Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2016

Information paper
May 2017

NTC AUSTRALIA
National Transport Commission

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 2016. The data is broken down by vehicle make, model and segment and by fuel and buyer type.

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 2016 the national average carbon dioxide emissions intensity from new passenger and light commercial vehicles was 182 g/km. This is a 1.1 per cent reduction from 2015.
- 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 2016 had purchased vehicles with best-in-class emissions, the national average carbon dioxide emissions intensity would have been reduced to 75 g/km, a 59 per cent reduction.
- About 90 per cent of all new vehicle sales in 2016 were from 15 makes. Of these 15 makes, Audi had the lowest corporate average emissions intensity (144 g/km), and Holden had the highest (222 g/km).
- The average emissions intensity for all Australian-made vehicles was 213 g/km in 2016. This is a 2.3 per cent increase when compared with 2015.
- Private buyers purchased vehicles with the lowest average emissions intensity (176 g/km), followed by business buyers (187 g/km) and government buyers (201 g/km).
- There were 51 'green' car models available in Australia in 2016 (compared with 72 in 2015), which represented 2.5 per cent of total sales (compared with 4.7 per cent in 2015). A 'green' car is defined as a vehicle that does not exceed 120 g/km.
- The average emission intensity for new passenger vehicles in European countries was 120 g/km in 2015. In the same year, Australia's average emissions intensity for passenger vehicles was 175 g/km, 46 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. For example, the five best-selling vehicles in the UK in 2016 were all small cars. In Australia, the Toyota Hilux was the best-selling model in 2016 with the Ford Ranger as the fourth best-selling vehicle (FCAI 2017a)
  - a lower proportion of diesel-powered engines
  - fewer government incentives for lower emissions vehicles
  - relatively lower fuel prices.

Contents

List of figures

List of tables

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 2016.

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) 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. We also used European Environment Agency data for the European comparisons.

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

The FCAI is the peak industry organisation representing the manufacturers and importers of passenger vehicles, light commercial vehicles and motorcycles in Australia. 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), 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 labelling 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.

Electric vehicles with emissions of 0 g/km have been excluded when calculating sales weighted averages. Although electric vehicles have no tailpipe emissions, the electricity that fuels these vehicles may produce emissions depending on their source.

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. Motor vehicle classifications and definitions

Passenger motor vehicles	Sports utility vehicles (SUVs)	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) × width (mm), rounded, as follows:	Vehicles classified as SUVs meet the FCAI criteria for classifying SUV vehicles 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 < 6,300mm^2	**Small** < 8,100mm^2	**Light bus < 20 seats** 8+ seats, but less than 20 seats
Light Hatch, sedan or wagon with a footprint range 6,301–7,500mm^2	**Medium** 8,101–8,800mm^2	**Light bus > 20 seats** 20+ seats
Small Hatch, sedan or wagon with a footprint range 7,501–8,300mm^2	**Large** 8,801–9,800mm^2	**Van/cab chassis ≤ 2.5t** Blind/window vans and cab chassis ≤ 2.5 t GVM
Medium Hatch, sedan or wagon with a footprint range 8,301–9,000mm^2	**Upper large** > 9,801mm^2	**Van/cab chassis > 2.5–3.5t** Blind/window vans and cab chassis 2.5–3.5 t GVM
Large Hatch, sedan or wagon with a footprint range 9,001–9,500mm^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 > 9,501mm^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.

Source: FCAI 2016

Carbon dioxide emissions per kilometer is directly related to vehicle fuel consumption. Table 2 provides fuel consumption figures and the corresponding carbon dioxide emissions intensities for petrol and diesel.

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

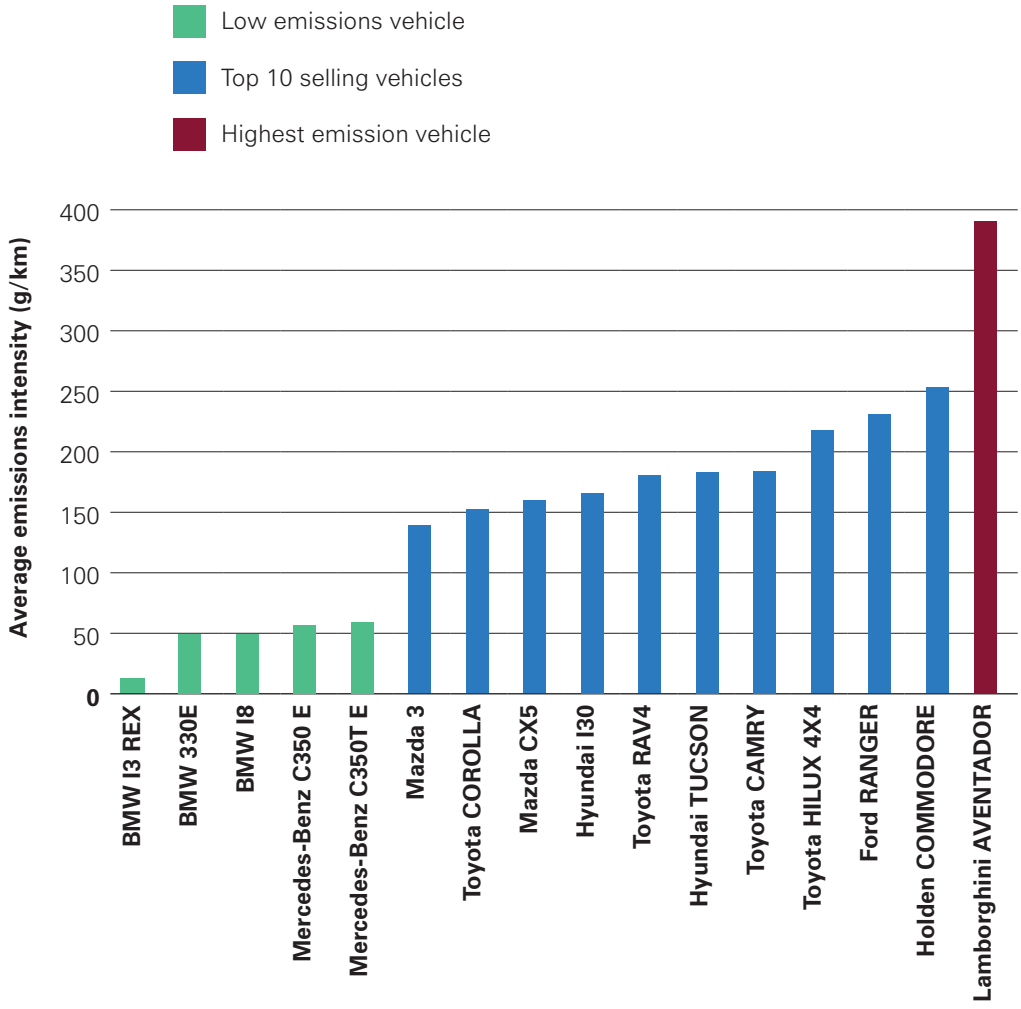
Table 2. Fuel consumption and corresponding average emissions intensity

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

Source: Department of Climate Change 2009

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 vehicles in Australia during 2016. Figure 1 also contains the five lowest emitting vehicle models (excluding zero emission vehicles) and the highest emitting model.

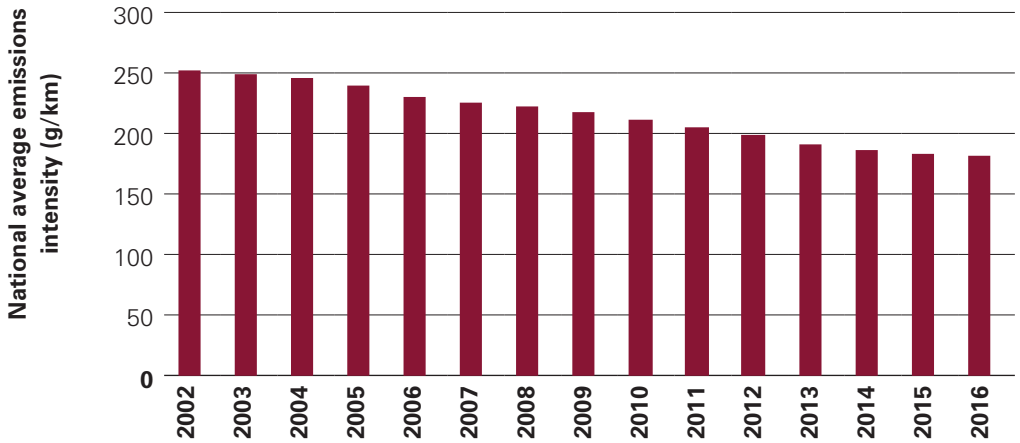
Figure 1: **Average emissions intensity for top 10 selling vehicles in Australia plus other selected models, 2016**



3 Australian emissions intensity

Across all new passenger and light commercial vehicles sold in 2016, the national average carbon dioxide emissions intensity was 182 g/km (Figure 2). This is a 1.1 per cent reduction from the previous year. 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 6 in the appendix.

Figure 2: **National average emissions intensity for new passenger and light commercial vehicles, 2002–2016**



Vehicle manufacturers

In 2016 there were 50 makes of new vehicles available 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. Table 7 in the appendix contains more detail on average emissions intensity for all makes sold in Australia.

Figure 3 shows the corporate average carbon dioxide emissions intensity for the top 15 makes in 2016 (data for all vehicle makes is provided in Table 7 in the appendix). Audi had the lowest corporate average carbon dioxide emissions intensity (144 g/km), and Holden had the highest (222 g/km).

Figure 3: Corporate average emissions intensity for the top 15 makes by volume, 2016

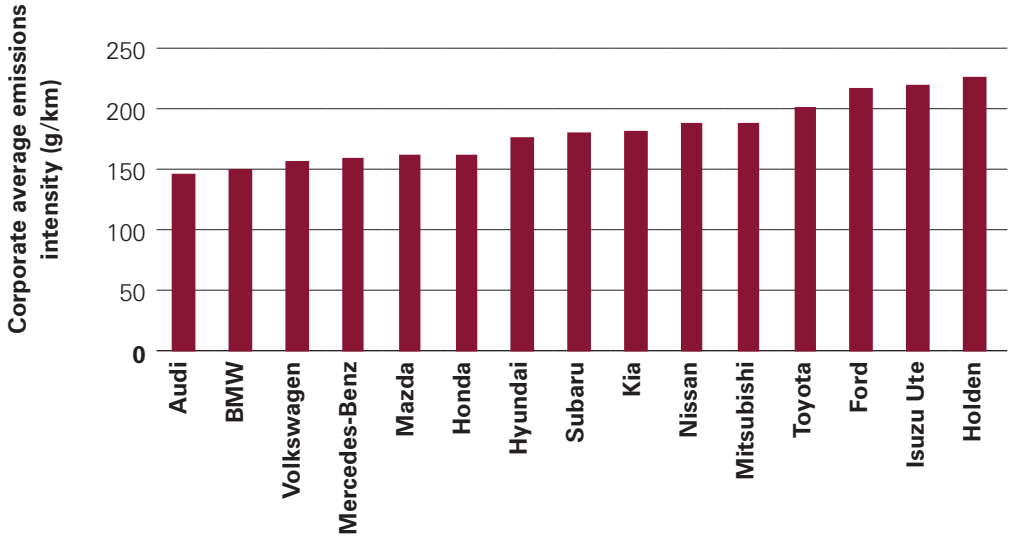
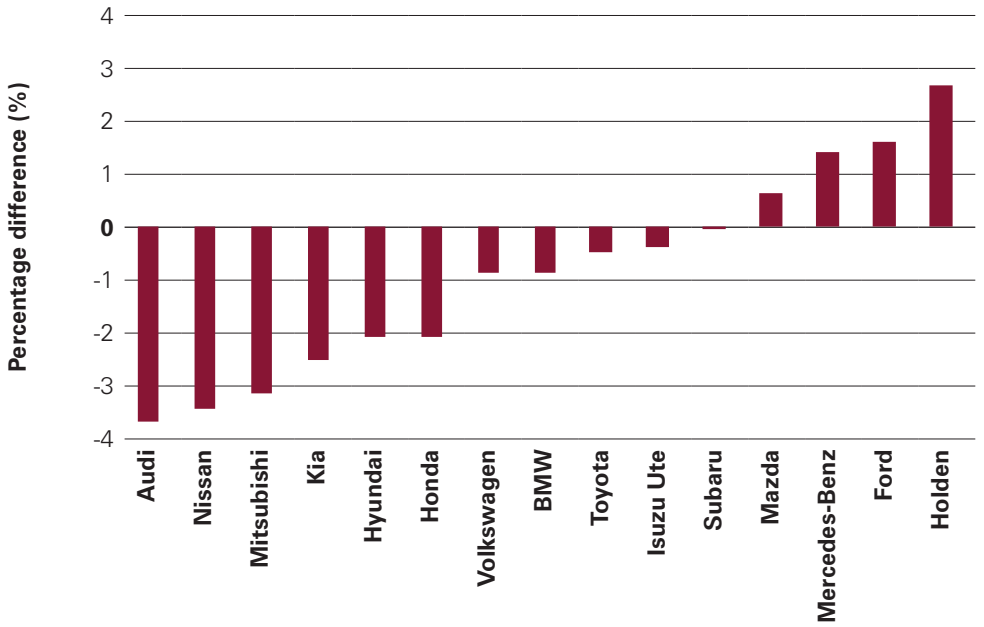


Figure 4 shows the change in corporate average carbon dioxide emissions intensity between 2015 and 2016 for the highest selling 15 makes. Audi had a 3.7 per cent reduction in average corporate emissions intensity. Holden's average carbon dioxide emissions intensity increased by 2.6 per cent.

Figure 4: Change in corporate average emissions intensity between 2015 and 2016 for the top 15 makes by volume



Australian-made vehicles

Ford Australia, GM Holden and Toyota Australia made cars in Australia in 2016. Ford Australia ceased production in October 2016. In 2016 the average carbon dioxide emissions value for all Australian-made light vehicles was 213 g/km. This is a 2.3 per cent increase when compared with 2015.

Figure 5 shows the average carbon dioxide emissions intensity for the Australian-made light vehicles by make in 2016. Toyota had the lowest emissions intensity (175 g/km), followed by Holden (233 g/km) and Ford (234 g/km).

The average carbon dioxide emissions for Toyota's Australian-made vehicles is below the overall national average of 182 g/km. Additional data on Australian car manufacturers is provided in Table 8 in the appendix.

