0	3,392	2,838
Jaguar	161	157	-2.8	2,483	2,640
Alfa Romeo	153	149	-2.3	1,057	1,279
Fiat	135	130	-3.9	2,008	1,158
Great Wall	228	222	-2.5	404	784
Infiniti	208	209	0.3	776	649
Maserati	211	226	7.1	740	642
Haval	226	227	0.5	710	633

Table 10 (continued)

Make	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
	2017	2018		2017	2018
Citroen	126	123	-2.8	735	494
RAM	-	253	n/a	-	491
Chrysler	281	291	3.6	258	250
Ferrari	272	284	4.4	210	241
Bentley	272	283	4.3	219	208
Aston Martin	287	263	-8.2	144	167
Lamborghini	310	316	1.9	122	134
McLaren	257	250	-2.9	116	88
Fiat Professional	145	137	-6.1	107	79
Lotus	198	201	1.2	62	56
Rolls-Royce	329	333	1.0	45	40
Alpine	-	137	n/a	-	32
Genesis	249	232	-7.1	26	19
Morgan	206	204	-0.9	8	10
Caterham	-	172	n/a	-	3
Ssangyong	208	198	-4.9	96	3
Chery	204	214	4.8	7	1
Proton	204	193	-5.6	39	1
Dodge	242	-	n/a	4	-
Foton Light	218	-	n/a	371	-
Total	**182**	**181**	**-0.4**	**1,150,374**	**1,110,388**

* Due to rounding, average emissions intensity appear the same for 2017 and 2018. However, the percentage change considers the unrounded figure.

Table 11: Average emissions intensity and annual sales by segment, 2017 and 2018

Segment	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
	2017	2018		2017	2018
SUV Medium	173	174	0.6	195,655	206,450
Small	151	151	-0.1*	220,104	199,123
Pick-up/Chassis 4×4	223	224	0.5	165,276	173,263
SUV Small	155	157	0.9	117,573	139,163
SUV Large	208	207	-0.6	136,684	132,662
Light	134	135	0.2	84,247	76,664
Medium	160	153	-4.1	63,423	46,231
Pick-up/Chassis 4×2	223	219	-1.6	41,818	37,668
Vans/Cab Chassis	207	205	-1.1	25,419	23,328
Sports	212	219	2.9	27,311	18,571
SUV Upper Large	257	259	0.8	15,722	16,933
Large	236	202	-14.5	32,818	15,405
People Movers	217	217	0.1*	13,551	13,357
Micro	126	129	2.6	7,142	7,819
Light Buses	256	258	0.8	2,262	2,642
Upper Large	251	206	-18.0	1,369	1,109
Total	**182**	**181**	**-0.4**	**1,150,374**	**1,110,388**

* Due to rounding, average emissions intensity appear the same for 2017 and 2018. However, the percentage change considers the unrounded figure.

Table 12: Top selling models within segments and comparison with best-in-class model, 2018

SEGMENT	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best -in-class model (%)	Best-in-class emissions intensity (g/km)*
MICRO	1	Kia	JA PICANTO	5,394	133	40	**95** Fiat PANDA (petrol)
	2	Mitsubishi	MIRAGE	1,032	110	16	
	3	Holden	SPARK	619	136	43	
	4	Fiat	500	514	115	21	
	5	Fiat	ABARTH	256	139	46	
	6	Suzuki	CELERIO	3	111	16	
	7	Fiat	PANDA	1	95	0	
LIGHT	1	Hyundai	ACCENT	15,675	153	70	**90** Toyota PRIUS C (petrol-electric)
	2	Mazda	200	10,775	119	32	
	3	Toyota	YARIS	9,542	146	62	
	4	Suzuki	SWIFT	7,785	116	28	
	5	Honda	JAZZ	6,887	136	52	
	6	Kia	YB RIO	6,595	144	60	
	7	Volkswagen	POLO	5,433	115	28	
	8	Holden	BARINA	3,767	154	71	
	9	MINI	COOPER	2,287	127	41	
	10	Suzuki	BALENO	2,071	125	39	
SMALL	1	Toyota	COROLLA	35,320	143	1,091	**12** BMW I3 REX (electric-petrol)
	2	Mazda	300	31,065	138	1,051	
	3	Hyundai	I30	28,188	171	1,321	
	4	Volkswagen	GOLF	19,076	137	1,045	
	5	Kia	CERATO YD	13,715	169	1,306	
	6	Holden	ASTRA	9,876	140	1,063	
	7	Subaru	IMPREZA	9,215	157	1,209	
	8	Honda	CIVIC 5D	8,483	146	1,119	
	9	Mitsubishi	LANCER	7,043	174	1,347	
	10	Kia	BD CERATO	4,905	167	1,294	

