

Carbon Emissions from New Australian Vehicles



- INFORMATION PAPER -

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Foreword

The National Transport Commission (NTC) is an independent body tasked by the Australian Transport Council to provide independent advice to the transport ministers on transport regulatory and operational reforms. The NTC undertakes these reforms across road, rail and intermodal transport to improve safety, productivity and environmental outcomes.

The Australian government will shortly commence developing a proposal for carbon dioxide standards for new light vehicles sold in Australia. To help inform this proposal, NTC has produced this report. We see this report as a key input into the national debate about carbon dioxide standards for new vehicles sold in Australia.

For the first time, detailed information about the performance of new vehicles sold in Australia is publicly available in this report. The data that underpins this report was provided by the Federal Chamber of Automotive Industries. I would like to thank Andrew McKellar, Chief Executive of the Federal Chamber of Automotive Industries, who made this data to available to NTC.

I would like to thank the Low Emissions Vehicle Automotive Partnership that provided NTC with an opportunity to present initial work at its forum in September 2009. I also acknowledge the work of NTC staff in developing this report, in particular Neil Wong, Andrew Georgiou and Lea Morgan.

A handwritten signature in black ink, appearing to read 'Greg Martin', written in a cursive style.

Greg Martin
Chairman

Executive Summary

The National Transport Commission (NTC) identified a gap in the existing data and information which was available for governments to help inform policy and program development around light vehicle emissions. In order to fill this information gap, the NTC has published this paper drawing on data provided by the Federal Chamber of Automotive Industries.

For the first time, this report provides detailed information of average emissions from new passenger and light commercial vehicles from Australia. The units for carbon dioxide emissions from vehicles are grams of carbon dioxide per kilometre (g/km).

At the direction of the Council of Australian Governments, the Commonwealth government is currently undertaking a regulatory impact statement to assess the costs and benefits of introducing carbon dioxide emission standards for light vehicles. The data presented in this paper will provide important input to that project. However this data will also inform broader work being undertaken around climate change and the automotive industry.

For example, if Australian consumers purchased vehicles with best-in-class emissions, the national average emissions from new passenger and light commercial vehicles would drop by one-third. In addition, governments are developing policy responses to encourage the manufacturing and development of 'green' cars, however there is currently no standard definition around what is considered to be a 'green' car. The data presented in this paper will contribute to that discussion.

The paper provides a benchmark for carbon dioxide emissions for new passenger and light commercial vehicles. It includes detailed emissions breakdowns by buyer type, vehicle segment and make. Future new vehicle emissions depend on many factors including consumer preference, the emissions performance of high volume selling vehicles, vehicle price and fuel price.

The information provided in this paper highlights an opportunity for governments, industry and the community to improve the emissions from new passenger and light commercial vehicles.

Fast facts:

- In 2008, the national average carbon emissions from new passenger and light commercial vehicles was 222 g/km. This was a 12 per cent reduction from 2002.
- If Australians purchased new vehicles with best-in-class emissions during 2008, the national average would be 34 per cent lower (146 g/km).
- In 2008, Australia's carbon emissions from new passenger vehicles were 41 per cent higher than the European Union (215 g/km compared to 153 g/km).
- In 2007, Australia's carbon emissions from new light commercial vehicles were 27 per cent higher than the European Union (258 g/km compared to 203 g/km).
- In 2008, 0.6 per cent of total car sales in Australia were 'green' cars. In the United Kingdom, 11 per cent of passenger vehicle sales were 'green' cars in 2008. (Using the Swedish government's 'green' car definition as a vehicle that does not exceed 120 g/km.)
- In Australia during 2008, private buyers had the lowest average vehicle emissions (210 g/km), followed by business buyers (233 g/km) and then government buyers (238 g/km).
- In Australia during 2008, Smart had the lowest average emissions (113 g/km) whereas Ferrari had the highest average emissions (443 g/km).
- Fifteen manufacturers annually sell 95 per cent of new vehicles in Australia. Of these manufacturers, Hyundai had the lowest average emissions (177 g/km) whereas Holden had the highest average emissions (252 g/km).
- In 2008, the average emissions from Australian-made vehicles was 267 g/km. This is a 4 per cent reduction from 2005.

Table of contents

1. INTRODUCTION	1
2. METHODOLOGY	3
3. AUSTRALIAN EMISSIONS	6
BUYER TYPE	7
FUEL TYPE.....	9
SEGMENT TYPE.....	11
VEHICLE MANUFACTURER	16
AUSTRALIAN-MADE VEHICLES	21
4. COMPARISON OF AUSTRALIAN AND INTERNATIONAL DATA	25
PASSENGER VEHICLES: EMISSIONS BY COUNTRY	26
PASSENGER VEHICLES: EMISSIONS DISTRIBUTION	28
PASSENGER VEHICLES: PROPORTION OF "GREEN" CARS.....	28
PASSENGER VEHICLES: EMISSIONS BY FUEL TYPE	29
PASSENGER VEHICLES: EMISSIONS BY SEGMENT	29
PASSENGER VEHICLES: EMISSIONS BY BUYER TYPE	31
PASSENGER VEHICLES: EMISSIONS BY MANUFACTURER	31
LIGHT COMMERCIAL VEHICLES	33
DISCUSSION	35
BIBLIOGRAPHY	37
APPENDIX A	39

List of abbreviations

ATC	Australian Transport Council
AWD	All wheel drive
CO ₂	Carbon dioxide
COAG	Council of Australian Governments
CYL	Cylinder
EU	European Union
FCAI	Federal Chamber of Automotive Industries
GVM	Gross vehicle mass
LPG	Liquid petroleum gas
NTC	National Transport Commission
SUV	Sports utility vehicle
UK	United Kingdom

1. Introduction

The Council of Australian Governments (COAG) has announced it would examine introducing carbon dioxide emissions standards for new light vehicles¹. The Commonwealth government is developing the proposal for these standards. A key input into this work would be detailed information on the carbon dioxide performance of new vehicles sold in Australia.

Current information available about carbon dioxide emissions for new vehicle(s) in Australia is either:

- for individual vehicle models as required by law to be displayed on the windscreen of new vehicles (e.g. 2009 Mitsubishi Colt ES Hatch carbon dioxide emission is 134 g/km); or
- annual emissions for the whole Australian new vehicle fleet (e.g. national average emission is 222 g/km in 2008). Table 1 shows national average carbon dioxide emissions.

However, information on the carbon dioxide emissions performance between these ends of the spectrum is very limited. There are no comprehensive reports available for carbon dioxide emissions by vehicle segment, buyer type or manufacturer for Australia. This situation is different overseas. For example, in the United Kingdom, industry annually publishes detailed information about the carbon dioxide performance of new vehicles by vehicle class, buyer type and manufacturers.

Table 1. National average CO₂ emissions from new passenger and light commercial vehicles

Year	New light vehicle emissions (g CO ₂ /km)
2002	252
2004	246
2005	245
2006	230
2007	226
2008	222

Source: Federal Chamber of Automotive Industries 2008 and 2009a.

The National Transport Commission (NTC) realised that this lack of information needed to be overcome and set out to fill this data gap.

In NTC's initial attempt to produce this information, NTC used commercially available information on aggregated vehicles sales and matched this with carbon dioxide emissions for equivalent vehicle models.

Over one thousand vehicle models were matched with carbon dioxide emissions from 2003 to 2008. This matching was done manually and was therefore time consuming. As such, only the carbon dioxide emissions for the top 70 per cent of vehicle models were matched with annual sales. With this matched data, carbon dioxide trend data for new vehicles for vehicle segment, buyer type and make was produced.

There was little publicly available information for NTC to compare the figures for quality control purposes.

To test the rigour of the results, they were presented at a forum run by the Low Emissions Vehicles Automotive Partnership held at the RACV Club in Melbourne during mid-September 2009. Feedback from the automotive industry was better data is available to more accurately reflect the performance of new Australian vehicles.

¹ Passenger vehicles (including sport utility vehicles) and light commercial vehicles.

Mr Andrew McKellar, the Chief Executive of the Federal Chamber of Automotive Industries, attended the forum and offered detailed sales and carbon dioxide emissions data to the NTC. The analysis using this new data was subsequently repeated and the results are presented in this paper.

NTC's aim was to produce rigorous information about new vehicle emissions in Australia. With the help of the Federal Chamber of Automotive Industries, this has been achieved. This new and comprehensive information will help inform the development of carbon dioxide standards for new Australian vehicles.

The next section of this paper describes the methodology used. The results of the analysis are presented in Section 3. Section 4 compares the Australian data with international data.

2. Methodology

The data supplied by the Federal Chamber of Automotive Industries was entered into a database and analysed. The data contained the full records of annual sales for the years 2005, 2006, 2007 and 2008. For 2009, the sales from January to August were provided. In all, there were over 350,000 records. 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, driven wheels, country of origin, fuel type, carbon dioxide emissions and fuel economy;
- *vehicle category*: consistent with the classifications in Table 3; and
- *sales data*: sales by state, metropolitan or rural buyers, and government, business or private buyers.

The carbon dioxide emissions for vehicles are calculated using the method described in the Australian design rule “fuel consumption labelling for light vehicles”, also known as ADR 81/02. The units for carbon dioxide emissions from vehicles are grams of carbon dioxide per kilometre or g/km.

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), where instead of each of the data points contributing equally to the final average, some data points contribute more than others,² in this case, the average was weighted to vehicle sales.

In the data provided, there were records containing carbon dioxide emissions with missing data. Table 2 contains the number of sales and the percentage of total sales missing data for vehicle emissions. In the calculations for average vehicle emissions, we did not include sales records with missing emissions data.

Table 2. Sales with missing data for the carbon dioxide emission

	2005	2006	2007	2008	Jan- Aug 2009
Sales with missing CO ₂ data	56,221	6,465	1,941	1,727	1,501
Percentage of total sales with missing CO ₂ data	5.9%	0.7%	0.2%	0.2%	0.3%

The Federal Chamber of Automotive Industries classifies motor vehicles into different segment type. Vehicles are classified into four main classes: passenger motor vehicles, sports utility vehicles (SUV), light trucks and heavy trucks. These four main classes are then broken down to sub-classes, for example, the sub-classes of sports utility vehicles are compact, medium, large and luxury. The motor vehicle classifications and definition are presented in Table 3.

In this report, NTC use the following definitions:

- “passenger vehicles” for the categories passenger motor vehicles and sports utility vehicles; and
- “light commercial vehicles” for the category light trucks.

² This description is from http://en.wikipedia.org/wiki/Weighted_mean.

Table 3. Motor vehicle classifications and definitions

Passenger Motor Vehicles	Sports Utility Vehicles	Light Trucks	Heavy Trucks
Passenger vehicles are classified dependent on size, specification and average retail pricing. Vehicle size is based on wheelbase x track but it is not an exclusive criteria for determining segmentation. Price banding of entrants is determined by the FCAI based on price relativity.	Vehicles classified as Sport Utility Vehicles (SUV) meet the FCAI criteria for classifying SUV vehicles based on a wagon body style, ground clearance and design purpose.	Vehicles designed principally for commercial but may include designs intended for non-commercial applications.	Vehicles designed for exclusive heavy commercial application.
Light Design - sedan; hatch; wagon. Engine; 3 - 4 cyl. Seating; 2/4/5 seat	Compact Design - wagon Engine; 4 - 6 cyl. Driven wheels; 2/4 & AWD	Vans Blind and window vans.	Truck 3,501 - 7,500 kgs GVM
Small Design - sedan; hatch; wagon. Engine 4 - 6 cyl. Seating 2/4/5 seat	Medium Design - wagon Engine; 4 - 8 cyl. Driven wheels; 2/4 & AWD	Pick-up / Chassis 4x2 Two wheel drive, central control cab utility, cab chassis and crew cab.	Truck 7,501 - 15,500 kgs GVM
Medium Design - sedan; hatch; wagon. Engine; 4 - 12 cyl. Seating; 2/4/5 seat	Large Design - wagon Engine; 6 - 8 cyl. Driven wheels; 2/4 & AWD	Pick-up / Chassis 4x4 Two wheel drive, central control cab utility, cab chassis and crew cab.	Truck 15,001 kgs & over GVM
Large Design - sedan; wagon. Engine; 6 - 12 cyl. Seating; 2/4/5 seat	Luxury Design - wagon Engine; 4 - 12 cyl. Driven wheels; 2/4 & AWD	Light Buses 8+ Seats, up to 3500 kgs GVM	Buses 3,501 kgs & over GVM
Upper Large Design - sedan. Engine; 6 - 12 cyl. Seating; 4/5 seat		Trucks 2.5 - 3.5 Tonne Forward control cab, 2,500 - 3,500 kgs GVM	
People Movers Design - wagon. Engine; 4/6/8 cyl. Seating; 7 plus			
Sports Design - coupe; convertible. 2&4 door Engine; 3 - 12 cyl. Seating; 2/4 seat			

Source: Federal Chamber of Automotive Industries 2009b.

Notes: 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 cross over occurs.

Consumers would be familiar with vehicle fuel consumption figures rather than carbon dioxide emissions. Table 4 contains fuel consumption figures for petrol and diesel and the corresponding carbon dioxide emissions.

Another way to relate carbon dioxide emissions to fuel is for each litre of fuel consumed. One litre of petrol will produce 2,289 grams of carbon dioxide. One litre of diesel will produce 2,695 grams of carbon dioxide.

Table 4. Fuel consumption and corresponding carbon dioxide emissions

Fuel consumption (litres per 100 kilometres)	CO ₂ emissions (g/km)	
	Petrol	Diesel
3	68	80
4	91	107
5	114	134
6	137	160
7	160	187
8	182	214
9	205	240
10	228	267
11	251	294
12	274	321
13	297	347
14	319	374
15	342	401
16	365	427
17	388	454
18	411	481
19	433	508
20	456	534

Source: Department of Climate Change (2009).

3. Australian Emissions

The average carbon dioxide emissions for new passenger and light commercial vehicles for Jan-Aug 2009 is 219 g/km (see Table 5). This table shows that national average emissions have dropped every year since 2002 (assuming 2003 emissions are between the 2002 and 2004 values). Between 2002 and 2009, average vehicle emissions reduced 13 per cent. The highest year-to-year fall in national average emissions was 4 per cent between 2005 and 2006.

Table 5. National average CO₂ emissions for passenger and light commercial vehicles

Year	Average CO ₂ emissions (g/km)	Change from previous year	Change from 2002
2002(a)	252	n/a	n/a
2004(a)	246	n/a	-2%
2005	239	-3%	-5%
2006	230	-4%	-9%
2007	226	-2%	-10%
2008	222	-2%	-12%
Jan to Aug 2009	219	-1%	-13%

a. Federal Chamber of Automotive Industries (2008).

The distribution of carbon dioxide emissions of Australian passenger and light commercial vehicles for 2005 and Jan-Aug 2009 is presented in Figure 1. There has been a shift to lower emissions vehicles with the national average emissions dropping 20 g/km over this period.

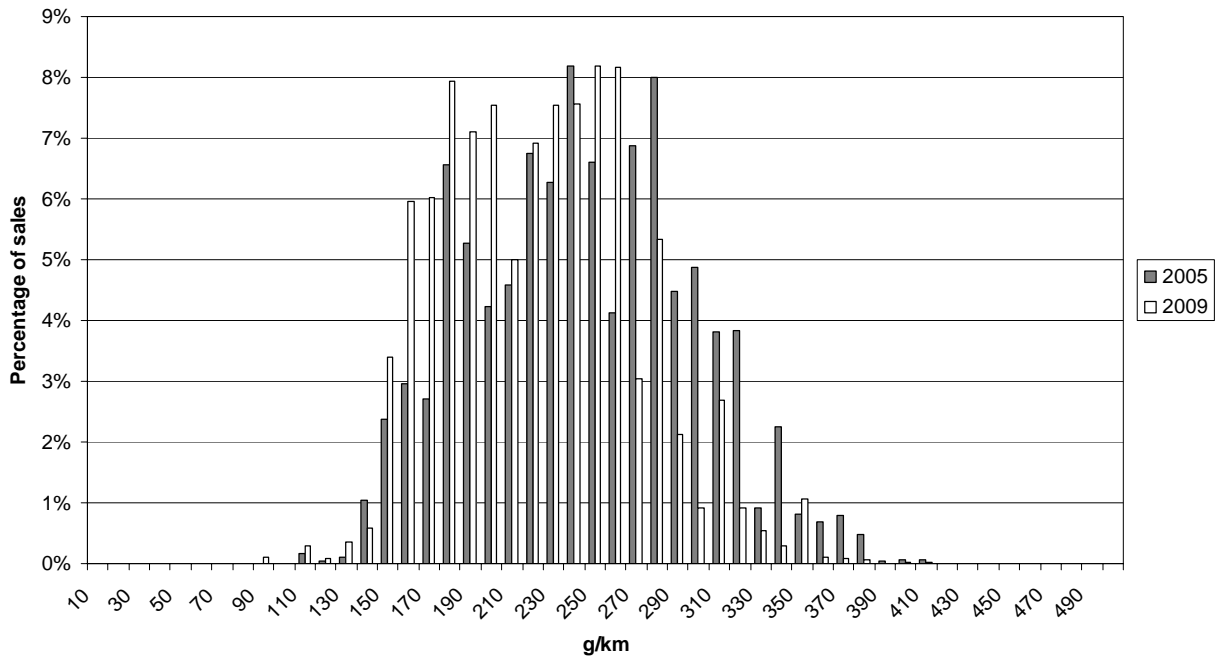


Figure 1. Distribution of average CO₂ emissions from new passenger and light commercial vehicles for 2005 and Jan-Aug 2009

Buyer type

Figure 2 shows the average emissions for new passenger and light commercial vehicles by buyer type. For both 2005 and Jan-Aug 2009, private buyers have the lowest average per vehicle emissions (225 and 207 g/km) followed by business buyers (253 and 230 g/km), then government buyers (264 and 232 g/km). The reduction in average emissions between 2005 and 2009 was 8 per cent for private buyers, 9 per cent for business buyers and 12 per cent for government buyers.