Figure 5: **Average emissions intensity for new Australian-made vehicles, 2016**

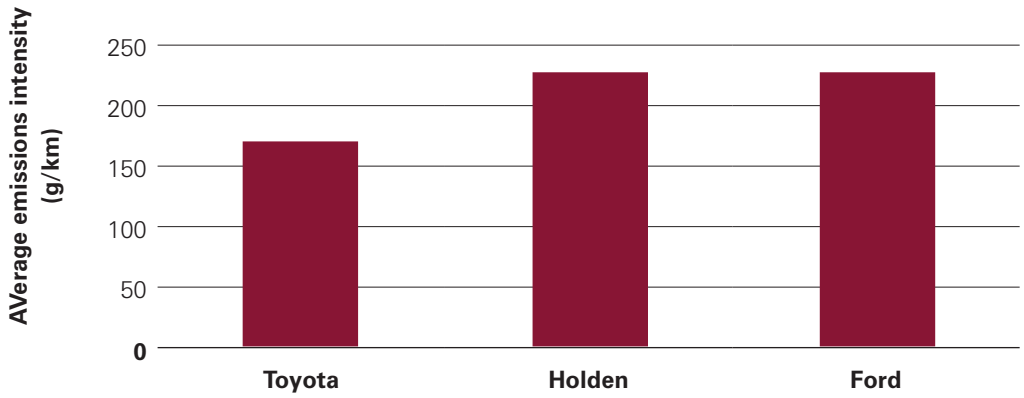
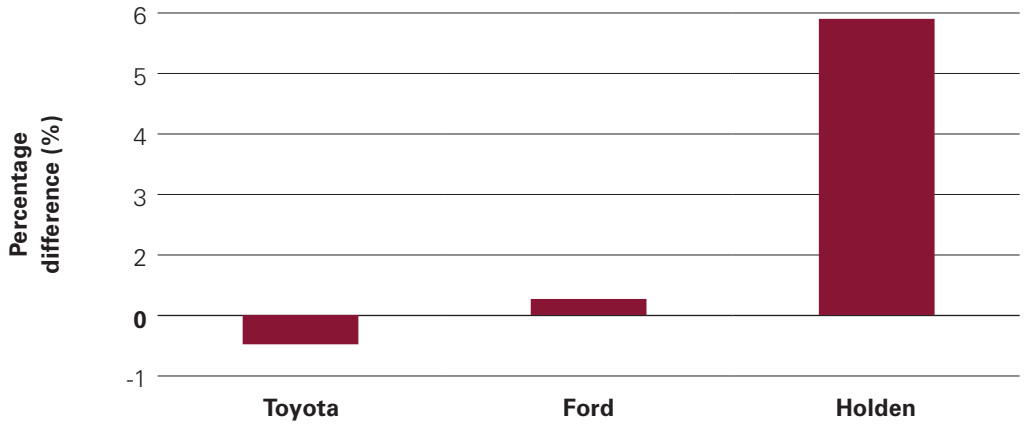


Figure 6: **Change in average emissions intensity for new Australian-made vehicles, 2015 and 2016**



The range and average emissions intensity for new Australian-made vehicles by make are presented in Figure 7. The average emissions are represented by the horizontal lines, and the ranges are represented by the vertical lines.

Figure 7: **Range and average emissions intensity for new Australian-made vehicles, 2016**

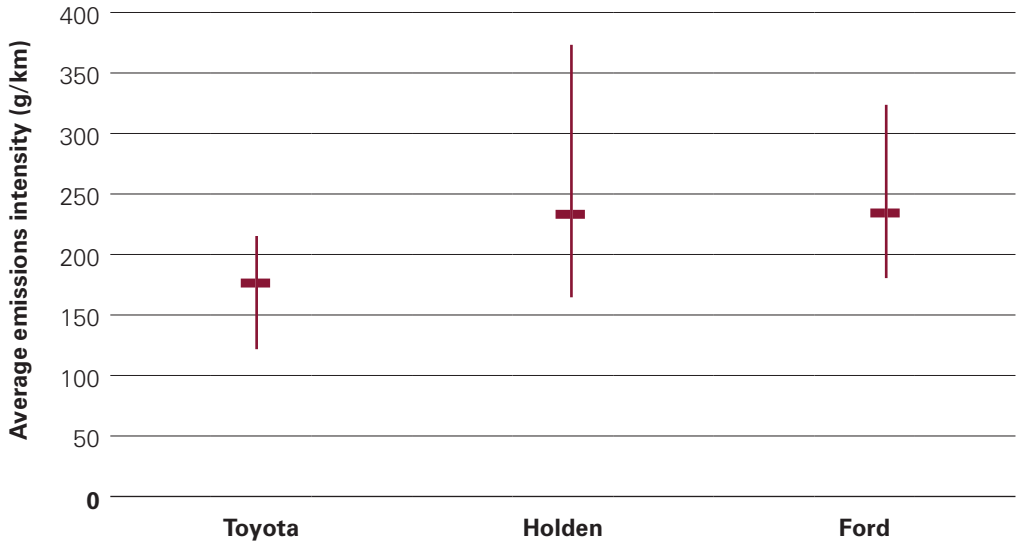


Figure 8 shows the average carbon dioxide emissions intensity from Australian-made models in 2016. The best performing Australian-made model was the Toyota Hybrid Camry (121 g/km), followed by the Holden Cruze (174 g/km). The Holden Caprice (300 g/km) had the highest average emissions intensity.

Additional data on Australian car models is provided in Table 9 in the appendix.

Figure 8: Average emissions intensity for new Australian-made vehicles by model, 2016

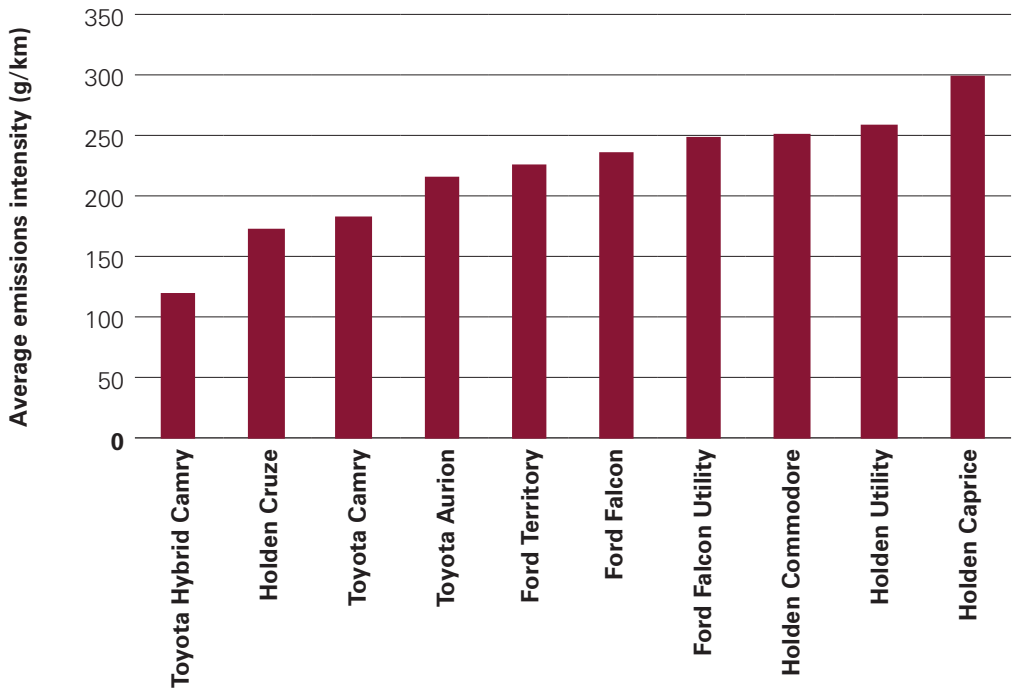
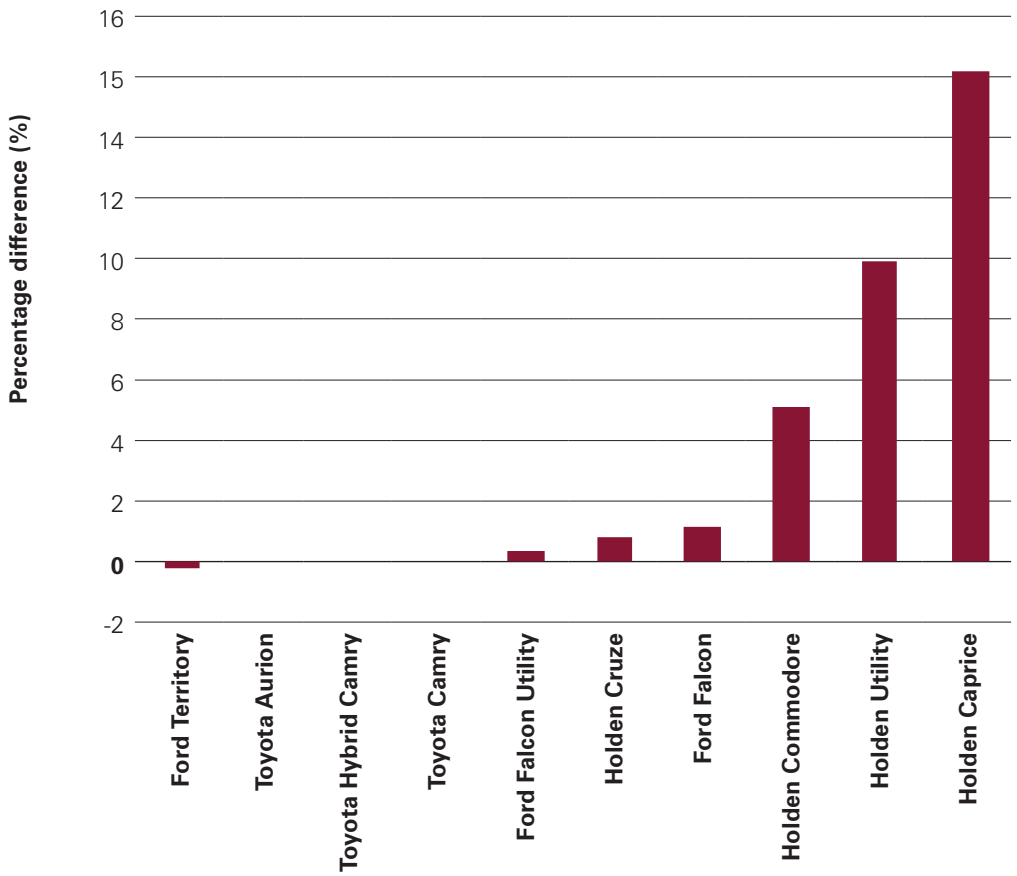


Figure 9 shows the change in average carbon dioxide emissions intensity for new Australian-made vehicle models between 2015 and 2016. The Ford Territory showed a decrease in emissions (0.2 per cent), while the Holden Caprice increased emissions by 15.1 per cent.

Figure 9: **Change in average emissions intensity for new Australian-made vehicle models between 2015 and 2016**



Segment type

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

Figure 10 shows the average carbon dioxide emissions intensity by segment during 2016. The lowest emitting segment was 'micro' (127 g/km). 'SUV upper large' (261 g/km) was the highest. Additional segment data, including the top 10 selling models for each segment, is provided in Tables 10 and 11 in the appendix.

SUVs as a segment grouping had a reduction of 4 per cent in average emissions intensity (185 g/km) during 2016 when compared with 2015.

Figure 10: Average emissions intensity by segment, 2016

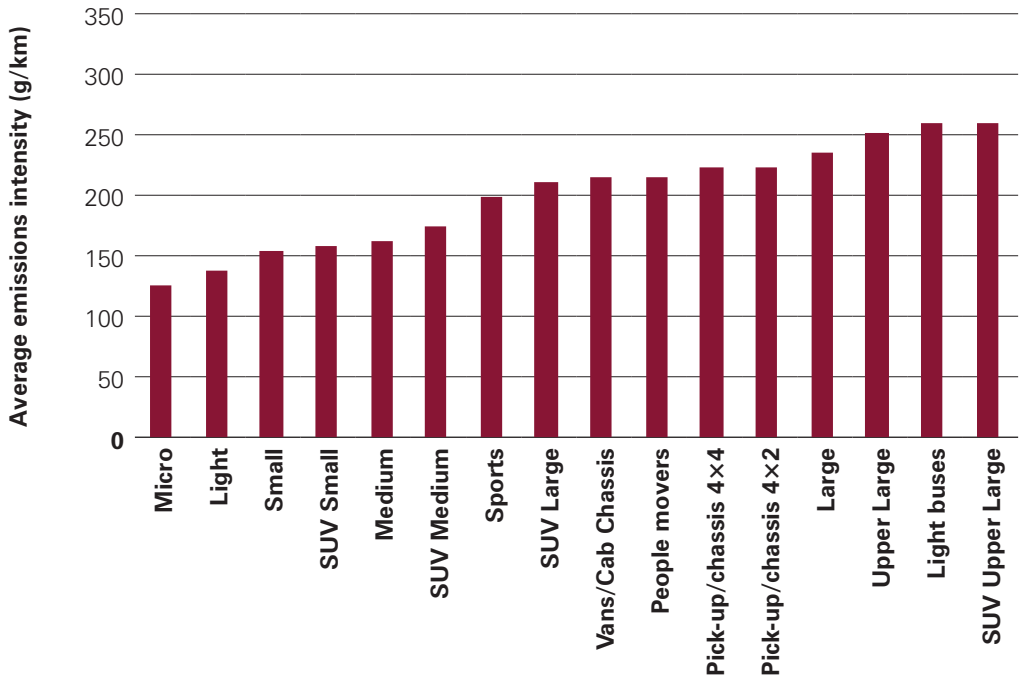


Figure 11 shows the change in average carbon dioxide emissions intensity by segment between 2015 and 2016. In 2016 the 'SUV small' segment had the greatest improvement of 5.9 per cent, while the 'sports' segment had the largest increase of average emissions intensity at 13 per cent.