Table 12 (continued)

SEGMENT	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best -in-class model (%)	Best-in-class emissions intensity (g/km)*
MEDIUM	1	Toyota	CAMRY	8,040	183	273	**49** BMW 330E (electric-petrol)
	2	Toyota	CAMRY HYBRID	6,041	97	98	
	3	Mazda	600	3,328	166	239	
	4	Ford	MONDEO	1,914	148	203	
	5	Volkswagen	PASSAT	1,804	141	188	
	6	Skoda	OCTAVIA	1,794	131	168	
	7	Subaru	LIBERTY	1,595	180	267	
	8	Audi	A4	1,360	135	175	
	9	Mercedes-Benz Cars	C200	1,310	146	198	
	10	BMW	330I	1,236	136	178	
LARGE	1	Holden	COMMODORE	9,040	213	364	**46** BMW 530E (electric-petrol)
	2	Kia	CK STINGER	1,957	235	410	
	3	Skoda	SUPERB	837	156	240	
	4	Mercedes-Benz Cars	E200	377	144	213	
	5	Mercedes-Benz Cars	M-AMG E63 S	243	212	361	
	6	Mercedes-Benz Cars	E220D	241	112	144	
	7	Jaguar	XF	222	148	222	
	8	Audi	A6	197	146	216	
	9	Maserati	GHIBLI	194	207	351	
	10	BMW	530I	162	142	208	

Table 12 (continued)

SEGMENT	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best -in-class model (%)	Best-in-class emissions intensity (g/km)*
UPPER LARGE	1	Chrysler	300 LX	250	291	482	**50** BMW 740E (electric-petrol)
	2	Mercedes-Benz Cars	S350 D FL	136	141	182	
	3	Porsche	97A	105	146	192	
	4	Lexus	LS500	66	217	334	
	5	BMW	630I GT	63	159	219	
	6	Maserati	QUATTROPORTE	44	231	361	
	7	Mercedes-Benz Cars	S450L FL	42	192	284	
	8	BMW	740I	41	164	228	
	9	Holden	CAPRICE	38	300	500	
	10	Mercedes-Benz Cars	S400D L FL	35	143	186	
PEOPLE MOVERS	1	Kia	CARNIVAL YP	6,610	233	94	**120** Citroen C4 GRD PICASSO (diesel)
	2	Honda	ODYSSEY	1,895	182	51	
	3	Volkswagen	MULTIVAN	1,095	201	67	
	4	LDV	G10	810	272	127	
	5	Toyota	TARAGO	738	214	78	
	6	Hyundai	IMAX	706	231	92	
	7	Mercedes-Benz Vans	V-CLASS	569	168	40	
	8	Mercedes-Benz Vans	VALENTE	392	166	38	
	9	Volkswagen	CADDY	253	138	15	
	10	Volkswagen	CARAVELLE	125	220	83	
SPORTS	1	Ford	MUSTANG	6,412	284	492	**48** BMW I8 ROADSTER (electric-petrol)
	2	Toyota	86	957	178	270	
	3	Mazda	MX5	835	165	243	
	4	Subaru	BRZ	688	181	277	
	5	BMW	M2	569	194	304	
	6	Porsche	911	511	239	398	
	7	Hyundai	VELOSTER	427	150	213	
	8	Audi	A5	400	142	196	
	9	Porsche	982	335	168	250	
	10	Nissan	370Z	326	248	416	

Table 12 (continued)