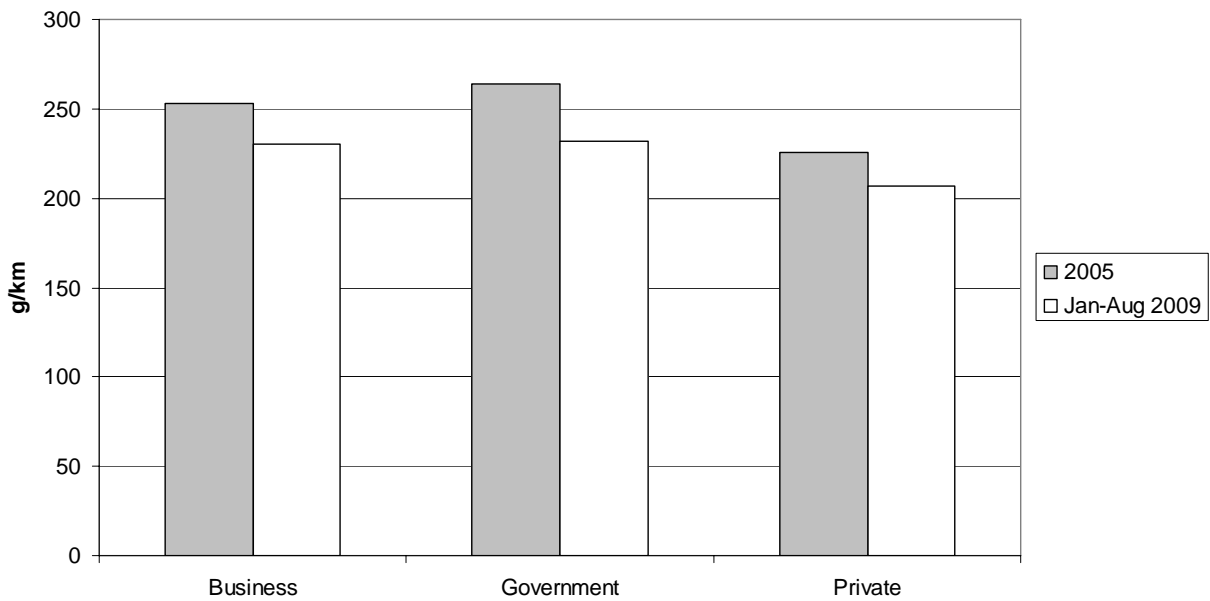


Figure 2. Average CO₂ emissions for new passenger and light commercial vehicles by buyer type for 2005 and Jan-Aug 2009

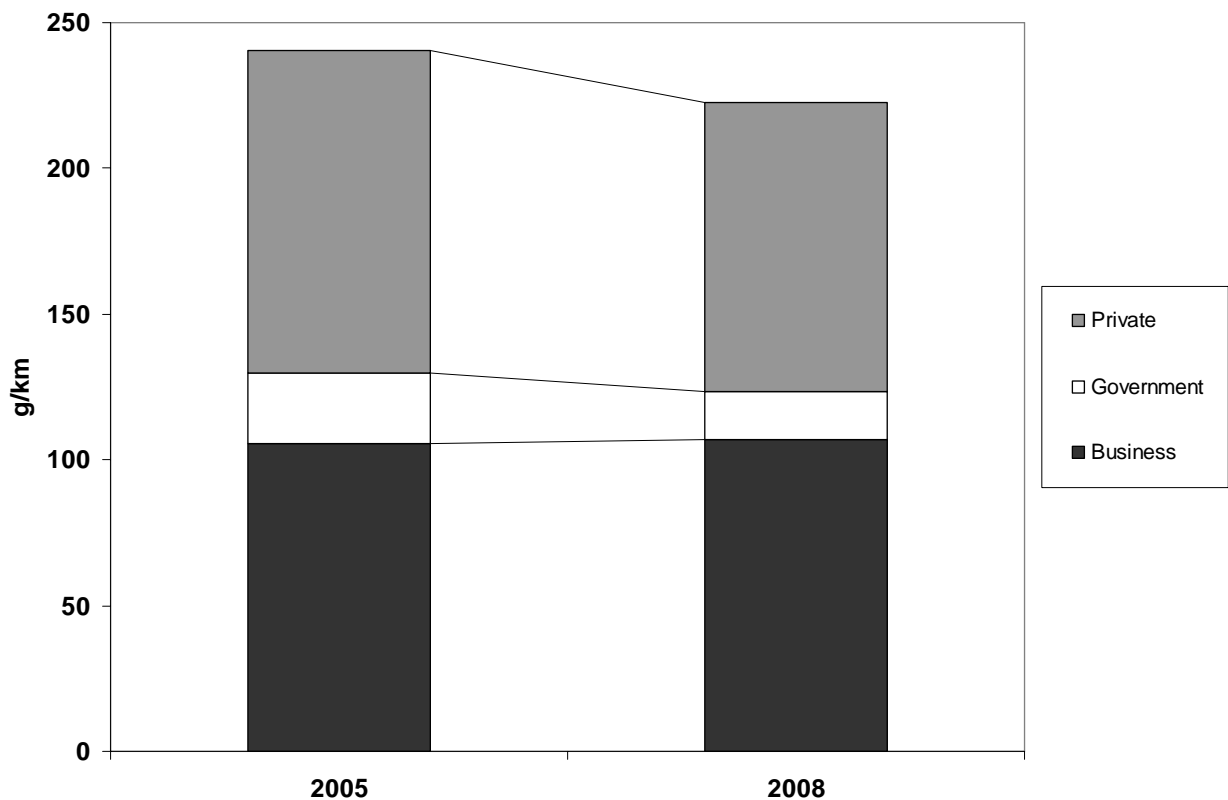


Figure 3. Buyer type contribution to annual new passenger and light commercial vehicle emissions for 2005 and 2008

Figure 3 shows the contribution of the three buyer types to the national average emissions for new passenger and light commercial vehicles in 2005 and 2008. The national average for 2005 and 2008 were 239 and 222 g/km respectively. Figure 3 shows that business and private buyers account for the majority of the contribution, whereas government buyers make a minority of the national contribution. This is directly related to the sales volumes for each of these buyer type and the average vehicle emissions for these buyer types.

The changes in the national average between 2005 and 2008 for the three buyer types are shown in Table 6. The contribution to national average emissions in 2008 for:

- private buyers have dropped 12 g/km from 2005 due to a drop in vehicle sales and a reduction in average vehicle emissions;
- government buyers have dropped 7 g/km from 2005 due to a large drop in vehicle sales and a reduction in average vehicle emissions; and
- business buyers have increased by 1 g/km from 2005 due to a 12 per cent increase in vehicle sales which was negated by an 8 per cent reduction in average vehicle emissions.

Table 6. Changes in buyer type contributions to national average emissions

Buyer type	Change between 2005 and 2008		
	Average CO ₂ emissions (g/km)	Sales	Buyer type contributions to national emissions
Private	Down 7%	Down 9,800 vehicles or 2%	- 12 g/km
Government	Down 10%	Down 18,600 vehicles or 21%	- 7 g/km
Business	Down 8%	Up 47,700 vehicles or 12%	+ 1 g/km
Total	Down 7%	Up 19,300 vehicles or 2%	- 18 g/km^a

a: Differs from the value of the difference between the 2005 and 2008 average emissions (239 – 222 = 17 g/km) due to rounding.

Fuel type

Figure 4 shows the average emissions for new passenger and light commercial vehicles by fuel type. For both 2005 and Jan-Aug 2009, petrol vehicles have the lowest average per vehicle emissions (238 and 216 g/km). LPG vehicles show little change in average emissions between 2005 and 2009 (248 and 249 g/km). Average emissions for diesel vehicles are 260 g/km in 2005 and 228 g/km in 2009. Between 2005 and 2009, the average vehicle emissions have decreased for diesel and petrol vehicles by 12 and 9 per cent respectively.

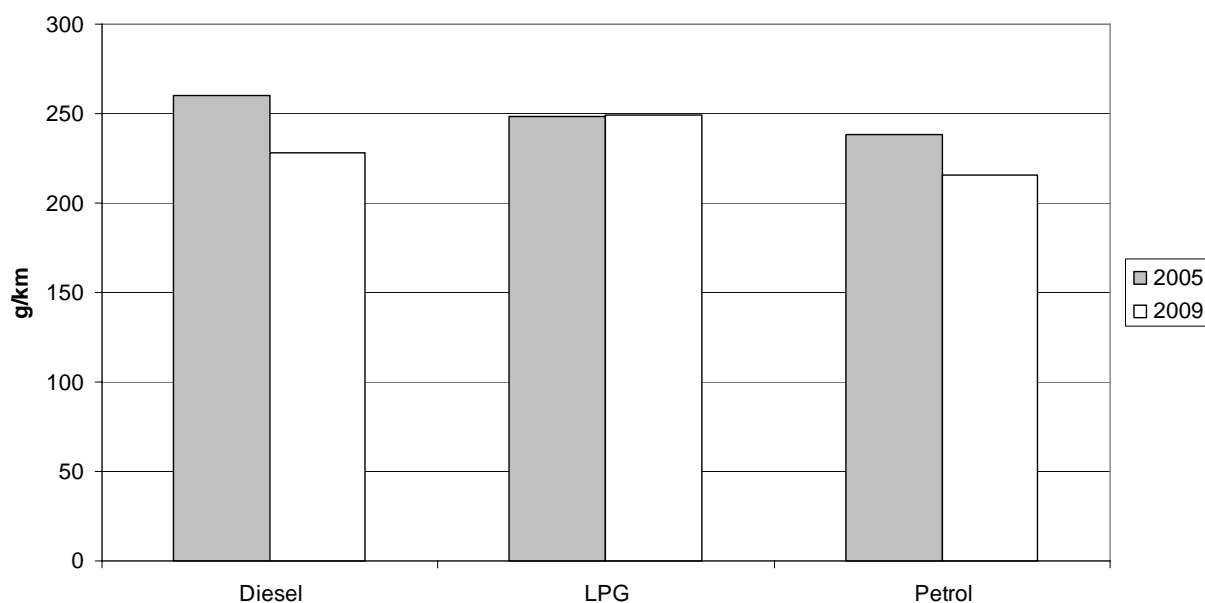


Figure 4. Average CO₂ emissions for new passenger and light commercial vehicles by fuel type for 2005 and Jan-Aug 2009

Figure 5 shows the contribution of the three fuel types to the national average emissions for new passenger and light commercial vehicles in 2005 and 2008. Petrol vehicles are the largest contributor to national average emissions in 2005 and 2008. However, the contribution from diesel vehicles has grown from 2005 and 2008 with a corresponding drop in the contribution from petrol vehicles in 2008.

The changes in the national average between 2005 and 2008 for the three fuel types are shown in Table 7. The contribution to national average emissions in 2008 for:

- petrol vehicles dropped by 38 g/km due to a reduction in sales (80,600 vehicles) and a reduction average vehicle emissions (8 per cent);
- diesel vehicles increased by 18 g/km due to the large increase in sales (97,700 vehicles) which was partially offset by the reduction in average vehicle emissions (11 per cent); and
- LPG vehicles increased by 1 g/km between 2005 and 2008 due to an increase in sales (5,100 vehicles) and a slight decrease in average vehicle emissions (1 per cent).

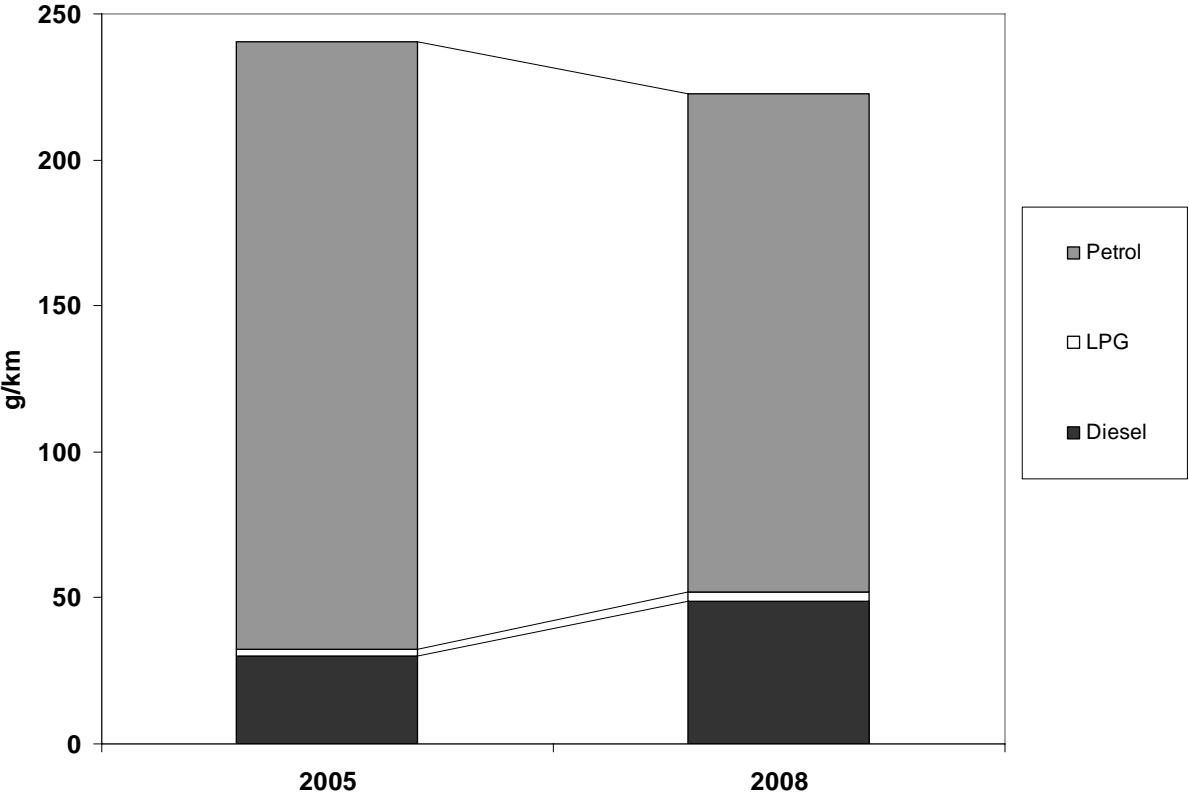


Figure 5. Fuel type contribution to national average CO₂ emissions for new passenger and light commercial vehicle for 2005 and 2008

Table 7. Changes in fuel type contributions to national average CO2 emissions

Fuel type	Change between 2005 and 2008		
	Average CO ₂ emissions (g/km)	Sales	Fuel type contributions to national average emissions
Petrol	Down 8%	Down 80,600 vehicles or 10%	- 38 g/km
Diesel	Down 11%	Up 97,700 vehicles or 86%	+ 19 g/km
LPG	Down 1%	Up 5,100 vehicles or 62%	+ 1 g/km
Total	Down 7%	Up 19,300 vehicles or 2%	- 18 g/km^a

a: Differs from the value of the difference between the 2005 and 2008 national average emissions (239 – 222 = 17 g/km) due to rounding.

Segment type

Segment analysis was undertaken using the categories shown in Table 3.

Figure 6 shows the average emissions for new passenger and light commercial vehicles by segment for 2005 and Jan-Aug 2009. For both 2005 and Jan-Aug 2009, the lowest emitting segment was “light” (160 and 159 g/km) followed by the “small” segment (191 and 183 g/km) and then the “medium” segment (222 and 210 g/km). The highest emitting segment in 2005 was SUV large (323 g/km), followed by SUV medium (306 g/km) and then “SUV luxury” (300 g/km). The highest emitting segment in Jan-Aug 2009 was “SUV large” (292 g/km), followed by “upper large” (287 g/km) and then “light buses” (270 g/km).

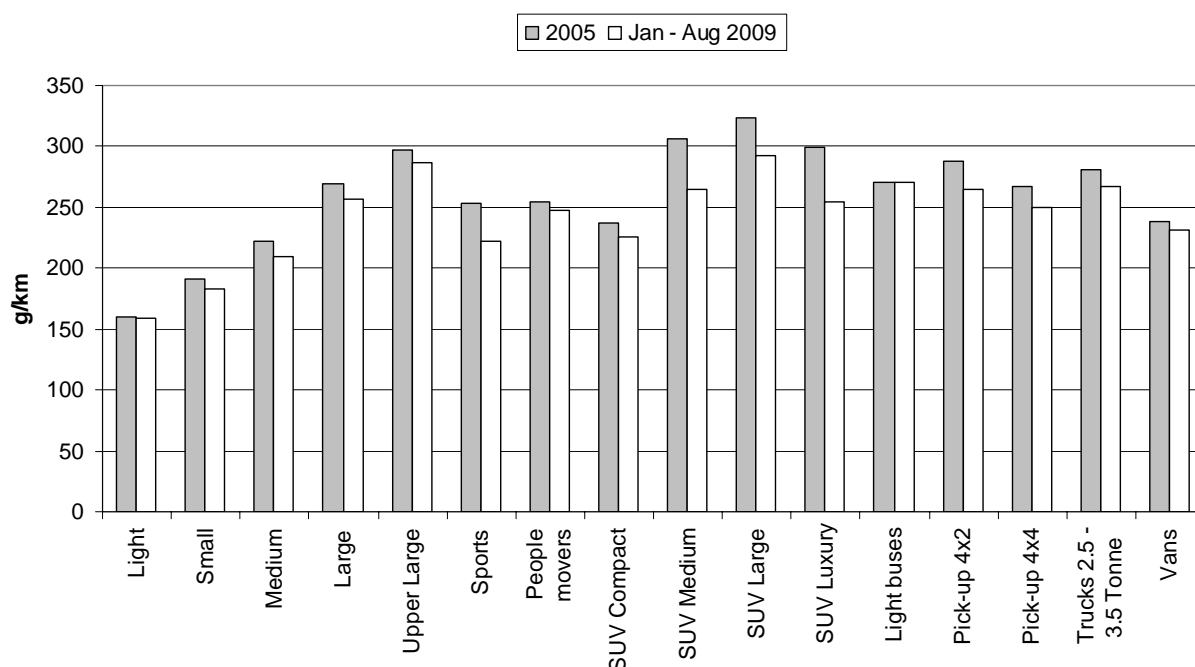


Figure 6. Average CO₂ emissions for new passenger and light commercial vehicles by segment for 2005 and Jan-Aug 2009

Figure 7 shows the change in segment emissions between 2005 and Jan-Aug 2009. Three segments – “sports”, “SUV medium” and “SUV luxury” – show emissions reductions of 10 per cent or more. The segments “light” and “light buses” showed little difference in average emissions between 2005 and Jan-Aug 2009.

