



FACULTY OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND

CORPORATE GOVERNANCE

THE USE OF ECONOMIC INSTRUMENTS IN MANAGING THE ENVIRONMENTAL EXTERNALITIES OF ROAD TRANSPORT

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ABSTRACT

The transport sector is the third largest and second fastest growing source of greenhouse-gas (GHG) emissions in Australia. Unless the Australian government and consumers reverse this trend, CO₂ emissions will continue to rise and offset any gains made in reducing carbon emissions in other sectors. Further, ignoring the problem of carbon emissions from the transport sector will jeopardise Australia's efforts to meet its current and future international obligations to reduce the nation's GHG emissions, and will place a greater burden on other sectors to make greater cuts in emissions.

The Australian government has no regulatory or economic instruments, or any ambitious targets to encourage a transition to lower carbon vehicles. While other countries in the Organization for Economic Co-operation and Development (OECD) have set and legislated ambitious targets to reduce road-transport emissions, the Australian government is projecting future growth in emissions from this sector. This growth is due to the unrestricted importation of high-emitting vehicles, significant growth in consumers' preference for high-emitting SUVs, and a slow decline in consumers purchasing light and small vehicles.

The challenge for Australia is to reduce emissions from the road-transport sector, which is almost entirely dependent on fossil fuels. To reduce road-transport emissions will require the introduction of strong economic instruments and complementary instruments to encourage behavioural change in consumers so that they choose more fuel-efficient lower carbon emitting vehicles.

This thesis examines individual policy instruments and combinations of policy instruments that are required to encourage behavioural change in consumer car-purchasing trends to lower the average carbon emissions from new passenger and light commercial vehicles (new light vehicles). This thesis considers the effectiveness of economic-policy instruments that include a carbon price on the cost of fuel under an emissions-trading scheme and carbon tax; reforming fiscal taxes into fiscal environmental taxes; and using command and control regulatory instruments.

STATEMENT OF CANDIDATE

I certify that the work in this thesis entitled ‘The Use of Economic Instruments in Managing the Environmental Externalities of Road Transport’ has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me. Any help or assistance I have received in my research work and the preparation of the thesis itself has been appropriately acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

Anna Mortimore (41948394)

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LIST OF ABBREVIATIONS

AAA	Australian Automobile Association
ACEA	Association of European Car Manufacturers or European Automobile Manufacturers Association.
ACIL	American Council of Independent Laboratories
ACT	Australian Capital Territory
ADR	Australian Design Rules
AEST	Australian Eastern Standard Time
AfMA	Australian Fleet Managers' Association
AP2 Report	<i>A New Climate Change Strategy and Action Plan for the Australian Capital Territory</i>
ATC	Australian Transport Commission
BITRE	Bureau of Infrastructure, Transport and Regional Economic
CCT	Company Car Tax
CNG	Compressed natural gas
CO	Carbon monoxide
CO ₂	Carbon dioxide
COAG	Council of Australian Government
CPM	Carbon-pricing mechanism
CPRS	Carbon Pollution Reduction Scheme
DG-ENV	Directorate-General for Environment
DG-TAXUD	Directorate for Taxation and Customs Union
EC	European Commission
EEC	European Economic Community
EPHC	Environment Protection and Heritage Council
ERC	Energy Research Centre
ETS	Emission trading scheme
EU	European Union
FBT	Fringe Benefits Tax
FBTA	Fringe Benefits Tax Assessment
FBTAA	Fringe Benefits Tax Assessment Act
FCAI	Federal Chamber of Automotive Industries
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GHG	Greenhouse gas
GM	General Motors

GMH	General Motors Holden
GST	Goods and Services Tax
GSTA	Goods and Services Tax Act
GVDS	Green Vehicle Duty Scheme
GVG	Green Vehicle Guide
HC	Hydrocarbons
HMRC	HM Revenue & Customs
IEA	International Energy Agency
ITF	International Transport Forum
JAMA	Japan Automobile Manufacturers Association
KAMA	Korean Automobile Manufacturers Association
LCT	Luxury Car Tax
LCV	Light commercial vehicle
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MMR	Monitoring mechanism regulation
MSRP	Manufacturer's suggested retail price
MVI	Motor vehicle industry
MVP	Motor vehicle producers
NACE	National average carbon emissions
NAFC	National average fuel consumption
NO _x	Oxides of nitrogen
NSW	New South Wales
NTC	National Transport Commission
OECD	Organization for Economic Co-operation and Development
PM	Particulate matter
QLD	Queensland
RIS	Regulatory impact statement
SUVs	Sports Utility Vehicles
TES	Tax Expenditure Statement
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
VAT	Value Added Tax
VIC	Victoria
VKT	Vehicle kilometres travelled per year
WA	Western Australia

CHAPTER 1

INTRODUCTION

1.1 Background

Australia is responsible for more carbon emissions per person than any other developed country in the world.¹ The Australian Government ratified the Kyoto Protocol in December 2007, and is committed unconditionally to reduce its emissions to five per cent below 2000 levels by 2020 and up to 15 per cent (below 2000 levels) by 2020 if there is a global agreement.² In the long term, the Australian Government has also committed to cut emissions to 80 per cent below 2000 levels by 2050.³ Reducing the nation's emissions and meeting its international target in 2020 and future target in 2050 will require reductions in emissions across all sectors of the economy. The main driver of global warming is the burning of fossil fuels, and the transport sector's intensive use of fossil fuels makes it one of the main emitters of CO₂.⁴

The transport sector is Australia's third largest and second fastest growing source of greenhouse-gas (GHG) emissions, accounting for 16.3 per cent of the nation's emissions in 2012, and the road-transport sector is the largest sub-sector (85 per cent).⁵ The transport sector is the largest end user of energy in Australia, and road transport is the largest user of final energy, accounting for 74 per cent of the sector's liquid-fuel

¹ Australian Government, Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, *National Targets* (2011) <<http://www.climatechange.gov.au/climate-change/greenhouse-gas-measurement-and-reporting/australias-emissions-projections/national>>.

² Ibid.

³ Australian Government, Department of the Environment, *Australia's Emissions Reduction Targets* <<http://www.climatechange.gov.au/climate-change/greenhouse-gas-measurement-and-reporting/australias-emissions-projections/australias>> (accessed 5 November 2014).

⁴ Martin Achtnicht, 'German Car Buyers' Willingness to Pay to Reduce CO₂ Emissions' (2012) 113 *Climatic Change*, 679–697.

⁵ Australian Government, Department of the Environment, *Australian National Greenhouse Accounts National Inventory Report 2012* (The Australian Government Submission to the United Nations Framework Convention on Climate Change) vol 1, 1–351, 50, para 3.1.2. The transport sector recorded one of the strongest sources of emission growth, increasing by 49.7 per cent (23.7 Mt CO₂-e) in the period 1990–2012, an average of 1.8 per cent annually. Most of the growth from emissions in the same period was recorded from road transportation (44.7 per cent). In the same period, emissions from passenger vehicles increased by 28.1 per cent (9.6Mt CO₂-e).

consumption.⁶ Australia's demand for transport fuels continues to rise steadily, and in the year to March 2014, transport emissions increased to 17 per cent of Australia's national inventory.⁷

In 2012, the *Energy White Paper* forecast that road-transport activity will more than double by 2050.⁸ However in the 'Australia's Emissions Projections 2012' report, the Australian Government projected that emissions growth in road transport would be 24 per cent in the period 2000–2020, and subsequently slow to no growth in the period 2020–2030 because of a combination of ongoing vehicle-efficiency improvements due to 'substantial fuel substitution' from petrol to diesel and biodiesel,⁹ and the adoption of new technologies.¹⁰ Such new technology refers to hybrid vehicles and the emergence of electric road vehicles that will become more cost competitive with conventional internal-combustion-engine vehicles.¹¹ However, the above projections are qualified on the grounds that the gradual adoption of such vehicles will be a 'result of the time taken to turn over the existing vehicle fleet'¹² and 'success will depend on the ability of these technologies to meet consumer needs'.¹³ Further, the Australian Government claims that the transition to fuel efficiency and low-emission transport will occur from higher fuel prices and from the introduction of a regulatory instrument, namely mandatory CO₂-emission standards for light vehicles.¹⁴ However, the regulatory CO₂-emission

⁶ Australian Government Department of Resources, Energy and Tourism, Bureau of Resources and Energy Economics, *Energy in Australia May 2013* (2013) <<http://www.bree.gov.au/publications/energy-australia>> (accessed 20 October 2014). Demand for transport fuels increased almost 20 per cent in the period 2000–2012.⁶

⁷ Australian Government, Department of the Environment, *Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2014: Australia's National Greenhouse Accounts* (August 2014), 1–38, 11.

⁸ Australian Government, Department of Energy, Resources and Tourism, *Energy White Paper 2012: Australia's Energy Transformation*, 1–257, 35, para 3.3.8.

⁹ Australian Government, Department of Climate Change and Energy Efficiency, *Australia's Emissions Projections 2012* (2012) <<http://www.climatechange.gov.au/sites/climatechange/files/files/climate-change/projections/aep-summary.pdf>>.

¹⁰ Australian Government, Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, *Australia's Emissions Projections 2012* <<http://www.climatechange.gov.au/reducing-carbon/reducing-australias-emissions/australias-emissions-projections>> (accessed 2 February 2014).

¹¹ Ibid 12.

¹² Ibid 12.

¹³ Australian Government, *Energy White Paper 2012: Australia's Energy Transformation*, 1–257, 35, para 3.3.8.

¹⁴ Ibid.

standards for light vehicles proposed to apply from 2015 have not yet been announced.¹⁵

The Australian Government's earlier attempt to reduce road-transport emissions through carbon pricing through either a market mechanism or a carbon tax did not succeed. That is, the Australian Governments proposed in 2009 to introduce an environmental policy abatement measure known as a 'Carbon Pollution Reduction Scheme' (CPRS), which was a cap-and-trade system of emission trading that was to take effect 1 July 2010,¹⁶ but failed to receive political support. The legislation did not pass through the Parliament, and the Australian Government had no choice but to defer the introduction of the instrument in April 2010 to at least 2013.¹⁷

The proposed CPRS was to provide the broadest coverage,¹⁸ and would include the transport sector because the Australian Government stated that '[this sector represented] the second fastest growing category of emissions and excluding these emissions from the Scheme for an extended period [would] increase the costs of meeting Australia's climate change objectives of other sectors'.¹⁹

To replace the CPRS, a carbon-pricing mechanism (CPM), commonly referred to as a carbon tax, was introduced and came into effect 1 July 2012, under the Clean Energy Bill 2011.²⁰ Initially, the carbon tax was to apply to transport fuel, but the Multi-Party Climate Change Committee applied political pressure, refusing to support the clean-energy legislation unless the carbon price did not apply to transport fuels for light vehicles.²¹ Further, there were plans to apply a carbon tax on fuels for heavy on-road

¹⁵ Australian Government, Department of Infrastructure and Transport, *Light Vehicle CO₂ Emission Standards for Australia, Key Issues-Discussion Paper—2011*

<http://www.infrastructure.gov.au/roads/environment/co2_emissions/files/Light_Vehicle_CO2_Standards_Discussion_Paper.pdf> (accessed 5 November 2014).

¹⁶ The law for the proposed CPRS was governed by the Carbon Pollution Reduction Scheme Bill 2010 (Cth), the Carbon Pollution Reduction Scheme (Consequential Amendments) Bill 2010 (Cth) and the Australian Climate Change Regulatory Authority Bill 2010.

¹⁷ Australian Government, Parliament of Australia, *Carbon Pollution Reduction Scheme* <http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChange/Governance/Domestic/national/cprs> (accessed 30 October 2014).

¹⁸ Australian Government, *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future White Paper* (15 December 2008) ch 6, para 6-1.

¹⁹ *Ibid* ch 6, para 6-5.

²⁰ Australian Government, *Clean Energy Act 2011*.

²¹ Australian Government, *Securing a Clean Energy Future: The Australian Government's Climate Change Plan* (2011) 1–158, 49 <<http://www.acsi.asn.au/Files/Government-Carbon-Tax-Plan>> (30

vehicles from 1 July 2014;²² however, the Australian Government abolished the carbon tax, effective from 1 July 2014.²³

At present, Australia has no ambitious targets, nor any effective economic instruments to influence the car-purchasing trends to lower the amount of carbon-emitting vehicles. While other countries in the Organization for Economic Co-operation and Development (OECD) have set and/or legislated ambitious targets to reduce road emissions, the Australian Government continues to project a future growth in road-transport emissions. The United Kingdom (UK) legislated its 2050 target to cut CO₂-equivalent emissions to 80 per cent below 1990 levels by 2030.²⁴ To meet this 2030 target, 60 per cent of new cars in the UK will be required to run on electricity.²⁵

The only mechanism for informing consumers about new vehicles' CO₂ emissions and fuel efficiency is the Fuel Consumption Label displayed on new light vehicles for sale. This label indicates a new vehicle's fuel efficiency (litres per 100 km) and its CO₂ emissions (g/km), which is meant to 'encourage consumers to purchase vehicles with better fuel economy, and help reduce Australia's greenhouse gas emissions'.²⁶ The

October 2014). A Multi-Party Climate Change Committee member (Tony Windsor) expressed concern that the tax was not fair and equitable to rural consumers because fuel prices were higher in the country than in the city, and there were no available alternatives to reduce carbon emissions. The lack of political and public acceptance, and the regressive nature of the tax led the Multi-Party Climate Change Committee to exclude transport fuel for all users of light vehicles from the carbon tax.

²² BDO, *Carbon Overview—Transport Sector* (2011)

<http://www.bdo.com.au/__data/assets/pdf_file/0019/128620/Carbon-Tax-Update-Transport-Final.pdf>

(accessed 18 June 2014). Heavy road-transportation vehicles travelling on public roads with a gross vehicle mass of greater than 4.5 tonnes were to be subject to a carbon tax effective from 1 July 2014, with the exception of alternative fuels such as LPG, LNG and CNG. Such fuels would be subject to the Road User Charge, which removed the ability to claim fuel tax credits.

²³ Australian Government, Department of the Environment, *Repealing the Carbon Tax under the Clean Energy Legislation (Carbon Tax Repeal) Act 2014* <<http://www.environment.gov.au/climate-change/repealing-carbon-tax>> (accessed 4 November 2014).

²⁴ United Kingdom, UK Committee on Climate Change, *Meeting Carbon Budgets—The Need for a Step Change, Progress Report to Parliament* (2009)

<<http://archive.theccc.org.uk/aws2/21667%20CCC%20Report%20AW%20WEB.pdf>> (accessed September 2013).

²⁵ United Kingdom, UK Committee on Climate Change, Meeting Carbon Budgets UK Committee on Climate Change, *Meeting Carbon Budgets—3rd Progress Report to Parliament* (2011)

<http://www.theccc.org.uk/wp-content/uploads/2011/06/CCC-Progress-Report_Interactive_3.pdf> (accessed September 2013).

²⁶ Australian Government, *Green Vehicle Guide*

<<http://www.greenvehicleguide.gov.au/GVGPublicUI/home.aspx>>.

Australian Government provides further information on the new vehicles' 'green vehicle ratings' in its Green Vehicle Guide (GVG) website.²⁷

This thesis examines consumer purchasing trends and the uptake of low-carbon vehicles in Australia. King states that significant reductions in CO₂ emissions can be achieved through using technologies that are already available by making 'smart choices' as individuals.²⁸ Rogan et al found that improvements in technological efficiency and reductions in CO₂ emissions in new vehicles have been offset by the significant growth in car-purchasing trends for larger higher emission vehicles.²⁹ For example, despite lower carbon vehicles being available, the car-purchasing trend in Australia for the period 2010–2013 demonstrated that sales for higher carbon-emitting Sports Utility Vehicles (SUVs) increased by 41 per cent and sales of lower carbon-emitting light vehicles decreased by 5.4 per cent.³⁰ Australia's growing preference for SUVs is reflected in the nations average CO₂ emissions for new vehicles being 44 per cent higher than in the European Union (EU) in 2012 (Australia: 190 g/km compared to the EU: 132 g/km).³¹ Moreover, 39.5 per cent of UK car buyers acquired passenger vehicles in the lowest CO₂-emission band of 76–130 g/km compared to 6.7 per cent of Australian car buyers. In addition, 7.3 per cent of UK car buyers acquired passenger vehicles in the highest CO₂-emission band of over 200 g/km compared to 41.7 per cent of Australian car buyers.³²

The adoption of regulatory emission standards and effective economic instruments in the UK act as incentives or disincentives in influencing consumers to make a

²⁷ Ibid. The scheme attempts to encourage buyers of new light vehicles to choose low-emission vehicles by differentiating the vehicle-purchase tax/stamp duty on the basis of the new light vehicle's 'environmental performance' determined according to the vehicle's 'green vehicle rating' provided by the Australian Government in the *Green Vehicle Guide*.

²⁸ Julia King, *The King Review of Low Carbon Cars Part II: Recommendations for Action* (March 2008).

²⁹ Fionn Rogan et al, 'Impacts of an Emission Based Private Car Taxation Policy—First Year ex-post Analysis' (2011) 45 *Transportation Research Part A* 583–597, 587; Stephan Leinert et al, 'Co-benefits? Not Always: Quantifying the Negative Effect of a CO₂-reducing Car Taxation Policy on NO_x Emissions' (2013) *Energy Policy* 1151–1159, 1153.

³⁰ VFACTS, *National Report Vehicle Sales, Federal Chamber of Automotive Industries, December 2012, and 2013* <www.fcai.com.au/sales>; Australian Government, Department of Industry, Innovation, Science, Research and Tertiary Education, *Key Automotive Statistics, 2010 and 2011*, 21, Table 3.

³¹ Australian Government, National Transport Commission, *Carbon Dioxide Emissions from New Australian Vehicles 2013* (2014) <[http://www.ntc.gov.au/Media/Reports/\(6B1DD6CF-FB2C-B934-74A8-47971CB09050\).pdf](http://www.ntc.gov.au/Media/Reports/(6B1DD6CF-FB2C-B934-74A8-47971CB09050).pdf)> (19 October 2014).

³² Australian Government, National Transport Commission, *Carbon Dioxide Emissions from New Australian Vehicles 2013* (Information Paper May 2014).

behavioural change to lower carbon vehicles.³³ With no such policy instruments in Australia, the car-purchasing trends for the higher carbon SUVs will ‘continue to rise’.³⁴

King projected that it is possible to reduce CO₂ emissions per kilometre by approximately 50 per cent below 2000 levels by 2030, and to achieve complete decarbonisation of road transport by 2050.³⁵ This is a sizeable challenge given the road-transport sector is invariably deemed the most difficult and expensive sector in which to reduce GHG emissions.³⁶ Such a reduction will require overcoming great behavioural challenges, lifestyle changes, and changes in individual attitudes and perceptions towards the technological changes in new vehicles that are often overlooked by policy makers.³⁷ Consumers may oppose policy instruments that restrict their freedom of choice, which makes it challenging to achieve political and public acceptance because introducing economic instruments typically requires a Pigouvian tax, charge or fee to correct the distortion and change behaviour.³⁸

This chapter has introduced the background of the research topic and explained the research problem under investigation. The remainder of the chapter will be organised as follows: Section 1.2 Significance of the Research; Section 1.3 Research Question; Section 1.4 Research Design and Methodology; Section 1.5 Scope of the Thesis; Section 1.6 Thesis Structure.

³³ The Society of Motor Manufacturers and Traders Ltd, *New Car CO₂ Report 2014 13th Report* <http://www.smmmt.co.uk/wp-content/uploads/sites/2/SMMT-New-Car-CO2-Report-2014-final1.pdf> (accessed 1 November 2014). The UK sales-weighted average new-car CO₂ emissions fell to 128.3 g/km in 2013, which was a 3.6 per cent reduction from 2012 and a 29.1 per cent reduction from 2000. Since 2008, the market has averaged a 4.1 per cent annual reduction in CO₂ emissions. Consumers are more aware of vehicle efficiency through economic instruments such as the differentiated CO₂-based vehicle-taxation regime, enhanced marketing, and new-car fuel-efficiency label.

³⁴ Federal Chamber of Automotive Industries, *Motor Vehicle Sales Strong in July 2014* (5 August 2014) <<http://www.fcai.com.au/news/news/all/all/365/motor-vehicle-sales-strong-in-july-2014>> (accessed 1 November 2014): ‘Releasing the July 2014 VFACTS figures, FCAI Chief Executive Tony Weber said SUVs continue to rise in popularity, with sales up 12.7 percent on July 2013 figures; and year-to-date figures up 4.1 percent’.

³⁵ King, above n 28, 4.

³⁶ Ella Graham-Rowe et al, ‘Can We Reduce Car Use and, If So, How? A Review of Available Evidence’ (2011) 45 *Transportation Research Part A: Policy and Practice* 401–418.

³⁷ Jillian Anable et al, ‘Modelling Transport Energy Demand: A Socio-technical Approach’ (2012) 41 *Energy Policy* 125–138.

³⁸ Georgina Santos et al, ‘Part I: Externalities and Economic Policies in Road Transport’ (2010) 28 *Research in Transportation Economics* 2–45, 18.

1.2 Significance of the Research

The challenge for Australia is to reduce emissions from the road-transport sector given that this sector is entirely dependent on fossil fuels.³⁹ Unless the Australian Government reverses this trend by introducing effective policy instruments to reduce road-transport emissions significantly, Australia will find it difficult to meet its international obligation to reduce its GHG emissions.⁴⁰

Further, there is mounting evidence of the ‘key role that behaviour change can play in decarbonising the transport sector’.⁴¹ For example, if in 2013, all Australians had purchased a new vehicle with ‘best-in-class emissions, the national average of carbon emissions for new vehicles⁴² (192 g/km) would be 34 per cent lower (126 g/km)⁴³ and would be compatible with the average emissions of passenger cars in the EU (127 g/km).⁴⁴ Thus, consumer preference is an important factor affecting the national average for carbon emissions for new vehicles, which is in turn a measure of the country’s car-purchasing trends.

The significance of the research aims to determine the ideal policy instrument(s) to target Australian car-buying trends and influence the decision of the one million (or more) consumers⁴⁵ who acquire a new vehicle each year. Policy instruments are generally divided into economic and regulatory instruments. Environmental taxes,

³⁹ Graham-Rowe et al, above n 36.

⁴⁰ Australian Government, Department of the Environment, *Australian National Greenhouse Accounts Quarterly Update of Australia’s National Greenhouse Gas Inventory September Quarter 2013* <http://www.environment.gov.au/system/files/resources/e18788bd-2a8a-49d1-b797-307a9763c93f/files/quarterly-update-september-2013_1.pdf> (accessed 22 February 2014). This is evidenced in the National Greenhouse Gas Inventory data disaggregated by sector for the year to September 2012 and September 2013, demonstrating that transport emissions had increased by 2.0 per cent, offsetting the 5.5 per cent reduction in the electricity energy sector.

⁴¹ Anable et al, above n 37, 137.

⁴² Australian Government, National Transport Commission, above n 32, 31. The ‘new vehicles’ or ‘new light vehicles’ refer to new passenger vehicles and light commercial vehicles. Vehicles that are ‘light commercial vehicles’ are light trucks that include pick-up/chassis 4x2, pick-up/chassis 4x4 and van/control cab truck. Europe categorises vehicles separately into new passenger vehicles (which includes SUVs) from light commercial vehicles.

⁴³ Ibid 4.

⁴⁴ European Energy Agency, *New Cars Meet CO₂ Target Two Years Ahead of the Deadline* (2014) <<http://www.eea.europa.eu/highlights/new-cars-meet-co2-target>> (accessed 31 October 2014).

⁴⁵ Australian Government, National Transport Commission, above n 32, 60.

emissions trading and environmental subsidies have been classified as economic instruments.⁴⁶

Targeting car-buying trends is of great importance because each new vehicle will produce CO₂ emissions for an average of 10 years and could be on-road for up to 20 years.⁴⁷ When selecting the ideal policy instrument to influence consumers' choice of new vehicle, it is important to assess whether the policy instrument will target all buyer types or select buyer types. That is, each year, business buyers (45 per cent) and Government buyers (4.5 per cent) will acquire approximately 47 to 50 per cent of new light vehicles, and private buyers (50–53 per cent) acquire the remaining balance. The purchasing preferences of new light vehicles generated the following average CO₂ emissions in 2013: nationally the average carbon emissions were 192 g/km; private buyers had the lowest average emissions (186 g/km); followed by business buyers (198 g/km); then followed by Government buyers (210 g/km).⁴⁸

This distinction is relevant to understanding the sales trends of different buyer types. For example, business and Government buyers will generally turn over new vehicles within the three-year warranty period, representing a significant number of new vehicles being rolled over each year into the second-hand market. Consequently, the type of vehicle chosen by business and Government buyers determines the type of vehicle being sold into the second-hand market, which is an important source of vehicles for lower income earners. For most private buyers, buying a new vehicle is one of the largest purchase considerations they will make, and the average life span of the light vehicle chosen can be up to 20 years.⁴⁹ As such, the purchasing trends of the buyer types determine the type of new vehicle chosen, and the kinds of vehicles that will remain on Australians roads (particularly considering only approximately 4 per cent of the nation's fleet is retired each year).⁵⁰

⁴⁶ Kalle Maatta, *Environmental Taxes: An Introductory Analysis* (Edward Elgar, 2006) 1–101, 7.

⁴⁷ Australian Government, Australian Bureau of Statistics, 9309.0—*Motor Vehicle Census, Australia, 31 January 2014* (latest issue released 30 July 2014) <<http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0>> (accessed 30 October 2014); Australian Government, Climate Change Authority. “Light vehicle emission standards for Australia. Research Report”, June 2014: Chapter 2:23.

⁴⁸ Australian Government, National Transport Commission, above n 32, 1–66.

⁴⁹ Australian Government, Climate Change Authority, *Light Vehicle Emissions Standards for Australia, Research Report, June 2014*, ch 2, 23.

⁵⁰ Ibid.

In determining consumer preferences, this thesis will examine the factors that buyer types consider when selecting a new vehicle. The literature demonstrates that in the period March 2011 – March 2012, most Australian consumers considered the following factors when buying a new car: purchase cost, followed by fuel costs and other running costs,⁵¹ with environmental effect and carbon emissions being the factor that was *least* considered.⁵² However, Achtnicht highlights the correlation between fuel consumption and CO₂ emissions, stating that ‘decreasing the CO₂ emissions of a fossil fuel based vehicle automatically means a decrease in fuel consumption—and therefore fuel costs’.⁵³

In effect, this raises doubts about consumers’ awareness of the correlation between fuel efficiency and CO₂ emissions. One of the reasons for this lack of awareness could be that there is no policy instrument that requires consumers to bear the cost of choosing a higher carbon-emitting vehicle.⁵⁴ Another reason might be that the lack of information means consumers are uninformed about the environmental consequences of their actions and therefore are not prompted to behave in an environmentally sustainable manner.⁵⁵ However, Stern notes that peoples’ behaviour is shaped by their habits and customs and expectations of their society, which can be an obstacle in bringing about behavioural change, and people will not adjust their behaviour instantly in response to economic incentives, but will change over time.⁵⁶

It is clear that Australian consumers’ car-purchasing trends will not change to lower carbon-emitting vehicles for the purpose of reducing the negative externalities of CO₂ emissions through their choice of new vehicle when there are no policy instruments addressing barriers to behavioural change.

⁵¹ Australian Government, Australian Bureau of Statistics, *4102.0 Australian Social Trends, July 2013* <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features40July+2013#use>> (accessed 1 November 2014).

⁵² Ibid.

⁵³ Achtnicht, above n 4, 683.

⁵⁴ OECD, *Recommendation of the Council on Guiding Principles Concerning International Economic Aspects of Environmental Policies* C(72) 128 (ay 26, 1972). The ‘polluter pays principle’ is ‘the principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution’, cited in Janet E Milne and Mikael Skou Andersen (eds), *Handbook of Research on Environmental Taxation* (Edward Elgar, 2012).

⁵⁵ Georgina Santos, Hannah Behrendt and Alexander Teytelboym, ‘Part II: Policy Instruments for Sustainable Road Transport’ (2010) 28 *Research in Transportation Economics* 46–91, 76.

⁵⁶ Nicholas Stern, *Stern Review: The Economics of Climate Change: Report to the Prime Minister and Chancellor*, London: HM Treasury (2006) <http://hm-treasury.gov.uk/sternreview_index.htm>.

1.3 Research Questions

If Australia is to transition to low-carbon transport and reduce road-transport emissions, the significant growth in high-carbon-emitting vehicles and the slow uptake of low-carbon-emitting vehicles indicates a need for policy change. In 2014, the Australian Government recognised the need for policy measures to encourage change in attitudes and behaviour towards efficient fuel use and the uptake of technology to improve transport energy efficiency.⁵⁷

There are many types of policy instruments that can either be reformed or introduced to internalise most types of road-transport externalities.⁵⁸ The choice of instrument(s) depends on the externalities the Government wants to target.⁵⁹ For example, Potter et al (2006) found that to reduce road-transport emissions it was important to target the taxation measure that would have an effect.⁶⁰ This approach can also be adopted in this thesis when considering the following core research questions:

1. Can economic instruments influence consumers' purchasing trends for new vehicles that are fuel efficient and lower carbon emitting for the purpose of reducing road-transport emissions?
2. Will economic instruments need to be combined with complementary instruments to obtain the optimal goal of encouraging a behavioural change in the uptake of lower emission vehicles to deliver the emission targets and reduce road-transport emissions?

Policy instruments have traditionally been divided into two main groups: economic instruments and regulatory instruments.⁶¹ In the first research question, this thesis examines the economic instruments that may be effective in encouraging a behavioural change for consumers to choose vehicles that are fuel efficient and low carbon emitting.

⁵⁷ Australian Government, National Transport Commission, above n 32, 33.

⁵⁸ Santos et al, above n 38, 18.

⁵⁹ Ibid.

⁶⁰ Stephen Potter et al, 'Tax Treatment of Employer Commuting Support: An International Review' (2006) 26(2) *Transport Reviews*, 221–237.

⁶¹ Kallee Maatta (2006). 'Environmental Taxes' in Janet E Milne and Mikael S Andersen (eds), *Handbook of Research on Environmental Taxation* (Edward Elgar, 2006) 1–114, 6.

Economic instruments can adopt an incentive approach to achieve the optimal outcome in consumption and production in the presence of externalities.⁶² Pigou emphasises the concept of externalities, and states that the polluter should always bear the cost of externalities.⁶³ He introduced the idea of using taxes as a way to capture or internalise externalities,⁶⁴ for example, by adopting an environmental tax.⁶⁵ Coase challenged Pigou's theory, arguing that in some situations negotiated settlements between the polluter and the victim are preferable.⁶⁶ The challenge was to identify the optimal Pigouvian tax for the value of the externality that would influence decision making and a behavioural change. Baumol and Oates proposed that the Government should set the tax at a level that would achieve a target or standard and adjust the tax as necessary over time.⁶⁷

In road transport, there are many economic instruments in that can be researched. The ideal policy instrument will depend on the type of externality being targeted.⁶⁸ Environmental taxes, emissions trading and environmental subsidies have been classified as economic instruments.⁶⁹ Potter et al state that the aim is to 'target the measure to where it has impact'.⁷⁰

This thesis will consider the economic instruments that the Australian Government has proposed to reduce road-transport emissions, that is, carbon pricing the cost of fuel via a market-based emissions-trading mechanism.

⁶² Santos et al, above n 38, 18.

⁶³ Arthur C Pigou, *The Economics of Welfare* (Macmillan, 4th ed, 1932).

⁶⁴ Ibid.

⁶⁵ Janet E Milne and Mikael S Andersen, 'Introduction to Environmental Taxation Concepts and Research' in Janet E Milne and Mikael S Andersen (eds), *Handbook of Research on Environmental Taxation* (Edward Elgar, 2012) 15–32, 21. In 1997, the EU's Eurostat, European Commission's Tax Directorate (DG TAXUD), OECD, and the International Energy Agency defined the term 'environmental tax' and focused on the nature of the tax base—what was being taxed—rather than the environmental intent or effect of the tax. They defined an environmental tax as a 'tax whose tax base is a physical unit (or a proxy of something that has a proven specific negative effect on the environment'.

⁶⁶ Ronald H Coase, 'The Problem of Social Coast' (1960) 3 *Journal of Law and Economics*, 1–44.

⁶⁷ William J Baumol and Wallace E Oates, 'The Use of Standards and Prices for Protection of the Environment' (1971) 73(1) *Swedish Journal of Economics*, 42–54.

⁶⁸ Govinda Timilsina and Hari Dulal, 'Fiscal Policy Instruments for Reducing Congestion and Atmospheric Emissions in the Transport Sector: A Review' (Policy Research Working Paper No 4652, The World Bank, Development Research Group, Sustainable Rural and Urban Development Team, 2008).

⁶⁹ Kalle Maatta, *Environmental Taxes: An Introductory Analysis* (Edward Elgar, 2006) 1–101, 7.

⁷⁰ Potter et al, above n 59, 221–237.

Further, this thesis will examine the possibility of reforming existing fiscal taxes into fiscal environmental taxes that are economic instruments primarily aimed at generating revenue, but may have a significant positive effect on the environment.⁷¹ Santos et al (2010) state that such taxes will continue to generate revenue, but can be reformed into corrective taxes by correcting market failure.⁷² That is, the taxes can be reformed to correct distortions and change behaviour to restore efficiency by providing either incentives or disincentives for buyer behaviour through increasing the marginal costs of certain activities.⁷³ This thesis will limit its research to following existing fiscal tax instruments that can be reformed to target the purchasing trends of consumers towards lower carbon-emitting vehicles; such instruments are state and territory Governments' vehicle-purchase tax/stamp duty, and car benefits under the Fringe Benefits Tax (FBT) regime.⁷⁴

The second research question will examine whether economic instruments need to be combined with complementary measures to influence consumers' choice of new vehicle and avoid negative externalities arising from consumers choosing higher carbon-emitting vehicles. The complementary measures will consider 'command' and 'control' regulatory instruments to control the externalities of new light vehicles by setting regulatory emission standards through legislation that can be imposed on the sale of all new light vehicles sold in Australia, whether these are imported or manufactured in the country. The regulation will 'command' the CO₂ emission standards or target be met, and the 'control' refers to the penalties to be imposed for non-compliance. Both consumers and producers will be forced to change their behaviour to meet such standards or targets.⁷⁵ This thesis will consider any other additional complementary measures to arise from the research findings to be referred to in the key findings of the Conclusion.

⁷¹ Maatta, above n 60, 20.

⁷² Santos et al, above n 38, 18.

⁷³ Ibid.

⁷⁴ *Fringe Benefits Tax Assessment Act 1986* (Cth) div 2 'Car Benefits'.

⁷⁵ Santos et al, above n 38, 18.

1.4 Research Design and Methodology

The research questions relate to investigation of economic instruments, and can be classified as socio-legal research. ‘Socio-legal’ is a term that has proven difficult to define. However, it has been stated that the word ‘socio’ in ‘socio-legal’ refers to the interface with a context within which law exists.⁷⁶ This includes the sociological, economic and behavioural aspects of the policy instruments. Socio-legal research is difficult to position, such that it ‘could be anywhere on this continuum—from objectivity of positivism to the subjectivity of interpretism’.⁷⁷ It is a unique framework that requires a mixed methodology to be tailored to the aims and objectives of the research.⁷⁸ It requires a theoretical framework that is a combination of positivism and non-positivism. Positivism is relevant to doctrinal research in understanding the conceptual basis of the existing law, but social-legal research must extend to the understanding of people’s behaviour towards the law,⁷⁹ which requires a non-positivist framework.

The positivist framework is based on the assumption that ‘knowledge is created by deductive reasoning [...] a precise causal relationship, logical conclusions and the making of predictions’.⁸⁰ The review of economic instruments that are based on law requires a legal-positivism research framework that relies on ‘a distinctly deductive form of legal reasoning [...] and [relies on developing] arguments and provide reasoning that are based on the law’.⁸¹ That is, legal reasoning is often deductive because the general rules are provided through legislation. This entails ‘a detailed and highly technical commentary on, and systematic exposition of, the content of legal doctrine’.⁸²

⁷⁶ S Wheeler and PA Thomas, ‘Socio-Legal Studies’ in D Hayton (ed) *Law’s Futures* (Hart Publishing, 2000) 271.

⁷⁷ Margaret McKerchar, *Design and Conduct of Research in Tax, Law and Accounting* (Thomson Reuters, 2010) 83.

⁷⁸ Ibid 118.

⁷⁹ Margaret McKerchar, above n 75, 73.

⁸⁰ Ibid 72.

⁸¹ McKerchar, above n 75, 115.

⁸² Terry Hutchinson and Nigel Duncan, ‘Defining and Describing What We Do: Doctrinal Legal Research’ (2012) 17(1) *Deakin Law Review* 83, 110.

The Pearce Committee defined doctrinal research as ‘research which provides a systematic exposition of the rules governing a particular legal category, analyses the relationship between [the] rules, explains area of difficulty and, perhaps, predicts future developments’.⁸³ The doctrinal methodology employed in legal research has been described as a two-part process: ‘first it involves locating the source of the law and then interpreting and analysing the law [in an attempt] to determine an “objective reality” that is a statement of the law encapsulated in legislation’.⁸⁴ The knowledge about reality, is the ‘process of identifying, analysing, organising and synthesising statutes, judicial decisions and commentary as expected of doctrinal or black letter law’.⁸⁵

In the context of this thesis, the ‘objective reality’ of the taxation law examined in the car-benefit FBT regime⁸⁶ involves the application of the law to the particular context, that is, the transactions that arise from the operation of the car-benefit FBT regime. For example, tax concessions for a car that is provided to an employee (as part of their salary package) that is available for their private use. However, the doctrinal paradigm fails to consider the effect of the existing law on taxpayer behaviour and the negative externalities of CO₂ emissions caused from the adoption of such law. That is, the scope of the legal positivism of the policy instruments examined is typically narrow and any societal or environmental implications of the law cannot be examined.⁸⁷

The Pearce Committee categorised the research of Australian law as ‘encompassing doctrinal research and in addition, reform oriented and theoretical research’, which constitute two types of non-doctrinal research.⁸⁸ Reform-oriented research ‘fosters a more complete understanding of the conceptual bases of legal principles and of the combined effects of a range of rules and procedures that touch on a particular activity’.⁸⁹ Theoretical research ‘fosters a more complete understanding of the

⁸³ Dennis Pearce, Enid Campbell and Don Harding, *Australian Law Schools: A Discipline Assessment for the Commonwealth Tertiary Education Commission* (Australian Government Publishing Service, 1987).

⁸⁴ Hutchinson, above n 80, 37, 83, 110.

⁸⁵ McKerchar, above n 75, 73, referring to Pearce, above n 81, 309.

⁸⁶ In Chapter 6, this thesis examines the car-benefit FBT provisions under the *Fringe Benefits Tax Assessment Act 1986* (Cth) div 2.

⁸⁷ McKerchar, above n 75, 115.

⁸⁸ Pearce, above n 81, 309.

⁸⁹ Ibid.

conceptual bases of legal principles and of the combined effects of a range of rules and procedures that touch on a particular area of activity’.⁹⁰

Researching economic instruments to change people’s behaviour to move to using sustainable transport for the future⁹¹ includes the examination of many types of taxes involved in road transport and requires a positivism and non-positivism research framework. For example, this thesis examines the reform of economic instruments based on existing law; this requires a legal-positivism research framework that adopts doctrinal or ‘black letter law’ research⁹² to examine the pertinent law applicable to the research question. A non-positivist research framework will then enable understanding of the effect of black letter law on consumers’ behaviour and on the community and environment. It will determine whether the law providing incentives or disincentives on behaviour causes distortions that affect road-transport externalities. This may justify either introducing law reform or additional economic instruments (in an otherwise inefficient economy) to correct distortions and change behaviour to restore efficiency.⁹³

The non-positivist framework is analogous to interpretivism, but comes in many different forms⁹⁴ and is based on inductive reasoning that occurs where the theory is generated from the research, and is in contrast to deductive research.⁹⁵ The research in this thesis may unite some degree of abduction or new knowledge.⁹⁶ McKerchar explains abduction is the preparedness of the researcher to seek new explanations beyond the inferences of logic, reflecting elements of both deductive and inductive reasoning.⁹⁷ This thesis will employ deductive reasoning when considering the implementation of the economic and regulatory instruments to reduce road-transport emissions. However, the inductive reasoning may then indicate that such a policy objective is not achievable for all policy instruments being researched. A full explanation of the researcher’s view will be provided and may lead to abduction, or a

⁹⁰ Ibid.

⁹¹ Santos, above n 38, 18.

⁹² Pearce, above n 4, 309.

⁹³ Santos et al, above n 38, 18.

⁹⁴ McKerchar, above n 75, 74.

⁹⁵ Ibid 75, referring to A Bryman, ‘The End of the Paradigm Wars?’ in P Alasuutari P, L Bickman and J Brannen (eds), *The Sage Handbook of Social Research of Social Research Methods* (Sage, 2008) 694.

⁹⁶ McKerchar above n 75, 275, referring to J Reichertz, ‘Abduction: The Logic of Discovery of Grounded Theory’ in A Bryant and K Charmaz (eds), *The Sage Handbook of Grounded Theory* (Sage, 2007).

⁹⁷ McKerchar, above n 75, 75.

degree of new knowledge being created that has relevance to the thesis research question.

The non-doctrinal legal research methodology is not empirical or evidence-based, that is, stemming from ‘observing and/or measuring social phenomena’.⁹⁸ Generally, the approach to legal research is unique when compared to quantitative and qualitative research,⁹⁹ and encompasses a combination of methodologies, providing ‘varying emphasis of different components’,¹⁰⁰ including the reform-oriented and theoretical research as discussed above.

This research will include a critical comparative analysis of the literature on the economic instruments and the other measures, as well as case studies of countries that have distinctive similarities with Australia in areas such as the law and trends in consumer behaviour. This research will review and assess the performance of economic and regulatory instruments to determine whether the policy instrument could be effective in Australia given the differences between the respective countries in culture, consumer behaviour and Government. For example, a comparative analysis between countries may indicate that the successful adoption of carbon pricing on transport fuel in one country may not necessarily translate to the successful adoption of the same policy instrument in Australia.

This thesis will summarise, collate and review all existing research to create a literature review on the relevant economic instruments with the aim of determining ‘what is known and not known’ in this area of research.¹⁰¹ The primary research will involve ‘reading, analysing and linking’ the new information from the literature review to the research question.¹⁰²

The literature review will involve ‘a critical analysis of existing research, theoretical and empirical’,¹⁰³ and examine the quantitative and qualitative data available. A

⁹⁸ Margie Walter (ed), *Social Research Methods* (Oxford University Press, 2nd ed, 2010) 485.

⁹⁹ McKerchar, above n 75, 115.

¹⁰⁰ McKerchar, above n 75, 116.

¹⁰¹ Walter, above n 98, 485.

¹⁰² Terry Hutchinson, *Researching and Writing in Law* (Lawbook Co./Thompson Reuters, 3rd ed, 2010) 38.

¹⁰³ Walter, above n 98, 485.

secondary literature review is important to this research topic, and it will include commentary on the research area that is gathered from texts; journal articles; Australian and international government papers, including various published statistical reports, government law reform and commission reports; conference papers; online information; and newspaper reports.¹⁰⁴ The research will attempt to encompass the most recent publications. It is important to acknowledge that the law and policy instruments proposed by the Australian Government at the time of performing this research may not have been implemented subsequent to the publication of the research because of a failure to achieve political and or public acceptance.

The combination of the employment of positivist and non-positivist research paradigms, and the research methodologies adopted in the socio-legal research framework to address the research question will provide a convincing argument in the Conclusion of the thesis for policy reform and the introduction of economic and regulatory instruments to reduce road-transport emissions in Australia.

1.5 Scope of the Thesis

The scope of this thesis is to assess the effect of policy instruments appropriate to Australia's legal or political system, that target consumers' purchasing decisions to influence car-purchasing trends¹⁰⁵ towards lower carbon-emitting vehicles, and does not extend to environmental subsidies.

The scope of this thesis does not extend to reducing passenger travel, increasing use of public transport, examining the carbon content of transportation fuels, or analysing the external effects of improving traffic flow and operations such as through reducing accidents, congestion, local pollution and traffic noise.¹⁰⁶ Nor does the research extend to reducing vehicle weight, or analysing the size or performance of new light vehicles or the sustainability of oil supply for new light vehicles. Such investigation has already been executed through extensive research undertaken on designing a new economic instrument that assigns luxury energy tax points on the basis of a vehicle's weight,

¹⁰⁴ Hutchinson, above n 100, 22.

¹⁰⁵ Rogan et al, above n 29, 583–597.

¹⁰⁶ Lynette Cheah and John Heywood, 'Meeting US Passenger Vehicle Fuel Economy Standards in 2016 and Beyond' (2011) 39 *Energy Policy* 454–466.

engine capacity, engine power and CO₂ emissions at various taxing points (e.g. at the time of purchase, annual registration, fuelling and disposal) to change ‘motorist behaviour in the choice and usage of passenger motor vehicles.’¹⁰⁷

The comparative analysis of the economic instruments is limited to the Member States of the EU that have the similar purchasing trends and fiscal taxes to Australia.

The scope of the thesis is limited to the discussion on passenger vehicles, and light vehicles. The reference to passenger vehicles includes passenger motor vehicles and SUVs. The reference to light vehicles refers to passenger vehicles and to light commercial vehicles.

1.6 Thesis Structure

This thesis comprises seven chapters, including the Introduction (Chapter 1). Chapters 2 to 6 address the research question by applying the research methodology to investigate economic instruments and regulatory measures. The Conclusion (Chapter 7) discusses the key findings of the research, as well as the research limitations, the contribution of the research, and suggestions for future research.

Chapters 2 and 3 contain papers that have been published in international peer-reviewed book chapters. Chapter 2 has been published in the book titled: *Critical Issues in Environmental Taxation: International and Comparative Perspectives: Vol 8*. Chapter 3 has been published in the book titled: *Environment Taxation in China and Asia Pacific: achieving sustainability through fiscal policy*. Chapters 4 and 6 contain papers that have been published in the peer-reviewed journal: *Australian Tax Forum* and Chapter 5 has been accepted for publication in a peer-reviewed journal: *Australian Tax Forum*. Chapter 7 will present the conclusion to the Phd thesis.

¹⁰⁷ Prafula Pearce, ‘Using Tax and Regulatory Measures to Reform Choice and Usage of Motor Vehicles’ (Australian Tax Research Foundation Research Study No 48, 2013).

Chapter 2

The chapter presents a literature review of the Australian Government's proposal to introduce an economic instrument to reduce carbon emissions. The proposal was a cap-and-trade system of emission trading known as the Carbon Pollution Reduction Scheme (CPRS), which was to commence 1 July 2010.¹⁰⁸

At the time, the government's preference was to employ a market-based instrument (CPRS) to redress the market's failure to reduce carbon pollution, and limit greenhouse-gas (GHG) emissions by placing a cap on emissions and a price on carbon systematically throughout the economy.¹⁰⁹ The instrument (CPRS) was expected to deliver substantial reductions to GHG emissions by allowing the market, namely consumers and business, to decide the best manner in which to reduce their emissions based on their own preferences and costs.¹¹⁰

The proposed 'carbon price' under the instrument (CPRS) was to provide a financial incentive for investment in low-emission technology, development and commercialisation, and lead to behavioural changes in consumers that would support a lower carbon economy.¹¹¹

The proposed instrument (CPRS) was to have the broadest coverage,¹¹² and was intended to apply to the transport sector because the Australian Government stated that '[this sector represented] the second fastest growing category of emissions and excluding these emissions from the Scheme for an extended period [would] increase the costs of meeting Australia's climate change objectives of other sectors'.¹¹³ The carbon-pricing market mechanism assumes that an increase in fuel prices will reduce 'fuel-user' demand for fuel and encourage behavioural change such as selecting different

¹⁰⁸ Australian Government, *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future White Paper* (15 December 2008) ch 6, paras 6–5, executive summary xxv.

¹⁰⁹ Ibid 5-1.

¹¹⁰ Ibid ch 2, para 14.22.

¹¹¹ Ibid.

¹¹² Ibid 6-1.

¹¹³ Ibid ch 2 para 14.23.

vehicles¹¹⁴ because the ‘fuel user’ is an economically rational consumer in an efficient market.¹¹⁵

This chapter examines whether CPRS could influence car-purchasing trends and encourage consumers to acquire new fuel-efficient low-carbon-emitting vehicles when fuel-price increases can be inelastic and consumer loss aversion can lead to behavioural anomalies and market failure.

Chapter 3

This chapter considers whether command and control policies such as the regulatory emission standards are required to control the externalities in road transport caused by the high intensity of CO₂ emissions of new light vehicles. Further, this chapter considers whether the Australian Government has the ‘political will’ against strong lobby groups to enable it to introduce the CO₂-emissions target that is required to regulate the CO₂ emissions of new cars manufactured and imported into Australia.

This research will employ a comparative analysis between the ability of the European Commission and the European Parliament to introduce stringent regulatory emission standards in 2009 to reduce the European Union’s (EU’s) average CO₂ emissions for new light vehicles and the Australian Government’s inability to regulate and introduce internationally compatible emission standards.

Chapter 4

An extensive literature review and secondary literature review was undertaken to examine the progress of the European Union (EU) Member States in meeting the regulatory emission standards mandated by the European Parliament in 2009. This chapter examines how the European Commission encouraged Member States to accelerate the uptake of low-carbon technology by reforming existing vehicle taxes to

¹¹⁴ Ibid 6-10.

¹¹⁵ David L Greene, John German and Mark A Delucchi, *Fuel Economy: The Case for Market Failure* (Springer Science, 2009) ch 11. Greene, German and Delucchi found that ‘persistently higher fuel prices in Europe did not lead to noticeably greater adoption of fuel economy technologies in gasoline vehicles is consistent with the uncertainty/loss aversion model of consumers’ fuel economy decision making’ 201.

‘carbon differentiated vehicle tax’. This research examines the assertion by the European Commission that ‘car taxation’ is a powerful instrument to influence the purchasing decisions of consumers.¹¹⁶ This research assesses whether the economic instrument is effective in influencing car-purchasing trends by encouraging a shift to consumers choosing low-emission vehicles.

This research includes a case study of Ireland because of its similarities to Australia in addressing consumers’ growing preference for higher carbon-emitting larger cars, the decline in its consumers choosing smaller cars, and the significant growth of its carbon emissions in the transport sector.¹¹⁷ This case study reviews whether the reform of Ireland’s vehicle taxes from engine size to differentiated rates of tax based on CO₂ emissions was effective in meeting the country’s ambitious targets to reduce its GHG emissions significantly. Further, this research examines whether additional economic instruments and complementary measures were introduced to meet the stringent targets and the regulatory emission standards for the EU.

Chapter 5

This chapter revisits the Council of Australian Governments’ (COAG) recommendation to the Henry Tax Review in 2008 on reforming the vehicle-purchase tax/stamp duty on the basis of the vehicles’ ‘environmental performance’ determined by the ‘green vehicle ratings’ provided in the Commonwealth’s Green Vehicle Guide (GVG) Stage 2. The Australian Capital Territory (ACT) Government adopted the reform in 2008. It was termed the Green Vehicle Duty Scheme (GVDS), and was promoted by COAG as ‘one model of this approach’¹¹⁸ that could be adopted by the other state and territory

¹¹⁶ European Commission, *Communications from the Commission to the Council and the European Parliament: Results of the Review of the Community Strategy to Reduce CO₂ Emissions from Passenger Cars and Light-Commercial Vehicles* (SEC, Brussels, February 2007).

¹¹⁷ Brian Ó Gallachoir, Martin Howley and Morgan Bazilian, ‘How Private Car Purchasing Trends Offset Efficiency Gains and the Successful Energy Policy Response’ (2009) 37 *Energy Policy* 3790. The growth of emissions in the transport sector outstripped emissions growth in other sectors. Emissions growth varied across the years: 11.4 per cent per-annum growth in the period 1995–2000, compared to the annual growth of 3.3 per cent between 1990 and 1995. In 2006, the transport sector was the only sector exhibiting significant growth in energy-related CO₂ emissions. If there had been no growth in the transport sector, there would have been an overall reduction in energy-related CO₂ emissions of 2.8 per cent, 3791.

¹¹⁸ *Ibid* ch 5, 10.

governments. The ACT Government continues to be the only jurisdiction in Australia to have reformed its vehicle-purchase tax/stamp duty.

This research will assess whether the ACT's fiscal environmental tax (GVDS) is an effective economic instrument in shifting consumers purchasing trends to lower carbon-emitting vehicles, and reducing the average carbon emissions from new light vehicles acquired in the ACT. The research methodology for this chapter will be doctrinal and non-doctrinal. The doctrinal research will examine vehicle-purchase tax/stamp duty (the ACT's GVDS) before and after the reform of the economic instrument.

The non-doctrinal research will examine whether the economic instrument (GVDS) meets the features of good policy design, and provides a strong price signal that will influence a behavioural change in car-purchasing trends by encouraging consumers to choose lower carbon-emitting vehicles. The review will include an extensive comparative analysis of the price signal between the ACT's economic instrument (GVDS) and the economic instrument (vehicle-purchase tax/stamp duty) adopted by other state and territory governments, as well as offering a comparison to the case study of Ireland presented in Chapter 4.

The effectiveness of the economic instrument (GVDS) in reducing the average CO₂ emissions of new vehicles acquired in the ACT cannot be assessed against any benchmark or target under regulatory emission standards because such standards do not exist. Instead, the research will prepare a comparative analysis of the purchasing trends of buyers in the ACT, and assess whether the new vehicles bought by different buyer groups (i.e. private, business and government) have reduced the average CO₂ emissions of new vehicles in the ACT compared to the other state and territory governments.

In addition, a comparative analysis will assess the effectiveness of the ACT's economic instrument (GVDS) to Ireland's vehicle-purchase tax by assessing the movement in new-car-purchasing trends from high-carbon-emitting vehicles to lower carbon-emitting vehicles before and after the reform of the economic instruments.

This research will also consider possible political and public resistance, barriers and challenges in reforming existing fiscal taxes into fiscal environmental taxes by

undertaking a literature review and a secondary literature review to determine whether such challenges can be addressed.

Chapter 6

This chapter considers reforming the economic instrument (Fringe Benefits Tax [FBT] regime) under which the car-benefit tax concession operates according to the *Fringe Benefits Tax Assessment Act 1986* (Cth), a fiscal tax into a fiscal environmental tax. This economic instrument was chosen because the reform of the instrument on 10 May 2011 to remove the incentive for people driving excess kilometres to reduce tax liability under the statutory formula method by adopting a single statutory rate of 20 per cent, regardless of the kilometres travelled, is unlikely to cut road CO₂ emissions significantly. The reform fails to address other behavioural effects that are harmful to the environment. That is, the FBT regime increases the total number of vehicles acquired and distorts employees' choice of vehicle towards larger higher carbon-emitting vehicles.¹¹⁹ The effect of this perverse subsidy is significant given that over 50 per cent of new light vehicles acquired by government and business buyers are mostly under the car-benefit FBT regime. This is a significant number of new light vehicles that are generally rolled over into the second-hand car yard towards the end of the three-year warranty period. In effect, this subsidy is filling up Australia's second-hand car yards with higher carbon-emitting vehicles, which makes it difficult for lower income earners to acquire fuel-efficient low-carbon-emitting vehicles.

An extensive literature review and secondary literature review will critically analyse the existing research, and assess the cost of the perverse subsidy to the community and the environment. A case study comparing the United Kingdom's (UK's) company-car tax reform to Australia's FBT regime will demonstrate the effect of reforming the economic instrument on the basis of CO₂ emissions. The case study demonstrates that before its reform in 2002, the UK's company-car tax regime was similar to Australia's car-benefit FBT regime. This research will prepare a comparative analysis by applying the UK reform to the Australian context, and demonstrating the effect the instrument will have

¹¹⁹ European Commission, *EU Study on Company Car Taxation* (Copenhagen Economics, 2009) <http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf> (accessed 6 November 2014).

through providing a strong price signal, and discouraging the acquisition of higher carbon-emitting vehicles. This chapter considers the effect of the proposed reforms on a powerful lobby group, namely the local car industry, and the implications of this on political acceptance of the instrument.

Chapter 7

The Conclusion Chapter provides the key findings of the research, as well as identifies the limitations and contributions of the research, and provides suggestions for future research.