Figure 11: **Change in average emissions intensity by segment between 2015 and 2016**

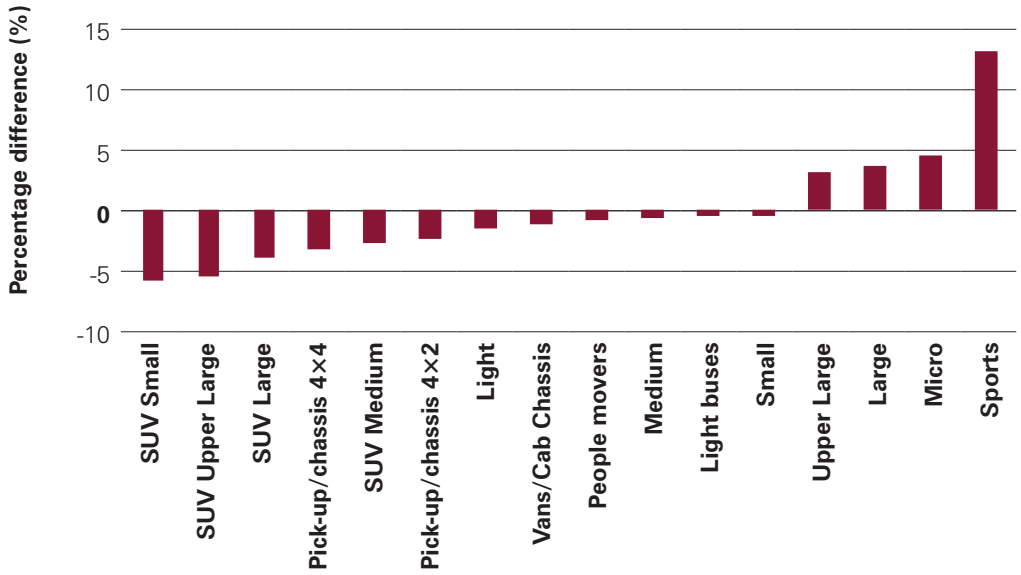
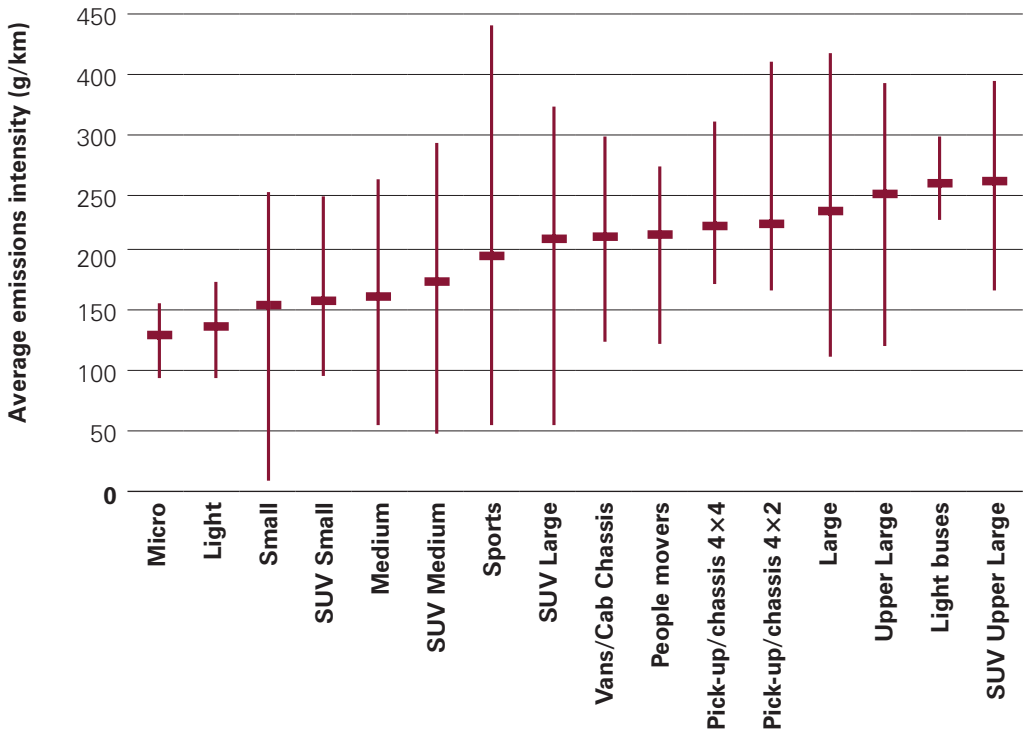


Figure 12 shows the average and the range in carbon dioxide emissions intensity for the segments during 2016. The average emissions are represented by the horizontal lines and the ranges are represented by the vertical lines.

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

Figure 12: Range and average emissions intensity by segment, 2016



If Australian consumers had purchased vehicles with best-in-class carbon dioxide emissions in 2016, the national average carbon dioxide emissions would have been reduced to 75 g/km, a 59 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.

Table 3. Best-in-class vehicles for carbon dioxide emissions intensity for each segment, 2015

Segment	Make and model (fuel source)	Best-in-class vehicle emissions intensity (g/km)
Micro	Fiat 500 (petrol)	90
Light	Toyota Prius C (petrol-electric hybrid)	90
Small	BMW i3 REX (extended range electric) Audi A3 (petrol)	12 37
Medium	BMW 330E (petrol)	49
Large	Mercedes-Benz E220D (diesel)	108
Upper large	Mercedes-Benz S300 BT (diesel-electric hybrid)	118
Sports	BMW i8 (plug-in hybrid electric vehicle) BMW 220D coupe (diesel)	49 107
People mover	Citroen C4 Grand Picasso (diesel)	120
SUV small	Citroen C4 Cactus (diesel)	92
SUV medium	Mitsubishi Outlander (plug-in hybrid electric vehicle)	42
	Land Rover Range Rover Evogue (diesel)	113
SUV large	Volvo XC90 (petrol-electric hybrid)	49
SUV upper large	Land Rover Range Rover (diesel)	166
Pick-up/chassis 4×2	Nissan Navara NP300 (diesel)	166
Pick-up/chassis 4×4	Nissan Navara NP300 (diesel)	172
Vans/CC	Citroen Berlingo (diesel)	122
Light buses	Toyota Hiace (diesel)	228

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

Buyer type

Figure 13 shows the average carbon dioxide emissions intensity by buyer type. Vehicles bought by private buyers had the lowest average carbon dioxide emissions intensity (176 g/km), followed by business buyers (187 g/km) and government buyers (201 g/km). Additional data on buyer types is provided in Table 13 in the appendix.

Figure 13: Average emissions intensity by buyer type, 2016

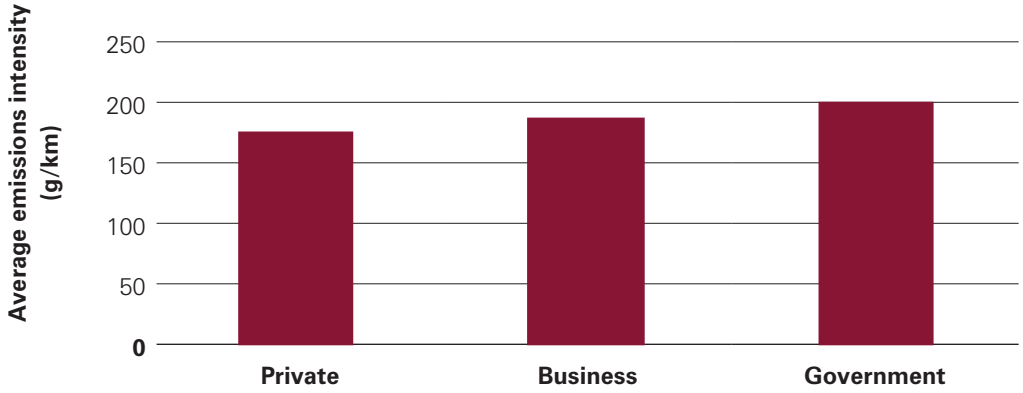
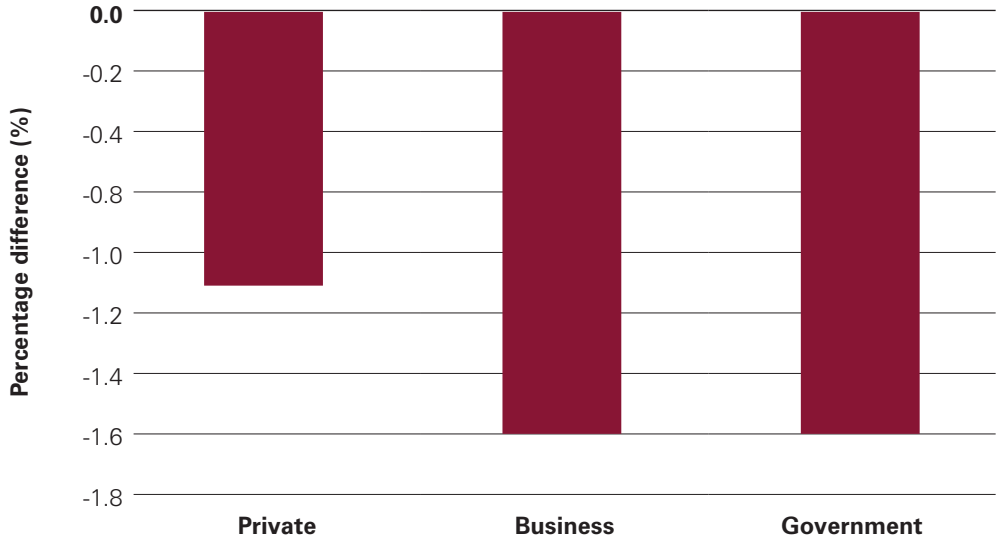


Figure 14 shows the reduction in average emissions intensity between 2015 and 2016. Business and Government buyers purchased vehicles representing a 1.6 per cent improvement in average emissions.

Figure 14: Change in average emissions intensity by buyer type between 2015 and 2016



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, rental and taxi.

Figure 15 shows the average carbon dioxide emissions intensity for these buyers. The change in average emissions intensity from 2015 to 2016 is shown in Figure 16. Additional data on the detailed buyer types is provided in Table 14 in the appendix.

Figure 15: Average emissions intensity by detailed buyer type, 2016

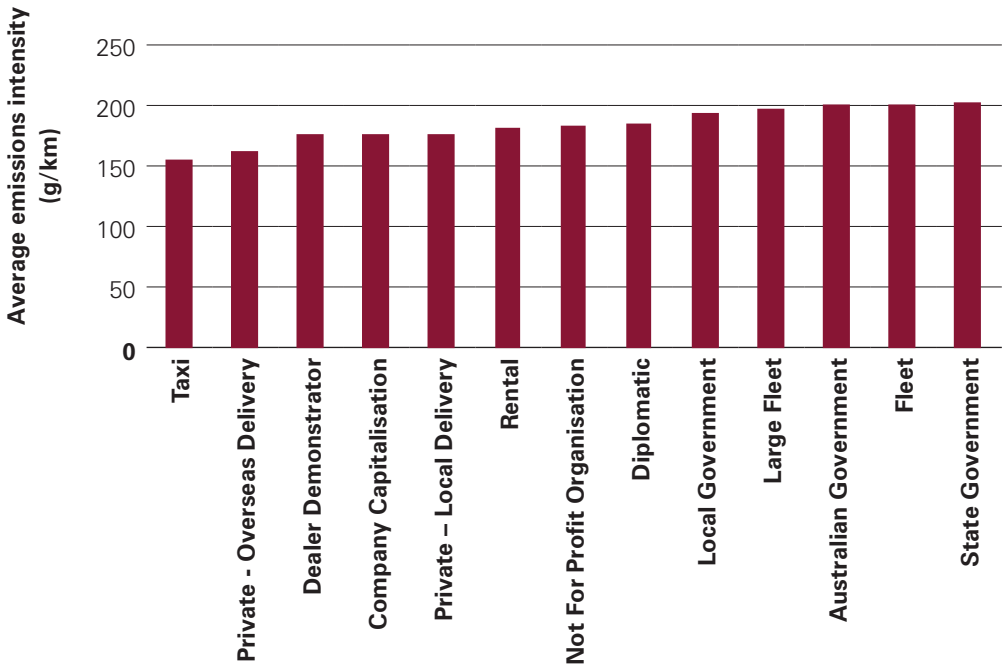
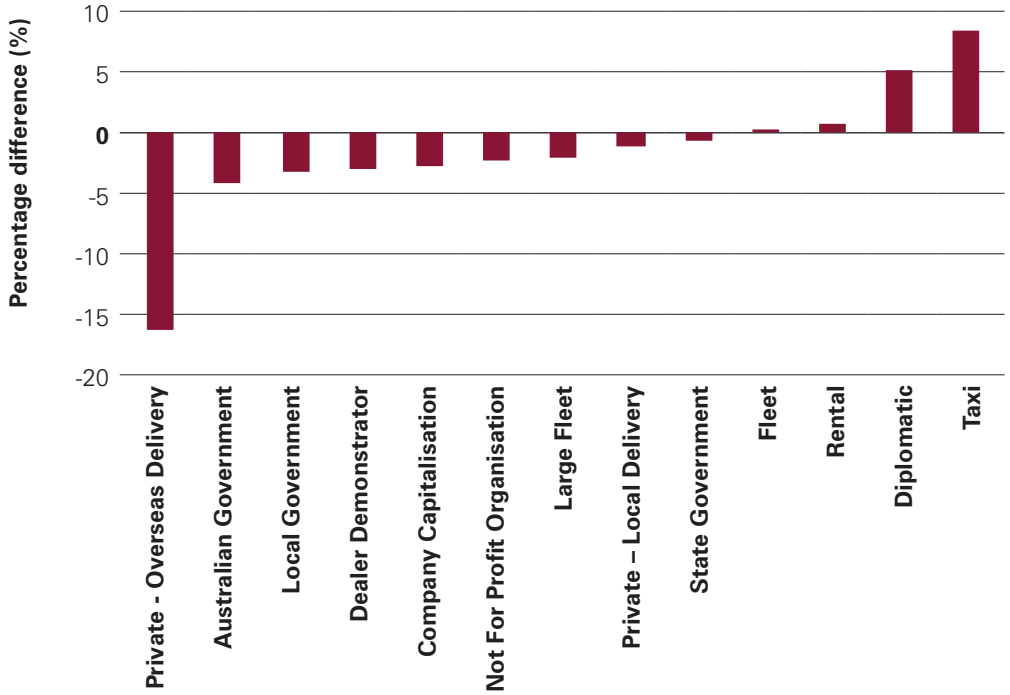


Figure 16: Change in average emissions intensity between 2015 and 2016 by detailed buyer type



The average carbon dioxide emissions intensity for the detailed government buyers is shown in Figure 17. The Australian Capital Territory government showed the lowest average emissions intensity (173 g/km) and the Northern Territory government had the highest average emissions intensity (212 g/km).

The change in average emissions intensity from 2015 to 2016 is shown in Figure 18. The Northern Territory local governments showed an improvement of 9.4 per cent, while the Tasmanian government increased by 2.1 per cent. Government buyers accounted for 3.6 per cent of new vehicle sales in 2016. Additional data on government buyer types is provided in Table 15 in the appendix.