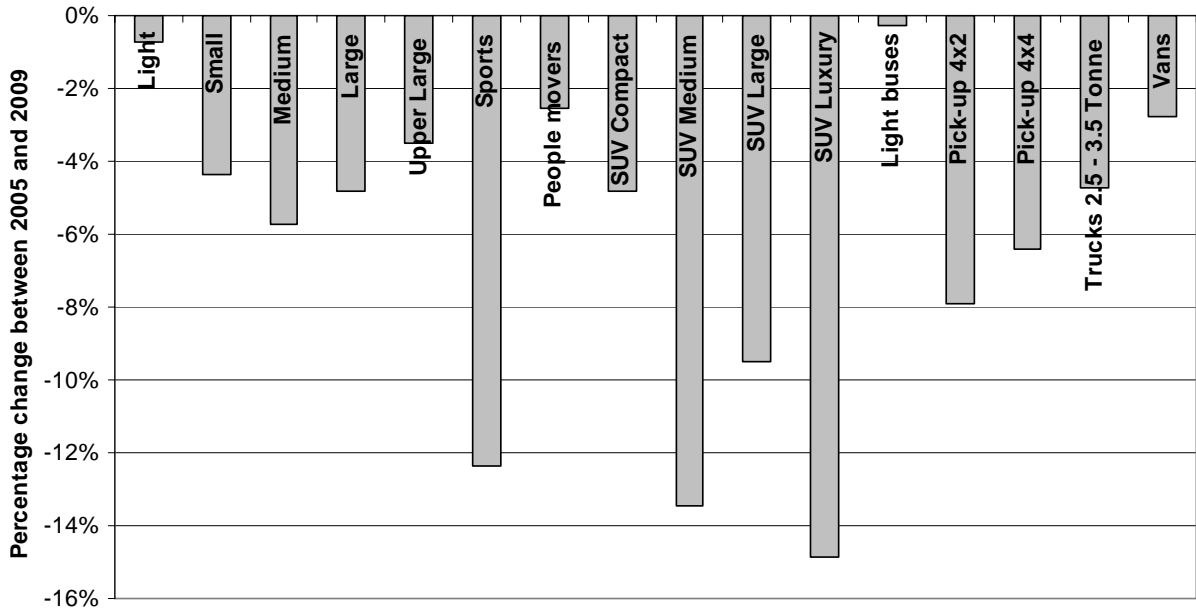


Figure 7. Change in average CO₂ emissions for new passenger and light commercial vehicles segment between 2005 and Jan-Aug 2009

Figure 8 shows how each segment contributes to the national average emissions for new passenger and light commercial vehicles for 2005 and 2008. Note that this national average drops from 239 g/km in 2005 to 222 g/km in 2008, an overall reduction of 17 g/km.

The changes in the national average between 2005 and 2008 for the five largest changes in segment contributions are shown in Table 8. The contribution to national average emissions in 2008 for the:

- “large” segment drops 15 g/km between 2005 and 2008 due to a drop in sales (50,000 vehicles) and a drop in average emissions (9 per cent);
- “light” segment increases by 4 g/km due to a rise in sales (31,000 vehicles) and a slight drop in average vehicle emissions (1 per cent);
- “pick-up 4x2” segment decreased by 4 g/km due to a drop in sales (7,000 vehicles) and a drop in average vehicle emissions (7 per cent);
- “pick-up 4x4” segment increases by 4 g/km due to a rise in sales (20,500 vehicles) and a drop in average vehicle emissions (6 per cent); and
- “SUV large” segment decreases by 2 g/km due to a drop in sales (4,000 vehicles) and a drop in average vehicle emissions (9 per cent).

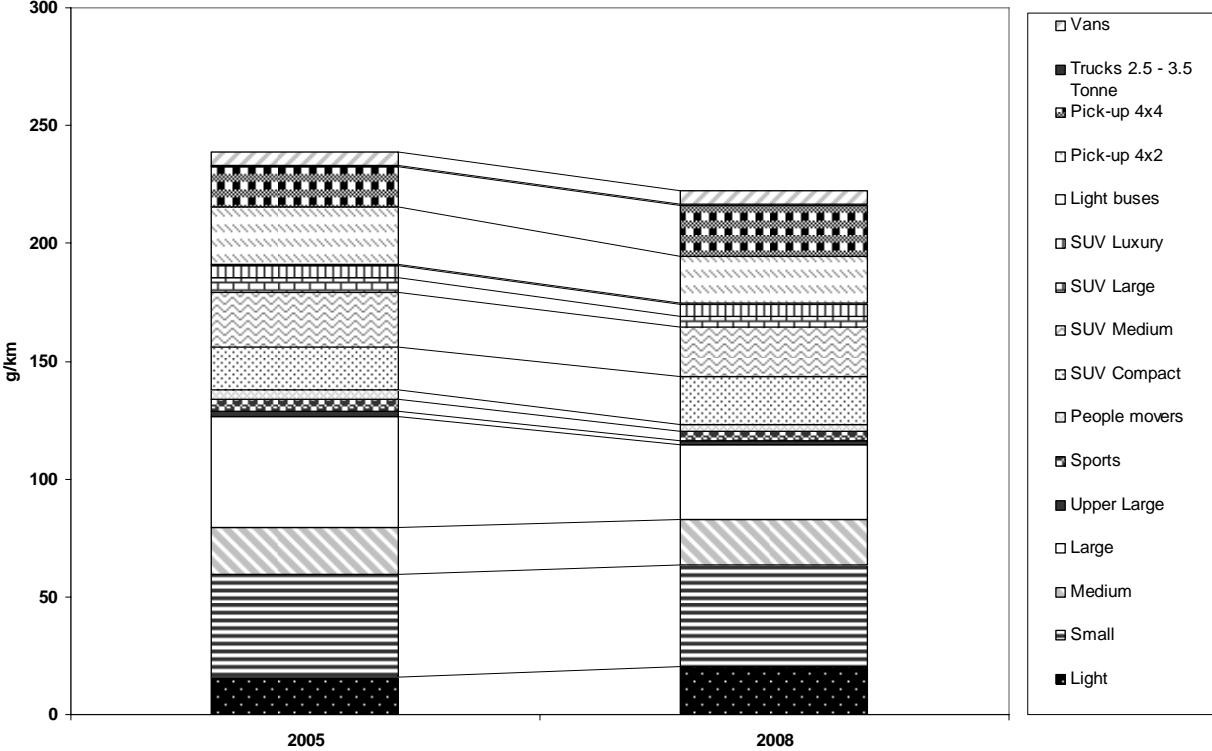


Figure 8. Segment contribution to national average CO₂ emissions for 2005 and 2008

Table 8. The largest five changes in segment contributions to national average CO₂ emissions

Segment	Change between 2005 and 2008		
	Average CO ₂ emissions (g/km)	Sales	Segment contributions to national average emissions
Large	Down 4%	Down 50,000 vehicles or 29%	- 15 g/km
Light	Down 1%	Up 31,000 vehicles or 32%	+ 4 g/km
Pick-up 4x2	Down 7%	Down 7,000 vehicles or 7%	- 4 g/km
Pick-up 4x4	Down 6%	Up 20,500 vehicles or 33%	+ 4 g/km
SUV large	Down 9%	Down 4,000 vehicles or 22%	- 2 g/km

Figure 9 shows the range in emissions for the segments for Jan-Aug 2009. The average emissions are represented in Figure 9 as the horizontal line and the vertical line shows the minimum and maximum emissions. The “sports” segment shows the greatest range in emissions but its average emissions is the fourth lowest from all segments at 222 g/km.

If Australian consumers purchased vehicles with best-in-class emissions, the national average carbon dioxide emissions reduce:

- 33 per cent to 160 g/km in 2005;
- 33 per cent to 155 g/km in 2006;
- 34 per cent to 149 g/km in 2007;
- 34 per cent to 146 g/km in 2008;
- 35 per cent to 143 g/km for Jan-Aug 2009.

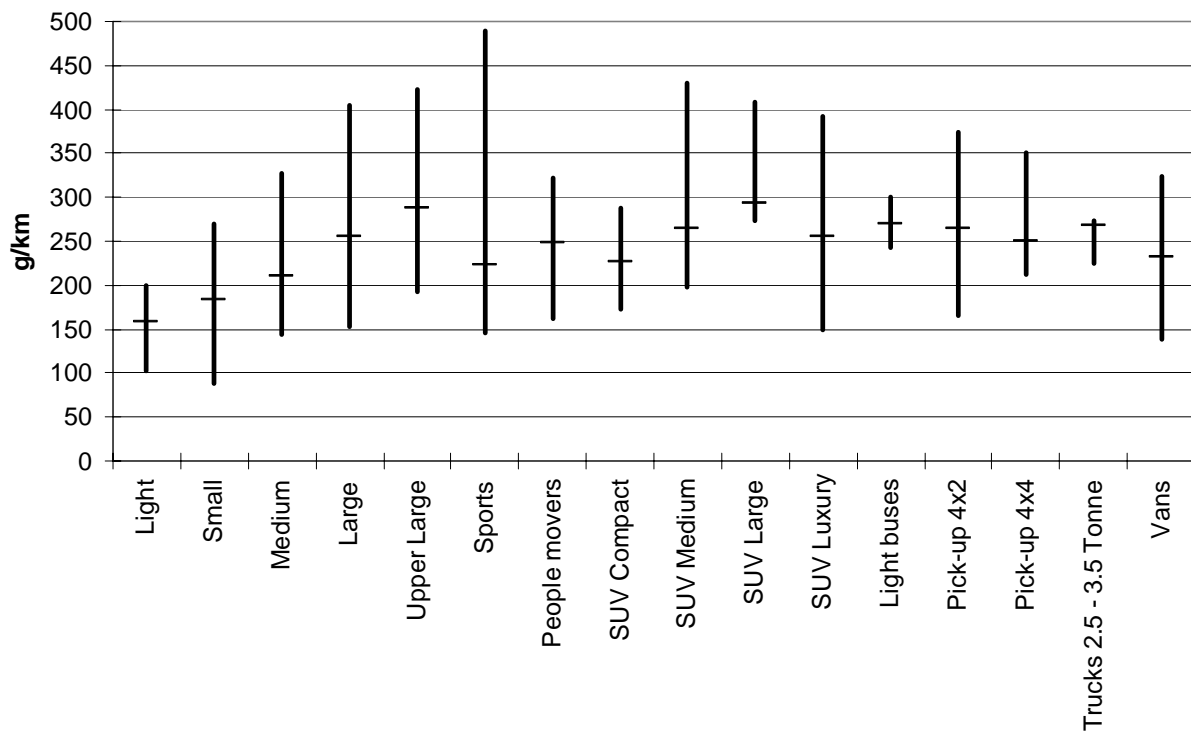


Figure 9. Range and average CO₂ emissions by segment for Jan-Aug 2009

Vehicle Manufacturer

Figure 10 shows the corporate average carbon emissions by vehicle make for 2005 and Jan-Aug 2009 ranked by sales. Toyota is the highest volume selling make in Jan-Aug 2009.

The three makes with the lowest corporate average emissions in Jan-Aug 2009 are Smart (109 g/km), Mini (160 g/km) and Proton (163 g/km). The three makes with the highest corporate average emissions in 2009 are Ferrari (440 g/km), Bentley (401 g/km) and Lamborghini (400 g/km).

Fifteen makes annually sell 95 per cent of new vehicles in Australia. The corporate average emissions of these market leading makes dictates the national average emissions for new passenger and light commercial vehicles. The corporate average vehicle emissions for these 15 market leading makes are presented in Table 9. Of these 15 makes, the three lowest corporate average emissions in 2009 are Hyundai (181 g/km), Volkswagen (188 g/km) and Suzuki (191 g/km). The three highest corporate average emissions in 2009 are Holden (245 g/km), Ford (240 g/km) and Nissan (232 g/km).

Table 10 shows the change in corporate average emissions for the 15 market leading makes. The best improvement in corporate average emissions between 2005 and 2009 was Kia (-17 per cent) and then Ford (-13 per cent). Hyundai, Mitsubishi, Nissan and Audi each showed a 10 per cent improvement in average emissions from 2005 to Jan-Aug 2009. The least improvement over this period from these 15 market leading makes was Suzuki (no change) and Holden (-3 per cent). Between 2008 to Jan-Aug 2009, Audi (-7 per cent) and Holden (-3 per cent) show the best improvement, although this result for Holden is the same as the period from 2005 to Jan-Aug 2009. The least improvement from 2008 to Jan-Aug 2009 comes from Hyundai (2 per cent) and Nissan (1 per cent).

The range of emissions for the 15 market leading makes for Jan-Aug 2009 are presented in Figure 11.

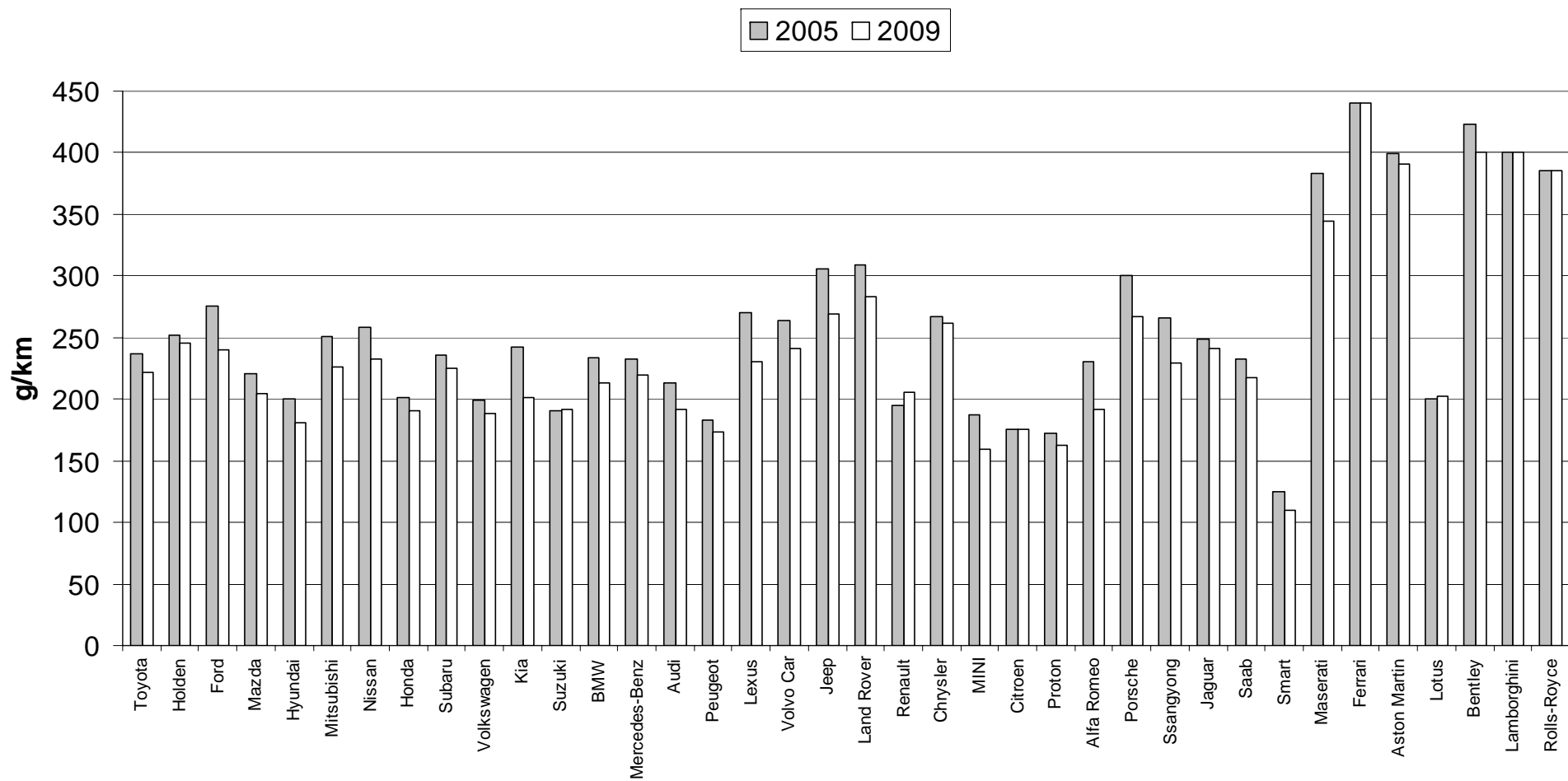


Figure 10. Corporate average CO₂ emissions for new passenger and light commercial vehicles by make for 2005 and Jan-Aug 2009 (ranked by sales volumes in 2009)

Table 9. Corporate average CO₂ emissions for top 15 makes by sales - ranked by emissions performance in 2009

Make	Average vehicle CO ₂ emissions (g/km)				
	2005	2006	2007	2008	Jan-Aug 2009
Hyundai	201	188	183	177	181
Volkswagen	199	193	193	193	188
Honda	202	199	196	194	190
Suzuki	190	192	193	193	191
Audi	213	218	222	205	192
Kia	242	222	215	201	201
Mazda	221	213	210	206	204
BMW	234	226	220	216	213
Mercedes-Benz	232	232	227	220	220
Toyota	237	228	222	222	221
Subaru	236	236	233	226	225
Mitsubishi	250	245	240	230	226
Nissan	258	242	241	231	232
Ford	275	254	247	242	240
Holden	252	248	253	252	245