CHAPTER 2

MANAGING TRANSPORT EMISSIONS THROUGH TAXES AND TRADABLE PERMITS—A COMPARATIVE ANALYSIS EVALUATING THE MECHANISMS IN AUSTRALIA’S CARBON POLLUTION REDUCTION SCHEME

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*Anna Mortimore**

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I. Introduction

Transport is a challenging sector for the Australian government as it is one of the strongest sources of emissions growth and has the lowest rate of abatement of greenhouse gas emissions. The sector is projected to contribute 14.3 per cent of Australia's total net CO₂ emissions or 88 MtCO₂ of the 599 MtCO₂ emissions per annum with an abatement of only 1.8 MtCO₂ per annum over the Kyoto period. **14.01**

The Carbon Pollution Reduction Scheme (CPRS) will be Australia's primary mechanism for reducing greenhouse gas emissions in all sectors and is due to commence on 1 July 2011. The CPRS is expected to redress market failure in not factoring the cost of greenhouse gas emissions into the price of goods and services, by employing a 'cap-and-trade' emission trading scheme (ETS) to limit greenhouse gas emissions. **14.02**

For road transport, there are three main options on who may regulate the CPRS: (1) fuel producers; (2) car manufacturers; and (3) individual motorists and hauliers. Australia's CPRS will be applied to fuel producers on the basis of fuel sales, increasing fuel prices and providing the necessary price signals to encourage the acquisition of the most fuel-efficient vehicles and technology for fuel-efficient vehicles. In contrast, the European Union (EU) believes that regulating motor vehicle efficiency standards is more efficient in improving fuel efficiencies and technological advancement. **14.03**

The impact of the CPRS will not, however, be felt by the transport sector for the first three years, because of the uncertainty of its impact on business, international competitiveness, motorists and heavy on-road transport businesses. The scheme will thus be applied to fuel suppliers, but motorists will be protected from its impact on fuel prices through a 'cent-for-cent' reduction in fuel excise taxes, which are currently the third lowest in the Organization for Economic Co-operation and Development **14.04**

(OECD). The Australian government has given motorists a moratorium of three years to plan for higher fuel prices and change their vehicles to more fuel-efficient ones. This moratorium includes a new perverse ‘CPRS fuel credit’ subsidy for heavy on-road transport businesses at a cost to the environment. At the end of the three years, the fuel tax rate will stay at the level reached and the government will review the adjustment mechanism.

This chapter compares the effectiveness of the EU regulatory model with the Australian CPRS in the road transport sector. It critically evaluates the challenges of applying a CPRS to the road transport sector, and considers if the CPRS can be a ‘one fit all’ fiscal measure applicable to all sectors. The study will assess which measure is likely to more significantly reduce carbon emission for road vehicles. **14.05**

II. Challenge of Reducing Transport Emissions

Transport emissions are the fastest growing pollutant in the OECD countries and the second fastest growing pollutant in the non-OECD countries, having increased by 25 per cent and 36 per cent respectively between 1990 and 2002.¹ Not only is transport one of the fastest growing sectors contributing to climate change, but the International Energy Agency claims that it will be one of the last sectors to reduce greenhouse gas emissions (GHG) below current levels.² Transport is one of the more expensive sectors for emission reduction because low carbon technologies are only just developing and tend to be expensive. Furthermore, the welfare costs for reducing travel demand is high.³ **14.06**

Globally, transport accounts for 14 per cent of GHG emissions, with 76 per cent of these emissions from road transport.⁴ In Australia, transport is **14.07**

¹ UK Treasury, *Stern Review on the Economics of Climate Change*, Annex 7c ‘Emissions from the Transport Sector’ <http://www.hm-treasury.gov.uk/d/Transport_annex.pdf> (accessed 1 March 2010).

² International Energy Agency, *Energy Technology Perspectives: Scenarios and Strategies to 2050* (Paris: IEA, 2006).

³ Ibid.

⁴ N 1 above.

the largest source of emissions growth, accounting for 14 per cent (79.1 million tonnes) of Australia's total GHG in 2006, increasing by 27 per cent (17.0 million tonnes) above 1990 levels. Road emissions were the main source of transport emissions in 2006, accounting for 12.1 per cent (69.9 million tonnes) of national emissions, increasing by 26.7 per cent (14.5 million tonnes CO₂-e) between 1990 and 2006.⁵ This represents a 21 per cent (7.4 million tonnes CO₂-e) increase of 1990 levels.

In the EU road transport emissions accounted for 20 per cent of total greenhouse emissions across EU-15 in 2004, and are projected to increase by 27 per cent of 1990 levels, by 2010.⁶ **14.08**

Growth of Road Emissions

Globally the increasing total stock of cars is the key driver of emissions, with global ownership levels rising threefold from 669.3 million vehicles in 2000 to 2029.9 million in 2050.⁷ The number of vehicles fuelled by petrol reduced from 87 per cent to 68 per cent and diesel vehicles increased by 12 per cent to 26 per cent; hybrid petrol vehicles increased by only 0.1 per cent to 4 per cent, indicating a slow shift to low-carbon technology.⁸ The OECD considers road transportation as the most environmentally harmful method of transportation in absolute terms and one of the worst in relative terms, as it is responsible for more GHG emissions than any other mode.⁹ OECD findings indicate: **14.09**

The average passenger vehicle produces more GHG emissions

⁵ National Greenhouse Inventory (Canberra: Department of Climate Change and Energy Efficiency, 2006).

⁶ UK Department of Transport, 'Road Transport and the EU Emissions Trading Scheme', <<http://www.dft.gov.uk/pgr/sustainable/climatechange/euemistrascheme?page=1>> (accessed 27 July 2009).

⁷ Kurt van Dender and Philippe Crist, *Policy Instruments To limit Negative Environmental Impacts from Increased International Transport An Economic Perspective*, OECD and Joint Transport Research Centre Discussion Paper No 2009, 9 May 2009, available at <<http://www.dft.gov.uk/pgr/sustainable/climatechange/euemistrascheme?page=1#a1001>> (accessed 10 July 2009) at 7.

⁸ Ibid.

⁹ OECD, *Environmentally Harmful Subsidies in Transport Sector* (OECD: Environment Policy Committee 2008), para 223 (hereinafter 'Harmful Subsidies').

and more pollutants, per passenger-km, than any other form of transport. Poor environmental performance per vehicle combined with huge number of passenger vehicles world-wide means that the largest portion of GHG emissions and air pollution problems caused by the transportation sector are attributable to personal vehicles.¹⁰

The growth of road emissions is determined by the amount of vehicle kilometres travelled per year (VKT) and by the vehicle type, engine size, engine efficiency and vehicle stock.¹¹ Emissions vary between vehicles. Naturally, larger heavier vehicles need more powerful engines and hence more fuel for the same distances travelled. And since most vehicles use petrol or diesel, they are the largest contributors to global warming.¹² **14.10**

To lower CO₂ emissions, road transport needs to use less oil, as there is a direct link between improved fuel efficiency and lower CO₂ emissions.¹³ However, as noted in the Stern Review¹⁴ the social cost of changing people's attitude and habits in the way they choose and use their vehicles will be challenging. Transport is a derived demand in that it is not demanded for its own sake but for what it enables such as personal travel. To exacerbate the problem the more affluent people become, the more likely they will choose to travel in more carbon-intensive modes of transport.¹⁵ **14.11**

(a) Reliance on road transport

Australia's population is widely dispersed and private motor vehicles are the primary mode of transport. High rates of urbanization, low density **14.12**

¹⁰ Ibid, para [228].

¹¹ *Transport Sector Greenhouse Gas Emissions Projections* (Canberra: Department of Climate Change and Energy Efficiency, 2007) at 8.

¹² Harmful Subsidies (n 9 above) at paras 224–30.

¹³ European Commission, 'Reducing CO₂ emissions from light-duty vehicles' cited at <http://ec.europa.eu/environment/air/transport/co2/co2_home.htm>.

¹⁴ N 1 above.

¹⁵ Ibid n 1.

cities and high population density within 50 km of the coast, emphasizes the economic and social significance of transport.¹⁶ For urban commuters, private vehicles offer flexibility and convenience, and this is reflected in the transport trends. In 2003, 75 per cent of people use motor vehicles to travel to work or study; 12 per cent use public transport to travel to work or study; and 5 per cent of people were able to walk or cycle to work because they lived in close proximity to work or study.¹⁷ This trend prevailed since 2000. In Europe, cars are also an important part of everyday lives, providing essential mobility for European society and the economy.¹⁸ In 2005, road transport accounted for 86 per cent of passenger transport.¹⁹

(b) Number of vehicles per resident

Australian's high reliance on motor vehicles is reflected in the number of registered motor vehicles in Australia, which is one of the highest in the world. The number of vehicles per 1,000 residents increased from 663 to 705 between 2003 and 2007.²⁰ **14.13**

In the EU-25, the number of cars per 1,000 residents was 469 in 2004, increasing by 32 per cent from 1990 levels at 355 per 1,000 residents.²¹ **14.14**

¹⁶ *Yearbook Australia 2003* (Canberra: Australian Bureau of Statistics, 2003), available at <www.abs.gov.au/ausstats/ABS@nsf/Previousproducts/1301.0Feature%20Article> (accessed on 1 March 2010).

¹⁷ 'Survey of Motor Vehicle Use, Australia 12 months ended 31 October 2007', Australian Bureau of Statistics, No 9208, available at <www.abs.gov.au/Ausstats/abs@nsf/mf/9208.0/> (accessed 1 March 2010) at 3.

¹⁸ European Commission, *Results of the Review of the Community Strategy to Reduce CO₂ Emissions from Passenger Cars and Light-Commercial Vehicles: Impact Assessment*, Commission Staff Working Document SEC (2007) 60 (Brussels, 2007).

¹⁹ *Ibid.*

²⁰ *Review of Australia's Automotive Industry 2008 – Final Report* 22 July 2008, Chapter 8 p 59, available at <http://www.innovation.gov.au/automotivereview/Documents/aug08%20final%20report_secure.pdf> (accessed 1 March 2010).

²¹ European Commission, *Statement by the Commission (Accompany the Adoption of a Regulation on CO₂/Cars)* <<http://ec.europa.eu/environment/air/transport/co2/pdf/statement.pdf>> (accessed 12 July 2009).

(c) Australia's transport per capita of greenhouse gas emissions

With such high vehicle ownership, Australia's transport per capita GHG **14.15** is the fourth highest in any OECD country and the seventh highest in the world.²² Its per capita GHG emissions due to transport in 2005 was 30 per cent higher than the OECD average and nearly four times the world average.²³

III. Carbon Pollution Reduction Targets

The International Panel of Climate Change Report shows that developed **14.16** countries need to cut their emissions collectively to 25–40 per cent below 1990 levels by 2020 and by 80–95 per cent by 2050.²⁴ Otherwise the 2-degree threshold 'may be crossed as early as 2050'.²⁵

The Australian government released a White Paper entitled Carbon **14.17** Pollution Reduction Scheme: Australia's Low Pollution Future on 15 December 2008, outlining the government's comprehensive strategy for introducing an emission trading system, and its commitment to a long-term target of 60 per cent reduction in greenhouse gas emissions from 2000 levels by 2050.²⁶ The medium-term national target is to reduce Australia's greenhouse GHG by between 5 per cent²⁷ and 15 per cent below 2000 levels by the end of 2020.²⁸ On a per capita basis, this target translates into a 34–41 per cent reduction in per capita emissions for every Australian.²⁹

²² Ross Garnaut, *The Garnaut Climate Change Review* (New York: Cambridge University Press, 2008), ch 7 ('Australia's Emissions in a Global Context') at 153–72.

²³ Ibid.

²⁴ European Commission, 'Action Against Climate Change by the European Commission, Leading Global Action to 2020 and Beyond' available at <<http://europa.eu>> (accessed on 15 October 2009) at 7.

²⁵ Ibid.

²⁶ Government of Australia, White Paper, *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future*, 2008, vol 1 ch 5 'A Framework for the Carbon Pollution Reduction Scheme' at 5–1 (hereinafter 'white paper').

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid at 5–3.

The EU has committed to a target of reducing emissions by 20 per cent in aggregate by 2020 compared with 1990 emissions, or 30 per cent in the context of strong commitments by other developed countries.³⁰ On a per capita basis, this target range translates into a 24–34 per cent reduction in emission for each European country. **14.18**

IV. Australia's Carbon Pollution Reduction Scheme

The introduction of the CPRS, proposed to commence on 1 July 2011, will be Australia's response to achieving its carbon pollution reduction target, and making substantial reductions in GHG emissions.³¹ The expectation is that the CPRS will redress market failure of reducing carbon pollution and limit greenhouse gas emissions by placing a cap on emissions and a price on carbon in a systemic way throughout the economy commonly referred to as a 'cap-and-trade' emissions trading mechanism.³² **14.19**

The cap will set a limit on the aggregate amount of emissions allowed each year, making the right to emit scarce, and this scarcity result in a price to emit carbon pollution. This is referred to as the carbon price or the permit price.³³ The market will determine the carbon pollution permit price, on which the Australian government will set a cap for five years at \$40 per tonne at the scheme's commencement in 2011.³⁴ The government has based the household assistance package on an assumed initial \$25 permit price, which is in line with Treasury modelling of the Government's unconditional interim target in 2020,³⁵ as discussed in **14.20**

³⁰ Ibid. p 3–2 This is based on a the population of the EU which is projected to be relatively stable over the 1990–2020 period.

³¹ The 'Carbon Pollution Reduction Scheme Bill 2009 was introduced into Parliament on 14 May 2009.

³² White paper (n 26 above).

³³ Ibid at para 5.2.

³⁴ Ibid, vol 2, ch 17 'Household Assistance Measures' at para 17–12.

³⁵ Ibid.

section IV. It is projected that the scheme will only affect 1,000 entities, covering a projected 75 per cent of Australia's emissions.³⁶

Businesses are free to emit as much as they want, provided they surrender **14.21**
an eligible compliance permit for every tonne of GHG they produce that
year. However, with the limited number of permits issued by the
government each year, businesses will need to compete to purchase the
number of permits they require, and businesses that value the permits
most will pay the market price or more either at auction or in the
secondary market.³⁷ Alternatively some businesses may find it more cost-
effective to reduce their exposure to the carbon liability by shifting their
exposure in a high-emission technology to a low-emission technology and
changing the way goods are produced.

The government prefers the market-based CPRS method of delivering **14.22**
substantial GHG emissions reduction to having to decide how each
economic sector should reduce its emissions, either through imposing
regulation or carbon taxes. The CPRS allows the market—namely the
consumers and businesses—to decide on the best way to reduce their
emissions based on their own preferences and costs. However, is the
CPRS an effective policy mechanism in reducing GHG emissions from
the road transport sector?

V. Carbon Pollution Reduction Scheme and the Road Transport Sector

The Australian government includes the transport emissions in the CPRS **14.23**
because they '... are the second fastest growing category of emissions and
excluding these emissions from the Scheme for an extended period will
increase the costs of meeting Australia's climate change objectives for
other sectors'.³⁸

³⁶ Ibid, vol 1 'Executive Summary'.

³⁷ Ibid.

³⁸ White paper (n 26 above) vol 1 ch 6 'Coverage' at 6–9.

The white paper considered the following options for including road transport in a CPRS: **14.24**

- fuel producers;
- car manufacturers;
- individual motorists and hauliers.

1. Option 1: Fuel Producers

Applying a carbon price to fuel suppliers—upstream suppliers like petroleum refiners and importers—would be administratively simple since transport fuels are subject to tax in Australia and in the EU. As such, a carbon price can be applied to the CO₂ emissions applicable to each type of fuel on which duty has been paid. **14.25**

The upstream suppliers of liquid fuels can respond by either switching to fuels with lower CO₂ emissions or buying carbon permits and passing on the carbon price to motorists by increasing fuel prices.³⁹ The motorists and hauliers will then have to decide whether to drive less or change to a more fuel-efficient vehicle or use other alternative modes of transport. **14.26**

Administratively, this is the most efficient option because the CPRS can be simultaneously integrated with and applied to the existing fuel tax system by imposing a tax upstream on all fuels entering the Australian market.⁴⁰ Compliance costs can be minimized as it applies to fewer entities. Namely the scheme applies to fuel suppliers and not to fuel retailers, where their fuel tax data can be reported to the scheme **14.27**

³⁹ Department for Transport, 'Road Transport and the EU Emissions Trading Scheme' cited at <<http://www.dft.gov.uk/print/pgt/sustainable/climatechange/euemistrascheme>> (accessed 1 March 2010) at 20.

⁴⁰ White paper (n 26 above) vol 1 ch 6 'Coverage' at 6.16. See also the Australian Institute of Petroleum Submission, No 673, at 5.

regulator.⁴¹ The permits will be determined on the same basis as calculating excise taxes, namely on total volume of fuel sold.

2. Option 2: Vehicle Manufacturers

It would be difficult to apply CPRS to vehicle manufacturers, as the carbon price would have to be determined based on the new vehicle's expected lifetime of emissions, which could be calculated by multiplying the tailpipe g CO₂/km by a notional lifetime km driven (such as 100,000km).⁴² At the time of sale, the manufacturers would have to surrender sufficient pollution permits to cover vehicles lifetime of CO₂ emissions.⁴³ The manufacturers have the choice of either reducing the CO₂ emissions of their vehicles and lowering the cost of the vehicle, or passing on the cost of the carbon price to the consumer. The consumer would then make the choice of whether to buy this vehicle, or choose a more fuel-efficient vehicle. Applying the CPRS to manufactured vehicles would achieve the intended objective of influencing manufacturers and consumers in choosing more fuel-efficient vehicles, except the calculation of the carbon price is controversial given that it is based on estimated future emissions rather than actual emissions as in fuel producer's option discussed above. **14.28**

3. Option 3: Motorists

The carbon price can be added to the cost of road fuel by fuel producers, but it is individual motorists and hauliers who have to surrender sufficient carbon permits each time they refuel. Just like in the first option, motorists and hauliers would decide whether they would drive less, take more care over fuel consumption while driving or buy a more fuel-efficient vehicle.⁴⁴ Unfortunately, this option is impractical and entails **14.29**

⁴¹ Ibid, vol 1 ch 6, 'Coverage' at 6.17.

⁴² Ibid at 6.25.

⁴³ Ibid.

⁴⁴ Ibid at 6.33.

high administrative and transaction costs since it involves a large number of individuals with relatively small volumes of emissions.⁴⁵

VI. Australia Applies Carbon Pollution Reduction Scheme to Fuel Producers

Australia will adopt the first option, where the emission permit obligations from domestic combustion of petroleum products will be imposed on upstream suppliers of liquid fuels.⁴⁶ The government believes that the scheme obligations must apply directly to the emitters to provide the incentive for these entities to undertake abatement, except that not all upstream petroleum products will be used by end users, and will not result in direct emissions of GHG into the atmosphere.⁴⁷ **14.30**

Therefore the scheme obligations will only apply to large fuel users rather than large emitters, because some large emitters may only use small or moderate amounts of fuel for their industrial process, and it is not practical or cost effective for upstream suppliers to net out such small amount of fossil fuels.⁴⁸ Large emitters are defined as entities with a facility emitting 25 000 tonnes of CO₂-e a year or more, whilst large fuel users are entities with a facility that emits 25 000 tonnes of CO₂-e or more from a combustion of a single fuel.⁴⁹ **14.31**

VII. Impact on Existing Fiscal Instruments

The Australian government will provide tax offsets to assist consumers and businesses to adjust to the introduction of a CPRS, directly impacting **14.32**

⁴⁵ Ibid at 6.31.

⁴⁶ Ibid [6–18] Policy position 6.7.

⁴⁷ Ibid [6.14– 6.15].

⁴⁸ Ibid [6.14].

⁴⁹ Ibid [6.15].

on fuel taxes and tax deductions for carbon pollution permits acquired by taxpayers who are carrying on a business.

1. Australia Subsidizes the Cost of Carbon by providing a Fuel Tax Adjustment

The Australian government announced transitional assistance to households and businesses to adjust to the impact of the scheme for a period of three years, by cutting excise or fuel tax of 38.143 cents per litre, on a ‘cent-for-cent’ basis, to offset the initial impact on transport fuels with the introduction of the scheme.⁵⁰ The government will assess the average permit price for the previous six months and automatically cut the fuel tax rate.⁵¹ The cuts in fuel taxes will be based on emission of carbon. With diesel emitting more carbon than petrol the fuel tax cut will provide more ‘cent-for-cent’ assistance than for petrol users.⁵² **14.33**

At the end of three-year transitional period, the government will review the adjustment, but has not stated whether it will reinstate fuel taxes. Otherwise the price signal is removed and the CPRS will have no impact on fuel prices, and will fail to effect behavioural change to fuel-efficient vehicles. **14.34**

2. Fuel Tax Credits to Business

The Australian government will subsidize industries to a full CPRS fuel tax credit, even though they currently do not pay fuel taxes and will not receive the benefit of fuel tax cuts.⁵³ The same applies to alternative fuels, such as LPG, CNG and LNG that are currently not subject to fuels tax, but the amount of credit will be based on their carbon price impact, which will be lower than the carbon emissions from petrol and diesel.⁵⁴ **14.35**

⁵⁰ Ibid 6.5.1 Transitional Assistance.

⁵¹ Ibid at 61.

⁵² Ibid 6.5.1.

⁵³ Ibid 6.5.1.

⁵⁴ Ibid 6.5.1 Transitional Assistance, at 62.

VIII. Australia's Solution to Reducing Road Transport Emissions?

Modelling by the Treasury for the White Paper in October 2008 states that **14.36** the introduction of a carbon price is 'likely to reduce fuel use and the emission intensity of transport'.⁵⁵ This means that the CPRS will likely significantly reduce transport emissions by sending a strong signal to fuel users that they will need to factor carbon costs into their long-term decisions.⁵⁶

The Treasury's modelling for a pollution reduction target of 5 per cent **14.37** below 2000 levels (CPRS—5) project that the introduction of a carbon price has the potential to induce significant reduction in transport emissions by:⁵⁷

- reducing demand for passenger road transport by around 4.5 per cent by 2050 'relative to the reference scenario'
- 'vehicle sharing increases, fewer trips are made, distances travelled are shorter and there is some substitution towards public transport';
- reducing total road fuel consumption by around 20 per cent by 2050 compared to 'the reference scenario'
- 'fuel emissions intensity falls and there is a lower demand' for transport fuels use of traditional petrol will fall the most with—electric vehicles and hybrid electric cars projected to make up 10 per cent of the transport sector in 2050.

Whilst its modelling suggests that significant reductions are long-term **14.38** outcomes, the level of certainty on the suggested level of abatement does not exist, nor is it quantifiable. Projected short-term targets to ensure that the above forecasts are achievable do not exist.

⁵⁵ Ibid 6.10.

⁵⁶ Ibid.

⁵⁷ Ibid.

The Treasury reports that shifts are already occurring in Australia, in response to the recent period of higher fuel prices, and that there has been an increase in the acquisition of more fuel-efficient vehicles, such as hybrids.⁵⁸ The White Paper may state that there has been growth in hybrids, but growth is slow and insignificant in terms of GHG emission reduction. From 2005 to January 2008, the number of hybrid passenger vehicles only grew from 0.3 per cent to 0.7 per cent (from 128 to 385 cars per month or 4,620 for the year) and the use of alternative fuel, and LPG, grew from 0.7 per cent to 1.6 per cent of new car sales.⁵⁹ Even though it can achieve a fuel efficiency of 89 CO₂/km and 3.9 L/100 km,⁶⁰ most private buyers are reluctant to pay a large premium for greater economy.⁶¹ Nor has the increase in acquisition of fuel-efficient vehicles resulted in a decline of road emissions. Higher oil prices may have contributed to a reduction of new car sales of large passenger vehicles by 20 per cent in 2006,⁶² but they still comprise 53.6 per cent of the total new passenger vehicle sales in 2008.⁶³

IX. Will the Scheme Deliver Significant Reduction in Road Emissions?

It is argued that applying the CPRS to fuel producers, and increasing fuel prices with the cost of carbon or the carbon pollution permit, will not significantly reduce road emissions. There are many other factors that need to be factored in as to whether the prices signal from a CPRS is adequate to influence behavioural change for consumers to acquire the lowest emission vehicles or whether other factors create uncertainty in the

⁵⁸ Ibid, 6.10.

⁵⁹ ANZ Economic and Market Research (2008) *Motor Vehicle Outlook*, 28 August 2008, available at <<http://www.anz.com/documents/economics/Motor%20Vehicle%20Outlook%20Aug%2008.pdf>> (accessed on 25 October 2009).

⁶⁰ Australian Green Vehicle guide.

⁶¹ The King Review of Low-Carbon Cars Pt II: Recommendations for Action (UK Treasury, 2008) para 2.12 (hereinafter 'King Review').

⁶² Department of Climate Change, Australian Government 'Transport Sector Greenhouse Gas Emissions Projections 2007' available at <<http://www.dft.gov.uk/pgr/sustainable/climatechange/euemistrascheme>> (accessed on 29 June 2009).

⁶³ Federal Chamber of Automotive Industries, 'Vehicle Sales' available at <<http://www.fcai.com.au/sales/new-vehicle-market>> (accessed on 1 March 2010).

market, which may affect the demand and supply of fuel efficient vehicles. Factors to consider are the impact of high fuel prices, the three-year transitory adjustment for fuel tax offset, fuel tax credits to business, the tax treatment of carbon pollution permits, increase in personal income, and loss-averse consumers that discount heavily fuel efficiency savings.

1. Criticism of the Transitional Adjustments

The Australian government has subsidised the impact of the CPRS by introducing Fuel Tax Credit subsidy, which will weaken the scheme by removing the impact of CPRS on fuel prices and behavioural change in acquiring fuel-efficient vehicles. Without any internationally competitive mandatory fuel efficiency targets, the exercise of including road transport in CPRS will provide no reduction in road transport emissions. **14.41**

2. Tax Treatment of Permits

The tax treatment of carbon pollution permits must be considered. Businesses acquiring fuel that includes the cost of the carbon pollution permit will be entitled to a tax deduction, since it is an expense incurred in the carrying on of the business. Thus, the impact of the CPRS will be ineffective if fuel price increases from the carbon pollution permits are reduced by a tax deduction claimed by fuel users who are entitled to claim a tax deduction for motor vehicle expenses. Tax deductibility for the carbon cost should be denied for high pollution vehicles or vehicles that fail to meet the fuel efficiency standards so that the taxation measure does not subsidize the carbon cost and remove the incentive for behavioural change in acquiring fuel-efficient vehicles. **14.42**

3. Price Signal from Higher Fuel Prices

The White Paper acknowledges the argument against including transport in the scheme, as demand is unresponsive to prices because of its ‘short **14.43**

run price elasticity'.⁶⁴ However the White Paper states that studies, such as the 2008 report by the Bureau of Infrastructure, Transport and Regional Economic (BITRE) show that fuel users are not responsive to price signals of increasing carbon costs and oil prices in the short term, but are more responsive in the long term, as they need time to adjust. This ultimately influences their decision about which motor vehicle to buy, as well as where to live and work.⁶⁵ The BITRE estimates that a 10 per cent increase in fuel prices would lead to a 1.5 per cent reduction in car use within one year and around 4 per cent in the longer run.⁶⁶

In 2008, the Garnaut Review stated that in the early years of the scheme **14.44** 'it is likely that high global oil prices will have a larger impact on the cost of petroleum based transport than an emissions price'.⁶⁷ That is, global oil prices from 1997 to 2008 have more than doubled, rising in Australia from AUD 0.74 to AUD 1.52 per litre.⁶⁸ Even so, the doubling of oil prices did not maintain or reduce transport emissions, where transport emissions increased significantly despite increases in fuel prices.

Modelling by the Garnaut Review indicates that the initial proposed **14.45** emission price will have minimal impact on the price of fuel. It is estimated that an emission price of \$20 per tonne CO₂-e would increase the cost of petrol by around 5 cents a litre, and the cost of travel by less than 1 per cent for a medium size car travelling 15,000 kilometres a year.⁶⁹ The impact of an emission price will become more substantial as the carbon price increases. Even so, Garnaut's modelling suggests that an emission price of \$200 per tonne of CO₂-e would increase cost of petrol by around 50 cents a litre.⁷⁰

⁶⁴ White Paper (n 26 above) at paragraph 6.10.

⁶⁵ Ibid.

⁶⁶ The Bureau of Infrastructure, Transport and Regional Economics 'How Do Fuel Use and Emissions Respond to Price Changes? BITRE Briefing 1 (Canberra, BITRE, 2008).

⁶⁷ Garnaut Review (n 22 above), ch 14.

⁶⁸ 'Average Retail Prices of Selected Items, Eight Capital Cities', 2008b cat. No 6403.0.55.001 (Canberra: Australian Bureau of Statistics, 2008).

⁶⁹ Garnaut Review (n 22 above), ch 14.

⁷⁰ Ibid.

However it is argued that such increases in fuel prices are minimal and will fail to deliver ‘substantial reduction’ in road transport emissions. Even the doubling of oil prices in 2008 did not reduce transport emissions, nor was there a significant shift to low-emission vehicles, such as the hybrid vehicle. **14.46**

The International Energy Agency (IEA) confirms that increases in oil prices will not necessarily result in lower global emissions where even though global oil use has slowed to around 1 per cent annually, total energy use has grown by almost 3 per cent annually.⁷¹ **14.47**

Finally, even if Australia’s fuel prices include the cost of carbon, the EU fuel prices (which do not include an emission price) would still be double the price of fuel in Australia, without any reduction in road emissions. In contrast, EU’s road transport emissions increased by 26 per cent during 1990 to 2004.⁷² That being the case, how will Australia’s scheme have any significant impact on transport emissions? What ‘fuel price’ or what ‘price of emissions’ will influence behavioural change of fuel users preferences in fuel-efficient vehicles, alternative modes of travel and residential location? Alternatively, should other additional measures apply to ensure an uptake of new technology and the lowest emission vehicles? **14.48**

4. Increase in Personal Income offsets higher Fuel Prices

Consumer response to higher fuel prices may be cushioned by rises in personal income, which is expected to rise strongly over the coming century, reducing the impact of higher fuel prices, as discussed above. **14.49**

⁷¹ International Energy Agency, *World Energy Outlook 2007: China and India Insights* (Paris: IEA, 2007); BP *Statistical Review of World Energy 2008*; *CO2 Emissions from Fuel Combustion* (Paris: International Energy Agency, 2007).

⁷² European Commission, ‘Proposal from the Commission to the European Parliament and Council for a regulation to reduce CO2 emissions from passenger cars Impact Assessment’ available at <http://ec.europa.eu/environment/air/transport/co2/pdf/sec_2007_1723.pdf> (accessed on 30 July 2009).

5. Loss-Averse Consumers

The price signal from the CPRS to influence behavioural change in consumers in choosing the lowest emission vehicle may be insignificant according to the OECD International Transport Forum (ITF) findings, if consumers are ‘loss averse and expect high discount rates on fuel economy.’⁷³ In deciding on whether to invest in better fuel economy, consumers expect very high discount rates such as a payback period of three years or so, indicating that implicit discount rates are high when consumers decide on fuel economy.⁷⁴ An argument for the high discount rates is that consumers pay little attention to fuel economy and care more about other attributes, which explains the very limited investment in low-emitting vehicles. This is further confirmed by the findings of the 2007 UK King Review, that there is a large gap between consumers attitudes and actions, where ‘future cost savings from fuel efficiency are heavily discounted at the time of buying a new car, and consumers report that they would require large financial benefits before switching to a smaller car or a car with a smaller engine’.⁷⁵ **14.50**

The OECD International Transport Forum (ITF) suggests that when consumers are loss averse and uncertain on factors that determine fuel economy, such as real and labelled fuel economy, they will invest less in fuel economy.⁷⁶ Loss aversion and uncertainties on the part of the consumer lead to uncertainty for the producers on how much to invest in **14.51**

⁷³ Kurt Van Dender and Philippe Crist, ‘Policy Instruments to Limit Negative Environmental Impacts from Increased International Transport, An Economic Perspective’ Joint Transport Research Centre, Discussion Paper 2009–9 (Paris: OECD ITF, 2009) at 11 (hereinafter ‘ITF Discussion Paper’). According to van Dender and Crist, ‘Loss aversion means that consumers evaluate outcomes in terms of changes from a reference state of wealth, and that losses are valued more than equivalent gains (to a larger extent that can be explained by declining marginal utility.’ See n 7 of their Discussion Paper.

⁷⁴ Ibid; see research by T Turrentine and K Kuraini, ‘Car Buyers and Fuel Economy?’ (2007) 35 *Energy Policy*, 1213–23, cited *ibid* at 29.

⁷⁵ King Review (n 61 above) at para 4–9.

⁷⁶ ITF Discussion Paper (n 73 above) at 10. This argument is based on research by DL Greene et al, ‘Fuel Economy: the Case for Market Failure’ in D Sperling and J Cannon (eds), *Reducing Carbon Impacts in the Transportation Sector* (The Netherlands: Springer, 2008), ch 11.

fuel economy. ‘Higher fuel prices increase what consumers want to pay for fuel economy, but does not affect their treatment of uncertainty so does not alleviate the producer uncertainty either.’⁷⁷ This is further exacerbated when fuel taxes are low and incomes are high, as they are in Australia.

Therefore to remove the uncertainty in the market for vehicle producers and consumers, strong signals from the government are required to influence behavioural change to vehicles with the lowest carbon emissions. It is argued that Australia’s CPRS will not provide a strong price signal to overcome such uncertainties and additional measures are warranted if producers are to invest significantly in low emission technology and deliver significant reductions in road emissions. **14.52**

X. EU ETS Excludes Road Transport

The European Union (EU) has not included road transport in its ETS. Even if the fuel producers’ option was considered, the OECD states that it would be a complementary measure to the existing scheme. This is because EU fuel taxes are considerably higher than carbon prices and there would thus be efficiency gains from including road transport in a cap-and-trade scheme if it were to replace fuel taxes.⁷⁸ **14.53**

The non-inclusion of transport in the EU ETS is because of the high cost of abatement in road transport compared to other sectors, including the high cost of new technology as well as behavioural change. Notwithstanding this, EU transport fuels are expensive because of the relatively high fuel taxes, being double the fuel taxes in Australia, as indicated in Appendix 1.⁷⁹ **14.54**

⁷⁷ Ibid at 11.

⁷⁸ OECD, ‘OECD Joint Transport Research Centre: Discussion Paper No. 2009 – 9 May 2009 Policy Instruments To limit Negative Environmental Impacts from Increased International Transport An Economic Perspective’ sighted 1 July 2009 at <<http://www.internationaltransportforum.org/2009/workshops/pdf/Environmental.pdf>>.

⁷⁹ Ibid at 10.

The OECD ITF argues that a carbon tax would have small effect on energy prices in transport, as transport fuels are less carbon-intensive compared to other sectors.⁸⁰ Thus, to significantly reduce transport emissions, eliminate market uncertainty for car manufacturers and reduce market imperfections, the EU considers mandating fuel-efficiency standards that will deliver significant improvements in fuel economy than those that have been achieved to date. **14.55**

XI. EU Regulates Performance Standards

Significant reductions in road emissions will be delivered through technological advancement in fuel-efficient vehicles. However, the King Review noted that ‘technology achieves nothing if it is not adopted—consumers must be engaged in order to realize fully the potential for reducing CO₂ from transport’.⁸¹ Equally important, the market must signal to manufacturers their demand for new low-carbon technology. This requires considerable investment, which manufacturers will be reluctant to make if demand appears slow.⁸² For instance the Toyota hybrid technology has taken 10 years to achieve annual worldwide sales of only 600,000 vehicles.⁸³ **14.56**

Therefore significant investment into low-emission technology will be slow if there is uncertainty in the market and if the emission price is too low to provide an adequate price signal encouraging production or acquisition of fuel-efficient vehicles. This is exacerbated if consumers are loss averse and heavily discount future fuel savings from choosing a fuel-efficient vehicle. Importantly, the OECD states that global stabilization of CO₂ emissions through 2050 at 2010 levels from road transport will require an attainment of fleet average fuel economy of 3.5 l/100 km **14.57**

⁸⁰ Ibid at 9. For example introducing a USD 50 per ton of carbon in the US would increase the price of coal by 140 per cent, while the price of gasoline would rise by 6 per cent.

⁸¹ King Review (n 61 above) at 7.

⁸² Ibid, para 2.12.

⁸³ Ibid.

(approximately 67 miles per gallon) by 2050.⁸⁴ However current and proposed regulations are inadequate to meet such fuel economy standards.

The EU's improvements in vehicle technology have led to a fuel efficiency improvement of 14 per cent between 1995 and 2006, which has been offset by an increase in demand for transport and vehicle size and an increase in CO₂ emissions from road transport by 26 per cent.⁸⁵ Despite the improvement in fuel efficiency in vehicle technology, The European Commission believe that progress to achieve the average new car fleet of 120g CO₂-e/km has been too slow.⁸⁶ **14.58**

To lower CO₂ emissions, road transport needs to use less oil, but the EU's import dependency is higher than 80 per cent, and in 2004 the EU-25 final energy consumption for road transport was 25 per cent.⁸⁷ Therefore to achieve significant reduction in CO₂ emissions requires a decarbonization of road transport, which can only be achieved through advancements in vehicle technology. Consequently the European Parliament adopted a set of regulatory measures in its attempt to deliver the EU's objective of achieving the most ambitious greenhouse emission target of 120g of CO₂/km. **14.59**

1. Regulatory Measures to Improve Fuel Efficiency in Vehicles

Regulations were passed by the European Parliament and Council on 23 April 2009 setting emission-performance standards for new passenger cars, with the fleet average to be achieved for all cars registered in the EU as 130 grams per kilometres (g/km).⁸⁸ A further reduction of 10 g CO₂/km or equivalent if technically necessary will be delivered by other **14.60**

⁸⁴ Ibid, research by JTRC (2008b).

⁸⁵ European Commission, 'Proposal from the Commission to the European Parliament and Council For a Regulation to Reduce CO₂ Emissions from Passenger Cars: Impact Assessment' available at <http://ec.europa.eu/environment/air/transport/co2/co2_home.htm> (accessed 1 March 2010) (hereinafter 'EC Proposal').

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Council Regulation (EEC) No 443/2009 of the European Parliament and of the Council of 23 April 2009, art 4.

technological improvement and by an increased use of sustainable bio-fuels.⁸⁹ This mandatory target is expected to deliver a cut of CO₂ emissions of around 25 per cent from current levels.⁹⁰

The fuel efficiency targets will be enforceable as penalties will apply **14.61** where the average CO₂ emissions of a manufacturers' fleet exceeds its limit in any year after 2012.⁹¹ Commencing in 2011, by 31 October of each year, the Commission shall publish a list for each manufacturer indicating whether they have met or not met the specified emission target for the preceding calendar year.⁹²

The EU's long-term target of 95g/km is planned for 2020, and innovative **14.62** technology is encouraged by granting manufacturers a maximum average of 7g/km of emission credits for their fleet if their vehicles are equipped with innovative technologies.⁹³ This measure will contribute to more than one-third of the emission reduction from non-ETS sectors by 2020.⁹⁴ Therefore, significant reductions in CO₂ emissions are projected to be achieved through regulation compared with the small reductions proposed with the adoption of the CPRS as discussed in section VIII.

⁸⁹ Ibid, section 9.

⁹⁰ European Commission *EU Action Against Climate Change: Leading Global Action to 2020 and Beyond* (Brussels: European Communities, 2009) at 14, available at <http://www.google.com.sg/url?sa=t&source=web&cd=1&ved=0CAYQFjAA&url=http%3A%2F%2Fec.europa.eu%2Fenvironment%2Fclimat%2Fpdf%2Fbrochures%2Fpost_2012_en.pdf&ndct=j&ndq=Leading+Global+Action+to+2020+and+Beyond+EC&ei=Ct-yS9KODpO3rAfXyuXWAw&usg=AFQjCNHxVcW8sQKX12UtDKiPDEIMYW16kA> (accessed 1 March 2010) (hereinafter 'EU Action').

⁹¹ Council Regulation (EEC) No 443/2009 of the European Parliament and of the Council of 23 Apr 2009, Article 9. The penalties amount to €5 for the first g/km of excess, €15 for the second g/km, €25 for the third g/km and €95 for each subsequent g/km. From 2019 the excess will cost €95.

⁹² Ibid, art 10.

⁹³ Ibid, art 12.

⁹⁴ EU Commission (n 90 above) at 14.

2. Regulatory Measures in Promoting Renewable Energy

Again, regulatory measures have been passed by the European Parliament and Council⁹⁵ to establish a mandatory national target consistent with a 10 per cent share of energy from renewable sources in transport in Community energy consumption by 2020.⁹⁶ The purpose of the mandatory national targets is to provide certainty for investors and encourage development of technology that will generate energy from all types of renewable sources.⁹⁷ **14.63**

3. Advantage to EU Automotive Industry

By setting such mandatory targets through regulatory measures certainty for the EU automotive industry—the world’s largest producer of passenger cars—will be assured. This will give the industry a leading edge in global competitiveness.⁹⁸ Meanwhile, Australian motor vehicle producers (MVP) will not be able to compete with such fuel-efficiency standards, unless such regulatory measures are mandated. **14.64**

4. Australia’s Fuel-Efficiency Vehicle Standards

The Australian motor vehicle industry may provide 6 per cent of the manufacturing employment and \$2.9 million in export income from its sales of its medium to large six-cylinder vehicles to the Middle East market. However, the industry is heavily subsidized and relies on substantial financial support from the Australian government for its survival.⁹⁹ The Australian MVI cannot compete internationally with the fuel-efficiency standards achieved in Europe as indicated in Table 14.1 **14.65**

⁹⁵ Council Directive (EC) 2009/28/EC of the European Parliament and of the Council of 23 April 2009, on the promotion of the use of energy from renewable sources and amending and subsequently repealing Council Directives 2001/77/EC and 2003/30/EC.

⁹⁶ Ibid, section 13.

⁹⁷ Ibid, section 14.

⁹⁸ EU Action (n 90 above) at 86.

⁹⁹ *Review of Australia’s Motor Vehicle Industry: Final Report*, 22 Jul 2008 (Canberra: Department of Innovation, Industry, Science and Research, 2008) at 10.

below, where new vehicles will have mandatory target to reduce the average new car fleet emissions to 120 grams of CO₂ per km compared to Australia's national average carbon emissions (NACE) voluntary target of 222 grams of CO₂ per km by 2010. This applies to new passenger vehicles in the countries listed in the following table as well as non-passenger vehicles less than 3.5 tonnes gross mass.¹⁰⁰ This makes it difficult to compare Australia's fuel efficiency standard of new passenger vehicles with those other countries.¹⁰¹

Table 14.1 Projected National Average Carbon Emissions (NACE) for all new light or passenger vehicles

	NACE (current)	Target	Coverage	Code
Australia	226.1g	222.0g	New light vehicles	Voluntary
	CO ₂ /km (2007)	CO ₂ /km (2010)	< 3.5 tonnes gross mass	
EU	160/0g CO ₂ /km (2007)	140.0g CO ₂ /km (2008) ¹⁰¹	Newly registered vehicles, including SUVs	Voluntary
EU	160/0g	120.0g	Newly registered vehicles, including SUVs	Mandatory
	CO ₂ /km (2007)	CO ₂ /km (2012)		
Japan	165.6g	138.0g	Cars and light trucks	Voluntary
		CO ₂ /km (2015)		

XII. Conclusion

Australia has included the transport sector in its CPRS, that applies to fuel producers, because there fewer entities to deal with and it is administratively cost-effective since it can be applied to the existing fuel tax system. The Australian government believes that the CPRS is its answer to redressing market failure and significantly reducing transport emissions. Increasing fuel prices by carbon cost will send a strong signal to fuel users to factor additional carbon costs into their fuel costs, ultimately influencing behavioural change. Fuel users will then be encouraged to acquire fuel-efficient vehicles. Modeling suggests that the impact of the CPRS is a long-term proposal, with forecasts made to 2050,

¹⁰⁰ Ibid, ch 8.

¹⁰¹ Ibid. The EU emission target of 140 grams of CO₂/km by 2008 was not met.

but there are market uncertainties in terms of the long-term impact of oil prices, the tax offsets for fuel taxes, fuel tax credits to business, loss-averse consumers that discount heavily fuel-efficiency savings, making it difficult for vehicle manufacturers to invest significantly in fuel-efficient technology.

The Scheme—whether ETS or CPRS—should not replace any existing **14.67** measures nor operate in isolation. Instead, it should be seen as a complementary measure. However the EU believes that substantial reductions in transport emissions will only occur if fuel efficiency improves significantly. Additionally, existing policies in reducing CO₂ emissions and improving fuel efficiency of new cars are too slow because of the above uncertainties. This requires mandating regulatory fuel-efficiency standards to create certainty for vehicle manufacturers.

Whilst Australia has internationally uncompetitive voluntary fuel- **14.68** efficiency standards, the government exacerbates the problem by introducing transitional measures to the CPRS, counteracting the impact of higher fuel prices by providing a subsidy that will offset the carbon costs by cutting fuel taxes on a ‘cent-for-cent’ basis for three years. This will allow consumers and businesses to adjust to higher fuel prices. In effect for the first five years, Australia’s CPRS will have no effect on reducing GHG emissions from transport. Nor is there certainty that fuel taxes will be restored within this period, which means that fuel prices may not be ‘high enough’ to influence behavioural change and encourage a shift from high emitting vehicles to fuel efficient vehicles. With no mandatory efficiency standards to compensate, Australia CPRS may not provide the substantial reductions to road transport emissions as expected.

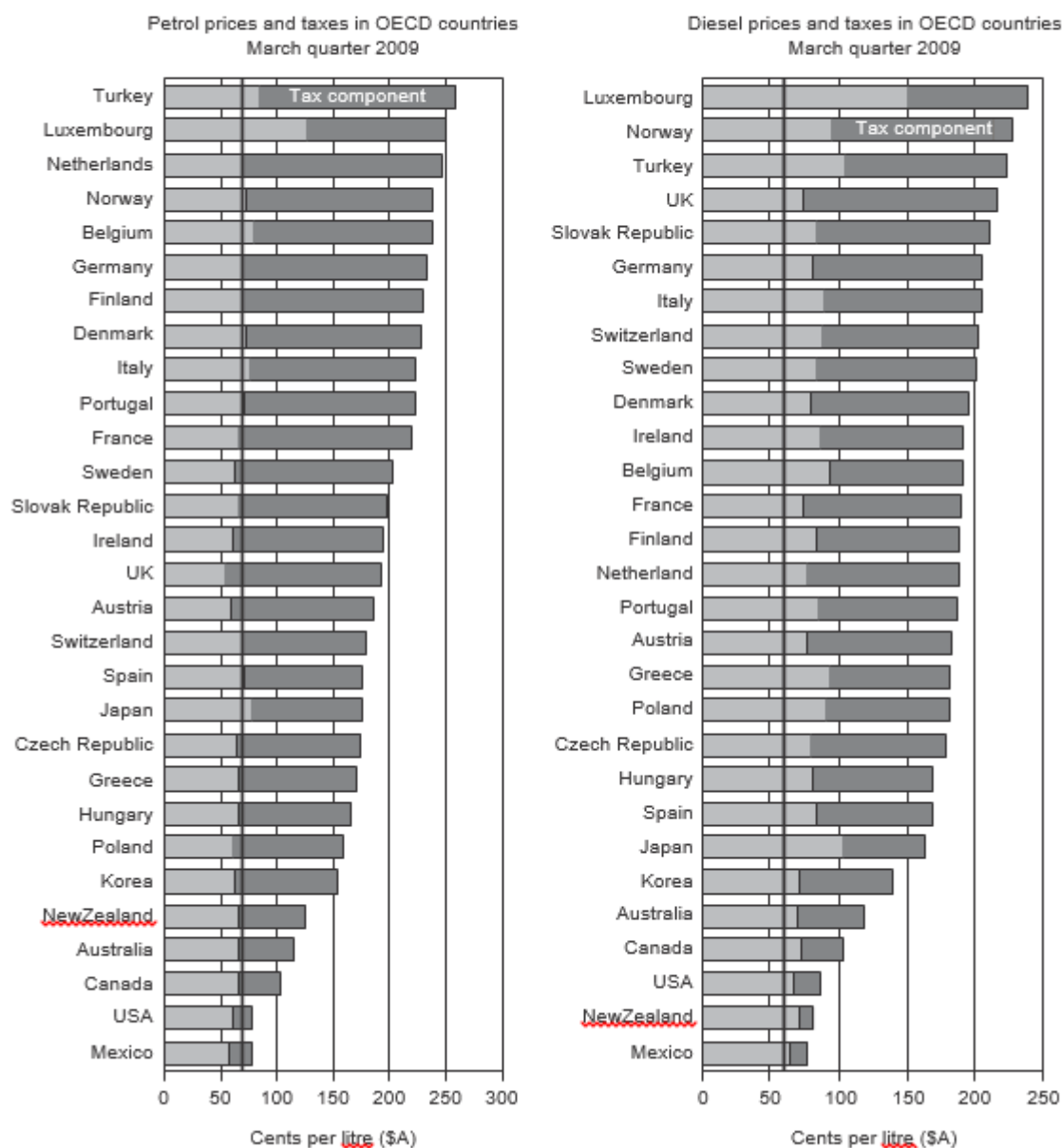


Figure 14.1 Petrol and Diesel Prices in March Quarter 2009

Source: *Australian Petroleum Statistics*, Department of Resources, Energy & Tourism.

XIII. CPRS Fails to Receive Bipartisan Support

The CPRS bills¹⁰² were introduced into Parliament on 14 May 2009 but failed to receive bipartisan support and were rejected by the Senate on 13 September 2009 and again on 2 December 2009. On 27 April 2010, the Australian Government decided to shelve the Scheme until after the current commitment period of Kyoto Protocol period ends in 2012¹⁰³ and in June 2010, the Australian Government decided to shelve the Scheme.

¹⁰² Carbon Pollution Reduction Scheme Bill 2010 (Cth) and the Carbon Pollution Reduction Scheme (Consequential Amendments) Bill 2010 (Cth)

¹⁰³ Prime Minister Kevin Rudd, Transcript of Doorstop Interview, Nepean Hospital, Penrith, NSW, 27th April 2010 (Interview Transcript 27th April 2010) <http://pmrudd.archive.dpmc.gov/node/6708>.

CHAPTER 3

MANDATING EMISSION TARGETS CAN SIGNIFICANTLY REDUCE ROAD- TRANSPORT EMISSIONS

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MANDATING EMISSION TARGETS CAN SIGNIFICANTLY REDUCE ROAD-TRANSPORT EMISSIONS

Anna Mortimore

In 2003, the Australian government and the Federal Chamber of Automotive Industry (FCAI) reached a third agreement to improve fuel efficiency of all new passenger vehicles powered by petrol, by setting a voluntary target of 6.8 l per 100 km by 2010, which is equivalent to an emission target of 159 g CO₂ per kilometre. Australia failed to meet its third voluntary fuel efficiency target, illustrating that voluntary fuel efficiency targets do not work. The FCAI introduced an emission target of 222 g CO₂/km by 2010, which was not agreed to by the Australian government.

In 2009, the Final Report by the Vehicle Fuel Efficiency Working Group recommended mandating emission targets. However, the May 2010 Final Report of Australia's Future Tax System stated that such targets are not required if a cap and trade system, known as a carbon pollution reduction scheme (CPRS), is introduced, as supplementary policies such as regulations will not achieve more abatement than the CPRS alone. In September 2010, the Australian government expressed commitment to introduce mandatory emission targets, but not until 2015.

This chapter examines whether a CPRS would have significantly reduced road transport emissions when fuel price increases can be inelastic and consumer behavioural anomalies may lead to market failure or whether a command and control regulation emission standards need to be mandated, to compel car manufacturers to increase technological advancement and the supply of low emission vehicles.

A comparative study with the EU will indicate whether the proposed Australian mandatory emission standards are harmonized with international standards, and whether Australia has considered the lessons learned from other countries in the design of its emission standards.

Technological Development of Low Emission Vehicles

According to the International Energy Agency (IEA) current policies are insufficient to stop road vehicle energy use rising above current levels and with projected car ownership worldwide set to treble to over 2 billion by 2050, global transport emissions will double without strong government action. (IEA 2009)

Julia King reported in the 2008 UK Review of Low-carbon Cars (King Review) that considerable CO₂ emission savings of up to 30–50 per cent can be achieved through enhancing the conventional vehicle systems and using technology, that is ‘close to the market’, through advances in hybrid and battery technology. (King 2008:6) An almost decarbonisation’ of road transport could achieve an 80–90 per cent reduction in road emissions. (King 2007:4)

Therefore to limit the growth of road emissions, and the accumulation of high polluting vehicles, new cars sold each year need to be low emission vehicles. This will be dependent upon governments introducing ‘strong’ fiscal instruments to increase the demand and supply of low emission vehicles.

Australia Prefers Market Mechanisms

In response, the Australian government released a White Paper in 2008 outlining Australia’s preference for market mechanism, a ‘cap and trade’ permit system, known as a ‘carbon pollution reduction scheme’ (CPRS). (Australian Government 2008) The CPRS was scheduled to commence in 2010, but failed to receive bipartisan support. Consequently on 27 April 2010, the former Prime Minister announced that the government would delay the implementation of the CPRS.

It is outside the scope of this chapter to discuss the proposed CPRS in detail. Principally, the CPRS employs a ‘cap and trade’ emission trading mechanism to limit greenhouse gas emissions, where the right to emit greenhouse gas emissions becomes scarce and scarcity entails a price. (Australian Government 2008:5–7) The CPRS assumes consumers follow the rational economic model. That is, according to the Pigou

theory (1932), the permit price per tonne of CO₂, or the carbon price would increase fuel prices by the cost of emitting carbon and, over time, this would provide the necessary price signal for consumers to reduce their demand for fuel and encourage a shift to fuel-efficient vehicles. (Australian Government 2008:6–5) However, consumers may not necessarily respond to the increase in fuel prices, nor consider fuel efficiency in making their final choice of vehicle.

Fuel Prices Changes May Be Inelastic

It is argued that the CPRS will have minimal to no effect in encouraging demand for fuel-efficient low emission vehicles, if the ‘carbon price’ is not the ‘correct price’. But what ‘price’ will encourage a behavioural change to low emission vehicles? For example, even EU fuel prices, which are more than double Australian fuel prices because of high fuel taxes,¹ did not abate the growth of carbon emissions in the EU. (Australian Government 2005:para. 8.4)

The UK Energy Research Centre (ERC) explains that demand response to fuel price changes is relatively inelastic, particularly when people become so dependent on their vehicles that they have little choice but to adapt to higher fuel prices. (UK ERC 2009:98) However, the fuel price elasticity of fuel demand is higher when fuel prices are higher, but this depends on the absolute level of price. (OECD/ITF 2010c:8). For example, reducing fuel demand in the passenger transport sector by 25 per cent may require a price rise of 41.7 per cent. (UK ERC 2009:100) This means that a high carbon price may be required to increase fuel prices to that level. But a high carbon price may not be acceptable by other sectors of the economy. It is also regressive, as it impacts on consumers who do not have the financial capacity to change to low emission vehicles.

Consumer Behavioural Anomalies

The CPRS assumes a rational consumer will respond to the higher fuel prices by considering future fuel savings and respond by choosing a fuel-efficient vehicle. Observations by economists Turrentine and Kurani consider consumers’ fuel economy decision-making is more complex than any single economic model and they ‘almost

certainly do not make their decisions according to the strict model of rational economic behaviour.’ (US EPA 2010:5) Further consumer behavioural anomalies, or certain patterns of behaviour such as loss aversion and hyperbolic discounting, can impact on consumer’s final choice of vehicle. (OECD/ITF 2010b:24)

Loss aversion can influence decision-making when consumers give potential losses greater weight than potential gains. That is, consumers are reluctant to pay up front for uncertain reduction in fuel expenditure. (Reeson and Dunstall 2009:5), and require large financial benefits before switching to a smaller car or a car with a smaller engine. (King 2008:para 4.9)

According to economic theory, such ‘behavioural anomalies’ are described as irrational (Reeson and Dunstall 2009:3) and can lead to market failure, thus creating uncertainty for manufacturers in deciding whether to increase the supply of low emission vehicles, and may explain their underinvestment in energy efficiency when consumers are risk averse. (OECD/ITF 2010b:10)

Since it takes a long time for low emission vehicles to become dominant in the vehicle fleet, and rather than waiting for consumers to change their preference to low emission vehicles, it is argued that emission standards need to be mandated so that all vehicle manufacturers can invest with certainty in the technological development of low emission vehicles and the future decarbonisation of the road transport sector.