Figure 17: Average emissions intensity by detailed government buyer type, 2016

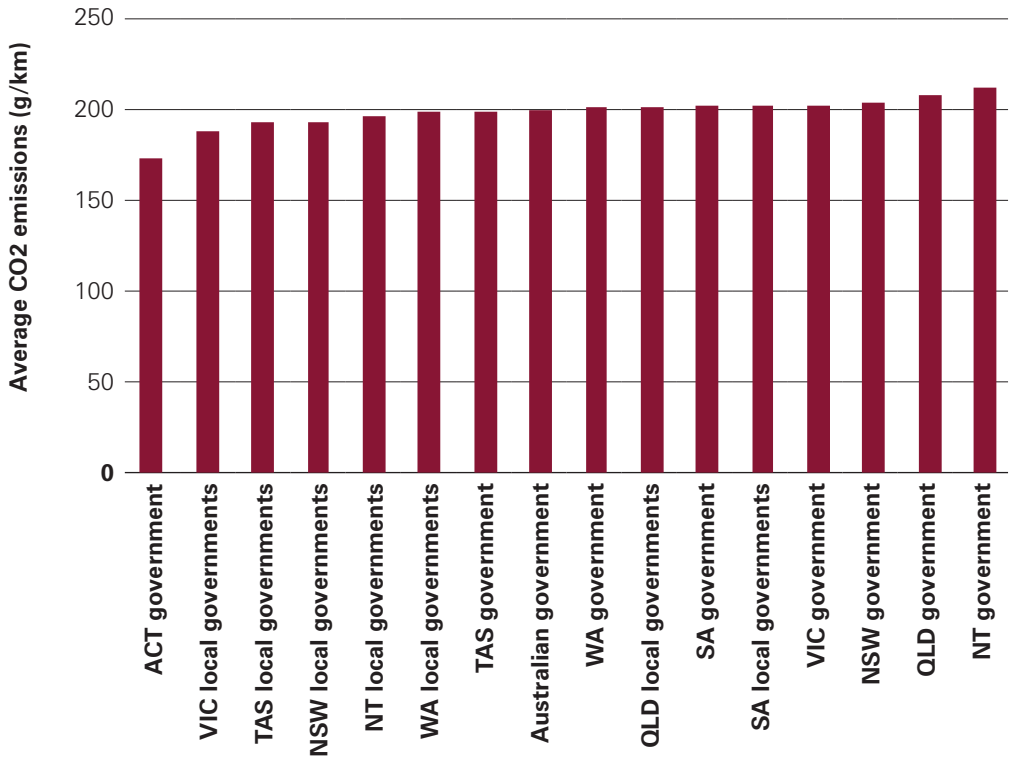
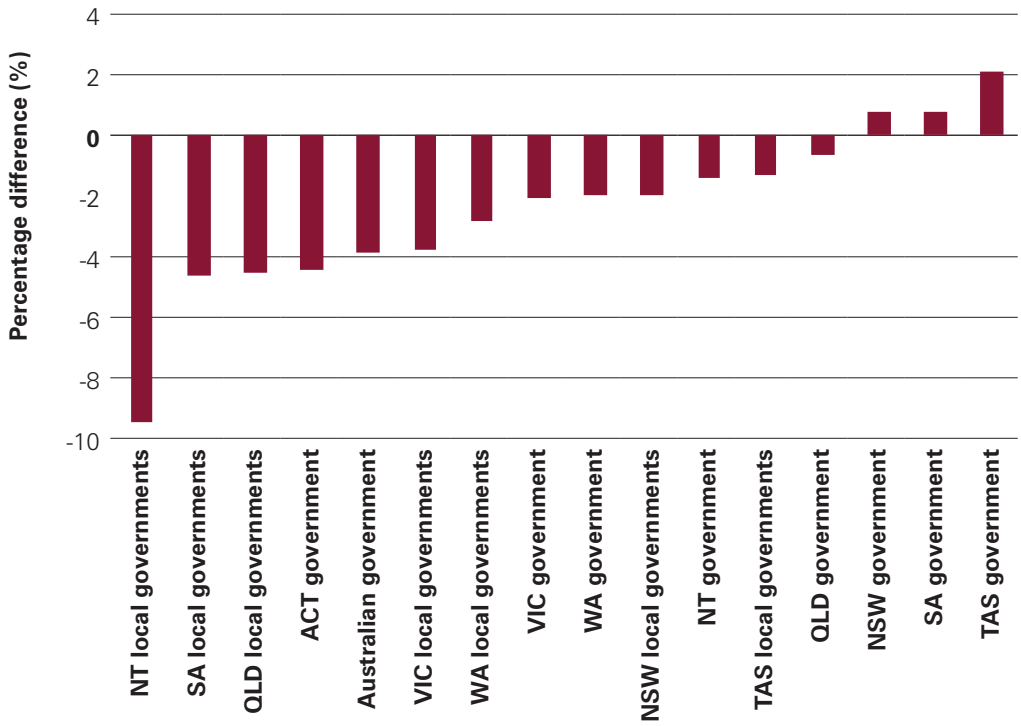


Figure 18: **Change in average emissions intensity between 2015 and 2016 by detailed government buyer type**



Fuel type

Figure 19 shows the average carbon dioxide emissions intensity by fuel type for 2016. Electric vehicles (fully electric and range extended electric) had the lowest average emissions intensity (30 g/km), followed by petrol vehicles (172 g/km), diesel vehicles (205 g/km) and liquefied petroleum gas (LPG) vehicles (221 g/km).

Figure 20 shows that electric vehicles had the best improvement between 2015 and 2016 (25 per cent). Petrol and diesel vehicles improved by 1.1 and 2.3 per cent respectively. LPG vehicles increased their emissions intensity by 8 per cent. Additional data on fuel types is provided in Table 16 in the appendix.

Figure 19: Average emissions intensity by fuel type, 2016

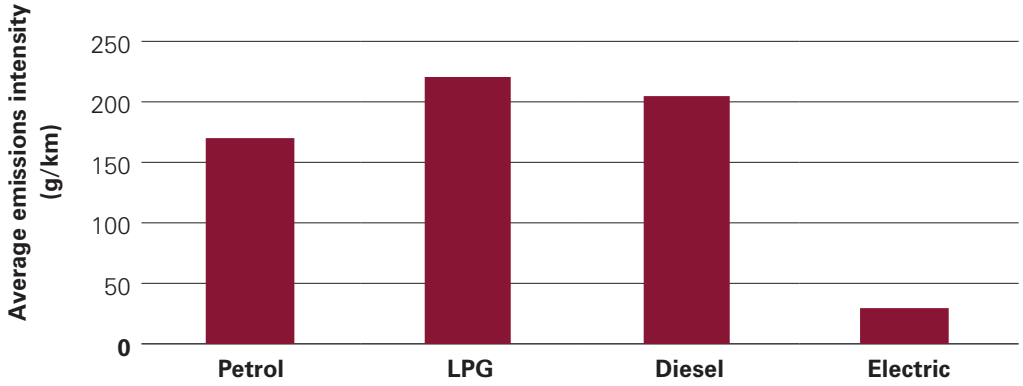
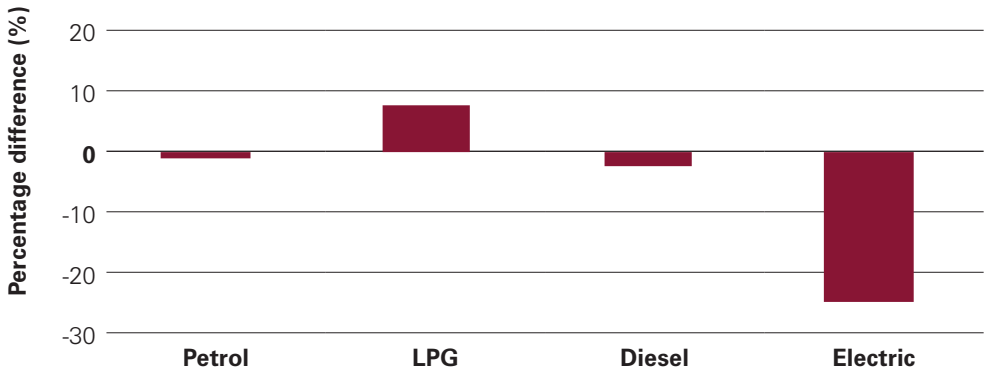
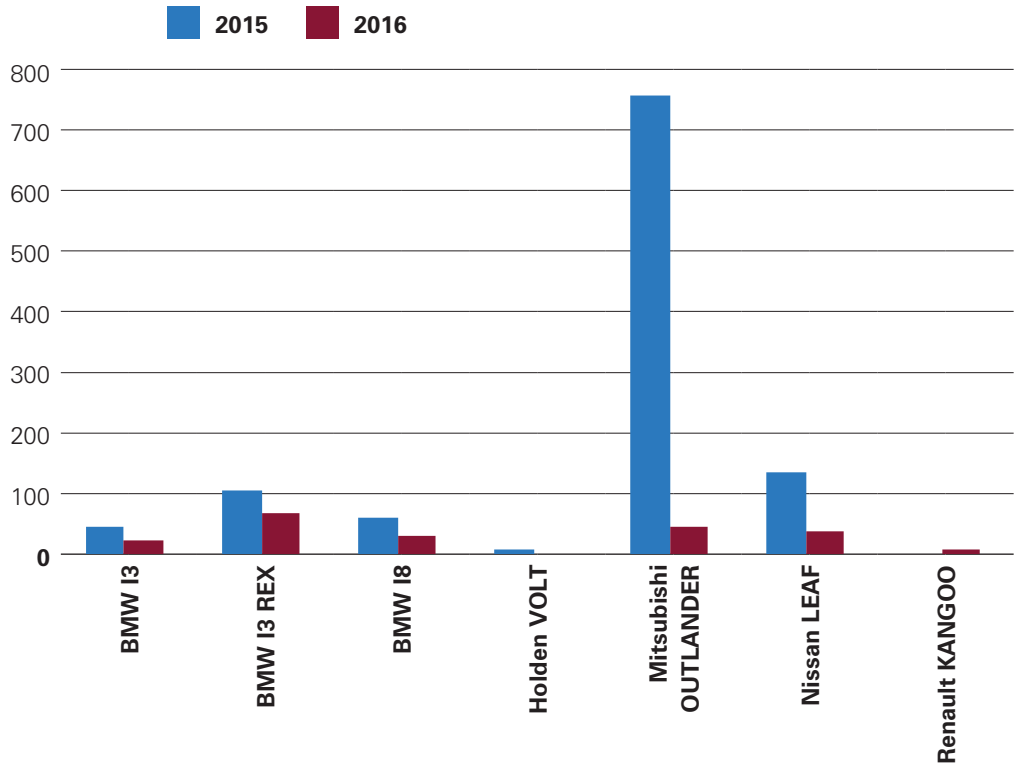


Figure 20: Change in average emissions intensity by fuel type between 2015 and 2016



The number of electric vehicles sold in 2016 was 219, compared to 1108 vehicles sold in 2015. This is an 80 per cent drop. Note that the FCAI data does not include the sales of Tesla vehicles. Figure 21 shows the sale of electric vehicles by make in 2015 and 2016. This shows a drop in sales across all but one model between 2015 and 2016. The Mitsubishi Outlander had 704 fewer sales in 2016.

Figure 21: Sales of electric vehicles in 2015 and 2016



Additional data on sales by model, state and buyer type for 2011 – 2016 are provided in Tables 23, 24 and 25 in the appendix.

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 2016 was 2.5 per cent of total sales (compared with 4.7 per cent in 2015). Figure 22 shows 'green' vehicle sales as a proportion of total new light vehicle sales between 2008 and 2016.

There were 51 green car models available in Australia in 2016 (compared with 72 in 2015). This includes electric vehicles with zero emissions. Figure 23 shows the number of green vehicle models available for sale between 2008 and 2016.

Table 17 in the appendix provides more detail on green vehicles sold in Australia in 2016.

Figure 22: **'Green' vehicles sales as a percentage of total new light vehicles sold, 2008–2016**

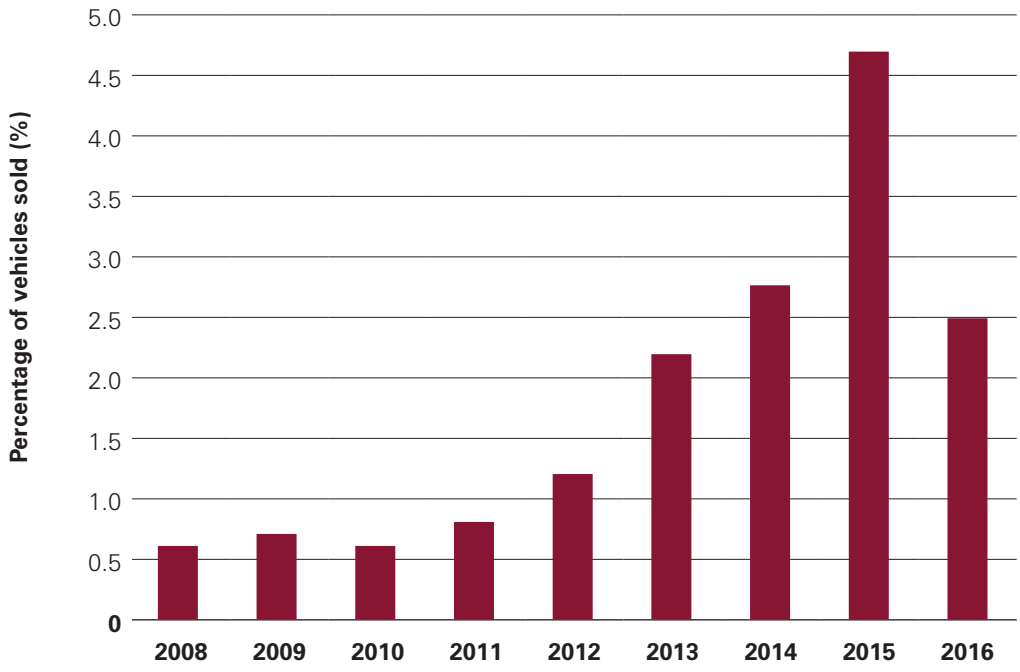
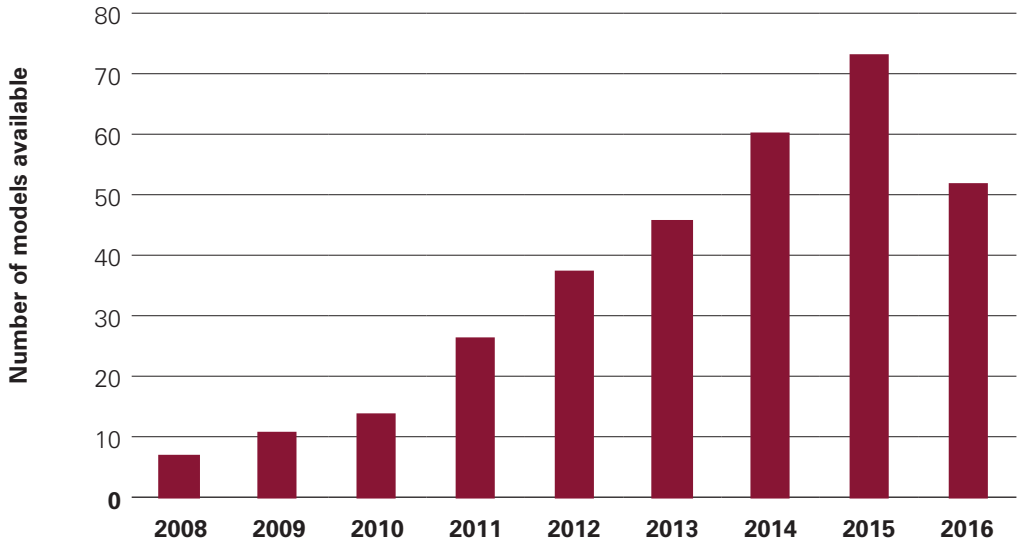


Figure 23: **'Green' vehicle model availability, 2008–2016**



4 Comparison of Australian and European data

This section compares Australian and European data. There are different methods used worldwide to calculate vehicle emissions. 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.