SEGMENT	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best -in-class model (%)	Best-in-class emissions intensity (g/km)*
SUV SMALL	1	Mitsubishi	ASX	19,034	176	71	**103** Lexus UX250H (petrol-electric)
	2	Mazda	CX3	16,293	147	42	
	3	Nissan	QASHQAI	13,950	159	55	
	4	Subaru	XV	12,937	159	54	
	5	Hyundai	KONA	12,352	164	59	
	6	Honda	HR-V	12,148	157	52	
	7	Toyota	C-HR	9,716	145	41	
	8	Mitsubishi	ECLIPSE CROSS	7,521	166	61	
	9	Holden	TRAX	5,433	163	58	
	10	Suzuki	VITARA	5,023	139	35	
SUV MEDIUM	1	Mazda	CX5	26,173	167	307	**41** Mitsubishi OUTLANDER (electric-petrol)
	2	Toyota	RAV4	22,165	177	333	
	3	Nissan	XTRAIL	21,192	185	351	
	4	Hyundai	TUCSON	19,261	182	344	
	5	Honda	CR-V	16,107	166	305	
	6	Mitsubishi	OUTLANDER	15,573	163	297	
	7	Kia	QL SPORTAGE	14,042	181	342	
	8	Subaru	FORESTER	12,432	198	382	
	9	Volkswagen	TIGUAN	9,146	170	316	
	10	Holden	EQUINOX	4,999	177	332	
SUV LARGE	1	Toyota	PRADO	18,553	211	331	**49** Audi Q7 (electric-diesel)
	2	Toyota	KLUGER	14,743	216	341	
	3	Subaru	OUTBACK	10,378	174	254	
	4	Isuzu Ute	MU-X	9,090	210	329	
	5	Mazda	CX9	8,094	201	310	
	6	Hyundai	SANTA FE	7,523	209	326	
	7	Mitsubishi	PAJERO SPORT	6,566	212	333	
	8	Ford	EVEREST	5,482	214	337	
	9	Holden	CAPTIVA	5,100	234	377	
	10	Kia	SORENTO UM	4,385	201	310	

Table 12 (continued)

SEGMENT	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best -in-class model (%)	Best-in-class emissions intensity (g/km)*
SUV UPPER LARGE	1	Toyota	LANDCRUISER	13,677	253	295	**64** Land Rover RANGE ROVER (electric-petrol)
	2	Nissan	PATROL	1,259	343	436	
	3	Mercedes-Benz Cars	GLS350D 4M	831	199	211	
	4	Land Rover	RANGE ROVER	283	237	270	
	5	Lexus	LX570	262	334	422	
	6	Lexus	LX450D	142	250	291	
	7	Bentley	BENTAYGA	98	251	292	
	8	Infiniti	QX80	93	342	434	
	9	Mercedes-Benz Cars	M-AMG G63 FL	69	299	367	
	10	Mercedes-Benz Cars	GLS63 AMG 4M	64	288	350	
PICK-UP/CHASSIS 4×2	1	Toyota	HILUX 4X2	13,125	238	44	**166** Nissan NAVARA (diesel)
	2	Isuzu Ute	D-MAX	5,324	198	19	
	3	Ford	RANGER	5,261	202	22	
	4	Nissan	NAVARA	3,458	174	5	
	5	Mazda	B32	2,999	243	46	
	6	Mitsubishi	TRITON	2,920	208	25	
	7	Holden	COLORADO	2,172	240	45	
	8	Mazda	B22	1,445	216	30	
	9	Great Wall	STEED	350	224	35	
	10	Holden	HOLDEN UTILITY	342	316	90	
PICK-UP/CHASSIS 4×4	1	Toyota	HILUX 4X4	38,580	220	49	**147** Nissan NAVARA (diesel)
	2	Ford	RANGER	36,883	227	54	
	3	Mitsubishi	TRITON	21,976	198	35	
	4	Holden	COLORADO	16,129	243	66	
	5	Isuzu Ute	D-MAX	13,226	207	41	
	6	Nissan	NAVARA	12,998	182	24	
	7	Toyota	LANDCRUISER	10,037	281	91	
	8	Volkswagen	AMAROK	9,059	229	56	
	9	Mazda	B32	8,723	262	78	
	10	LDV	T60	3,194	249	69	

Table 12 (continued)

SEGMENT	Selling rank within segment	Make	Model	Sales	Average emissions intensity (g/km)	Difference in average emissions intensity compared with best -in-class model (%)	Best-in-class emissions intensity (g/km)*
VANS/CAB CHASSIS	1	Toyota	HIACE	6,852	239	121	**108** Citroen BERLINGO (diesel)
	2	Hyundai	ILOAD	4,362	228	111	
	3	Volkswagen	TRANSPORTER	2,095	201	87	
	4	Volkswagen	CADDY VAN	1,974	139	29	
	5	Renault	TRAFIC	1,922	164	52	
	6	Ford	TRANSIT CUSTOM	1,880	182	68	
	7	LDV	G10	1,337	231	114	
	8	Mercedes-Benz Vans	VITO	1,320	168	56	
	9	Renault	KANGOO	800	139	29	
	10	LDV	V80	444	240	123	
LIGHT BUSES	1	Toyota	HIACE	2,641	258	13	**228** Toyota HIACE (diesel)
	2	LDV	V80	1	233	2	

* Best-in-class is the lowest emissions model variant and excludes fully electric vehicles with emissions of 0 g/km.