Regulating Emission Standards

Mandatory and voluntary emission targets adopted by the EU, Australia and Japan are shown in the Table 9.1

Table 9.1 Projected national average carbon emissions (NACE) for all new light or passenger vehicles

	NACE (current, 2007) (g CO ₂ /km)	Target (g CO ₂ /km)	Coverage	Code
Australia	226.1	222.0 (2010)	New light vehicles < 3.5 tonnes gross Mass	Voluntary
EU	160.0	140.0 (2008)	Newly registered vehicles, including SUVs	Voluntary
EU	160.0	120.0 (2012)	Newly registered vehicles, including SUVs	Mandatory
Japan	165.6	125.0 (2015)	Cars and light trucks	Mandatory

Source: Australian Government, Department of Innovation Industry, Science and Research (2008), *A New Car Plan for a Greener Future*, p. 63: ‘A precise comparison between the European Union and other regulatory regimes is difficult because of differences in fleets and test methods.’

Voluntary Emission Standards in Australia

Australia’s ‘voluntary’ agreements were between the Australian government and the automotive industry, known as the Federal Chamber of Automotive Industries (FCAI), which represented both the manufacturing industry and importers of passenger vehicles and commercial vehicles in Australia. Participation in voluntary agreements was solely at the discretion of the participating entity (namely the FCAI), and there was no serious pressure from government to compel the entity to join. (IPCC 2007:7.9.2.1) The FCAI developed a code of practice for reducing the fuel consumption of new passenger cars (IEA 2008:23), which is voluntary and not enforceable. The IEA reported that Australian automotive industries introduced two sets of voluntary targets in 1978 and 1987, which contributed to fuel efficiency improvements, and both targets failed because of consumers’ preference for bigger cars. (IEA 2008:26) Obviously the Australian government’s fiscal measures need to be ‘strong’ to shift consumers to low emission vehicles.

In 2003, the Australian government reached a third agreement with the FCAI to improve fuel efficiencies of all new passenger vehicles fuelled by petrol, setting a ‘voluntary target’ of 6.8 l/100 km by 2010. (Australian Government 2007:38) The national average fuel consumption (NAFC) target applied to all new passenger vehicles sold by a manufacturer or importer in a given year. (ACIL 1999) The target represented

the majority of passenger vehicles as 85.2 per cent of all passenger vehicles used petrol as at 31 March 2008. (ABS 2009)

In 2004, the FCAI and the Australian government commenced negotiations to change the above voluntary NAFC target to reflect the international challenge to reduce carbon emissions from motor vehicles and established a 'national average carbon emissions' (NACE) target. However, according to the Australian Transport Council, the parties were unable to agree on a revised target. (ATC and EPHC 2009:16) Even though there has been no agreement, the emission target shown in Table 9.1 is the target referred to by the FCAI in assessing the performance of Australia's fleet vehicles.

The NACE target proposed by the FCAI of 222 g CO₂/km by 2010 applies to all new vehicles under 3.5 tonnes. (FCAI 2008a) Vehicles include not only new passenger vehicles, but all new light vehicles such as SUVs and light commercial vehicles, and all types of fuel (petrol, diesel, LPG, etc.). (ABS 2009) The FCAI claims that this enlarged list of vehicles and all types of fuels makes the target for reducing CO₂ more challenging. (FCAI 2008b) Consequently the FCAI argues that a comparison with other countries (see Table 9.1) is difficult when international targets only apply to new passenger vehicles and SUVs. It is argued that failure by Australia to adopt internationally competitive targets has failed to harmonise emission targets internationally and avoids scrutiny by masking the true performance of locally manufactured new vehicles. In addition the European Commission is proposing to adopt separate emission targets for light commercial vehicles that are more tailored to specific vehicle segments (IEA 2010a:25) such as longer model life; differences in CO₂ emission may vary because of vehicle size, shape, the load carried, the number of start-stops, and so forth. (Association of European Car Manufacturers (ACEA) 2010b:5).

International Targets

In 1998, the Association of European Car Manufacturers (ACEA), which represents 80 per cent of new registrations in the EU, entered into 'Memorandum of Common Understanding' with the European Commission, a voluntary agreement to 'limit average emissions from newly registered passenger cars to 140g/km by 2008' (see Table 9.1).

(EC 1998) An intermediate target was set at 165–170 g CO₂/km by 2003. In 1999, voluntary agreements with the same targets were entered into with the Japan Automobile Manufacturers Association (JAMA), which represents over 10 per cent of annual registrations in the EU, and with the Korean Automobile Manufacturers Association (KAMA), which represents less than 5 per cent of annual registrations. (Europa 2000) The EC agreed that if JAMA and KAMA were selling vehicles in the EU, they would also be required to achieve the EU target of 140 g CO₂/km by 2008.

The European Commission would report to the European Parliament and to the Council on the progress of the emission performance standards for new passenger cars. (Europa 2000) The above three manufacturers' associations would be required to confirm their progress regarding CO₂ emissions. In 2009, JAMA achieved an average CO₂ emission of 142.6 g CO₂/km and KAMA, 141.8 g CO₂/km for. In spite of achieving significant reduction in emissions since their 2003 interim targets of 165–170 g CO₂/km, both associations were unable to reach the 140 g CO₂/km target by 2008–09.

The voluntary agreements requiring fuel efficiency improvements accounted for high levels of dieselization of the passenger car market in the EU, but further reductions in emissions would need to be met through technological developments. However, this required new strategies and technological approaches, but manufacturers did not adopt these 'quickly enough and trends towards larger, heavier vehicles continued to offset much of the technology uptake.' (IEA 2010b:21) Therefore the Commission reported to the Council and the European Parliament on 7 February that the target of 120 g CO₂/km set by the EU would not be met by 2012, unless additional measures were taken. (EC 2007)

The proposal was met with heavy lobbying from the car industry. The point of contention was that the manufacturers of large and heavy cars could be in a disadvantageous position compared with manufacturers of smaller, lighter and lower emitting cars if a similar target was applied to all types of cars. (EC. 2008).

The European Council and European Parliament adopted the Commission's proposal and set the most ambitious average emission performance standards of 130 g CO₂/km by 2012 for all new passenger vehicles registered in the Community (for each manufacturer) mandated by the European Parliament and Council on 23 April 2009 (Regulation 443/2009/EC).² A further reduction of 10 g CO₂/km will be delivered by other technological improvements such as tyre pressure monitoring systems, more effective air conditioning systems and by an increased use of sustainable biofuels. The Commission recommended improving vehicle labelling and encouraging sales of vehicles with low fuel consumption taxation measures. (EC 2010b) The emission performance standards will be enforceable through charging penalties for manufacturers whose fleet's average CO₂ emissions exceed the limit in any year after 2012 (Regulation 443/2009/EC, Article 9). The penalties will be based on the number of g CO₂/km that an average vehicle sold by the manufacturer is above the target, multiplied by the number of vehicles sold by the manufacturer. From 2012 to 2015, the penalties will be: a premium of €5 per vehicle for the first g CO₂/km; €15 for the second; €25 for the third gram; €95 for the fourth, and onwards. From 2019, manufacturers will pay €95 for each g CO₂/km exceeding the target (Regulation 443/2009/EC, Article 9). Manufacturers expect to meet the target to avoid the significant penalties. The regulation applies to all manufacturers that sell new cars in Europe, which includes the US Japanese and Korean manufacturers.

The EU mandatory targets have provided certainty to the EU motor vehicle industry by providing long-term targets of 95 grams of CO₂/km for 2020, and encouragement through providing manufacturers incentives by granting them super credits for vehicles with CO₂ emission below 50 g/km, where each vehicle is counted as 3.5 cars in 2012 and 2013, as 2.5 cars in 2014, 1.5 cars in 2015, and one car from 2016 (Regulation 443/2009/EC, Article 5). It is projected that this measure will contribute to more than one-third of the emission reduction from non-emission trading scheme sectors by 2020. (EC 2010a)

Comparison of Australian and European Targets

A comparison of the Australian and EU emission targets is possible as test methods used in measuring vehicle emissions are directly comparable in both countries. (Australian Government NTC 2009:25) In 2009, the FCAI reported that Australia achieved a NACE of 218.5 g CO₂/km, an improvement of 1.8 per cent compared with the 2008 NACE of 222.4 g CO₂/km. In response the FCAI stated: 'Australia's new vehicle market had reached a new environmental milestone with average carbon dioxide the lowest on record, helped by improvements in engine technology.' (FCAI 2010) However, the 2009 Final Report of Australia's Vehicle Fuel Efficiency noted that it was 'not aware of any data or information that demonstrates that voluntary NAFC target has had any influence on the modest reductions in fuel consumption achieved to date.' (ATC and EPHC 2009:22)

The above 2009 NACE of 218.5 g CO₂/km for new light vehicles less than 3.5 tonnes gross mass represents the following vehicles: passenger cars CO₂ average of 195.5 g/km (down from 201.7 g/km in 2008); SUVs at 246.3 g CO₂/km and light commercial vehicles (LCVs) at 253.6 g CO₂/km. (Martin 2010) These ratings may have met the FCAI target, but not the Australian government's fuel efficiency target for new passenger vehicles (fuelled by petrol) of 6.8 l/100 km, which is equivalent to an emissions target of 159 g CO₂/km. (Green Vehicle Guide 2010) None of the Australian manufactured vehicles reached these targets. The National Transport Commission reported that in the period January–August 2009, GM Holden (Australia) had the highest average emissions of 279/km, and 'showed virtually no improvement (–0.1 per cent) in the average vehicles emissions from 2005 to Jan-Aug 2009.' (Australian Government NTC 2009:21), demonstrating that voluntary targets are ineffective when they are not mandated.

The EU-27 achieved a NACE of 145.7 g CO₂/km in 2009 (EU 2009), 33 per cent less than Australia's NACE of 218.5 g CO₂/km. Australia's voluntary targets are less ambitious, less environmentally effective and more economically inefficient than other fiscal measures. Consequently Australia's new passenger fleets are one of the world's most polluting. The FCAI explained that the differences in the reported NACE targets

for each jurisdiction are principally due to differences in consumer preferences for factors such as fuel type and vehicle size. (FCAI 2008b) However, it is argued that Australia's voluntary targets and lack of fiscal measures penalizing the acquisition of high polluting vehicles has allowed the importation of high emitting vehicles such as SUVs, which are increasing in popularity. For example, in 2010 Toyota (Australia) sold more HiLux utilities, with a CO₂ rating of 217 g/km, than Corollas, with a rating of 173 g CO₂/km (Dowling 2010), and the lowest emitting vehicle in Australia, the Prius (89 g CO₂/km), sold one for every ten LandCruiser 4WDs sold. Thus the voluntary targets have failed to encourage the acquisition of low emission vehicles such as the hybrids, and have failed to encourage the acquisition of fuel-efficient vehicles that use diesel, as 84 per cent of Australia's fleet in 2009 was registered with petrol type. (ABS 2009) In the EU, mandatory targets and fiscal incentives have encouraged the use of diesel, which has the advantage of producing less CO₂/km than equivalent petrol vehicles. For example, in 2009, the highest diesel usage recorded was in Belgium at 72 per cent, and France at 70 per cent. (OECD ITF 2010a:25)

Australia Considers Mandatory Emission Standards

In 2008, the Council of Australian Governments (COAG) requested the Australian Transport Council (ATC) and the Environment Protection and Heritage Council (EPHC) to form a Vehicle Fuel Efficiency Working Group, representing the federal and state/territory transport, environment and industry representatives, to evaluate potential vehicle fuel efficiency measures. (ATC and EPHC 2009:9) The working group report provided the framework for Australia's National Transport Policy, within which to incorporate and report progress towards potential vehicle fuel efficiency measures. (ATC and EPHC 2009:17)

The working party identified that a CPRS would not adequately address potential market failures caused by 'non-price barriers' such as consumers' choice of vehicle. (ATC and EPHC 2009:20) Therefore the working party report was made on the understanding that additional 'complementary' measures would work in parallel with the CPRS, to assist in the transition to a 'low carbon economy.' (ATC and EPHC 2009:18)

In response the working party recommended there was a case for mandating fuel consumption/CO₂ standards for new light vehicles sold in Australia, and advised that before appropriate legislation could be introduced, a ‘regulatory impact statement’ (RIS) would be required to assess the costs and benefits of such an approach. (ATC and EPHC 2009:26) This analysis would: consider the design of the standard; assess the technological options to achieve the various CO₂ emission targets; address the timing of the standard, providing initial and longer-term targets; consider how the target would support programmes such as the Australian government’s Green Car Innovation Fund and Green Car Challenge; and how the standard can account for emerging technologies such as plug-in electric hybrid vehicles, fully electric vehicles and vehicles designed to operate on emerging low carbon fuels. (ATC and EPHC 2009:25)

Despite the good results achieved by the EU mandatory targets, the working party declined to harmonize its targets with international targets with proposed emission target scenario’s for all light vehicles up to 350 tonnes as follows:

- NACE target between 160 and 180 g CO₂/km in 2015; and
- NACE target of 150 g CO₂/km in 2020; or
- NACE target of 115 g CO₂/km in 2025 (ATC and EPHC 2009:50)

However, these regulatory standards are not as stringent as the EU targets. The targets combine both passenger vehicles and light vehicles, which have varying sales-weighted, average CO₂ emissions, making it difficult to make international comparisons. For example, the proposed NACE for 2020 of 150 g CO₂/km does not even meet the target achieved by the EU-27 of 145.7 g CO₂/km in 2009. But the level of emissions achieved by the EU only refers to passenger vehicles. Separate targets for passenger vehicles and LCVs would need to be set to make a proper assessment of the target’s performance. Also the delay of introducing and adopting the above proposed targets will fail to ‘allow industry time to adapt product development.’ (IEA 2010a:19)

Additionally, the above standards fail to adopt the recommendations made by the IEA for existing standards to be more stringent and harmonized in ‘as many aspects of fuel efficiency standards’ to enable comparison of targets between countries. The IEA states that such measures will reduce industry costs and remove barriers to trade. (IEA

2010a:19) In response to the public discussion on the vehicle fuel efficiency enquiry, the motor vehicle manufacturers opposed mandating emission targets. GM Holden (Australia) made submissions to the working party in November 2008, that ‘mandating emission targets should only be considered as a last resort, because they are an ‘extremely blunt instrument, costly, require significant government resources to effectively enforce, and generally will constrain innovation and disrupt normal market forces.’ (GMH 2008a:25) The fact is that if the NACE targets were enforceable, Australia may end up not having a car manufacturing industry.

Naturally Australia’s motor vehicle industry would be supportive of voluntary targets, as it is party to the negotiations and may have some influence over the targets. (Thalmann and Baranzini 2008). It would also be supportive of agreeing to a CPRS market mechanism, which may have less impact on the industry and may defer the introduction of more challenging measures such as taxes or command and control regulation.

The Australian FCAI also criticized the use of regulation in its submission to the Public Discussion Paper on Vehicle Fuel Efficiency, claiming ‘Japan, the United States and the EU have introduced second best measures to address fuel efficiency and emissions such as mandatory emissions targets, because they do not have a more efficient market based measure such as a CPRS.’ (FCAI 2008b:11)

The Australian Treasury’s Final Report on Australia’s Future Tax System, published on 2 May 2010, stated that once a CPRS was operational ‘additional measures that seek to reduce emissions (in sectors not covered by CPRS) and which are not justified on other grounds should be phased out.’ (Australian Government 2010a:360) The Final Report concurred with the above submissions made by GM Holden and the FCAI, that implementing non-market approaches through regulations was inefficient in achieving environmental outcomes and was likely to impose significant costs on business and households. (Australian Government 2010a:347)

It is argued that the additional costs of command and control regulation are outweighed by the certainty that manufacturers wish to bring forward to the market the technological development and supply of fuel-efficient vehicles. This requires a long lead-time of up to five years to design and produce such vehicles and a further seven years for automotive manufacturers to recover their investment.

At the time of writing this chapter, the Australian government announced in September 2010 that it was committed to introducing mandatory emissions standards for light vehicles in 2015, but made no announcement on the emission targets.

Government's Role in Supporting Mandatory Fuel Emission Targets

It is argued that Australia has no independent government body, such as the European Commission to monitor and regulate the performance of the new passenger cars and SUVs in achieving emission targets. The Australian government did not have detailed information on average emission from new passenger cars and LCVs until 2010. The National Transport Commission (NTC) identified this shortcoming and the information has now been compiled. (Aust. Government NTC 2009:1) However, the NTC findings showed there are no comprehensive reports available for CO₂ emissions by vehicle segment, buyer type or manufacturer for Australia. (Aust. Government NTC 2009:2)

It was the FCAI that prepared reports on Australia's NACE performance. The FCAI was responsible for introducing all three voluntary fuel efficiency targets and the 2004 NACE target. All fuel efficiency targets failed, and the Australian government did not agree to the 2004 NACE target.

Reviews of the motor vehicle industry performance in reducing emissions by automotive associations such as the Australian FCAI are likely to be biased to meet the needs of the industry rather than the environment, and the targets are less likely to be stringent. All submissions made by GM Holden to Australia's Future Tax System were supported by the FCAI, both opposing all taxes and mandatory regulations on carbon emissions.

The ATC, established in June 1993, is not a regulatory body, but provides advice to governments on the ‘co-ordination and integration of all surface transport and road policy issues at a national level.’ (ATC 2010) It was only at the request of the Council of Australian Governments in 2008 that the ATC prepared a report in 2009, identifying Australia’s poor vehicle fuel efficiency and carbon emission standards record, when compared with international standards. Even then the proposed mandatory emission targets discussed earlier are not internationally compatible.

It is the role of the Australian government to recognize the shortcomings of the proposals – they are not in accord with the IEA’s 2008 recommendations for harmonized fuel efficiency standards across countries.

Yet it appears that the Australian government will not adhere to the IEA’s 2008 recommendations, considering the announcement made by the Prime Minister³ in July 2010 outlining future mandatory emission targets (Stanford 2010):

- NACE target of 190 g CO₂/km in 2015; and
- NACE target of 155 g CO₂/km in 2024.

These targets are even less stringent than the targets proposed by the working party, discussed earlier. In response, the Australian government has been criticized for ‘dragging the chain on the issue of vehicle emissions in an attempt to protect the local car industry, which builds large six-cylinder sedans, utility vehicles and four-wheel-drives.’(Blackburn 2010)

Like the EU, the Australian local car industry will be able to meet the above targets and reduce emissions by converting its new passenger fleet from petrol to diesel. However, experience from the EU indicates that such targets will not ‘push’ the local car industry to reduce road transport emissions significantly without innovation and technological advances of low emission vehicles that will reduce the consumption of fossil fuels. Local Australian car manufacturers will not be competitive if stringent emission targets, such as the EU’s mandatory target of 120g CO₂/km by 2012 for new passenger vehicles are not adopted.

International Harmonization of Automobile Emission Standards

The IEA strongly recommends harmonizing as many aspects of fuel efficiency standards as possible across countries. (IEA 2010a:19) Europe has been at the forefront of international harmonization efforts with the 1958 Agreement of the United Nations Economic Commission for Europe (UNECE) on technical standards. (European Automobile Manufacturer's Association (ACEA) 2010) China and Japan have also adopted internationally harmonized regulations for emissions established for Europe by the UNECE. They have adopted target values in each class, divided by vehicle mass. (IEC, 2008:31)

Hence it is argued that international harmonization is important as the automotive sector is of a global nature, and is engaged in international trade. Harmonizing global standards and regulations will encourage more stringent targets and bring certainty to manufacturers by increasing the competitiveness of the industry and reducing industry costs and barriers of trade. (IEA 2010a:19)

For example, the automobile manufacturers associations active in the EU, namely the ACEA, the JAMA and the KAMA, are engaged in 'international harmonization' in meeting the mandatory standards of the European Parliament and Council, in order to be able to register their cars for sale in the EU. These automobile manufacturers account for 60 per cent of the world's new passenger vehicles; with the EU 27 producing 33 per cent of the world passenger car production; JAMA producing 20 per cent and KAMA producing 7 per cent. (Worldometers 2010)

Australia will not be engaging in the international harmonization of regulatory standards if the federal government adopts the proposed mandatory regulatory standards. Not only will the Australian vehicle manufacturers continue be uncompetitive, but the proposed mandatory emission targets will benefit the 81 per cent of vehicles imported into the country, as the targets are not stringent and will fail to restrict high emitting vehicles from being imported into the country.

Conclusion

It was argued that a cap and trade market mechanism such as a CPRS will not bring certainty to Australian car manufacturers and importers in increasing the supply of low emission vehicles, because behavioural anomalies may create market failure and the possibility of price inelasticities of demand if fuel prices are not high enough. Rather than waiting for consumers to make a behavioural shift to low emission vehicles, it will be more effective to introduce command and control regulatory emission standards, to create certainty for manufacturers to increase supply and invest in the technological advancement of low emission vehicles.

In 2010 the Australian government announced its commitment to introducing mandatory emission targets in 2015. However, Australia's proposed mandatory target will not be harmonized with other countries, nor will it be as effective or stringent as that of the EU – the EU achieved Australia's proposed target for 2020 in 2009. In effect Australia's proposed targets will not push local car manufacturers to use technological advancement to produce low emission vehicles, nor restrict the importation of high emitting vehicles, consequently failing to cut the country's road transport emissions significantly.

Notes

¹. Australia's excise duty on unleaded petrol is AU\$0.38143 per litre, which is the fourth lowest tax rate of the OECD-30 countries.

². Article 4, phasing in requirements where in 2012 65 per cent of each manufacturer's newly registered cars must comply on average with the limit value set by the legislation. This will rise to 75 per cent in 2013, 80 per cent in 2014 and 100 per cent from 2015 onwards.

³. Prime Minister Julia Gillard.

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CHAPTER 4

REFORMING VEHICLES TAXES ON NEW CAR PURCHASES CAN REDUCE ROAD TRANSPORT EMISSIONS—EX POST EVIDENCE

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REFORMING VEHICLES TAXES ON NEW CAR PURCHASES CAN REDUCE ROAD TRANSPORT EMISSIONS—EX POST EVIDENCE

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Abstract

Australia is falling behind the international trend towards low carbon transport to reduce greenhouse gas (GHG) emissions. For instance, in 2012 the Australian Government forecasted that road transport emissions would continue to increase to 2020 and then slow to 2030 because of higher oil prices and the introduction of mandatory CO₂ emissions standards. The forecast assumed vehicle efficiencies of petrol and diesel engines would improve, and there would be a gradual shift to alternative technologies. However, in 2007 the European Union found that while advances in vehicle technology had delivered most of the carbon reductions, these advances were offset by new cars that had become significantly more powerful, larger, and heavier. This is the case in Australia. The article shows how Australia can accelerate the uptake of low carbon technology through reforming existing vehicle taxes into an environmental tax. The reform will require basing the tax on CO₂ emissions from previously being based on the vehicles technical characteristics such as cylinder capacity, engine size and fuel type. The literature supports the reform of vehicle taxes into an environmental tax, which was found to be a powerful instrument in influencing the purchase decisions of consumers.¹ Specifically, the article examines the literature and reviews the ex post evidence on the successful reform of vehicles taxes. In the case study of Ireland, it was found that the reformed vehicle taxes based on CO₂ emissions provided a strong price signal, and consumer response was greater than anticipated. As a result, Irelands ambitious targets in reducing its GHG emissions were met.² The article provides evidence to Australia's policy makers, consultants and car manufacturers that reforming existing vehicle taxes into an environmental related tax is an effective measure in transitioning Australia into a low carbon transport and reducing road transport emissions.

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¹ European Commission, Communications from the Commission to the Council and the European Parliament: "Results of the review of the Community Strategy to reduce CO₂ emissions from passenger cars and light-commercial vehicles", (SEC) Brussels, February 2007.

² Fionn Rogan et al., "Impacts of an emission based private car taxation policy- first year ex-post analysis" (2011) 45 Transportation Research Part A: Policy and Practice 583, 596.

1 Introduction

The transport sector is arguably the most difficult and expensive sector in which to reduce greenhouse gas emissions (GHG),³ with carbon dioxide (CO₂) generated by transport in Australia increasing by 50.7 percent (93.5 Mt CO₂-e) in 2012-2013 from 1990 levels (62.0 Mt CO₂-e).⁴ Unless the government reverses this trend, CO₂ emissions will continue to rise and offset the gains made in reducing carbon emissions in other energy sectors.⁵ The largest contributor to transport GHG emissions is road transport. The International Energy Agency states that to limit emissions from this sector, policy makers should implement measures to encourage a shift from cars to public transportation and to fuel efficient and lower carbon vehicles.⁶ The scope of this article addresses policy measures that encourage a shift to such lower carbon motor vehicles.

In 2010, the Henry Report stated that GHG (in Australia) were best dealt with through an economy-wide market mechanism or similar scheme, and once they were in place it would be inefficient to impose taxes on transport or fuel.⁷ However, the proposed market mechanism entitled Carbon Pollution Reduction Scheme was not passed through the Senate, and the proposed mechanism was deferred in 2010. Nonetheless, a carbon tax under the Clean Energy Act 2011 was introduced on 1 July 2012.⁸ However, transport fuel for light vehicles was exempted from the carbon tax because it was met

³ Transport Policies to reduce CO₂ Emissions from the light Duty Vehicle Fleet,” in Raymond Kopp and William Pizer (eds.), *Assessing U.S. Climate Policy Options* (Resources for the Future, Washington:2007).

⁴ Australian Government, Australian National Greenhouse, “Quarterly Update of Australia’s National Greenhouse Gas Inventory June Quarterly 2013 Update of Australia’s National Greenhouse Gas Inventory” <http://www.environment.gov.au/system/files/resources/ef4a14b1-9ec8-48d5-b776-70a3795c7bfc/files/quarterly-update-june-2013.pdf> , 8

⁵ Department of Climate Change and Energy Efficiency, “Reducing Carbon: Reducing Australia’s Emissions” (2012) <http://www.climatechange.gov.au/climate-change/greenhouse-gas-measurement-and-reporting/australias-emissions-projections/national> at 27 March 2013.

⁶ France, International Energy Agency, “CO₂ Emissions from Fuel Combustion 2012” <<http://www.iea.org/publications/freepublications/publication/CO2emissionfromfuelcombustionHIGHLIGHTS.pdf>> at 1 July 2013, 10.

⁷ Australia, Australian Government, “Australia’s future tax system: Report to the Treasurer”, Canberra, May 2010, 389; at http://taxreview.treasury.gov.au/content/Content.aspx?doc=html/pubs_reports.htm on 20 February 2013.

⁸ Australia, Australian Government, “Securing a Clean Energy Future, The Australian Government’s Climate Change Plan” 2011< <http://www.cleanenergyfuture.gov.au/wp-content/uploads/2011/07/Consolidated-Final.pdf>> para 3.2.1 at 21 February 2013.

with strong opposition from consumers and did not receive public support.⁹ Rabe¹⁰ found perceived benefits of including transport fuel in a carbon tax may be difficult to discern and not calculable until future generations. Anable, Lane and Kelay¹¹ found that level of support for government action diminishes significantly with respect to policies to tackle emissions from transport.

The Australian Government has since then introduced no other fiscal instrument. Nor did the 2012 Energy White Paper entitled Australia's Energy Transformation¹² set any short and long-term targets to encourage a shift to fuel-efficient and lower carbon vehicles. Clearly, this failure to address road transport emissions makes it challenging for Australia to reach its global obligation to reduce the country's GHG emissions.

Hence, it is argued that rising road transport emissions can be addressed through reforming existing vehicle taxes into an environmental tax. Furthermore reforming an existing tax will receive public acceptance because it only applies to the acquisition of new vehicles and will not receive the political backlash of introducing a new tax.

The earlier literature on the effectiveness of reforming vehicle taxes on the basis of CO₂ emissions has been mixed. However, an ex post analysis of the policy change in the European Union indicates that the success of the differentiated CO₂ vehicle taxes aimed at reducing CO₂ emissions will depend on the design of the tax and the rate of tax differentiation in providing a strong price signal to influence the decisions of consumers to purchase fuel efficient and lower carbon motor vehicles.¹³ It was found to be a "powerful instrument" that could achieve environment goals (reduce carbon emissions),

⁹ Phillip Coorey, "Windsor says he'll stop carbon plans if Greens go too far", The Sydney Morning Herald (Fairfax Media), 28 February 2011. It was considered inequitable to penalize people for living in rural areas by imposing a carbon tax on fuel, when there was no access to public transport in these areas and no alternative but to use private vehicles for transport.

¹⁰ Barry Rabe and Christopher Borick, "Carbon Taxation and Policy Labelling: Experience from American States and Provinces" (2012) 29 Review of Policy Research 3, 358.

¹¹ United Kingdom, UK Department for Transport, "An evidence base review of public attitudes to climate change and transport behaviour" (Jillian Anable, Ben Lane and Tanika Kelay) July 2006.

¹² Australian Government, Department of Industry, "2012 Energy White Paper: Australia's energy transformation" <http://www.ret.gov.au/energy/facts/white_article/Pages/energy_white_article.aspx#what> at September 2013.

¹³ Ibid para 3.3.8.

economic policy goals (vehicle taxation revenue and vehicle ownership levels)¹⁴ and social policy goals (influence car purchase behavior, maintain public acceptance and equity).¹⁵ Depending on the design of the tax, it could control vehicle ownership, vehicle engine efficiency, and the development of new technology.¹⁶ Furthermore, reformed vehicle taxes could indirectly provide a non-tariff barrier that would discourage the importation of high polluting vehicles into the importing country.¹⁷

In the context of reducing carbon emissions of new light motor vehicles, this article first examines the importance of setting environmental policy objectives and targets in formulating policy design. Second, the article assesses Australia's progress in transitioning new motor vehicle fleet to low carbon transport. Third, the article examines whether Australia ought to adopt environmental tax reform of its vehicle taxes by differentiating such taxes on the basis of carbon emissions, and whether it will become a "powerful instrument" in accelerating the transition of Australia's new motor vehicles to a low carbon passenger fleet. A case study of Ireland's effective reform of its vehicle taxes for its passenger fleet in 2008 is examined, because of its similarity with Australia's growing trend for large, high-polluting vehicles and significant growth in road transport emissions. This article provides support for Australian policy makers that reforming existing vehicle taxes into an environmental tax can be effective in reducing road transport emissions by providing a strong price signal that will influence buyers to choose fuel efficient and lower carbon emitting light vehicles.

¹⁴ Christian Brand, Jillian Anable and Martino Tran, "Accelerating the transformation to a low carbon passenger transport system: The role of car purchase taxes and scrappage incentives in the UK" (2013) 49 Transportation Research part A 132.

¹⁵ Ibid.

¹⁶ Heinz Jansen, Cecile Denis, (1999) "Welfare cost assessment of various policy measures to reduce pollutant emissions from passenger road vehicles" 4 Transportation Research: Part D: Transport and Environment 379.

¹⁷ Eri Saikawa, "Policy Diffusion of Emission Standards, Is there a Race to the Top ?" (2013) 65 World Politics 1.

2 Australia's future projections for road transport emissions

In ratifying the Kyoto Protocol to the United Nations in December 2007, the Australian Government committed unconditionally to reduce its emissions by 5 percent and conditionally by 15 or 25 percent of 2000 levels by 2020, depending on the extent of international action.¹⁸

The transport sector in Australia is the second largest source of GHG emissions,¹⁹ and reducing emissions in this sector plays an important role in this country's international obligation to meet the above emission target. However, annual emissions from transport increased by 2.8 percent in the year to June 2013, and offset the decline of emissions in other sectors to a total reduction of the country's emission by 0.1 percent.²⁰

Unless this trend towards rising transport emissions can be reversed, the Australian Government will find it challenging to reach the above commitments. Hence, the Australian Government cannot ignore the challenge to abate transport sector emissions if it is to meet its international obligation to reduce the country's emissions.

2.1 Projected growth in transport emissions

In 2012, the transport sector contributed 15 percent (91 MtCO₂-e) of Australia's net emissions, and is the second largest source of emissions growth in Australia.²¹

¹⁸ Australian Government, Department of the Environment, "Reducing Carbon National Targets: December 2007" <<http://www.climatechange.gov.au/climate-change/greenhouse-gas-measurement-and-reporting/australias-emissions-projections/national>> at 15 September 2013.

¹⁹ Australian Government Department of Environment, "National Greenhouse Gas Inventory June Quarter 2013" <http://www.climatechange.gov.au/sites/climatechange/files/documents/03_2013/nggi-quarterly-2010-dec.pdf> at 29/1/2014, para 3.

²⁰ Australian Government, above n 4,3.

²¹ Australian Government: Department of the Environment. "Australia's Abatement Task and 2013 Emissions Projections", <http://www.environment.gov.au/node/35053> at 30 January 2014, 11.

Table 1: Projected growth of transport emissions

	1990	2000	2020	2030	Increase 1990- 2000		Increase 2000- 2020		Increase 2020- 2030		Increase 1990- 2030	
	Mt CO2-e	Mt CO2-e	Mt CO2-e	Mt CO2-e	Mt CO2-e	%	Mt CO2-e	%	Mt CO2-e	%	Mt CO2-e	%
Transport	62**	75**	99*	106*	13	21	24	32	7	7	44	71
Major contributor Road transport	54**	66**	82**	81**	12	22	16	24	-1	-1.2	27	50
Road transport % of transport	87%	88%	82%	76%	92%		66%		0%		61%	

Source: *Australian Government: Department of the Environment Australia, 'Australia's Abatement Task and 2013 Emissions Projections.'

**Australian Government: Department of Climate Change and Energy Efficiency, 'Australia's Emissions Projections 2012' <http://www.climatechange.gov.au/sites/climatechange/files/files/climate-change/projections/aep-summary.pdf>, 1990: Table 4, 6; 2000: Table 4,6; 2020: Table 5, 7; 2030: Table 6, 8.

From 1990 to 2012, emissions from the transport sector increased by 50.7 percent to 93.5 Mt CO₂-e,²² and are projected to increase to 59.6 percent of 1990 levels by 2020 (99 Mt CO₂-e), and 70.9 percent of 1990 levels by 2030 (106 Mt CO₂-e).

The transport sector in Australia is the largest user of final energy, and accounted for 73 percent of total final consumption²³ in May 2013. Automotive gasoline accounted for 41 percent of total energy use in the sector.²⁴ The challenge for Australia, then, is to reduce emissions from the transport sector given that it is entirely dependent on fossil fuels.^{25,26}

As shown in Table 1, road transport is the largest subsector in the transport emissions, which accounted for 87 percent of transport emissions in 1990, and projected to reduce to 82 percent of transport emissions by 2020 and 76 percent of transport emissions by

²² Australian Government, above n 4, 9.

²³ Australia, Australian Government: Department of Resources, Energy and Tourism, Economics, Energy in Australia May 2013 <http://bree.slicedlabs.com.au/sites/default/files/files/publications/energy-in-aust/bree-energyinaustralia-2013.pdf> at 30 January 2013, 73

²⁴ Ibid, 73.

²⁵ Ella Graham-Rowe et al., "Can we reduce car use and, if so, how? A review of available evidence" (2011) 45 Transportation Research Part A: Policy and Practice 401.

²⁶ Pascal Poudenx, "The effect of transportation policies on energy consumption and greenhouse gas emission from urban passenger transportation" (2008) 42 Transportation Research Part A: Policy and Practice 901.

2030. However, the 2012 White Article has forecast that road transport activity will more than double by 2050.²⁷

Table 1 shows that the Australian Government is projecting future growth in road transport emissions of 24 per cent in the period 2000 to 2020. It is also projecting that this will then slow to no growth in the period between 2020 and 2030 because of a combination of ongoing vehicle efficiency improvements and the adoption of new technologies.²⁸

Vehicle fuel efficiency improvements will include a “substantial fuel substitution” from petrol to diesel and biodiesel,²⁹ a gradual increase in the adoption of hybrid vehicles, and the emergence of electric road vehicles which will become more cost competitive with conventional internal combustion engine vehicles.³⁰ It is projected that the gradual adoption of such vehicles will be a “result of the time taken to turn over the existing vehicle fleet”.³¹ It is also anticipated that there will be a shift in private road transport towards smaller vehicles that are more fuel economical than medium and large passenger vehicles.³²

As the 2012 Energy White Article³³ noted, “...increased fuel efficiency will be essential if emissions are to be reduced [and] innovation and better urban planning will also play important roles.”³⁴ The 2012 Energy Article also pointed to higher fuel prices and the introduction of mandatory CO2 emission standards for light vehicles to improve the vehicle efficiencies of conventional internal combustion engines and the transition to electric and hybrid vehicles.³⁵

²⁷ Australia, Australian Government: Department of Energy, Resources and Tourism, “2012 Energy White”, above n 12 para 3.3.8.:35

²⁸ Australia, Australian Government: Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, “Australia’s Emissions Projections 2012” <<http://www.climatechange.gov.au/reducing-carbon/reducing-australias-emissions/australias-emissions-projections>> at 2 February 2014, 13.

²⁹ Ibid 7.

³⁰ Ibid 12.

³¹ Ibid 12.

³² Ibid 13.

³³ Australian Government: Department of Resources, Energy and Tourism, “2012 Energy White Article”, above n 12.

³⁴ Ibid para 3.3.8: 35.

³⁵ Ibid.

However, the 2012 Energy White Article also observed that, “success will depend on the ability of these technologies to meet consumer needs”.³⁶ In effect, the 2012 Energy White Article assumes consumers will make the gradual transition to alternative technologies such as hybrid, electric and smaller vehicles, without complementary measures such as an environmental tax to encourage consumers to choose such vehicles.

The European Commission, however, found that the combination of fiscal instruments such as mandating CO2 emission standards and the environmental tax of higher fuel prices was not enough to transition to lower carbon vehicles and reduce road transport emissions.³⁷

Whether there will be a change of approach in the release of the Energy White Article in late 2014, given the change of government in 2013, is yet to be seen. In December 2013, the Australian Government released an Issues Article seeking preliminary consultation on “identified issues of interest”, which will be addressed in the Government’s Energy White Article.³⁸ In terms of reducing transport emissions, the Issues Article seeks consultation on the same issues addressed in the 2012 White article, namely the importance of improving fuel efficiency and increasing the use of alternative fuels.³⁹ Further, the Issues Article seeks comments on measures that may encourage changing attitudes and behaviour towards efficient fuel use, as well as the uptake of technology to improve transport energy efficiency.⁴⁰ Moreover, for alternative fuels, the Government seeks comments on any barriers to increasing the uptake of electric vehicles, LPG and advanced biofuels.⁴¹ The Issues Article acknowledges the importance of fuel quality standards and fuel economy disclosure to help improve efficiency,⁴² and that there are “opportunities to raise performance standards utilizing existing legislation, with minimum cost to the economy but with an overall benefit to the economy.”⁴³

³⁶ Ibid para 3.3.8.

³⁷ European Commission, above n 1, para 3.1.

³⁸ Australian Government: Department of Industry, “Energy White Article, Issues Article December 2013”, http://ewp.industry.gov.au/sites/ewp.industry.gov.au/files/energy-white-article-issues-article_0.pdf, at 3 February 2014, (ii)

³⁹ Ibid.

⁴⁰ Ibid, 33.

⁴¹ Ibid, 38.

⁴² Ibid, 32.

⁴³ Ibid, 32.

This article provides ex-post analysis and evidence that reforming existing legislation, namely vehicle purchase taxes, can satisfy the Issues Article directive of changing attitudes and behavior by encouraging the uptake of low emission vehicles to improve fuel efficiency and significantly reduce GHG emissions.

2.2 No future targets to reduce road transport CO2 emissions

The Australian Government has no ambitious targets or strong commitment to reducing GHG emissions from road transport. Instead, the Australian Government forecasts that transport emissions will continue to rise as discussed in paragraph 2.1.

In contrast, other OECD countries have set and/or legislated ambitious targets to reduce road emissions. For instance, the emissions reduction target of the European Commission GHG is to reduce transport emissions by 60 percent by 2050 compared to 1990 levels.⁴⁴ The United Kingdom legislated their 2050 target to cut CO2 equivalent emissions by 80 percent from 1990 levels, with the mid-term target of 60 percent by 2030.⁴⁵ To meet the UK 2030 target, 60 percent of new cars will be required to run on electricity.⁴⁶

The Australian Capital Territory Minister for the Environment, Climate Change and Water, Mr Corbell, claims that people around Australia have become disenchanted with the lack of real action to address climate change. On 26 October 2010, the Australian Capital Territory (ACT) government committed to a “strong and ambitious target” of 40 percent cut in emissions based on 1990 levels by 2020, and 80 percent by 2050. As Mr

⁴⁴ European Commission, “Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system 2011” (European Commission) Brussels, March 2011.

⁴⁵ United Kingdom, UK Committee on Climate Change, “Meeting Carbon Budgets – The Need for a Step Change, Progress Report to Parliament,” 2009 <http://archive.theccc.org.uk/aws2/21667%20CCC%20Report%20AW%20WEB.pdf> at September 2013.

⁴⁶ United Kingdom, UK Committee on Climate Change, Meeting Carbon Budgets UK Committee on Climate Change, “Meeting Carbon Budgets – 3rd Progress Report to Parliament,” 2011 < http://www.theccc.org.uk/wp-content/uploads/2011/06/CCC-Progress-Report_Interactive_3.pdf > at September 2013. (UK Committee on Climate Change, 2011).

Corbell pointed out, “By passing the Climate Change and Greenhouse Reduction Bill 2010, the ACT is showing the rest of the country what must be done.”⁴⁷

The above reduction targets are more challenging than those set by the Federal Government, which aims to reduce carbon emissions from 2000 levels, not from 1990 levels as discussed in paragraph 2.1.

Jarvinen et al. argued that to meet these ambitious targets by 2050 will require significant reduction in carbon emissions, and that these targets are incompatible with simply improving the efficiency of petrol and diesel engines.⁴⁸ Rather, it will require the substitution of the internal combustion engine with alternative power systems.⁴⁹ The Australian Government’s 2012 White Paper shows no such commitment.

2.3 Progress since International Energy Agency Review in 2005

There has not been much progress since the International Energy Agency’s review of Australia in 2005 in terms of reducing transport emissions. The International Energy Agency (IEA) stated that transport was receiving less attention than other sectors, with Australia’s current fuel efficiency standards at the lower end of the IEA countries. Given this, the IEA recommended that if the Australian Government wanted to deal with the overall energy efficiency of the economy, it should address transport energy use more forcefully.⁵⁰ Clearly, Australia’s lack of effective fiscal measures has contributed to Australia’s road transport emissions being one of the highest in the OECD.

⁴⁷ S Corbell, “Greenhouse Gas Emissions Targets Adopted” (2010) Minister for the Environment, Climate Change and Water <http://www.environment.act.gov.au/_data/assets/pdf_file/0020/207335/Greenhouse_Gas_Legislation_Passes_Media_Release.pdf> at 14 June 2013.

⁴⁸ Justine Jarvinen, Fiona Orton and Tim Nelson, “Electric Vehicles in Australia’s National Electricity Market: Energy Market and Policy Implications” (2012) 25 *The Electricity Journal* 63.

⁴⁹ *Ibid.*

⁵⁰ France, International Energy Agency, “Energy Policies of IEA Countries”, Australia 2005 <<http://www.iea.org/publications/freepublications/publication/australia2005.pdf>> at 14 June 2013, 13.

2.3.1 Growth in higher carbon emitting vehicles

As shown in Table 2, the trend of Australia's new vehicle fleet in the period 2010 to 2013 was not towards fuel efficient and lower carbon emitting vehicles.

Table 2: Trends of Australia's new fleet for period 2010–2013

Segment	2010*		2011*		2012**		2013**		2012***
	Volume	Vol %	Volume	Vol %	Volume	Vol %	Volume	Vol %	Average CO2 emissions (g/km)
Light	137,916	16.6	132,422	16.4	137,606	15.5	130,757	14.5	148
Small	239,191	29.0	244,090	30.3	252,167	28.5	266,413	29.6	171
Medium	82,622	10.0	75,984	9.4	87,674	9.9	77,985	8.6	175
Large	98,583	12.0	78,077	9.7	63,096	7.1	52,482	5.8	233
Upper large	3,753	0.4	3,042	0.3	3,235	0.3	4,238	0.4	251
People Movers	12,655	1.5	11,109	1.3	11,640	1.0	9,242	1.0	237
Sports	17,402	2.1	14,570	1.8	21,437	1.3	25,337	2.8	179
Total Passenger	592,122	71.6	559,314	69.6	575,427	65.3	566,454	62.9	
SUV's			244,136		307,253	34.7	333,511	37.0	
. compact			39,535		60,683	6.8	74,809	8.3	190
. medium	35,285	28.4	90,215	30.4	110,044	12.4	119,464	13.3	207
. large			101,292		121,791	13.8	126,530	14.0	236
. luxury			13,094		14,735	1.7	12,708	1.4	287
Passenger and SUV									
Percentage of total vehicles	827,570	100.0	803,450	100.0	882,680	100.0	899,965	100.0	
		79.9		79.6		79.5		79.2	
Light commercial vehicles	179,553	17.4	176,726	17.5	197,704	17.8	204,566	18.0	
Heavy commercial vehicles	28,614	2.8	28,261	2.8	31,648	2.8	31,696	2.8	
Total vehicles	1,035,574		1,008,437		1,112,032		1,136,227		›

*Australian Government, Dept. of Industry, Innovation, Science, Research and Tertiary Education, Key Automotive Statistics , 2010 and 2011 Table 3 p 21,

<http://www.innovation.gov.au/Industry/Automotive/Statistics/Documents/KeyAutomotiveStatistics.pdf>.

**VFACTS 'National Report Vehicle Sales, Federal Chamber of Automotive Industries, December 2012, and 2013', www.fc.ai.com.au/sales.

*** National Transport Commission 'Carbon Dioxide Emissions from New Australian Vehicles 2011, Information Article, March 2012', The National Transport Commission (NTC) prepares an annual report on carbon dioxide emissions from new passenger and light commercial, where a unit for carbon dioxide from vehicles is expressed as grams of carbon dioxide per kilometer (g/km)

<http://www.ntc.gov.au/filemedia/Reports/C02EmissionsNewAustVeh2011InfoPa.pdf>.

When comparing vehicle sales from 2010 to 2013 for the various vehicle segments in Table 2, the following trends are highlighted: sales of higher carbon emitting SUVs increased by 41 percent in 2013 when compared with 2010; sales of lower carbon emitting light vehicles declined by 5.4 per cent; sales of small vehicles increased by 11.3 per cent; and sales of locally produced high carbon emitting large passenger vehicles declined by 46.7 per cent. Further sales of Australia's locally produced large passenger vehicles as a percentage of passenger and SUVs declined from 12 percent in 2010 to 5.8 percent in 2013.

Overall, Table 2 shows a trend towards higher carbon emitting SUV vehicles rather than a transition to low carbon passenger vehicles. The continuing growth of the high carbon emitting SUVs in Australia's new vehicle sales as shown in Table 2 is in stark contrast to other OECD countries, where market share of large SUVs has decreased.⁵¹ In the EU, 30.5 percent of total new car registrations in 2011 were passenger cars emitting 101–120gCO₂/km, and 67 percent of registrations were vehicles emitting less than 140g of CO₂/km.⁵²

The continuing growth of SUVs in Table 2 has been described as “Four wheel drives lead car sales to record highs”,⁵³ “SUVs are the ‘fastest growing segment’, and as the “SUV phenomenon”.⁵⁴ This choice of vehicle by consumers can have a significant impact on CO₂ emissions. For example, on average an SUV produces 70 percent more emissions than a smaller car;⁵⁵ this is discussed further in paragraph 4.1.

⁵¹ France, International Energy Agency, “Tracking Clean Energy Progress 2012” <http://www.iea.org/media/etp/Tracking_Clean_Energy_Progress.pdf> at 2 April 2013.

⁵² Denmark, European Environment Agency, “Monitoring CO₂ Emissions from new passenger cars in the EU: Summary of data for 2011” (European Union) Copenhagen, April 2013.

⁵³ Richard Blackburn, “4WDs lead car sales to record highs”, Sydney Morning Herald, 4 January 2013 <<http://www.smh.com.au/business/the-economy/4wds-lead-car-sales-to-record-highs-20130104-2c850.html>> at 6 March 2013.

⁵⁴ Stephen Ottley, “Soon it will be plug it in not fill it up”, Sydney Morning Herald, 26 February 2011 <http://smh.drive.com.au/motor-news/soon-it-will-be-plug-it-in-not-fill-it-up-20110225-1b8sa.html?utm_medium=twitter&utm_campaign=DTN+Australia%3A&utm_source=twitterfeed&utm_medium=twitter&utm_campaign=DTN+Australia%3A&utm_source=twitterfeed> at 6 March 2013.

⁵⁵ United Kingdom, British Government, “The King Review of low-carbon cars Part I: the potential for CO₂ reduction 2007” <<https://research.mbs.ac.uk/INNOVATION/Portals/0/docs/seminar/kingreview.pdf>> at September 2013.

In 2007, the European Commission stated that while fuel efficiency increased due to improvements in car technology in the period to 2004, new cars sold in the European Union (EU) had become significantly bigger and more powerful.⁵⁶

The same trend is occurring in Australia and has contributed to Australia's national average carbon emissions from new passenger vehicles being 46 percent higher than in the EU (199g/km compared to 136g/km)⁵⁷ in 2012. Australia's national average carbon emissions from new passenger and light commercial vehicles performance have not improved significantly since the IEA reported on Australia's performance in a 2006 survey of 19 IEA member countries. In this survey, it was reported that Australia had the least efficient road passenger transport and one of the lowest levels of new passenger vehicle fuel efficiency in the world, and that the gap was expected to widen.⁵⁸

Moreover, had Australian consumers purchased vehicles with best-in-class emissions in 2012, the national average carbon dioxide emissions could have been reduced to 119g/km, that is, a reduction of 40 percent.⁵⁹ However, with no effective fiscal measures in place, consumers are not encouraged to acquire these best-in-class fuel efficient and lower carbon vehicles.

2.3.2 Vehicles sold by EU importers have higher average CO₂ in Australia than in the EU

The National Transport Commission (NTC) found CO₂ emissions from new vehicles are higher in Australia than in the EU because fewer fiscal measures have been adopted to reduce carbon dioxide emissions.⁶⁰ Further, the absence of strong fiscal measures has allowed unrestricted importation of high carbon emitting vehicles into the Australian new car market. These vehicles would not have sold in the importer's market because

⁵⁶ European Commission, above n 1, 6.

⁵⁷ Australian Government, National Transport Commission, "Carbon Dioxide Emissions from New Australian Vehicles 2012" <<http://www.ntc.gov.au/filemedia/Reports/C02EmissionsNewAustVeh2012InfoPa.pdf>> at 14 October 2013.

⁵⁸ Australian Government Minister's Task Group on Energy Efficiency, "Report of the Prime Minister's Task Group on Energy Efficiency July 2010" <http://ee.ret.gov.au/sites/default/files/documents/03_2013/report-prime-minister-task-group-energy-efficiency.pdf> at 14 October 2013, 126.

⁵⁹ National Transport Commission, above n 57, 14.

⁶⁰ Ibid 25.

high vehicle taxes are imposed and discourage the purchase of less fuel-efficient vehicles, as discussed in paragraph 2.3.3. For example, the NTC reports that the average emissions in 2011 for new vehicles by manufacturer for the European Union was at its lowest 119 g/km for Fiat, and at its highest 153 g/km for Daimler, compared to the average emissions of imported vehicles in Australia which at its lowest was 152g/km for Fiat, and at its highest 227 g/km for Volvo.⁶¹

2.3.3 Absence of fiscal measures impacts on local car production

Further, the absence of fiscal measures has allowed the Australian local car industry to become uncompetitive by continuing to manufacture high carbon emitting vehicles, thus limiting car exports to countries without such fiscal measures, such as the Middle East. Economic instruments that directly affect trade have been described as non-tariff barriers because governments restrict imports based on whether the product meets their domestic standards for environmental performance.⁶² Rather than raise the Australian local car industry's environmental standards and bring them into harmony with the stricter standards of their export markets, proponents such as Mr Weber of the Federal Chamber of Automotive Industries justify the local car industry's position, and argue that Australia needs to "beat down the non tariff barriers across South East Asia for the domestic car industry to remain viable."⁶³

2.3.4 Importance of fuel economy to rational economic consumers

The 2012 White Paper claims that consumers will shift to fuel efficient vehicles with higher fuel costs (as discussed in paragraph 2.1). However the findings in the 2002 EU study prepared by COWI A/S (discussed in paragraph 3.2), found rising fuel prices had little effect on people's buying patterns of fuel inefficient, high polluting vehicles.

⁶¹ Ibid 25.

⁶² Eri Saikawa, "Policy Diffusion of Emission Standards: Is there a Race to the Top?" (2013) 65 *World Politics* No 1.

⁶³ Jason Murphy, "Local Auto industry blames FTA with Thailand", *Australian Financial Review*, 10 April 2013, 3.

In terms of buying a car, Greene et al,⁶⁴ and Anable et al⁶⁵ found that up-front vehicle purchase price, reliability, and safety are more important to consumers than environmental concerns. Further, traditional preferences such as appearance, power, image and brand also feature more strongly in consumer's decision making when buying a car. The Australian Bureau of Statistics supports the above findings, given 58 per cent of people considered "purchase cost" to be a key factor when buying a new car in 2012, followed by "fuel economy/running costs" (41 per cent).⁶⁶ Yet, despite public awareness, only 7 per cent of households would consider the "impact on the environment" when choosing a new passenger vehicle.⁶⁷

While fuel consumption is an important factor when choosing a car, consumers take a very short-term view when weighing up vehicle purchase costs, and on average apply a very high discount rate of 60 percent or an equivalent 18 month payback period for fuel costs.⁶⁸ Fisher et al.⁶⁹ explained that if consumers fully valued the discounted present value of future fuel savings, then fuel economy standards would largely be redundant. Anable et al.⁷⁰ found that even if fuel consumption was a first order proxy, its importance 'drops off' nearer to the purchase decision when, as literature suggests, non-environmental factors as discussed above continue to dominate the car purchase process.⁷¹ Van Dender⁷² found the problem of low willingness to pay for better fuel economy at least partly stems from consumers' reluctance to pay up front in return for an uncertain reduction in fuel expenditure. Greene et al makes the following observation: If consumers undervalue fuel economy improvements relative to their expected present value over the full life of a vehicle, the market will provide too little

⁶⁴ David Greene, John German and Mark Delucchi, "Fuel Economy: The Case for Market Failure" in James Cannon and Daniel Sperling (eds)", *Reducing Climate Impacts in the Transportation Sector* (Springer Science and Business Media, Knoxville: 2009).

⁶⁵ Jillian Anable, Ben Lane and Tanika Kelay, above n 11.

⁶⁶ Australian Government: Australian Bureau of Statistics, "4102.0 – Australian Social Trends, July 2013", <http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features40July+2013#use> at 3 February 2014.

⁶⁷ Ibid.

⁶⁸ The King Review Part I: the potential for CO2 reduction (2007)1-79: 60.

⁶⁹ United States of America, "Economic Impacts of Tightening the Corporate Average Fuel Economy (CAFE) Standards" (Carolyn Fisher, Winston Harrington and Ian Parry), Washington, June 2004.

⁷⁰ Jillian Anable, Ben Lane and Tanika Kelay, above n 11.

⁷¹ Ibid.

⁷² Kurt van Dender, "Energy Policy in transport and transport policy" (2009) 37 *Energy Policy* 3854.

fuel economy and will under-invest in research and development of energy efficient technologies.⁷³

The evidence on consumers' decision making in undervaluing fuel economy is against the rational economic model, and likely to lead to market failure.⁷⁴ Greene⁷⁵ adds that policies that influence the market via purchase price such as feebates or fuel economy standards have greater leverage on fuel economy than fuel prices. Thus, Greene's views support the European Commission COWI A/S study⁷⁶ findings discussed in paragraph 3.2.

Therefore it is critical to provide a strong price signal to ensure the environmental aspect is factored in when choosing a fuel-efficient, low emitting vehicle and does not 'drop-off' at the time of purchase. The European Commission found that reforming existing vehicles taxes differentiated on the basis of carbon emissions was a "powerful instrument" that provides a strong, up front price signal that encourages the acquisition of low carbon vehicles.⁷⁷

It is argued that reforming vehicle taxes into an environmental tax differentiated on the basis of carbon emission is critical, given that Australia has no effective environmental policy instrument to accelerate the transition to lower carbon motor vehicles. The 2010 Henry Report's finding that such supplementary measures are not required is no longer applicable,⁷⁸ given that transport fuels for light vehicles (4.5 tonnes or less) are exempt from the carbon tax, as discussed in paragraph 1.0. Fuel tax adjustments were made to heavy vehicles (more than 4.5 tonnes) under the Clean Energy (Fuel Tax Legislation Amendment) Bill 2011 by reducing existing fuel tax credits by an amount equal to the carbon price, which was imposed through the existing fuel tax regime. Thus, the government indirectly imposed a carbon price on business for its liquefied and gaseous fuel emissions.⁷⁹

⁷³ David Greene, John German and Mark Delucchi, above n 64.