Australia 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.

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 4. A summary of the European measures was published by the European Conference of Ministers of Transport (2007).

Table 4. European measures that have reduced carbon dioxide emissions from motor vehicles

European measure	Effect of measure
High fuel prices through higher fuel taxes	Encourages consumers to purchase fuel-efficient vehicles to lower running costs European consumers purchase more small vehicles compared with Australian consumers European consumers prefer manual transmission vehicles, whereas Australian consumers prefer automatic transmissions
Low diesel taxes compared with petrol taxes	Encourages consumers to purchase diesel vehicles to reduce running costs
Regulating carbon dioxide emissions from motor vehicles	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 5 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 2016 was 173 g/km and 222 g/km respectively.

Table 5: Average emissions intensity for new passenger and light commercial vehicles, 2015 and 2016

Groupings	Average emissions intensity (g/km)		Annual change (%)
	2015	2016	
Passenger vehicles	175	173	-1.0
Light commercial vehicles	229	222	-2.9

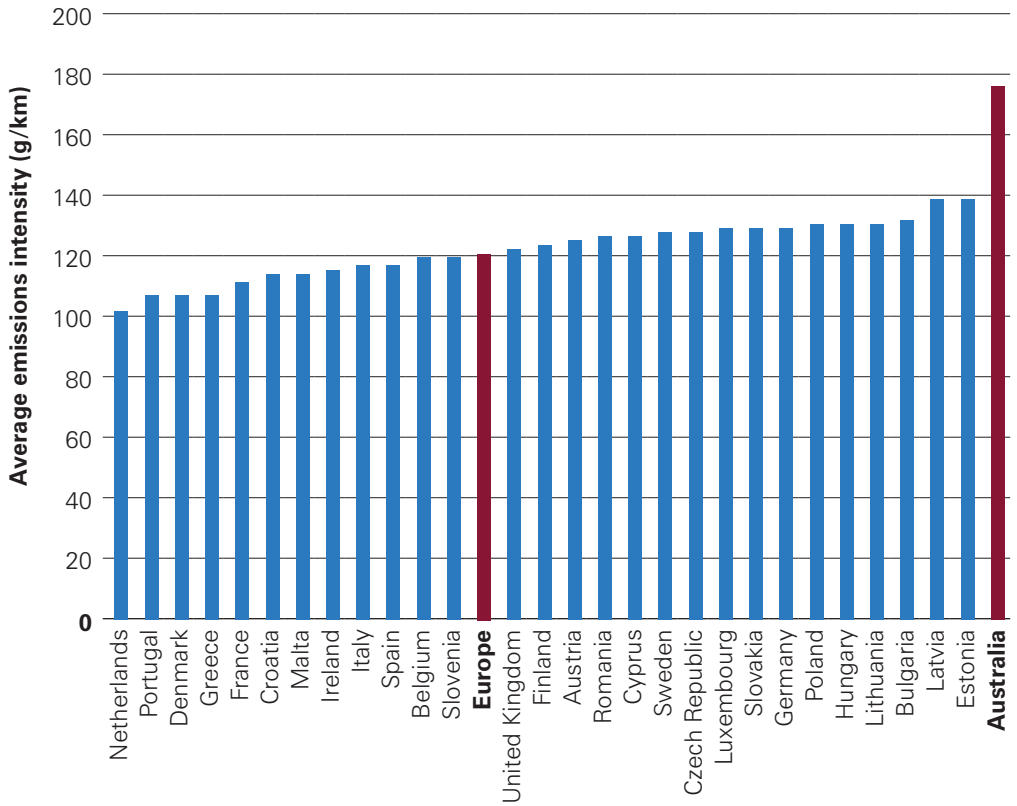
The rest of this section compares Australian and European carbon dioxide emissions intensity data for passenger and light commercial vehicles separately. As the latest European Environment Agency data is from 2015, this is the year we used to do the comparisons.

Passenger vehicles: average emissions intensity by country

The breakdown for average carbon dioxide emissions intensity for new passenger vehicles by country for 2015 is shown in Figure 24. The average emissions intensity for new passenger vehicles in Europe was 120 g/km compared with Australia's average of 175 g/km; 46 per cent higher than the European average. In 2015 European emissions intensity ranged from 101 g/km in the Netherlands to 137 g/km in Estonia (73 per cent and 28 per cent lower than Australia respectively).

European average emissions intensity was reduced by 3.1 per cent for 2015 compared with 2014. In the same period, Australia's average emissions intensity fell by 1.5 per cent (see Table 18 in the appendix). The European countries that showed the highest annual reductions were Netherlands (5.4 per cent) and Lithuania (3.7 per cent). Additional European data is provided in Table 18 in the appendix.

Figure 24: **Average emissions intensity for new passenger vehicles by country, 2015**



Passenger vehicles: average emissions intensity by make

Figure 25 shows average carbon dioxide emissions intensity for new passenger vehicles by make for Europe and Australia in 2015. Vehicles have been grouped in a way that makes comparisons possible. The groupings are shown in Table 19 in the appendix.

Corporate average emissions intensity in European countries range from 104 g/km for Peugeot to 164 g/km for Jaguar Land Rover. The range of corporate average emissions in Australia was from 139 g/km for Škoda to 211 g/km for Holden. Additional data is provided in Table 20 in the appendix.

Figure 25: **Corporate average emissions intensity for new passenger vehicles by make for Europe and Australia, 2015**

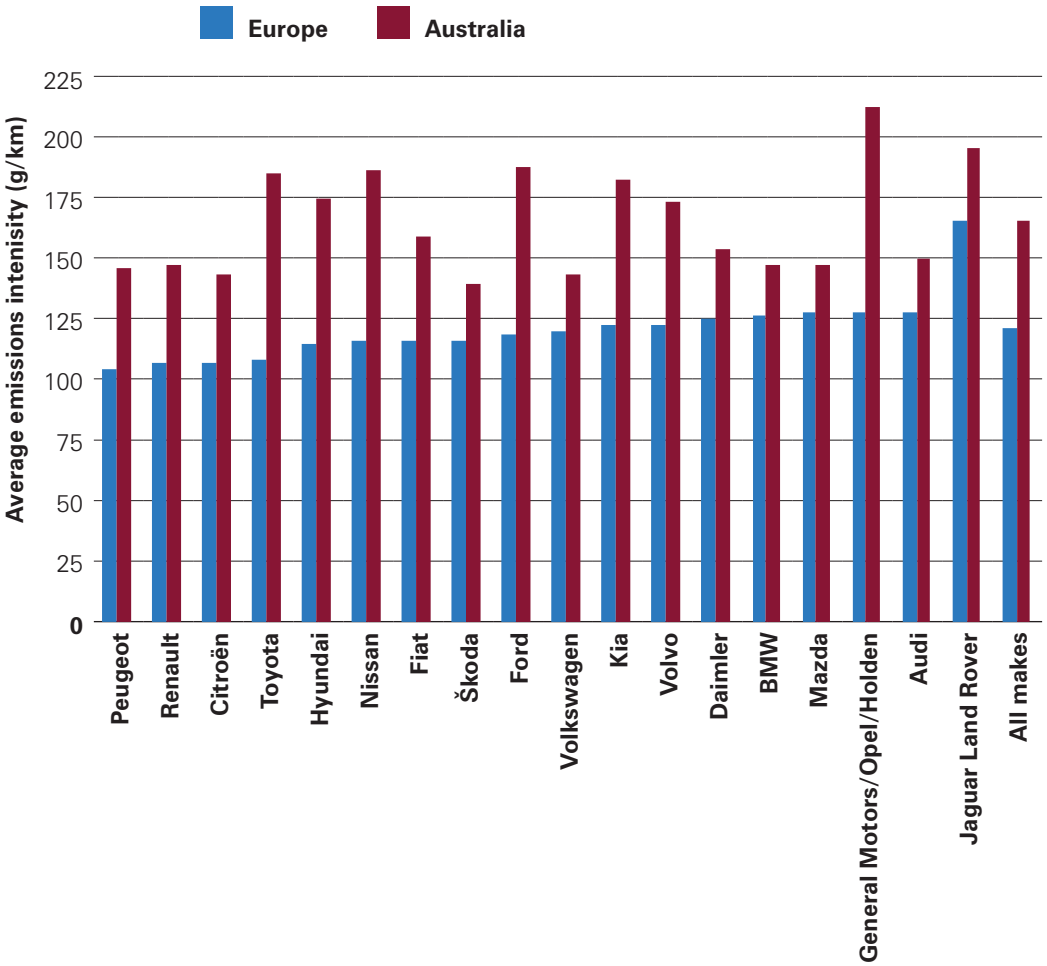
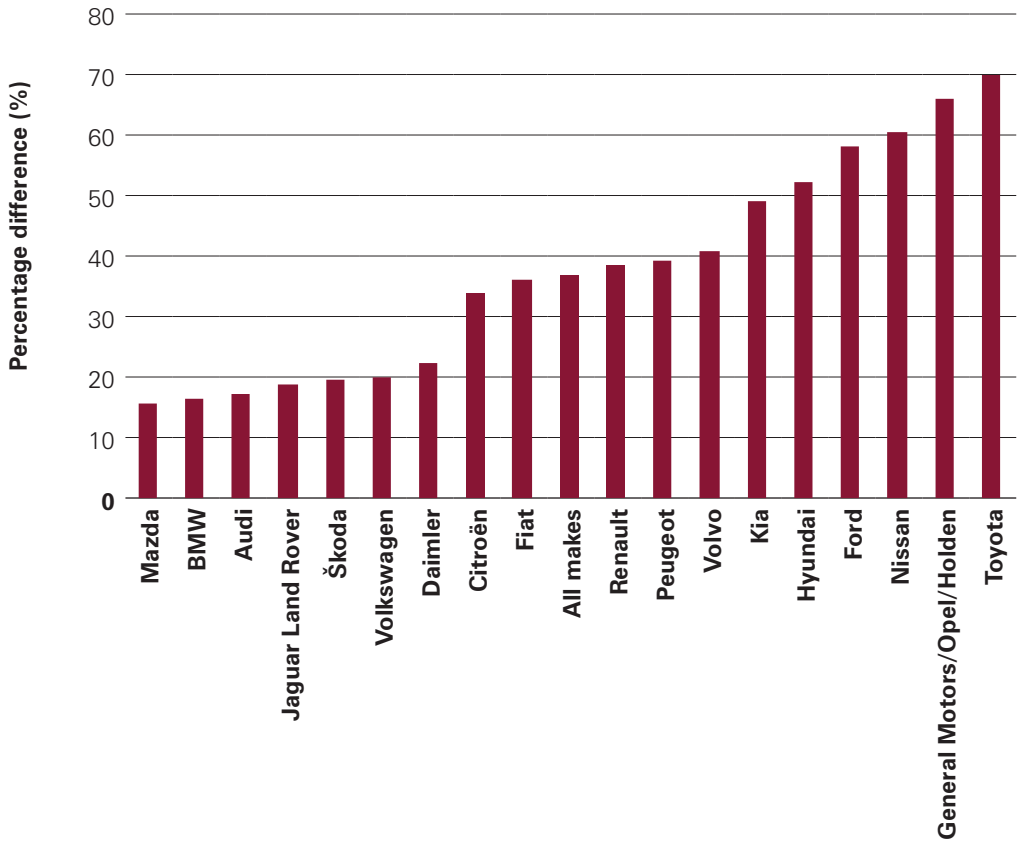


Figure 26 shows the differences between the corporate average emissions intensity for passenger vehicle makes sold in Australia compared with Europe. The smallest difference in corporate average emissions was for Mazda (16 per cent higher in Australia), while the largest difference was for Toyota (70 per cent higher in Australia).