Table 13: Average emissions intensity for models with a sales volume greater than 1,000 vehicles, 2018

Rank	Make	Model	Average emissions intensity (g/km)	Sales
1	Toyota	HILUX 4X4	220	38,580
2	Ford	RANGER	227	36,883
3	Toyota	COROLLA	143	35,320
4	Mazda	300	138	31,065
5	Hyundai	I30	171	28,188
6	Mazda	CX5	167	26,173
7	Toyota	RAV4	177	22,165
8	Mitsubishi	TRITON	198	21,976
9	Nissan	XTRAIL	185	21,192
10	Hyundai	TUCSON	182	19,261
11	Volkswagen	GOLF	137	19,076
12	Mitsubishi	ASX	176	19,034
13	Toyota	PRADO	211	18,553
14	Mazda	CX3	147	16,293
15	Holden	COLORADO	243	16,129
16	Honda	CR-V	166	16,107
17	Hyundai	ACCENT	153	15,675
18	Mitsubishi	OUTLANDER	163	15,573
19	Toyota	KLUGER	216	14,743
20	Kia	QL SPORTAGE	181	14,042
21	Nissan	QASHQAI	159	13,950
22	Kia	CERATO YD	169	13,715
23	Toyota	LANDCRUISER	253	13,677
24	Isuzu Ute	D-MAX	207	13,226
25	Toyota	HILUX 4X2	238	13,125
26	Nissan	NAVARA	182	12,998
27	Subaru	XV	159	12,937
28	Subaru	FORESTER	198	12,432
29	Hyundai	KONA	164	12,352
30	Honda	HR-V	157	12,148
31	Mazda	200	119	10,775
32	Subaru	OUTBACK	174	10,378
33	Toyota	LANDCRUISER	281	10,037
34	Holden	ASTRA	140	9,876
35	Toyota	C-HR	145	9,716

Table 13 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
36	Toyota	YARIS	146	9,542
37	Subaru	IMPREZA	157	9,215
38	Volkswagen	TIGUAN	170	9,146
39	Isuzu Ute	MU-X	210	9,090
40	Volkswagen	AMAROK	229	9,059
41	Holden	COMMODORE	213	9,040
42	Mazda	B32	262	8,723
43	Honda	CIVIC 5D	146	8,483
44	Mazda	CX9	201	8,094
45	Toyota	CAMRY	183	8,040
46	Suzuki	SWIFT	116	7,785
47	Hyundai	SANTA FE	209	7,523
48	Mitsubishi	ECLIPSE CROSS	166	7,521
49	Mitsubishi	LANCER	174	7,043
50	Honda	JAZZ	136	6,887
51	Toyota	HIACE	239	6,852
52	Kia	CARNIVAL YP	233	6,610
53	Kia	YB RIO	144	6,595
54	Mitsubishi	PAJERO SPORT	212	6,566
55	Ford	MUSTANG	284	6,412
56	Toyota	CAMRY HYBRID	97	6,041
57	Ford	EVEREST	214	5,482
58	Holden	TRAX	163	5,433
59	Volkswagen	POLO	115	5,433
60	Kia	JA PICANTO	133	5,394
61	Isuzu Ute	D-MAX	198	5,324
62	Ford	RANGER	202	5,261
63	Holden	CAPTIVA	234	5,100
64	Suzuki	VITARA	139	5,023
65	Holden	EQUINOX	177	4,999
66	Kia	BD CERATO	167	4,905
67	Ford	ESCAPE	171	4,764
68	Honda	CIVIC 4D	144	4,512
69	Kia	SORENTO UM	201	4,385
70	Hyundai	ILOAD	228	4,362

Table 13 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
71	Jeep	GRAND CHEROKEE	231	3,939
72	Ford	FOCUS	157	3,875
73	Hyundai	ELANTRA	167	3,843
74	Nissan	PATHFINDER	234	3,825
75	Holden	BARINA	154	3,767
76	Toyota	FORTUNER	228	3,592
77	Nissan	NAVARA	174	3,458
78	Mazda	600	166	3,328
79	Audi	Q5	152	3,299
80	Mitsubishi	PAJERO	240	3,279
81	LDV	T60	249	3,194
82	Mazda	B32	243	2,999
83	Renault	KOLEOS	186	2,992
84	Mitsubishi	TRITON	208	2,920
85	Land Rover	DISCOVERY SPORT	148	2,890
86	Volvo Car	XC60	155	2,827
87	Lexus	NX300	180	2,712
88	Toyota	HIACE	258	2,641
89	Holden	TRAILBLAZER	252	2,606
90	Volkswagen	TIGUAN ALLSPACE	176	2,454
91	Audi	Q3	142	2,453
92	MINI	COOPER	127	2,287
93	Audi	A3	121	2,260
94	Land Rover	RR SPORT	195	2,258
95	Holden	COLORADO	240	2,172
96	Subaru	WRX	218	2,139
97	Volkswagen	TRANSPORTER	201	2,095
98	Suzuki	BALENO	125	2,071
99	Mercedes-Benz Cars	A200	134	2,046
100	Mercedes-Benz Cars	GLA180 FL	133	1,990
101	Volkswagen	CADDY VAN	139	1,974
102	Kia	CK STINGER	235	1,957