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ European Commission, European Commission's Directorate-General for Environment, "Fiscal Measures to Reduce CO2 Emissions from New Passenger Cars" (COWI), Denmark, January 2002.

⁷⁷ European Commission, above n 1, para 3.3.1.

⁷⁸ Australia, Australian Government, above n 8.

⁷⁹ Clean Energy (Fuel Tax Legislation Amendment) Bill 2011. The fuel tax credits will not be reduced for the agriculture, forestry and fishery industries. The Government had intended to introduce further

3 Vehicle taxes

Potter et al.⁸⁰ considered it important to target the taxation measure that has impact. The taxing point for the ‘purchase of vehicles’ and ‘ownership of vehicles’ are commonly referred to as ‘vehicle taxes’, which are generally designed for revenue generation rather than as an instrument to reduce carbon emissions.^{81,82} However, the base of such taxes can be carbon differentiated to provide a strong price signal to influence the acquisition of fuel-efficient and low CO₂ emitting motor vehicles.

3.1 Overview

There is a growing body of literature that supports vehicle taxes as a means of providing strong price signals to influence consumers on the type of vehicles being purchased, by reducing CO₂ emissions intensity in new passenger vehicles.⁸³ Most vehicle taxes are paid annually and/or at the time of purchasing a new vehicle. For the purposes of this article, the annual tax will be referred to as ‘ownership tax’. This is commonly known as ‘circulation tax’ in the EU, and as ‘registration tax’ in Australia. The ownership tax is levied over the period the vehicles is owned and is normally recurrent in nature.⁸⁴

A ‘vehicle purchase tax’ is paid at the time the new passenger vehicle is acquired, commonly known as a ‘registration tax’ in the EU, and ‘stamp duty’ in Australia. An alternative to a vehicle purchase tax is a ‘feebate/bonus malus’, which is a combination

legislation to apply a carbon price on heavy on-road vehicles from 1 July 2014, but this measure was not agreed to by all the members of the Multi-Party Climate Change Committee.

⁸⁰ Stephen Potter et al., “Tax Treatment of employer commuting support” (2006) 26 *Transport Reviews* No. 2 221.

⁸¹ Australia, Australian Government, above n 8, 338.

⁸² Thomas Sterner, “Fuel taxes: an important instrument for climate policy” (2007) *Energy Policy* 1.

⁸³ Growing literature supporting the reform of vehicle taxes differentiated on the basis of CO₂ emissions, includes: European Commission, above n 1; Christian Brand, Jillian Anable and Martino Tran, above n 14.; Sean Giblin and Aonghus McNabola, ‘Modelling the impacts of a carbon emission-differentiated vehicle tax system on CO₂ emissions intensity from new vehicle purchases in Ireland’ (2009) 37.4 *Energy Policy* 1404; Fionn Rogan et al, above n 2; Hugh Hennessy and Richard Toll, ‘The impact of tax reform on new car purchases in Ireland’ (2011) 39 *Energy Policy* 7059; France, International Energy Agency, *Policy Pathways, Improving Fuel Economy of Road Vehicles 2012* <http://www.iea.org/publications/freepublications/publication/Fuel_Economy_2012_WEB.pdf> at 14 October 2013, 32.

⁸⁴ Uwe Kunert and Harmut Kuhfeld, “The diverse structures of passenger car taxation in Europe and the EU Commissions proposal for reform” (2007) 15 *Transport Policy* 306.

of a vehicle purchase tax/fee and a rebate/subsidy⁸⁵ that rewards buyers of vehicles that are more fuel-efficient than the average vehicles, and penalizes buyers of less fuel efficient vehicles.⁸⁶ In addition to vehicle taxes, most EU countries will also impose a ‘Value Added Tax’ (VAT), known as a ‘Goods and Services Tax’ in Australia, based on the before-tax sale price of the new passenger car. Some EU countries differentiate the tax according to the vehicles CO2 emissions. Further discussion of VAT is beyond the scope of this article.

3.2 EU studies support reforming vehicle taxes on basis of CO2 Emissions

There have been several studies commissioned by the European Union on the transport CO2 emissions mitigation policies. Modeling prepared by COWI A/S in 2002 (COWI study), a leading international consulting group, was commissioned by the European’s Directorate-General for Environment (DG-ENV) in co-operation with the Directorate for Taxation and Customs Union (DG-TAXUD)⁸⁷ to “study the potentials effects of fiscal framework measures to reduce CO2 emissions of new passenger cars”.⁸⁸ The object of the study was to determine which fiscal measures will assist the Commission to achieve the European Council and the European Parliaments target of reducing CO2 emissions from new passenger cars to 120g of CO2/km by 2005, or by 2010 at the latest.⁸⁹ The study considered the “CO2 efficiency of the national taxation system”, and in light of the analysis, individual Member States were able to review their national taxation system.⁹⁰

The COWI study found substantial variations in the vehicle taxation systems of nine selected Member States: Belgium, Denmark, Finland, Germany, Italy, Netherlands, Portugal, Sweden and the UK. The COWI study selected these countries on the basis they were sufficiently representative of the following factors: GDP, population density,

⁸⁵ Kelly Gallagher and Erich Muehlegger, “Giving green to get green? Incentives and consumer adoption of hybrid vehicle technology” (2011) 61 *Journal of Environmental Economics* 1.

⁸⁶ Christian Brand, Jillian Anable and Martino Tran, above n 14.

⁸⁷ European Commission’s Directorate-General for Environment, above n 76, 2.

⁸⁸ Ibid.

⁸⁹ Ibid 23.

⁹⁰ Ibid 23.

family structures, urbanization, taxation systems, income levels, income distribution, and whether there was a domestic production of cars or not.⁹¹

Of the selected countries, five countries do not have vehicle purchase taxes (Germany, Luxembourg, Sweden, France and the UK). However, France adopts a bonus-malus system, which grants a premium for the purchase of low emitting vehicles, explained in paragraph 5.1. The remaining four selected countries (Denmark, Finland, The Netherlands and Portugal) applied very high levels of vehicle purchase tax compared to ownership tax. There was no uniformity across the Member States on the design of the vehicle purchase taxes, which were typically based on the physical properties of the car such as cylinder capacity or fuel consumption, or related to the price of the car.⁹²

The annual ownership taxes on passenger cars applied to all nine selected countries except France, which is a regional measure rather than a national one.⁹³ Again, the average ownership taxes exhibited substantial variations among countries, and could be based on the vehicle's technical characteristics such as fuel type, dead weight, cylinder capacity, engine size, fuel consumption, and age of the vehicle.⁹⁴

The findings from the COWI A/S Study on the potential of reforming vehicle taxes as a measure to support the demand for more CO2 vehicles were as follows:

- Both vehicle purchase tax and ownership tax have the ability to provide CO2 reductions. No type of tax is superior to another;⁹⁵
- It is essential to differentiate the taxes in such a way that taxes on very energy effective cars are significantly lower than taxes on cars with poor energy efficiency;⁹⁶
- Enhancing the differentiation of existing systems can provide significant CO2 reductions. However, the modeling shows that the largest CO2

⁹¹ Ibid 1.

⁹² Ibid 42.

⁹³ Ibid 13.

⁹⁴ Ibid 42.

⁹⁵ Ibid 115.

⁹⁶ Ibid 1.

reductions occurred when existing tax systems were replaced by purely CO2 differentiated element for both vehicle purchase tax and ownership tax;⁹⁷

- Simple increases of the taxes that do not involve changes to the tax base provide only very small CO2 reductions;⁹⁸
- A shift to fuel efficient vehicles may increase the share of diesel vehicles that can provide further significant CO2 reductions.⁹⁹

The COWI study concluded that both vehicle taxes were effective measures in reducing CO2 emissions and supporting the target to reduce CO2 emissions from new cars down to a level of 120 g/km. Modeling from the COWI study found that the average emissions of new passenger cars could be reduced on average by about 5 percent by 2008 if the existing tax base were converted to a CO2 differentiated system.¹⁰⁰

In terms of fuel taxes, the COWI A/S Study found increasing fuel taxes by a further 25 percent would bring about only a very small reduction in the average CO2 emissions from new cars in the order of less than 1 percent. Only in a very few cases was the reduction more than 1 percent, but never above 2 percent.¹⁰¹ The COWI study concluded that fuel taxes are not very effective as an instrument in reducing average CO2 emissions from new cars, but in a broader sense can encourage energy efficient driving behaviors.¹⁰² Further discussion of fuel taxes is outside the scope of this article.

3.3 EU vehicle taxes reformed to meet CO2 emission targets

In 1998, the Association of European Car Manufacturers (ACEA) entered into a voluntary agreement with the European Commission under the Memorandum of Common Understanding ‘to limit average emissions from newly registered passenger cars to 140g/km by 2008’.¹⁰³ No fines were imposed if manufacturers failed to meet these standards.

⁹⁷ Ibid 115.

⁹⁸ Ibid 1.

⁹⁹ Ibid 115.

¹⁰⁰ Ibid.

¹⁰¹ Ibid 21, 115.

¹⁰² Ibid 115.

¹⁰³ European Commission, “Communication from the Commission to the Council and the European Parliament – Implementing the Community strategy to reduce CO2 emissions from cars: an environmental agreement with the European automobile industry”, Brussels, 29 July 1998.

In 2004, emissions from the average new car sold reached 163g CO₂/km, which was 12.4 per cent below the 1995 starting point of 186g CO₂/km.¹⁰⁴ While efficiency improvements in car technology delivered most of the reductions in CO₂ emissions, the rebound effect was that new cars sold in the EU during this period became significantly bigger and more powerful.¹⁰⁵ By 2005, it was clear that the ACEA would not meet the target of 140g of CO₂/km by 2008.¹⁰⁶ On 5 July 2005, the European Commission (Commission) presented a proposal for a Directive that would require Member States to harmonize their vehicle taxes and link CO₂ emissions to car taxes.¹⁰⁷ At the time, only several Member States reformed their vehicle taxes to promote the acquisition of fuel-efficient vehicles.¹⁰⁸

Again in 2007, the Commission reported to the Council and the European Parliament that notwithstanding that vehicle taxes “can significantly contribute to lowering the costs of compliance with efficiency targets”, its implementation by Member States had been disappointing.¹⁰⁹

The Commission proposed the adoption of concrete fiscal measures to “drive consumer demand towards fuel efficient cars: this would foster a more sustainable car market, where manufacturers can compete on grounds of environmental performance” without having to jeopardize improvements in comfort and safety considered to be important to consumers.¹¹⁰ Member States were reminded of their responsibility to reduce CO₂ emissions through CO₂ related taxes and other fiscal instruments.¹¹¹

¹⁰⁴ European Commission, above n 1, 8.

¹⁰⁵ Ibid.

¹⁰⁶ Thomas Klier and Joshua Linn, “Using Vehicle Taxes to reduce carbon dioxide emission rates of new passenger vehicles: Evidence from France, Germany and Sweden” (2012) Resources for the Future <<http://web.mit.edu/ceep/www/publications/workingarticles/2012-011.pdf>, 8> at 2 October 2013.

¹⁰⁷ European Commission, “Passenger car related taxes directive” (Council Directive, Commission of European Communities) July 2005 COM(2005) 261.

¹⁰⁸ European Commission, “Progress report on implementation of the Community’s integrated approach to reduce CO₂ emissions from light duty vehicles” (Commission to the European Parliament, the Council and the European Economic and Social Committee) Brussels, November 2010.

¹⁰⁹ European Commission, above n 1, 2.2.3.

¹¹⁰ Ibid 3.1.

¹¹¹ Ibid 3.3.

The Commission proposed a Council Directive to support the adoption of passenger car taxation, and to promote the “purchase of fuel efficient cars throughout the EU and help manufacturers in respect to the upcoming efficiency framework.”¹¹²

To ensure regulatory targets be met, the European Parliament and the Council mandated the average new car fleet target by 2012, and set a long-term target of 95g CO₂/km by 2020.¹¹³ However, subsequent negotiations between the EU Member States and lobbying by the car industry persuaded the Commission to increase the original proposed target from a maximum of 120g to 130g CO₂/km, and delay the target date by a further three years from 2012 to 2015 with interim targets.¹¹⁴

Yet again, the Commission encouraged Member States to adopt differentiated “car taxation” based on carbon emissions as soon as possible, because it was a “powerful instrument” to influence the purchase decisions of the consumers by promoting the purchase of fuel efficient and low CO₂ emitting cars.¹¹⁵

The car taxation measure would facilitate the efforts of the car manufacturers to meet their obligations to bring such fuel-efficient technology to the market, making it easier to meet their CO₂ reduction target.¹¹⁶ Differentiated taxes would apply to all cars on the market. Car manufacturers also supported the introduction of tax measures to shape consumers’ demand towards fuel-efficient cars, and help create a market for breakthrough technologies.¹¹⁷

¹¹² Ibid 3.3.1.

¹¹³ European Parliament and of the Council, “Setting emission performance standards for new passenger cars as part of the Community’s integrated approach to reduce CO₂ emissions from light-duty vehicles: Regulation (EC) 443/2009” <<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:008:en:PDF>> accessed on 14 October 2013> at 14 October 2013.

¹¹⁴ Greenpeace, “Claims versus reality: How the European car lobby proved itself wrong”, *Climate Consultations*, 2 December 2011 <http://ec.europa.eu/clima/consultations/0012/citizens/barry_dagleish_claims_v_reality_en.pdf> at 19 April 2013.

¹¹⁵ European Commission, above n 1.

¹¹⁶ Ibid.

¹¹⁷ ACEA, “Vehicles In Use: The Automobile Industry Pocket Guide” (2012) European Automobile Manufacturers’ Association <http://www.ACEA.be/news/news_detail/tax_guide_2012_incentives_increase_further/> at 2 April 2013.

By 2008, many Member States commenced reforming the base of their vehicle's taxation systems to CO2 differentiation emission rates.¹¹⁸ The reform measures entailed either a complete redesign of the vehicle taxation system or additional CO2 emission taxes or subsidies being added to the pre-existing taxes.¹¹⁹

3.4 Vehicle taxes vary between Member States in the EU

By 2012, 19 of the 27 EU Member State countries imposed some form of CO2 based vehicle taxes on the vehicle purchase tax and/or ownership tax of passenger cars, compared with 11 in 2007 and nine in 2006.¹²⁰ Eight of the 19 countries applied some form of CO2 tax on both vehicle taxes (Denmark, Cyprus, Finland, France, Ireland, Malta, Portugal and The Netherlands); six countries applied some form of CO2 tax only on the vehicle purchase tax (Austria, Belgium, Latvia, Romania, Slovenia and Spain); and five countries applied some form of CO2 tax only on the ownership tax (Germany, Greece, Sweden, Luxembourg and the UK).¹²¹

Any inter-country comparisons should be “done with utmost care” as the total achievable reduction in CO2 emissions can vary depending on the degree of tax differentiation adopted by the country; further, the implemented system can be complex and quite different from country to country.¹²² Table 3 shows the performance of nine EU member states in reducing CO2 emissions by reforming existing vehicle taxes and applying some form of CO2 tax to the ownership and/or vehicle purchase taxes.

¹¹⁸ Lisa Ryan, Susana Ferreira and Frank Convery, “The impact of fiscal and other measures on new passenger car sales and CO2 emissions intensity: Evidence from Europe” (2009) 31 *Energy Economics* 365; Fionn Rogan et al, above n 2; Thomas Klier and Joshua Linn, above n 116. Thomas Klier and Joshua Linn, above n 116 examined the fiscal measures such as vehicle taxes to influence consumers to choose more fuel-efficient vehicles.

¹¹⁹ Thomas Klier and Joshua Linn, above n 106.

¹²⁰ ACEA, “Overview of CO2-Based Motor Vehicle Taxes in the EU” (2013) European Automobile Manufacturers' Association <http://www.acea.be/news/news_detail/tax_guide_2012_incentives_increase_further/> at 15 October 2013.

¹²¹ Ibid.

¹²² Uwe Kunert and Harmut Kuhfeld, above n 84 refers to the vehicle tax systems in Europe, being very diverse. This applies to the types of charges, the multitude of assessment bases and the tax scales: Zahedi and L Cremades, Taxes in “EU Countries: How Fair is their Calculation? (2012) XVI International Congress of Engineering Projects”, (University of Politecnica de Catalunya, Barcelona) <<http://upcommons.upc.edu/e-prints/bitstream/2117/18150/1/vehicles.pdf>> refers to the fact that vehicle taxes in the EU are very complex and vary from country to country, and not all vehicle taxes are efficient for the purposes of reducing CO2 emissions.: European Commission, European Commission's Directorate-General for Environment, above n 76., refers to the types of taxes that are in effect in the Member States. The specific design of the taxes differ substantially between the Member States, in terms of the level of taxation; the extent to which differentiation is applied and the tax base in use.

Table 3: New car purchase tax and average CO₂ emissions from new passenger cars by member state

Countries	2008 CO ₂ g/km	2009 CO ₂ g/km	2010 CO ₂ g/km	2011 Co ₂ g/km	2012 Co ₂ g/km	% Change 2012**
Ownership taxes						
Germany	164.8	154	151.2	145.6	141	-17.0
United Kingdom	158.2	149.7	144.2	138.1	133	-18.8
Vehicle purchase taxes						
Belgium	147.8	142.1	133.4	130.0	128	-16.4
Spain	148.2	142.2	138.0	136.0	132	-16.0
Bonus malus						
France	140.1	133.5	130.5	127.7	124	-16.8
Vehicle purchase tax and ownership taxes						
Ireland	156.8	145	133.2	128.2	125	-24.2
Portugal	138.2	133.8	127.3	122.8	119	-16.6
Denmark	146.4	139.1	126.6	125.0	117	-25.7
Netherlands	156.7	146.9	135.8	126.2	123	-25.1

* Source: European Environment Agency

** Source: ACEA Pocket Guide 2013 http://www.acea.be/uploads/publications/CO2_tax_overview_2013.pdf

Countries with the most effective CO₂ tax schemes had the biggest reductions in carbon emissions and the lowest average CO₂ emissions from new passenger cars, as shown in Table 3.

3.5 Member states that adopt both vehicle taxes

Table 3 shows that The Netherlands, Denmark, Portugal and Ireland have imposed both vehicle taxes (acquisition and ownership), and have the lowest average CO₂ specific emissions from newly registered vehicles in the EU, below the average emissions CO₂ target of 130gCO₂/km.¹²³

Denmark has the highest vehicle purchase tax followed by The Netherlands, which is reflected in both countries having the lowest average emissions for new cars of any

¹²³ European Union, European Environment Agency, "Monitoring CO₂ emissions from new passenger cars in the EU: summary of the data for 2012" www.eea.europa.eu/publications/monitoring_CO2_emissions_from_new_passenger_cars_in_the_EU-2.pdf at 22 April 2013.

member states.¹²⁴ The Netherlands made significant progress in 2011 by jumping from seventh place in 2010 to second in 2011, largely due to tax changes encouraging sales of lower CO2 vehicles.¹²⁵

Ireland has the fourth highest tax burden on petrol and diesel car ownership within the EU 25.¹²⁶ Rogan¹²⁷ found that the policy change in vehicle taxes acted as a strong price signal and consumers response was greater than expected, evidenced by the reduction in Ireland's average emissions from new passenger vehicles by 29.3 percent within four years of introducing vehicle purchase taxes in 2008. In effect, Ireland's vehicle taxation system has reduced the country's average carbon emissions for new vehicles within a comparatively short time frame.

4 Case study: Ireland

Ireland is chosen as a case study because of the country's similarities with Australia. Namely, Ireland had to address the significant growth¹²⁸ in the transport sector and the growing preference for high emitting vehicles.¹²⁹

¹²⁴ Amela Ajanovic and Haas Reinhard, "The role of efficiency improvements vs. price effects for modeling passenger car transport energy and demand- Lessons from European countries" (2012) 41 *Energy Policy* 36.

¹²⁵ Anon, "Europe cleaning up act as car CO2 targets loom" (2012) JATO <<http://www.jato.com/PressReleases/Europe%20cleaning%20up%20act%20as%20car%20CO2%20targets%20loom.pdf>> AT 5 July 2013.

¹²⁶ Uwe Kunert and Harmut Kuhfeld, above n 84.

¹²⁷ Fionn Rogan et al, above n 2.

¹²⁸ Brian O'Gallachoir, Martin Howley and Morgan Bazilian, "How private car purchasing trends offset efficiency gains and the successful energy policy response" (2009) 37 *Energy Policy* 3790. The growth of transport emissions outstripped the growth in other sectors. The emissions growth varied across the years: 11.4% per annum growth in the period 1995-2000, compared with annual growth of 3.3 per cent between 1990 to 1995. In 2006, the transport sector was the only sector exhibiting significant growth in the energy-related CO2 emissions. If there had been no growth in the transport sector, there would have been an overall reduction in emissions of 2.8 percent in overall energy related CO2 emissions. 3791

¹²⁹ European Commission, "Communications from the Commission to the European Parliament, the Council and the European Economic and Social Committee," (COM) Brussels, February 2007.

4.1 Growth of Ireland's transport emissions

The transport sector accounted for 19.9 percent of CO₂ emissions in 1990 and increased to 34.6 percent by 2006 due to an annual growth rate of 6.5 per cent.¹³⁰ Given this, the National Climate Change Strategy in Ireland¹³¹ forecasted that this sector would account for the largest increase in emissions by 2010 if no policy measures were taken.

Additionally, the EU assigned specific emission reduction targets for each Member State in order to support reaching its target of 20 percent GHG reduction relative to 1990 levels by 2020.¹³² Ireland's assigned reduction target in non-ETS emissions was 20 percent compared to 2005 levels by 2020. This target would require a reduction of 1.29 percent annually between 2009 and 2020.¹³³

Ireland focused its reforms on private car transport because in 2007 it accounted for 37.5 percent of transport GHG emissions and 12 percent of non-ETS GHG emissions.¹³⁴ Transport CO₂ emissions rose sharply between 1990 and 2007 when the stock of cars on Irish roads more than doubled.¹³⁵ Between 1990 and 2007 there was a 182 percent (6.3 percent per annum) growth in energy-related CO₂ emissions from the transport sector,¹³⁶ thus making it extremely challenging for Ireland to achieve the projected 1.29 percent annual reduction in non-ETS emissions.

At the time, smaller cars in the 900cc were declining in numbers, compared to strong growth in the 1.7 – 1.9lcc, and greater than 1.9lcc range, indicating a growing trend toward purchasing larger vehicles.¹³⁷ Thus, cars with engines greater than 1.71 cc increased their share from 13 percent in 1990 to 29 percent in 2006, with the market in this period being dominated by petrol cars.¹³⁸

¹³⁰ Brian O'Gallachoir, Martin Howley and Morgan Bazilian, above n 128: 3791.

¹³¹ Ireland, Irish Government: The Department of Environment and Urban Economics, "National Climate Change Strategy in Ireland" (NCCSI), Dublin, 2007.

¹³² Hannah Daly and Brian O'Gallachoir, "Modelling private car energy demand using a technological car stock model" (2011) 99(4) Transportation Research Part D: Transport and Environment 1145.

¹³³ Ibid.

¹³⁴ Ibid.

¹³⁵ Ireland: Martin Howley, Fergal O'Leary and O'Gallachoir "Sustainable Energy Ireland", *Energy in Transport 2007* Cork, October 2007.

¹³⁶ Ibid.

¹³⁷ Brian O'Gallachoir, Martin Howley and Morgan Bazilian, above n 128.

¹³⁸ Ibid.

The challenge in Ireland (as it remains in Australia) was to address consumers growing preference to buy larger vehicles. The choice of vehicle by consumers can have a significant impact on CO2 emissions. For example, an SUV on average has 70 percent more emissions than a smaller car¹³⁹ as discussed in paragraph 2.3.

Petrol/electric hybrids can have CO2 emissions up to 30 percent below their petrol or diesel equivalents with the Toyota Yaris hybrid emitting just 79g/km compared with 104g/km for the lowest diesel Yaris in 2012.¹⁴⁰ Therefore, choosing a more fuel-efficient vehicle achieves financial savings, as the vehicle requires less fuel for the same distance travelled and produces less CO2 emissions as a result of lower fuel use.¹⁴¹

4.2 Ireland's vehicle tax base shifts from engine size to CO2 emissions

Ireland reformed its vehicle taxes on 1 July 2008, and targeted the car purchasing trends by changing the basis of vehicle taxation from engine size to (potential) emissions per kilometer on both the vehicle purchase tax and ownership tax. This was done in order to ensure that any private car manufacturers' efficiency gains were not offset by purchasing trends.¹⁴² The change affects new private cars but has no effect on usage costs,¹⁴³ with older cars remaining on the prior 'engine size' based systems.¹⁴⁴ The reforms introduced to Ireland's vehicle taxes were as presented in Table 4.

¹³⁹ Great Britain, British Government, "King Review of low-carbon cars"(Professor Julia King) Birmingham, March 2007.

¹⁴⁰ United Kingdom, The Society of Motor Manufacturers and Traders (SMMT), "Driving the Motor Industry New Car CO2 Report 2013, The 23rd Report" <<http://www.lowcvp.org.uk/assets/reports/SMMT-New-Car-CO2-Report-2013-web.pdf>> at 15 July 2013.

¹⁴¹ British Government, above n 139.

¹⁴² Fionn Rogan et al., above n 2.

¹⁴³ Hugh Hennessy and Richard Toll, above n 83, 7060.

¹⁴⁴ Miao Fu and Andrew Kelly, "Carbon related taxation policies for road transport: Efficacy of ownership and usage taxes, and the role of public transport and motorist cost of perception on policy outcomes" (2012) 22 *Transport Policy* 57.

Table 4: Reform of Irelands vehicle taxes introduced 1 July 2008

CO2 emission bands	CO2g./km	Annual ownership tax (EUR)	*Vehicle purchase tax (%) per vehicle	Example Vehicle cost 50,000 EUR
A	0-120g	104	14	7,000
B	121-140g	156	16	8,000
C	141-155g	302	20	10,000
D	156-170g	447	24	12,000
E	171-190g	630	28	14,000
F	191-225g	1,050	32	16,000
G	226g +	2,100	36	18,000

Source: Rogan et al., 2011:585

*Vehicle purchase tax calculated on “open market selling price”, which is the expected retail price including all taxes, (including VAT).

The tax rates linked to specific bands of CO2 emissions (g/km) as shown in Table 4 are significantly differentiated for the purpose of influencing the purchase decision of consumers to choose less CO2 emitting vehicles.¹⁴⁵ Charging an ‘up-front’ vehicle purchase tax in addition to the vehicle price has elevated the environment and the vehicles CO2 emissions from ‘least important’ to an ‘important factor’ for consumers when deciding which car to buy.

Table 5: Comparison of ownership taxes in Ireland and the UK

Emissions	UK rates		Irish rates EUR
	GDP	EUR	
Up to 100	0	0	104
101 to 110	35	40	104
111-120	35	40	104
121-120	120	140	156
131-140	120	140	156
141-150	125	145	302
151-165	150	175	447
166-175	175	204	447
176-185	175	204	630
186-200	215	251	630
201-225	215	251	1050
226-255	405	472	2100
Over 255	405	472	2100

Source: Hennessey et al., 2011

Table 5 shows that Ireland’s annual ownership taxes rates are significantly differentiated according to the vehicle’s CO2 emissions, and this is evidenced when comparing Ireland’s tax rates with those of the UK.

¹⁴⁵ Fionn Rogan et al., above n 2.

For example, if a consumer prefers to buy a new car on the basis of power and engine size but finds the vehicle emits 226g of CO₂/ km, then the tradeoff for the consumer's preference is an additional 'up front' vehicle purchase tax in Band G of EUR 18,000 (Table 4) and higher annual ownership taxes of EUR 2,100 (Table 5).

In effect, Ireland's high carbon differentiated vehicle taxes have provided a strong price signal and successfully influenced consumers to buy lower carbon-emitting vehicles. Namely, before the new taxes were introduced, the share of lower emitting vehicles of less than 155g/km in bands A-C was on average 41% in 2006/2007. After the new taxes were announced, in the period July 2008 – December 2008, the share of these three bands rose to 73 percent, and increased again to 78 percent in 2010, and to 91 percent in 2011.¹⁴⁶ The largest increase in sales after the tax change was in B label band (120-140g/km) rising from 23 percent to 41 percent.¹⁴⁷

The largest reduction was in the sales of high emitting new private vehicles was in the following emission bands:¹⁴⁸

Band D (>155-170g) 24 percent in 2007 to 6 percent in 2010

Band E to F (>170-225) 34 percent in 2007 to 3 percent in 2010

4.3 Ireland's significant reduction in average CO₂ emissions from new cars

Rogan et al.¹⁴⁹ found the fiscal measure had a much larger than expected impact on reducing CO₂ emissions. That is, before introducing the vehicle taxation reforms, the average CO₂ emissions between 2000 and 2007 were around 166g/km for both new petrol and diesel cars, which reduced by 13 percent to 145g/km in the first year (2009), saving 5.9 ktCO₂ because of a significant shift to diesel cars.¹⁵⁰ Further reductions in GHG of 16.8 per cent from 2009 to 2011 as shown in Table 3, placed the average CO₂ emissions of new car fleet at 128.3 g/km, meeting the 2015 EU target of 130g/km by 2012. Overall, Ireland recorded the highest total reduction in weighted average CO₂ emissions of 22.7 per cent in the period 2007 to 2011, as shown in Table 3. That is, the

¹⁴⁶ Fionn Rogan et al., above n 2, 588.

¹⁴⁷ Ibid.

¹⁴⁸ Ibid.

¹⁴⁹ Ibid.

¹⁵⁰ Ibid.

magnitude of change in the weighted average CO₂ emissions is shown when compared with EU data. Within one year of introducing the new emission based taxation system for new private cars, Ireland's vehicle emissions went from 8 percent above the EU average of 154g/km¹⁵¹ to 6 percent below.¹⁵²

Such an immediate and significant change in purchasing patterns towards lower-emitting vehicles resulting from the significant CO₂ tax differentiation strongly supports the effectiveness and impact of this environmental tax instrument in reducing CO₂ emissions. Rogan (2011)¹⁵³ also asserted that the decline in new private car sales in 2008 to close to 2003 levels and a further 62 percent decline in 2009 were a result of the economic recession in Ireland, rather than the impact of the change in vehicle taxes.¹⁵⁴ The decline in Irish new car sales was comparable to those in the EU.¹⁵⁵

5 Alternative mechanisms to vehicle purchase tax

The following mechanisms are alternatives to the vehicle purchase tax, such as the bonus malus scheme, or those imposed in addition to the vehicle purchase tax, such as the annual CO₂-based ownership tax, or special tax incentives provided to encourage the uptake of alternative fuelled vehicles, such as electric vehicles.

5.1 Bonus malus scheme

Some commentators have suggested that the French bonus/malus scheme may be more publically acceptable than other fiscal measures because of the reward element.¹⁵⁶ Brand et al.¹⁵⁷ found more ambitious feebate schemes were faster in accelerating low carbon and plugged-in technology uptake, particularly in the short to medium term.

¹⁵¹ ACEA, "Industry Report" (2009) European Automobile Manufacturers' Association sighted at <www.acea.be/statistics> at 2 April 2013.

¹⁵² Fionn Rogan et al., above n 2.

¹⁵³ Ibid.

¹⁵⁴ Ibid 589.

¹⁵⁵ Ibid.

¹⁵⁶ Sashank Musti and Kara Kockleman, "Evolution of the household vehicle fleet: Anticipating fleet composition, PHEV adoption and GHG emissions in Austin, Texas" (2011) 45 *Transportation Research: Policy and Practice* 707.

¹⁵⁷ Christian Brand, Jillian Anable and Martino Tran, above n 14.

France reformed its vehicle purchase tax in January 2008, and began taxing and subsidizing purchase according to the vehicle's emissions rate.¹⁵⁸ Under a bonus malus, a premium is granted for the purchase of a new car when its CO2 emissions are 105g/km or less.¹⁵⁹ Vehicles emitting 20g/km or less of CO2 benefit from a maximum premium of EUR 7,000, but the incentive cannot exceed 20 percent of the vehicle purchase price, including VAT.¹⁶⁰ The premium reduces to EUR 5,000 for vehicles emitting between 20g/km and 50g/km, and EUR 4,500 when CO2 emissions are between 50g/km and 60g/km.¹⁶¹

An additional bonus of EUR 200 applies when a car at least 15 years old is scrapped and the new car purchased emits a maximum of 105g/km,¹⁶² while hybrid vehicles emitting 110g/km or less benefit from a premium of EUR 2,000. Electric vehicles are exempt from company tax, and hybrid vehicles emitting less than 110 g/km are exempt during the first two years after registration.¹⁶³

A malus is payable when the CO2 emissions from the new car purchased exceeds 135g/km. The maximum malus paid is EUR 6,000 when CO2 emissions exceed 200g/km. In addition to this one-off malus paid at the time of purchase, cars emitting more than 190g/km pay a yearly tax of EUR 160.¹⁶⁴ This is in addition to the annual ownership tax.

The French reacted more favourably to the scheme than expected, accounting for a EUR 500 million loss in 2010, and this prompted a readjustment to the vehicle purchase taxes and subsidies.¹⁶⁵ Thus, a feebate program must be carefully designed, monitored, and adjusted to counter the problems of costs, demand effects, and tax revenues.¹⁶⁶

¹⁵⁸ Thomas Klier and Joshua Linn, above n 106, 31.

¹⁵⁹ ACEA, above n 117.

¹⁶⁰ Ibid.

¹⁶¹ Ibid.

¹⁶² Ibid.

¹⁶³ Ibid.

¹⁶⁴ Ibid.

¹⁶⁵ Christian Brand, Jillian Anable and Martino Tran, above n 14, 135.

¹⁶⁶ Ibid.

5.2 Annual CO2-based ownership tax

Table 3 shows that Germany imposed only an annual CO2 based ownership tax, and had the highest average CO2 emission for new passenger vehicles of 141g of CO2 per kilometer, exceeding the EU average of 136g/km for 2012.¹⁶⁷ That is, in 2009 Germany changed its ownership taxes based on engine size to a tax based system that accounted for a vehicle's CO2 emission rate.¹⁶⁸ However, the rate of tax is so low (EUR 50/ EUR 70 per car) that its impact on car choice is negligible.¹⁶⁹ The OECD found that Germany's measures were not providing a clear carbon price signal.¹⁷⁰

Consequently, the average CO2 emissions from new cars in Germany are one of the worst performing of all Member States.¹⁷¹ Klier and Linn¹⁷² observed that a possible explanation for this is that consumers are more responsive to the vehicle purchase tax than to annual ownership taxes, because of the uncertainty over future ownership taxes.

5.3 Special tax incentives for low CO2 emission vehicles

To promote the lowest carbon emission vehicles such as electric, hybrid, and other alternative fuel vehicles, vehicles taxes are exempt for several EU member states. For example, Denmark exempts electric vehicles weighing less than 2,000 kg from its vehicle taxes. However, this exemption does not apply to hybrid vehicles. Similarly, in Germany electric vehicles are exempt from annual ownership taxes for a period of five years.¹⁷³

In Ireland, electric vehicles are exempt from vehicle purchase tax up to a maximum of EUR 5,000. Plug-in hybrids benefit from a vehicle purchase tax of EUR 2,500, and

¹⁶⁷ National Transport Commission, above 57: 24.

¹⁶⁸ Thomas Klier and Joshua Linn, above n 106.

¹⁶⁹ Stephen Potter et al., n 71, 222.

¹⁷⁰ OECD, "Economic Surveys: Germany" 2012, 81-116: Germany is the largest national emitter in the European Union and the third largest in the OECD after the United States and Japan. The motor vehicle tax on ownership was reformed in 2009 to include CO2 components in the tax base. However, these measures are not providing a clear carbon price signal: 92. The OECD in its Economic Survey of Germany, recommended the adoption of "motor vehicle tax to encourage the adoption of energy efficient cars." 93.

¹⁷¹ ACEA, above n 117.

¹⁷² Thomas Klier and Joshua Linn, above n 106, 2.

¹⁷³ ACEA, above n 117.

conventional hybrid vehicles and other flexible fuel vehicles benefit from a vehicle purchase tax to a maximum of EUR 1,500.¹⁷⁴

In the Netherlands, electric vehicles are exempt from registration tax and annual circulation tax, and hybrids are exempt if they emit less than 95g/km (diesel) or less than 110 g/km (petrol).¹⁷⁵

Special tax incentives are provided under the bonus malus system discussed in paragraph 5.1.

6 Ex post evidence on success of carbon differentiated vehicle taxes

Literature on the effectiveness of “carbon differentiated vehicle tax” measures has been mixed.¹⁷⁶ Many of the earlier studies prior to 2007 outlined possible policy responses to reforming vehicle taxes, based on the engine size to CO2 emissions. The response depended on the whether the price signal of the possible policy design was significant to influence a behavioural shift to lower CO2 emitting vehicles.

Rogan et al found that only a few studies have specifically been ex post of the policy change, but none have assessed the impact of the reform of the car taxation policy aimed at reducing emissions.¹⁷⁷ That is, Rogan et al provided an ex post analysis of the first full year of the policy change in vehicle taxes, introduced in Ireland in July 2008, by analyzing the purchasing trends in terms of specific CO2 emissions, engine size and fuel, implications on car prices, level of CO2 abatement, new car CO2 intensity, and revenue gathered.¹⁷⁸ Hennessy et al. ex post analysis of the 2008 vehicle tax reform in Ireland found that the impact on new passenger car sales was far larger than the schemes analyzed in the previous studies.¹⁷⁹

¹⁷⁴ Ibid.

¹⁷⁵ ACEA, above n 117.

¹⁷⁶ Christian Brand, Jillian Anable and Martino Tran, above n 14, 136.

¹⁷⁷ Fionn Rogan et al, above n 4, 584.

¹⁷⁸ Ibid.

¹⁷⁹ Hugh Hennessy and Richard Toll, above n 83 , 7064.

Furthermore, there is a conflict in the literature as to which vehicle tax is effective in influencing the demand for low CO₂ emitting vehicles. The COWI study discussed in paragraph 3.2 found that both vehicle purchase tax and ownership taxes have the ability to provide CO₂ reduction, and that no type of tax was superior to another.

Earlier literature by Ryan et al.¹⁸⁰ performed an econometric modeling study using data from 1995 to 2004, and suggested that the vehicle purchase tax did not appear to have an important impact to the CO₂ emissions intensity of the new passenger car fleet over and above the effects of ownership and fuel taxes.¹⁸¹

The study concluded that “it is the ownership tax (or circulation tax) that is more influential in determining fuel efficiency and hence CO₂ emissions of the vehicle purchased.”¹⁸² However, Ryan et al. stated that vehicle purchase taxes ‘may have the potential to affect consumer behavior directly as they are applied at the point of sale and influence whether a customer purchases a diesel or petrol vehicle.’¹⁸³

Brand et al.’s¹⁸⁴ study differed from Ryan et al.’s,¹⁸⁵ because the vehicle purchase taxes investigated between 1995 and 2004 by the latter were different in design and ambition than the ones modelled by the former. Any differences between the studies were because of different settings such as socio-economic, political, prevailing pricing and taxation, vehicle fleet characteristics, policy setups, and analytical methods used.¹⁸⁶

For example, when compared to the UK ownership tax policy design, the Irish CO₂ emission bands have a wider range and, given that the UK has no vehicle purchase tax, explains why the Irish carbon-differentiated tax scheme has a larger effect.

Further, Mayeres and Proost,¹⁸⁷ and Giblin and McNabola¹⁸⁸ found annual ownership taxes have a larger impact on individual choices than vehicle purchase taxes. Giblin and

¹⁸⁰ Lisa Ryan, Susana Ferreira and Frank Convery, above n 118.

¹⁸¹ Lisa Ryan, Susana Ferreira and Frank Convery, above 118: 373.

¹⁸² Ibid.

¹⁸³ Ibid.

¹⁸⁴ Christian Brand, Jillian Anable and Martino Tran, above n 14, 144.

¹⁸⁵ Lisa Ryan, Susana Ferreira and Frank Convery, above n 118.

¹⁸⁶ Christian Brand, Jillian Anable and Martino Tran, above n 14, 144.

¹⁸⁷ Inge Mayeres and Stef Proost, “Should diesel cars in Europe be discouraged?” (2000) 31(4) *Regional Science and Economics* 453.

McNabola¹⁸⁹ observed that as the quoted purchase price of the new passenger vehicle is inclusive of the vehicle purchase tax, the purchaser might not view this as an extra carbon-related cost. Moreover, any extra annual ownership tax will depend on the carbon intensity of the vehicle chosen by the consumer.¹⁹⁰ The findings by Beck et al.¹⁹¹ have suggested that annual and variable emissions charges can be viewed as contributing drivers for individuals to be willing adopters of hybrid technology. This can result in significant behavioral change in line with reducing vehicle CO2 emissions.

Modeling by Klier and Linn¹⁹² found that consumers respond more to purchase taxes than to annual ownership taxes, and that a possible explanation for this is that consumer preferences simply differ across countries.¹⁹³ Meghan et al.¹⁹⁴ Chetty,¹⁹⁵ and Finkelstein¹⁹⁶ found consumers are more responsive to tax and price changes that are more prominent.

The ex-post analysis by Rogan et al.¹⁹⁷ agreed with the COWI study discussed in paragraph 3.2, and found both vehicle taxes in Ireland provided a very definite and strong pricing signal towards low emitting vehicles. Mandell¹⁹⁸ found that changes to the vehicle taxes could affect the purchase and ownership of new passenger vehicles. The advantage of imposing both taxes is that a CO2 differentiated vehicle purchase tax will provide an incentive for buyers to choose a vehicle with lower emissions, and a recurrent ownership tax will give buyers of used cars an incentive to switch to vehicles with lower emissions; however, this is not the case with one-off taxes.¹⁹⁹

¹⁸⁸ Sean Giblin and Aonghus McNabola, n 78, 1410.

¹⁸⁹ Ibid.

¹⁹⁰ Ibid.

¹⁹¹ Matthew Beck, John Rose and David Hensher, "Behavioural responses to vehicle emissions charging" (2011) 38 *Transportation No. 3* 445, 461.

¹⁹² Thomas Klier and Joshua Linn, above n 106, 22.

¹⁹³ Ibid 22.

¹⁹⁴ Meghan Busse, Jorge Silva-Russo and Florian Zettlemeyer, "\$1000 Cash-Back: The Pass- Through of Auto Manufacturing Promotions" (2006) 96(4) *American Economic Review* 1253.

¹⁹⁵ Raj Chetty, Adam Looney and Kory Kroft, "Salience and Taxation: Theory and Evidence" (2009) 99(4) *American Economic Review* 1145.

¹⁹⁶ Amy Finkelstein, "E-Z Tax: Tax Salience and Tax Rates" (2009) 124(3) *Quarterly Journal Economics* 969.

¹⁹⁷ Fionn Rogan et al, above n 2.

¹⁹⁸ Svante Mandell, "Policies Towards a More Efficient Car Fleet" (2009) 37(12) *Energy Policy* 5184.

¹⁹⁹ Denmark, OECD and European Environment Agency, "Comparisons of CO2 related tax rate differentiation in motor vehicle taxes 2012" <<http://www2.oecd.org/ecoinst/queries/index.htm>> at 5 May 2013.

The findings of Brand et al.'s²⁰⁰ study are generally in line with other studies, with the car purchase feebate policies shown to be the most successful and effective policy instrument in accelerating low carbon technology uptake and reducing GHG emissions. Moreover, “if designed carefully and adjusted over time, [it] can avoid overburdening consumers with ever more taxation whilst ensuring revenue neutrality”.²⁰¹

The effectiveness of the various vehicle taxation schemes shown in Table 3 shows that policy choice, design, and rate differentials play a crucial role in determining the strength of the behavioural response in transitioning to low emission transport and achieving the national policy goal or targets of reducing road transport emissions.

Therefore, Rogan et al. stated that the early signs of vehicles taxes differentiated on the basis of the vehicles CO2 emissions are particularly effective:

“This should help raise the profile of this type of policy, particularly when studies that seek to find policy solutions to the transport energy challenge, fail to include a car tax policy that drives lower emissions.”²⁰²

Brand et al. (2013)²⁰³ advised that consideration of the wider impacts should be considered when deciding the rate of reducing in carbon emissions, and that the rate with which CO2 limits need to be tightened in order to keep pace with the fuel efficiency improvements, avoid net losses, and maintain public acceptance are future potential scenarios that demands consideration.

7 Limitations addressed

The impact of differentiated vehicle taxes have been criticized for having various limitations, such the very high shift to diesel internal combustion vehicles with

²⁰⁰ Christian Brand, Jillian Anable and Martino Tran, above n 14.

²⁰¹ Christian Brand, Jillian Anable and Martino Tran, above n 14, 146.

²⁰² Fionn Rogan et al, above n 2, 596.

²⁰³ Christian Brand, Jillian Anable and Martino Tran, above n 14.

associated consequences for higher NOx emissions and particulates,²⁰⁴ the potential rebound effect, and loss of government revenue.²⁰⁵

The focus of this article is limited to the acquisition of new motor vehicles, and does not address other environmental externalities such as congestion, local air pollution and earmarking of revenue, which were beyond its scope. Nonetheless, it is submitted that differentiated vehicle taxes based on CO2 emissions apply to the acquisition of new vehicles, and it is generally assumed that buyers of new vehicles have the financial capability. Vehicle taxes will increase Australia's fleet of lower carbon emitting vehicles, which will flow through to the second hand car market and make lower emissions vehicles more readily affordable for lower income earners.

7.1 Impact on fleet renewal

The argument that vehicle purchase tax discourages the renewal of the vehicle fleet is not supported given that many EU member states have had vehicle taxes since 2007, and the average age of EU passenger cars remains unchanged at 8.0 years in 2010.²⁰⁶ This average age is less than Australia's average fleet age of 10 years (ABS 9309.0, 2012), and none of Australia's state governments have adopted carbon differentiated vehicles taxes other than the ACT. The ACT government has a vehicle purchase tax based on each vehicle's environmental performance, and the average age of the motor vehicle fleet is eight years.²⁰⁷ The ACT government claims that if the current turnover of vehicle continues, then around 50 percent of the fleet will be replaced by 2020; this is important in giving the ACT the opportunity to "help people choose the lowest emission new car that meets their needs".²⁰⁸

²⁰⁴ Robin North, Robert Noland, Washington Ochieng and John Polak, 'Modelling of particulate matter emissions from a light duty diesel vehicle' (2006) 11(5) *Transportation Research: Part D: Transport and the Environment* 344–357

²⁰⁵ Christian Brand, Jillian Anable and Martino Tran, above n 14, 133. The rebound effect means that an increase in fuel efficiency of a new vehicle, the marginal cost of driving is lower. The UK travel statistics show that drivers with new cars drive around 2,500km/year further.

²⁰⁶ ACEA, 'Vehicles In Use' (2010) European Automobile Manufacturers' Association <http://www.acea.be/news/news_detail/vehicles_in_use/> at 2 April 2013.

²⁰⁷ Australian Capital Territory Government, Transport for Canberra 2012-2031 <http://www.transport.act.gov.au/data/assets/pdf_file/0003/397245/Pages_from_EDS_ACT_Transport_Policy_FA_final_web.pdf> at 25 June 2013, 9.

²⁰⁸ Ibid.

7.2 Vehicle taxes biased towards more efficient diesel vehicles

Mandell²⁰⁹, and Rogan et al.²¹⁰ found that the change in vehicle taxes differentiated on carbon emissions was not a switch to smaller engine sizes, but a fuel switch towards diesel. Differentiated vehicle taxes can increase market share for diesel cars, which are considered superior due to their higher fuel efficiency. In the European countries, diesel vehicle sales account for more than half of all new motor vehicle sales, and nearly 40 percent in major emerging markets such as India.²¹¹ The associated consequences of acquiring diesel cars, however, are higher NOx emissions and particulates.²¹² Kunert²¹³ proposed that the structure of the vehicle taxes should be rebalanced according to the level of CO2 emissions, but it should not be the sole purpose.

However, vehicle taxes have accelerated technical advancements and improvements in both diesel and petrol engines which has made the two fuel types closer substitutes.²¹⁴ For instance, advances in engine technology and emission control through EURO 5 or EURO 6 have essentially forced the adoption of the diesel particulate filter and ultralow sulfur fuel, and these have nearly eliminated black carbon emissions from new light duty vehicles.²¹⁵ To ensure all new vehicles meet such standards, emission bands could be extended to include a band for air pollution, such as tailpipe emission standards on diesel particulate matter.²¹⁶

Further, Kok isolated the separate effects of consumer preferences and the technological advances in choosing diesel-fuelled cars, and found that these are offset by an increase in larger and heavier diesel vehicles than the average petrol vehicles sold. This

²⁰⁹ Svante Mandell, above n 198.

²¹⁰ Fionn Rogan et al, above n 2.

²¹¹ ACEA, "Diesel- historical series by country in Western Europe 1990-2009" (2011) European Automobile Manufacturers' Association <http://www.acea.be/news/news_detail/vehicles_in_use/> at 2 April 2013; Australian Capital Territory Government, "Transport for Canberra 2012-2031" <<http://www.acea.be/collection/statistics/>> at 16 March 2012.

²¹² Robin North, Robert Noland, Washington Ochieng and John Polak, above n 204.

²¹³ Uwe Kunert and Harmut Kuhfeld, above n 84.

²¹⁴ Hugh Hennessy and Richard Toll, above n 83.

²¹⁵ Ray Minjares, Kate Lumberg and Sanchez Posada, "Alignment of policies to maximize the climate benefits of diesel through control of particulate matter and black carbon emissions" (2013) 54 *Energy Policy* 54.

²¹⁶ Ibid.

diminishes the observed CO₂-advantage of diesel cars, and at times can mean that the diesel cars' CO₂ advantage is worse off.²¹⁷

Knittel²¹⁸ and Sprei et al²¹⁹ also found 56 percent of CO₂ reduction from technological advances in the European Member States between 2000 and 2007 was offset by increases in larger vehicles. However, from 2008 to 2011 this effect was neutralized through monitoring the carbon emissions bands. That is, any future transition to decarbonization and electrification can be implemented through the design of vehicle taxes that can be monitored and adjusted by a combination of credits, fees, rebates, and additional tax differentiation bands to counter these problems and demand effects.²²⁰

7.3 Rebound effect

The rebound effect is an important consideration. The COWI A/SSstudy found that the average size of vehicle in 2008 was larger than the average size in 1999/2000 because of the rebound effect that occurs when cars become more energy efficient as technology progresses.²²¹ The enhanced energy efficiency results in greater demand for larger vehicles.

Hennessy et al.²²² and Brand et al²²³ suggested that while vehicle taxation reform will increase fuel efficiency and lower driving costs, people may drive more which means the reduction in carbon dioxide emissions is only minimal. Increased vehicle travel can lead to other externalities, such as traffic congestion and tailpipe emissions.²²⁴ If these

²¹⁷ Robert Kok, "New car preferences move away from greater size, weight and power: Impact of Dutch consumer choices on average CO₂ emissions" (2003) 21 *Transportation Research Part D* 53.

²¹⁸ Christopher Knittel, "Automobiles on Steroids: Product Attribute Trade-Offs and Technological Progress in the Automobile Sector" (2011) 101 *American Economic Review* 3368.

²¹⁹ Francis Sprei, Sten Karlsson and John Holmberg, "Better performance or lower fuel consumption: technical development in the Swedish new car fleet 1975-2002" (2008) 13 *Transportation Research D* 75.

²²⁰ Christian Brand, Jillian Anable and Martino Tran, above n 14.

²²¹ European Commission's Directorate-General for Environment, above n 76, 95.

²²² Hugh Hennessy and Richard Toll, above n 83.

²²³ Christian Brand, Jillian Anable and Martino Tran, above n 14.

²²⁴ David Greene, "Rebound 2007: Analysis of U.S light-duty vehicle travel statistics" 41 *Energy Policy* 14.

costs are high it may have important ramifications for the costs and benefits of policies to improve energy efficiency.²²⁵

The modeling by Brand et al²²⁶ Peter de Haan²²⁷ and Small et al²²⁸ suggests that the potential for consumers buying more fuel-efficient vehicles and traveling longer distances is not hugely significant. However, this depends on fuel prices and real income growth.

Sorrell²²⁹ referenced a number of international studies and concluded that the direct long-run rebound effect is likely to be less than 30 percent in the household sector, and may be closer to 10 percent for transport.

The International Energy Agency²³⁰ suggested that the rebound effects are quite low, in the order of 10 percent to 20 percent more driving for a doubling of fuel economy or halving of fuel use per kilometer. Greene²³¹ pointed out that the period from 1966-2007 demonstrates a rebound effect of fuel efficiency on light duty vehicle travel in the United States of 10 percent. In an earlier study, Schafer and Victor²³² found that the time humans spend on mobility is relatively constant over time and over cultures.

To counter significant rebound effects, governments may choose to introduce vehicle use based policies, or increase fuel taxes as a deterrent against an increase in driving.²³³

²²⁵ Carolyn Fisher and Winston Harrington, "Should fuel economy standards be tightened?" (2007) 28(4) *Energy Journal* 1.

²²⁶ Christian Brand, Jillian Anable and Martino Tran, above n 14.

²²⁷ Peter de Haan, Michael Mueller, Roland Scholz, "How much do incentives affect car purchase? Agent-based microsimulation of consumer choice of new cars- Part II: forecasting effects of feebates based on energy-efficiency" (2008) 37 *Energy Policy* 1083.

²²⁸ Kenneth Small and Kurt Van Dender, "Fuel efficiency and motor vehicle travel: the declining rebound effect" (2007) 28 *The Energy Journal* 25.

²²⁹ Great Britain, UK Energy Research Centre, "The Rebound Effect: An assessment of the evidence for economic-wide energy savings from improved energy efficiency" (Steve Sorrell, Senior Fellow UKERC) London, October 2007.

²³⁰ International Energy Agency, above n 51.

²³¹ David Greene, above n 224.

²³² Andreas Schafer and David Victor, "The future mobility of the world population" (1998) 34 *Transportation Research Part A* 171.

²³³ International Energy Agency, above n 51 and Amela Ajanovic and Haas Reinhard, above n 124 refer to the use of measures such as increasing fuel taxes along with fuel intensity standards to compensate for the rebound due to the standards in deterring any rebound effects of encouraging the acquisition of fuel efficient vehicles.

Kageson²³⁴ argued that while one should be aware of the direct rebound effect, its existence is not a valid argument against investing in improved fuel efficiency.

7.4 Carbon differentiated vehicle taxes are not regressive

Vehicle taxes are environmental taxes that impose taxes on goods, which are paid for by the consumer. However the tax imposes a heavier burden on high-income households than on low-income households. The arguments for removing a vehicle purchase tax is based on the premise that the price of a vehicle increases by the addition of a vehicle purchase tax, and as Katri²³⁵ stated, the behavioral effects of this would be for consumers normally to reduce their consumption of the commodity. However, empirical evidence has shown that price responsiveness depends on the income of the households; thus, low-income households would be more responsive to price increases and more likely to reduce their consumption than higher-income households.²³⁶ In this case, the incidence of a vehicle purchase tax is less regressive, as the tax burden of low-income households would be reduced more than that of higher-income households.²³⁷ Furthermore, the carbon differentiated vehicle tax affects only those buying a new motor vehicle, and does not affect the low-income household.²³⁸

7.5 Impact on revenue

The objective of governments in changing the base of vehicle taxation system to CO2 emissions is twofold: reduce CO2 emissions and remain at least revenue-neutral.²³⁹

Vehicle taxes are an important revenue source for all EU Member States. On average, vehicle purchase tax and ownership taxes accounted for 1.9 percent of all revenues in 2010.²⁴⁰ Therefore the design of a vehicle tax system is important to national tax

²³⁴ Per Kageson, 'Dieselization in Sweden' (2013) 54 *Energy Policy* 42.

²³⁵ European Commission, Directorate General for Taxation and Customs Union, "Regressivity of environmental taxation: myth or reality?" (Katri Kosonen), European Union, 2012.

²³⁶ Ibid.

²³⁷ Ibid.

²³⁸ Australia, ACT Government, "Green Vehicles Duty Scheme 2008"

http://www.rego.act.gov.au/assets/PDFs/Green_Vehicle_A5_brochure.pdf at April 2013.

²³⁹ European Commission's Directorate-General for Environment, above n 76.