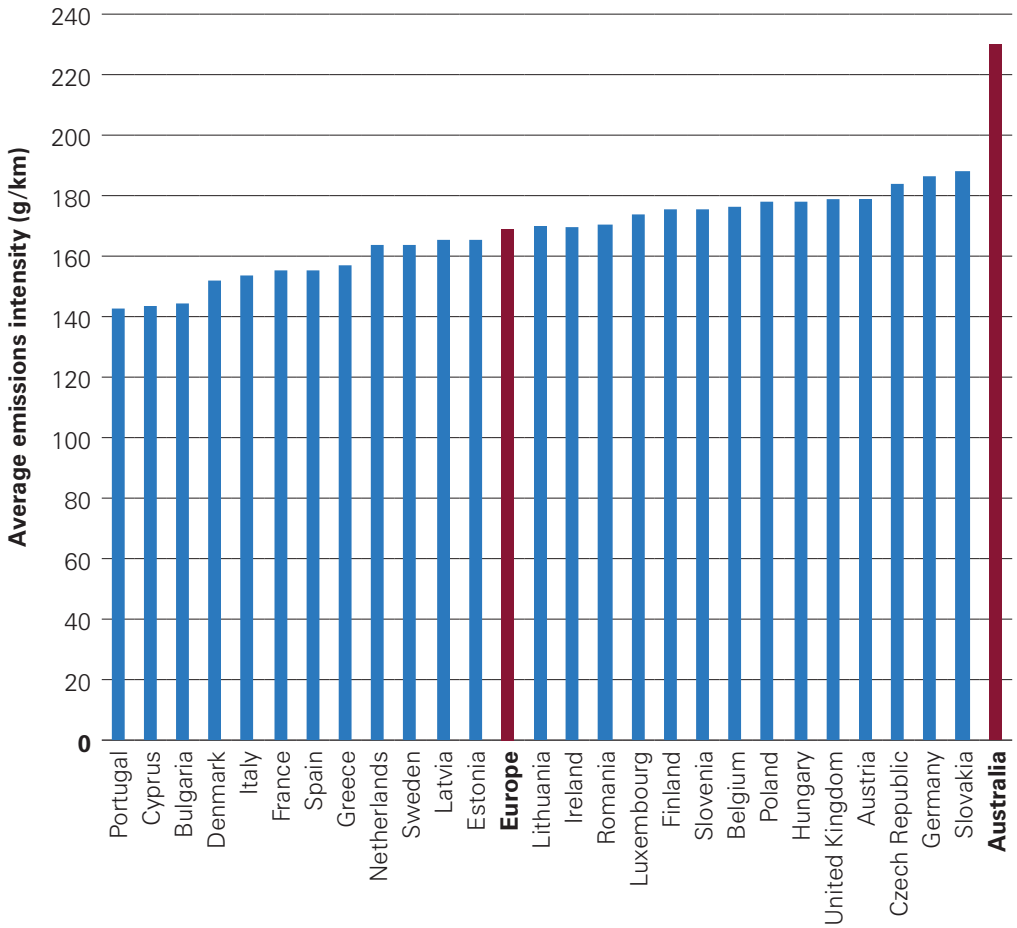
Figure 26: **Differences in corporate average emissions intensity for new passenger vehicles in Australia compared with Europe by make, 2015**



Light commercial vehicles: average emissions intensity by country

Figure 27 shows the average carbon dioxide emissions intensity for light commercial vehicles in Europe was 168 g/km in 2015. The average Australian emissions intensity was 229 g/km; 36 per cent higher than Europe. Additional data is provided in Table 21 in the appendix.

Figure 27: **Average emissions intensity for light commercial vehicles by country, 2015**



Light commercial vehicles: average emissions intensity by make

Figure 28 shows the average carbon dioxide emissions intensity by make for Europe and Australia. Renault had the lowest corporate average emissions intensity for light commercial vehicles in Europe and Peugeot in Australia. Renault's average emissions intensity was 148 g/km in Europe and 173 g/km in Australia, while Peugeot's were 151 g/km in Europe and 146 g/km in Australia.

Mercedes-Benz had the highest average emissions intensity in Europe at 189 g/km and Holden in Australia at 236 g/km respectively. Additional data is provided in Table 22 in the appendix.

Figure 28: **Differences in average emissions intensity for new light commercial vehicles in Australia compared with Europe by make, 2015**

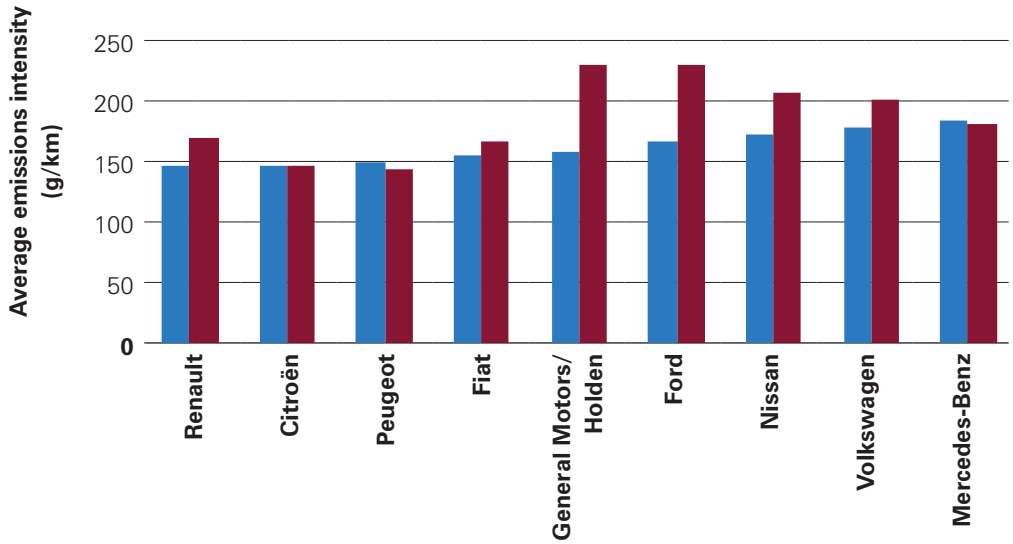
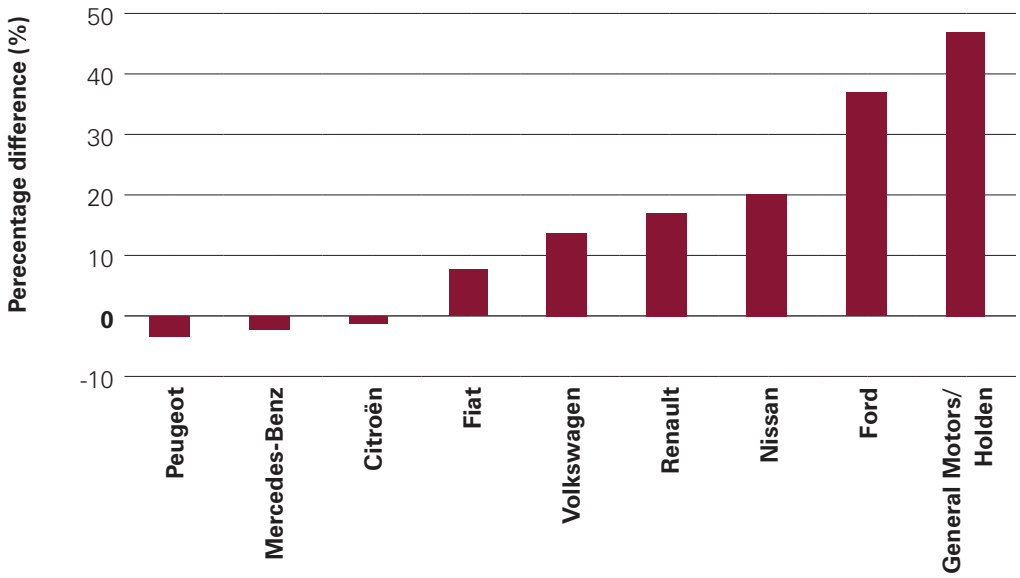


Figure 29 shows the difference in the emissions intensity for light commercial vehicles between Europe and Australia for 2015. When comparing Australia with Europe, Peugeot had average emissions that were 3 per cent lower, and General Motors/Holden's average emissions were 47 per cent higher.

Note that for three makes (Citroen, Peugeot and Mercedes-Benz) the Australian average emissions intensity was lower than the European average.

Figure 29: Differences in average emissions intensity for new light commercial vehicles in Australia compared with Europe by make, 2015



References

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

European Environment Agency (EEA) 2016, *Monitoring CO2 emissions from new passenger cars and vans in 2015*, EEA, Report No. 27/2016.

European Conference of Ministers of Transport 2007, *Cutting transport CO2 emissions. What progress?*, Paris.

Federal Chamber of Automotive Industries (FCAI) 2017a, Record sales year for 2016 flags dramatic shift in buyer preferences, viewed 2 May 2017, <https://www.fcai.com.au/news/index/index/year/all/month/all/article/476>.

Federal Chamber of Automotive Industries (FCAI) 2017b, FCAI segmentation criteria, viewed 5 May 2017, <www.fcai.com.au/sales/segmentation-criteria>.

Appendix

This appendix provides tables containing the data used in this report. Note that we have rounded for the average emissions intensity values for all tables except Table 6. The percentage change values in the tables use the unrounded figures.

Table 6. **National average emissions intensity for new passenger, sport utility and light commercial vehicles 2002-2016**

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	-3.7
2013	192.2	-3.4
2014	187.8	-2.3
2015	184.2	-1.9
2016	182.1	-1.1

N/A – Not applicable

Table 7. **Corporate average emissions intensity and annual sales by make, 2015 and 2016**

Make	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Toyota	199	198	-0.5	206,005	209,395
Mazda	157	158	0.6	114,024	118,217
Hyundai	177	174	-2.1	102,004	101,555
Holden	217	222	2.6	102,951	94,308
Ford	210	213	1.6	69,659	80,371
Mitsubishi	190	184	-3.2	71,743	73,368
Nissan	191	184	-3.4	65,926	66,784
Volkswagen	155	154	-0.9	59,806	56,030
Subaru	178	177	-0.1	43,600	47,018
Kia	182	178	-2.5	33,736	42,668
Honda	162	158	-2.1	40,100	40,838
Mercedes-Benz	154	156	1.4	32,727	37,787

Make	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
BMW	149	148	-0.9	24,975	28,006
Audi	149	144	-3.7	23,088	24,258
Isuzu Ute	216	215	-0.4	20,984	23,377
Suzuki	153	149	-3.0	19,086	19,495
Land Rover	198	181	-8.9	11,885	13,597
Jeep	223	218	-2.2	24,418	12,620
Renault	153	152	-0.3	10,014	9,321
Lexus	181	174	-3.8	8,691	9,027
Volvo Car	172	157	-9.0	4,943	5,878
Skoda	139	132	-5.4	4,750	4,760
Porsche	195	194	-0.5	4,090	4,434
MINI	131	132	0.7	3,342	3,765
Peugeot	145	138	-4.9	4,000	3,129
Jaguar	164	155	-5.6	1,292	3,008
Fiat	158	154	-2.7	3,945	2,414
LDV	250	259	3.9	767	1,542
Citroen	144	125	-13.2	1,106	965
Foton Light	218	218	-0.1	1,065	839
Infiniti	213	206	-3.1	574	807
Alfa Romeo	139	143	2.6	1,577	711
Maserati	256	233	-8.9	519	483
Chrysler	248	271	9.0	925	462
Ssangyong	206	208	0.9	1,000	371
Dodge	242	242	0.0	1,184	366
Fiat Professional	170	172	1.5	293	293
Haval	-	236	N/A	0	286
Bentley	278	282	1.7	158	190
Ferrari	288	270	-6.2	167	188
Proton	188	191	1.9	421	182
Lamborghini	309	309	0.0	84	127
Aston Martin	319	314	-1.6	130	115
Great Wall	236	223	-5.3	142	110
McLaren	278	266	-4.2	36	93
Rolls-Royce	330	330	0.2	30	37
Lotus	191	211	10.2	48	31
Chery	191	187	-2.0	201	19
Morgan	193	198	2.4	21	5
Caterham	144	181	25.7	1	3
Smart	112	-	N/A	76	0

N/A – Not applicable

Table 8. **Average emissions intensity and annual sales by Australian-made makes, 2015 and 2016**

Make	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Holden	220	233	5.8	47,989	43,246
Toyota	176	175	-0.6	31,960	30,318
Ford	233	234	0.3	17,494	13,532
Australian-made	**208**	**213**	**2.3**	**97,443**	**87,096**

Table 9. **Average emissions intensity and annual sales by Australian-made vehicle models, 2015 and 2016**

Make	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Holden Commodore	239	252	5.2	27,770	25,860
Toyota Camry	183	183	0	21,773	20,594
Holden Cruze	173	174	0.8	13,959	11,630
Ford Territory	228	227	-0.2	8,902	6,928
Ford Falcon	234	237	1.1	5,938	4,434
Toyota Hybrid Camry	121	121	0	5,881	5,891
Holden Utility	235	258	9.9	4,936	4,802
Toyota Aurion	215	215	0	4,306	3,833
Ford Falcon Utility	247	248	0.4	2,654	2,170
Holden Caprice	261	300	15.1	1,324	954
Total	**208**	**213**	**2.3**	**97,443**	**87,096**

Table 10. **Average emissions intensity and annual sales by segment, 2015 and 2016**

Segment	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Small	153	153	-0.5	232,939	224,386
SUV Medium	179	174	-2.8	144,937	172,194
Pick Up/Chassis 4X4	230	222	-3.3	134,003	146,528
SUV Large	220	212	-3.9	139,734	142,495
SUV Small	168	158	-5.9	111,275	110,414
Light	138	136	-1.6	111,954	95,021
Medium	162	161	-0.6	78,123	74,573
Pick Up/Chassis 4X2	230	224	-2.5	40,657	43,948
Large	227	235	3.5	43,940	39,392
Sports	174	197	13.0	22,905	27,464
Vans/Cab Chassis	216	213	-1.2	20,993	23,812
SUV Upper Large	277	261	-5.5	12,525	15,914
People movers	218	216	-0.9	11,946	12,864
Micro	121	127	4.4	10,717	10,207
Upper Large	242	250	3.1	2,976	2,286
Light buses	260	259	-0.5	2,685	2,155
Total	**184**	**182**	**-1.1**	**1,122,309**	**1,143,653**

Table 11. Top selling models within segments, 2016

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 (g/km) *
Micro	1	Mitsubishi	MIRAGE	3,064	116	29	90
	2	Kia	PICANTO TA	1,934	130	44	Fiat 500
	3	Holden	SPARK	1,747	136	51	
	4	Nissan	MICRA	1,525	152	69	
	5	Fiat	500	1,043	127	41	
	6	Suzuki	CELERIO	742	111	24	
	7	Fiat	ABARTH	135	145	61	
	8	Holden	BARINA SPARK	13	137	53	
	9	Fiat	PANDA	4	102	13	
Light	1	Hyundai	ACCENT	18,703	145	61	90
	2	Mazda	2	13,639	121	34	Toyota Prius C (petrol-electric hybrid)
	3	Toyota	YARIS	12,158	145	62	
	4	Suzuki	SWIFT	8,372	145	61	
	5	Honda	JAZZ	8,316	137	52	
	6	Volkswagen	POLO	8,186	114	27	
	7	Kia	RIO	6,054	147	64	
	8	Holden	BARINA	4,166	169	87	
	9	MINI	COOPER	2,943	125	39	
	10	Ford	FIESTA	2,722	133	48	
Small	1	Toyota	COROLLA	40,330	151	1162	12
	2	Hyundai	I30	37,772	165	1272	BMW i3 REX (range extended electric).
	3	Mazda	3	36,107	138	1052	
	4	Volkswagen	GOLF	19,470	133	1005	
	5	Kia	CERATO YD	13,111	170	1313	Fully electric BMW i3 and Nissan Leaf are also available at 0 g/km
	6	Holden	CRUZE	12,904	174	1352	
	7	Mitsubishi	LANCER	7,272	178	1381	
	8	Ford	FOCUS	6,783	149	1142	
	9	Honda	CIVIC 4D	6,576	144	1101	
	10	Nissan	PULSAR	5,790	164	1270	
Medium	1	Toyota	CAMRY	20,594	183	273	49
	2	Toyota	CAMRY HYBRID	5,891	121	147	BMW 330E
	3	Mazda	600	4,369	152	210	
	4	Subaru	LIBERTY	3,495	180	267	
	5	Ford	MONDEO	3,122	150	207	
	6	Volkswagen	PASSAT	3,090	135	175	
	7	Audi	A4	2,942	133	171	
	8	Mercedes-Benz	C200	2,531	138	182	
	9	Mercedes-Benz	C250	2,064	138	182	
	10	Skoda	OCTAVIA	1,973	134	173	