Table 13 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
103	Renault	TRAFIC	164	1,922
104	Ford	MONDEO	148	1,914
105	Honda	ODYSSEY	182	1,895
106	Ford	TRANSIT CUSTOM	182	1,880
107	Porsche	95B	191	1,874
108	Audi	Q2	136	1,865
109	Land Rover	DISCOVERY	185	1,833
110	Volkswagen	PASSAT	141	1,804
111	Skoda	OCTAVIA	131	1,794
112	BMW	X5 XDRIVE30D	166	1,722
113	MG	MG ZS	160	1,692
114	Mercedes-Benz Cars	GLC250	168	1,676
115	Mercedes-Benz Cars	GLC250D	149	1,599
116	Subaru	LIBERTY	180	1,595
117	Volvo Car	XC40	169	1,588
118	Mazda	CX8	155	1,550
119	BMW	X3 XDRIVE20D	146	1,522
120	Mercedes-Benz Vans	X-CLASS	206	1,520
121	Land Rover	RR VELAR	165	1,450
122	Mazda	B22	216	1,445
123	Suzuki	IGNIS	113	1,435
124	Land Rover	RR EVOQUE	138	1,375
125	Peugeot	3008	149	1,372
126	Audi	A4	135	1,360
127	Audi	Q7	161	1,349
128	Skoda	KODIAQ	170	1,346
129	LDV	G10	231	1,337
130	BMW	X1 XDRIVE25I	146	1,334
131	Jeep	COMPASS	193	1,329
132	BMW	X3 XDRIVE30I	174	1,325
133	Mercedes-Benz Vans	VITO	168	1,320

Table 13 (continued)

Rank	Make	Model	Average emissions intensity (g/km)	Sales
134	Mercedes-Benz Cars	C200	146	1,310
135	Nissan	PATROL	343	1,259
136	BMW	330I	136	1,236
137	Audi	A1	113	1,228
138	Toyota	CAMRY V6	200	1,188
139	Volvo Car	XC90	163	1,170
140	Audi	S3	152	1,161
141	Ford	ECOSPORT	154	1,158
142	Volkswagen	MULTIVAN	201	1,095
143	Jeep	WRANGLER	268	1,092
144	Porsche	CAY	201	1,084
145	Mercedes-Benz Cars	C300	148	1,033
146	Mitsubishi	MIRAGE	110	1,032
147	Hyundai	SONATA	195	1,024
148	MINI	COOPER	146	1,024
149	Mercedes-Benz Cars	A180	135	1,015
150	Mercedes-Benz Cars	GLA250 4M FL	162	1,007
Total*				**1,020,294**

* The total shown in this row is for this table only and differs to the national total shown in other tables.

Table 14: Average emissions intensity and annual sales by buyer type, 2017 and 2018

Buyer type	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
	2017	2018		2017	2018
Business	186	186	0.1*	554,733	557,188
Private	176	174	-1.2	557,018	515,163
Government	199	195	-2.1	38,623	38,037
Total	**182**	**181**	**-0.4**	**1,150,374**	**1,110,388**

* Due to rounding, average emissions intensity appear the same for 2017 and 2018. However, the percentage change considers the unrounded figure.

Table 15: Average emissions intensity and annual sales by detailed buyer type, 2017 and 2018

Buyer type	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
	2017	2018		2017	2018
Private – local delivery	176	174	-1.2	556,893	514,991
Dealer demonstrator	172	173	0.5	180,826	183,960
Fleet	201	201	-0.3*	171,170	165,562
Rental	180	180	-0.5*	71,264	77,126
Large fleet	198	198	0*	69,634	73,358
Company capitalisation	172	177	2.8	42,198	37,157
State Government	200	195	-2.5	24,940	25,059
Not-for-profit organisation	181	180	-0.4	18,253	18,791
Local Government	195	194	-0.5	9,307	9,365
Federal Government	200	194	-3.3	4,376	3,613
Taxi	144	132	-8.0	793	1,010
Private – overseas delivery	181	176	-2.7	125	172
Business – overseas delivery	165	173	4.5	506	128
Diplomatic	180	181	0.2	89	96
Total	**182**	**181**	**-0.4**	**1,150,374**	**1,110,388**

* Due to rounding, average emissions intensity appear the same for 2017 and 2018. However, the percentage change considers the unrounded figure.