²⁴⁰ Europa: European Commission Press Release: Clarifying EU rules on car taxes, 14 December 2012.

authorities,²⁴¹ with the nature of its design possibly having a significant effect on government revenue streams.²⁴² Therefore the aim is to design the new system with the goal of reducing CO2 and remaining “revenue-neutral”.²⁴³

For instance, changing the vehicle purchase tax to a CO2 base may mean that revenue drops instantly and permanently,²⁴⁴ as the policy might effectively encourage buyers to choose smaller, more fuel efficient vehicles which are in a lower emissions tax band, as shown in Table 4. However, the revenue loss in changing the ownership tax to a CO2 base may be more gradual as car stocks adjust to the new consumer choice of fuel efficient, low emitting vehicles.²⁴⁵

In encouraging its member states to adopt CO2 based vehicle taxation measures, the European Commission recommended that these measures could be designed in a revenue neutral way that would not impose an additional burden on consumers, but reward buyers of low emitting cars and penalize the purchase of less efficient vehicles.²⁴⁶

This was not the case in Ireland, where Hennessy et al.²⁴⁷ estimated that the reduction in tax revenue in Ireland would be half a billion euro per year, and unacceptable given the fiscal situation in the country. McAleer²⁴⁸ confirmed that vehicle taxation system revenue for the first half of 2009 was down by EUR 597 million compared to the same period in 2009. However, Rogan et al.²⁴⁹ stated that Ireland’s recession also impacted on the fall in car sales, and must be isolated in order to determine the real impact of the new vehicle taxation policy measures on the country’s vehicle tax revenue. Excluding the impact of the recession, Rogan et al.’s²⁵⁰ modeling showed that the new tax measure

²⁴¹ European Commission, Eurostat, “Taxation trends in the European Union (2012 Edition)” <http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-DU-12-001/EN/KS-DU-12-001-EN.PDF> at April 2013.

²⁴² W Diem, “France Cuts High-Mileage Car Bonuses, Hikes Gas-Hog Levies” (2011) Wards Auto <http://wardsauto.com/ar/france_bonus_malus_111018> at April 2013.

²⁴³ Fionn Rogan et al, above n 2: 593.

²⁴⁴ Hugh Hennessy and Richard Toll, above n 83.

²⁴⁵ Ibid 7065.

²⁴⁶ European Commission, above n 1, para 3.1.

²⁴⁷ Hugh Hennessy and Richard Toll, above n 83.

²⁴⁸ Michael McAleer, ‘State VRT falls by Euro 597m’, Irish Times, 22 July 2009 <<http://www.irishtimes.com/newsarticle/motors/2009/0722/1224251061499.html>> at 13 October 2013.

²⁴⁹ Fionn Rogan et al, above n 2.

²⁵⁰ Ibid.

had a 33 percent negative impact on revenue on the car vehicle taxation revenue, or EUR 166 million.

Feebates, fiscal incentives can also have a significant effect on government revenue streams and place additional tax burdens.²⁵¹ The difficulty with a feebate system is the uncertainty determining the consumer's response to the fiscal pricing incentives, which makes it difficult to determine the optimal feebate rates and timing of the tightening by emissions bands.²⁵² However, as discussed in paragraph 5.0, "if designed carefully and adjusted over time, [it] can avoid overburdening consumers with ever more taxation whilst ensuring revenue neutrality".²⁵³ Hence, governments may need to adjust the size and timing of rebates and fees over time to ensure that the measure is economically feasible.²⁵⁴

8 Australian Capital Territory's green vehicle duty scheme

In response to the major review of Australia's Future Tax System²⁵⁵ in 2008 (called the Henry Review), the Council of Australian Governments (COAG) had for the first time agreed on a comprehensive strategy to accelerate energy efficiency and recommended on encouraging demand for fuel-efficient low emission vehicles through reforming existing vehicle taxes by adopting differentiated charges linked to the vehicles environmental performance.²⁵⁶ One model recommended by COAG, was the ACT Green Vehicle Duty System (GVDS), introduced in 2008, based on the environmental ratings published in the Australian Government's Green Vehicle Guide.²⁵⁷ However, the final Henry Report released on 2 May 2010 opposed the proposed reform, leaving ACT as the only Australian state/territory government that had reformed its vehicle purchase taxes to provide "an incentive for the purchase of low emission vehicles and a

²⁵¹ Christian Brand, Jillian Anable and Martino Tran, above n 14.

²⁵² Kelly Gallagher and Erich Muehlegger, above n 85.

²⁵³ Christian Brand, Jillian Anable and Martino Tran, above n 14, 146.

²⁵⁴ Ibid.

²⁵⁵ Chaired by the former Secretary to the Treasury, Dr Ken Henry.

²⁵⁶ Australian Council of Australian Governments, COAG Meeting 2 July 2009, www.coag.gov.au/node/66

²⁵⁷ Australia, Australian Transport Council and Environmental Protection and Heritage Council Vehicle Fuel Efficiency Working Group, "Vehicle Fuel Efficiency, Potential measures to encourage the uptake of more fuel efficiency, low carbon emission vehicles" (Australian Transport Council) Canberra, *Recommendation 2.1*; September 2008, 29).

disincentive against the purchase of vehicles with poor environmental performance.”²⁵⁸ However, the tax design of ACT’s GVDS is not as effective as the EU member states discussed in paragraph 3.4, and will not significantly reduce emissions from passenger vehicles. Further analysis and discussion of the tax design in ACT’s GVDS and the appropriateness of using the Australian Governments Green Vehicle Guide will be the basis of a subsequent article by the author.

9 Conclusion

Australia has no effective fiscal instruments to reduce road transport emissions. Further, the federal government has not set or legislated any ambitious targets or strong commitments in reducing road transport emissions. Instead, the government projects road transport CO₂ emissions to be 82 Mt CO₂-e by 2020, showing an increase of 51.8 per cent of 1990 levels. These emissions will then slow to no growth from 2020 to 2030 to 81 Mt CO₂-e, attributable to fuel efficiency improvements in conventional combustion engine vehicles, rising fuel prices, future introduction of mandatory CO₂ emissions standards, and an accelerated take-up of hybrid and fully electric vehicles. Furthermore, the forecast is qualified on the basis that the success of technology in reducing road transport emissions is dependent on the “ability of these technologies to meet consumer needs”²⁵⁹ as discussed in paragraph 2.1.

However consumers undervalue fuel economy and expect a high pay back period when choosing a car for fuel efficiency. Furthermore, the importance of this factor has been found to “drop-off” at the time purchase as discussed in paragraph 2.3.2. Therefore it is argued that the Australian Government’s projection of slowing road transport emissions between the period 2020 and 2030 is unlikely to be met without the implementation of effective fiscal measures to encourage the transition to low carbon transport.

In determining what fiscal measures will most likely be effective in reducing road transport emissions, policy makers will need to recognize that rational economic theory

²⁵⁸ Australian Capital Territory Government, “Summary of Actions”(2013) <http://www.transport.act.gov.au/data/assets/pdf_file/0006/397383/Summary_of_Actions_EDS_ACT_Transport_Policy_FA_final_web.pdf> at 16 May 2013.

²⁵⁹ Australian Government: Department of Energy, Resources and Tourism, “Energy White Article 2012”, above n 27, para 3.3.8.

may not necessarily apply to the acquisition of new light vehicles. This will impact on the choice of policy mix and policy design to ensure such instruments are effective in meeting the objective of reducing road transport emissions.

The article shows that vehicle taxes reformed into an environmental tax, are a “powerful instrument” that can “drive consumer demand towards fuel efficient cars” and foster a more sustainable car market as discussed in paragraph 3.3. Car manufacturers have supported the introduction of this measure, as they are able to compete on the grounds of environmental performance, instead of having to meet consumers demand for larger and more powerful vehicles.

The ex post evidence on the successful transition to low carbon transport will require fiscal measures that provide a strong up-front price signals to influence buyers’ choice of vehicle. In the case study of Ireland, the consumer response to the strong price signal at the time of purchasing a new passenger vehicle was greater than expected. That is, in the period 2007 to 2011, the weighted average of CO₂ emissions of new passenger vehicles reduced by 22.7 per cent.

Thus, supporting the 2012 White Paper that consumer’s choice of vehicle will influence the degree of acceleration to low carbon technology and the amount of carbon emission reductions. However, successful transition to lower carbon-emitting vehicles is dependent on the introduction of fiscal measures that can influence consumer choice at the time of acquisition. The advantage of reforming an existing vehicle purchase tax is that it will not be perceived to be overburdening consumers with another tax, and will most likely be politically acceptable. Although the success of the reform depends on the effectiveness of the tax design and the rate of CO₂ tax differentiation, which must be flexible to ensure governments can assess and adjust the carbon-differentials according to the level of the transition to lower carbon vehicles and to ensure the reform remains at least revenue neutral.

CHAPTER 5

WILL CARS GO GREEN IN THE ACT? A CASE STUDY OF THE REFORMED VEHICLE STAMP DUTY

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WILL CARS GO GREEN IN THE ACT? A CASE STUDY OF THE REFORMED VEHICLE STAMP DUTY

*Anna Mortimore **

Abstract

In the year to December 2013 emissions from Australia's transport sector increased by 53.5 per cent compared to 1990 levels. The domestic transport sector now accounts for over 70 per cent of liquid fuels consumed in this country,¹ with passenger vehicles being the largest source of emission in this sector. Currently, the Australian Government has no fiscal instruments for mandatory fuel efficiency or carbon emission targets to reduce road transport emissions. Part 1 of the two-part series provided ex-post evidence that reforming vehicle purchase taxes/stamp differentiated on the basis of CO₂ emissions was an effective measure to significantly reduce road transport emissions. In 2009, the Council of Australian Governments (COAG) recommended that vehicles purchase taxes be reformed on the basis of new vehicles' "environmental performance", and proposed the Australian Capital Territory's (ACT's) vehicle purchase tax/stamp duty as one model for this approach. However, the 2010 Henry Report rejected COAG's recommendation. This paper revisits the COAG's recommendations and provides an analysis for Australia's policy makers on whether the tax design and price signal of ACT's vehicle purchase tax provide a model to be adopted by the rest of Australia, or whether an alternative instrument is recommended. The literature review suggests that to achieve significant reductions in average CO₂ emissions from new light vehicles will depend on the choice of tax design, a strong upfront price signal, level of tax differential, public acceptance, and the interaction of other complementary tax policy measures. The article will assist policy makers in designing tax policy measures for the proposed Energy White Paper in 2014. In turn, this proposal will meet the objectives outlined in the Issues Paper, that is, to encourage a behavioural change in buyers that could lead to their choosing fuel-efficient, low-carbon emitting new vehicles, as well as to help address the barriers and challenges to reforming vehicle purchase taxes/stamp duty.

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¹ Australian Government, Department of the Environment, "Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2013, Australia's National Greenhouse Accounts": 9 [this phrase unclear]. Sighted <http://www.environment.gov.au/system/files/resources/d616342d-775f-4115-bcfa-2816a1da77bf/files/nggi-quarterly-update-dec13.pdf> 27 April 2014

1 Introduction

This article is Part 2 of a two-part series that revisits and reviews the recommendation by the COAG in 2009 to reform vehicle purchase taxes differentiated on the basis of new light vehicles' "environmental performance". Part 1 of the two-part series provided the ex-post analysis and evidence that reforming vehicle taxes into a fiscal environmental tax² by differentiating the tax on the basis of CO2 emissions was pivotal in EU Member States significantly accelerating the transition to low-carbon technology, and meeting the EU's mandatory CO2 emission target of 130g/km by 2015.

In 2007 the European Commission (EC) advised Member States of the EU of their important responsibility to adopt environmental fiscal measures through their taxation policies to drive consumer demand towards fuel-efficient cars, and to make it easier for the EU to deliver its CO2 average new car fleet reduction target³ of 130g/km by 2015. The EC encouraged Member States to reform their car taxation policies differentiated on the basis of CO2 emissions so as to "gradually induce a switch towards relatively less emitting cars."⁴ The ex-post analysis and evidence in Part 1 of the two-part series support the reintroduction of the recommendation by COAG to reform vehicle purchase taxes (commonly known as stamp duty) for the purpose of increasing the demand for fuel-efficient, low-carbon emitting vehicles.⁵ However, the recommendations that were submitted to the 2008 Henry Review on Australia's Future Tax System were rejected in the final Henry Report in 2010.⁶

² Milne J., and Andersen, M.S. (2012). Introduction to environmental taxation concepts and research. *Edward Elgar Handbook of Research on Environmental Taxation*, 15-32: 22. Environmental related taxes are categorised according to their relative environmental and fiscal functions, such as incentive environmental taxes (also known as regulatory taxes), financing environmental taxes, and fiscal environmental taxes. The reforms of vehicle purchase taxes/stamp duty differentiated on the basis of CO2 emissions are primarily aimed at generating revenue and altering behaviour for the benefit of the environment.

³ European Commission, Communications from the Commission to the Council and the European Parliament: "Results of the review of the Community Strategy to reduce CO2 emissions from passenger cars and light-commercial vehicles", (SEC) Brussels, February 2007: 7 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0019:FIN:en:PDF> 12 April 2014

⁴ Ibid: 9

⁵ Australian Government, Department of Infrastructure and Transport (Cth). "Light vehicle CO2 emission standards for Australia, Key Issues – Discussion paper" 2011. Sighted http://www.infrastructure.gov.au/roads/environment/co2_emissions/files/Light_Vehicle_CO2_Standards_Discussion_Paper.pdf 1 April 2014

⁶ Australian Treasury, Henry Final Report, "Australia's future tax system" (2010) Treasury at 363 sighted at www.treasury.gov.au

To date, Australia has no mandatory fuel efficiency standards, no CO₂ emission targets, and no effective fiscal or incentive environmental instruments to reduce road transport emissions. In 2012, road transport emissions comprised 84 per cent of Australia's transport emissions, that is, 15 per cent of total emissions.⁷ Without reducing transport emissions, the Australian Government will find it difficult to meet its international obligation to reduce the nation's overall greenhouse gas emissions by 5 per cent of 2000 levels. That is, the National Greenhouse Gas Inventory data for the year to September 2013 showed that transport emissions had increased by 2.0 per cent, offsetting the 5.5 per cent reduction in the electricity energy sector.⁸ Transport represents more than one-third of Australia's energy use and generates 40 per cent of all household emissions.⁹ Furthermore, there are more new cars sold in Australia per capita than in any other market in the world.¹⁰ In 2013, it was reported that sales were 2.2 per cent higher than in 2012, and that it was a record year with sales totaling 1.136 million.¹¹ The industry is projecting 2014 will be even stronger with a forecast of 1.145 million sales.¹² The growth in vehicle sales has been in high-carbon emitting SUVs, which account for 30 per cent of new vehicle sales.¹³ Thus, almost one in three new vehicles now sold in Australia is a high-carbon emitting SUV.

⁷ Australian Government, Department of Climate Change and Energy Efficiency, "Transport Emissions Projections 2012". Sighted <http://www.climatechange.gov.au/sites/climatechange/files/files/climate-change/projections/aep-transport.pdf> 12 April 2014

⁸ Australian Government: Department of the Environment, "Australian National Greenhouse Accounts Quarterly Update of Australia's National Greenhouse Gas Inventory September Quarter 2013". Sighted http://www.environment.gov.au/system/files/resources/e18788bd-2a8a-49d1-b797-307a9763c93f/files/quartlerly-update-september-2013_1.pdf 22 February 2014

⁹ Australian Government, Department of Industry (Cth) "Report of the Prime Minister's task Group on Energy Efficiency" (July 2010) 126 < http://ee.ret.gov.au/sites/default/files/documents/03_2013/report-prime-minister-task-group-energy-efficiency.pdf>.

¹⁰ Dowling J. (2013). "Australians are buying cars at a faster rate than other major economies" 8 January 2013. Sighted <http://www.news.com.au/national/australians-buying-cars-at-faster-rate-than-us-japan-and-the-uk/story-fndo4eg9-1226549553197> 8 September 2014. Car sales per capita were 1,112,032 (2012 sales) in a population of 22,864,983: 48,600 cars per million;

¹¹ Federal Chamber of Automotive Industries, "2013 New Vehicle Market" <http://www.fcai.com.au/sales/2013-new-vehicle-market>. Sighted 8 September 2014. Australians bought a record 1,136,227 cars in 2013. Business purchases in the SUV segment increased by 5.9 per cent. Private sales were up a total 8.1 per cent, which included 37.2 per cent rise in private purchases of light commercial vehicles. Roy Morgan Research, "Australia's \$10 billion budget for large SUVs". Sighted oymorgan.com/~media/Files/Findings%20PDF/2013/October/5262-price-budgets-for-new-car-intenders-by-segment-august-2013.pdf 10 March 2014

¹² Hagon, T., (2013). "Record 1.14 million car sales for 2013", *Drive*. Sighted <http://news.drive.com.au/drive/motor-news/record-114-million-car-sales-for-2013-20140106-30cij.html> 10 March 2014

¹³ Ibid.

In 2013, the Australian Government's Bureau of Resources and Energy Economics reported that the transport sector accounts for the largest share of Australia's end use consumption. That is, for the period 2000–01 to 2011–12, energy consumption of transport increased by an estimated average of 2.4 per cent per annum per year.¹⁴ Transport is the largest consumer of liquid fuels (including LPG and refined products), with road transport using the most final energy and accounting for 74 per cent of liquid fuel consumption.¹⁵ In this sector, passenger cars are the largest contributors to CO₂ emissions.

Reducing road transport emissions requires less dependence on fossil fuels, and the most cost effective way to reduce dependence on fossil fuels is to increase energy efficiency.¹⁶ This can be achieved through improving vehicle efficiency and reducing CO₂ emissions, moving passenger kilometres to higher efficiency modes (modal shifting), or increasing vehicle occupancy.¹⁷ The article will focus on improving vehicle efficiency through encouraging sales of fuel-efficient, low-emitting vehicles. It contends that this encouragement should be in the form of a strong price signal conveyed to new motor vehicle buyers at the time of acquisition to facilitate a behavioural shift toward buying fuel-efficient, lower-CO₂-emitting vehicles.

Given that buying a car is one of the largest purchase considerations most people will make,¹⁸ that the average life span of the vehicle chosen can be 20 years, and that about 4 per cent of the fleet is retired each year,¹⁹ a strong price signal will an important mechanism for behavioural change. In the 1.7 million households that purchased a passenger vehicle between March 2011 and March 2012, purchase cost was considered to be a key factor (58 per cent), followed by fuel economy and running costs.²⁰ In terms of non-financial factors, size and type of vehicle were the next most important

¹⁴ Australian Government, Department of Resources, Energy and Tourism, Bureau of Resources and Energy Economics, (BREE) (2013) "Energy in Australia" May 2013: 21

¹⁵ Ibid: 73

¹⁶ Enkvist, Z.P. et al. (2007). A cost curve for greenhouse gas reduction. *The McKinsey Quarterly*, 35–45

¹⁷ United Kingdom, UK Energy Research Centre. "What policies are effective at reducing carbon emissions from surface passenger transport? A review of interventions to encourage behavioural and technological change" (Robert Gross et al.) London, March 2009.

¹⁸ Australian Government, *Australian Bureau of Statistics*, "4102.0 Social Trends, July 2013"

¹⁹ Australian Government, Climate Change Authority. Light vehicle emissions standards for Australia, Research Report, June 2014: Chapter 2: 23

²⁰ Australian Government, *Australian Bureau of Statistics*, above n 18.

considerations.²¹ However, despite increased public awareness of the effect of greenhouse gases from passenger vehicles, environmental impact and carbon emissions were the *least* important considerations when buying a car in Australia in 2012.²²

Shifting environmental impact from least important consideration to one of the most important considerations via a strong price signal at the time of acquisition (sufficiently differentiated) will provide the largest incentive for CO₂ reductions.²³ The article revisits the 2009 COAG recommendation to reform vehicle taxes for the purpose of reducing Australia's road transport emissions. It also reviews the ACT Government's reformed vehicles purchase tax/stamp duty known as the Green Vehicle Duty Scheme (GVDS) to ascertain if it is a possible model for state and territory governments to adopt, or whether an alternative instrument is recommended.

The structure of the article is as follows: Section 2 discusses the importance of reforming vehicle taxes by policy makers who are under mounting international pressure to reduce the nation's CO₂ emissions; Section 3 reviews COAG's recommendation to the Henry Review of Australia's Future Taxation System in 2008 to adopt differentiation vehicle taxation; Section 4 examines the effectiveness of the ACT's GVDS as a policy measure to reduce road transport emissions compared to the EU vehicle purchase taxes in Part 1; and Section 5 reviews the barriers and challenges to reforming vehicle purchase taxes.

2 Australia to Increase its Future International Commitment

By 2020, Australia has an obligation to meet its international commitment to reduce national greenhouse gas emissions by 5 per cent of 2000 levels. Moreover, there is mounting international pressure on the Australian Government to increase its commitment to climate change.²⁴ Intense United Nations' climate change negotiations took place in 2014, with countries discussing their proposed commitment to reduce

²¹ Ibid

²² Ibid

²³ European Commission, European Commission's Directorate-General for Environment (2002). "Fiscal Measures to Reduce CO₂ Emissions from New Passenger Cars." Final Report. A study undertaken by COWI A/S, January 2002

²⁴ Kehoe, J. (2014). Heat on Abbott as US urges climate action. *The Australian Financial Review*, 8-9 March: 7

greenhouse gas emissions that will ultimately lead to a new global climate agreement in Paris in 2015 (to come into force from 2020).²⁵ In the first quarter of 2015, governments are expected to “intensify domestic preparations” for their contributions towards the agreement.²⁶ Consequently, the Australian Government will face growing international pressure to increase its commitment to reducing GHG emissions.

Given this, the Australian Government will need to address its lack of policy instruments to reduce transport emissions. The International Energy Agency (IEA) estimates that if rigorous measures are implemented, fuel consumption of new light vehicles can be halved by about 2030, thereby cutting emissions and improving energy security.²⁷

In its 2012 White Paper, the Australian Government discussed its reliance on higher oil prices, and on the transition to low energy transport and alternative fuels to achieve a reduction in GHG emissions. However, it acknowledged that “success will depend on the ability of these technologies to meet consumer needs.”²⁸

In 2013, the Australian Government released an Issues Paper, which was a consultative article that sought comment and consultation on possible measures to encourage changes in behaviour and uptake of technology to improve transport energy,²⁹ as well as any barriers to the uptake of electric vehicles and advanced biofuels³⁰ to be considered in the Energy White Paper in 2014.

In 2013, the Australian Government released the Emissions Reduction Fund Green Paper (known as the Direct Action Plan) in which it referred to activities that could

²⁵ United Nations Framework Convention on Climate Change, (2014) “Background on the UNFCCC: The international response to climate change”,. Sighted <https://unfccc.int/2860.php> 8 March 2014

²⁶ United Nations Framework Convention on Climate Change, (2014) “Warsaw Outcome”. Sighted https://unfccc.int/key_steps/warsaw_outcomes/items/8006.php 9 March 2014

²⁷ International Energy Agency, (2009) “Transport, energy and CO₂”: 169 http://ee.ret.gov.au/sites/default/files/documents/03_2013/report-prime-minister-task-group-energy-efficiency.pdf

²⁸ Australian Government, Department of Industry, “2012 Energy White Paper: Australia’s energy transformation” <http://www.ret.gov.au/energy/facts/white_paper/Pages/energy_white_paper.aspx#what> at September 2013. para 3.3.8

²⁹ Ibid, 33

³⁰ Australian Government: Department of Industry, (2013) “Energy White Paper Issues Paper, December 2013”, http://ewp.industry.gov.au/sites/ewp.industry.gov.au/files/energy-white-paper-issues-paper_0.pdf,: 38 at 3 February 2014.

reduce transport emissions, including switching to lower emission fuels and using more efficient vehicles. The Direct Action Plan also referred to measuring the reduction in transport emissions by using a baseline such as rewarding fleet operations that reduce emissions per tonne of freight per kilometre. The government claimed that the benefit of this approach was that emission reductions can be calculated and applied to fleets of different sizes.³¹ In effect, the government's policy is to pay businesses to pollute less through an Emissions Reduction Fund.

However, with the release of the 2014 Emissions Reduction Fund White Paper, the government has conceded that:

... direct funding approaches may not be the most efficient means of increasing the uptake of more efficient vehicles ... because choices are often affected by non-price considerations such as size, colour, function and branding. This means that even relatively large incentives may do little to change consumer preference. In these circumstances, emissions reductions are likely to be achieved more efficiently through other measures ...³²

Here, the government suggested that changing consumer preference for fuel-efficient vehicles can be promoted through other government measures.³³

However, for Australia to meet its current and future international commitments, the Australian Government will require state and territory governments to improve fuel efficiency and reduce CO₂ emissions from road transport. This review will assist Australian Government policy makers to either revisit and adopt COAG's 2009 recommendations, or consider an alternative tax policy design to influence consumers' choice of fuel-efficient and low carbon-emitting vehicles.

³¹ Australian Government, Department of the Environment.(2013). Emissions Reduction Fund Green Paper": 54. Sighted http://www.environment.gov.au/system/files/resources/66237232-3042-4cd8-99a3-040705fead3b/files/erf-green-paper_1.pdf 4 April 2014

³² Australian Government (2014). Emissions Reduction Fund White Paper: 40 para 2.7

³³ Australian Government, *ibid*: 40

3 COAG Supports Reforming Vehicle Purchase Taxes/Stamp Duty

In 2009, the Vehicle Fuel Efficiency Report was prepared in response to the request in 2007 from Mr Kevin Rudd, the then prime minister and chair of the COAG for the Australian Transport Commission (ATC) and the Environment Protection Heritage Council (EPHC), to form a Vehicle Fuel Efficiency Working Group (Working Group) and “develop jointly a package of vehicle fuel efficiency measures designed to move Australia towards international best practice.”³⁴ The scope of the Working Group was to focus on measures that would improve the “greenhouse emission performance of new vehicle models relative to existing models”, increase the overall proportion of lower greenhouse emission vehicles in the vehicle population, and deliver improved transport greenhouse efficiency reductions in the short to medium term (5–20 years).³⁵

At the time, the Australian Government acknowledged that “complementary measures” would be required as road transport emissions would not be adequately addressed with the introduction of a “cap and trade” emission-trading scheme known as the Carbon Pollution Reduction Scheme (CPRS)³⁶ which was proposed to commence on 1 July 2010. However, due to lack of bipartisan support, the CPRS was finally shelved in June 2010.³⁷

The Working Group referred to the various European Commission reports on transport CO₂ emission mitigation policies, such as the 2002 European COWI Study³⁸ and the 2008 UK King Review.³⁹ All of these reports concluded that measures directed at improving vehicle fuel efficiency are the most effective strategies in reducing CO₂ emissions from road transport.⁴⁰ The Working Group referred to the experience of many

³⁴ Australian Transport Council and Environmental Protection and Heritage Council Vehicle Fuel Efficiency Working Group (2008). “Vehicle Fuel Efficiency, Potential Measures to encourage the uptake of more fuel-efficient, low-carbon emission vehicles” (*Australian Transport Council*) Canberra, September 2008, 5).

³⁵ Ibid 6.

³⁶ Ibid 15

³⁷ Garrett, P. (2010). Garrett first heard of ETS shelving in newspaper. *ABC Online News* <<http://www.abc.net.au/news/2010-06-05/garrett-first-heard-of-ets-shelving-in-newspaper/855030>> on 8 May 2013.

³⁸ European Commission, European Commission’s Directorate-General for Environment, above n 23.

³⁹ Great Britain, British Government (2007). “King Review of low-carbon cars”(Professor Julia King) Birmingham, March 2007.

⁴⁰ Australian Transport Council and Environmental Protection and Heritage Council Vehicle Fuel Efficiency Working Group, above n 34: 32.

Member States, which suggested that strong fiscal signals around purchase and ongoing ownership costs (registration costs) of vehicles could be an effective mechanism in influencing behavioural changes in both the consumer in purchasing a more efficient vehicle and the manufacturers in supplying more fuel-efficient vehicles to the market.⁴¹

The Final Vehicle Fuel Report released by the Working Party in April 2009 recommended the following fiscal measures to encourage the demand for fuel-efficient and low emission vehicles:

State and territory governments give consideration to revising their stamp duty and/or registration regimes for new light vehicles to establish differential charges linked to environmental performance. Limiting the scheme to new vehicles would be easier to implement and raise fewer equity issues.⁴²

Any differential stamp duty and/or registration charges should utilise the environmental ratings published on the Australian Government's Green Vehicle Guide as the measure of environmental performance. (The ACT stamp duty system provides one model of this approach.⁴³)

Revenue neutrality should be considered as a design feature for any differential charges to assure the community that the objective is not simply higher public revenue.⁴⁴

The 2009 Report was the first acknowledgement that Australian state and territory governments had agreed on a comprehensive strategy to accelerate energy efficiency to combat climate change.⁴⁵ On 2 July 2009, the COAG called on the Henry Tax Review⁴⁶ to consider the merits of the recommendations for financial incentives to encourage the

⁴¹Ibid: 28

⁴²Ibid: 29 Recommendation 2.1

⁴³Ibid: 29 Recommendation 2.2

⁴⁴Ibid: 29 Recommendation 2.3

⁴⁵ Australia, Council of Australian Governments, *COAG Meeting July 2009* <<http://www.coag.gov.au/node/66#4.%20Climate%20Change>> on 13 May 2013.

⁴⁶ In 2008, the Australian Government announced a major review into Australia's Future Tax System chaired by the former Secretary to the Treasury, Dr Ken Henry (called the Henry Review). The terms of reference for the review were to create a tax transfer structure that would position Australia to deal not only with current tax design problems, but also to focus on the changes required to meet future demographic, social, economic and environmental challenges. In this way, duty/registration charges could be reformed into an environmental tax.

purchase of fuel-efficient vehicles through a differentiated vehicle taxation regime linked to environmental performance.⁴⁷ However, the 2010 Henry Report rejected COAG's recommendation.

3.1 The 2010 Henry Report rejects reforming vehicle taxes

The 2010 Henry Report stated that, "targeting vehicle fuel efficiency as a means of achieving reduced emissions is a blunt instrument compared to targeting emissions directly by reflecting the cost of carbon emissions in fuel prices."⁴⁸ The Report recommended that differential stamp duty and registration schemes aimed at encouraging the purchase of more fuel-efficient vehicles should be abolished once the emission-trading scheme (CPRS) or equivalent scheme was introduced.⁴⁹ The Report considered that a market-based mechanism such as the CPRS was the most cost-effective way to reduce Australia's carbon emissions,⁵⁰ and supplementary policies would only be required as a result of "clearly identified market failures that create barriers to the take-up of cheaper abatement opportunities".⁵¹

The 2010 Henry Report did not support the Australian Government's argument that there is market failure in increasing the uptake of low emission vehicle technology,⁵² and rejected the "complementary measures" recommended by COAG's Working Groups, such as that differential stamp duty/registration charges should be linked to environmental performance. The Report recommended that such taxes and charges should remain as revenue raising, and not be reformed into an environmental tax.⁵³

Duff explained that many economists promoting an emission-trading scheme assume that the market is efficient and believe taxes should affect the market outcomes as little

⁴⁷ Australia, Council of Australian Governments (2009), above 45

⁴⁸ Australian Government, (2010) "Australia's future tax system"

http://taxreview.treasury.gov.au/content/content.aspx?doc=html/pubs_reports.htm p363. Sighted 29 September 2014

⁴⁹ Ibid, 364. The CPRS was to commence on 1 July 2010, under the Carbon Pollution Reduction Scheme.

⁵⁰ Ibid 362.

⁵¹ Ibid 363

⁵² Australian Transport Council and Environmental Protection and Heritage Council, above n 34: 18.

⁵³ Australian Government, above n 48: 362. Recommendation 66:

"The revenue raising component of State taxes on motor vehicle ownership and use should be made explicit and over time only be used to recover those costs related to road provision.

as possible as they are often regarded as distorting market signals.⁵⁴ The literature does not support the “fuel user” as an economically rational consumer in an efficient market. Greene et al. stated that consumers undervalue fuel economy because of the combined effects of uncertainty about the cost and value of fuel economy, and loss aversion behaviour that leads to market failure.⁵⁵ Van Dender found that the loss aversion argument provides a theoretical argument for consumers’ low willingness to pay for fuel economy improvements up front in return for uncertain reductions in fuel expenditure.⁵⁶ Such findings clearly identify market failure, support the need for environmental fiscal instruments to overcome uncertainty and loss aversion, and influence consumers in choosing fuel-efficient vehicles at the time of acquisition, which subsequently reduces CO2 emissions.⁵⁷

4 Australian Capital Territory: Green Vehicle Duty Scheme

The ACT Government is the first and only jurisdiction in Australia to reform vehicle purchase taxes/stamp duty by setting differential stamp duty costs for new light vehicles on the basis of these vehicles’ “environmental performance”. The taxation policy measure is called the GVDS, and was introduced in September 2008 to provide “an incentive for the purchase of low-emission vehicles and a disincentive against the purchase of vehicles with poor environmental performance.”⁵⁸

4.1 Overview

The reform was part of the ACT Government’s climate change response entitled “Weathering the Change – the ACT Climate Change Strategy for the period 2007–

⁵⁴ Duff David, (2003) “*Tax Policy and Global Warming*” Canadian Tax Journal, 2063-2118

⁵⁵ Greene, D.L., German, J., Delucchi, M.A. (2009). Fuel Economy: The Case for Market Failure. In Sperling, D., James Cannon (Eds.), *Reducing Climate Impacts in the Transportation Sector*. Springer Science, Springer, 2008: 181-206

⁵⁶ Van Dender, K., (2009). Energy policy in transport and transport policy. *Energy Policy* 37: 3854-3862, 3857. Loss aversion means that consumers evaluate outcomes in terms of changes from a reference state of wealth, and that losses are valued more than equivalent gains (to a larger extent than can be explained by declining marginal utility).

⁵⁷ Mortimore, A., (2014). *Reforming Vehicle Taxes on New Car Purchases can reduce Road Transport Emissions – Ex Post Evidence*. 29 Australian Tax Forum, SSRN-id247142.pdf (2 – 40)

⁵⁸ Australian Capital Territory Government, *Summary of Actions* (2013) <http://www.transport.act.gov.au/_data/assets/pdf_file/0006/397383/Summary_of_Actions_EDS_ACT_Transport_Policy_FA_final_web.pdf> on 16 May 2014.

2015”.⁵⁹ In October 2010, under its Climate Change and Greenhouse Gas Reduction Act 2010, the ACT Government introduced the country’s most ambitious greenhouse gas targets for the ACT: zero net greenhouse gas emission by 2060; 40 per cent reduction of 1990 levels of emissions by 2020; 80 per cent of 1990 levels of emission by 2050⁶⁰, compared to the national commitment of reducing the country’s emissions by 5 per cent of 2000 levels by 2020.⁶¹

In its report, the ACT government set a new benchmark for Australia’s most ambitious greenhouse gas reduction targets, with the ACT Minister for the Environment, Climate Change and Water, Mr Simon Corbell, stating that:

“Around Australia, people have become disenchanted with the lack of real action to address climate change. By passing the Climate Change and Greenhouse Gas Reduction Bill 2010, the Act is showing the rest of the country what must be done.”

The ACT Government stated that the growth in emissions from passenger vehicles averaged around 1.2 per cent since 1990,⁶² and that significant emissions and cost savings are associated with the move toward fuel-efficient vehicles in the short to medium term.⁶³ The government referred to the Australian National Transport Commission’s report that showed that if Australians had purchased new vehicles with “best-in-class emissions”, national average carbon emissions from the passenger vehicle fleets would have been reduced to 126g/km. This would have meant a reduction of 34 per cent⁶⁴ on Australia’s average carbon dioxide emissions for new passenger vehicles and light commercial vehicles of 192g/km for 2013.⁶⁵

⁵⁹ ACT Government: “Weathering the Change”. Sighted http://www.environment.act.gov.au/_data/assets/pdf_file/0015/240333/strategy_plan_version4.pdf 11 March 2014

⁶⁰ Australian Capital Territory Government, “Environment and Sustainable Development “(2012) <http://www.environment.act.gov.au/climate_change/greenhouse_gases_in_the_act> on 16 May 2014.

⁶¹ Australian Government, “Clean Energy Future” (2011) <<http://www.cleanenergyfuture.gov.au/transport-fuels/>> on 4 September 2010.

⁶² Australian Capital Territory, “A new climate change strategy and action plan for the Australian Capital Territory” 2012: at http://www.environment.act.gov.au/_data/assets/pdf_file/0004/254947/AP2_Sept12_PRINT_NO_CROPS_SML.pdf, on 26 February 2014, 57.

⁶³ Ibid: 59

⁶⁴ Australian Government, National Transport Commission (2013). “Carbon Dioxide Emissions from New Australian Vehicles”: 22.

The ACT Government deliberated on the opportunities required to encourage vehicle buyers to choose “best-in-class”. It considered the introduction of “environmental performance-based charging” for registration and/or stamp duty on the acquisition of new motor vehicle⁶⁶ because it “targets people at the time of vehicle purchase rather than after they’ve already bought a car”.⁶⁷ That is, the existing vehicle purchase tax/stamp duty was reformed into a “fiscal environmental tax”, which is a tax/duty that is primarily aimed at generating revenue and designed to have a significant positive effect on the environment.⁶⁸

4.2 Green Vehicle Duty Scheme

The vehicle purchase tax/stamp duty rates in place before the introduction to the GVDS are shown in Table 1 below.

Table 1: Vehicle purchase tax/stamp duty before GVDS

Duty payable on vehicles < or equal to \$45,000	Duty payable on vehicles with value greater than \$45,000
3 per cent of the dutiable value	\$1,350 + 5 per cent of dutiable value exceeding \$45,000

Only two duty rates applied as a percentage of market value, depending on whether the market value was less than, equal to, or greater than \$45,000. Market value and purchase value of a new light motor vehicle include Goods and Services Tax (GST) and a Luxury Car Tax (LCT) (if applicable).

The GVDS introduced by the ACT Government on 3 September 2008 differentiated the duty rates on the basis of new light vehicles’ “environmental performance score”

<http://www.ntc.gov.au/filemedia/Reports/CarbonEmisNewAustVeh2013.pdf> at 25 May 2014.

⁶⁵ Ibid, 23

⁶⁶ Australian Capital Territory Government, “Weathering the Change”, above 59...

⁶⁷ Australian Capital Territory Government, “Green Vehicle Duty Scheme”(2013)

<http://www.rego.act.gov.au/assets/PDFs/Green_Vehicle_A5_brochure.pdf> on 16 May 2013

⁶⁸ Maatta K., (2006). Environmental Taxes. *Edward Elgar Handbook of Research on Environmental Taxation*, 1 – 114: 20. The primary purpose of the taxes is to generate revenue, but may have a significant positive effect on the environment. The GVDS is not an incentive environmental tax as the primary purpose of the tax/duty is to generate revenue for the government.

determined from the Green Vehicle Ratings of “A”, “B”, “C” or “D” provided in the Commonwealth’s Green Vehicle Guide (GVG) (as discussed in Section 4.2.1 below).⁶⁹

Table 2: Vehicle purchase tax/stamp duty payable on new motor vehicles

Green vehicle rating	*Duty payable on vehicles < or equal to \$45,000	*Duty payable on vehicles with value greater than \$45,000
A	Nil	Nil
B	2 per cent of the dutiable value	\$900 + 4 per cent of dutiable value exceeding \$45,000
C	3 per cent of the dutiable value	\$1,350 + 5 per cent of dutiable value exceeding \$45,000
D	4 per cent of the dutiable value	\$1,800 + 6 per cent of the dutiable value exceeding \$45,000

* ACT Government: ACT Revenue Office: Green Vehicle Rating for S208(1) of the Duties Act 1999

The price signal (shown in Table 2) indicates a nil rate of duty for vehicles with an “A” rating, an increase in the tax rate/duty for vehicles with a Green Vehicle rating of “B”, no change in tax rate/duty for vehicles with a “C” rating, and a 1 per cent increase in the tax rate/duty for vehicles with a “D” rating.

The ACT Government claimed that the above differential stamp duty rates for new light vehicles when applied at the time of purchase have a “greater potential to change people’s purchasing behaviour” by providing an incentive for the purchase of low-emitting vehicles and a disincentive against the purchase of vehicles with poor environmental performance.⁷⁰ The “price signal” of ACT’s GVDS can be compared with the previous duty rates as shown in Table 3 below.

⁶⁹ Australian Capital Territory Government, *Motor vehicle registration duty calculator* (2013) <<http://revenue.act.gov.au/calculators/motor-vehicle-registration-duty-calculator>> on 10 May 2013

⁷⁰ Australian Capital Territory Government, (2013). *Green Vehicle Duty Scheme*, [above n 67](#)

Table 3: Price signal of differentiated rates under GVDS compared with former duty rates

Vehicle	CO2 g/km	Green vehicle rating	Fuel	*Retail Price \$	ACT stamp duty payable under old system	% Duty Old system	ACT GVDS	% Duty under GVDS	Savings/ Extra taxes
Prius 1.8L 4cyc	89	A	Hybrid	37,389	1,121	3.0	Nil	0	-1,121
Ford Focus 4 cycl, 2.0L	154	B	Petrol	36,289	1,088	3.0	725	2.0	-363
Citroen C4 e-HDI Seduction	101	B	Diesel	30,690	920	3.0	613	2.0	-307
Holden VF Commodore	222	B	Petrol	40,690	1,221	3.0	819	2.0	-402
Toyota Aurion GSV50R	215	B	Petrol	40,139	1,204	3.0	802	2.0	-402
Hyundai I30 Active GD	160	B	Petrol	27,764	834	3.0	555	2.0	-279
Ford Focus 4cycl, 2.0L	144	C	Diesel	40,139	1,204	3.0	1,204	3.0	No change
Toyota Camry	183	C	Petrol	35,002	1,050	3.0	1,050	3.0	No change
Hyundai 2013 i30 Active	122	C	Diesel	28,424	852	3.0	852	3.0	No change
Ford Falcon G6E EcoBoost	201	C	Petrol	51,408	1,670	3.2	1,670	3.2	No change
Toyota Prado	232	D	Petrol	61,589	2,179	3.5	2,795	4.5	+616

* Recommended retail price (inclusive of GST) from www.redbook.com.au

The ACT Government promoted the introduction of the GVDS by advising new car buyers that models in the “B” category would generally be cheaper to buy, and that other models “will either receive a reduction in duty, or no change”⁷¹ compared to the former rates of duty applicable prior to 3 September 2008 (as shown in Table 3).

Nonetheless, Table 3 questions the effectiveness of the GVDS tax design, and whether the price signal will encourage buyers to choose fuel-efficient, lower-emitting vehicles when new vehicles with high CO2 emissions (Holden VF Commodore: 222g/km) are “B” rated and receive a reduction in duty, and new diesel-fuelled vehicles with lower

⁷¹ Australian Capital Territory Government, (2013). *Green Vehicle Duty Scheme* [above n 67](#)

CO₂ emission (Ford Focus:144g/km; Hyundai Active:122g/km) are “C” rated and receive no reduction in duty.

This questions the GVDS tax design in adopting the Green Vehicle Ratings, and whether the minor changes in the tax/duty rates are sufficiently differentiated to provide a strong enough price signal at the time of purchase to influence buyers to choose a lower-emitting vehicle.

Part 1 of the two-part series stated that the success of the tax policy measure in reducing road transport emissions depended on the tax design, as well as on a strong up-front price signal that was differentiated in such a way that taxes for all energy effective cars were significantly lower than taxes for cars with poor energy efficiency.⁷² Simple tax increases (as shown in Table 3) that do not involve changes to the tax base provide only very small CO₂ reductions.⁷³

4.2.1 GVDS tax policy design: adopting Green Vehicle Guide rankings

The Green Vehicle Guide (GVG) is a government website prepared by the Commonwealth Department of Infrastructure, Regional Development and Local Government. Under the Australian Design Rules, car manufacturers are required to provide emission and consumption data on all new light vehicles. According to the Motor Vehicle Standards Act 1989, all new light vehicles sold in Australia are allocated a 1 to 5 star rating based on the new vehicle’s overall “environmental performance” score of 20. The environmental performance score is the sum of the new light vehicle’s greenhouse gas emissions rating score out of 10, and the air pollution rating score out of 10⁷⁴ (as shown in Table 3). Buyers of new cars can compare the environmental performance and star ratings from 1 to 5 of all new car models on the market with details on the GVG website.⁷⁵

⁷² European Commission, European Commission’s Directorate-General for Environment, above n 23: 1

⁷³ Ibid.

⁷⁴ Australian Government, *Green Vehicle Guide* (2013) <

<http://www.greenvehicleguide.gov.au/gvgpublicui/Information.aspx?type=RatingsAndMeasurements>> on 16 May 2013.

⁷⁵ Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government, Green Vehicle Guide website at www.greenvehicleguide.gov.au

4.2.2 Green vehicle guide (stage 2) incorporated into design of GVDS

Maatta (2006) stated that the design of a policy instrument should meet the transparency principle, so that a tax levied on a product is clear to taxpayers in terms of what is and what is not taxable, and that taxes related to attributes such as CO₂ emissions can be monitored and observed.⁷⁶ Further, Greene et al. (2009) stated that the decision maker must have a clear picture of the choice problem he or she faces, and should be fully aware of the set of alternatives from which to choose.⁷⁷

Under the GVDS, the consumer does not have a “clear picture” of the vehicle purchase tax/stamp duty payable on the new vehicle they choose to buy. That is, duty payable on the new vehicle is not “transparent” to the consumers in Table 2 because the tax/duty is based on “green vehicle ratings” determined from another policy instrument, that is, the GVG. Fundamentally, the effectiveness of the GVDS depends on the accuracy of the “green vehicle ratings” in the GVG prepared by the Australian, which is not “monitored and observed” but adopted by the ACT Government as being an accurate assessment of the new vehicles “environmental performance”. Rather, the “green vehicle ratings” in Table 3 provide imperfect and misleading information to the consumer, resulting in lower taxes/stamp duty payable on higher-emitting vehicles and higher taxes/stamp duty payable on lower-emitting vehicles.

Nor is it “transparent” to consumers that the GVG (Stage 2) allocated air pollution ratings⁷⁸ for new diesel-fuelled motor vehicles are low and out of date. That is, the ratings in the GVG (Stage 2) are based on Euro 4 (ADR 79/02)⁷⁹ and not on the current stringent Euro 5 standards that have applied in the European Union since 1 January 2011. These standards apply to the registration of new cars sold in the market;⁸⁰

⁷⁶ Maatta K. (2006), above 68: 43

⁷⁷ Greene et al, above n 55: 182

⁷⁸ The air pollution performance rating (a rating out of 10) is based the level of air pollution rating for the emission of carbon monoxide (CO), hydrocarbons (HC) and oxides of nitrogen (NO_x). Additionally, diesel vehicles must also meet a limit for the emissions of particulate matter (PM). The air pollution ratings is determined under the Australian Design Rules (ADR) 79 air pollutant emission standards to which each vehicle model is certified before being available for supply to the market.

⁷⁹ Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government, Green Vehicle Guide website at www.greenvehicleguide.gov.au The initial ratings were launched in 2004, reviewed in 2005, and took effect from 1 January 2006

⁸⁰ Europa: “Summaries of EU legislation, Reduction of pollutant emissions from light vehicles”. Sighted <http://europa.eu/legislation_summaries/environment/air_pollution/128186_en.htm#amendingact> 31

however, they will not apply in Australia until November 1, 2016. The Euro 6 standards set even lower emission limits that will apply to the registration of new vehicles in the EU from 1 January 2015, but will not apply in Australia until 1 July 2018.⁸¹ Many imported diesel-fuelled vehicles are Euro 5 compliant,⁸² which means that the air pollution ratings out of 10 in the GVG (Stage 2) are imperfect. In effect, the green vehicle ratings for petrol-fuelled vehicles shown in Table 4 are more favourable because of the “lower pollution ratings” applied to diesel-fuelled vehicles in Table 5.

Table 4: ACT Government green vehicle rating guide for petrol-fuelled vehicles

Green vehicle rating	Environmental Performance Score (out of 20)	Petrol fuelled vehicles	CO2 g/km Comb	GHG rating 10=best	Air pollution rating 10=best
A – Environmental leading edge models	16+ <i>5 star rating</i>	Holden TM Barina Toyota Prius Holden Volt Toyota Camry Hybrid	158 89 27 121	7.5 9.0 10.0 8.0	8.5 8.5 8.5 8.5
B – Models with environmental performance significantly above average	14+ <i>4 to 4 1/2 star rating</i>	Honda Jazz Hybrid Toyota Aurion Holden JH Cruze SRI Holden VE Commodore Holden WM SIDI Caprice Holden VE SIDI Calais	121 215 186 230 236 234	8.5 6.0 6.5 5.5 5.5 5.5	6.5 8.5 8.5 8.5 8.5 8.5
C – Models with average environmental performance	9.5+ 3 star and 3 1/2 star rating	Ford FG Falcon XR6 Holden VE Calais Holden VF SIDI Commodore Ford FG Falcon F6 Ford Falcon XT Ecoboost	279 292 216 274 300 236	4.5 4.0 6.0 3.0 5.5 6.5	5.5 6.5 6.0 6.5 6.5 6.5
D – Models with below average environmental performance	Under 9.5 2 1/2 star to 1 star rating	Ford RG Falcon Landcruiser 200 Toyota Prado	303 313 306	3.5 3.5 3.5	4.5 5.5 5.5

May 2013. Euro 6 standards will come into force on 1 September 2014 for the approval of new vehicles, and from 1 January 2015 for the registration and sale of new types of cars.

⁸¹ Australian Fleet Management Association, (2013) “Submission to the Australian Productivity Commission: Review of the Australian Automotive Manufacturing Industry” 27 November 2013: 7. Sighted http://www.pc.gov.au/_data/assets/pdf_file/0017/130157/sub041-automotive.pdf; 8 September 2014

⁸² Australian Fleet Management Association, (2012) “Submission to the Department of Infrastructure and Transport regarding the proposed changes (Stage3) to the Green Vehicle Guide”. Sighted <http://www.afma.net.au/documents/item/452>; Australian Government, Department of Infrastructure and Regional Development, “Vehicle Emission Standards” Sighted <http://www.infrastructure.gov.au/roads/environment/emission/> 8 September 2014: 6

Most new vehicles with a “B” rating emit over 200g of CO₂/km and are described in Table 4 as “models with environmental performance significantly above average”. Similarly, new vehicles with a “C” rating have even higher emissions, and are described as models with “average environmental performance”. Table 4 shows that the GVG (Stage 2) favours most Australian-made vehicles with a green vehicle rating of “B”, even though they are considered to be high-emitting vehicles and their emissions exceed Australia’s 2012 average CO₂ emissions for new passenger vehicles of 190g of CO₂/km.⁸³ When compared to the EU’s 2012 average carbon emissions from new passenger vehicles of 132g/km⁸⁴, all these Australian vehicles would be reclassified with a green vehicle rating of “D”, or as being models with “below average environmental performance”.

Notwithstanding that the diesel-fuelled vehicles may have lower CO₂ emissions as displayed in Table 5, the “out of date” air pollution ratings in GVG (Stage 2) result in an overall lower environmental performance score and green vehicle rating compared to the petrol-fuelled vehicles in Table 4.

Table 5: ACT Government Green Vehicle Rating Guide applied to diesel-fuelled vehicles

Green vehicle rating	Environmental Performance Score (out of 20)	Diesel-fuelled vehicles	CO ₂ g/km comb	GHG rating (10=best)	Air pollution rating 10=best
A – Environmental leading edge models	16+ 5 star rating	No 5 star rated diesel vehicles			
B – Models with environmental performance significantly above average	14+ 4 to 4 1/2 star rating	Citroen DS3	95	9	6
		Volvo 2011	104	8.5	6
		Drive Honda Civic	105	8.5	6
C – Models with average environmental performance	9.5+ 3 star and 3 ½ star rating	Ford Focus	142	7.5	5.0
		Trend; Holden	176	7.0	6.0
		JH Cruze; Ford	117	8.5	5.0
		Fiesta; Mazda;	150	7.5	5.0
		Golf TDI	144	7.5	6.0
D – Models with below average environmental performance	Under 9.5 2 ½ star to 1 star rating	Ford SZ	232	5.5	3.0
		Territory Landcruiser 200	273	4.5	3.0

* Australian Government: Green Vehicle Guide

<http://www.greenvehicleguide.gov.au/gvgpublicui/Information.aspx?type=RatingsAndMeasurements>

⁸³ Australian Government, National Transport Commission, above n 64.

⁸⁴ Ibid, 31

Moreover, the CO₂ emissions of the “C” rated diesel-fuelled new vehicles in Table 5 are lower than most of “B” rated petrol-fuelled new vehicles in Table 4.

4.2.2.1 Monitoring and review of GVG (stage 2)

The “environmental performance” data provided in tables 4 and 5 cannot be assessed against any mandatory average CO₂ emission targets or fuel efficiency targets because Australia has no such targets. According to the Luxury Car Tax (LCT) regime, the Australian Government defines a “fuel-efficient car” as having a fuel consumption that does not exceed 7 litres/100 kilometres.⁸⁵ This equates to emissions of 162g of CO₂/km (discussed further in Section 5.4.1 below). In applying this emission standard to Table 4, most of the petrol-fuelled vehicles would have failed to meet the government’s fuel efficiency threshold, despite the new vehicle having a B rating and being described as a model with “environmental performance significantly above average”. Further, while all diesel-fuelled vehicles in Table 5 would have satisfied the fuel efficiency threshold, they have been allocated a “C” rating.

4.2.2.2 GVG (stage 3) proposed

In 2012, the GVG (Stage 2) ratings were reviewed for the new GVG (Stage 3). This is because it was acknowledged that an “increasing proportion of vehicles will receive higher ratings” at a time when governments around the world are introducing more demanding mandatory standards for air pollution and CO₂ emissions.⁸⁶

The proposed GVG (Stage 3) will abolish the (star) ratings and consumers will be able to compare vehicles on the basis of CO₂ emissions (in g/km) of all new vehicles while continuing to provide information on other features such as fuel consumption, energy consumption and air pollution standard.⁸⁷ The Australian government will provide

⁸⁵ Tax Laws Amendment (Luxury Car Tax) Act 2008, Section 6 (4)

⁸⁶ Australia, Australian Government: Department of Infrastructure and Transport, “Discussion Paper on a new approach to comparing the environmental performance of vehicles on the Green Vehicle Guide” issued July 2012: 3

⁸⁷ Australian Government, “Green vehicle guide: What’s New”. Sighted <http://www.greenvehicleguide.gov.au/GVGPublicUI/Information.aspx?type=WhatsNew> 15 September 2014. Consumers will be able to compared vehicles on the following new default rank order as follows :

supplementary information on the GVG website, providing an explanation of how to interpret the CO₂ emission data through an analysis of average new vehicle CO₂ emission from the previous year, and to any future regulatory CO₂ emissions standards.⁸⁸

The Australian Government assumed that consumers were “more knowledgeable about the environmental impacts than they were when the GVG was first launched in 2004.” However, the Australian Bureau of Statistics consumer survey shows that when buying a new car, consumers rank fuel efficiency as the second most important consideration and the environmental impact as the least,⁸⁹ indicating buyers of new vehicles may not be aware that fuel efficiency is directly correlated to CO₂ emissions.⁹⁰

The proposed new standards were to take effect from 1 January 2012.⁹¹ However, they were postponed to 1 January 2013, and then further postponed to be “launched sometime in 2014.”⁹² Clearly, the new GVG (Stage 3) standards need to be introduced as soon as possible given the imperfect information provided in GVG (Stage 2).

4.2.2.3 COAG’s recommendation to utilise GVG as a measure of environmental performance

In effect, COAG’s recommendation that any differential stamp duty should utilise the environmental ratings published in the GVG as a measure of the new vehicle’s “environmental performance” is not supported. The GVG (Stage 2) green vehicle rating system used in the tax design of the GVDS does not meet the key role of providing sufficient consumer information to influence consumer choice in favour of those cars

CO₂ emissions (in g/km); energy consumption (in Wh/km); air pollution emission certification level (Euro 4,5, or 6); fuel consumption (combined, then urban, then extra urban in L/100km; Noise emissions.

⁸⁸ Australian Government: Department of Infrastructure and Transport, above n 74: 5

⁸⁹ Australian Government, *Australian Bureau of Statistics*, “4102.0 Social Trends, July 2013

⁹⁰ International Energy Agency, “Global Fuel Economy Initiative,”

<http://www.iea.org/media/files/GlobalFuelEconomyInitiativePlanofAction20122015.pdf>

50% more fuel efficient by 2050 worldwide

⁹¹ Australian Government, Department of Infrastructure and Transport, “Stage 3 Ratings for Green Vehicle Guide: Discussion Paper” issued 16 May 2011

<http://www.infrastructure.gov.au/roads/environment/files/GVG_Stage3_Ratings_Discussion_Paper_May_2011.pdf> at 6 June 2013.