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 (g/km) *
Large	1	Holden	COMMODORE	25,860	252	133	108
	2	Ford	FALCON	4,434	237	119	Mercedes-Benz E220D (diesel)
	3	Toyota	AURION	3,833	215	99	
	4	Skoda	SUPERB	733	152	41	
	5	Mercedes-Benz	E200	526	144	34	
	6	Jaguar	XF	433	152	41	
	7	Audi	A6	420	139	29	
	8	Hyundai	GENESIS	373	261	142	
	9	Maserati	GHIBLI	330	204	89	
	10	Mercedes-Benz	E350D	200	147	36	
Upper Large	1	Holden	CAPRICE	954	300	154	118
	2	Chrysler	300 LX	460	271	129	Mercedes-Benz S300 BT (diesel-electric vehicle)
	3	BMW	740I	111	164	39	
	4	Mercedes-Benz	S350 D	96	152	29	
	5	Mercedes-Benz	S400L	86	184	56	
	6	BMW	730D	68	129	9	
	7	Maserati	QUATTROPORTE	63	225	91	
	8	Mercedes-Benz	S350 BLUETEC	44	159	35	
	9	Audi	A8	42	161	36	
	10	Porsche	970	42	187	58	
People movers	1	Kia	CARNIVAL YP	4,777	236	97	120
	2	Honda	ODYSSEY	2,712	182	51	Citroen C4 Grand Picasso (diesel)
	3	Hyundai	IMAX	1,387	254	111	
	4	Volkswagen	MULTIVAN	961	198	65	
	5	Toyota	TARAGO	900	215	79	
	6	LDV	G10	579	272	127	
	7	Mercedes-Benz	V-CLASS	454	166	38	
	8	Mercedes-Benz	VALENTE	375	166	38	
	9	Volkswagen	CADDY	195	142	19	
	10	Volkswagen	CARAVELLE	131	222	85	
Sports	1	Ford	MUSTANG	6,208	277	466	49
	2	Hyundai	VELOSTER	2,232	169	245	BMW i8 (range extended plug-in electric vehicle)
	3	Toyota	86	2,068	173	253	
	4	Mazda	MX5	1,577	158	223	
	5	Mercedes-Benz	C300 CPE	1,007	154	214	
	6	Holden	ASTRA	749	139	184	
	7	Mercedes-Benz	E250	523	148	202	
	8	Audi	A3	522	115	135	

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 (g/km) *
	9	Mercedes-Benz	C200 CPE	515	140	186	
	10	Holden	CASCADA	500	181	269	
SUV Small	1	Mazda	CX3	18,334	148	61	92 Citroen C4 CACTUS (diesel)
	2	Mitsubishi	ASX	18,126	175	90	
	3	Honda	HR-V	12,403	158	72	
	4	Nissan	QASHQAI	12,259	157	71	
	5	Subaru	XV	8,290	163	77	
	6	Holden	TRAX	7,976	174	89	
	7	Suzuki	VITARA	5,713	139	51	
	8	Audi	Q3	3,524	140	52	
	9	Volkswagen	TIGUAN	2,575	158	72	
	10	Nissan	JUKE	2,382	146	59	
SUV Medium	1	Mazda	CX5	24,564	159	278	42 Mitsubishi Outlander (plug-in hybrid electric vehicle)
	2	Hyundai	TUCSON	20,132	182	333	
	3	Toyota	RAV4	19,526	179	327	
	4	Nissan	XTRAIL	18,903	185	340	
	5	Subaru	FORESTER	13,407	184	338	
	6	Mitsubishi	OUTLANDER	12,401	160	282	
	7	Kia	QL SPORTAGE	9,841	182	333	
	8	Honda	CR-V	7,970	189	349	
	9	Land Rover	DISCOVERY SPORT	4,432	159	279	
	10	Ford	KUGA	4,395	174	315	
SUV Large	1	Toyota	PRADO	14,730	212	332	49 Volvo XC 90 (petrol-electric hybrid)
	2	Subaru	OUTBACK	12,207	175	257	
	3	Toyota	KLUGER	11,829	241	392	
	4	Holden	CAPTIVA	11,246	227	364	
	5	Hyundai	SANTA FE	7,834	194	296	
	6	Isuzu Ute	MU-X	7,018	218	346	
	7	Ford	TERRITORY	6,928	227	363	
	8	Jeep	GRAND CHEROKEE	6,379	226	362	
	9	Mitsubishi	PAJERO SPORT	6,238	212	333	
	10	Nissan	PATHFINDER	5,560	234	377	

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 (g/km) *
SUV Upper Large	1	Toyota	LANDCRUISER	11,813	304	83	166
	2	Nissan	PATROL	2,003	301	81	Land Rover Range Rover (diesel)
	3	Mercedes-Benz	GLS350D 4M	670	199	20	
	4	Land Rover	RANGE ROVER	454	229	38	
	5	Lexus	LX570	285	334	101	
	6	Mercedes-Benz	GL350 BT	252	199	20	
	7	Mercedes-Benz	GLS500 4M	97	264	59	
	8	Mercedes-Benz	G63 AMG	91	322	94	
	9	Mercedes-Benz	GLS63 AMG 4M	80	288	73	
	10	Infiniti	QX80	61	350	111	
Pick-up/ chassis 4x2	1	Toyota	HILUX 4X2	11,028	235	41	166
	2	Ford	RANGER	6,054	202	22	Nissan Navara (diesel)
	3	Isuzu Ute	D-MAX	5,038	212	27	
	4	Holden	HOLDEN UTILITY	4,802	258	56	
	5	Mitsubishi	TRITON	3,928	214	29	
	6	Mazda	B32	3,163	236	42	
	7	Nissan	NP300 NAVARA	2,792	186	12	
	8	Ford	FALCON	2,170	237	43	
	9	Holden	COLORADO	2,033	239	44	
	10	Mazda	B22	1,852	213	28	
Pick-up/ chassis 4x4	1	Toyota	HILUX 4X4	31,076	216	26	172
	2	Ford	RANGER	30,880	202	17	Nissan Navara (diesel)
	3	Mitsubishi	TRITON	17,969	214	24	
	4	Holden	COLORADO	16,353	239	39	
	5	Nissan	NP300 NAVARA	13,185	186	8	
	6	Isuzu Ute	D-MAX	11,321	212	23	
	7	Mazda	B32	9,489	236	37	
	8	Volkswagen	AMAROK	7,498	205	19	
	9	Toyota	LANDCRUISER	7,031	304	77	
	10	Foton Light	TUNLAND	680	212	23	

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 (g/km) *
Vans/Cab Chassis	1	Toyota	HIACE	7,478	259	113	122
	2	Hyundai	ILOAD	5,467	248	103	Citroen Berlingo (diesel)
	3	Volkswagen	TRANSPORTER	1,960	198	63	
	4	Renault	TRAFIC	1,730	164	35	
	5	Volkswagen	CADDY VAN	1,706	138	13	
	6	Ford	TRANSIT CUSTOM	1,205	189	55	
	7	Mercedes-Benz	VITO	1,153	165	36	
	8	Renault	KANGOO	1,114	169	39	
	9	Suzuki	APV	472	190	56	
	10	LDV	G10	471	272	123	
Light buses	1	LDV	V80	44	233	2	228
	2	Toyota	HIACE	2,111	259	14	Toyota Hiace (diesel)

* Best-in-class excludes fully electric vehicles and is not average sales weighted emissions.

Note: For all segments except light buses, the top 10 selling vehicles are shown.

Table 12. **Average emissions intensity for models with a sales volume greater than 1,000 vehicles, 2016**

Rank	Make	Model	Average emissions intensity (g/km)	Sales
1	Toyota	COROLLA	151	40,330
2	Hyundai	I30	165	37,772
3	Mazda	3	138	36,107
4	Toyota	HILUX 4X4	216	31,076
5	Ford	RANGER	230	30,880
6	Holden	COMMODORE	252	25,860
7	Mazda	CX5	159	24,564
8	Toyota	CAMRY	183	20,594
9	Hyundai	TUCSON	182	20,132
10	Toyota	RAV4	179	19,526
11	Volkswagen	GOLF	133	19,470
12	Nissan	XTRAIL	185	18,903
13	Hyundai	ACCENT	145	18,703
14	Mazda	CX3	148	18,334
15	Mitsubishi	ASX	175	18,126
16	Mitsubishi	TRITON	197	17,969
17	Holden	COLORADO	240	16,353
18	Toyota	PRADO	212	14,730
19	Mazda	2	121	13,639
20	Subaru	FORESTER	184	13,407
21	Nissan	NP300 NAVARA	181	13,185
22	Kia	CERATO YD	170	13,111
23	Holden	CRUZE	174	12,904
24	Honda	HR-V	158	12,403
25	Mitsubishi	OUTLANDER	160	12,401
26	Nissan	QASHQAI	157	12,259
27	Subaru	OUTBACK	175	12,207
28	Toyota	YARIS	145	12,158
29	Toyota	KLUGER	241	11,829
30	Toyota	LANDCRUISER	255	11,813
31	Isuzu Ute	D-MAX	214	11,321
32	Holden	CAPTIVA	227	11,246
33	Toyota	HILUX 4X2	235	11,028
34	Kia	QL SPORTAGE	182	9,841
35	Mazda	B32	248	9,489
36	Suzuki	SWIFT	145	8,372
37	Honda	JAZZ	137	8,316
38	Subaru	XV	163	8,290
39	Volkswagen	POLO	114	8,186
40	Holden	TRAX	174	7,976

Rank	Make	Model	Average emissions intensity (g/km)	Sales
41	Honda	CR-V	189	7,970
42	Hyundai	SANTA FE	194	7,834
43	Volkswagen	AMAROK	216	7,498
44	Toyota	HIACE	239	7,478
45	Mitsubishi	LANCER	178	7,272
46	Toyota	LANDCRUISER	304	7,031
47	Isuzu Ute	MU-X	218	7,018
48	Ford	TERRITORY	227	6,928
49	Ford	FOCUS	149	6,783
50	Honda	CIVIC 4D	144	6,576
51	Jeep	GRAND CHEROKEE	226	6,379
52	Mitsubishi	PAJERO SPORT	212	6,238
53	Ford	MUSTANG	277	6,208
54	Kia	RIO	147	6,054
55	Ford	RANGER	202	6,054
56	Toyota	CAMRY HYBRID	121	5,891
57	Nissan	PULSAR	164	5,790
58	Suzuki	VITARA	139	5,713
59	Nissan	PATHFINDER	234	5,560
60	Hyundai	ILOAD	248	5,467
61	Mazda	CX9	208	5,123
62	Isuzu Ute	D-MAX	212	5,038
63	Hyundai	ELANTRA	167	4,819
64	Holden	HOLDEN UTILITY	258	4,802
65	Kia	CARNIVAL YP	236	4,777
66	Subaru	IMPREZA	158	4,731
67	Ford	FALCON	237	4,434
68	Land Rover	DISCOVERY SPORT	159	4,432
69	Ford	KUGA	174	4,395
70	Mazda	6	152	4,369
71	Kia	SORENTO UM	182	4,202
72	Holden	BARINA	169	4,166
73	Mitsubishi	PAJERO	239	4,049
74	Mitsubishi	TRITON	214	3,928
75	Toyota	FORTUNER	225	3,871
76	Toyota	AURION	215	3,833
77	Audi	A3	115	3,676
78	Ford	EVEREST	224	3,614
79	Audi	Q3	140	3,524
80	Subaru	LIBERTY	180	3,495
81	Volkswagen	TIGUAN	158	3,399
82	Mazda	B32	236	3,163

Rank	Make	Model	Average emissions intensity (g/km)	Sales
83	Holden	COLORADO 7	252	3,138
84	Ford	MONDEO	150	3,122
85	Land Rover	RR SPORT	193	3,099
86	Volkswagen	PASSAT	135	3,090
87	Mitsubishi	MIRAGE	110	3,064
88	MINI	COOPER	125	2,943
89	Audi	A4	133	2,942
90	Subaru	WRX	216	2,936
91	Audi	Q7	155	2,873
92	Nissan	NP300 NAVARA	186	2,792
93	Land Rover	RR EVOQUE	136	2,732
94	Ford	FIESTA	133	2,722
95	Honda	ODYSSEY	182	2,712
96	Audi	Q5	163	2,618
97	Volkswagen	TIGUAN	186	2,575
98	Mercedes-Benz	C200	138	2,531
99	Land Rover	DISCOVERY	230	2,470
100	BMW	X5 XDRIVE30D	162	2,385
101	Nissan	JUKE	146	2,382
102	Hyundai	VELOSTER	169	2,232
103	Lexus	NX200T	181	2,221
104	Porsche	95B	191	2,172
105	Ford	FALCON	248	2,170
106	Volkswagen	TOUAREG	197	2,168
107	Volvo Car	XC60	169	2,134
108	Toyota	HIACE	259	2,111
109	Audi	A1	110	2,104
110	Jeep	CHEROKEE	217	2,079
111	Toyota	86	173	2,068
112	Mercedes-Benz	C250	138	2,064
113	Holden	COLORADO	239	2,033
114	BMW	X3 XDRIVE20D	138	2,013
115	Mercedes-Benz	GLC250D	149	2,005
116	Nissan	PATROL	315	2,003
117	Skoda	OCTAVIA	134	1,973
118	Volkswagen	TRANSPORTER	198	1,960
119	Renault	CLIO	123	1,936
120	Kia	PICANTO TA	130	1,934
121	Volkswagen	JETTA	148	1,923
122	Mazda	B22	213	1,852
123	Ford	ECOSPORT	150	1,819
124	Holden	SPARK	136	1,747
125	Renault	TRAFIC	164	1,730