Table 9. Changes in corporate average CO₂ emissions for top 15 makes by sales

Make	Change between 2005 and Jan-Aug 2009
Kia	-17%
Ford	-13%
Nissan	-10%
Audi	-10%
Hyundai	-10%
Mitsubishi	-10%
BMW	-9%
Mazda	-7%
Toyota	-7%
Honda	-6%
Volkswagen	-5%
Mercedes-Benz	-5%
Subaru	-5%
Holden	-3%
Suzuki	0%

Make	Change between 2008 and Jan-Aug 2009
Audi	-7%
Holden	-3%
Volkswagen	-2%
Honda	-2%
Mitsubishi	-2%
BMW	-1%
Ford	-1%
Suzuki	-1%
Mazda	-1%
Toyota	0%
Subaru	0%
Kia	0%
Mercedes-Benz	0%
Nissan	1%
Hyundai	2%

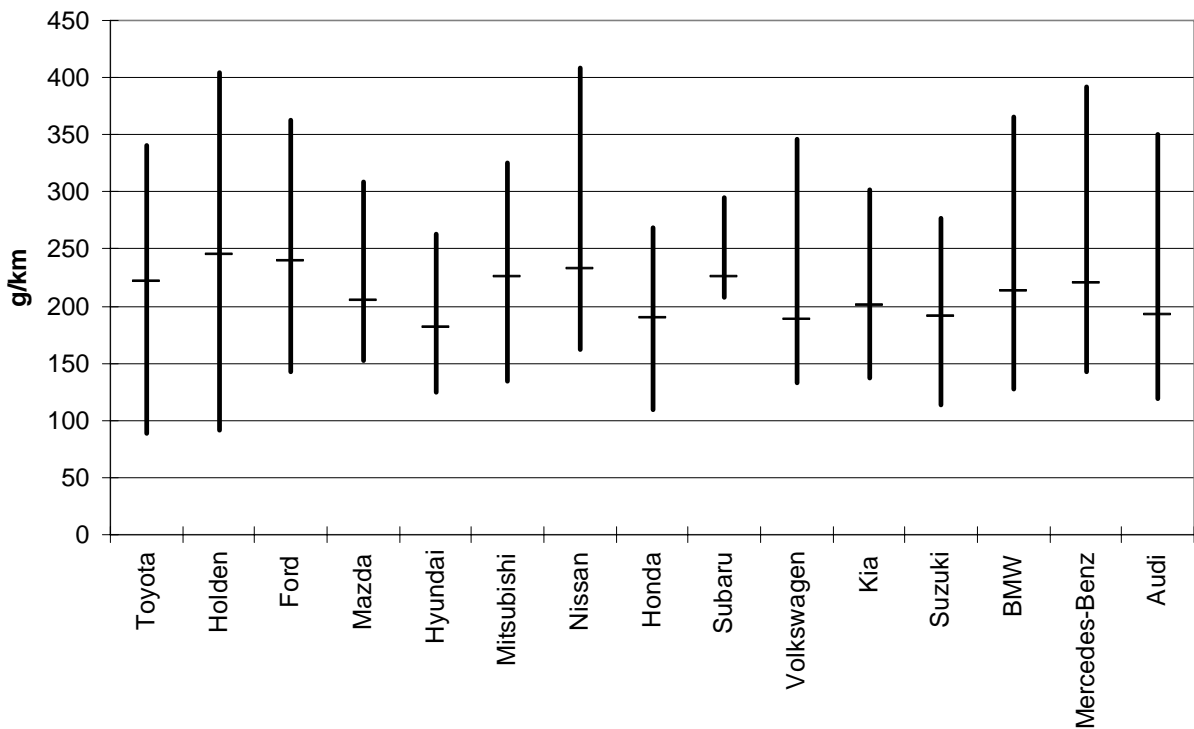


Figure 11. Range and average CO₂ emissions for top 15 makes by sales for Jan-Aug 2009

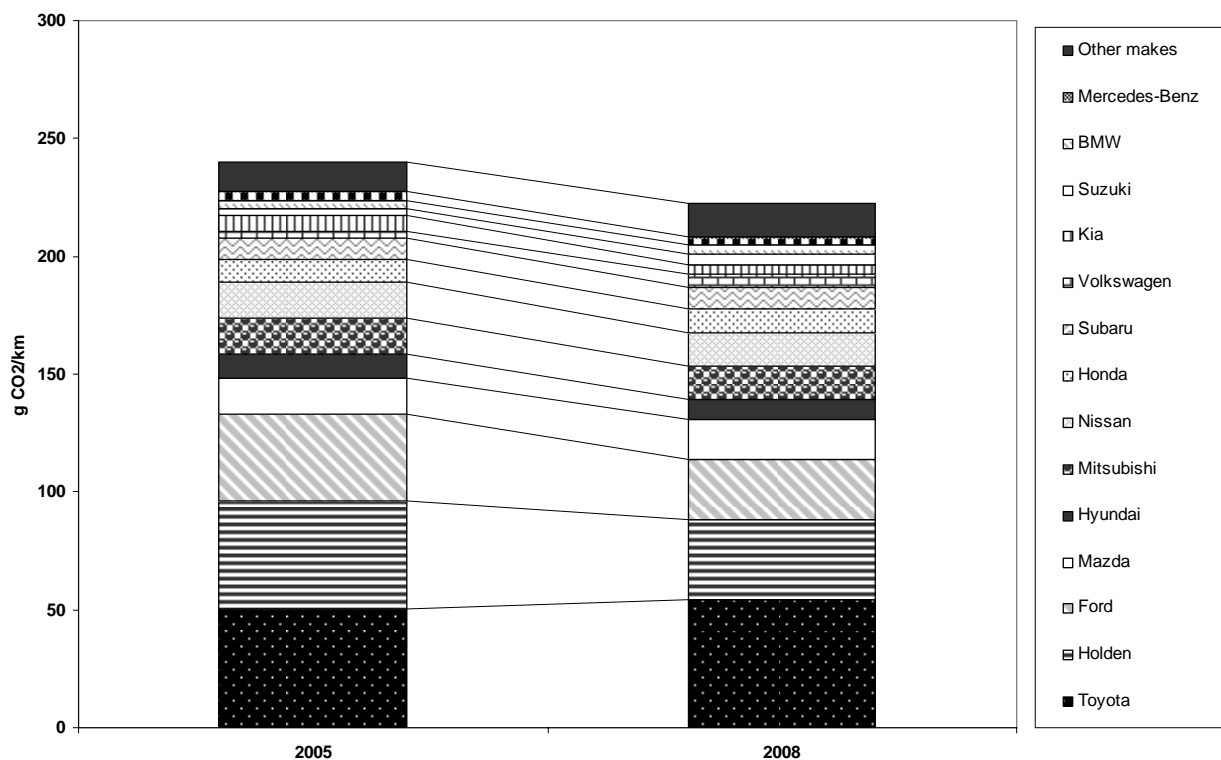


Figure 12. Make contribution to national average CO₂ emissions for passenger and light commercial vehicles for 2005 and 2008

Figure 12 shows how each make contributes to the national average emissions for 2005 and 2008.

The changes in the national average between 2005 and 2008 for the five largest changes in make contributions are shown in Table 11. The contribution to national average emissions in 2008 for:

- Holden dropped 12 g/km from 2005 due to a drop in sales (44,000 vehicles) and unchanged average emissions;
- Ford by 11 g/km from 2005 due to a drop in sales (24,500 vehicles) and a drop in average vehicle emissions (12 per cent);
- Toyota by 4 g/km from 2005 due to a rise in sales (36,000 vehicles) and a drop in average vehicle emissions (6 per cent);
- Volkswagen by 3 g/km from 2005 due to a rise in sales (14,000 vehicles) and a drop in average vehicle emissions (3 per cent); and
- Kia by 2 g/km from 2005 due to a drop in sales (5,500 vehicles) and a large drop in average vehicle emissions (17 per cent).

Table 10. The largest five changes in make contributions to national average CO₂ emissions

Make	Change between 2005 and 2008		
	Average CO ₂ emissions (g/km)	Sales	Make contributions to national average emissions
Holden	Unchanged	Down 44,000 vehicles or 25%	- 12 g/km
Ford	Down 12%	Down 24,500 vehicles or 19%	- 11 g/km
Toyota	Down 6%	Up 36,000 vehicles or 18%	+ 4 g/km
Volkswagen	Down 3%	Up 14,000 vehicles or 89%	+ 3 g/km
Kia	Down 17%	Down 5,500 vehicles or 22%	- 2 g/km

Australian-made vehicles

There were four makers of Australian manufactured cars in 2005. Mitsubishi closed its Australian manufacturing plant in 2008 leaving three Australian car makers: Ford Australia, General Motors Holden and Toyota Australia.

The average of all Australian-made vehicles was 278 g/km in 2005 and 264 g/km in Jan-Aug 2009; a 5 per cent improvement in emissions over this period (see Table 12). Australian-made vehicles are all large vehicles with typically higher emissions than the national average emissions.

Table 12 and Figure 13 show the average carbon dioxide emissions for the Australian-made vehicles by make. Toyota had the lowest emissions of the Australian vehicle manufacturers with emissions of 247 g/km in 2005 and 231 g/km in Jan-Aug 2009; a 6 per cent improvement over this period. Ford had the highest emissions (290 g/km) in 2005 but reduced these emissions by 8 per cent to 268 g/km in Jan-Aug 2009. In Jan-Aug 2009, Holden had the highest average emissions of 279 g/km. Holden showed virtually no improvement (-0.1 per cent) in average vehicle emissions from 2005 to Jan-Aug 2009.

Table 11. Average CO₂ emissions for new Australian-made vehicles by make

Make	Average CO ₂ emissions (g/km)					Change from 2005 to Jan-Aug 2009
	2005	2006	2007	2008	Jan-Aug 2009	
Holden	280	280	287	287	279	0%
Ford	290	274	270	269	268	-8%
Mitsubishi	277	261	259	259		n/a
Toyota	247	240	233	233	231	-6%
Australian-made	278	270	267	267	264	-5%

The range and average emissions for new Australian-made vehicles are presented in Figure 13. The noticeable feature of Figure 13 is that the maximum vehicle emissions have reduced over the period 2005 to Jan-Aug 2009.

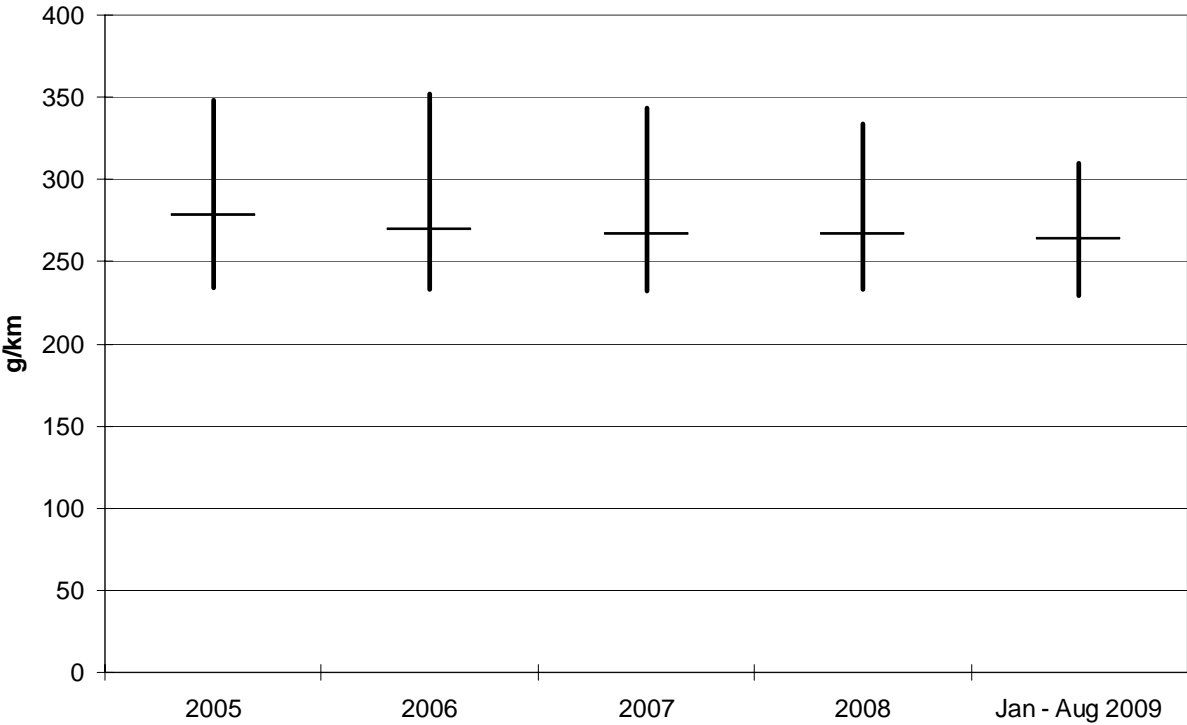


Figure 13. Range and average CO₂ emissions for new Australian-made vehicles

Table 12. Average CO₂ emissions for new Australian-made vehicles by model

Make	Model	Average vehicle CO ₂ emissions (g/km)				
		2005	2006	2007	2008	Jan-Aug 2009
Ford	Falcon	280	265	259	257	256
Ford	Falcon Utility	290	271	265	271	280
Ford	Territory	312	297	296	294	290
Ford	Fairlane	291	256	246	247	
Ford	Ltd	340				
Holden	Adventra	327	315	314		
Holden	Commodore	265	270	281	280	272
Holden	Holden Utility	305	299	301	309	303
Holden	Crewman	309	309	299	293	
Holden	Caprice	323	330	333	334	309
Holden	Monaro	348	352	343		
Holden	Statesman	296	297	298	289	292
Mitsubishi	380	259	260	259	259	
Mitsubishi	Magna	282	286			
Mitsubishi	Verada	292				
Toyota	Camry	234	233	232	233	229
Toyota	Avalon	267				
Toyota	Camry V6	268	269			
Toyota	Aurion		233	233	233	233

Table 12 shows the average emissions from Australian-made models. Figure 14 shows the change in average emissions for new Australian-made vehicles for models manufactured between 2005 and Jan-Aug 2009. Over this period, the most improved emissions were from the Ford Falcon (-9 per cent) and the Ford Territory (-7 per cent). The Holden Commodore had an increase of 3 per cent in average emissions between 2005 and Jan-Aug 2009.

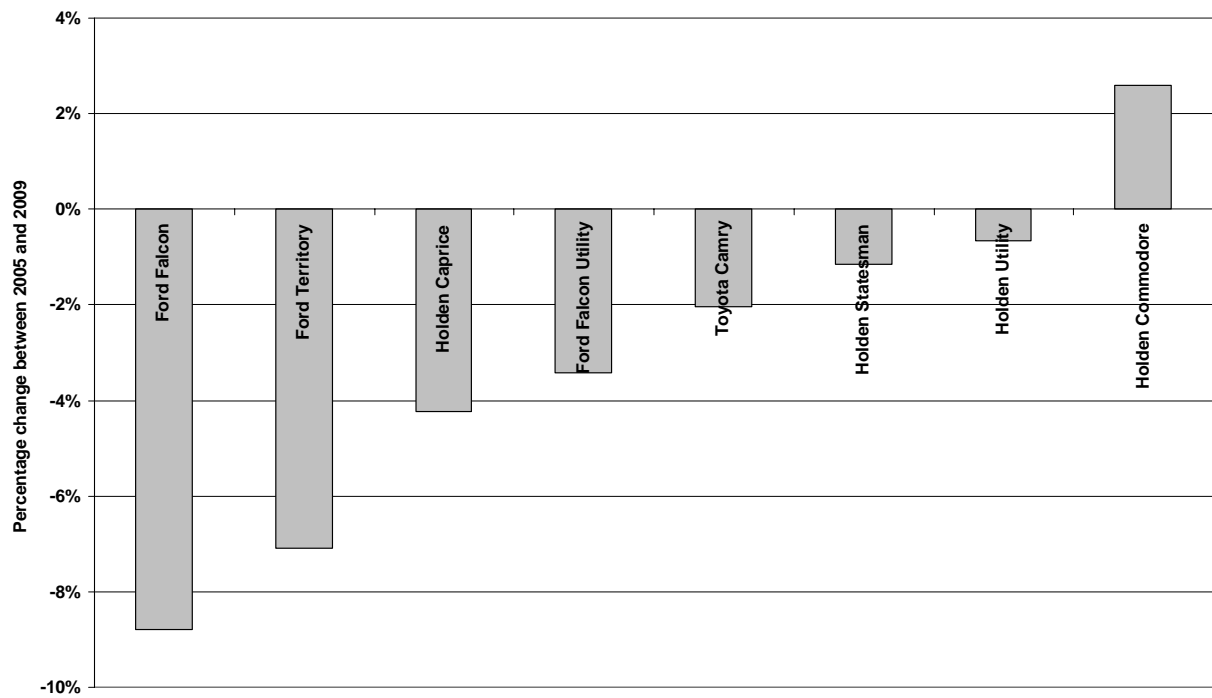


Figure 14. Change in average CO₂ emissions for new Australian-made vehicles for models manufactured between 2005 and Jan-Aug 2009

4. Comparison of Australian and International Data

In this section, Australian and international data are compared. However, this task is not straightforward because different test methods are used to calculate vehicle emissions. If the same vehicle is run in each of these tests, different carbon dioxide results are obtained. There are three main tests:

- European method;
- Japanese method; and
- United States method.

Australia uses the European method. Therefore, Australian vehicle emissions are directly comparable with European vehicle emissions. However, the published data from Europe is mainly for passenger vehicles. The Australian data presented in Section 3 was for combined passenger vehicles and light commercial vehicles. Therefore, to make the comparison with the European data, the Australian emission data for passenger vehicles only is needed. This Australian data is shown in Table 14. The average emissions for passenger vehicles in Australia were 231 g/km in 2005 and 211 g/km in Jan-Aug 2009. This was a 9 per cent drop in emissions over this period.

There is also some limited information available from Europe for light commercial vehicles. These light commercial vehicles are the equivalent of the combined Australian segments of pick-ups 4x2, pick-ups 4x4, trucks 2.5-3.5 GVM and vans (does not include light buses). The average carbon dioxide emissions for these Australian segments are presented in Table 14. The average emissions were 273 g/km in 2005 and 253 g/km in 2009, a 7 per cent drop in emissions over this period.