⁹² Australian Government, Department of Infrastructure and Transport, “What’s New – A new Green Vehicle Guide website will be launched in 2014”

<https://www.greenvehicleguide.gov.au/GVGPublicUI/Information.aspx?type=WhatsNew> at 25 February 2014.

that use less fuel and thereby emit less CO₂. Instead, the GVG (Stage 2) provides imperfect information, which Greene et al. (2009) claimed can cause market failure and “almost certainly contributes to or exacerbates the uncertainty/loss aversion market deficiency.”⁹³

Nor will the proposed GVG (Stage 3) be a “measure of environmental performance” as it will be relying on consumers to individually compare and assess the environmental performance of vehicles based on data provided by the government rather than choosing new vehicles on the basis of green vehicle ratings.

4.2.3 GVDS tax policy design should be a flexible

Policy instruments must be flexible to react to external changes. These include amendments to legislation or regulatory standards⁹⁴ and to any amendments at any given point of time.⁹⁵ However, the tax design of the GVDS is inflexible when changes need to be made to the GVG. That is, without star ratings in the proposed GVG (Stage 3), the tax design of the GVDS will not be able to calculate the vehicle purchase tax/stamp duty rates for new vehicles released onto the market.⁹⁶

Therefore, in order to maintain the current GVDS tax design, the ACT Government needs to introduce CO₂ emission ratings to calculate the duty rates. In turn, this would provide a crucial price signal to encourage consumers to choose fuel-efficient low-emitting vehicles (as discussed in Section 4.2.7 below).

Alternatively, the GVDS tax design could be made more flexible by adopting “carbon emission bands” that would be easier to amend or correct at any given point of time,⁹⁷ thus providing clear, accurate and direct information to buyers of new light vehicles. Whether the tax/duty rate influences consumers’ choice of new vehicles will depend on

⁹³ Greene et al. above n 55: 204

⁹⁴ Baumol, W.J. and Oates, W.E. (1988). *The Theory of Environmental Policy*. 2nd ed., Cambridge: Cambridge University Press, 192.

⁹⁵ Rehbinder, E. (1993). Environmental Regulation Through Fiscal and Economic Incentives in a Federalist System. *Ecology Law Quarterly*, 20 (1): 57-83, 60-61

⁹⁶ Corbell S. (2102), Minister for the Environment and Sustainable Development, response to discussion paper on “A new approach to comparing the environmental performance of vehicles on the Green Vehicle Guide” 13 September 2012. Sighted 1 March 2014

⁹⁷ Baumol and Oates, above n 94: 192

whether the “price signal” between each band of CO2 emissions is strongly differentiated.⁹⁸ This will determine the effectiveness of policy measures in achieving the ACT Government’s policy objective of reducing road transport emissions within the given time schedule.⁹⁹

4.2.4 GVDS tax policy design: assess the effectiveness of the price signal

In Australia, all state governments and territories have the power to impose their own vehicle taxes. Each state government determines its own vehicle purchase tax/stamp duty as shown in Table 6 below.

Most state and territory governments (with the exception of Queensland) impose a vehicle purchase tax/ stamp duty based on the purchase price¹⁰⁰ of the vehicle (as shown in Table 6). The Queensland Government calculates duty based on a fixed fee component that increases according to vehicle size (such as the number of cylinders),¹⁰¹ and applies a lower rate of duty for hybrid or electric vehicles.¹⁰² The “price signal” of state and territory governments’ vehicle purchase tax/rate of duty is shown below in Table 7.

⁹⁸ Mortimore, A., above n 57

⁹⁹ Maatta, K., above 68:8

¹⁰⁰ Purchase price includes GST and Luxury Car Tax, if applicable.

¹⁰¹ Australian Government, *Australian Bureau of Statistics*, “4629.0.55.001 – Discussion Paper: Environmental taxes in Australia – Experimental new statistics, 2000-2011”

¹⁰² Queensland Government, (2013) Registration fees and labels

<<http://www.tmr.qld.gov.au/Registration/Registration-fees-and-labels.aspx>> at 10 May 2013.

Table 6: State and territory government vehicle purchase tax/stamp duty

State/territory	Duty payable on total market value of vehicle (including GST)
NSW	Stamp duty/vehicle purchase tax is calculated on the market value of the vehicle or the price you paid, whichever is the greater ¹⁰³ . 3 per cent of the vehicle price up to \$45,000 \$1,350 plus 5 per cent for every dollar over \$45,000
Victoria	Duty is payable on the market value of the vehicle. ¹⁰⁴ 3 per cent of the vehicle price to \$60,316 5 per cent of the vehicle price more than \$60,316
South Australia	Rate of duty is based on the “value of the vehicle” ¹⁰⁵ . \$60 for the first \$3,000 of the vehicle price 4 per cent for every dollar over \$3,000
Tasmania	Rate of duty based on the “vehicle market value” ¹⁰⁶ . 3 per cent of the vehicle market value price up to \$35,000 11 per cent for every dollar between \$35,000 and \$45,000; 4 per cent for every dollar over \$45,000
Western Australia	Rate of duty is based on the “dutiable value” ¹⁰⁷ . 2.75 per cent of the vehicle price up to \$25,000; a sliding scale is used between \$25,000 and \$50,000 from 2.75 per cent to 6.5 per cent 6.5 per cent for every dollar over \$50,000
Queensland	Rates of duty is based on the “dutiable value” ¹⁰⁸ Electric/hybrid (any number of cylinders): 2 per cent of purchase price. All other cars: up to 4 cylinder: 3 per cent of purchase price up to 6 cylinder: 3.5 per cent of purchase price 7 or more cylinder: 4 per cent of purchase price

¹⁰³ New South Wales Government, Office of State Revenue on <http://www.osr.nsw.gov.au/taxes/vehicle> Sighted 15 September 2014

¹⁰⁴ Victoria Government, Vicroads, “Motor vehicle duty” for vehicles transferred on or after 1 July 2013 and before 1 July 2014. <http://www.sro.vic.gov.au/sro/sronav.nsf/childdocs/-34FAD0EFBAFF8BE0CA2575A100442101-E35A67FBAB847FF1CA2575D10080A69F-B3293FEA7710298CCA2577510083B133-D869AB57C060532BCA257B8900226281?open> Sighted 15 September 2014

¹⁰⁵ South Australia, “Stamp Duty on Motor Vehicles”. Rate of duty is based on the “value of the vehicle” which is the recommended retail price or manufacturer’s list price (including GST and luxury car tax) where applicable. Sighted <http://www.revenuesa.sa.gov.au/taxes-and-duties/stamp-duties/motor-vehicles#Rateofstampduty> 9 March 2014

¹⁰⁶ Tasmania Government: Department of Infrastructure, Energy and Resources, “Transport duty rates”. Sighted www.transport.tax.gov.au/fees/duty_rates 9 March 2014.

¹⁰⁷ WA Government, Circular V.L.D 4 “Definition of dutiable value” The “dutiable value” of a car is the price fixed, which is structured on the basis that GST is payable on every vehicle (including the luxury car tax). Sighted <http://www.finance.wa.gov.au/cms/content.aspx?id=3085> 19 September 2014

¹⁰⁸ Queensland Treasury Department, “Vehicle registration duty” Dutiable value of a new vehicle is the list price, which includes luxury car tax and GST. Sighted <https://www.osr.qld.gov.au/duties/vehicle-registration-duty/index.shtml>

Table 7: Comparison of state and territory government stamp duty on new passenger and SUV vehicles to Ireland's vehicle purchase tax

State	CO2 g/km	Duty payable on new motor vehicle and % of duty payable to purchase value**							
		\$ GST (incl)	* ACT	* QLD	* NSW	* Vic	* SA	* WA	Ireland***
Prius 1.8L 4cyc Rating A	89	37,389	Nil	748 (2%)	1,121 (3%)	1,196 (3%)	1,436 (3.8%)	1,723 (4.6%)	5,234 (14%)
Ford Focus (petrol) 4 cycl, 2.0L Rating B	154	36,289	726 (2%)	1,089 (3%)	1,088 (3%)	1,064 (2.9%)	1,392 (3.8%)	1,611 (4.4%)	7,257 (20%)
Ford Focus (diesel) 4cyc, 2.0L Rating C	144	40,139	1,206 (3%)	1,206 (3%)	1,204 (3%)	1,286 (3.2%)	1,548 (3.8%)	2,015 (5%)	8,027 (20%)
Holden 6 cycl Rating B	222	40,690	814 (2%)	1,220 (3%)	1,220 (3%)	1,306 (3.2%)	1,568 (3.8%)	2,075 (5%)	13,835 (34%)
Landcruiser 200 (diesel) 8 cyl 4.6L Rating D	273	126,231 Including LCT ¹⁰⁹ \$15,142= 126,231	6,674 (5.2%)	5,052 (4%)	5,415 (4.3%)	6,572 (5.2%)	4,992 (3.9%)	8,205 (6.5%)	39,992 (36%)
Commodore VF SS; 8cyc, 6.0L Rating D	274	54,769	2,388 (4.3%)	2,192 (4%)	1,840 3.3%	1,753 (3.2%)	2,132 (3.8%)	3,559 (6.5%)	19,716 (36%)

* State and Territory Governments new motor vehicle stamp duty calculated as at 15 September 2014

<http://www.strattonfinance.com.au/car-finance/learn/articles/motor-vehicle-stamp-duty-guide.aspx>

** Purchase value for all state and territory governments is the manufacturer's list price, including the GST and luxury car tax (LCT), which applies to vehicles with a value (including GST) of more than LCT threshold of \$60,316 for the 2013–2014 financial year.¹¹⁰

*** Ireland applies a VAT of 23 per cent as from 1 January 2013. The above estimates have not been adjusted for the VAT. The calculations show the impact of Ireland's vehicle purchase tax.

<http://www.revenue.ie/en/tax/vat/rates/current-historic-rates-vat.html#rates>

¹⁰⁹ Luxury car tax: Total luxury car value, including GST: \$111,089 - \$60,316 (LCT threshold) = \$50,773; Subtract the GST included in this amount \$50,773 x 10/11 = \$46,157; Apply LCT 33% x \$46,157 = \$ 15,232 LCT payable. Therefore, the purchase value of the car is: \$111,089 (incl GST) + LCT of \$15,232 = \$126,321

¹¹⁰ Australian Tax Office, "Working out the LCT on a sale". LCT does not apply to fuel-efficient vehicles under \$75,375 which were delivered or imported after 3 October 2008. A "fuel-efficient car" has a fuel consumption that does not exceed seven litres per 100 kilometres as a combined rating under the vehicle standards in force under section 7 of the Motor Vehicle Standards Act 1989. If the value is above this balance, the 33 per cent LCT rate applies. The conversion of 7 litres/100 kilometres is 162g of CO2/km. Sighted on <http://www.ato.gov.au/Business/Luxury-car-tax/How-to-work-out-the-LCT-amount/Working-out-the-LCT-on-a-sale/> 10 March 2014

Table 7 shows that the ACT and Queensland (Qld) are the only governments in Australia that discount stamp duty/vehicle purchase tax for hybrid, electric vehicles, and vehicles that have an environmental performance rating of “A” in the GVG (Stage 2). Consumers buying a hybrid car in the ACT will pay no stamp duty, whereas in Queensland the duty will be discounted to 2 per cent compared to other states where the tax rate/ duty can range from 3 per cent in New South Wales (NSW) to the highest rate of 4.6 per cent in Western Australia (WA).

For “B” rated vehicles, the ACT discounts tax/duty to 2 per cent, whereas state governments’ tax/duty range from 3 per cent (Qld, NSW, Vic) to 4.4 per cent in WA. Most territory/state tax/duty for “C” rated vehicles is 3 per cent (Act, Qld, NSW, Vic), while WA imposes tax/duty of 5 per cent. For the highest CO₂ emitting vehicles (those with a “D” rating), the tax/ duty varies from 3.3 per cent in NSW to the highest rate of 6.5 per cent in WA.

In terms of ACT Government’s tax initiative in penalising or discouraging consumers from choosing high emitting vehicles, the vehicle purchase tax/stamp duty paid at the time of purchase in the ACT is not significantly different from that of other state governments. Furthermore, the highest duty of 4.3 per cent for the higher emitting “D” rated vehicles is lower than the tax/duty of 6.5 per cent in WA (which is not differentiated on the basis of environmental performance).

Nonetheless, the “price signals” from all state and territory tax/duty are not sufficiently “differentiated” to significantly shift buyer choice towards new light vehicles, compared to the “strong differentiated price signal” adopted in Ireland (as shown in Table 7). That is, ACT’s reformed tax rates/duty under the GVDS range from 0 per cent to 5 per cent compared to Ireland’s tax/duty (differentiated on the basis of CO₂ emissions bands), which ranges from 14 per cent to 36 per cent¹¹¹. In Ireland, for instance, the tax/duty of 36 per cent of the new vehicle’s purchase price (including VAT of 23 per cent), which is applied to new vehicles with emissions that exceed 226g/km,¹¹² has had a significant

¹¹¹ Independent Vehicle Registration Tax Guide and Motoring Site, “CO₂ emissions VRT system” <http://vrt.ie/vrtDetail.php?page=14> on 14 April 2014. Ireland’s VRT rates vary from the lowest tax rate of 14 per cent for new vehicles with CO₂ emissions in the band 0 to 80g/km to the highest tax rate of 36 per cent for new vehicle with CO₂ emissions in the band 226 and more.

¹¹² Mortimore. A., above n 57.

impact on altering private car purchasing patterns. This is in direct comparison to ACT's highest tax/duty rate of 4.3 per cent for "D" rated vehicles, which has had no impact on vehicle purchase decisions (discussed further in Section 4.2.6 below).

Thus, the above analysis shows the importance of regularly reviewing and monitoring the tax design, and assessing whether or not the differentiation in the price signal of tax/duty is significant in shifting buyers' choice of vehicles. That is, penalising buyers for choosing a higher CO2 emitting vehicle by levying a higher rate of tax.

4.2.5 ACT Government's policy on review and monitor of GVDS

The ACT Government's strategy in addressing its emission reduction targets has been documented in various reports.¹¹³ In 2007, the ACT Government launched the Climate Change Strategy Report for the period 2007 to 2025 entitled *Weathering the Change Action Plan*. In this report, the ACT Government outlined its ambitious emission reductions targets (discussed in Section 4.1 above), and the reform of the Territory's vehicle purchase tax/stamp duty (GVDS) introduced on 3 September 2008. But it was not until 2012 that the ACT Government released an update to its Climate Change Strategy Report entitled *A New Climate Change Strategy and Action Plan for the Australian Capital Territory* (known as the AP2 Report), which set out its strategic pathway through a summary of Actions.¹¹⁴

The AP2 Report released the performance of the GVDS for the period 2008 to mid-2011 (discussed in Section 4.2.6 below). The Report stated that the review of the GVDS duty scheme would be completed in 2011–12, and that amendments to the scheme would be considered to increase the incentives towards "best-in-class" green vehicle purchasing. According to Action 25 in the AP2 Report, the ACT Government would evaluate the GVDS to identify how it could better encourage the purchase of lower emission vehicles.¹¹⁵

¹¹³ The GVDS was initiated as an action under the 2007 Report entitled "Climate Change Strategy: Weathering the Change" Action Plan 1, above 59.

¹¹⁴ Australian Capital Territory, AP2 Report, above n 62. The Action Plan target is to reduce 138,000 tonnes of CO2 transport emissions by 2020; page xiv. In terms of reducing transport emissions, Action 25 required the ACT Government to evaluate the ACT Green Vehicle Stamp Duty Scheme to identify how it could better encourage the purchase of lower emission vehicle: xi

¹¹⁵ Ibid: xi.

In June 2014, the ACT Government released a “Low Emission Vehicle Strategy Discussion Paper”, which proposed various options to encourage the purchase of low emission vehicles. For the GVDS, other than proposing greater incentives at the time of purchase (rebates or fee bates) to encourage buyers to choose low emission vehicles,¹¹⁶ there were no proposals to change the price signal or design of the policy instrument. Rather, the government included the abovementioned AP2 Report (see Table 8) in the Discussion Paper, and stated that the GVDS was influencing a market shift in the new vehicle market.

In terms of reporting, the AP2 Report stated that independent assessment and reporting would be carried out every three years from 2014 to 2020 by the Office of Commissioner for Sustainability and the Environment.¹¹⁷

Furthermore, the 2012–2031 Transport for Canberra Report released in 2012 stated that the target for transport emissions was to increase the efficiency of travel by decreasing the intensity of ACT’s passenger fleet. This intensity would be measured by reviewing the annual report on emissions of Australian vehicle fleet reported in the National Transport Commission (NTC) annual report¹¹⁸ (discussed further in Section 4.6 below).

4.2.6 ACT Government’s review and monitor of GVDS tax design and price signal

The GVDS was introduced on 3 September 2008, but it was not until 2012 that the ACT Government released the performance of the GVDS in the AP2 Report (as shown in Table 8). However, no comments have been made on the tax design or price signal in any of the reports, nor has the performance of the GVDS been updated since June 2011.

¹¹⁶ ACT Government, (2014) “Low emission vehicle strategy: Discussion paper” June 2014, 1-19: 11. The consultation period commenced on 24 June 2014 and ended on 19 August 2014. Sighted http://www.transport.act.gov.au/policy_and_projects/transport_planning_studies/Low-Emission-Vehicle-Strategy/Low-Emission-Vehicle-Strategy-discussion-paper 3 October 2014

¹¹⁷ Australian Capital Territory: AP2, above n 62: xi. The AP2 report outlined the ACT Government’s new public reporting framework, which would be subject to an independent assessment and reporting by the Office of Commissioner for Sustainability and the Environment. (OCSE), through the publication of Implementation Status Reports (ISR) every three years from 2014 to 2020, which would assess the performance against the achievement of AP2 outcome.

¹¹⁸ ACT Government, “Transport for Canberra, Transport for a sustainable city 2011-2031”:60. Sighted <http://timetotalk.act.gov.au/storage/Transport%20Policy%202014%20October%20Full.pdf> 13 March 2014

Table 8: Movement in ACT vehicle sales under the Green Vehicle Duty Scheme for the period: September 2008 to June 2011

Green Vehicle Rating	Age of new cars sales Sept 2008	Percentage of new cars sales June 2011	Comparison 2008 to 2011
A	2%	7%	+5%
B	9%	27%	+18%
C	75%	54%	-21%
D	12 -14%	12 - 14%	0%

Source: ACT Government AP2 A new climate change strategy and action plan for the Australian Capital Territory, 2012: 58

In the period September 2008 to June 2011, there was a 5 per cent increase in consumers choosing “A” rated vehicles, an increase of more than 18 per cent in consumers choosing “B” rated vehicles, and a 21 per cent decrease in consumers choosing “C” rated vehicles. However, it is not possible to state unequivocally that there has been an increase in fuel-efficient, low-emitting vehicles because the misleading green vehicle ratings in GVG (Stage 2) can vary widely, depending on whether the vehicle is petrol fuelled or diesel fuelled (as shown in Table 9 below).

Table 9: Comparison of CO2 emissions for vehicles in green vehicle rating fuelled by petrol and diesel

Green Vehicle Rating	CO2 emission in g/km for petrol fuelled vehicles in Table 2	CO2 emission in g/km for diesel fuelled vehicles in Table 3
A	CO2 emissions range from 89g/km to 159g/km	nil
B	CO2 emissions range from 107g/km to 236g/km	CO2 emissions range from 95g/km to 105g/km
C	CO2 emissions range from 183g/km to 325g/km	CO2 emissions range from 117g/km to 176g/km
D	CO2 emissions range from 303g/km to 313g/km	CO2 emissions range from 232g/km to 273g/km

Source: ACT Government AP2, A new climate change strategy and action plan for the Australian Capital Territory, 2012: 58

Nevertheless, if 16.6 million vehicles were registered in 2013, 79.9 per cent were petrol-fuelled vehicles, and 17.2 per cent were diesel-fuelled vehicles,¹¹⁹ then it is highly likely that most of the 18 per cent increase in “B” rated vehicles were petrol-fuelled vehicles.

¹¹⁹ Australian Government: Australian Bureau of Statistics (2013). “9309.0 Motor Vehicle Census”, 31 January 2013: 6

If so, it is not possible to assess whether there has been an actual reduction of GHG emissions from consumers choosing lower-emitting vehicles, when the CO₂ emissions in the “B” rated green vehicle category can range from 95g/km to 236g/km (as shown in Table 9).

Ranking vehicles according to their “environmental performance” and not according to their “CO₂ emissions” makes it difficult to assess whether there has been an actual reduction of GHG emissions because of a wide disparity among emissions for new vehicles rated “B” and those rated “C” (as shown in Table 9). Furthermore, the fact that there was no shift in the “D” rated high-CO₂-emitting vehicles (303g/km to 313g/km) supports the argument that the level of tax differentiation for the higher CO₂ emitting vehicles is not a “strong price signal” in discouraging consumers to choose such vehicles.

The performance of the ACT’s GVDS is compared with state governments’ vehicle purchase tax/stamp duty scheme in Section 4.5. However the GVDS cannot be compared with any mandatory CO₂ standard or equivalent fuel economy standards, as there are none. The Transport for Canberra Report states that monitoring and progressive reporting for transport emissions will be included in the annual report on emissions of Australian Vehicle Fleet by the National Transport Commission. However, monitoring and assessing the performance of GVDS in the NTC report is not possible because average CO₂ emissions for new passenger vehicles for each individual state and territory are not provided (as shown in Section 4.5 below).¹²⁰

Notwithstanding that there is no mandatory emission target to assess the performance of the GVDS (shown in Table 8), the mechanism can be assessed against the performance of Ireland’s vehicle purchase tax.

¹²⁰ ACT Government, “Transport for Canberra, Transport for a sustainable city 2012-2031”:60. Sighted http://www.transport.act.gov.au/data/assets/pdf_file/0003/397245/Pages_from_EDS_ACT_Transport_Policy_FA_final_web.pdf 1 April, 2014. The Report recorded the monitoring and reporting action as ACTION 33 “Release an annual Transport for Canberra update report from 2012–2013 and review and update Transport for Canberra in five years.”

4.2.7 GVDS tax policy design compared with Ireland's vehicle purchase tax

Part 1 of the two-part series discussed the ex-post analysis of the successful reform of EU Member States' vehicle purchase taxes.¹²¹ The article highlighted important differences between policy instruments, and provided evidence that policy choice, design and price signal all play crucial roles in meeting the policy objective of reducing road transport emissions. The case study of Ireland in Part I showed that by 2007 technological efficiency improvements in private cars were being offset by car purchasing trends for higher emitting vehicles, resulting in no net improvements in the energy efficiency of the car fleet.¹²² Ireland's reform of vehicle purchase tax – differentiated on the basis of CO2 emissions – resulted in greater than expected CO2 emission savings within the first year (as shown in Table 10), thereby outperforming results achieved in the first three years following the introduction of the ACT Government's GVDS (as shown in Table 9).

Table 10: Vehicle sales compared before and after the reform of Ireland's vehicle taxes

CO2 Emission bands	CO2g/km	Vehicle purchase tax (%) per vehicle after 1.7.2008	Pre-reform New car sales 1 July 2007 to 30 June 2008 %	Year 1 of new car sales 1 July 2008 to 30 June 2009 %	Percentage (%) change in first year.
A – B	0 – 140g	14-16	18	55	+37
C – D	141 -170g	20-24	48	34	-14
E – G	171 – 226g+	28 – 36	34	11	-23

Source: Rogan F., Dennehy, E., Daly, H., Howley, M., Gallachoir, B. (2011) Impacts of an emission based private car taxation policy – first year ex-post analysis. *Transportation Research Part A* 45: 583-597: 588.

The price signal of Ireland's vehicle purchase tax ranged from 14 per cent to 36 per cent, calculated on the purchase price/market selling price of a vehicle (inclusive of VAT of 23 per cent)¹²³. Within the first year of reform, there was a 37 per cent increase in consumers choosing low emission vehicles (CO2 emission bands 0 – 140g), and a 23 per cent (171–226g) decrease in consumers choosing higher emitting vehicles (as shown

¹²¹ Mortimore, A., above n 57.

¹²² O'Callachoir, B.P., Howley, M., Cunningham, S., Bazilian, M. (2009). "How private car purchasing trends offset efficiency gains and the successful energy policy response." *Energy Policy* 37, 3790–3802

¹²³ European Commission, "VAT Rates Applied in the Member States of the European Union." Sighted http://ec.europa.eu/taxation_customs/resources/documents/taxation/vat/how_vat_works/rates/vat_rates_en.pdf 1 March 2014

in Table 10). In total, 89 per cent of buyers in Ireland chose new vehicles that emitted less than 171g of CO₂ compared to 56 per cent before the tax reform.¹²⁴

However, it is not possible to compare the ACT Government's GVDS determined on the basis of "environmental performance" (as shown in Table 8) to Ireland's CO₂ emission bands (as shown in Table 10). For instance, 55 per cent of Ireland's new vehicles categorised in the CO₂ emission bands of A and B emitted between 1g to 140g of CO₂/km, compared to 34 per cent of new vehicle sales in ACT (as shown in Table 8) that were rated with an 'environmental performance' score of "A" and "B" but emitted between 89g to 236g of CO₂/km (as shown in Table 9).

4.2.8 COAG's recommendation for differential stamp duty: ACT's GVDS as one model

The failure of the GVDS to significantly reduce CO₂ emissions in road emissions is not an indication that the measure is ineffective, but rather a failure in the tax design and price signal adopted by the ACT Government. That is, the GVDS is not an efficient tax in terms of reducing CO₂ emissions because the price signal is ineffective, and the tax design's adoption of the GVG as a measure of new vehicle's environmental performance lacks transparency and flexibility.

4.3 Environmental taxes combined with direct regulation

According to Maatta, environmental taxes are often applied in conjunction with direct regulation such as mandatory CO₂ emissions or fuel efficiency standards.¹²⁵ Moreover, such regulation (commonly referred to as command and control policies) force consumers and producers to change their behaviour.¹²⁶ However, the Australian Government failed to introduce light vehicle CO₂ emission standards announced in its Discussion Paper back in 2011.¹²⁷ In effect, then, the performance of the GVDS could

¹²⁴ Rogan, F., Dennehy, E., Daly, H., Howley, M., Gallachoir, B. (2011). Impacts of an emission based private car taxation policy– First year ex-post analysis *Transportation Research Part A: Policy and Practice* 45: 583-597.

¹²⁵ Maatta, K., (2006) above 68:23

¹²⁶ Santos, G., Behrendt, H., Maconi, L., Shirvani, T., Teytelboym, A. (2010). Part I: Externalities and economic policies in road transport. *Research in Transportation Economics* 28, 2-45:2

¹²⁷ Australian Government: Department of Infrastructure and Transport (2011) "Light vehicle CO₂ emission standards for Australia – Key Issues – Discussion Paper - 2011

not be assessed against any regulated CO₂ emissions target for new light vehicles. And nor could the GVDS, based on new vehicles GVG environmental performance be assessed against the EU's regulated CO₂ emissions standards.

The function of taxes differentiated on the basis of CO₂ emission bands (such as those shown in Table 10) were introduced in Ireland to provide an incentive to reduce emissions below a regulated emission level.¹²⁸ Notwithstanding that the beneficial effect of the environmental tax in achieving the mandatory standards is by no means certain¹²⁹ and is often determined on the basis of hypothetical effects, the impact on the environment may be difficult to verify.¹³⁰ Faure et al. stated that environmental taxes require emissions to be monitored as closely as possible to ensure their effectiveness, even if this is difficult.¹³¹

4.4 Regulating the monitoring fiscal environmental taxes

The beneficial effects of fiscal environmental taxes will require regular review and monitoring to ensure that the measure is effective in reducing CO₂ emissions, or require the tax design or price signal to be adjusted and/or complementary measures to be introduced or adjusted.

For example, in order to meet the EU's Kyoto Protocol emissions reduction target,¹³² a monitoring and reporting mechanism known as Monitoring Mechanism Regulation (MMR) was established in 1993, revised in 2004, and came into force on 8 July 2013.¹³³ This mechanism reflected the sum of national inventories and relied on the Member States to monitor their own GHG emissions and to keep track of their progress towards

¹²⁸ Mortimore, A. (2014), above 57: para 4.1

¹²⁹ Maatta, K., above 68: 20

¹³⁰ Ibid: 20

¹³¹ Faure, M.G. and Weishaar (2012). The role of environmental taxation: economics and the law. *Edward Elgar Handbook of Research on Environmental Taxation*, 399 – 4, 408

¹³² European Commission, "EU-15 over-achieves first Kyoto target", http://ec.europa.eu/clima/policies/gas/index_en.htm on 25 March, 2014. The 15 countries that were EU Member States when the Kyoto Protocol was agreed in 1997, committed to reduce their collective emissions in the first Kyoto Protocol's first period (2008–2012) to 8 per cent below the level of their various base years, which was 1990 in most cases.

¹³³ European Commission, *ibid*, Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level, relevant to climate change;

meeting their emission targets for 2013-2020.¹³⁴ Additional reporting requirements were introduced to enhance reporting processes that were essential to recognise the efforts made by the Member States to meet their commitments. Each Member State has their own annual reporting requirements for emissions, and is expected to outline the projected progress towards meeting their obligations.¹³⁵ Every two years, the Commission assesses the progress of each of the Member States¹³⁶ to allow for corrective action.

In Ireland, the European Commission assigned a reduction target of 20 per cent GHG reduction relative to 1990 levels by 2020.¹³⁷ This required a reduction of 1.29 per cent annually between 2009 and 2020.¹³⁸ Ireland's challenge was to address consumers' growing preference for buying larger vehicles. This necessitated a strong price signal in order to shift consumers towards choosing fuel-efficient, low-emission vehicles. The strong price signal incorporated in Ireland's vehicle purchase tax enabled the country to reduce its average CO₂ emissions for new passenger cars from 166g/km in 2007 to 145g/km in 2008. This represented a 13 per cent reduction in CO₂ emissions in the first year the tax policy measure was introduced relative to average CO₂ emissions before the vehicle purchase tax change.¹³⁹ By 2012, the average CO₂ emissions for new passenger cars had reduced further to 125g/km in 2012, that is, 36 per cent lower than the ACT's average CO₂ (197g/km) emissions for 2012.¹⁴⁰

Similar taxes in operation in other Member States of the EU have also been effective in significantly reducing road transport emissions (as detailed in Part 1 of the two-part series).¹⁴¹ In the period 2007 to 2012, vehicle taxes reduced road emissions by 16.4 per

¹³⁴ European Commission, "Monitoring and reporting of GHG emissions". Sighted http://ec.europa.eu/clima/policies/g-gas/monitoring/index_en.htm 25 March 2014

¹³⁵ European Parliament and of the Council, Decision No 406/2009/EC of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

¹³⁶ Ibid, para 24.

¹³⁷ Mortimore A. (2014), above n 57: para 4.1

¹³⁸ Ibid

¹³⁹ Ibid

¹⁴⁰ Australian Government, National Transport Commission, "Carbon Dioxide Emissions from New Australian Vehicles 2012"

<<http://www.ntc.gov.au/filemedia/Reports/C02EmissionsNewAustVeh2012InfoPa.pdf>> Australian Government on 4 March 2014.

¹⁴¹ Mortimore A. (2014), above n 57.

cent in Belgium, 18.8 per cent in United Kingdom, 24.2 per cent in Ireland, 25.7 per cent in Denmark, and 25.1 per cent in the Netherlands.¹⁴²

The ex-post analysis indicates that vehicle purchase tax is an effective fiscal environmental measure in significantly reducing road transport emissions, providing that the tax design is effective and the price differential signal is strong, as was the case in Ireland and which led to “greater than expected emissions savings.”¹⁴³ Administratively it is relatively simple, since the tax system is already in place.¹⁴⁴ Further, Santos et al. (2010) stated that such taxes will continue to generate revenue, but can be reformed into corrective taxes by correcting market failure.¹⁴⁵ That is, the taxes can be reformed to correct distortions and change behaviour to restore efficiency by providing either incentives or disincentives for buyers’ behaviour by increasing the marginal costs of certain activities.¹⁴⁶

4.5 CO2 based vehicle taxes to be adopted by all state and territory governments

To reduce road transport emissions, policy makers will need to require all state and territories to reform vehicle purchase taxes/stamp duty. Table 11 shows the number of new light vehicles acquired, total number of vehicles, and government buyers’ average CO2 emissions for new light vehicles achieved by state and territory buyers in 2013 compared to 2012.

¹⁴² European Automobile Manufacturers Association “The Automobile Industry Pocket Guide 2013” 1-81: 63. Sighted http://www.acea.be/uploads/publications/POCKET_GUIDE_13.pdf 25 May 2014

¹⁴³ Rogan, F., Dennehy, E., Daly, H., Howley, M., Gallachoir, B., above 124

¹⁴⁴ Santos et al., above 126: 19

¹⁴⁵ Ibid: 18

¹⁴⁶ Ibid: 18

Table 11: New motor vehicle sales and average CO2 emissions for new passenger and light commercial vehicles by government buyers

State/territory	No of passenger vehicles by state/territory 2013 ***	No of new motor vehicle sales 2013*	Government buyers CO2 2012 average CO2 emissions g/km**	Government buyers CO2 2013 average CO2 emissions g/km****
Australian Capital Territory	229,060	17,860	194	197
New South Wales	3,877,515	351,050	211	208
Victoria	3,446,548	307,292	214	209
Queensland	2,556,581	233,139	214	223
South Australia	1,016,590	70,491	203	207
Western Australia	1,476,743	125,544	217	213
Tasmania	305,913	19,458	208	209
Northern Territory	91,071	11,393	215	217
	13,000,021	1,136,227		

* Federal Chamber of Automotive Industries www.fcai.com.au/sales/2013-new-vehicle-market Includes light vehicles: passenger vehicles; SUV's; and light commercial vehicles.

** Australian Government, 2012 National Transport Commission Report

*** Australian Bureau of Statistics 4102.0 Social Trends, July 2013. Passenger vehicles includes: cars, four wheel drive passenger vehicles, people movers, but excludes motorcycles, utility vehicles and light commercial vehicles.

**** Australian Government, 2013 National Transport Commission Report

The 2013 National Transport Commission report shows that the national average emissions from new passenger and light commercial vehicles was 192g/km, and that the average emissions on cars chosen by buyer type ranging from the lowest to the highest were private buyers (186 g/km), business buyers (198g/km), followed by government buyers (210 g/km).¹⁴⁷

The average CO2 emissions (197g/km) for new passenger vehicles chosen by the ACT Government in 2013 may have been the lowest compared to all other state governments; however, the average is 1.5 per cent higher than in 2012 (194g/km) and 5.5 per cent higher than the average for Australian private vehicle buyers (186g/km).¹⁴⁸ The ACT Government's average CO2 emissions (197g/km) may be even higher than the average emissions for private buyers in the ACT. Unfortunately, such statistics are not provided in the NTC report.

¹⁴⁷ Australian Government, National Transport Commission, above n 64: 16

¹⁴⁸ Australian Government, National Transport Commission, above n 64: 24

In effect, the ACT Government is not necessarily an exemplary example of its own policy objective that buyers choose fuel-efficient, low-emitting vehicles. Furthermore, it will be difficult to convince business and private buyers to agree to higher vehicle purchase taxes/duty when government buyers are choosing vehicles that are less efficient and more emission intensive (as shown in Table 11).

On the other hand, the ACT Government may have supported locally produced vehicles and chosen vehicles with a “B” ranked “environmental performance” on the basis of the information provided in the GVG (Stage 2) when, in fact, the new vehicle is a high CO₂ emitting vehicle (as discussed in 4.2.1). For example, Victoria (209g/km) and South Australia (207g/km) have high average CO₂ emissions because both state governments have adopted the Australian Government Fleet Vehicle Selection Policy, and predominately purchase Australian made vehicles with average CO₂ emissions of 210g/km. Toyota had the lowest emissions (179g/km) followed by Holden (213 g/km), while Ford had the highest emissions (237g/km).¹⁴⁹

With no mandatory national CO₂ emission targets, Australian average CO₂ emissions levels for new passenger vehicles is significantly higher (44 per cent) than in the EU (190g/km compared with 132g/km)¹⁵⁰

Furthermore, the NTC does not provide each state and territory with respective annual average CO₂ emissions of new light vehicles by buyer type. This means that monitoring the performance of each state and territory in reducing CO₂ emissions is not possible. Table 11 shows that NSW was the most populous state in terms of the number of vehicles and government buyers, whereas QLD had the highest CO₂ emissions of all state and territory governments.

Policy makers considering reform of vehicle purchase taxes will need the NTC to provide annual reports on average emissions by buyer type in each state and territory for the purposes of reviewing and monitoring the performance of the environmental tax design and price signal. In addition, the performance of each state and territory will

¹⁴⁹ Australian Government, National Transport Commission, above n 64: 18

¹⁵⁰ Australian Government, National Transport Commission, above n 64: 31

need to be assessed against an overall national reduction target. This target figure will need to be agreed on by COAG and by the Australian Government in order to achieve the national objective of reducing greenhouse gas emissions.

The Victorian and South Australian Governments may only agree to reform their vehicle purchase taxes once the local car industry ceases production in 2017. However, this timeline may need to be brought forward if the Australian Government finds that road transport emissions must be reduced to meet its international commitment to climate change (as discussed in Section 2 above).

5 Barriers and Challenges to Reforming Vehicle Purchase Taxes/Stamp Duty

The success of the environmental fiscal measure will depend on policy makers' actions or responses to the challenges and barriers to reforming vehicle purchase tax on the basis of CO₂ emissions. Anderson stated that environmental taxes are often applied on the basis of least political resistance.¹⁵¹ Braathen argued that a tax would never be chosen due to the financial cost it would represent for the lobbying polluters.¹⁵² Inevitably, reforming vehicle purchase taxes/stamp duty through imposing a strong price signal will bring strong opposition from powerful lobby groups such as the Australian Motor Vehicle industry and the Automobile Association of Australia. The fear is that the competitiveness of the most affected industrial sectors could be significantly negatively affected.¹⁵³

Further challenges for policy makers include the interaction of vehicle purchase tax/stamp duty with other complementary tax policy instruments, public acceptance of higher taxes, and the provision of information to the public regarding the reform of vehicle taxes on the basis of CO₂ emissions. This could depend on each government's political economy of environmental policy at the time of reform, as Boyer and Laffont

¹⁵¹ Anderson, M.S. (1995). The use of Economic Instruments for Environmental Policy: A Half Hearted Affair, in TemaNord 1995: 588, *Sustainable Patterns of Consumption and Production*, Nordic Council of Ministers, 55-69.

¹⁵² Braathen, N A., (2012). The political economy of environmental taxation, in, *Edward Elgar Handbook of research on environmental taxation* (230-245): 234.

¹⁵³ Ibid: 237

found that politicians exercise discretion in pursuing the private political agendas of their electoral base.¹⁵⁴ Further discussion is outside the scope of this article.

5.1 Lobby group: the Australian Motor Vehicle Industry

As the Australian Motor Vehicle Industry (MVI) would be the ‘losers’ in any vehicle tax reform, it would be motivated to lobby against measures that would adversely affect their interests. Likewise, policy makers would be reluctant to undertake measures that would impose a heavier burden on certain sectors of society.¹⁵⁵ Given that the Australian motor vehicle industry will be manufacturing cars up until the end of 2017, the Australian Government is unlikely to support any reform of vehicle purchase taxes on the basis of CO2 emissions during this period. Such reform would undoubtedly have an impact on sales for the Australian Motor Vehicle industry (MVI).

Furthermore, Stigler’s theory of how firms can capture policies for their own benefit, and push for benefits that a state could provide to the industry,¹⁵⁶ applies to the Australian MVI. For instance, the Australian Government’s Fleet Vehicle Selection Policy was introduced to support the local car industry, in that Commonwealth agencies operating under the *Financial Management and Accountability Act 1997 (Cwlth)* and other government agencies that have ‘opted in’ under this Act, are required to select passenger and light commercial vehicles that are manufactured in Australia unless it can be “demonstrated that no suitable vehicle is available.”¹⁵⁷ The policy states that “environmental considerations such as fuel efficiency” is not a consideration for choosing an alternative vehicle¹⁵⁸.

¹⁵⁴ Boyer, M. and Laffont, J-J. (1999). Toward a political theory of the emergence of environmental incentive regulation. *RAND Journal of Economics*, 30 (1) Spring, 137-57: 152.

¹⁵⁵ Maatta K., above 68: 26

¹⁵⁶ Stigler, G.J. (1971). The theory of economic regulation. *Bell Journal of Economic and Management Science*, 2 (1), 3-21.

¹⁵⁷ Australian Government, Productivity Commission Inquiry Report (2014). “Australia’s Automotive Manufacturing Industry” No. 70, 31 March 2014: 1-340: 171.

¹⁵⁸ Australian Government, Department of Finance, (2012). “Fleet Vehicle Selection Policy (as at April 2012). Sighted <http://www.finance.gov.au/vehicle-leasing-and-fleet-management/fleet-guidance-and-related-material.html> 25 August 2014. The policy states “A Commonwealth agency that purchases an imported passenger vehicle must provide a business case detailing the operational requirements that preclude the selection of a vehicle that was produced in Australia” Department of Finance 2012

In 2012–13, the Commonwealth, Victorian and South Australian Governments, all of which have a preferential purchasing policy to buy Australian manufactured vehicles, accounted for 56 per cent of fleet purchases, compared to 21 per cent of fleet purchases by the remaining jurisdictions.¹⁵⁹ However, the total number of vehicles purchased by all governments together is less than 50,000 annually, which is small given that over 1.1 million new vehicles are acquired each year.¹⁶⁰ It is envisaged that this policy will continue until Australian motor vehicle manufacturers in Victoria and South Australia cease production at the end of 2017.¹⁶¹ As a result of this policy directive, the Australian Government and the Victorian and South Australian state governments may not support the reform of vehicle purchase taxes/stamp duty. This supports Braathen findings that interest groups such as the local car industry have so much influence on political decisions that they could block the introduction of instruments.¹⁶² Moreover, Rajan pointed out that policy makers' attempts to introduce policy options remain hemmed in by strong lobbies at federal and state government levels.¹⁶³

The Productivity Commission considered that such fleet procurement policies act as a subsidy to producers, which can impose costs on government and, in turn, on taxpayers. Thus, the Commission recommended the removal of the policy when the local car industry ceases operations at the end of 2017.¹⁶⁴

Nevertheless, it is now an opportune time to reintroduce discussion on reforming vehicle taxes. Such discussion will provide information, increase public acceptance, and bring about the progressive implementation of environmental fiscal taxes.¹⁶⁵

¹⁵⁹ Australian Government, Productivity Commission Inquiry Report (2014), above n 157: 169

¹⁶⁰ Ibid. Governments with preferential purchasing policy included the Australian Government, Victoria and South Australian state governments. All other state/territory governments did not adopt a preferential purchasing policy.

¹⁶¹ Ibid: 88 The Productivity Commission prepared the following Draft Proposal 3.2 “The Australian, Victorian and South Australian governments, by 2018, should remove fleet procurement policies that require government agencies to purchase vehicles manufactured in Australia.”

¹⁶² Braathen N.A. above n 152: 233

¹⁶³ Rajan S.C., (2006) “Climate change dilemma: technology, social change or both? An examination of long-term transport policy choices in the United States” *Energy Policy* 34 (2006) 664-679: 670

¹⁶⁴ Australian Government, Productivity Commission Inquiry Report (2014), above n 157: 172.

Recommendation 5.7 “After Ford, Holden and Toyota have ceased manufacturing motor vehicles in Australia, the Australian, South Australia and Victorian governments should remove fleet procurement policies that require government agencies to purchase vehicles manufactured in Australia.” The Australian Government supports this recommendation that the “policy will be redundant once no manufacturing remains in production.”

¹⁶⁵ Maatta K., above 68: 31

5.2 Vehicle purchase taxes regarded as non-tariff barriers

The Productivity Commission would not support reforming vehicle purchase taxes on the basis of carbon emissions, as the Commission would consider such taxes as non-tariff barriers. For example, Australia has bilateral trade arrangement with Thailand under which there is zero tariff.¹⁶⁶ Thailand is the third largest importer of vehicles and components from Australia; nonetheless, Thailand imposes a 40 per cent excise tariff¹⁶⁷ on the imported Australian manufactured Ford Territory (249g/km).¹⁶⁸ Thailand's excise tax is based on engine size, and from 1 January 2016 excise taxes will be differentiated on the basis of CO2 emissions.¹⁶⁹

Consequently, Thailand's excise taxes are part of that country's environmental taxation policy measure to reduce national transport emissions. In 2014, the Productivity Commission Inquiry Report on Australia's Automotive Manufacturing Industry stated that Thailand's vehicle excise tax should be removed, because "Australia's interest would be best served by multilateral reductions in trade barriers."¹⁷⁰ However, policy measures do not contravene the General Agreement on Tariffs and Trade (GATT) as they are imposed on all vehicles sold in Thailand, whether they are imported or manufactured domestically, for the protection of the environment.¹⁷¹

On the other hand, Australia's failure to impose such non-tariff barriers is allowing high-emitting vehicles into Australia, and is not discouraging consumers from choosing such vehicles. Braathen argued that emission cuts in participating countries would be offset by emission increases elsewhere.¹⁷² In effect, Australia's increasing road

¹⁶⁶ Australian Government, Productivity Commission, Inquiry Report (2014) "Productivity Commission on Car Industry" March 2014: above n157: 1-287: 67.

¹⁶⁷ Ibid: 67

¹⁶⁸ Australian Government, Department of Infrastructure and Transport, "Green Vehicle Guide" Ford SZ Territory Titanium Petrol emits 249g of CO2/km. Sighted <https://www.greenvehicleguide.gov.au/GVGPublicUI/SearchResults.aspx> 6 April 2014

¹⁶⁹ Swire, M., Tax News, "Thailand Restructures Vehicle Taxes" http://www.tax-news.com/news/Thailand_Restructures_Vehicle_Taxes_58922.html 7 April 2014

¹⁷⁰ Australian Government: Productivity Commission 2014, above 157: 43

¹⁷¹ World Trade Organization, "WTO rules and environmental policies: GATT exceptions" For a trade-related measure to be eligible for an exception under Article XX, paragraphs (b) or (g) must establish that there is a connection between its stated environmental policy goal and the measure. That is paragraph (b) requires the measure to be necessary for the protection of human, animal or plant life or health or (g) relates to the conservation of exhaustible natural resources. Sighted http://www.wto.org/english/tratop_e/envir_e/envt_rules_exceptions_e.htm 17 September 2014

¹⁷² Braathen. N.A., above 152: 238

transport emissions will not only offset emission cuts in other sectors of the country, but will also offset emission cuts in participating countries such as Thailand. The OECD indicated that imposing such border tax adjustments could be one way of preventing carbon leakage.¹⁷³

5.2.1 Lobby groups claim taxes are to blame for Australia's high car prices

The Australian Automobile Association (AAA) claims Australian car prices are amongst the highest in the world. That is, the AAA submission to the 2013 Productivity Commission Review of the Australian Automotive Industry reported on an international price comparison among Australia, the United States and Canada of four vehicles on the basis of the “manufacturer’s suggested retail price (MSRP) excluding GST and VAT.”¹⁷⁴ The AAA stated that the cost of almost \$90,000 for the BMW 528i 2.0L in Australia was \$30,000 more than for the same model in Canada. According to the AAA, Australia has some of the “world’s most expensive cars due in large part to the distortionary effect of the LCT.”¹⁷⁵

On the website known as the “Red book for Australian vehicles”, the MSRP provides a manufacturers’ price guide for the sale prices of vehicles (including GST¹⁷⁶ but excluding costs such as “stamp duty and other government charges”).¹⁷⁷ Further, the MSRP does not include LCT. The MSRP is determined by vehicle manufacturers ahead of time, and provides a guideline for dealers to establish their initial asking price for consumers looking to buy a new car.¹⁷⁸ The MSRP is determined by taking into account manufacturing costs associated with shipping the car to the dealer, the car makers and the car dealers’ profits, the vehicle make and model, how popular the model is, and

¹⁷³ OECD (2009), “The Economics of Climate Change Mitigation”, Paris, France: OECD

¹⁷⁴ Australian Automobile Association, (2013) “Review of the Australian Automotive Manufacturing Industry” (preliminary findings) on http://www.pc.gov.au/_data/assets/pdf_file/0013/130504/sub077-automotive.pdf

¹⁷⁵ Ibid.

¹⁷⁶ RedBook, The Pricing Authority. Sighted <http://www.redbook.com.au/cars/research/new/details/2014-bmw-528i-f10-lci-694520?R=694520&Silo=spec&Vertical=car&Ridx=1&eapi=2>

¹⁷⁷ Ibid. The Redbook price is referred to EGC, which refers to the price provided by a manufacturer as MSRP – Manufacturer Suggested Retail Price for a vehicle that excludes costs such as options, dealer delivery, stamp duty and other government changes.

¹⁷⁸ CarsDirect, “What is the Difference between the Sticker Price and MSRP?” Sighted <http://www.carsdirect.com/car-pricing/what-is-the-difference-between-the-sticker-price-and-msrp> 10 April 2014

where it is sold.¹⁷⁹ The MSRP differs from the dealer's invoice, which is the final price the dealer pays to the manufacturer for the car. LCT of 33 per cent is imposed on the GST-inclusive value of luxury cars over the relevant threshold, which is payable at the time the luxury car is sold.¹⁸⁰

In effect, AAA's submission to the Productivity Commission claiming the LCT is for a "large part" responsible for the high prices of new vehicles is not justified. The manufacturers and dealers determine the prices of the imported vehicles, which do not include LCT. Yet, while the AAA calls on the Productivity Commission to "consider the future of this tax and its current and future effects on affordability, consumer choice and road safety,"¹⁸¹ no mention is made of the importance of reducing CO2 emissions and protecting the environment.

The Federal Chamber of Automotive Industries (FCAI) did not support AAA findings; that is, the FCAI compared Australian new vehicle prices with equivalent models in the United Kingdom (UK) and New Zealand, and found that the majority of the 13 models examined were cheaper than their UK equivalents.¹⁸² However, the FCAI comparisons did not include associated costs such as stamp duty, registration and other taxes, because they can vary from market to market.¹⁸³ The FCAI report was prepared to correct the "distorted views" on the price of cars in Australia and to educate the community about the differences in car prices.¹⁸⁴ However, Mr Weber of the FCAI admitted that the comparisons among more expensive cars became irrelevant because the "very hefty rate of tax" under the LCT regime became a major factor in making such vehicles expensive.¹⁸⁵

¹⁷⁹ Ibid

¹⁸⁰ Australian Government Australian Taxation Office, "Luxury car tax". Sighted.

https://www.ato.gov.au/Print-publications/Luxury-car-tax/?page=2#LCT_payable_on_supplying_a_luxury_car

17 September 2014. The luxury car tax thresholds for the relevant financial year applies in the financial year the car was imported, acquired or sold. The LCT thresholds for the 2014-15 financial year: \$75,375 for fuel-efficient vehicles and \$61,884 for other vehicles.

¹⁸¹ Australian Automobile Association (2013), above n 182.

¹⁸² Federal Chamber of Automotive Industries (2014).. "Vehicle price and specification comparison".

Sighted <http://www.fcai.com.au/specification/vehicle-price-and-specification-comparison> 17 September 2014

¹⁸³ Ibid

¹⁸⁴ Beissmann, T. (2014). "Australians pay less for cars than buyers in other countries, says FCAI" 2

August, 2014. Sighted <http://www.caradvice.com.au/299926/australians-pay-less-for-cars-than-buyers-in-other-countries-says-fcai/> 17 September 2014

¹⁸⁵ Ibid.

Nevertheless, the AAA and FCAI international comparisons of new vehicle prices currently do not refer to “buyers’ purchase cost”, and should include all taxes and charges such as GST, LCT and vehicle purchase taxes/stamp duty. These would demonstrate to the public that Australian car prices are lower than international car prices, because economic instruments are being introduced or reformed to encourage the acquisition of low-emission vehicles.

5.3 Public acceptance through provision of information on environmental taxes

The greatest impediment to policy makers’ implementing environmental taxes is public acceptability.¹⁸⁶ Public opposition to instruments that are perceived to be unfair can create resistance to efficiency-enhancing taxes and regulations.¹⁸⁷ Here, the views of interest groups such as AAA may be problematic in terms of achieving public acceptance, particularly when the public has been misinformed that Australia’s car prices are amongst the highest in the world, even before considering the reform of vehicle purchase taxes.

Literature shows that one important reason for public opposition to environmental taxes is that the public “does not seem to understand – or trust – the main rationale for such Pigouvian taxes”.¹⁸⁸ In their study of fuel taxes, Kallbekken and Saelen found that any increase in taxes was supported, providing people understood and believed that the taxes would have positive environmental consequences.¹⁸⁹ Thus, it is important that the public is informed about the evidence that reforming vehicle purchase taxes is an effective environmental fiscal measure in reducing road transport emissions (as shown in Part I).¹⁹⁰ Support also relies on individuals’ perceptions of the environmental consequences of the taxes to themselves and to other people.¹⁹¹ That is, it is important to inform the public of the growing number of countries are imposing higher vehicle purchase taxes (differentiated on the basis of CO2 emissions) on all new light vehicles

¹⁸⁶ Kallbekken S. and Saelen H. (2011). Public acceptance for environmental taxes: Self-interest, environmental and distributional concerns. *Energy Policy* 39: 2966-2973.

¹⁸⁷ Ibid

¹⁸⁸ Ibid: 2967

¹⁸⁹ Ibid: 2972

¹⁹⁰ Mortimore, A. (2014), above n 57.

¹⁹¹ Kallbekken S., Saelen H., above n 197: 2968.

sold in their country (either locally produced or imported) to meet emission reduction targets.

Comments made by AAA that Australian car prices are amongst the “highest in the world” are distortionary and may lead to public opposition of higher vehicle purchase taxes. Rather, AAA and FCAI international comparisons of new vehicle prices should refer to “buyers’ purchase cost” and include all taxes and charges such as GST, LCT and vehicle purchase taxes/stamp duty, as shown in Table 12.

Table 12: New Vehicle purchase price for Holden Commodore in ACT compared with Ireland

Vehicle purchase tax & GST	Taxes %	Commodore VF SS 8cycl (274 g/km)		Landcruiser 200 (diesel) 8 cycl 4.6L (273 g/km)	
		Ireland	Australia	Ireland	Australia
Purchase cost		49,790	49,790	100,990	100,990
GST	10		4,979		10,099
VAT	23	11,451		23,227	
Vehicle purchase tax*	36	22,047		44,718	
ACT stamp duty**	3.3 5.0		1,840		5,766
LCT***	33*				15,232
Purchase price		83,288	56,609	168,935	132,087
Total charges:		33,498	6,819	67,945	31,097
Taxes as a % of vehicle cost		40%	12%	40%	24%

Source: Redbook www.redbook.com.au

*Vehicle purchase tax of 36% applies if new vehicle CO2 emissions is more than 225g/km. <http://www.revenue.ie/en/tax/vrt-guide.html#section6>

** ACT Stamp Duty on Commodore VF SS was C rated; and Landcruiser 200 (diesel) was D rated in the green vehicle guide.

*** Luxury car tax threshold for 2013-14: \$60,316

Table 12 compares the purchase price of the GM Holden Commodore in Australia to the purchase price if the car had been imported into Ireland (excluding any general tariffs). Interest groups have argued that cars imported into the Australia market exceed the cost of the vehicles in the imported country, and the same argument could apply to Holden Commodores imported into Ireland. The cost of a locally produced GM Holden Commodore is 28 per cent higher in Ireland than in Australia due to the higher taxes

and charges imposed on the new vehicle in Ireland (40 per cent) compared to Australia (12 per cent). Ireland's vehicle purchase tax of 36 per cent is a fiscal environmental tax applied to new vehicles with CO2 emissions more than 225g, which is intended to discourage consumers from choosing this vehicle.

In the case of a Landcruiser imported into Australia compared to Ireland, even with the imposition of a LCT, taxes are 16 per cent higher in Ireland (40 per cent) than in Australia (24 per cent). Interest groups should acknowledge that such environmental taxes are a part of the importing countries' environmental policy objectives for reducing road transport emissions.

Furthermore, vehicle purchase taxes can lower the cost of a fuel-efficient, low-carbon vehicle as shown below in Table 13.