Table 16: Average emissions intensity and annual sales by fuel type, 2017 and 2018

Fuel type	Average emissions intensity (g/km)		Change from 2017 to 2018 (%)	Sales	
	2017	2018		2017	2018
Petrol	170	167	-1.5	773,677	740,980
Diesel	206	208	1.1	375,587	368,245
Total*	**182**	**181**	**-0.4**	**1,149,264**	**1,109,225**

* Totals in this row do not match the national totals shown in other tables because they do not include electric vehicles, nor LPG vehicles (of which there were none sold in 2018)

Table 17: Electric vehicle sales by model for FCAI data, 2017 and 2018

Make and Model	2017	2018
Audi A3	15	1
Audi Q7	0	14
BMW 330E	89	34
BMW 530E	21	27
BMW 740E	2	4
BMW I3	43	16
BMW I3 REX	75	26
BMW I3S	0	36
BMW I3S REX	0	37
BMW I8	24	12
BMW I8 ROADSTER	0	2
BMW X5 XDRIVE40E	29	14
Hyundai IONIQ	0	54
Jaguar I-PACE	0	39
Land Rover RANGE ROVER	0	3
Land Rover RR SPORT	0	1
Mercedes-Benz Cars C350 E	207	297
Mercedes-Benz Cars C350T E	5	9
Mercedes-Benz Cars E350E	12	10
Mercedes-Benz Cars GLE500E	45	39
Mercedes-Benz Cars S500L E	1	0
MINI COOPER	2	0
Mitsubishi OUTLANDER	369	370
Porsche 97A	14	33
Porsche CAY	71	53
Renault FLUENCE	2	0
Renault KANGOO	1	16
Renault ZOE	2	48
Volvo Car XC60	7	103
Volvo Car XC90	88	54
Total	**1,124**	**1,352**

Table 18: Electric vehicle sales by state for FCAI data, 2017 and 2018

State	2017	2018
Australian Capital Territory	40	37
New South Wales	395	461
Northern Territory	1	1
Queensland	147	210
South Australia	152	147
Tasmania	5	14
Victoria	307	401
Western Australia	77	81
Total	**1,124**	**1,352**

Table 19: Electric vehicle sales by buyer type for FCAI data, 2017 and 2018

State	2017	2018
Company capitalisation	299	304
Dealer demonstrator	279	381
Diplomatic	0	1
Federal Government	1	1
Fleet	53	111
Large fleet	56	36
Local Government	5	16
Not-for-profit organisation	2	3
Private – local delivery	377	442
Rental	21	23
State Government	31	34
Total	**1,124**	**1,352**

Table 20: 'Green' vehicle average emissions intensity and sales by segment, 2018

SEGMENT	Make	Model	Average emissions intensity (g/km)	Sales
MICRO	Fiat	PANDA	95	1
	Mitsubishi	MIRAGE	110	1,032
	Suzuki	CELERIO	111	3
	Fiat	500	115	514
	Kia	JA PICANTO	117	326
LIGHT	Renault	ZOE	0	48
	Toyota	PRIUS C	90	518
	Peugeot	208	104	152
	Skoda	FABIA	108	883
	Citroen	C3	110	122
	Renault	CLIO	110	29
	Suzuki	SWIFT	111	6,577
	Volkswagen	POLO	112	4,853
	MINI	COOPER	113	536
	Audi	A1	113	1,225
	Ford	FIESTA	113	154
	Mazda	200	114	6,634
	Suzuki	BALENO	118	194
SMALL	BMW	I3S	0	36
	BMW	I3	0	16
	BMW	I3 REX	12	26
	BMW	I3S REX	14	37
	Hyundai	IONIQ	61	192
	Toyota	PRIUS	80	235
	Lexus	CT200H	95	607
	Toyota	COROLLA	97	4,421
	BMW	118D	99	86
	Toyota	PRIUS V	101	375
	Mercedes-Benz Cars	A200D	105	113
	BMW	218D AT	111	35
	BMW	118I	112	630
	Volvo Car	V40	113	194
	Citroen	DS4	113	1
	Mercedes-Benz Cars	B200 CDI	114	41
	Peugeot	308	115	376

Table 20 (continued)