Table 13. Change in average CO₂ emissions for new Australian-made vehicles for models manufactured between 2005 and Jan-Aug 2009

	Average vehicle CO ₂ emissions (g/km)					Change between 2008 and Jan-Aug 2009	Change between 2005 and Jan-Aug 2009
	2005	2006	2007	2008	Jan - Aug 2009		
Passenger vehicles	231	223	219	215	211	-2%	-9%
Light commercial vehicles	273	265	258	256	253	-1%	-7%

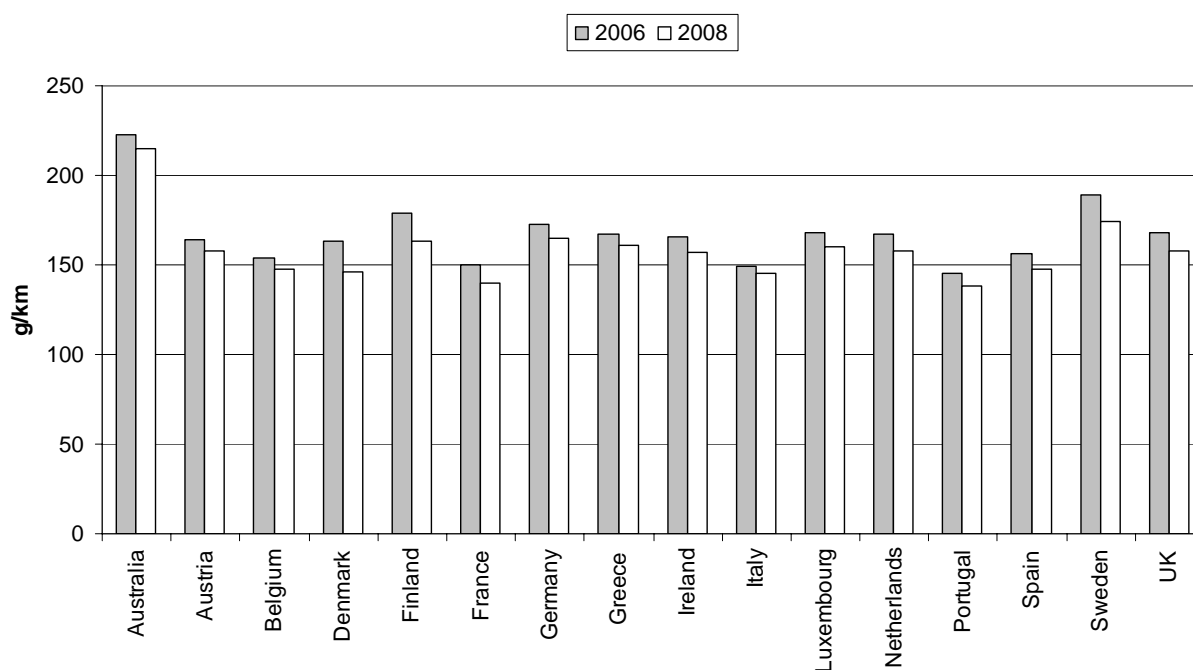
The next two sections present comparisons of the Australian and European data for passenger vehicles and Australian and European data for light commercial vehicles. The last section discusses the differences between the Australian and European data.

In comparing Australian with international data, where possible, data from the European Union has been used. If comparable data was not available for the European Union (e.g. segment data), data from the United Kingdom has been used.

Passenger vehicles: emissions by country

The average carbon dioxide emissions for new passenger vehicles by country for 2006 and 2008 is presented in Figure 15 (European data for 2005 was not available). Australia has higher emissions than these European countries. In 2008, European emissions ranged from 138 g/km for Portugal to 174 g/km for Sweden. Australia's average emissions was 215 g/km in 2008 which is 55 per cent higher than Portugal's emissions and 23 per cent higher than Sweden's emissions. The European Union's average vehicle emission for 2008 was 153 g/km³.

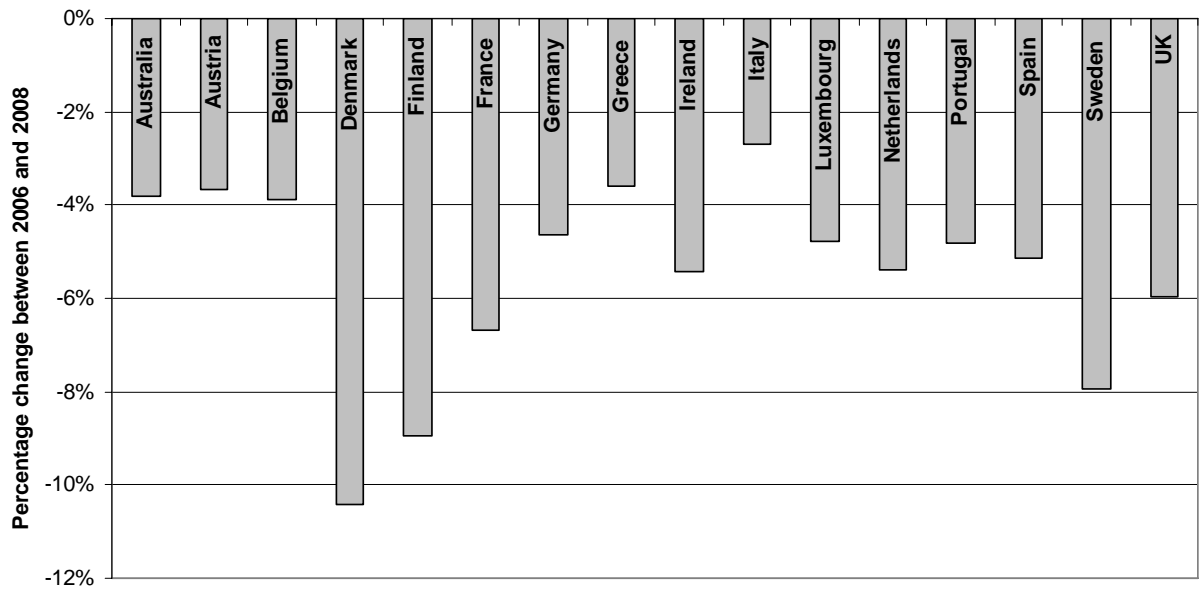
Figure 16 shows the change in emissions by country between 2006 and 2008. Denmark and Finland have the highest reductions in emissions with 10 and 9 per cent respectively. Australia's emissions reduced by 4 per cent between 2006 and 2008. Italy had the lowest improvement (3 per cent) for the countries shown over this period.



Source for European Union data: Transport and Environment (2008 and 2009).

Figure 15. Average CO₂ emissions for new passenger vehicles by country for 2006 and 2008

³ Transport and Environment (2009).

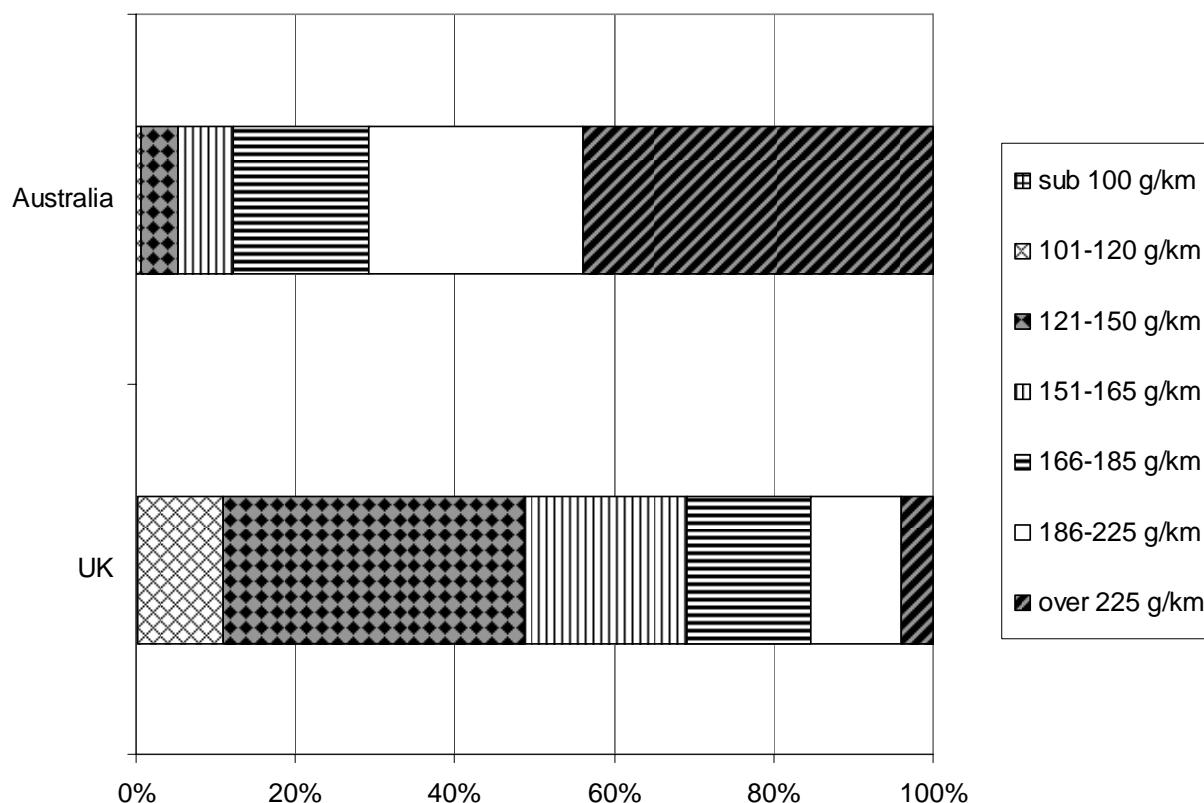


Source for European Union data: Transport and Environment (2008 and 2009).

Figure 16. Changes in emissions for new passenger vehicles by country between 2006 and 2008

Passenger vehicles: emissions distribution

The distribution of new passenger vehicles by carbon dioxide emissions in the United Kingdom and Australia for 2008 are shown in Figure 17. Figure 17 uses the United Kingdom's fuel excise duty categories to group vehicles into different emissions bands. The United Kingdom has a higher proportion of vehicles in the lower emissions bands, for example, about half of vehicles sold have emissions under 150 g/km. In Australia the proportion of vehicles sold with emissions under 150 g/km was 5 per cent.



Source for United Kingdom data: Society of Motor Manufacturers and Traders (2009).

Figure 17. Emission distribution for new passenger vehicles for Australia and the United Kingdom for 2008

Passenger vehicles: proportion of “green” cars

The Swedish Government defines a “green” car as a vehicle that does not exceed 120 g/km of carbon dioxide.⁴ Using this definition, the proportion of “green” cars sold in the United Kingdom in 2008 was 11 per cent of total sales. In Australia, the proportion of “green” cars sold in 2008 was 0.6 per cent of total sales.

The models of “green” cars available in Australia in 2008 were:

- Smart C451, 103 g/km;
- Smart A451, 104 g/km;
- Toyota Prius, 106 g/km;
- Honda Civic Hybrid, 109 g/km;
- Fiat 500, 111 g/km;
- Smart A450, 113 g/km; and
- Audi A3, 119 g/km.

All these vehicles are classified in the “small” or “light” vehicle segments.

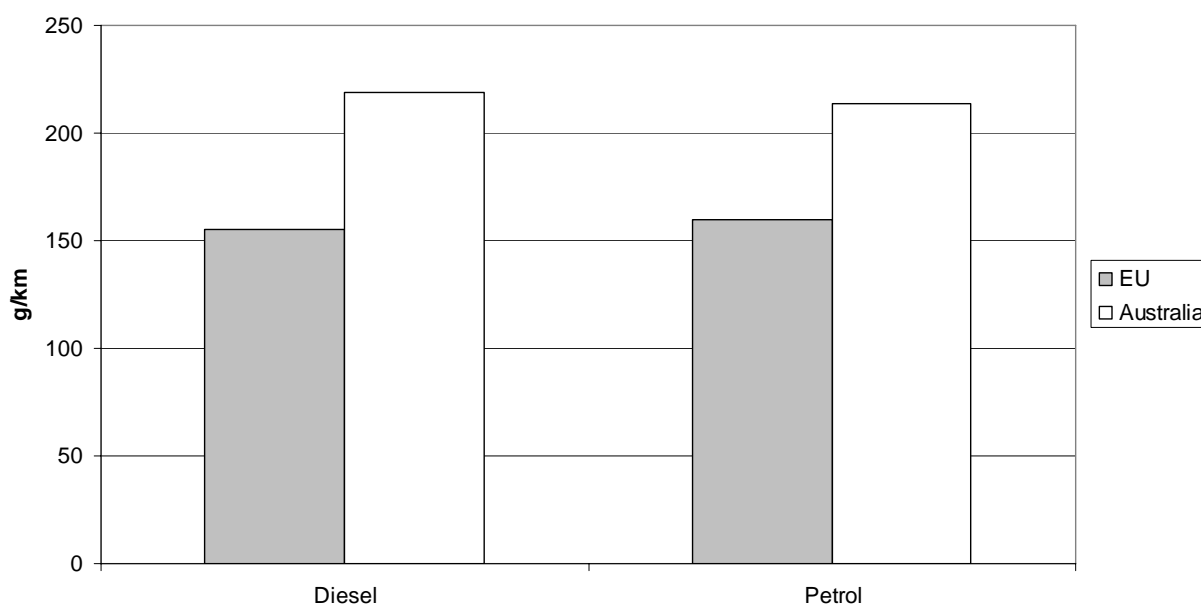
⁴ Government Offices of Sweden (2007).

In 2005, there were three “green” vehicle models available. In Jan-Aug 2009, there are 14 “green” vehicle models available (see Table 17 in Appendix A).

Passenger vehicles: emissions by fuel type

The average emissions by fuel type for the European Union and Australia for 2008 are presented in Figure 18. Average emissions for diesel vehicles are 155 g/km for the European Union and 219 g/km for Australia. Average emissions for diesel vehicles were 41 per cent higher in Australia compared to the European Union. Average emissions for petrol vehicles are 160 g/km for the European Union and 214 g/km for Australia. Average emissions for petrol vehicles were 33 per cent higher in Australia compared to the European Union.

The proportion of diesel and petrol vehicles sales in the European Union was 52 and 48 per cent respectively of passenger vehicle sales in 2008.⁵ In Australia, the proportion of diesel and petrol vehicles sales was 12 and 87 per cent respectively of passenger vehicle sales in 2008.



Source for European Union data: Commission of the European Communities (2009).

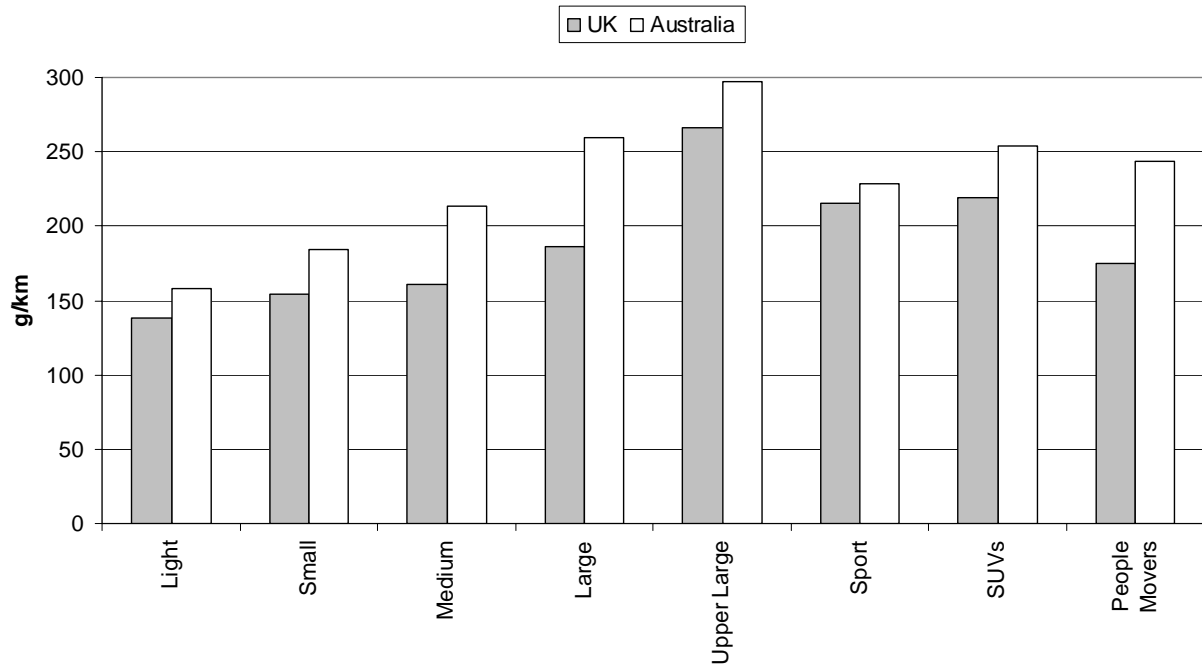
Figure 18. Average CO₂ emissions for new passenger vehicles by fuel type for the European Union and Australia in 2008

Passenger vehicles: emissions by segment

Figure 18 shows average carbon dioxide emissions by segment for Australia and the United Kingdom for 2008. To produce the data in Figure 18, segment categories used in the United Kingdom were matched to segment categories used in Australia (Table 18 in Appendix A). There are likely to be differences between the United Kingdom and Australian segment categories where the same vehicle model in both markets maybe placed under different segments. Figure 18 shows that the average emissions in the United Kingdom’s segments are lower than the equivalent Australian segments. The lowest average emissions was from the “light” segment with 138 g/km in the United Kingdom and with 158 g/km in Australia. The highest emitting segment is “upper large” with 266 g/km in the United Kingdom and 298 g/km in Australia.