Table 13: New Vehicle purchase price for a Toyota Hybrid in Australia compared with Ireland

Vehicle purchase tax & GST	Taxes %	Ireland \$	Australia \$
Vehicle price* Toyota Prius Hybrid (89 g/km)		45,990	45,990
GST	10		4,599
VAT	23	10,577	
Vehicle purchase tax*	15	8,485	
ACT stamp duty	0		Nil
Purchase price		65,052	50,589
Total charges:		19,062	4,599
Taxes as a % of vehicle cost		29%	9%

Source: Redbook.new vehicle prices sighted at www.redbook.com.au

* Vehicle Purchase Tax of 15% applies to vehicles with CO2 emissions more than 80g/km and up to an including 100g/km. <http://www.revenue.ie/en/tax/vrt-guide.html#section6>

The purchase cost of a Toyota Hybrid is 20 per cent less in Australia (9 per cent) than in Ireland (29 per cent) because of higher VAT rates and a CO2 based vehicle tax of 15 per cent compared to nil in the ACT territory. The Irish case study shows that the lowest emission band for vehicles with CO2 emissions between 0g/km to 80g/km is 14 per cent

of the value of the vehicle (including VAT).¹⁹² The ACT's purchase prices for hybrid electric vehicles are amongst the lowest internationally because of the low GST and vehicle purchase tax/stamp duty. However, the transition to low-emission vehicles is slow.

Contrary to the opinion of some interest groups,¹⁹³ VAT and vehicle purchase taxes in EU member states such as Ireland are generally higher than taxes imposed by state and territory governments in Australia.

5.4 Interaction of vehicle purchase tax/stamp duty with other tax policy instruments

Environmental taxes are part of the legal tax system because they are instruments of taxation and environmental policies, and therefore must be integrated into both concepts.¹⁹⁴ In this way, the effectiveness of reforming existing vehicle purchase tax/stamp duty into a fiscal environmental tax will depend on interaction with other tax policy instruments such as *A New Tax System (Goods and Services Tax) Act 1999* (GSTA), the luxury car tax (LCT), and the car benefit under the *Fringe Benefits Tax Assessment Act* (FBTAA). Most new vehicles sold in Australia are imported, which means that the general 5 per cent tariff will apply and will be included in the purchase price/market-selling price.¹⁹⁵

5.4.1 Luxury car tax

With the LCT threshold set at \$60,316 for 2013–2014, it is unlikely that LCT will have an impact on the majority of vehicle sales as the average private buyer is likely to spend

¹⁹² Ireland Department of Community and Local Government, "Motor Tax Rates based on CO2 Emissions", at <http://www.environ.ie/en/LocalGovernment/MotorTax/MotorTaxRates/MotorTaxRatesbasedonCO2Emissions/> on 12 April 2014

¹⁹³ Federal Chamber of Automotive Industry, (2014) "Car Policy had good ignition but has crashed" Canberra Times, 26 February 2014. Sighted www.canberratimes.com.au 14 April 2014. Mr Kellar stated that, "Motorists pay fuel tax, goods and services tax, luxury car tax, registration fees and stamp duty. The family car is absolutely a cash cow."

¹⁹⁴ Rodi, M. and Ashiabor, H. (2012). "Legal authority to enact environmental taxes" *Edward Elgar Handbook of Research on Environmental Taxation* 73, 59-81

¹⁹⁵ Australian Government: Productivity Commission, Inquiry Report (2014) above 157: 89

around \$35,000 on their next new car.¹⁹⁶ With private car buyers acquiring just over half of all new car sales annually, this equates to around \$19 billion annually or approximately 1.3 per cent of Australia's annual GDP.¹⁹⁷ It is estimated that the second largest sales bracket will be on large SUVs costing more than \$70,000. Further, it is anticipated that Australians will outlay an estimated \$10 billion on the biggest available SUVs by 2017,¹⁹⁸ irrespective of the LCT of 33 per cent and the tax-exempt incentive for fuel-efficient vehicles¹⁹⁹ under the threshold of \$75,375 for 2013–2014.

This data implies that consumers are prepared to buy a high-value, high-carbon emitting new vehicle regardless of the tax, and are not encouraged to buy “new fuel-efficient vehicles.” This is because the vehicle they choose to buy is not within the threshold range \$60,316 to \$75,375.

The 2010 Henry Report recommended the LCT should be abolished because the “\$75,375 threshold for fuel-efficient luxury cars is a costly and ineffective way of limiting greenhouse gas emissions.”²⁰⁰ The 2014 Productivity Commission Report also recommended the removal of the luxury car tax.²⁰¹

While it may be an ineffective measure in limiting CO₂ emissions, without the LCT more consumers may have been encouraged to choose such high-emitting vehicles. The Australian Government has announced that it will review the LCT in its Taxation White Paper because it is a “higher cost and less efficient method of raising revenue”.²⁰²

¹⁹⁶ Roy Morgan Research, (2013). “Australia's \$10 billion budget for large SUVs” 28 October 2013. Sighted <http://roymorgan.com/~media/Files/Findings%20PDF/2013/October/5262-price-budgets-for-new-car-intenders-by-segment-august-2013.pdf> 10 March 2014

¹⁹⁷ Ibid

¹⁹⁸ Ibid

¹⁹⁹ Australian Government Tax Laws Amendment (Luxury Car Tax) Bill 2008, Revised Supplementary Explanatory Memorandum, A “fuel efficient car” is defined as a car that “has a fuel consumption not exceeding 7 litres per 100 kilometres (162g of CO₂/km) as a combined rating under vehicle standards in force under Sec 7 of the Motor Vehicle Standards Act 1989”

²⁰⁰ Australian Government, (2010) “Australia's Future Tax System” known as the Henry Report, released on 2 May 2010: para E8-2
http://www.taxreview.treasury.gov.au/content/FinalReport.aspx?doc=html/publications/Papers/Final_Report_Part_2/chapter_e8-2.htm on 28 March 2014

²⁰¹ Australian Government, Productivity Commission Inquiry Report (2014), above n 157: 33.

Recommendation 5.6 The Australian Government should in its forthcoming Taxation White Paper consider the removal of the luxury car tax.

²⁰² Productivity Commission (2014), n157: 33. Recommendation 5.6: the Productivity Commission recommended that the Australian Government should in its forthcoming Taxation White Paper to consider more efficient sources of revenue to replace the LCT. The Australian Government supports this

Policy makers would be well advised to incorporate such taxes into the reform of the vehicle purchase tax, which can be significantly differentiated for higher-emitting vehicles that, generally speaking, are the vehicles that fall within the LCT. Future discussion is outside the scope of this article.

5.4.2 Car benefits under the FBTA and GSTA

Business, government and rental fleet buyers acquire over half of all new vehicles sold annually, and most are likely to be under the FBT regime.²⁰³ The COWI Study (2002) stated that company cars can have an enormous impact upon the size and composition of the country's car fleet as a whole, and upon its CO₂ emissions profile.²⁰⁴

The Copenhagen Report (2009) found that company cars acquired for employees under a salary package scheme encouraged the acquisition of large vehicles which generally tend to be more expensive, more powerful, and high-carbon emitting.²⁰⁵ The 2002 COWI Study found that this is partly explained by the fact that many of these cars are used by more affluent motorists such as professionals, managers, and company executives who tend to prefer larger and more expensive cars than the fleet average.²⁰⁶ The tax treatment reduces the real costs to the buyers, thereby encouraging the trend toward larger cars.²⁰⁷ For example, vehicles acquired as a car benefit under the FBTA may be entitled to a rebate²⁰⁸ for the GST paid on the vehicle (as shown in Table 11), which is a significant loss of tax revenue to the community. Moreover, reforming vehicle purchase taxes/duty with a higher price signal may not shift behaviour toward purchasing lower carbon vehicles. This is because the tax burden of business is lower

in principle but must consider "any sources of government revenue with which to replace these measures..."

²⁰³ Mortimore, A. (2011). What now for environmental sustainability? Government fails to link the Australian Car FBT concessions to vehicle emissions. *Australian Tax Forum*, 501–543:520.

²⁰⁴ European Commission, European Commission's Directorate-General for Environment, above n 23: 32, 48

²⁰⁵ Ibid: 54

²⁰⁶ Ibid: 48

²⁰⁷ Ibid: 48

²⁰⁸ Goods and Services Tax Act 1999, Division 11 Creditable Acquisition. Employers registered for GST (Sec 23 GSTA 1999) will be entitled to input tax credits for their creditable acquisitions. (Sec 11-1 GSTA 1999)

than that of consumers given that business has access to tax deductions that consumers do not.²⁰⁹

Policy makers will most likely defer any reform to such complementary tax measures until the local car industry ceases production at the end of 2017. In addition, the current tax regime benefits car importers in an open market, as there is no fiscal measure that discourages the importation of high polluting vehicles. After 2017, the FBT measure could be reformed²¹⁰ in order to reduce the undesirable behaviour discussed above,²¹¹ and reflect the negative externalities of transportation choices.²¹² Further discussion on the FBT measure and GST regime is outside the scope of this article.

6 Conclusion

Part I of the two-part series provided the ex-post analysis and evidence regarding the success of reforming vehicle purchase tax in various EU Member States in order to significantly reduce road transport emissions. This conclusion was supported by literature that indicates that a fiscal environmental policy instrument can influence consumer vehicle choice and affect low-carbon technology acceleration to reduce CO₂ emissions in road transport.²¹³ Such a policy instrument could achieve the objective proposed by the Australian Government in its 2013 Issues Paper to the Energy White Paper for 2014 for measures that encourage changes in consumers and the “uptake of technology to improve transport energy efficiency.”²¹⁴

It is recommended to policy makers that state and territory governments’ vehicle purchase tax/stamp duty should be reformed into a fiscal environmental tax and be sufficiently differentiated on the basis of CO₂ emissions.²¹⁵ However, COAG’s proposal in 2009 to consider the ACT Government’s GVDS as a possible model for

²⁰⁹ Maatta, K., above 68: 52

²¹⁰ Mortimore, A. (2011), above n 203.

²¹¹ Maatta, K., above 68: 5

²¹² Mann, R. (2005). On the Road Again: How Tax Policy Drives Transportation Choice. *Virginia Tax Review*, 587 - 665

²¹³ Brand, C., Anable, J., and Tran, M. (2013). “Accelerating the transformation to a low carbon passenger transport system: The role of car purchase taxes and scrappage incentives in the UK.” 49 *Transportation Research part A*: 132-149: 146

²¹⁴ Australian Government, Department of Industry, (2013) “Energy White Paper, Issues Paper” above n 30: 33

²¹⁵ European Commission, European Commission’s Directorate-General for Environment, above n 23.

reforming vehicle purchase taxes/stamp duty for all other state and territory governments is not supported.

Furthermore, COAG's recommendation in "utilising the environmental ratings" published in the GVG (State 2) as a measure of the new vehicles' "environmental performance" is also not supported. The GVG (Stage 2) Green Vehicle Ratings are distorted and misleading, with lower duty applying to higher-emitting vehicles, and higher duty applying to lower-emitting, diesel-fuelled vehicles. Monitoring and measuring the performance of the GVDS on the basis of "environmental performance" in reducing CO₂ emissions is inaccurate given that the range of CO₂ emissions can vary widely among green vehicle rankings. The GVDS' poor performance was evident in the 2013 National Transport Commission report where it was shown that the ACT Government's average carbon emissions from its choice of new passenger vehicles and light commercial vehicles (197g/km) was higher than the average for Australian private buyers (186g/km) in 2013. Additionally, the average carbon emissions for the vehicles chosen by the ACT Government in 2013 (197 g/km) compared to those chosen in 2012 (194 g/km) had increased by 1.5 per cent.

Further, the price signal of the ACT's GVDS was not "strongly differentiated", and only varied slightly in comparison to state governments' price signals. The performance of the GVDS was reported three years after the measure was introduced on 3 September 2008; however, no review was made. Consequently, the extent to which road transport emissions had been reduced was inconclusive. Moreover, it supports the 2002 COMI Study's findings that simple increases in taxes that do not involve changes to the tax base provide only very small reductions in CO₂ emissions.²¹⁶

The GVDS failure to significantly reduce CO₂ emission in road transport emissions is not an indication that the environmental tax policy measure is ineffective; rather, it is a failure of the tax design and price signal adopted by the ACT Government. As a result, it is not recommended as an appropriate model for policy makers in reforming vehicle

²¹⁶ Ibid.

purchase taxes, because the linkage between the fiscal environmental tax and amount of emission reduction is crucial to environmental effectiveness.²¹⁷

The review indicates to policy makers the importance of annually monitoring tax design, and whether or not the level of price differentiation is sufficient to influence a behavioural change in encouraging the uptake of fuel-efficient or alternatively fuelled vehicles. In this way, the tax design could adopt CO2 emissions bands that are differentiated so that taxes for very energy effective cars are lower than taxes for cars with poor energy efficiency.²¹⁸ The advantage of using CO2 emission bands in the tax design is that it is a flexible system, and the CO2 emission bands can be lowered for the purposes of meeting the average CO2 emissions target for new light vehicles. Furthermore, the CO2 emission bands abide by the transparency principle, which offers certainty to buyers regarding the level of tax applicable for their choice of new light vehicle. Alternative tax designs are discussed in Part 1 of the two-part series.

However, the adoption of CO2 emission bands requires both COAG and the Australian Government to set national mandatory fuel efficiency or CO2 emission targets. Every state and territory government will be expected to meet their commitment, which will require annual reporting on their performance. The National Transport Commission currently provides an annual report on CO2 emissions from new Australian vehicles, which could be further extended to include the performance for each state and territory government, and include each buyer type.

For the tax design to be effective, it should not be offset by interaction of other taxation policy measures that are advantageous to certain buyer types through subsidising vehicle costs at the expense of the community and the environment. If certain buyers are being advantaged, then policy makers need to neutralise the impact of such tax policy measures by either imposing a higher rate of tax or surcharge, or reforming and aligning tax measures such as the car benefits under the FBT regime and the input tax credits available under GSTA. That is, the tax design of the vehicle purchase tax should maintain neutrality and equity among buyer types and be complementary to other

²¹⁷ Smith S. (1995). "Green taxes and charges: policy and practice in Britain and Germany". *The Institute for Fiscal Studies*:21-23.

²¹⁸ Ibid.

related tax policy measures. Whether this can be achieved will depend on the amount of power that particular interest groups have, and how this power is wielded in the political process.²¹⁹

Finally, it is important that the public is fully informed that reforming vehicle purchase taxes will have a positive effect in reducing CO2 emissions, and that it will assist the Australian Government in meeting its international commitments to reduce the nation's greenhouse gas emissions.

²¹⁹ Hahn R.W. (1990). The political economy of environmental regulation: towards a unifying framework. *Public Choice*, 22, 21-47.

CHAPTER 6

WHAT NOW FOR ENVIRONMENTAL SUSTAINABILITY? GOVERNMENT FAILS TO LINK AUSTRALIAN CAR FBT CONCESSIONS TO VEHICLE EMISSIONS

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WHAT NOW FOR ENVIRONMENTAL SUSTAINABILITY? GOVERNMENT FAILS TO LINK AUSTRALIAN CAR FBT CONCESSIONS TO VEHICLE EMISSIONS

Anna Mortimore

Abstract

Australia's Fringe Benefits Tax (FBT) regime is not aligned with environmental policy objectives of reducing greenhouse gas emissions from road transport. Unfortunately, the reform announced by the Australian Government on 10 May 2011 to remove the incentive for people driving excess kilometres to reduce tax liability is unlikely to significantly cut road emissions. This is because the reform fails to address other behavioural effects harmful to the environment, that is, the concession will continue to increase the total number of vehicles acquired, and distort employees' choice of vehicle towards larger, more carbon emitting vehicles.

To achieve a significant reduction in road transport emissions will require improving the fuel efficiency of conventional vehicles as well as a gradual transition from fossil fuels to alternative fuels, both of which will involve technological advancement in low carbon vehicles. However, to bring such technology to the market will require consumers to make a behavioural change by purchasing low emission vehicles, and this will require Government support so that consumers are guided towards making such low carbon choices.

This article argues that the existing car fringe benefits concession is an effective measure to encourage a behavioural change to low-emission vehicles, particularly as over half of all new vehicles acquired each year are fleet vehicles under the FBT regime. This would also significantly build up the country's fleet of low-emission vehicles, as vehicles under the FBT regime are sold onto the second hand market every two to three years.

Given this, the article considers what reform is necessary to the car FBT regime to encourage a behavioural change that would build up Australia's fleet of low emission vehicles and support the environmental policy objective of significantly reducing road transport emissions.

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1 Introduction

In Australia's quest to successfully reduce greenhouse gas emissions (GHG), the transport sector presents the greatest challenge. According to the Stern Review, the carbon emissions from the transport sector are growing faster than in any other sector,¹ and this sector will be one of the last to reduce emissions below current levels.² Additionally, it is considered to be one of the more expensive sectors in which to cut emissions, because low carbon technologies tend to be high-priced, while the welfare costs of reducing demand for travel are high.³

Road emissions from passenger vehicles is the largest contributor to transport sector emissions and, according to the Organisation for Economic Cooperation and Development (OECD), "poor environment performance per vehicle combined with the huge number of passenger vehicles worldwide, means that the largest portion of GHG emissions and air pollution problems caused by the transportation sector are attributable to personal vehicles."⁴

Nevertheless, the vast majority of transport emissions can be reduced through technological advances to produce low emitting vehicles.⁵ Commissioned by the UK Government, The King Review explains that considerable CO₂ emission savings can be achieved through enhancing conventional vehicle systems and by using technology such

¹ Department of Climate Change, "Transport Sector Greenhouse gas emissions Projections" 2007 <http://www.greenhouse.gov.au/projections/pubs/transport2007.pdf> at 2. The sectors that contribute to greenhouse gas emissions include: stationary energy, transport, industrial processes, agriculture, land use and waste.

² Dept of Energy and Climate Change, "2007 Energy White Paper: meeting the energy challenge" para 7.8 sighted at <http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk/energy/whitepaper/page39534.html> accessed on 13 March 2011.

³ Ibid.

⁴ OECD, Environment Directorate, Environment Policy Committee, "Environmentally Harmful Subsidies in Transport Sector" 2008, para 228.

⁵ R. Garnaut. "The Garnaut Climate Change Review, Final Report", October 2008 – Consultation Paper (Garnaut, R Chairman). The Garnaut Climate Change Review was initiated in April 2007 by the then leader of the Opposition, Kevin Rudd. The terms of reference of the review were to report to the Australian Government on the policies that mitigate climate change and reduce the costs of adjustment to climate change and reduce the effects of climate change, sighted on <http://www.garnautreview.org.au/index.htm> The Australian Governments White Paper released on 15 December 2008 acknowledges and accepts the findings of the Garnaut Climate Change Report, para 21.3.5.

as hybrid and battery that is “close to the market”.⁶ In the short term (five to ten years), a 30 per cent saving in fuel consumption could be achieved for the average new light passenger vehicle.⁷ However, this would require an increase in demand for low emitting vehicles, because “technology achieves nothing if it is not adopted”.⁸

In 2008, the Garnaut Climate Change Review stated that the car benefit tax concession under the Fringe Benefits Tax Assessment Act 1986 (Cth) was a measure in conflict with environmental instruments such as the Carbon Pollution Reduction Scheme (CPRS), and would need to be reformed.⁹ That is, the car FBT system is not aligned with environmental policy objectives of reducing greenhouse gas emissions. Essentially, the car FBT system distorts employees’ and employers’ choice of vehicle by subsidising vehicle costs. This has the effect of lowering the cost of larger vehicles as well as failing to encourage the acquisition of low emission vehicles.

Most recommendations to reform the FBT system have focused on reducing emissions by discouraging unnecessary travel. In the May 2011 Budget, the Australian Government adopted the 2010 Henry Report’s recommendation for car fringe benefits under the current statutory formula method to be valued at a single statutory rate of 20 per cent, regardless of kilometres travelled.¹⁰ The tax applies to new contracts entered into on 10 May 2011 after 7.30pm (AEST), and will be phased in over four years.¹¹ This amendment to the Fringe Benefits Tax Assessment Act 1986 was introduced into

⁶ J. King “The King Review of low-carbon cars Part II: recommendations for action” March 2008 at 6 sighted at http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/d/bud08_king_1080.pdf accessed on 13 March 2011. ‘The UK Chancellor commissioned Professor Julia King, Vice-Chancellor of Aston University and former Director of Advanced Engineering at Rolls-Royce plc, working with Lord Nicholas Stern, to undertake an independent review to examine the vehicle and fuel technologies which over the next 25 years could help to decarbonise road transport, particularly cars. The Review drew on expertise from across both industry in the UK and internationally, and Government.’ Part I of the Review was published on 9th October 2007 which discussed the potential for reducing CO2 emissions from road transport. Part II of the report was published on 12th March 2008, which discussed the challenges, making recommendations to the government, industry, the research community and consumers on the potential for reducing CO2 emissions.

⁷ Ibid.

⁸ J. King, above n 6, at para 4.6.

⁹ Garnaut Review, above n 5, Chapter 19 “Complementary Measures” para 19-1.

¹⁰ Australian Treasury, Henry Final Report, “Australia’s future tax system” (2010) Treasury at 372 sighted at www.treasury.gov.au.

¹¹ W.Swan MP, Treasurer ‘Reforms to Car Fringe Benefit Rules’ sighted at <http://www.treasurer.gov.au/DisplayDocs.aspx?doc=pressreleases/2011/050.htm&pageID=003&min=wms&Year=&Doc Type=0> accessed on 21 May 2011. The reform will only apply to new vehicle contracts entered into after 7.30pm (AEST) on 10 May 2011 and will be phased in over four years.

the Commonwealth Parliament on 2 June 2011 in the Tax Laws Amendment (2011 Measures No 5) Bill 2011.¹²

However, the reform fails to identify other behavioural effects that are harmful to the environment. In these terms, a 2009 study by Copenhagen Economics carried out for the European Commission (EU Study) on the “harmful environmental effect of company car subsidies” in the EU, member states found an increase in the total number of cars, and that most cars under the subsidies were bigger, higher-emitting vehicles.¹³

The tax-transfer system is not limited just to revenue raising; rather, it is internationally recognised as an effective instrument that can influence the demand for low emission vehicles, deliver better fuel efficiency, and lower greenhouse gas emissions. On this premise, the article argues that the reform of the FBT system fails to encourage a behavioural change to low emission vehicles and increase Australia’s fleet of such vehicles, particularly when more than half of all new vehicles sold each year are acquired under the FBT system.¹⁴

This article discusses the importance of the FBT system as an effective instrument in reducing road transport emissions. An analysis of the current FBT system, the call for reform made by various Committees, and the Henry Report which has since been adopted by the Government, will demonstrate that all proposals for reform have failed to encourage a behavioural shift to low emissions vehicles. This paper argues that such a shift is essential if emissions are to be significantly reduced; indeed, according to the OECD, deep cuts to GHG in the transport sector require a reduction in the carbon intensity of travel, not just a reduction in kilometres travelled.¹⁵

¹² Schedule - 5 Car fringe benefits to the Tax Laws Amendment (2011 Measures No.5) Bill 2011 replaces the current statutory rates with a single statutory rate of 20 per cent.

¹³ European Commission, “EU study on company car taxation” (2009) by Copenhagen Economics sighted on http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_papers/taxation_paper_22_en.pdf accessed on 21 March 2011.

¹⁴ ANZ Economics and Market Research, “Motor Vehicle Outlook – 2009: a hard road ahead for vehicle sales” issued 27 February 2009, at 3, sighted on www.anz.com.

¹⁵ K Van Dender & P. Crist, OECD ITF “Policy instruments to limit negative environmental impacts from increased international transport” (2008) para 20 at 9, sighted at www.oecd.org/dataoecd/12/53/41612575.pdf accessed on 31 May 2010.

The final section of the article proposes that the reform of the FBT system should have adopted a ‘polluter pay’ system. To exemplify this, the paper applies the UK model of Company Car Taxation to the Australian car FBT system, by linking the statutory fraction to the vehicles’ carbon emissions. Under this reformed system, polluters would not be subsidised for the vehicle costs of their high emitting vehicle, while the car tax concession would encourage the uptake of low emission vehicles.

The article acknowledges that the Australian motor vehicle industry would strongly oppose any reform likely to affect the domestic fleet sales of their large passenger vehicles. However, failure by the Government to reform the FBT system based on a vehicle’s emission performance has allowed the industry to continue to manufacture mostly high polluting vehicles.

2 Significant reduction of road transport emissions from vehicle technology

To reduce GHG emissions, the EU Study points out that road transport needs to use less petroleum-based fuels as there is a direct link between improved fuel efficiency and lower CO₂ emissions.¹⁶ The transport sector, however, is dominated by such fuels, which contribute more than 97 per cent of primary energy consumed.¹⁷ Less dependency on petroleum-based fuels, then, will require a shift of Australia’s passenger fleet to low emitting vehicles and future technological advancement that is focused on decarbonisation of road transport.

Significant reductions in CO₂ emissions could be achieved through use of technologies that are currently available, and through individuals making smart choices about what to drive.¹⁸ According to the 2008 UK King Review on the potential for reduction in carbon emissions, changes in choices by consumers to low emission vehicles would bring a projected 10-15 per cent reduction in GHG emissions from road emissions, much of which could occur over the next few years without compromising comfort or

¹⁶ European Commissions above n 13, at 9.

¹⁷ Garnaut, above n 5, at para 7.1.3.

¹⁸ King Review, above n 6, para 8, Executive summary.

convenience.¹⁹ The Review also claims that an almost complete decarbonisation of road transport by 2050 was a “realistic ambition”,²⁰ one that could be achieved by “bringing existing technologies from the shelf to the showroom as quickly as possible.”²¹ Again, this would be dependent on a behavioural change by consumers toward low-emission vehicles, as technology “achieves nothing if it is not adopted.”²²

In 2009, the Australian Government proposed influencing consumers’ decisions in acquiring low emission vehicles by introducing a ‘cap and trade’ emission trading mechanism known as the CPRS to limit greenhouse gas emissions.²³ The CPRS increases fuel prices by the cost of emitting carbon; thus it provides the necessary price signal to influence consumers toward purchasing more fuel-efficient vehicles.²⁴ This will increase demand for more efficient vehicles and contribute to the development of new vehicles and fuel technologies.²⁵

However the CPRS was rejected in Parliament twice, and on 27 April 2010 the Australian Government announced the scheme would be deferred. Further discussion of the CPRS is outside the scope of this paper.

Even with a CPRS, the Garnaut Review points to the need for additional measures to support the uptake of low-emissions technologies.²⁶ The UK King Review explains that complementary policy measures would be required because an emission-trading scheme

¹⁹ King Review, above n 6, at 7. ‘The King Review of low-carbon cars’ Part II: recommendations for action’.

²⁰ King Review, above n 6, at 4. ‘The King Review of low-carbon cars’ Part II: recommendations for action’.

²¹ King Review, above n 6, at 5.

²² King Review, above n 6, at 7.

²³ Australian Government, Department of Climate Change - White Paper “Carbon Pollution Reduction Scheme: Australia’s Low Pollution Future” released paper on 15/12/2008, Chapter 6 Coverage at 6-9, <http://www.climatechange.gov.au/publications/cprs/white-paper/cprs-whitepaper.aspx> The White paper follows on from the ‘Green Paper’ released in July 2008 and takes into account many submissions from business and the report from Professor Garnaut Climate Change Review, para 5-7.

²⁴ White paper, above n 23, at para 6-10.

²⁵ White Paper, above n 23, at para 6-5. Modelling by the Australian Government Treasury indicates that a carbon price has the ‘potential to induce significant reductions in transport emissions’ by reducing total road consumption by around 20 per cent by 2050 and

- reduce fuel intensity and lower demand for transport fuels; and
- reduce the use of traditional petrol; and
- increase the uptake of electric and hybrid electric vehicles projected to make up 10 per cent of the transport sector by 2050.

²⁶ Garnaut Review, above n 5, para 17-1-2.

was not the total solution to reducing transport car emissions given that consumers are ‘loss averse’ and discount heavily the future cost savings from fuel efficiency.²⁷

Behavioural change to the purchase of low emission vehicles is difficult when people’s concern for the environment is not reflected in their choice of vehicle.²⁸ Indeed, environmental factors such as fuel efficiency are among the least important considerations for new car buyers.²⁹ Consumers are unwilling to pay a higher purchase price by choosing a more fuel efficient-vehicle, even though they will realise future savings in the reduced spending on fuel.³⁰ Non-environmental factors (costs, performance, styling, and image) may well be deemed more important by consumers when deciding on a vehicle.³¹ However, business, government and rental fleet buyers are influenced by other factors when choosing their fleet vehicles, such as ‘buy Australian’,³² purchase price, the vehicle’s reliability, maintenance, and resale value.³³ Moreover, influencing fleet managers’ purchase decisions is important, when their choice of vehicle determines the amount of carbon emitted over the rest of the life of the vehicles.³⁴

Given that fleet managers are sensitive to the high price of low carbon vehicles,³⁵ it is argued that the car FBT system would be an effective measure in subsidising the high vehicle cost and encouraging a behavioural change to such vehicles.

²⁷ King Review, above n 6, para 3.34.

²⁸ King Review, above n 6, at 28. There is a “gap between people’s attitudes towards the environment and their actions through their choice of vehicle and the way they drive.”

²⁹ B Land & S Potter, “The adoption of cleaner vehicles in the UK: exploring the consumer attitude – action gap” *Journal of Cleaner Production* Vol 15, 2007, p1085 – 1092, para 4.2. This is also supported in the 2008 UK King Review.

³⁰ King Review, above n 6, at 7 The King Review findings show that ‘on average, consumers apply a very high discount rate (60 per cent), which implies that they are looking to an 18 month payback period for fuel costs’ at 60.

³¹ B Land & S Potter, above n 29, at para 4.2. See also King Review, above n 6, at 60. The King Review findings indicated, “people tend to purchase cars on the basis of up-front price, reliability, comfort and safety. Environmental concerns do not figure highly. Traditional preferences such as appearance, power, image and brand still feature much more strongly in people’s decision- making than the environment and emissions.”

³² D. Borthwick, National Transport Commission, “Vehicle fuel efficiency consultation” 14 November 2008 sighted.

³³ D. Borthwick, National Transport Commission, above n 32.

³⁴ D. Borthwick, National Transport Commission, above n 32.

³⁵ B Land & S Potter, above n 29, para 4.2.

3 Car benefits provided under the Fringe Benefits Tax Assessment Act

Employers commonly offer employees a company car as part of their salary package, a non-cash benefit that is available for their private use. Prior to the introduction of the Fringe Benefits Tax Assessment Act (FBTAA) in 1986, employees would either fail to disclose or undervalue the non-cash benefit in their tax return, resulting in little or no tax being paid and subsequent revenue leakage to the Government.

Consequently, the Australian Government introduced the Fringe Benefits Tax Assessment Act in 1986, which placed the responsibility for disclosure and taxation of fringe benefits on the employer. The fringe benefits tax rate of 46.5 per cent equals the top personal income marginal rate, currently at 45 per cent, plus the Medicare Levy of 1.5 per cent, which is applied to the grossed-up taxable value of the fringe benefit.

The employer has the choice of adopting either of the following methods in calculating the taxable value of the car benefit: the statutory formula method³⁶ known as the default method, or the operating cost method.³⁷ Both methods provide a subsidy, namely, a tax concession that reduces the “overall cost of car ownership”³⁸ regardless of the vehicle’s environmental performance.

The statutory formula method may be preferred by employers because it is the simplest to administer, thus saving them compliance costs. That is, the taxable value of the car benefit is determined by applying a statutory fraction to the ‘base value’³⁹ of the car. The statutory fraction to be applied will depend on when the new vehicle contract was entered into. The Australian Government announced changes to the statutory fraction that will apply only to new vehicle contracts entered into after 7.30pm (AEST) on 10 May 2011, by replacing the four-tiered statutory fractions shown in Table 1 with a single flat rate of 20 per cent, discussed in paragraph 4.0.

³⁶ *Fringe Benefits Tax Assessment Act 1986* (Cth) (FBTAA) S 9.

³⁷ FBTAA S10.

³⁸ Dr K Henry ‘Australia’s Future Tax System’ Consultation Paper (2008) at 261, sighted at http://taxreview.treasury.gov.au/content/ConsultationPaper.aspx?doc=html/publications/Papers/Consultation_Paper/foreword.htm accessed on 10 March 2011.

³⁹ FBTAA S 136, ‘base value’ of the car is the cost price of the car or the leased value S9(2).

3.1 Statutory formula method prior to 11 May 2011

For new vehicle contracts entered into before 7.30pm (AEST) on 10 May 2011, the four-tiered statutory fractions⁴⁰ shown in Table 1 will continue to apply. The applicable statutory fraction will depend on the total kilometres travelled by the vehicle each tax year. Table 1 indicates that the more kilometres travelled each year, the lower the statutory fraction and tax liability.

Table 1: Calculation of the car benefit ‘taxable value of car benefit’ using the FBT statutory percentage on a motor vehicle with a base value of \$50,000

Kilometres travelled	Statutory fraction	Taxable value	Gross up 2.0647	Tax payable 46.5%	Tax Savings (from first band) \$	Tax Savings (from first band) %
More than 40,000	0.07	3,500	7,226	3,360	9,121	73
25,000 – 39,999	0.11	5,500	11,356	5,280	7,201	57
15,000 – 24,999	0.20	10,000	20,647	9,600	2,881	23
Less than 15,000	0.26	13,000	26,841	12,481		

Tax savings more than double when the car is driven 25,000 kilometres, which is why employers remind staff with company cars to go on travelling expeditions known as the ‘March rally’ in order to increase kilometres travelled and thus attract a lower statutory fraction and reduce the FBT liability.⁴¹ Whether the employee needs to go on a March rally and make up the extra kilometres will depend on the structure of the employee’s remuneration package. That is, the cost incurred by the employer in providing the car benefit, including the employer’s FBT liability, will be charged against the salary package. So an estimate of the kilometres likely to be travelled needs to be made upfront in order to calculate this FBT liability, which the employer pays by instalments throughout the year. If in March the vehicle has not travelled enough kilometres as required under the salary package to reach the above pre-determined statutory threshold,

⁴⁰ FBTAA S 9(2)(c).

⁴¹ Parliament of Australia, Senate Committee for Rural and Regional Affairs and Transport “Investment of Commonwealth and State funds in public passenger transport infrastructure and services” (2009) para 5.57 sighted at http://www.aph.gov.au/senate/committee/rarat_ctte/completed_inquiries/index.htm accessed on 13 March 2011.

the employee is then faced with either driving the additional kilometres to reach this threshold or having to make up the extra FBT liability through adjustment to the employee's cash salary. However, the above tax savings in Table 1 make it worthwhile for the employee to drive the extra kilometres, regardless of the increase in fuel costs, and car wear and tear.

This was evident in the 2008 survey undertaken by the fleet management company, SG Fleet, which shows that of its 15,496 novated leases in the FBT year ended 30 March 2008, a disproportionate number of drivers travelled between 15,000 and 16,000 kilometres where the statutory rate is 20 per cent, and between 25,000 and 26,000 kilometres where the statutory rate is 11 per cent.⁴² The data indicates that drivers aim for particular kilometre bands in order to reduce their FBT liability. That is, the cost of driving an extra 2,000 to 3,000 kilometres in order to fall within a lower FBT bracket means moving from the statutory fraction bracket of 20 per cent to 11 per cent, as shown in Figure 1.

Interestingly, the Australian Government acknowledges in its annual Tax Expenditure Statement (TES) that this approach “may result in the undervaluation of the benefit when calculating fringe benefits tax with the result that less tax is paid on car fringe benefits than would be if the cost of the benefit were paid by employees out of after tax cash remuneration.”⁴³ The Australian Government estimates in its annual TES that the tax expenditure associated with the cost of providing the vehicle plus the associated running cost under the statutory formula method was \$1.140 million for 2010, and that it is projected to rise in the future.⁴⁴ This tax expenditure is described as a “revenue forgone estimate” that identifies the financial benefit of the tax concession to taxpayers receiving those concessions relative to taxpayers that do not.⁴⁵

⁴² Bracks Review, was named after its chairman Hon Steve Bracks, Leader of the 2008 Review of Australia's Automotive Industry at 69 “SG Fleet, Submission to the 2008 Automotive Review”, sighted at www.innovation.gov.au/automotivereview.

⁴³ Australian Government Treasury, “Tax Expenditures Statement” (2010) D18, sighted at http://www.treasury.gov.au/documents/1950/PDF/2010_TES_consolidated.pdf accessed on 22 June 2011.

⁴⁴ Australian Government Treasury, above n 43 at D18 2010-11 \$1.110m; 2011-12 \$1.220; 2012-13 \$1,290; 2013-14 \$1,340.

⁴⁵ Australian Government Treasury, above n 43 at D18.

Nevertheless, the introduction of the statutory formula method has been justified for two reasons. Firstly, its simplicity in application may be preferred by some employers in terms of reduced compliance costs⁴⁶ and, secondly, because of the concessions support for the Australian car industry discussed further in paragraph 6.0.

3.2 FBT car concession is a “perverse subsidy”

The existing graduated statutory rates and the reformed single statutory flat rate of 20 per cent are both “perverse subsidies”⁴⁷ that encourage harmful environmental behaviour and negate or limit the effectiveness of environmental policy objectives of reducing greenhouse emissions. The graduated statutory rates may provide an incentive for unnecessary travel, but the 2009 EU Study reveals additional behavioural effects can apply to both subsidies. That is, subsidising vehicle costs encourages ‘over purchasing’ of cars, leads to more fuel consumed, more congestion and more emissions, as well as distorts employees and employers toward choosing larger, higher emitting vehicles than would have been acquired privately.⁴⁸ The 2009 EU study explains that the dominance of larger company cars is arguably linked to such cars being offered to persons with above average salaries who would demand larger models.⁴⁹

In Australia, this is evidenced by the National Transport Commission’s (NTC) 2009 findings that private buyers had the lowest average emissions (210 grams of CO₂/km), followed by business buyers (233 g/km) and government buyers (238 g/km).⁵⁰

The findings from the 2009 EU Study indicate that the subsidy has substantially increased the EU’s total stock of cars because the subsidy has made it attractive for employees to take their remuneration in the form of cars. The 2009 EU Study extrapolated the results of two Dutch studies scaled up to the EU level, estimating that

⁴⁶ C.Black ‘Fringe benefits tax and the company car: Aligning the tax with environmental policy’ (2008) at 186, 25 EPLJ 182.

⁴⁷ Myers N & Kent J, “Perverse Subsidies: Tax \$s Undercutting Our Economies and Environments Alike”. The International Institute for Sustainable Development, Winnipeg, Manitoba. Myers and Kent defined ‘perverse subsidies’ as those that are detrimental to both the environment and the economy in the long run.

⁴⁸ European Commission, “EU study on company car taxation” (2009) above n 13, para 3.4.

⁴⁹ Ibid, para 1.2.

⁵⁰ National Transport Commission, (NTC) “Carbon Emissions from New Australian Vehicles” (2009) para 5.63 sighted at <http://www.ntc.gov.au/filemedia/general/carbonemissionsfromnewausvehicle.pdf> accessed on 13 March 2011.

the increase in vehicle stock for the EU could be between 8 to 21 million.⁵¹ The EU study states that “the results should be interpreted as possible orders of magnitude rather than precise estimates of effects.”⁵²

Even though the magnitude of the increase in the total number of cars in Australia resulting from the introduction of the car FBT subsidy on Australia’s motor vehicle fleet is unknown, the EU Study does indicate that an increase in Australia’s fleet would have occurred.

3.3 Impact of the FBT scheme on Australia’s motor vehicle fleet

The official VFACTS data released by the Federal Chamber of Automotive Industries (FCAI) shows that more between 700,000⁵³ and 800,000⁵⁴ new passenger and sports utility vehicles (SUV) are sold each year. Indeed, business, government and rental fleet buyers acquire over half of all new vehicles sold annually,⁵⁵ which are most likely to be vehicles under the FBT system.⁵⁶

In 1999, the Review of Business Taxation, A Tax System Redesign (Review of Business Taxation 1999), acknowledged that the concessional tax treatment of car fringe benefits provides a strong incentive for some employees to take a car as part of their remuneration package.⁵⁷ Again, in 2008, the Henry Review⁵⁸ states that the

⁵¹ European Commission, “EU study on company car taxation” (2009) above n 13 para 1.2.

⁵² European Commission, “EU study on company car taxation” (2009) above n 13 para 1.2.

⁵³ FCAI ‘New Vehicle Market’ 2009. Total passenger motor vehicle sales were 540,562 passenger vehicles and 188,153 SUV’s, total of 728,715, sighted at <http://www.fcai.com.au/sales/new-vehicle-market> accessed on 28 May 2011.

⁵⁴ T.Thoresen, “Australia’s new car fleet: fuel consumption trade-offs 1985-2005” at 14 New passenger vehicle sales for 2007 was 637,019 and SUV’s were 198,176, total of 835,195.

⁵⁵ ANZ Economics and Market Research, “Motor Vehicle Outlook – 2009: a hard road ahead for vehicle sales issued 27 February 2009, at 3, sighted on www.anz.com.

⁵⁶ Parliament of Australia, Senate Committee for Rural and Regional Affairs and Transport “Investment of Commonwealth and State funds in public passenger transport infrastructure and services” (2009) above n 41 para 5.63.

⁵⁷ Review of Business Taxation (RBT) chaired by Mr John Ralph, was known as the Ralph Committee. The discussion paper was entitled: “A Platform for consultation” and the final report was entitled “A Tax System Redesigned.” The discussion paper referred to the distortionary effect of the statutory formula. at 774.

⁵⁸ Henry Review, named after Dr Ken Henry, Secretary to the Treasury, who chaired the 2008 Review Panel of Australia’s Future Tax system. The Review Panel comprised of Mr Greg Smith (Australian Catholic University); Dr Jeff Harmer (Secretary of the Department of Families, Housing, Community Services and Indigenous Affairs), Heather Ridout (Australian Industry Group), and Professor John Piggott (University of New South Wales).

subsidy encourages employees to “skew their consumption towards motor vehicle services.”⁵⁹ For example, the number of statutory car benefits increased by 12.7 per cent in the 1996-1997 income year when the number of statutory car benefits was 481,543,⁶⁰ compared to 542,891 vehicles in 2007-08,⁶¹ with 1,156,179⁶² vehicles in 2007-08 using the FBT operating cost method. Therefore, in 2008, there were an estimated 1,699,070 vehicles provided by way of fringe benefits, representing 14.4 per cent of Australia’s registered passenger fleet.⁶³

This percentage would be higher if all vehicles acquired under the FBT system that were sold into the second hand market every two to three years were included in the above figure. In effect, the fleet-purchasing decision made by the fleet manager is important, as it contributes to road transport emissions for the life of the vehicle - an average of 10 years.⁶⁴

However, fleet managers are sensitive to the high purchase price of low carbon vehicles or low emitting vehicles,⁶⁵ and claim that the current FBT system “actively provides financial disincentives” because of the additional costs incurred in purchasing vehicles with environmental features such as LPG or a diesel engine.⁶⁶

On the basis of this, the Australian Fleet Managers Association Inc (AfMA)⁶⁷ criticised the FBT system for becoming the single biggest barrier to the adoption of best practice

⁵⁹ Henry Review, above n 38, at 90.

⁶⁰ Warren.N., “Fringe Benefit Tax Design: Decision Time” Institute of Chartered Accountants in Australia, (2006), refers to ATO statistics for 1996-1997, sighted at [www.charteredaccountants.com.au/files/documents/Institute_FBT_report\(150306\).pdf](http://www.charteredaccountants.com.au/files/documents/Institute_FBT_report(150306).pdf).

⁶¹ ATO Statistics, Table 7B of the 2007-2008 Table 8.8, number of vehicles using the statutory formula method who have completed a FBT return.

⁶² Senate Committee on Rural and Regional Affairs and Transport “Inquiry into the investment of Commonwealth and State funds in public transport infrastructure and services’ Appendix 4 at 111.

⁶³ Australian Bureau of Statistics, “9309.0 - Motor Vehicle Census, Australia’ 31 Mar 2008” at 3. There were 11,803,536 million registered passenger vehicles at 31 March 2008, sighted at <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/9309.031%20Mar%202008?OpenDocument>.

⁶⁴ ABS, “9309.0 – Motor Vehicle Census, Australia, 31 Mar 2009” sighted at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0/> The average age for vehicles is 10.0 years for vehicles registered in 2010. This is older than the 9.9 years recorded in 2009, with 20 per cent of these vehicles being manufactured before 1992. <http://www.ntc.gov.au/filemedia/News/SubmissionVehicleFuelEfficiency.pdf> accessed on 10 March 10, 2011.

⁶⁵ B. Lane and S. Potter above n 29, at para 4.2.

⁶⁶ Australasian Fleet Managers Association, ‘The Australasian Fleet Managers Association (AfMA) Submission regarding Fringe Benefit Tax (FBT)’ 18 December 2008, at 4.

⁶⁷ Australasian fleet Managers Association is a not for profit organisation responsible for the management of approximately 800,000 vehicles.

on safety and emission reduction, as FBT actively punishes organisations financially for adopting new technology and socially responsible practices.”⁶⁸ Given that the additional cost of acquiring low emission vehicles made such vehicles less financially attractive to Fleets, the AfMA recommended that:

“There is an urgent need to reconcile the legislative conflicts that produce disincentives to allow Fleets to be at the forefront of a robust movement to substantially increase the number and range of safer and more environmentally friendly vehicles in the Fleet.”⁶⁹

Given the importance of this taxation measure, the paper examines the impact of the reform of the FBT system announced on 10 May 2011, and considers what reform is necessary to align the taxation measure with environmental policy objectives of delivering the favourable environmental effect of reducing road transport emissions.

3.4 Removal of the car fringe benefits tax concession?

Many submissions have recommended the removal of the FBT concessions for company cars. In 2000, the Australian Parliament report, *The Heat is On: Australia’s Greenhouse Future*, recommended that the FBT incentive for company cars be removed and incentives that encourage public transport and cycling be introduced.⁷⁰ In 2002, the Australia Institute recommended the removal of the concessionary tax treatment of company cars.⁷¹

The House Standing Committee on Environment and Heritage report on *Sustainable Cities* (2005) also recommended the removal of incentives for greater car use, but proposed that the incentive should be extended to other modes of transport.⁷²

⁶⁸ Australasian fleet Managers Association, above n 66.

⁶⁹ Ibid.

⁷⁰ Australian Parliament, Senate Environment, Communications, Information Technology and the Arts References Committee, “*The Heat is On: Australia’s Greenhouse Future* (2000)” Recommendation 48, at 230.

⁷¹ C. Hamilton, R. Dennis, H. Turton, “Taxes and Charges for Environmental Protection” *The Australian Institute*, (2002) at viii, Discussion Paper No 46 <https://www.tai.org.au/documents/downloads/DP46.pdf>.

⁷² House Standing Committee on Environment and Heritage, *Sustainable Cities* (2005), <http://aph.gov.au/house/committee/enviro/cities.htm> Recommendation 8, p77 Chapter 5 of the Report considered transport sustainability and identified environmental, economic and social costs linked to

The OECD recommended that policy makers should attempt to understand the environmental effects of removing a subsidy, and how consumers and producers are likely to react to the removal of that subsidy.⁷³ Thus, to remove the FBT subsidy with the goal of reducing environmental pressures, the OECD advises that “it is essential to consider the broader sectoral and macroeconomic context of a particular subsidy”⁷⁴ such as its impact on the local car industry (discussed in paragraph 6.0). Removal of a subsidy without considering its context could have the opposite effect to that which was intended.⁷⁵ Therefore, if removing the FBT tax concessions results in employers’ offering cash allowances in place of a company car, which is then used to acquire a car privately that is fuel inefficient, then the removal of the FBT subsidy will have minimal benefit to the environment. Alternatively, if reforming the FBT subsidy reduces the cost of vehicle use for low emission vehicles and results in an increase in Australia’s fleet of fuel-efficient low emission vehicles, then the environmental impact of reforming the FBT subsidy is positive.

3.5 Proposals for reforming the car fringe benefits tax system

All proposals for reforming the FBT system were more concerned with removing the incentive for unnecessary travel. None of the proposals considered the possibility that the tax concession could have other harmful environmental effects identified in the 2009 EU study on company car taxation, such as the subsidy distorting an employee’s decision toward choosing a larger vehicle than required and increasing the total number of vehicles on road, as discussed earlier in paragraph 3.2.⁷⁶

For instance, the final report of the 1999 Ralph Committee Review of Business Taxation recommended a revenue neutral approach for the FBT system by replacing the current statutory formula with a schedule of operating costs of the vehicle under which 45 per cent (business–use percentage) is deducted to determine the taxable value of the

heavy reliance on the private car (p59), and the impediments to reducing this dependency was the concessions available to private vehicles under the FBT. (p45).

⁷³ OECD, above n 4, at para 2.1.

⁷⁴ OECD, above n 4, at para 279.

⁷⁵ OECD, above n 4, at para 279.

⁷⁶ European Commission, “EU Study on company car taxation”, above n 13.

employee's car benefit.⁷⁷ The business-use percentage could exceed the prescribed percentage providing the claim could be substantiated.⁷⁸ Administratively, there were compliance cost advantages as the method was simple in that the vehicles' running costs would be determined from a schedule, which eliminated the need for record keeping. Furthermore, the link to unnecessary kilometres travelled was removed.

In 2007, the Senate Standing Committee on Rural and Regional Affairs and Transport in its report *Australia's Future Oil Supply and Alternative Transport Fuels*, recommended that the government review the statutory formula method of valuing car fringe benefits to address the perverse incentives it creates for more car use.⁷⁹

In August 2007, the Australian Government appointed the then Secretary to the Treasury, Dr Ken Henry, to chair a Review Panel (Henry Review) into Australia's future tax system for the next 10 to 20 years, and make recommendations for the design of the country's future tax-transfer system.⁸⁰

According to the terms of reference, the objective of the review was to create a tax transfer system that would position Australia to meet demographic, social, economic and environmental challenges.⁸¹ In terms of the environment, consultation questions were asked of business and the broader community on how to reform policies that have the potential to improve both the structure of the tax transfer system and the environmental outcome by changing the incentives faced by individuals and firms.⁸²

⁷⁷ Ralph Committee,(1999) "'RBT, A Tax System Redesigned' Discussion paper: A Platform for Consultation" (1999) at 223 para 5.4(a) The schedule of operating costs was based on the published surveys conducted by motoring organisations of aggregate running costs (both fixed and variable) of vehicles.

⁷⁸ Ralph Committee (1999) above n 77, at 223, para 5.4(a).

⁷⁹ Senate Standing Committee on Rural and Regional Affairs and Transport, "Australia's Future Oil Supply and Alternative Transport Fuels, Final Report" (2007) http://www.aph.gov.au/senate/committee/rrat_ctte/oil_supply/index.htm p163 Recommendation 10.

⁸⁰ Henry Review above n 38, 'Overview' at Section 13.

⁸¹ Henry Review, above n 38 'Executive Summary'.

⁸² Henry Review, above n 38, at 247. The following consultation questions were presented for consideration:

Q13.1 Bearing in mind that tax is one of several possible instruments that can address environmental externalities, what opportunities exist to use specific environmental taxes to address Australia's environmental challenges?

Q13.2 Noting that many submissions raise concerns over unintended environmental consequences of taxes and transfers, such as the fringe benefits tax concession for cars, are there features of the tax-transfer system, which encourage poor environmental outcomes, and how might such outcomes be addressed?

The Henry Review raised the consultation question of the FBT treatment of car benefits that impact on the everyday decisions of individuals and businesses and may create incentives that impact adversely on environmental outcomes.⁸³ Submissions were invited from individuals, academics, business and the broader community to provide feedback to these consultation questions. The Review Panel provided the final report to the Treasurer by the end of 2009, which was released to the public in May 2010. The recommendations from this review are discussed in paragraph 3.6.

The 2008 Garnaut Review recommended to the Review Panel that the FBT statutory fraction method be amended to ensure it was distance neutral.⁸⁴

The 2008 Review of Australia's Automotive Industry, A New Car Plan for a Greener Future (commonly known as the Bracks Review), recommended to the Henry Review the "adoption of a new fringe benefits tax statutory rate table that is more evenly spread across the range of kilometres travelled."⁸⁵ The rate table commences from the same statutory fraction of 26 per cent for kilometres travelled per FBT year of 0 to 14,000, increasing in increments of 2,000 kilometres, with the highest band remaining the same as the existing statutory fraction of 7 per cent for kilometres travelled at 40,000 per FBT year, as shown in Table 1. The Bracks Review claimed that the new rate table would encourage drivers to use their vehicles only when necessary and not for the purpose of reducing FBT liability. The Review also indicated that some submissions recommended a flat structure rate;⁸⁶ however, it rejected this proposal as a rate that is too low could reduce the cost of salary packaging vehicles and erode the effectiveness of the FBT system, while a high rate could remove the incentive for salary package vehicles altogether.⁸⁷

Q13.3 Given the environmental challenges confronting Australian society, are there opportunities to shape tax-transfer policies, which do not currently affect the environment in ways, which could deliver better environmental outcomes?

⁸³ Henry Review, above n 38, at para 13.2 p 249.

⁸⁴ Garnaut Review, above n 5, at 527.

⁸⁵ Bracks Review, above 42, at 69 The new rate table proposed the following statutory fractions: 0-14,000: 26%; 14,001-16,000: 21%; 16,001-18,000: 19%; 18,001-20,000: 17%; 20,001-22,000: 15%; 22,001-24,000: 13%; 24,001-26,000: 11%; 26,001-34,000: 10%; 34,001-40,000: 9%; 40,000: 7%.

⁸⁶ Bracks Review, above n 42, at 69.

⁸⁷ Bracks Review, above n 42, at 69.

In August 2009, the Senate Standing Committee on ‘Investment of Commonwealth and State funds in public passenger transport infrastructure and services’ investigated the need for improvement in urban public transport and the fringe benefits taxation of cars. The Committee recommended an “amendment to the car FBT statutory formula to remove the incentive to drive fringe benefits cars excessively to reach the next threshold.”⁸⁸ The Committee also recommended that “it would be preferable to increase the number of distance bands rather than use a flat rate, since a flat rate advantages cars which are driven further, which should be seen as contrary to environmental goals to restrain car use.”⁸⁹

In 2007, Kraal, Yapa and Harvey conducted a survey of 1,250 cars in both metropolitan and regional areas on the FBT system, and confirmed that the FBT’s statutory formula method encourages employees to “drive unnecessary mileage in salary packaged vehicles to obtain tax concessions.”⁹⁰ The authors recommended to the Henry Review that the FBT’s statutory rates for cars be reformed by “removing the tax concession at the 15,000 kilometre band and using the statutory fraction band of 26 per cent rate, or using a single statutory rate of 20 per cent.”⁹¹ The recommendation was described as an “environmentally sustainable car salary packaging.”⁹² The authors’ preferred solution to determine the taxable value of the car fringe benefit was the use of the Operating Cost Method. This would facilitate the “...curbing of excessive motor vehicle greenhouse emissions and foster petrol savings”, because it is the most accurate method in claiming genuine business kilometres.⁹³ However, business does not find this method as administratively simple as the FBT statutory formula method. Indeed, the Operating Cost Method may well remove the excess kilometres driven, but the subsidy reduces vehicle costs and fails to encourage a behavioural change to low emission vehicles.

⁸⁸ Parliament of Australia, Senate Committee for Rural and Regional Affairs and Transport, above n 40, para 5.79 Recommendation 7.

⁸⁹ Parliament of Australia, Senate Committee for Rural and Regional Affairs and Transport Senate Committee, above n 40, at para 5.78.

⁹⁰ Kraal, Yapa and Harvey, “The impact of Australia’s Fringe Benefits Tax for cars on petrol consumption and greenhouse emissions” (2008) *Australian Tax Forum* at 191.

⁹¹ Kraal, Yapa and Harvey, above n 90, at 215. The survey showed that 20 per cent of car drivers travelled the necessary kilometres to reach the 15,000 km, 25,000 km and 40,000 km, and 80 per cent of employees live within 15kms of their workplace.

⁹² Kraal, Yapa and Harvey, above n 90, at 216.

⁹³ Kraal, Yapa and Harvey, ‘Fringe benefit tax for cars: some further considerations for policy change and reform’ (2009) *Australian Tax Forum* at 590 sighted on 7 March 2011.

However, the OECD stated that the largest proportion of GHG emissions in the transport sector is attributable to the environmental performance of personal vehicles, not from reducing kilometres travelled.⁹⁴ This was supported by the King Review, which found emission reduction is unlikely to be achieved through overall reductions in distance travelled,⁹⁵ because it was more cost effective to reduce CO2 emissions through improvements in vehicle technology.⁹⁶

This view is also evident in the data collated by Kraal, Yapa and Harvey (discussed above) provides an example of the typical car driven and the average number of cars acquired under each of the FBT statutory bands. This data has been collated in Table 2 below, and includes the fuel efficiency of vehicles and carbon emissions collated from the Green Vehicle Guide. For example, the survey indicates that in the \$36,000 to \$37,500 price bracket a typical car might be the Ford Futura, which has a fuel economy of 13 litres/100 kms and emits 298g of CO2/km, and in the \$37,500 to \$38,000 price bracket, a typical car might be a Mitsubishi Pajero RV6 with a fuel economy of 13.5/100 km, emitting 322g of CO2/km.