SEGMENT	Make	Model	Average emissions intensity (g/km)	Sales
SMALL (cont.)	Audi	A3	116	1,706
	Skoda	RAPID	117	461
	Hyundai	I30	119	133
	Volvo Car	V40 CC	119	43
	Alfa Romeo	GIULIETTA	119	120
MEDIUM	BMW	330E	49	34
	Mercedes-Benz Cars	C350 E	56	297
	Mercedes-Benz Cars	C350T E	59	9
	Toyota	CAMRY HYBRID	96	5,852
	Lexus	ES300H	104	68
	Alfa Romeo	GIULIA	109	26
	Jaguar	XE	111	134
	Mercedes-Benz Cars	CLA220D	111	130
	Lexus	IS300H	113	193
	BMW	420D GRAN COUPE	114	4
	Mercedes-Benz Cars	CLA220D SB	115	14
	Mercedes-Benz Cars	C250 BT	116	1
	BMW	320D	116	184
	Volvo Car	S60	117	2
	BMW	320D G TURISMO	118	20
	Audi	A4	119	300
	Mercedes-Benz Cars	C200 BT	119	7
	Volvo Car	V60	120	9
LARGE	BMW	530E	46	27
	Mercedes-Benz Cars	E350E	55	10
	Audi	A6	110	8
	Mercedes-Benz Cars	E220D	112	241
	Jaguar	XF	114	83
	BMW	520D TOUR	119	20

Table 20 (continued)

SEGMENT	Make	Model	Average emissions intensity (g/km)	Sales
UPPER LARGE	BMW	740E	50	4
	Porsche	97A	58	33
SPORTS	BMW	I8 ROADSTER	48	2
	BMW	I8	49	12
	BMW	420D COUPE	114	5
	Mercedes-Benz Cars	C250D CPE	115	38
	MINI	COOPER	119	2
	Audi	A3	120	189
PEOPLE MOVERS	Citroen	C4 GRD PICASSO	120	9
SUV SMALL	Lexus	UX250H	104	35
	Citroen	C4 CACTUS	108	85
	Peugeot	2008	110	365
	Suzuki	IGNIS	113	1,435
	BMW	X1 SDRIVE18D	114	841
	Mercedes-Benz Cars	GLA220 D FL	118	495
	Renault	CAPTUR	120	66
	Infiniti	Q30	120	7
SUV MEDIUM	Mitsubishi	OUTLANDER	41	370
	Volvo Car	XC60	49	103
SUV LARGE	Jaguar	I-PACE	0	39
	Audi	Q7	49	14
	Volvo Car	XC90	49	54
	Land Rover	RR SPORT	64	1
	BMW	X5 XDRIVE40E	77	14
	Mercedes-Benz Cars	GLE500E	78	39
	Porsche	CAY	78	53
SUV UPPER LARGE	Land Rover	RANGE ROVER	64	3
VANS/ CAB CHASSIS	Renault	KANGOO	0	16
	Citroen	BERLINGO	108	99
TOTAL*				**45,786**

* The total shown in this row is for this table only and differs to the national total shown in other tables.

Table 21: Corporate average emissions intensity for new passenger vehicles for Australia, 2017

Make	Average emissions intensity (g/km)	Sales
Alfa Romeo	153	1,057
Aston Martin	287	144
Audi	145	22,011
Bentley	272	219
BMW	148	23,576
Chery	204	7
Chrysler	281	258
Citroen	120	469
Dodge	242	4
Ferrari	272	210
Fiat	135	2,008
Ford	205	32,819
Genesis	249	26
Haval	226	710
Holden	208	64,486
Honda	155	46,783
Hyundai	172	91,368
Infiniti	208	776
Isuzu Ute	212	8,087
Jaguar	161	2,483
Jeep	221	8,270
Kia	177	54,737
Lamborghini	310	122
Land Rover	167	13,112
LDV	271	761
Lexus	177	8,800
Lotus	198	62

Make	Average emissions intensity (g/km)	Sales
Maserati	211	740
Mazda	151	102,230
McLaren	257	116
Mercedes-Benz Cars	159	36,933
Mercedes-Benz Vans	166	973
MG	175	600
MINI	130	3,712
Mitsubishi	178	57,049
Morgan	206	8
Nissan	185	39,961
Peugeot	132	3,392
Porsche	187	4,484
Proton	204	39
Renault	158	5,982
Rolls-Royce	329	45
Skoda	137	5,350
Ssangyong	208	95
Subaru	173	52,511
Suzuki	132	18,986
Toyota	180	150,532
Volkswagen	143	43,815
Volvo Car	155	4,681
Total*		**915,599**

* The total shown in this row is for this table only and differs to the national total shown in other tables.