Rank	Make	Model	Average emissions intensity (g/km)	Sales
126	Volkswagen	CADDY VAN	138	1,706
127	Mercedes-Benz	GLC250	168	1,692
128	Honda	CITY	133	1,686
129	Hyundai	SONATA	201	1,676
130	Mercedes-Benz	GLA180	133	1,670
131	Suzuki	GRAND VITARA	224	1,639
132	Subaru	LEVORG	201	1,621
133	Mazda	MX5	158	1,577
134	Renault	CAPTUR	125	1,563
135	Audi	S3	158	1,539
136	Nissan	MICRA	152	1,525
137	Jaguar	XE	146	1,524
138	Renault	KOLEOS	203	1,524
139	Volvo Car	XC90	167	1,486
140	BMW	X1 XDRIVE25I	152	1,426
141	Mercedes-Benz	A250 SPORT 4M	156	1,394
142	Hyundai	IMAX	254	1,387
143	Porsche	CAY	190	1,341
144	Suzuki	BALENO	124	1,336
145	BMW	X1 SDRIVE18D	114	1,334
146	Toyota	FJ CRUISER	267	1,330
147	Kia	JF OPTIMA	196	1,302
148	Jeep	WRANGLER	267	1,283
149	BMW	330I	136	1,264
150	Peugeot	308	123	1,237
151	Ford	TRANSIT CUSTOM	189	1,205
152	BMW	X3 XDRIVE20I	175	1,188
153	Mercedes-Benz	VITO	165	1,153
154	Volvo Car	V40	127	1,129
155	Mercedes-Benz	GLE250D 4M	159	1,127
156	Mercedes-Benz	GLA250 4M	162	1,114
157	Renault	KANGOO	169	1,114
158	Mercedes-Benz	GLE350D 4M	179	1,107
159	Jeep	COMPASS	197	1,097
160	Lexus	NX300H	132	1,087
161	Kia	SPORTAGE SLE	199	1,083
162	Renault	MEGANE	128	1,073
163	Jeep	RENEGADE	144	1,051
164	Fiat	500	127	1,043
165	Mercedes-Benz	A180	135	1,023
166	Mercedes-Benz	C300 CPE	154	1,007
167	Holden	MALIBU	192	1,005

Table 13. **Average emissions intensity and annual sales by buyer type, 2015 and 2016**

Buyer type	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Private	178	176	-1.1	606,659	571,332
Business	190	187	-1.6	474,321	531,664
Government	204	201	-1.6	41,329	40,657
Total	**185**	**182**	**-1.4**	**1,122,309**	**1,143,653**

Table 14. **Average emissions intensity and annual sales by detailed buyer type, 2015 and 2016**

Buyer type	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Private – Local Delivery	178	176	-1.1	606,343	571,107
Fleet	201	201	0.2	154,406	159,812
Dealer Demonstrator	181	176	-2.8	148,433	189,537
Large Fleet	202	198	-1.9	59,137	65,798
Rental	180	181	0.8	56,930	60,318
Company Capitalisation	181	176	-2.7	37,495	38,742
State Government	205	204	-0.5	28,595	26,584
Not For Profit Organisation	188	184	-2.1	16,065	16,168
Local Government	201	195	-3.1	9,240	10,364
Australian Government	209	200	-4.2	3,494	3,709
Taxi	143	155	8.4	1,522	1,067
Private - Overseas Delivery	193	162	-16.0	316	225
Diplomatic	176	185	5.1	72	110
Total	**184**	**182**	**-1.1**	**1,122,048**	**1,143,541**

Table 15. **Average emissions intensity and annual sales by detailed government buyer type, 2015 and 2016**

Buyer type	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
NSW government	202	204	0.8	9,579	8,100
VIC government	206	202	-2.1	6,217	6,664
QLD government	209	208	-0.6	5,698	4,686
NSW local governments	197	193	-2.0	3,528	3,738
Australian government	207	199	-3.9	3,494	3,709
WA government	205	201	-2.0	2,164	2,854
VIC local governments	196	188	-3.8	1,973	2,303
SA government	200	202	0.8	2,792	2,190
QLD local governments	211	201	-4.6	1,431	1,872
WA local governments	204	199	-2.9	1,319	1,337
TAS government	195	199	2.1	994	950
NT government	215	212	-1.4	971	938
SA local governments	212	202	-4.6	566	655
TAS local governments	195	192	-1.3	290	253
ACT government	181	173	-4.5	189	233
NT local governments	217	196	-9.4	124	175
Total	**204**	**203**	**-0.04**	**41,329**	**40,657**

Table 16. **Average emissions intensity and annual sales by fuel type, 2015 and 2016**

Fuel type	Average emissions intensity (g/km)		Change from 2015 to 2016 (%)	Sales	
	2015	2016		2015	2016
Petrol	173	172	-1.1	785,780	781,114
Diesel	210	205	-2.3	333,543	361,776
LPG	205	221	8.0	2,061	612
Electric*	41	30	-25.3	925	151
Total	**184**	**182**	**-1.1**	**1,122,309**	**1,143,653**

* Note that electric vehicles with emissions of 0 g/km are excluded

Table 17. **'Green' vehicle average emissions intensity and sales by segment, 2016**

Segment	Make	Model	Average emissions intensity (g/km)	Sales
Micro	Fiat	PANDA	102	4
	Mitsubishi	MIRAGE	110	3064
	Suzuki	CELERIO	111	742
Light	Toyota	PRIUS C	90	903
	Peugeot	208	108	610
	Audi	A1	110	2104
	Skoda	FABIA	110	857
	Volkswagen	POLO	114	8186
	Mitsubishi	MIRAGE	116	161
Small	Nissan	Leaf	0	42
	BMW	I3	0	22
	BMW	I3 REX	13	70
	Toyota	PRIUS	82	415
	Lexus	CT200H	95	901
	BMW	118D	99	273
	Toyota	PRIUS V	101	467
	Mercedes-Benz	A200 CDI	105	2
	Mercedes-Benz	A200D	105	177
	BMW	218D AT	111	213
	BMW	118I	112	688
	Mercedes-Benz	B200 CDI	114	171
	Audi	A3	115	3676
	Citroen	C4	116	67
	Citroen	DS4	116	21
	Skoda	RAPID	117	367
Medium	BMW	330E	49	74
	Mercedes-Benz	C350 E	56	162
	Mercedes-Benz	C350T E	59	6
	Mercedes-Benz	C300 BTH	105	33
	Mercedes-Benz	CLA200 CDI	110	91
	Mercedes-Benz	CLA220D	111	59
	Lexus	IS300H	113	320
	Mercedes-Benz	CLA200 CDI SB	114	51
	BMW	420D GRAN COUPE	114	76
	Mercedes-Benz	CLA220D SB	115	15
	Mercedes-Benz	C250 BT	116	442
	BMW	320D	116	479
	BMW	320D G TURISMO	118	33
	Mercedes-Benz	C200 BT	119	103

Segment	Make	Model	Average emissions intensity (g/km)	Sales
Large	Mercedes-Benz	E220D	108	141
	Mercedes-Benz	E300 BTH	113	5
	BMW	520D	114	190
Upper large	Mercedes-Benz	S300 BT HYBRID	118	4
Sports	BMW	I8	49	32
	BMW	220D COUPE	107	125
	BMW	420D COUPE	114	65
	Mercedes-Benz	C250D CPE	115	212
SUV small	Citroen	C4 CACTUS	95	226
	Suzuki	IGNIS	114	41
	BMW	X1 SDRIVE18D	114	1334
	Mercedes-Benz	GLA220 D	118	173
SUV medium	Mitsubishi	OUTLANDER	0	49
SUV large	BMW	X5 XDRIVE40E	77	60
	Mercedes-Benz	GLE500E	78	40
Vans/ Cab Chassis	Renault	KANGOO	0	4

Table 18. **Average emissions intensity and annual registrations for new passenger vehicles by country, 2014 and 2015**

Country	Average emissions intensity (g/km)		Change from 2014 to 2015 (%)	Annual registrations (thousands)	
	2014	2015		2014	2015
Netherlands	107	101	-5.4	384	438
Greece	108	106	-1.5	71	76
Portugal	109	106	-3.0	142	179
Denmark	110	106	-3.5	188	204
France	114	111	-2.6	1,838	2,011
Malta	115	113	-1.5	6	7
Croatia	115	113	-1.9	35	36
Ireland	117	114	-2.5	96	123
Italy	118	115	-2.4	1,351	1,573
Spain	119	115	-3.1	895	1076
Belgium	121	118	-2.6	485	503
Slovenia	121	119	-1.5	54	53
Europe	**123**	**120**	**-3.2**	**12,500**	**12,700**
United Kingdom	124	121	-2.2	2,467	2,623
Austria	128	124	-3.4	303	308
Finland	127	123	-3.1	103	106
Romania	128	125	-2.3	70	81
Luxembourg	129	128	-1.2	49	46
Cyprus	129	126	-2.6	8	9
Sweden	131	126	-3.6	297	338
Czech Republic	131	126	-3.6	179	227
Slovakia	131	128	-2.6	74	78
Germany	132	128	-2.8	3,012	3,177
Poland	132	129	-2.0	304	354
Hungary	133	130	-2.6	68	77
Lithuania	135	130	-3.7	14	17
Bulgaria	135	130	-3.5	16	17
Latvia	140	137	-2.1	12	14
Estonia	140	137	-2.0	21	21
Australia	**177**	**175**	**-1.5**	**884***	**924***

* New car sales

Table 19. **Equivalent make for new passenger vehicles in Europe and Australia**

Make in Europe	Combined makes in Australia
BMW	BMW, Mini and Rolls-Royce
Daimler	Mercedes-Benz and Smart
General Motors/Opel	Holden
Toyota	Toyota and Lexus
Nissan	Nissan and Infiniti

Table 20. **Corporate average emissions intensity for new passenger vehicles for Europe and Australia by make, 2015**

Make	Average emissions intensity (g/km)		Percentage difference (%)
	Europe	Australia	
Peugeot	104	145	39
Renault	106	147	39
Citroën	106	142	34
Toyota	108	184	70
Hyundai	114	174	53
Nissan	115	185	61
Fiat	116	158	36
Škoda	116	139	20
Ford	118	187	58
Volkswagen	119	143	20
All makes	120	164	37
Kia	122	182	49
Volvo	122	172	41
Daimler	125	153	22
BMW	126	147	17
Mazda	127	147	16
General Motors/Opel/Holden	127	211	66
Audi	127	149	17
Jaguar Land Rover	164	195	19

Table 21. **Average emissions intensity and annual registrations for new light commercial vehicles by country, 2014 and 2015**

Country	Average emissions intensity (g/km)		Change from 2014 to 2015 (%)	Annual registrations (thousands)	
	2014	2015		2014	2015
Portugal	145	142	-2.1	24	27
Cyprus	158	143	-9.5	1	1
Bulgaria	149	144	-3.4	8	9
Denmark	155	151	-2.6	25	29
Italy	157	153	-2.5	107	117
France	152	155	2.0	348	309
Spain	156	155	-0.6	90	76
Greece	157	156	-0.6	5	5
Netherlands	167	163	-2.4	46	49
Sweden	170	163	-4.1	26	28
Latvia	167	165	-1.2	2	2
Estonia	178	165	-7.3	3	4
Europe	**171**	**168**	**-1.6**	**1,423**	**1,455**
Ireland	169	169	0.4	16	22
Lithuania	176	169	-4.0	2	2
Romania	172	170	-1.2	8	9
Luxembourg	179	173	-3.4	3	3
Finland	180	175	-2.8	10	10
Slovenia	185	175	-5.4	5	6
Belgium	179	176	-1.7	52	59
Poland	169	177	4.7	61	47
Hungary	178	177	-0.6	15	15
United Kingdom	181	178	-1.7	307	351
Austria	184	178	-3.3	30	31
Czech Republic	191	183	-4.2	12	13
Germany	190	186	-2.1	212	224
Slovakia	193	187	-3.1	5	7
Australia	**235**	**229**	**-2.6**	**197***	**198***

*New vehicle sales

Table 22. **Average emissions intensity for new light commercial vehicles for Australia and Europe by make, 2015**

Make	Average emissions intensity (g/km)		Percentage difference (%)
	Europe	Australia	
Renault	148	173	17
Citroën	150	148	-1
Peugeot	151	146	-3
Fiat	158	170	8
General Motors/Holden	161	236	47
Ford	171	235	37
Nissan	176	212	20
Volkswagen	181	205	13
Mercedes-Benz	189	185	-2

Table 23. **Electric vehicle sales by model for 2011–2016**

Make and Model	2011	2012	2013	2014	2015	2016
BMW I3	0	0	0	9	47	22
BMW I3 REX	0	0	0	24	103	70
BMW I8	0	0	0	3	61	32
Holden VOLT	0	80	101	58	8	0
Mitsubishi IMIEV	30	95	0	0	0	0
Mitsubishi OUTLANDER	0	0	0	863	753	49
Nissan LEAF	19	77	188	173	136	42
Renault FLUENCE	0	1	3	0	0	0
Renault KANGOO	0	0	0	5	0	4
Total	**49**	**253**	**292**	**1135**	**1108**	**219**

Table 24. **Electric vehicle sales by state for 2011–2016**

State	2011	2012	2013	2014	2015	2016
Australian Capital Territory	2	10	14	36	28	20
New South Wales	5	50	79	195	205	50
Northern Territory	0	0	3	3	2	4
Queensland	3	47	26	166	177	22
South Australia	14	32	16	325	354	43
Tasmania	1	5	6	13	22	7
Victoria	23	81	114	286	239	59
Western Australia	1	28	34	111	81	14

Table 25. **Electric vehicle sales by buyer type for 2011–2016**

Buyer Type	2011	2012	2013	2014	2015	2016
Company Capitalisation	16	119	42	363	599	74
Dealer Demonstrator	0	57	48	379	143	51
Federal Government	16	1	0	0	0	11
Fleet	4	8	32	10	10	0
Large Fleet	2	4	25	39	13	7
Local Government	0	10	37	7	9	1
Not For Profit Organisation	0	0	1	0	0	0
Private - Local Delivery	11	47	95	298	298	72
Private - Overseas Delivery	0	0	0	23	4	0
State Government	0	0	12	16	12	3