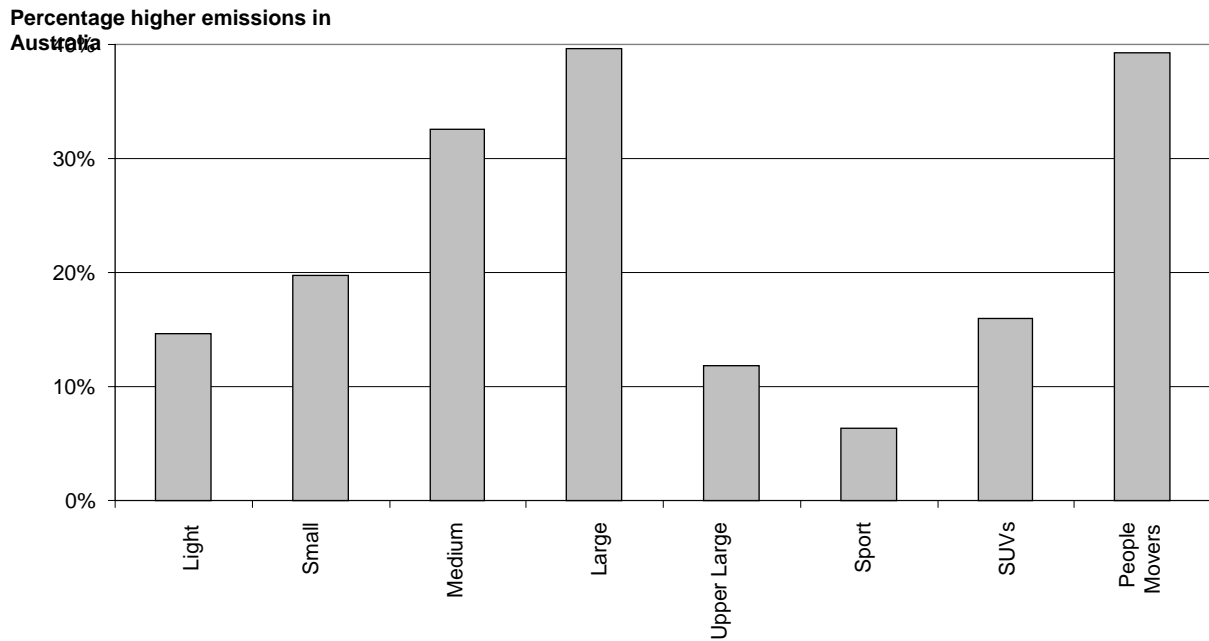
Figure 18 shows the difference in Australian segment compared to the United Kingdom. These differences range from 6 per cent for the “sports” segment to 40 per cent for the “large” segment.

⁵ Commission of the European Communities (2009).



Source for United Kingdom data: Society of Motor Manufacturers and Traders (2009).

Figure 19. Average CO₂ emissions for new passenger vehicles by segment for Australia and the United Kingdom for 2008



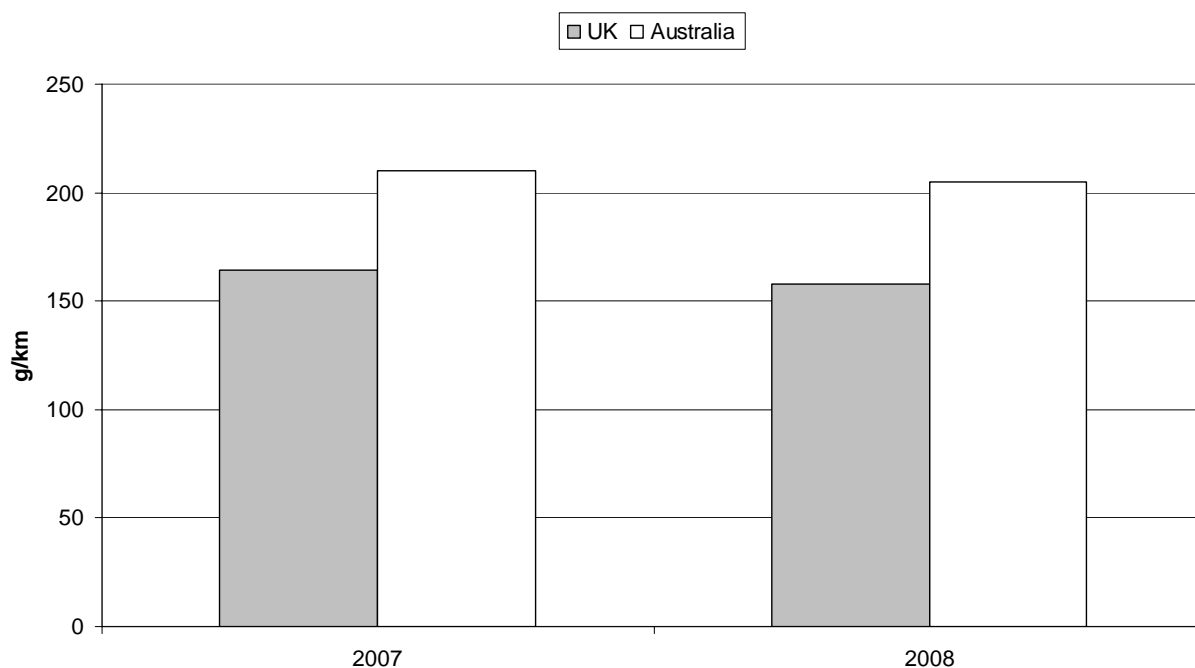
Source for United Kingdom data: Society of Motor Manufacturers and Traders (2009).

Figure 20. Difference in average CO₂ emissions for new passenger vehicles by segment for Australian and the United Kingdom in 2008

Passenger vehicles: emissions by buyer type

Average carbon dioxide emissions from private buyers in the United Kingdom and Australia are presented in Figure 20. This shows that private buyers from the United Kingdom purchase lower average emission vehicles than Australian private buyers. In 2008, private buyers from Australia purchased vehicles with emissions 30 per cent higher than private buyers from the United Kingdom.

We could only compare private buyers between Australia and the United Kingdom. This is because the United Kingdom classifies non-private buyers into company fleet size whereas in Australia the classification is government and business buyers.

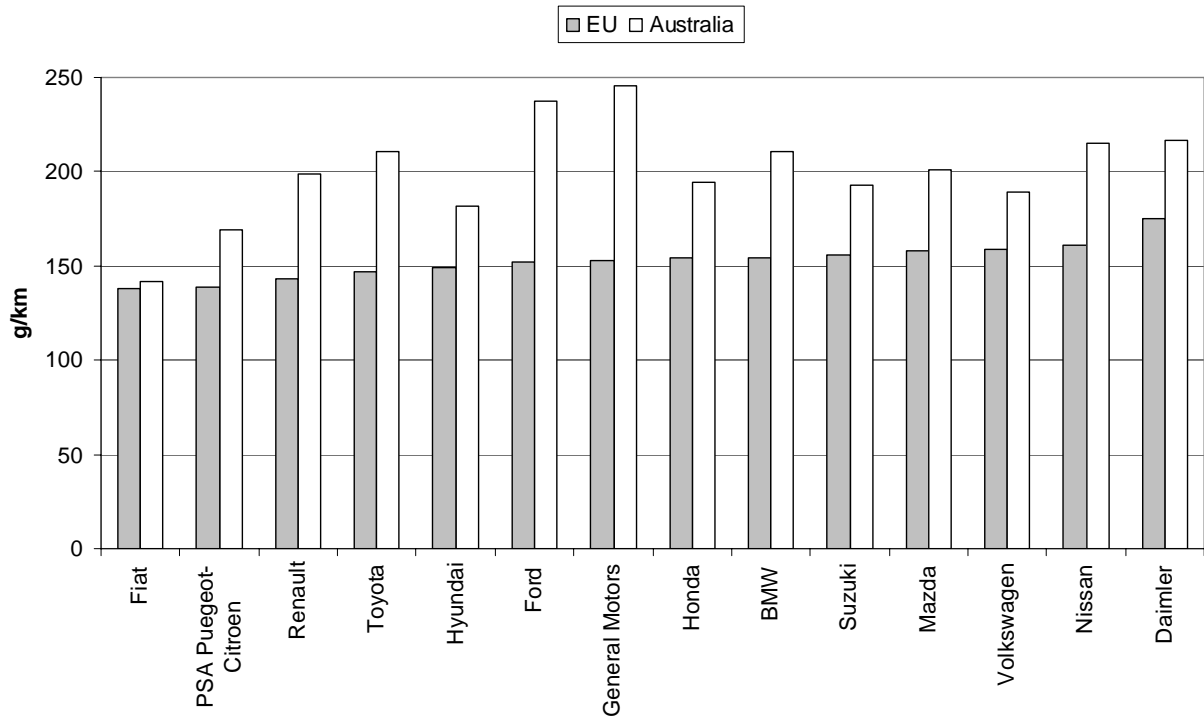


Source for United Kingdom data: Society of Motor Manufacturers and Traders (2009).

Figure 21. Average CO₂ emissions for new passenger vehicles for private buyers for the United Kingdom and Australia in 2007 and 2008

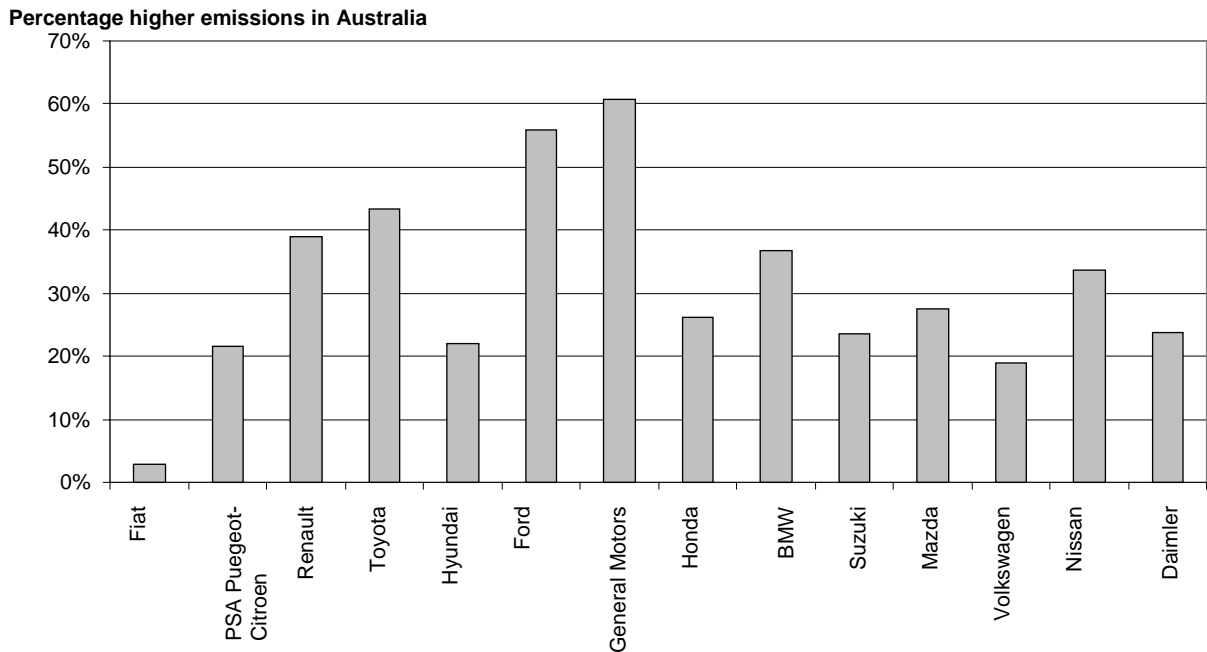
Passenger vehicles: emissions by manufacturer

The average emissions for new vehicles by manufacturer for the European Union and Australia for 2008 are shown in Figure 21. We have grouped the vehicles of the makes in Australia to generate an equivalent to manufacturers in the European Union as shown in Table 19 in Appendix A. The range of manufacturer's corporate average emissions in the European Union are Fiat (138 g/km) to Daimler (175 g/km). The range of manufacturer's corporate average emissions in Australian are Fiat (142 g/km) to General Motors Holden (246 g/km). Note the range in emissions from manufacturers in the European Union is 37 g/km compared to a larger range in Australia of 104 g/km.



Source for European Union data: Transport and Environment (2009).

Figure 22. Corporate average CO₂ emissions for new passenger vehicles by manufacturer for the European Union and Australia in 2008



Source for European Union data: Transport and Environment (2009).

Figure 23. Difference in average CO₂ emissions for new passenger vehicles by manufacturer for the European Union and Australia in 2008

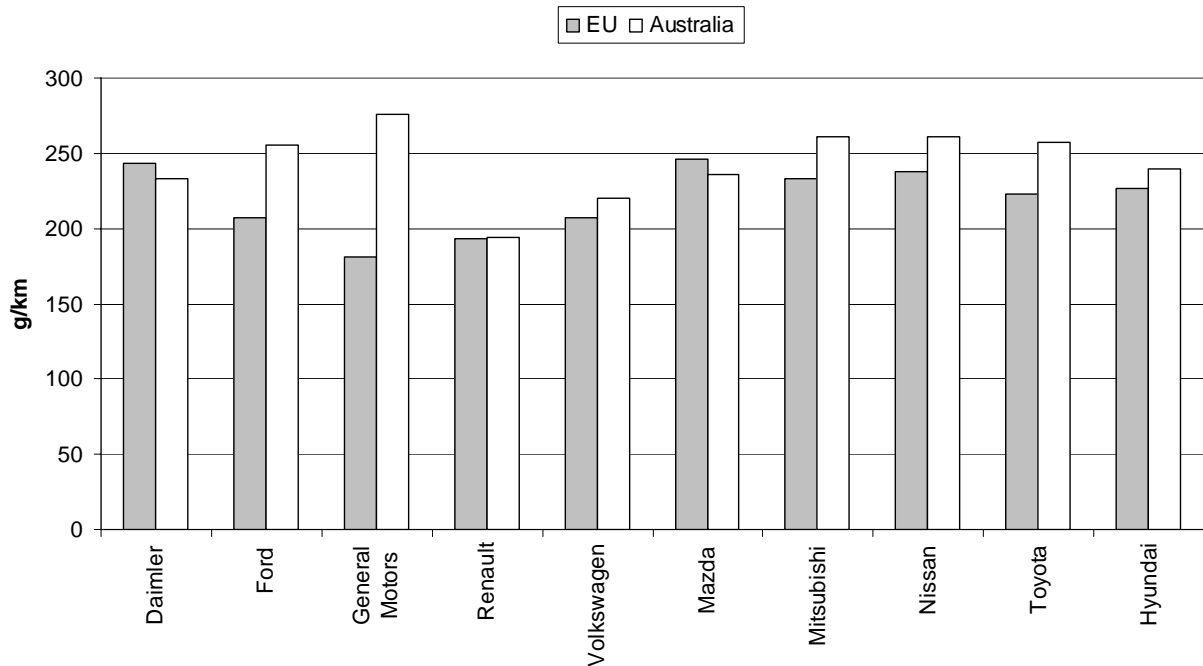
Light commercial vehicles

Compared to passenger vehicles, there is less data available for the European Union for light commercial vehicles. We could not find any published trend data on average emissions from light commercial vehicles from Europe.

The average emissions for light commercial vehicles for the European Union was 203 g/km in 2007.⁶ The equivalent Australian emissions for 2007 is 258 g/km, 26 per cent higher than the European Union.

Figure 24 shows corporate average carbon dioxide emissions by manufacturer for the European Union and Australia for 2007. The lowest corporate average emission in the European Union was General Motors with 181 g/km and for Australia was Renault with 194 g/km. The highest corporate average emission in the European Union was Mazda with 246 g/km and for Australia was General Motors Holden with 276 g/km.

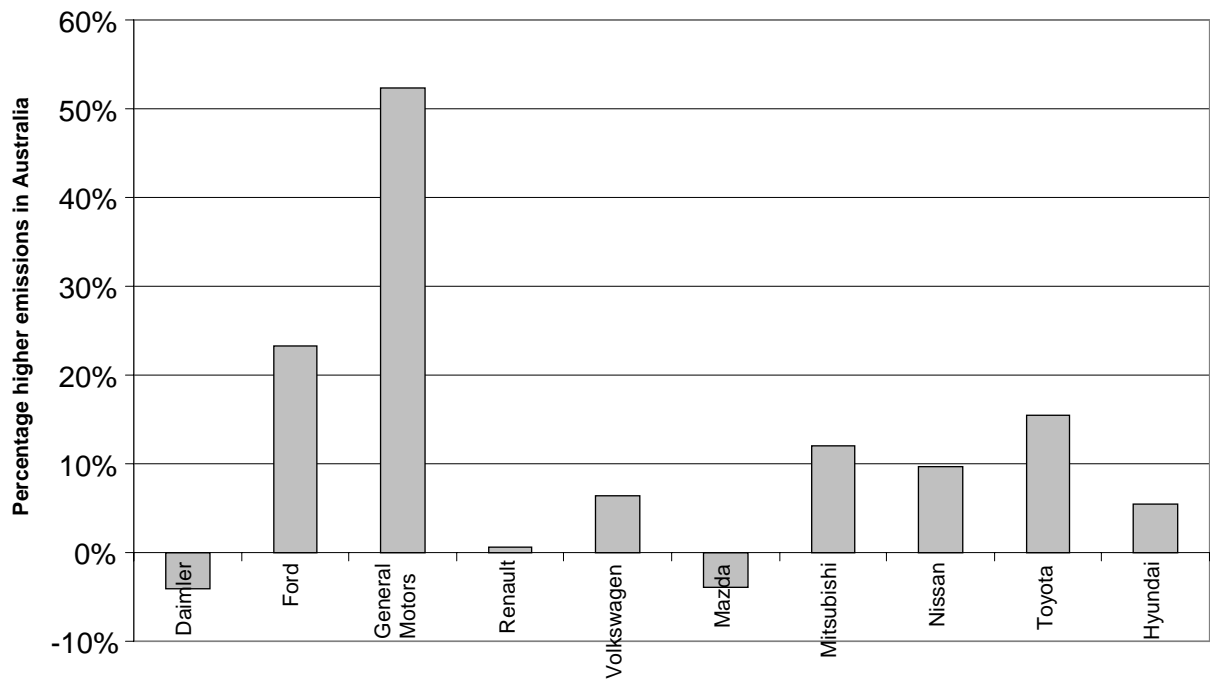
Figure 25 shows the difference in corporate emissions between Australia and the European Union in 2007. The corporate average emissions for Daimler and Mazda were 4 per cent lower in Australia compared to the European Union. The corporate average for General Motors was 52 per cent higher in Australian compared to the European Union.