Table 22: Average emissions intensity for new light commercial vehicles for Australia by make, 2017

Make	Average emissions intensity (g/km)	Sales
Citroen	138	266
Fiat Professional	145	107
Ford	223	44,393
Foton Light	218	371
Great Wall	228	404
Holden	247	25,820
Hyundai	235	5,645
Isuzu Ute	205	17,717
LDV	238	1,819
Mazda	251	14,119
Mercedes-Benz Vans	165	1,240
Mitsubishi	199	23,605
Nissan	182	16,633
Renault	160	2,920
Ssangyong	195	1
Suzuki	190	270
Toyota	233	65,724
Volkswagen	199	13,721
Total*		**234,775**

* The total shown in this row is for this table only and differs to the national total shown in other tables.

Table 23: Average emissions intensity and annual registrations for new passenger vehicles by country, 2016 and 2017

Country	Average emissions intensity (g/km)		Change from 2016 to 2017 (%)	Annual registrations (thousands)	
	2016	2017		2016	2017
Portugal	105	105	0.0*	207	222
Denmark	106	107	1.0	221	220
Netherlands	106	108	2.3	378	412
Greece	106	109	2.4	79	88
France	110	110	0.5*	2,167	2,256
Malta	112	111	-0.7	7	8
Ireland	112	112	-0.4*	146	129
Croatia	112	113	1.4	45	48
Italy	113	113	0.0*	1,823	1,965
Spain	114	115	0.5	1,185	1,286
Belgium	116	116	0.0*	541	548
Finland	120	118	-1.5	115	114
Europe	**118**	**119**	**0.4**	**14,712**	**15,107**
Slovenia	119	120	0.5	53	60
Romania	122	121	-1.1	95	107
Austria	120	121	0.2	329	353
United Kingdom	120	121	0.8	2,687	2,533
Cyprus	124	122	-1.1	12	13
Sweden	123	122	-0.6	364	369
Czech Republic	121	124	2.4	214	221
Hungary	126	126	-0.2*	95	107
Slovakia	125	126	1.0	89	97
Bulgaria	126	126	0.3*	20	26
Luxembourg	126	127	0.7	49	52
Germany	127	127	0.2*	3,316	3,377
Lithuania	126	127	1.0	20	25
Poland	126	128	1.4	417	430
Latvia	129	129	-0.1*	15	15
Estonia	134	133	-0.8	23	26
Australia	**173**	**171**	**-0.7**	**927#**	**916#**

* Due to rounding, average emissions intensity appear the same for 2016 and 2017. However, the percentage change considers the unrounded figure.
\# New car sales

Table 24: Average emissions intensity and annual registrations for new light commercial vehicles by country, 2016 and 2017

Country	Average emissions intensity (g/km)		Change from 2016 to 2017 (%)	Annual registrations (thousands)	
	2016	2017		2016	2017
Portugal	140	132	-5.7	29	31
Cyprus	144	133	-7.4	2	2
Bulgaria	141	135	-4.5	9	9
Malta	147	136	-7.7	1	1
Italy	145	142	-2.2	167	159
Croatia	150	142	-5.3	7	5
Spain	148	142	-3.8	113	121
Denmark	152	150	-1.5	34	34
France	159	151	-5.0	283	303
Greece	155	152	-1.9	6	6
Netherlands	156	153	-1.9	63	63
Latvia	157	154	-1.7	2	2
Sweden	155	156	0.3	30	44
Estonia	162	156	-3.7	4	4
Europe	**164**	**156**	**-4.6**	**1,590**	**1,609**
Ireland	164	156	-4.5	26	23
Romania	170	158	-7.1	10	12
Luxembourg	168	159	-5.4	4	4
Lithuania	169	160	-5.2	3	3
Belgium	169	161	-5.1	65	73
Slovenia	168	161	-4.0	7	9
Finland	167	162	-3.3	12	14
Hungary	168	163	-2.9	19	16
Poland	171	163	-4.8	47	41
United Kingdom	173	163	-5.5	350	328
Austria	172	165	-3.9	34	38
Germany	179	169	-5.3	245	243
Slovakia	186	170	-8.4	7	7
Czech Republic	183	173	-5.6	11	14
Australia	**222**	**221**	**-0.4**	**216#**	**235#**

New car sales

* Due to rounding, average emissions intensity appear the same for 2016 and 2017. However, the percentage change considers the unrounded figure.

National Transport Commission
Level 3/600 Bourke Street
Melbourne VIC 3000
Tel: (03) 9236 5000
enquiries@ntc.gov.au
www.ntc.gov.au

National Transport Commission

Leading change