Source for European Union data: AEA (2008).

Figure 24. Corporate average CO₂ emissions by manufacturer for the European Union and Australia for 2007

⁶ AEA (2008).



Source for European Union data: AEA (2008).

Figure 25. Difference in corporate average CO₂ emissions by manufacturer for Australia compared to the European Union in 2007

Discussion

There are a number of reasons for lower emissions in these European countries compared to Australia. The European measures to reduce carbon dioxide from vehicles are shown in Table 15. In Australia, there have been fewer measures to reduce average carbon dioxide emissions from new vehicles. A summary of European measures in transport was published by the European Conference of Ministers of Transport (2007).

Table 14. European measures that have reduced CO₂ emissions from motor vehicles

European measures	Effect of measure
High fuel prices through higher fuel taxes	Encourages consumers to purchase fuel efficient vehicles to lower running costs
Low diesel taxes compared to petrol taxes	Encourages consumers to purchase diesel vehicles to reduce running costs
Historical threat of government regulation for corporate average carbon dioxide emissions for manufacturers	This previously encouraged manufacturers to reduce their corporate average emissions. Now the European Commission has introduced regulation from 2012 for passenger vehicles. The European Commission is current developing regulation for light commercial vehicles.
Good fuel quality standards	Enables vehicle technology to improve fuel efficiency and lower carbon dioxide emissions
Vehicle excise duties	Encourages consumers to purchase low carbon dioxide 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 annual running costs of the new vehicles
Consumer information in printed advertisements	Provides information to consumers about relative carbon dioxide efficiency and annual running costs of the new vehicles

Some scenario modelling of average emissions from Australian passenger vehicles was undertaken for 2008. The actual average emissions in Australia were substituted with values from parts of this paper. In this analysis, Australian sales for 2008 have not been changed. These scenarios show reductions of between 16 and 36 per cent (see Table 16).

Table 15. Scenario modelling for Australian passenger vehicles in 2008

Scenario	Assumptions	Average CO ₂ emission (g/km)	Percentage change from base case
Base case	No change	215 g/km	n/a
Australians buy vehicles with the best-in-class emissions	Australian segments for passenger vehicles have the best-in-class emissions in 2008 No change in segment sales in Australia	137 g/km	-36%
Australian segments for passenger vehicles have lower average CO ₂ emissions	Australian segments for passenger vehicles had the same average CO ₂ emissions as the United Kingdom in 2008 No change in segment sales in Australia	175 g/km	-19%
Australian private buyers buy vehicles with lower average CO ₂ emissions	Australian private buyers have the same average CO ₂ emissions as United Kingdom buyers in 2008 No change buyer type sales in Australia No change to average CO ₂ emissions for government and business buyers	180 g/km	-16%
Some Australian makes for passenger vehicles have lower corporate average CO ₂ emissions	Australian makes for passenger vehicles had the corporate average CO ₂ emissions as the manufacturers in the European Union in 2008 (these makes represent 85 per cent of passenger vehicle sales for Australia) No change in sales by make in Australia No change to average CO ₂ emissions for makes that are not represented in the manufacturers from the European Union in Figure 21	164 g/km	-24%

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Appendix A

This appendix contains tables with sales and average vehicle emissions used in the report. In addition, segment emissions by fuel type are also included that was not reported above.

Table 16. Sales for vehicle models with emissions lower than 120 g/km by year

Year	Make	Model	Segment	CO ₂ emissions (g/km)	Sales
2005	Smart	A450	Light	113	86
2005	Smart	C450	Light	113	338
2005	Toyota	Prius	Small	106	1423
2006	Honda	Civic hybrid	Small	109	813
2006	Smart	A450	Light	113	84
2006	Smart	C450	Light	113	449
2006	Toyota	Prius	Small	106	1974
2007	Honda	Civic hybrid	Small	109	791
2007	Smart	A450	Light	113	33
2007	Smart	A451	Light	116	9
2007	Smart	C450	Light	113	345
2007	Smart	C451	Light	112	47
2007	Toyota	Prius	Small	106	3176
2008	Audi	A3	Small	119	107
2008	Fiat	500	Light	119	76
2008	Fiat	500	Light	111	103
2008	Honda	Civic hybrid	Small	109	813
2008	Smart	A450	Light	113	1
2008	Smart	A451	Light	116	71
2008	Smart	C450	Light	113	5
2008	Smart	C451	Light	112	184
2008	Smart	C451	Light	116	64
2008	Smart	C451	Light	103	5
2008	Toyota	Prius	Small	106	3413
Jan-Aug 2009	Audi	A3	Small	119	140
Jan-Aug 2009	Fiat	500	Light	119	27
Jan-Aug 2009	Fiat	500	Light	111	52
Jan-Aug 2009	Honda	Civic hybrid	Small	109	248
Jan-Aug 2009	Mini	Cooper	Small	104	52
Jan-Aug 2009	Smart	A451	Light	116	8
Jan-Aug 2009	Smart	A451	Light	116	16
Jan-Aug 2009	Smart	A451	Light	104	22
Jan-Aug 2009	Smart	C451	Light	112	46
Jan-Aug 2009	Smart	C451	Light	116	40
Jan-Aug 2009	Smart	C451	Light	103	70
Jan-Aug 2009	Suzuki	Alto	Light	113	116
Jan-Aug 2009	Toyota	Prius	Small	106	1358
Jan-Aug 2009	Toyota	Prius	Small	89	594

Table 17. Matched segment types for Australian and the United Kingdom

Australian segment categories	United Kingdom segment categories
Light	<p>SEGMENT A - MINI Normally less than 1.0 cc Bodystyle "miniature" Normally two doors Length normally not exceeding 3050 mm (10 Feet)</p> <p>SEGMENT B - SUPERMINI Normally between 1.0 - 1.4 cc Bodystyle bigger than mini Length normally not exceeding 3745 mm (~ 12.5 feet) Performance greater than mini More variety of trims per range</p>
Small	<p>SEGMENT C - LOWER MEDIUM Normally between 1.3 - 2.0 cc Length of saloon not exceeding 4230 mm (~ 14 feet)</p>
Medium	<p>SEGMENT D - UPPER MEDIUM Normally between 1.6 - 2.8 cc Length of saloon normally not exceeding 4470 mm (~ 14.9 feet)</p>
Large	<p>SEGMENT E - EXECUTIVE Normally between 2.0 - 3.5 cc Bodystyle generally bigger than Upper Medium Normally four doors Length of saloon normally not exceeding 4800 mm (~ 16 feet) More luxuriously appointed</p>
Upper Large	<p>SEGMENT F - LUXURY SALOON Normally above 3.5 cc Most luxurious available</p>
Sports	<p>SEGMENT G - SPECIALIST SPORTS Sports coupes, sports saloons and traditional sports</p>
Sports Utility vehicles (includes compact SUV, medium SUV, large SUV and luxury SUV)	<p>SEGMENT H - DUAL PURPOSE 4x4 off-road</p>
People movers	<p>SEGMENT I - MULTI PURPOSE VEHICLE 4x2 or 4x4 estates with a seating capacity of up to eight people</p>

Source for United Kingdom data: Society of Motor Manufacturers and Traders 2009.

Table 18. Equivalent manufacturers in European Union and Australia

Manufacturer in European Union	Combined makes in Australia
BMW	BMW and Mini
Daimler	Mercedes-Benz and Smart
General Motors	General Motors Holden, Saab and Hummer
Hyundai	Hyundai and Kia
PSA Peugeot-Citroen	Peugeot and Citroen

Table 19. Emissions distribution by sales of passenger and light commercial vehicles

Emissions range (g/km)	Sales				
	2005	2006	2007	2008	Jan – Aug 2009
1 to 10	0	0	0	0	0
11 to 20	0	0	0	0	0
21 to 30	0	0	0	0	0
31 to 40	0	0	0	0	0
41 to 50	0	0	0	0	0
51 to 60	0	0	0	0	0
61 to 70	0	0	0	0	0
71 to 80	0	0	0	0	0
81 to 90	0	0	0	0	594
91 to 100	0	0	149	234	40
101 to 110	1,423	2,787	3,967	4,233	1,750
111 to 120	424	533	434	609	445
121 to 130	924	1,214	2,077	4,292	2,103
131 to 140	9,304	7,223	10,747	8,825	3,433
141 to 150	21,386	31,184	30,419	23,982	19,799
151 to 160	26,558	30,534	39,877	54,827	34,799
161 to 170	24,468	50,471	56,564	53,489	35,202
171 to 180	59,136	74,757	82,376	83,852	46,393
181 to 190	47,467	43,850	48,696	49,721	41,451
191 to 200	38,036	48,374	70,751	79,586	44,018
201 to 210	41,267	40,038	33,605	46,282	29,211
211 to 220	60,801	56,556	60,501	62,747	40,388
221 to 230	56,543	84,177	93,089	77,402	44,064
231 to 240	73,780	72,529	98,118	77,139	44,164
241 to 250	59,555	53,944	74,650	77,420	47,777
251 to 260	37,159	74,710	75,004	73,235	47,722
261 to 270	61,953	67,814	55,420	35,861	17,800
271 to 280	72,039	34,440	47,101	56,165	31,101
281 to 290	40,284	30,332	29,522	25,680	12,445
291 to 300	44,001	33,978	23,566	13,026	5,336
301 to 310	34,344	19,646	22,930	22,288	15,753
311 to 320	34,584	20,031	12,877	9,347	5,300
321 to 330	8,191	10,002	7,824	7,507	3,221
331 to 340	20,186	11,772	4,332	4,659	1,760
341 to 350	7,393	12,034	16,451	17,202	6,226
351 to 360	6,285	4,409	3,241	2,011	611
361 to 370	7,214	2,931	2,233	1,133	542
371 to 380	4,367	3,544	2,781	796	359
381 to 390	389	71	598	133	34
391 to 400	506	213	272	278	125
401 to 410	643	298	344	314	176
411 to 420	66	77	92	91	23
421 to 430	25	63	137	69	6
431 to 440	15	0	0	23	35
441 to 450	6	0	3	0	0
451 to 460	0	0	0	0	0
461 to 470	0	0	0	3	0
471 to 480	11	17	7	11	2
481 to 490	0	4	46	38	8
491 to 500	20	10	9	2	0
Total	900,753	924,567	1,010,810	974,512	584,216

Table 20. Average CO₂ emissions for new passenger and light commercial vehicles by buyer type

Buyer type	Average vehicle CO ₂ emissions (g/km)					Change between 2005 and 2009
	2005	2006	2007	2008	Jan-Aug 2009	
Business	253	242	237	233	230	-9%
Government	264	251	244	238	232	-12%
Private	225	216	214	210	207	-8%

Table 21. Sales for new passenger and light commercial vehicles by buyer type

Buyer type	2005	2006	2007	2008	Jan – Aug 2009	Change between 2005 and 2008	
Business	398,847	396,742	442,712	446,577	265,241	47,730	12%
Government	87,525	78,430	71,292	68,890	38,911	-18,635	-21%
Private	470,602	455,860	498,747	460,772	281,565	-9,830	-2%
Total	956,974	931,032	1,012,751	976,239	585,717	19,265	2%

Table 22. Average CO₂ emissions for new passenger and light commercial vehicles by fuel type

Fuel Type	Average vehicle CO ₂ emissions (g/km)					Change between 2005 and 2009
	2005	2006	2007	2008	Jan-Aug 2009	
Diesel	260	249	236	232	228	-12%
LPG	248	255	245	246	249	0%
Petrol	238	227	224	220	216	-9%

Table 23. Sales for new passenger and light commercial vehicles by fuel type

Fuel Type	2005	2006	2007	2008	Jan-Aug 2009	Change between 2005 and 2008
Diesel	110,608	130,403	175,022	205,353	133,444	86%
LPG	8,282	13,698	12,900	13,378	6,823	62%
Petrol	838,084	786,931	824,829	757,508	445,450	-10%
Total	956,974	931,032	1,012,751	976,239	585,717	2%

Table 24. Average CO₂ emissions by segment

Segment	Average vehicle CO ₂ emissions (g/km)				
	2005	2006	2007	2008	Jan - Aug 2009
Light	160	159	158	158	159
Small	191	190	188	184	183
Medium	222	221	217	213	210
Large	269	263	261	260	256
Upper Large	297	289	292	298	287
Sports	254	241	231	229	222
People movers	254	251	250	244	247
SUV Compact	238	236	236	229	226
SUV Medium	306	296	277	271	265
SUV Large	323	320	313	294	292
SUV Luxury	300	285	272	266	255
Light buses	271	273	276	269	270
Pick-up 4x2	288	278	268	267	265
Pick-up 4x4	267	261	254	252	250
Trucks 2.5 - 3.5 GVM	281	278	275	267	267
Vans	238	236	237	236	232

Table 25. Minimum CO₂ emissions by segment

Market Segment	2005	2006	2007	2008	Jan-Aug 2009
Light	113	113	112	103	103
Small	106	106	91	91	89
Medium	155	155	150	144	144
Large	188	186	162	162	153
Upper Large	243	214	214	214	192
Sports	163	157	155	155	145
People movers	212	167	167	161	161
SUV Compact	160	160	174	174	173
SUV Medium	238	198	197	197	197
SUV Large	283	283	273	273	273
SUV Luxury	229	192	178	178	150
Light buses	232	232	232	243	243
Pick-up 4x2	166	166	166	166	166
Pick-up 4x4	168	219	212	212	212
Trucks 2.5-3.5 GVM	224	224	224	224	224
Vans	151	151	151	138	139

Table 26. Maximum CO₂ emissions by segment

Segment	2005	2006	2007	2008	Jan-Aug 2009
Light	225	225	203	199	199
Small	287	287	287	287	269
Medium	324	326	326	328	328
Large	387	387	367	405	405
Upper Large	495	495	495	495	423
Sports	499	499	490	490	490
People movers	322	358	358	358	322
SUV Compact	298	293	293	287	287
SUV Medium	386	384	430	430	430
SUV Large	408	408	408	408	408
SUV Luxury	397	392	392	392	392
Light buses	300	300	300	300	300
Pick-up 4x2	365	365	375	375	374
Pick-up 4x4	419	419	352	339	351
Trucks 2.5-3.5 GVM	284	284	284	284	273
Vans	324	324	336	336	324

Table 27. Sales by segment

Segment	2005	2006	2007	2008	Jan - Aug 2009
Light	95,890	116,086	127,891	126,600	77,724
Small	218,013	219,358	232,388	228,463	141,413
Medium	85,421	87,025	92,066	86,819	48,027
Large	167,304	136,280	139,372	119,339	65,331
Upper Large	6,823	7,334	9,346	5,467	2,435
Sports	19,615	16,626	19,449	17,211	11,095
People movers	15,738	15,442	16,202	12,646	7,027
SUV Compact	73,319	75,675	90,330	85,597	54,093
SUV Medium	71,287	61,361	74,434	75,485	46,412
SUV Large	19,083	15,469	13,370	14,874	6,632
SUV Luxury	16,603	18,585	20,347	18,722	12,856
Light buses	2,298	2,622	2,465	3,417	1,440
Pick-up 4x2	79,534	69,545	70,606	72,812	42,647
Pick-up 4x4	62,728	67,639	82,691	83,308	52,351
Trucks 2.5 - 3.5 GVM	1,747	1,532	1,494	1,180	623
Vans	21,571	20,453	20,300	24,299	15,611
Total	956,974	931,032	1,012,751	976,239	585,717

Table 28. Minimum, average and maximum CO₂ emissions by segment for Jan-Aug 2009

Segment	Average vehicle CO ₂ emissions (g/km)		
	Minimum	Average	Maximum
Light	103	159	199
Small	89	183	269
Medium	144	210	328
Large	153	256	405
Upper Large	192	287	423
Sports	145	222	490
People movers	161	247	322
SUV Compact	173	226	287
SUV Medium	197	265	430
SUV Large	273	292	408
SUV Luxury	150	255	392
Light buses	243	270	300
Pick-up 4x2	166	265	374
Pick-up 4x4	212	250	351
Trucks 2.5 - 3.5 GVM	224	267	273
Vans	139	232	324

Table 29. Corporate average CO₂ emissions

Make	Average vehicle CO ₂ emissions (g/km)					Change between 2005 and 2009
	2005	2006	2007	2008	Jan-Aug 2009	
Toyota	237	228	222	222	221	-7%
Holden	252	248	253	252	245	-3%
Ford	275	254	247	242	240	-13%
Mazda	221	213	210	206	204	-7%
Hyundai	201	188	183	177	181	-10%
Mitsubishi	250	245	240	230	226	-10%
Nissan	258	242	241	231	232	-10%
Honda	202	199	196	194	190	-6%
Subaru	236	236	233	226	225	-5%
Volkswagen	199	193	193	193	188	-5%
Kia	242	222	215	201	201	-17%
Suzuki	190	192	193	193	191	0%
BMW	234	226	220	216	213	-9%
Mercedes-Benz	232	232	227	220	220	-5%
Audi	213	218	222	205	192	-10%
Peugeot	183	177	172	170	174	-5%
Lexus	270	240	232	233	231	-15%
Volvo Car	264	251	240	237	242	-9%
Jeep	306	301	292	260	269	-12%
Land Rover	309	306	297	289	284	-8%
Isuzu Ute				225	223	-
Dodge		188	220	236	248	-
Renault	195	195	196	198	206	5%
Chrysler	267	269	267	259	262	-2%
MINI	187	188	167	167	160	-15%
Citroen	175	167	166	168	176	0%
Proton	172	161	158	161	163	-5%
Alfa Romeo	230	219	213	203	191	-17%
Fiat		137	137	144	155	-
Porsche	301	292	280	280	267	-11%
Skoda			173	171	177	-
Ssangyong	266	259	256	234	230	-14%
Jaguar	249	247	250	245	241	-3%
Great Wall					250	-
Saab	233	233	220	218	218	-6%
Hummer			343	343	344	-
Smart	124	122	115	113	109	-12%
Maserati	384	385	360	346	345	-10%
Ferrari	440	436	445	443	440	0%
Aston Martin	400	401	397	389	391	-2%
Lotus	200	207	205	204	202	1%
Bentley	423	422	419	414	401	-5%
Lamborghini	400	400	400	400	400	0%
Rolls-Royce	385	385	385	385	385	0%
Maybach	383	390		388		-
Morgan	232	164	218	264		-

Table 30. Sales by make

Make	2005	2006	2007	2008	Jan – Aug 2009
Toyota	202,392	213,545	236,342	238,548	126,714
Holden	174,464	146,511	146,680	130,338	75,923
Ford	129,140	114,965	108,071	104,715	61,862
Mazda	66,520	63,664	77,734	79,826	50,490
Hyundai	48,010	46,523	50,007	45,409	42,141
Mitsubishi	57,776	54,175	65,397	60,692	35,780
Nissan	56,032	53,392	60,015	59,214	34,367
Honda	47,001	54,202	60,529	52,571	27,848
Subaru	36,044	37,520	38,445	38,492	24,418
Volkswagen	15,520	21,178	26,906	29,395	20,155
Kia	25,293	20,770	20,985	19,661	13,073
Suzuki	13,794	15,798	21,575	22,523	12,854
BMW	15,910	16,034	17,197	17,263	10,732
Mercedes-Benz	15,164	15,912	17,779	15,593	10,472
Audi	4,808	5,770	7,225	9,410	7,563
Peugeot	7,025	8,107	8,807	7,254	4,039
Lexus	6,005	7,162	8,199	6,670	3,600
Volvo Car	2,917	4,000	4,851	4,469	2,903
Jeep	5,078	5,099	5,744	5,232	2,527
Land Rover	3,092	3,392	3,708	4,320	2,480
Isuzu Ute	0	0	0	273	1,822
Dodge		344	2,082	2,325	1,720
Renault	3,114	2,495	2,613	2,919	1,562
Chrysler	2,479	3,610	3,059	2,469	1,331
MINI	2,097	2,038	2,269	2,082	1,249
Citroen	3,005	3,507	3,803	2,703	1,129
Proton	2,164	2,008	2,336	1,856	909
Alfa Romeo	1,572	1,646	1,866	1,203	782
Fiat		335	741	1,265	778
Porsche	1,205	1,154	1,380	1,157	718
Skoda	0	0	146	818	696
Ssangyong	2,645	2,206	2,123	1,372	640
Jaguar	975	1,011	820	890	576
Great Wall	0	0	0	0	502
Saab	1,510	1,605	1,862	1,158	479
Hummer			273	1,078	391
Smart	799	773	459	330	202
Maserati	80	107	134	201	84
Ferrari	76	101	145	163	68
Aston Martin	58	111	160	147	51
Lotus	55	47	90	70	39
Bentley	101	108	127	95	21
Lamborghini	32	38	46	46	18
Rolls-Royce	10	12	17	17	9
Maybach	3	1	0	3	0
Morgan	4	2	2	3	0
Caterham	0	0	2	1	0
Daihatsu	2,735	54	0	0	0
MG Rover	270	0	0	0	0
Total	956,974	931,032	1,012,751	976,239	585,717

Table 31. Average, maximum and minimum CO₂ emissions by top 15 makes by sales for Jan-Aug 2009

Make	Minimum (g/km)	Average (g/km)	Maximum (g/km)
Toyota	89	221	341
Holden	91	245	405
Ford	143	240	363
Mazda	152	204	309
Hyundai	125	181	263
Mitsubishi	134	226	326
Nissan	162	232	408
Honda	109	190	269
Subaru	208	225	295
Volkswagen	133	188	346
Kia	137	201	302
Suzuki	113	191	277
BMW	128	213	366
Mercedes-Benz	142	220	392
Audi	119	192	351

Table 32. Sales for Australian-made vehicles

Make	Model	2005	2006	2007	2008	Jan-Aug 2009
Ford	Falcon Utility	18,384	15,858	13,758	12,600	7,455
Ford	Territory	23,454	18,364	17,290	12,882	6,856
Holden	Adventra	3,153	2,543	655	2	1
Holden	Crewman	6,698	5345	3,638	1,090	6
Holden	Holden Utility	13,464	8,729	7,882	12,359	7,537
Ford	Fairlane	1,829	1,105	1,703	114	13
Ford	Falcon	53,080	42,390	33,941	3,936	19,776
Ford	Ltd	151	53	77	2	
Holden	Caprice	741	1,090	2,611	1,641	942
Holden	Commodore	66,765	56,531	57,307	51,093	28,772
Holden	Monaro	2,834	912	152	8	2
Holden	Statesman	2,832	1,986	2,143	1,804	384
Mitsubishi	380	3,548	12,423	10,942	3,272	9
Mitsubishi	Magna	11,410	591	3		
Mitsubishi	Verada	1,054	51	3		
Toyota	Aurion		3,380	22,036	19,562	8,826
Toyota	Avalon	2,949	28			
Toyota	Camry	24,446	24,221	26,336	23,067	12,352
Toyota	Camry V6	12,046	6,023	8		
Total		248,838	201,623	200,485	143,432	92,931

Table 33. National average CO₂ emissions for passenger vehicles

Country	2006	2007	2008	Change from 2006 to 2008
Australia	223	219	215	-4%
Austria	164	163	158	-4%
Belgium	154	153	148	-4%
Denmark	163	160	146	-10%
Finland	179	177	163	-9%
France	150	149	140	-7%
Germany	173	169	165	-5%
Greece	167	165	161	-4%
Ireland	166	162	157	-5%
Italy	149	147	145	-3%
Luxembourg	168	166	160	-5%
Netherlands	167	165	158	-5%
Portugal	145	144	138	-5%
Spain	156	153	148	-5%
Sweden	189	181	174	-8%
United Kingdom	168	165	158	-6%

Table 34. Emissions distribution by sales of passenger vehicles

Emissions range (g/km)	2005	2006	2007	2008	Jan – Aug 2009
1 to 10	0	0	0	0	0
11 to 20	0	0	0	0	0
21 to 30	0	0	0	0	0
31 to 40	0	0	0	0	0
41 to 50	0	0	0	0	0
51 to 60	0	0	0	0	0
61 to 70	0	0	0	0	0
71 to 80	0	0	0	0	0
81 to 90	0	0	0	0	594
91 to 100	0	0	149	234	40
101 to 110	1,423	2,787	3,967	4,233	1,750
111 to 120	424	533	434	609	445
121 to 130	924	1,214	2,077	4,292	2,103
131 to 140	9,304	7,223	10,747	8,756	3,408
141 to 150	21,386	31,184	30,419	23,982	19,753
151 to 160	25,436	29,500	39,062	53,899	34,271
161 to 170	22,761	49,150	55,182	52,199	34,412
171 to 180	58,535	74,098	81,657	83,132	45,676
181 to 190	47,042	42,784	47,395	48,449	40,739
191 to 200	38,036	48,374	70,751	77,792	42,526
201 to 210	40,703	39,267	32,960	45,799	28,996
211 to 220	51,779	42,599	39,153	39,604	25,749
221 to 230	43,732	71,607	77,877	58,938	31,552
231 to 240	61,831	61,193	89,361	72,613	40,051
241 to 250	46,640	39,199	36,039	33,922	23,012
251 to 260	32,635	59,669	64,928	61,468	39,101
261 to 270	46,821	45,794	35,382	16,041	7,950
271 to 280	53,635	20,873	34,012	38,443	17,548
281 to 290	14,299	19,667	22,287	21,874	10,602
291 to 300	38,757	26,962	16,171	6,992	2,949
301 to 310	23,491	8,627	7,444	9,197	8,710
311 to 320	24,326	12,449	7,806	5,927	2,690
321 to 330	4,731	5,094	4,842	4,116	1,611
331 to 340	12,003	8,668	2,041	1,897	1,350
341 to 350	4,106	7,750	14,262	12,762	3,586
351 to 360	3,069	3,489	2,570	1,782	569
361 to 370	5,851	2,349	2,050	1,081	541
371 to 380	4,367	3,544	2,629	212	76
381 to 390	368	71	598	133	34
391 to 400	506	213	272	278	125
401 to 410	643	298	344	314	176
411 to 420	42	75	92	91	23
421 to 430	25	63	137	69	6
431 to 440	15	0	0	23	35
441 to 450	6	0	3	0	0
451 to 460	0	0	0	0	0
461 to 470	0	0	0	3	0
471 to 480	11	17	7	11	2
481 to 490	0	4	46	38	8
491 to 500	20	10	9	2	0
Total	739,683	766,398	835,162	791,207	472,769

Table 35. Average CO₂ emissions for passenger vehicles by fuel type

Fuel Type	Average vehicle CO ₂ emissions (g/km)				
	2005	2006	2007	2008	Jan-Aug 2009
Diesel	273	250	227	219	215
LPG	249	255	245	243	242
Petrol	231	221	218	214	210

Table 36. Sales of passenger vehicles by fuel type

Fuel Type	2005	2006	2007	2008	Jan-Aug 2009
Diesel	41,538	51,637	74,203	91,942	60,319
LPG	5,640	8,581	7,845	7,925	4,161
Petrol	741,918	709,023	753,147	691,356	408,565
Total	789,096	769,241	835,195	791,223	473,045

Table 37. Average CO₂ emissions for passenger vehicles by segment type for the United Kingdom and Australia for 2008

Segment	Average vehicle CO ₂ emissions (g/km)		Percentage difference
	United Kingdom	Australia	
Light	138	158	15%
Small	154	184	20%
Medium	161	213	33%
Large	186	260	40%
Upper Large	266	298	12%
Sport	215	229	6%
SUVs	219	254	16%
People Movers	175	244	39%

Table 38. Average CO₂ emissions for passenger vehicles by buyer type

Buyer type	Average vehicle CO ₂ emissions (g/km)				
	2005	2006	2007	2008	Jan-Aug 2009
Business	247	235	230	225	220
Government	260	246	238	230	223
Private	220	212	210	205	202

Table 39. Sales of passenger vehicles by buyer type

Buyer type	2005	2006	2007	2008	Jan-Aug 2009
Business	293,580	289,905	323,801	320,332	186,008
Government	67,272	58,675	51,972	49,286	28,932
Private	428,244	420,661	459,422	421,605	258,105
Total	789,096	769,241	835,195	791,223	473,045

Table 40. Corporate average emissions for passenger vehicle by manufacturer for the European Union and Australia in 2008

Manufacturer	Average vehicle CO ₂ emissions (g/km)		Percentage difference
	European Union	Australia	
Fiat	138	142	3%
PSA Peugeot-Citroen	139	169	21%
Renault	143	199	39%
Toyota	147	211	43%
Hyundai	149	182	22%
Ford	152	237	56%
General Motors	153	246	61%
Honda	154	194	26%
BMW	154	211	37%
Suzuki	156	193	24%
Mazda	158	201	27%
Volkswagen	159	189	19%
Nissan	161	215	34%
Daimler	175	217	24%

Table 41. Average CO₂ emissions for light commercial vehicles by segment

Segment	Average vehicle CO ₂ emissions (g/km)					Change between 2005 and 2009
	2005	2006	2007	2008	Jan-Aug 2009	
Pick-up 4x2	288	278	268	267	265	-8%
Pick-up 4x4	267	261	254	252	250	-6%
Trucks 2.5-3.5 GVM	281	278	275	267	267	-5%
Vans	238	236	237	236	232	-3%
Average emissions	273	266	258	256	254	-7%

Table 42. Average CO₂ emissions by make for light commercial vehicles

Make	Average vehicle CO ₂ emissions (g/km)					Changes between 2005 and 2009
	2005	2006	2007	2008	Jan-Aug 2009	
Citroen	176	176	176	176	176	0%
Fiat				196	196	n/a
Ford	285	270	255	256	261	-8%
Great Wall					250	n/a
Holden	289	283	276	276	270	-7%
Hyundai			240	239	238	n/a
Isuzu Ute				225	223	n/a
Kia	250	271	284	275	271	9%
Land Rover	299	299	296	292	291	-3%
Mazda	272	266	236	237	236	-13%
Mercedes-Benz	232	232	233	227	224	-3%
Mitsubishi	270	266	261	256	251	-7%
Nissan	253	255	261	260	258	2%
Peugeot				195	195	n/a
Proton	166	166	166	166	166	0%
Renault	194	195	194	198	195	0%
Ssangyong	268	270	260	223	222	-17%
Suzuki	181	190	190	190	190	5%
Toyota	270	264	258	256	254	-6%
Volkswagen	232	220	220	216	210	-9%

Table 43. Sales by make for light commercial vehicles

Make	2005	2006	2007	2008	Jan – Aug 2009
Citroen	477	504	617	386	241
Fiat				63	131
Ford	31,580	26,511	28,861	30,895	17,881
Great Wall					502
Holden	45,906	33,554	30,741	30,160	17,560
Hyundai			18	2,000	2,161
Isuzu Ute				273	1,822
Kia	4,399	1,345	720	459	257
Land Rover	44	35	30	80	68
Mazda	7,074	7,332	10,760	10,156	6,577
Mercedes-Benz	1,739	1,630	1,572	1,293	850
Mitsubishi	12,602	12,945	17,829	19,752	13,433
Nissan	12,840	17,236	22,505	21,080	13,065
Peugeot				98	255
Proton	1,225	789	844	672	304
Renault	671	795	656	798	523
Ssangyong	1,238	958	1,102	602	358
Suzuki	173	330	449	542	338
Toyota	45,761	54,936	57,553	62,091	34,141
Volkswagen	2,149	2,891	3,299	3,616	2,205
Total	167,878	161,791	177,556	185,016	112,672

Table 44. Average CO₂ emissions by manufacturer for the European Union and Australia in 2007

Manufacturer	Average vehicle CO ₂ emissions (g/km)		Difference
	European Union	Australia	
Daimler	243	233	-4%
Ford	207	255	23%
General Motors	181	276	52%
Renault	193	194	1%
Volkswagen	207	220	6%
Mazda	246	236	-4%
Mitsubishi	233	261	12%
Nissan	238	261	10%
Toyota	223	257	15%
Hyundai	227	240	6%
Average	203	258	27%

Table 45. Average CO₂ emissions by segment and fuel type

PETROL	Average vehicle CO ₂ emissions (g/km)				
	2005	2006	2007	2008	Jan-Aug 2009
Large	270	264	263	262	258
Light	160	159	159	158	159
Light buses	298	299	299	299	299
Medium	223	223	222	219	217
People movers	254	252	252	247	252
Pick-up 4x2	292	286	283	286	285
Pick-up 4x4	316	313	314	314	310
Small	192	191	189	187	186
Sports	254	241	233	231	224
SUV Compact	238	236	236	230	228
SUV Large	382	379	375	346	350
SUV Luxury	314	303	289	289	276
SUV Medium	310	301	292	286	280
Upper Large	297	291	296	303	295
Vans	243	246	245	246	243
DIESEL					
Large	211	209	210	192	187
Light	135	135	132	131	131
Light buses	246	241	243	243	243
Medium	172	174	175	179	178
People movers	244	235	222	222	226
Pick-up 4x2	240	247	229	229	228
Pick-up 4x4	257	252	247	247	246
Small	153	157	157	154	154
Sports	-	226	186	179	178
SUV Compact	251	245	216	202	206
SUV Large	303	306	296	285	285
SUV Luxury	263	259	255	249	242
SUV Medium	291	282	249	247	242
Trucks 2.5-3.5 GVM	281	278	275	267	267
Upper Large	-	220	220	222	219
Vans	233	222	226	225	222
LPG					
Large	249	255	245	243	242
Pick-up 4x2	248	255	245	252	260

Table 46. Sales by segment and fuel type

PETROL	2005	2006	2007	2008	Jan-Aug 2009
Large	161,270	126,843	130,601	110,280	60,341
Light	95,859	115,359	126,541	125,161	77,154
Light buses	917	1,335	1,313	1,457	648
Medium	84,186	83,161	82,438	74,303	39,233
People movers	14,944	14,304	14,854	11,056	5,812
Pick-up 4x2	72,799	55,168	50,507	46,564	26,232
Pick-up 4x4	11,311	9,928	8,369	6,344	3,381
Small	213,296	210,575	219,861	210,260	130,108
Sports	19,615	16,504	18,801	16,294	10,575
SUV Compact	73,133	75,576	89,779	81,703	49,184
SUV Large	4,793	3,115	2,817	2,201	796
SUV Luxury	11,790	10,873	10,338	7,577	5,018
SUV Medium	56,209	45,588	48,226	47,393	28,175
Upper Large	6,823	7,125	8,891	5,128	2,169
Vans	10,878	11,464	11,493	11,787	6,624
Trucks 2.5-3.5 GVM	261	13			
DIESEL					
Large	394	856	926	1,134	829
Light	31	727	1,350	1,439	570
Light buses	1,381	1,287	1,152	1,960	792
Medium	1,235	3,864	9,628	12,516	8,794
People movers	794	1,138	1,348	1,590	1,215
Pick-up 4x2	4,093	9,260	15,044	20,795	13,753
Pick-up 4x4	51,417	57,711	74,322	76,964	48,970
Small	4,717	8,783	12,527	18,203	11,305
Sports		122	648	917	520
SUV Compact	186	99	551	3,894	4,909
SUV Large	14,290	12,354	10,553	12,673	5,836
SUV Luxury	4,813	7,712	10,009	11,145	7,838
SUV Medium	15,078	15,773	26,208	28,092	18,237
Trucks 2.5-3.5 GVM	1,486	1,519	1,494	1,180	623
Upper Large		209	455	339	266
Vans	10,693	8,989	8,807	12,512	8,987
LPG					
Large	5,640	8,581	7,845	7,925	4,161
Pick-up 4x2	2,642	5,117	5,055	5,453	2,662
Total	956,974	931,032	1,012,751	976,239	585,717