⁹⁴ OECD, Environment Directorate, Environment Policy Committee, above n 4, at para 228.

⁹⁵ King Review, above n 6, at para 4.6.

⁹⁶ King Review, above n 6, at para 2.2.

Table 2: Average number of cars per price range and number of kilometres travelled; fuel economy and carbon emissions/km⁹⁷

Price range of cars	Typical car	L/100 Km*	CO2g/km ⁹⁸	No <15 Kms	No 15-25 kms	No 25-40 kms	No >40 kms	Total no of cars	%
Statutory Fraction				26%	20%	11%	7%		
Less than \$29,000	Ford Focus	9L	199	25	44	38	35	142	32
\$29,000 to \$36,000	Commodore	12L	280	12	30	41	24	107	24
\$36,500 to \$38,500	Mitsubishi Pajero Rv6	13.5L	322	21	20	78	16	135	32
More than \$38,500	Jeep Cherokee Sport	11.8L	283	4	18	22	10	54	12
Total				62	112	179	85	438	
Percentage				14%	25%	40%	20%		100

* Green vehicle Guide

In terms of the number of vehicles acquired under each FBT statutory band, Table 2 shows 40 per cent of the vehicles acquired were in the lower FBT Statutory Fraction band of 11 per cent, and 20 per cent were in the FBT statutory fraction band of 7 per cent. In addition, Table 2 supports the 2009 EU Study⁹⁹ in that not only does the FBT system encourage unnecessary kilometres, but the subsidy attracts the acquisition of more expensive, higher emitting vehicles that have higher vehicle costs because they are less fuel-efficient and require more litres of fuel for the same kilometres travelled.

In fact, the Australian vehicles chosen by the taxpayers in Table 2 have emissions that are 40 to 50 per cent higher than vehicles under international best practice. That is, after measuring the environmental performance of the cars, the National Transport Council (NTC) reported that international best practice for business and government fleets was carbon emissions of 167 g/km in 2007, compared to those vehicles in Table 2 with carbon emissions ranging from 199g/km to 322g/km.¹⁰⁰

⁹⁷ Kraal, Yapa and Harvey, above n 90, with the data extracted from data table 5: average number of cars priced < \$29,000 and '000 kilometres travelled; Data Table 6 Average number of cars priced \$26,001-\$36k and '000 kilometres travelled (p 205); Data table 7 Average number of cars priced \$36,001-\$37.5k and '000 kilometres travelled; Data Table 8 Average number of cars priced \$37.5-\$38k and '000 kilometres travelled; Data Table 9 Average number of cars priced \$38-\$38.5k and '000 kilometres travelled; Data Table 10 Average number of cars priced > \$38.5k kilometres travelled.

⁹⁸ Australian Government, "Green Vehicle Guide" sighted at <http://www.greenvehicleguide.gov.au/GVGPublicUI/SearchResults.aspx> accessed on 16 March 2011.

⁹⁹ European Commission, "EU Study on company car taxation", above n 13.

¹⁰⁰ D. Borthwick, National Transport Commission, above n 32.

For example, the Ford Focus in Table 2 requires 9 litres of fuel for each 100 kilometres travelled and emits 199g of CO₂ per kilometre travelled, while the Mitsubishi Pajero requires 13.5 litres of petrol for the same kilometres travelled, and emits 322g of CO₂ per kilometre. However if the Ford Focus was fuelled by diesel instead of petrol, the vehicle would require only 5.6 litres of fuel per 100 kilometres travelled instead of 9 litres and emit 146g of CO₂ per kilometre, thus meeting the international best practice standard of 167g/km. A further reduction in emissions would occur if there was a behavioural change to ‘green cars’ such as a hybrid Prius, which would require only 3.9 litres of fuel for 100 kilometres and limit emissions to 89 grams of CO₂ per kilometre,¹⁰¹ that is, 89 per cent less than the emissions from a Mitsubishi Pajero.

Recommendations for the reform of the FBT system discussed earlier fail to recognise the significant environmental effects of car choice and the varying range of emissions within every class or type,¹⁰² or alternative fuels such as diesel, biodiesel or liquefied petroleum gas (LPG). For example, the findings from the UK King Review indicate the choice between petrol and diesel has a direct effect on emissions, with diesel cars currently being around 10-20 per cent more fuel-efficient than equivalent petrol models.¹⁰³

However, the transition to diesel vehicles in Australia has been slow, with diesel and petrol vehicles sales accounting for 12 and 87 per cent respectively in 2008, compared to 52 and 48 per cent respectively in the European Union.¹⁰⁴ None of the vehicles in Kraal, Yapa and Harvey’s FBT survey were fuelled with diesel.

When Kraal, Yapa and Harvey were questioned by the National Tax Forum in 2009 on whether to “restructure FBT for greater concessions for high fuel efficient cars” as promoted by the Australian Conservation Foundation, the authors responded: “....this

¹⁰¹ Australian Government, “Green Vehicle Guide” sighted at <http://www.greenvehicleguide.gov.au/GVGPublicUI/SearchResults.aspx> accessed on 16 March 2011.

¹⁰² J. King, “The King Review of low-carbon cars Part I: the potential for CO₂ reductions” (2007) at 63 accessed on 10 March 11, 2011. King Review provides examples of SUV’s emissions can range from 150g per kilometre to over 300g per kilometre.

¹⁰³ J. King, above n 102, at 64.

¹⁰⁴ Australian Transport Council, National Transport Commission above n 50, at 29.

solution would seem to raise more complexities and may be inequitable as it may encourage a shift to imported vehicles.”¹⁰⁵

But the shift to imported vehicles has already happened, and does not justify the failure to reform the FBT system on the basis of a vehicle’s environmental performance. In 2006, Neil Warren of KPMG Chartered Accountants said it was “not unreasonable to assume that over half of the intended subsidy to domestic vehicle manufacturing industry arising from the application of the FBT statutory formula is now benefiting car importers”,¹⁰⁶ and reported that sales of Australian built motor vehicles had fallen to 29 per cent in 2004.¹⁰⁷ However in 2010 this had more than halved to 14 per cent.¹⁰⁸

The issue of ‘raising more complexities’ was not the case when the UK reformed the Company Car Taxation (CCT) system in 2002, linking the CCT to a vehicle’s carbon dioxide emissions and achieving significant reductions in CO₂ emissions from cars, as discussed in paragraph 5.0.

3.6 Henry Report on Australia’s future tax system

The Australian Government released the Henry Report entitled Australia’s Future Tax System to the public on 2 May 2010. This Report recognised that the current statutory formula was introduced for non-environmental purposes, and that it may promote behaviour with adverse environmental consequences by creating “an incentive for individuals to travel additional kilometres, adding to carbon pollution and congestion.”¹⁰⁹ In response to this concern, the Henry Report recommended that the car fringe benefits “be valued at a single statutory rate of 20 per cent, and would apply regardless of kilometres travelled.”¹¹⁰

¹⁰⁵ Kraal, Yapa and Harvey, above n 93, at 595. Kraal, Yapa and Harvey presented the above FBT findings and recommendation to a National Tax Forum symposium in 2009 to delegates who were mainly administrators from the social services not-for-profit sector. Delegates included the Australian Council for Social Securities, the Brotherhood of St Laurence, Mission Australia, various trade unions etc.

¹⁰⁶ Warren, above n 60, at 18.

¹⁰⁷ Warren, above n 60, at 18.

¹⁰⁸ T. Hagon, “A place for local talent” *The Age*, 8 January 2011, sighted on <http://theage.drive.com.au/motor-news/a-place-for-local-talent-20110107-19i3b.html>.

¹⁰⁹ Australian Treasury, Henry Final Report, “Australia’s future tax system” (2010) Treasury at 371 sighted at www.treasury.gov.au.

¹¹⁰ Refer to Table 1, where the statutory fraction band for 20 per cent will apply in calculating the FBT liability: value of car x single statutory rate of 20 per cent x gross-up rate x days held/days in FBT year x

For example, in applying the single statutory rate of 20 per cent to the vehicle worth \$50,000 in Table 1, the tax payable will be \$9,600¹¹¹ regardless of the kilometres travelled. This will be discussed further in paragraph 4.0

Again, the single statutory rate may reduce ‘excess kilometres travelled’ between the statutory fraction bands, but fails to acknowledge emissions can vary between vehicles and within every class or type of vehicle. That is, the flat rate fails to differentiate between vehicles such as an SUV that can emit between 245 to 341 grams of CO₂ per kilometre travelled, and a hybrid vehicle that emits 89 grams of CO per kilometre travelled.¹¹²

In applying the Henry Report’s recommendation of a single 20 per cent statutory rate, Table 3 shows the likely reduction in carbon dioxide emissions per tonne that would occur if there were reductions in mileage of, for instance, 5,000 kilometres per year, because a vehicle no longer needs to travel the additional kilometres per year to reach the statutory band of 20 per cent under the current FBT system. Table 3 shows the reduction in CO₂ emissions for the 5,000 kilometres, which will vary depending on the fuel efficiency of the vehicle and the amount of carbon dioxide emitted per kilometre travelled.

FBT rate. For a \$50,000 worth \$50,000 held for 365 days, the calculation is: $\$50,000 \times 20\% \times 2.0647 \times 365/365 \times 46.5\% = \$9,600$.

¹¹¹ Henry Final Report, above n 109, at 372-recommendation 9b Section A1 Personal income tax. The Australian Government has not indicated whether it will accept or reject this recommendation.

¹¹² Australian Government, “Green Vehicle Guide” Toyota Landcruiser 200, 2010 model Petrol 91RON emits 341 gCO₂/km, while a Holden VE sports wagon can emit between 221 g of CO₂/km to 327g of CO₂/km sighted at www.greenvehicleguide.gov.au

Table 3: Reduction in emissions for fewer kilometres travelled under a 20% flat statutory rate

Car	L/100 Km	CO2g/km	25,000 km Total Tonnes/ CO2	Reduced emissions for 5000 km CO2/tonne	Total emissions 20,000km CO2/tonne
Ford Focus	9L	199	4.975	.845	3.980
commodore (Australian made)	12L	241	6.025	1.205	4.820
Ford Futura Wagon	13L	298	7.450	1.490	5.960
hybrid Prius	3L	89	2.225	.445	1.780
International best practice	7L	167	4.175	.835	3.340

While Table 3 shows a reduction in emissions, the total tonnage of emissions for the same kilometres travelled is higher for fuel inefficient vehicles. On its own, the Henry Report’s recommendation for a single statutory rate of 20 per cent will be unlikely to encourage a behavioural change to low emission vehicles. Nor will it contribute to the joint Australian Transport Council and the Environment Protection and Heritage Council’s ‘Vehicle Fuel Efficiency Working Group’¹¹³ efforts in developing vehicle fuel efficiency measures that are designed to move Australia towards ‘international best practice’.¹¹⁴ This will require “improving the greenhouse emission performance of new vehicles.”¹¹⁵

The ‘international best practice’ vehicle in Table 3 emits 3.340 tonnes of carbon dioxide for each 20,000 kilometres travelled, which is less than all other vehicles except those which are low carbon. In fact, the Toyota Prius, a low carbon vehicle, emits 4.180 fewer tonnes of emissions than the Ford Futura Wagon for the same kilometres travelled. This supports the findings of the King Review that changes in consumers’ choice toward low emission vehicles can bring forward a reduction of GHG emissions from road

¹¹³ The Vehicle Fuel Efficiency working Group was formed at the request of the Australian Transport (ATC) and the Environment Protection Heritage Council (EPHC). The working group represented Commonwealth and State/Territory transport, environment and industry representatives. The Working Group were required to assess the effectiveness of measures in an international and local context and outline potential measures to improve vehicle fuel efficiency and reduce CO2 emissions.

¹¹⁴ Australian Transport Council and the Environment Protection and Heritage Council Vehicle Joint “Vehicle Fuel Efficiency Working Group”, Final Report March 2009, at 4, sighted at http://www.atcouncil.gov.au/documents/files/VFE_FinalReport09.pdf accessed on 7 March 2011.

¹¹⁵ Australian Transport Council and the Environmental Protection and Heritage Council, “Vehicle Fuel Efficiency Working Group” above n 114, at para 3.4 sighted at http://www.atcouncil.gov.au/documents/files/VFE_FinalReport09.pdf.

transport.¹¹⁶ Table 3 clearly highlights the consequences of ignoring the harmful environments effects of the vehicle chosen by an employee or employer.

In addition, Kraal, Yapa and Harvey argue that adopting a single statutory rate of 20 per cent will foster petrol savings by removing the incentive for unnecessary kilometres travelled.¹¹⁷ For example, if mileage travelled is reduced from 25,000 kilometres to 20,000 kilometres, Table 4 shows the highest emitting vehicle appears to have the greatest petrol saving of \$910, while the lowest emitting vehicle has the least petrol saving of \$210. The greatest petrol saving, however, comes from purchasing a fuel-efficient vehicle, where for each 20,000 kilometres travelled the total cost of petrol is \$840 for the Hybrid Prius and \$1,960 for the ‘International best practice vehicle’, compared to \$3,360 for the high-emitting Commodore and \$3,640 for the Ford Futura Wagon.

Table 4: Petrol Savings under a 20% flat statutory rate

Car	L/100 km	25,000 km Total Litres (petrol)	Total fuel cost @ \$1.40 per litre \$	20,000 km Total Litres (petrol)	Total fuel cost @ \$1.40 per litre \$	Total Petrol Savings \$
Ford Focus	9L	2,250	3,150	1,800	2,520	630
Commodore (Australian made)	12L	3,000	4,200	2,400	3,360	840
Ford Futura Wagon	13L	3,250	4,550	2,600	3,640	910
Hybrid Prius	3L	750	1,050	600	840	210
International best practice	7L	1,750	2,450	1,400	1,960	490

Table 4 illustrates projected petrol savings with reduced kilometres travelled under the reformed 20 per cent flat statutory rate, while Table 3 demonstrates the likelihood of a reduction in GHG emissions. Both scenarios support the findings in Kraal, Yapa and Harvey’s 2007 survey discussed in paragraph 3.5, but it is argued that the petrol savings and the reduction in carbon emissions would have been greater had taxpayers chosen low emitting vehicles at the time of acquisition.

¹¹⁶ King Review, above n 6, at 7.

¹¹⁷ Kraal, Yapa and Harvey, above n 90, at 192.

In terms of the tax concession claimable for the fuel consumed by the vehicles listed in Table 4 under the Income Tax Assessment Act 1997,¹¹⁸ a higher tax concession of \$3,640 would be claimed for the high emitting Ford Futura Wagon, which is \$2,800 more than the tax concession that would be claimed for the lowest emitting vehicle of \$840, or \$1,680 for the international best practice vehicle. It is argued, then, that this is in conflict with environmental policy objectives and the ‘polluter pays principle’, given that the polluter is being subsidised for higher fuel costs and higher emissions at a cost to the community and the environment.

4 The Government adopts Henry Report’s reform

The Australian Government proposes to implement the Henry Report’s recommendation for valuing car fringe benefits with a single statutory rate of 20 per cent, regardless of the kilometres travelled, to apply to new vehicle contracts entered into after 7.30 (AEST) on 10 May 2011, and phased in over four years as shown in Table 5.

Table 5: Single flat rate of 20% phased in over four years

Existing Contracts		New Contracts entered into after 7.30pm (AEST) on 10 May 2011			
Distance travelled during the FbT year (1 April – 31 March)	Statutory fraction	From 10 May 2011	From 1 April 2012	From 1 April 2013	From 1 April 2014
0 – 15,000 km	0.26	0.20	0.20	0.20	0.20
15,000 – 25,000 km	0.20	0.20	0.20	0.20	0.20
25,000 – 40,000 km	0.11	0.14	0.17	0.20	0.20
More than 40,000 km	0.07	0.10	0.13	0.17	0.20

The Government provides no explanation of why there needs to be a phase-in period of four years. Rather, it seems only to add a further administrative burden on employers. After this period, the use of the statutory formula method will be simpler.

¹¹⁸ *Income Tax Assessment Act 1997*, general deduction provision: s 8-1(1)(b).

The Government describes the reform as both a taxation and environmental reform, in that it will remove the “unintended incentive for people to drive their vehicle further.”¹¹⁹ Emissions will only be reduced for the ‘excess kilometres travelled’ to reach the lowest statutory fraction. However, the phasing-in period shown in Table 5 will still encourage excess kilometres for employees travelling over 25,000 kilometres for a further two years, and for a further three years for employees travelling more than 40,000 kilometres during an FBT year.

The impact on the existing statutory fractions shown in Table 1 compared to the single statutory rate of 20 per cent is shown in the following table.

Table 6: The FBT of a motor vehicle with a base value of \$50,000: when applying the FBT four tiered statutory fractions compared to the single statutory rate of 20%

Kilometres travelled	Statutory fraction	Tax payable 46.5%	Tax payable Applying single flat rate of 20%	Tax (Savings) or Additional tax
More than 40,000 km	0.07	3,360	9,600	6,240
25,000 – 39,999 km	0.11	5,280	9,600	4,320
15,000 – 24,999 km	0.20	9,600	9,600	Nil
Less than 15,000 km	0.26	12,481	9,600	(2,881)

Undoubtedly the reform will disadvantage employees who travel between 25,000 and 40,000 km, with an additional tax of \$4,320, and for those who travel over 40,000 km, an additional tax of \$6,240. Therefore the reform discourages the perverse incentive to drive excessive kilometres to reduce tax liability. However, the additional taxes may remove some of the incentive for choosing the statutory formula method, and taxpayers with high kilometres may find it more attractive to use the operating cost method.

Nonetheless there is still a tax saving to the high-income earner, who will not necessarily be discouraged to include a car as part of their salary package. In addition, the single statutory rate of 20 per cent will benefit low kilometre commuters who travel less than 15,000 kilometres. As shown in Table 1, there is a tax saving here of \$2,881. Employees who mostly travel to and from work with little additional travel may be encouraged to consider salary packaging a car. In effect, the new rate may encourage

¹¹⁹ W.Swan MP, Treasurer “Reforms to Car Fringe Benefit Rules”, above n 11.

more vehicles being acquired by employees who are low kilometre users. This may very well offset any environmental gain achieved from reducing excess kilometres, and is contrary to the Treasurer's statement that this is both a taxation and environmental reform.¹²⁰ The reform measure may in fact increase peak hour users and traffic congestion.

More importantly, both the graduated statutory rate FBT system and the new single flat rate of 20 per cent provide no incentive for taxpayers to make a behavioural change to fuel efficient, low emitting vehicles, and will not deliver significant reduction in greenhouse gas emission from road transport.

4.1 Cost to the community and environment

The FBT is not a major source of revenue for the Australian Government when tax revenue is offset against tax concessions. For example, in 2008-09 the estimated tax concessions for fringe benefits were \$3.3 billion compared with FBT revenue collections of \$3.8 billion.¹²¹

The FBT concession for the statutory formula method of \$1.7 billion in the FBT tax year 2007-08 is projected to increase to \$2 billion by 2009-10.¹²² This concession is considered to be one of the largest tax expenditures outside superannuation and capital gains tax.¹²³

With the reform of the FBT 'statutory formula' method from the four-tiered statutory percentages to a single 20 per cent flat rate, the Australian Government projects that this measure will result in a gain to revenue of \$970 million over the forward estimates, and the ongoing gain in revenue will increase GST payments to the States by \$50 million over the same period.¹²⁴ This estimate is made on the premise that this reform will

¹²⁰ Hon W. Swan, Treasurer "Reforms to Car Fringe Benefits Rules", above n 11.

¹²¹ Henry Review, above n 38, at 88.

¹²² Australian Government, Treasury, "Tax Expenditure Statement," (2008) Chapter 6, D24 Application of Statutory Formula to value car benefits at 105.

¹²³ Parliament of Australia, Senate Committee for Rural and Regional Affairs and Transport, above n 41, at para 5.62.

¹²⁴ Australian Government, "Budget 2011-2012: Fringe benefits tax – reform of the car fringe benefits rules" sighted at http://www.aph.gov.au/library/pubs/RP/BudgetReview2011-12/CarFBT.htm#_ftn2 accessed on 25 May 2011.

remove the incentive to “drive salary-sacrificed and employer-provided vehicles to increase their concession.”¹²⁵ This may be the case, but employees who travel more than 25,000 kilometres per year may shift to the operating cost method, while employees who travel less than 15,000 kilometres per year may be drawn to salary packaging. In effect, the reform may well increase the number of vehicles under the FBT system, and continue to subsidise vehicle costs without any consideration of the fuel efficiency of the vehicle chosen by the employee.

However, the tax concession represents revenue forgone each year to the Australian Government and the community had the employees’ private car benefits been non concessional. Given this concession is a cost to the community, it should then benefit the community and environment by encouraging the acquisition of low emission vehicles that will build up Australia’s fleet of low emission vehicles and encourage further technological advancement in decarbonising road vehicles.

The Australian Vehicle Fuel Efficiency Working Group’s Final Report in 2009 identified that taxation measures are being utilised around the world to improve vehicle fuel efficiency and reduce CO₂ emissions from road vehicles.¹²⁶ However vehicle taxation must be linked to emissions performance, as the United Kingdom’s Company Car Tax (CCT) system demonstrates in paragraph 5.1.

5 Proposal to link the car FBT concession to vehicles’ emissions

To address the shortcomings of the current FBT system and encourage taxpayers to choose low emission vehicles, it is recommended that the taxable value of a company’s motor vehicle be linked to that vehicle’s CO₂ emissions, that is, the lower the vehicle’s carbon emissions, the lower the tax liability. This method adopts the ‘polluter pays principle’,¹²⁷ and supports environmental policy mechanisms such as the CPRS.

¹²⁵ W. Swan, Treasurer, ‘Budget Measures Budget Paper No. 2 2011-2012’ at 23 sighted on <http://www.aph.gov.au/budget/2011-12/content/download/bp2.pdf> accessed on 26 May 2011.

¹²⁶ The Australian Transport Council and the Environment Protection and Heritage Council, “Vehicle Fuel Efficiency Working Group” above n 114 at 15.

¹²⁷ B.J. Richardson, K.L. Chanwai, “The UK’s climate change levy: Is it working?” *Journal of Environmental Law* (2003) – Oxford University Press, at para 2.1. The ‘polluter pays’ principle removes hidden subsidies that gave an unfair competitive advantage to polluting industries. This concept was advanced in the 1970s by the Organisation for Economic Cooperation and Development (OECD).

This article now considers in some detail the reform of the United Kingdom's company car tax system, which has linked the tax concession to a vehicle's environmental performance. This reform has been held out as the model of 'potential practice' for other European Union member nations.¹²⁸

5.1 Taxable value determined on carbon dioxide emissions – UK experience

In meeting the United Kingdom's 1997 Kyoto Protocol commitments to reduce the nation's emissions under the United Nations Framework Convention, the UK Labour government announced a 'Statement of Intent on Environmental Taxation' setting out the government's objective of reforming the taxation system by shifting the burden of taxation from 'goods' to 'bads', to encourage innovation in meeting higher environmental standards, and create a cleaner environment for the benefit of everyone.¹²⁹ The new tax system would encourage behavioural change by internalising environmental costs under the 'polluter pays' system and signal to taxpayers the need to adopt environmentally sustainable practices.¹³⁰ In 1999, the UK Government announced it would reform the company car tax system by linking the company car tax to a vehicle's CO₂ emissions.¹³¹ The reform took effect in April 2002, providing plenty of lead-time for car manufacturers to make necessary adjustments to the production of their vehicles.

The UK Government launched its 'Powering Future Vehicles Strategy' in July 2002, setting challenging targets to reduce transport emissions by promoting the development and uptake of clean, low carbon vehicles (defined as emitting 100 g of CO₂ per km or less) and ensuring the full involvement of the UK automotive industry in the new technology. To support this transition, the Government set a target that low carbon cars should represent 10 per cent of all car sales by 2012.¹³² To achieve this target, the

¹²⁸ Commission to the Council and the European Parliament, "Taxation of Passenger cars in the EU – Options for Actions at National and Community Levels", COM (2002) 0431.

¹²⁹ House of Commons "UK the 1997 Statement of Intent on Environmental Taxation" Research Paper 09/86 sighted at <http://www.publications.parliament.uk/pa/cm200708/cmselect/cmtreasy/231/23108.htm> accessed on 28 February 2011.

¹³⁰ Richardson, Chanwai, above n 127, at para 2.1.

¹³¹ Department for Transport 'The Future of Transport – White Paper Released on 20 July 2004', para 10.09, sighted on <http://webarchive.nationalarchives.gov.uk/+http://www.dft.gov.uk/about/strategy/whitepapers> accessed on 1 March 2011.

¹³² B Lane and S Potter, above n 29, para 1.0.

Government reformed the CCT “to provide financial incentives for employers and company car drivers to choose cars which produce lower levels of CO₂ emissions.”¹³³

In 2003, the Energy White Paper said that the United Kingdom would primarily reduce emissions through fiscal incentives and technological advancement.¹³⁴ The Government claimed that by linking the CCT to a car’s CO₂ performance, it was encouraging car buyers to buy lower-carbon vehicles.¹³⁵ An evaluation of the CCT tax was made by the UK Government in 2004 and 2004, monitoring the impact of the CCT system on car buyers’ choice, as discussed in paragraph 5.1.2.

5.1.1 United Kingdom’s company car tax system prior to 2002

Table 7 shows that prior to April 2002 the UK company car taxation system was similar to the Australian FBT system, where the taxable benefit was calculated by applying a statutory fraction to the list price of the car which was determined by the car’s annual level of business mileage for the year. Again, taxpayers were encouraged to increase kilometres travelled for the purpose of paying less tax.¹³⁶

Table 7: UK Statutory Rates for Business Miles travelled

Business Miles	% of list price
Less than 2,500	35%
2,500 to 17,999	25%
18,000 or more	15%

5.1.2 Company Car Tax Reform from April 2002

The reform of the CCT maintained the above tax percentages of 15 per cent to 35 per cent that were applied to the list price of the cars, with an upper limit of 80,000 pounds. However, the mileage thresholds in the above system were replaced with a range of

¹³³ B Lane and S Potter, above n 29, para 1.0. Inland Revenue, Report of the evaluation of company car tax reform, Inland Revenue, UK (2004).

¹³⁴ Department of Trade and Industry (DTI) ‘Our Energy Future – Creating a Low Carbon Economy White Paper’ (2003) sighted at <http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk/files/file10719.pdf>.

¹³⁵ Department of Trade and Industry (DTI) ‘Our Energy Future – Creating a Low Carbon Economy White Paper’ (2003), above n 134, para 5.10.

¹³⁶ UK Parliament, “Taxing company cars” (2002) at 7 sighted on www.parliament.uk/briefing-papers/RP02-10.pdf accessed on 28 June 2011.

approved CO2 emissions for the car, rounded to the next 5g/km.¹³⁷ The lowest tax rate of 15 percent applied to the lowest emission threshold shown in Table 8, and for each 5g/km of CO2 emissions that exceeded this threshold, the percentage charge increased by 1 per cent until the level reached a maximum of 35 per cent, currently at 240g/km.¹³⁸

Progressive tightening of the rates has occurred since the reform measure was introduced in 2002, encouraging employees and employers to purchase and lease the lowest emitting cars as shown in Table 8.¹³⁹ That is, Table 8 shows the low tax rate threshold commenced at 165g/km in the 2002-2003 year, which was progressively reduced to a lower rate of 99g/km in the 2012-2013 year, and a nil percentage rate for those vehicles emitting no emissions, being applicable only for the next 5 years from 6 April 2010.

Table 8: CO2 Emissions figures for UK car tax

Tax Year	CO2 Charge (%)	Co2 emissions (g/km)
2002-03	15	165
2003-04	15	155
2004-05	15	145
2005-06, 07, 08	15	140
2008-2009	15	135
2009-2010	10	120
	15	135
2010-2011	0	0 (powered by electricity)
	5	75
	15	130
2011-2012	0	0 (applies for 5 years from
	15	6 April 2010)
2012-2013		125
	0	0
	10	99

¹³⁷ HM Revenue & Customs, "Report on the interaction between company cars, employee car ownership scheme cars and mileage allowance payments" (2008) at 34.

¹³⁸ HM Treasury, "Rev 6 Protecting the Environment: Reform of the Company Car Taxation" (2000) sighted at http://www.hm-treasury.gov.uk/bud_bud00_pressrev6.htm.

¹³⁹ HM Treasury, 'Company Car Tax' sighted at http://www.hm-treasury.gov.uk/d/junebudget_chapter2.pdf.

The following additional discounts or surcharge apply to influence the employee or employer to choose the lowest emitting vehicle by either increasing or decreasing the above CO2 charge, depending on the type of fuel used:¹⁴⁰

- Diesel cars incur a 3 per cent surcharge to reflect higher levels of harmful local air pollutants such as particulates and nitrous oxides;
- This surcharge is waived if the diesel cars meet the Euro IV emissions standards (a measure of cleanliness set down in an EU-wide directive) before EURO IV standards became mandatory from 1 January 2006 onwards;
- Discount of 2 per cent to run on LPG or compressed natural gas; 3 per cent for hybrid electric; and
- Discount of 6 percent applies for electric only cars.

Further tightening of the above discounts and surcharges apply from 6 April 2011, to encourage an additional behavioural shift to low or nil carbon emitting vehicles:¹⁴¹

There will be no longer any reductions for alternative fuels (hybrids, bi-fuels and cars manufactured to run on “E85”;

Diesel surcharge will apply to all diesels; and

The 80,000 pounds limit for the price of a car for car benefit purposes will no longer apply.

In applying the above CCT rates to the example in Table 1, the taxable value for a company car worth \$50,000 will vary depending on the fuel type and the level of CO2 emissions, as shown in Table 9.

¹⁴⁰ HM & Customs, “Report on the Evaluation of the Company Car Tax Reform; Stage 2”(2006) at 20 www.hmrc.gov.uk/budget2006/company-car-evaluation.pdf.

¹⁴¹ HM Revenue & Customs, “Forthcoming changes to the car benefit rules” signed at <http://www.hmrc.gov.uk/cars/rule-changes.htm> accessed on 13 March 2011.

Table 9: Company car tax calculation using UK CO2 Emissions figures¹⁴²

Fuel Type	CO2 Emissions (g/km)	Percentage of car's price to be taxed at 2008 CO2 emissions charge rates	Taxable Value \$
Petrol	240	35	17,500
Diesel	162	22	11,000
Diesel ultra low sulphur	162	19	9,500
Electric car	0	9	4,500
Hybrid	120	12	6,000
Gas	145	13	6,500

Table 9 shows that the highest taxable value of \$17,500 will apply if a company car fuelled with petrol emits 240g of CO2 per kilometre. Large tax savings can be made if the taxpayer chooses an electric vehicle or hybrid. Obviously, the UK CCT will be a crucial factor in determining an employee's choice of car, as he/she would be keen to choose a vehicle that reduces tax costs while at the same time provides a car suitable for private as well as business use.¹⁴³

The HM Revenue & Customs (HMRC) closely monitored the impact of the CCT reform by commissioning two evaluations on the reform in its first year (2003) and its third year (2004). The first stage of the CCT evaluation (Stage 1) was published in April 2004, and assessed the effectiveness of the reform for the first twelve months.

The second stage evaluation report was released by the HMRC in March 2006, providing a comprehensive report on the findings of the evaluation which examined the effectiveness of the reform and assessed whether it reached the objectives of company car tax reform since being introduced in 2002.¹⁴⁴

¹⁴² Calculation of CO2 charge: If the vehicle CO2 emissions are 240g/km, then the percentage of the car's value to be tax, is 240g CO2/km less approved emissions threshold of 140g CO2/km equals 100g CO2/km that exceeds the threshold. The 15% CO2 charge is increased by 1 percent for each 5g/km of CO2 emissions, which equals 20%, which equals a total CO2 charge of 35%.

¹⁴³ B. Lane and S. Potter, above n 29, para 4.2.

¹⁴⁴ HM & Customs, "Report on the Evaluation of the Company Car Tax Reform; Stage 2"(2006), above n 140.

The report found:

- The reform is encouraging a substantial number of people to choose cars with lower CO₂ emissions. Survey results found around 60 per cent of company car drivers who had a choice of company car were influenced by the CCT reform and chose cars with lower CO₂ emissions;
- When drivers opted out of company cars they usually chose higher polluting vehicles with higher emissions of 5g/km on average than the company cars they replaced;
- A significant reduction of 400,000 company cars from around 1.6 million in 1999 at the time when the reform was announced to 1.2 million in 2005. The company car tax reform was cited as the major reason for employers and employees opting out of company cars. Some of the other reasons given were that employees wanted a different type of car from that which the employer was willing to offer as a company car, and that company cars were no longer considered essential to the needs of an employer's business;
- At least 44 per cent of employers had considered no longer providing company car benefits;
- Many who opted out of the benefit chose to receive additional cash and pay tax. The extra income tax on extra cash paid when employees stopped having company cars offset the reduction in income tax on company cars. The estimated reduction in income tax for each year up to 2005/06 is estimated to be under 5 per cent of the total amount of tax collected for company car benefits for 2002/2003;
- The survey indicated that 50 to 60 per cent of company cars changed to diesel which has lower GHG emissions than petrol (2002: 26 per cent), forecasted to rise to 60 to 70 per cent over the next few years;
- Significant reductions in CO₂ emissions from cars of 0.2 to 0.3 Mt CO₂-e for 2005, projected to increase to 0.65Mt Co₂-e in 2010, with projected yearly reduction of 0.4 to 0.9 Mt Co₂ in the long run to 2020. This is about a 1 per cent cut of all UK car CO₂ emissions; and
- Unnecessary business travel reduced by 300 to 400 million business miles from April 2002 to March 2003, with a reduction in traffic congestion.

The UK CCT has been successful in not only reducing unnecessary kilometres driven, but also encouraging a substantial number of people to choose company cars with low emission. Since the introduction of the reform in 2002, the average CO2 emissions on all new cars sold in the UK have dropped from 174.7g/ km to 144.5g/km in 2010.¹⁴⁵ The ‘over purchasing’ of new company cars under the former CCT system is 29 per cent lower than in 2005 when the registration of new company cars was 1.2 million, which dropped from 1.6 million employees receiving car benefits at the time the reform was announced in 1999.¹⁴⁶ However, the uptake of higher emitting vehicles by employees opting out of company cars highlights the importance for further reform for vehicles that are not under the FBT regime, to ensure employees are encouraged to acquire low emission vehicles privately.

The Stage 2 evaluation report found that the reform of the company car tax in 2002 was an effective measure in significantly reducing CO2 emissions from cars.¹⁴⁷ In particular, the Report showed the CCT system to be an effective measure in strengthening the country’s fleet of low emission vehicles, one that will continue to build up over many years as company cars are sold into the private second hand market every three to four years.¹⁴⁸ In time, “privately owned cars in the UK will have on average, lower CO2 emissions because they are former company cars.”¹⁴⁹

Additionally, the CCT system allows the Government to support advances by car manufacturers in vehicle technology and encourages the uptake of low carbon vehicles by tightening the lower rate thresholds to nil for vehicles with no emissions as shown in Table 7. This will thereby encourage a behavioural shift away from the use of fossil fuels. The effectiveness of this measure is evident when comparing the Australian uptake of low carbon vehicles to those in the UK. The NTC findings show the growth of ‘green cars’ vehicles in Australia (vehicles with emissions that do not exceed 120 g/km) accounted for 0.6 percent of total car sales in 2008, compared to 11 per cent in

¹⁴⁵ J. Potter, ‘UK Company Car Tax Revised’ sighted at www.foes.de/pdf/CCT_Potter.pdf accessed on 13 March 2011.

¹⁴⁶ J. Potter, ‘above n 145.

¹⁴⁷ HM Revenue & Customs, above n 140, at 4.

¹⁴⁸ HM Revenue & Customs, above n 140, at 23.

¹⁴⁹ HM Revenue & Customs, above n 140, at 23.

the United Kingdom.¹⁵⁰ Unlike in the UK, there are no incentives to acquire low carbon vehicles in Australia, which are generally privately purchased and not offered for sale as fleet vehicles as in the UK.

This is reflected in the NTC findings that Australia's new passenger vehicles were high emitting when compared to those of the United Kingdom. That is, the proportion of vehicles sold in Australia with emission under 150g/km was 5 per cent, compared to 50 per cent of all vehicles sold in the United Kingdom which have emissions under 150 g/km.¹⁵¹ Further evidence of Australia's poor fuel efficiency record is that in 2008, EU-27 vehicles achieved a national average carbon emissions target (NACE) of 145.7g of CO₂/km, which represents 33 per cent less emissions than Australia's NACE of 215g CO₂/km.¹⁵²

Clearly the above favourable results from the UK's CCT regime should go far to assuage past concerns as to whether the Australian FBT system is an effective instrument in reducing emission, which has previously been described as "... at best a rough instrument to use to influence behaviour."¹⁵³

5.2 Linking Australia's FBT system to vehicles' carbon emissions

It is unlikely that the UK CO₂ emission charges in Table 8 will be adopted in Australia, considering the CO₂ emission charges applied to the base value of the car are higher than the current statutory fraction rates. But, similarly to the UK company car taxation system, Australia can use the existing FBT statutory fractions in Table 1 for consistency, with kilometres travelled being replaced with the vehicle's emissions expressed as the number of grams of CO₂ emitted per kilometre, made available from the Green Vehicle Guide. The lowest tax rate of 7 per cent is applied to the lowest emission threshold, which needs to be set by the Government. For the purposes of the example in Table 10, the lowest emission threshold will be set at 145g/km, and will

¹⁵⁰ National Transport Commission, above n 50, at 28.

¹⁵¹ National Transport Commission, above n 50, at 28.

¹⁵² National Transport Commission, above n 50, at 26. European emissions ranged from 138g/km for Portugal to 174g/km for Sweden, which means Australia's average emissions of 215g/km was 55 per cent higher than Portugal's emissions and 23 per cent higher than Sweden's emissions. According to the Federal Chamber of Automotive industries, Australia's NACE target for 2009 was 218.5gCO₂/km.

¹⁵³ C. Black, above n 46 at 195.

increase by 1 per cent for every 5 g/km of CO₂ emissions that exceeds this threshold to a maximum of 26 per cent, being the highest FBT statutory fraction under the current FBT system. A surcharge of 2 per cent could apply to diesel cars unless it meets the Euro IV emissions standards, and the following discounts could apply:

- 1 per cent for cars using LPG or compressed natural gas;
- 3 per cent for hybrid vehicle with CO₂g/km of 100 or less; and
- 5 per cent for electric vehicle with no CO₂/g/km emissions.

In recalculating the taxable value in Table 1, for a vehicle worth \$50,000, the new taxable value based on the vehicles CO₂ emissions will be as shown in Table 10.

Table 10: Statutory fraction method with new fractions or CO₂ Emission Charges

Fuel Type	CO ₂ Emissions (g/km)	CO ₂ Emission Charges applied to base value of car %	Taxable Value
Petrol	240	26	13,000
Diesel	162	12 (additional surcharge of 3%)	6,000
Diesel ultra low sulphur	162	10	5,000
Electric car	0	2	1,000
Hybrid	100	4	2,000
Gas	145	6	3,000

The above new fractions or the CO₂ emission provide for quite low statutory tax rates compared to the single statutory rate of 20 per cent, and effectively provide a significantly greater subsidy to company cars for the purpose of encouraging a behavioural shift to low emission vehicles. In effect, the above CO emission rates are a substantial departure from the current taxation policy discussed in paragraph 6.0, by aligning taxation policy with environmental policy objectives of significantly reducing carbon emissions.

The proposed CO₂ emission charges in Table 10 incorporate the ‘polluter pays’ principle with the highest polluting vehicle bearing the highest tax burden with a taxable value of \$13,000, compared to the lowest emitting vehicles with a taxable value of \$1,000 for an electric vehicle, or \$2,000 for a hybrid.

In Table 1, the highest taxable value under the current statutory fraction formula method was \$13,000 for the lowest kilometres travelled of less than 15,000 kilometres, and the lowest taxable value of \$3,500 was for the highest kilometres travelled in excess of 40,000 kilometres for the year.

Under the single statutory rate of 20 per cent, the taxable value is \$9,600 regardless of kilometres travelled. This is \$3,400 less than the taxable value shown in Table 10 for the highest polluting vehicle with emissions of 240g of CO₂ per kilometre.

A comparison of the three different methods of calculating the taxable value shows the UK CCT system is highly favourable, and provides the strongest incentives for employees and employers to choose the lowest emission vehicle and fuel type to lower the FBT liability.¹⁵⁴ Thus, considerable tax savings can be made if the employee and employer choose the lowest emitting vehicle.

This will address the concern by fleet managers that the current FBT system discourages Fleets from acquiring lower emission vehicles because they are less “financially attractive”.¹⁵⁵

5.2.1 CO₂ emission charges applied to operating cost method

Currently, two-thirds of car benefits are valued under the operating cost method as discussed in paragraph 3.3, which may increase with the adoption of the single statutory rate of 20 per cent applicable to new vehicle contracts entered into after 7.30pm on 10 May 2011. That is, an employee who travels more than 25,000 kilometres per year may request a change to the operating cost method if this method provides a lower FBT liability than under the single statutory rate method, even though the employee will have an additional administrative burden of maintaining a logbook to substantiate car usage. Therefore, if the FBT regime is to provide incentives for a behavioural change to low emission vehicles, then it must also apply to the operating cost method.

¹⁵⁴ HM Revenue & Customs, above n 140 at 25. The findings showed that cars had CO₂ emissions that were 15g/km lower on average by 2004 since the introduction of the company car tax reform in 2002.

¹⁵⁵ Australasian fleet Managers Association, above n 66, at 3.

For example, applying the same CO2 emission charge rates to a new car costing \$50,000, assuming a business percentage of 50 per cent and operating costs of \$4,000, the taxable value under the operating cost method¹⁵⁶ will be \$8,700¹⁵⁷ to which the same statutory fraction CO2 emission charges discussed in paragraph 5.2.0 are applied as follows:

Table 11: Applying CO2 emission charges to operating cost method

Fuel Type	Taxable Value without CO2 Emission Charge	CO2 Emissions (g/km)	CO2 Emission Charges applied to taxable value of car. %	CO2 Emission Charge	Taxable Value with CO2 Charge
Petrol	8,700	240	26	2,262	10,962
Diesel	8,700	162	10 (additional surcharge of 3%)	1,044	9,744
Diesel ultra low sulphur	8,700	162	7	870	9,570
Electric car	8,700	0	2	174	8,874
Hybrid	8,700	100	4	348	9,048
Gas	8,700	145	6	522	9,222

For the highest polluting vehicle with emissions of 240 g/km, the taxable value is still more than the taxable value of \$9,600 under the single statutory rate of 20 per cent discussed in paragraph 3.6, but not as high as the taxable value of \$13,000 under the proposed statutory fraction method with CO2 emission charges shown in Table 10. However, the taxable value of the low emission vehicles in Table 11 will not provide significant tax savings to encourage employees to change to a low emission vehicle, particularly when the taxable value of low emission vehicles under the operating cost method in Table 11 are higher than under the statutory fraction method with CO emission charges in Table 10.

¹⁵⁶ S10 of the FBTA 1986, where the formula used for calculating the taxable value is $(C \times (100\% - BP)) - R$, where: C = operating cost of the car, BP = Business percentage; R = Recipients payment.

¹⁵⁷ Taxable value = (operating cost of \$4,000 + deemed depreciation \$9,375 + deemed interest \$4,025) = \$17,400 x (100% - business percentage applicable to the car of 50%). Deemed depreciation under Sec 11(1) = Cost of vehicle \$50,000 x depreciation rate of 18.75% x 365 days / 365 days. Deemed interest under Sec 11(2) = Cost of vehicle \$50,000 x interest rate of 0.0805 x 365 days / 365 days.

Furthermore, CO2 emission charges applied to the taxable value of the car benefit will diminish with increased business use, allowing high polluting vehicles a tax concession for vehicle costs, regardless of the vehicles' greenhouse emissions.

Thus, to reform the FBT regime to provide incentives for a behavioural shift to low emission vehicles, it is recommended that the statutory fraction method based on CO2 emission charges should be the only method that applies to car benefits.

5.2.2 Henry Report rejects the use of subsidies to reduce vehicle emissions

Despite the success of the UK CCT system in encouraging a behavioural change to low emission vehicles, the Henry Report considers: "individual emissions levels depend not only on the efficiency of the vehicle, but also on other factors, particularly distance travelled, weight carried and driver behaviour."¹⁵⁸ Whilst these factors are likely to contribute to lowering road emissions, the UK King Review states that significant cuts to road emissions will come from improvements in vehicle technology.¹⁵⁹

The Henry Report also rejects the use of subsidies to target vehicle fuel efficiency because it "may reward people who purchase a fuel-efficient vehicle yet travel large distances, and penalise people who purchase a less expensive, less fuel-efficient vehicle, but travel rarely."¹⁶⁰ However, it cannot be guaranteed that people who purchase a less fuel-efficient vehicle will 'travel rarely' and emit less carbon emissions. Nor can it be assured that when the vehicle is sold into the second hand market that the purchaser will 'travel rarely'. Given this, it is more favourable to purchase a fuel-efficient vehicle at the time of acquisition, because the purchaser of an ex-fleet vehicle may have high fuel costs and high emissions over the remaining life of vehicle.¹⁶¹

Targeting vehicle fuel efficiency as a means of reducing emissions is considered by the Henry Report to be a "blunt instrument" compared to targeting emissions directly by

¹⁵⁸ Henry Report, above 109, at 363.

¹⁵⁹ King Review, above 6, at para 2.2.

¹⁶⁰ Henry Report, above n 109, at 363. The Final Report states that taxes levied on second-hand cars 'may encourage premature scrapping of older cars in favour of new cars.'

¹⁶¹ National Transport Commission, above n 50.

reflecting the cost of carbon emission in fuel prices.¹⁶² Consequently, the Henry Report argues that an emission-trading scheme is the total solution to reduce car emissions, where additional policy measures will not be required.¹⁶³ Discussion on whether the CPRS is the ‘total solution’ in reducing road transport emissions is outside the scope of this paper.

Furthermore, the Henry Report also rejects the use of incentives to encourage taxpayers to undertake “environmentally beneficial activities” because it would “impose costs on the whole community through the higher taxes needed to fund them.”¹⁶⁴ This means the Henry Report would most likely have rejected reforming the current FBT system on the basis of vehicles emissions, because the Report considers such subsidies as a cost to the community. If this is the case, then it is argued that the current car fringe benefits system and the Henry Reports recommended single flat rate of 20 per cent should be removed because it imposes a cost on the whole community by having to fund a concession that provides no benefit either to the community or the environment, as discussed in paragraph 4.1.

6 Impact of the proposed FBT reform on the motor vehicle industry

The Australian motor vehicle producers (MVP) would strongly oppose reforming car FBT concession linked to the vehicles CO₂ emissions when the average CO₂ emissions from Australian-made vehicles was 264 g/km in January-August 2009,¹⁶⁵ which is above the highest CO₂ emissions of 240g of CO₂/km shown in Table 10. In effect, most Australian-made vehicles will bear the highest FBT liability.¹⁶⁶

However, it is unlikely that the Australian Government will support a measure that disadvantages the local car industry. This became evident when the 2009 Senate Standing Committee on Rural and Regional Affairs and Transport questioned Treasury

¹⁶² Henry Report, above n 109, at 363.

¹⁶³ Henry Report, above n 109, at 362.

¹⁶⁴ Henry Report, above n 109, at 357.

¹⁶⁵ National Transport Commission, above n 50, at 21.

¹⁶⁶ National Transport Commission, above n 50.

on the policy purpose of making FBT cars concessionary. The Committee noted that “Treasury gave an uninformative answer which avoided the question.”¹⁶⁷

The difficulty the Government faces in reforming the car benefit FBT system and significantly reducing road emissions as proposed in paragraph 5.0 is the impact of these measures on the automotive industry and the economy, given that in 2010 the automotive manufacturing industry employed over 53,000 people and automotive exports totalled more than \$2,088 million.¹⁶⁸ It is the largest manufacturing sector in Australia, representing around 6 per cent of Australia’s total value added and contributing around 1 per cent of national GDP.¹⁶⁹

However the Australian Motor Vehicle Industry (MVI) has been supported by the Australian Government since 1986, when the Button Plan¹⁷⁰ was introduced to protect the economic viability of this sector.¹⁷¹ At the time, the statutory formula method under the FBT legislation was being indirectly designed to support the MVI through subsidising vehicle cost. With financial support, the car FBT concessions, import tariffs and quotas on imported vehicles, Australian-made motor vehicles accounted for an estimated 85 per cent of domestic passenger vehicles sales in 1986.¹⁷²

Since the Button Plan, the Australian motor vehicle market has changed dramatically. Rising oil prices, falling import quotas and tariffs from 57.5 per cent in 1984, to 5 per cent from 1 January 2010 opened the market to imports. This has caused a major shift in consumer preference for smaller low fuel consumption vehicles, and a change in preference from locally produced larger vehicles to sports utility vehicles (SUV’s).¹⁷³

¹⁶⁷ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, at para 5.63.

¹⁶⁸ Australian Government, Dept of Innovation, Industry, Science and Research “March 2011 Automotive Update” sighted at <http://www.innovation.gov.au/Industry/Manufacturing/Documents/DIISRManufacturingDataCard.pdf> accessed on 27 June 2011.

¹⁶⁹ Federal Chamber of Automotive Industries (FCAI) “Submission to the Inquiry into Manufacturing in Victoria” (2009) at 2 sighted at http://www.parliament.vic.gov.au/images/stories/committees/edic/submissions/VMI_Sub_58_FCAI.pdf accessed on 27 June 2011.

¹⁷⁰ The ‘Button Plan’ is named after the Minister for Industry and Commerce, Senator Button, who was to report on the long term future of the car industry and how to make it efficient. The recommendations proposed by Senator Button are known as the ‘Button Plan’.

¹⁷¹ Warren, above n 60, at 16.

¹⁷² Warren, above n 60, at 19.

¹⁷³ Bracks Review, above n 42, at 10. The sports utility vehicles range in size from the Suzuki Vitara and Toyota RAV4 through to the Hummer.

In effect, sales of locally produced passenger vehicles have fallen significantly by more than three quarters from 85 per cent in 1986 to 51 per cent in 1995, 29 per cent in 2004, 19.4 per cent in 2007, 17 per cent in May 2008,¹⁷⁴ and 14.1 per cent in 2010.¹⁷⁵

Consequently, the local car industry would be concerned if the car FBT concession was reformed because over 75 per cent of domestically produced vehicles represent fleet sales to the government and business sector.¹⁷⁶ In these terms, GM Holden expressed their concern to the Henry Review that the operation of the FBT system was vital to the sustainability of the local industry¹⁷⁷ and, “without the car FBT concession there would be little incentive to offer cars as fringe benefit, and employees left to their own devices would be more likely to buy imported vehicles.”¹⁷⁸ The same argument was made in the 1999 Ralph Review of Business Taxation when the local car industry argued “... any tightening of the formula would damage its sales and encourage employers to choose cheaper, imported cars”.¹⁷⁹ The shift to imported cars, of course, is already happening without any reform to the car FBT concession.

The Federal Chamber of Automotive Industries (FCAI)¹⁸⁰ submission in March 2009, urged the Review Panel to carefully consider the implications of their recommendations to the Australian MVI and the effect on the purchasing decisions by business if there are changes to the FBT Statutory Formula method.¹⁸¹

GM Holden’s submission to the 2008 ‘Public Discussion Paper on Vehicle Fuel Efficiency’ said that the “long term future of the industry depended on manufacturers

¹⁷⁴ Bracks Review, above n 42, at 10.

¹⁷⁵ T. Hagon, ‘A place for local talent’ above n 108.

¹⁷⁶ Bracks Review, above n 42, at 10. The business sector acquired 113,807 (or 56.8 per cent) of Australian made vehicles sales, the government acquired 37,073 (or 19 per cent) of Australian made vehicle sales and private buyers acquired 50,293 vehicles or less than a quarter of Australia made vehicle sales. With declining domestic sales, the industry’s sustainability and survival has been reliant on sales of its medium to large six-cylinder vehicle to the Middle East markets, with exports of motor vehicles totalling \$2.9 million and automotive components totalling \$1.7 billion in 2007. 15.

¹⁷⁷ GM Holden Submission to Henry Review “GM Holden Submission to Australia’s Future Tax System Review” Oct 2008, at 5.

¹⁷⁸ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41 Senate, para 5.63.

¹⁷⁹ Ralph Committee, above n 77, at 224.

¹⁸⁰ The FCAI is an industry organisation that represents vehicle manufacturers and importers of passenger vehicles, light commercial vehicles and motorcycles in Australia.

¹⁸¹ FCAI, “Submissions to the Review of Australia’s Future Tax System” (March 2009) at 7 sighted at www.fcai.com.au/.../submission-to-the-review-of-australia-s-future-tax-system---march-2009

having strong demand for locally produced vehicles.”¹⁸² Thus, the current FBT car concession remains to support the local car industry, which only represents 14 per cent of all car sales.¹⁸³

The Australian Government has continued to support the Australian MVI by announcing in 2008 that it would extend its financial support to 2020 by a further \$6.2 billion over 13 years or \$477 million per year.¹⁸⁴ The OECD reported in its 2010 economic survey of Australia that this additional assistance made the total level of subsidies to the Australian automotive industry the second highest in the OECD on a per capita basis.¹⁸⁵ In fact, the OECD reported that justification for more assistance to distressed industries “has no solid empirical evidence” and that such subsidies “hinder structural adjustment and the reallocation of resources in the economy.”¹⁸⁶ It is outside the scope of this paper, however, to discuss the financial support provided by the government.

The 2009 Senate Standing Committee in Rural and Regional affairs and Transport believed that support to the Australian MVI extended to the car FBT concession.¹⁸⁷ The Committee said that “it appears that the concessionary car FBT at about \$1.7 billion per year, considered as assistance to the car industry, is by far the largest element of government assistance to the industry.”¹⁸⁸ The Committee described this as “a subsidy of at least \$10,000 to secure a consumer’s decision to buy Australian instead of imported.”¹⁸⁹ The Committee noted, “at least it should be stressed – the true figure may be much higher, since it depends on how much the concession actually influences

¹⁸² GM Holden, “GM Holden Submission to the Public Discussion Paper on Vehicle Fuel Efficiency: Potential measures to encourage the uptake of more fuel efficient, low carbon emission vehicles” (November 2008), at 18.

¹⁸³ Bracks Review, above n 42, at 10. In 2007, 327,984 vehicles were produced: 201,173 (or 61 per cent) vehicles were sold domestically and 126,811 (or 39 per cent) were exported.

¹⁸⁴ Borthwick, National Transport Council, above n 32.

¹⁸⁵ OECD, “OECD Economic Survey, Australia” (2010) at 67, sighted on <http://resources.news.com.au/files/2010/11/15/1225953/995883-101116-aes.pdf> accessed on 27 June 2011.

¹⁸⁶ OECD, above n 185 at 67.

¹⁸⁷ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, at para 5.65.

¹⁸⁸ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, at para 5.68.

¹⁸⁹ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, para 5.68. The Report continues to state: ‘At least should be stressed – the true figure may be much higher, since it depends on how much the concession actually influences people’s behaviour (the more people who buy Australian anyway, the greater is the subsidy taken over each of the buyers whose behaviour is influenced). This seems to be the unknown.’

people's behaviour (the more people who buy Australian anyway, the greater is the subsidy taken over each of the buyers whose behaviour is influenced)."¹⁹⁰

When questioned by the Committee, the Australian Government was reluctant to admit that "the purpose of the concession is to support the Australian car industry (no other purpose has been suggested)."¹⁹¹ This led to the Committee making the following recommendation in relation to the application of the statutory formula method:¹⁹²

- the Government should state the purpose of making the tax concessionary (noting that whether the tax should be concessionary, and whether there should be a statutory formula for the sake of easy compliance, are different questions);
- the Government should investigate and report on how well the concession is achieving its purpose; and
- the Government should investigate and report on what the likely effects on consumer behaviour would be if the concessionary aspect of car FBT was reduced or removed.

Without reforming and linking the FBT concession to the vehicles emissions, the MVI has been allowed to continue manufacturing vehicles that have emissions 40 to 50 per cent higher than international best practice of 163 g/km in 2007.¹⁹³ According to the NTC, this is directly attributable to Australian-made vehicles being all large vehicles and that "therefore emissions are higher."¹⁹⁴

The local car manufacturers Ford and GM Holden recorded the highest corporate CO2 emissions for the top 15 makes by sales.¹⁹⁵ For example, the NTC report showed

¹⁹⁰ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, at para 5.68.

¹⁹¹ Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, at para 5.64.

¹⁹² Parliament of Australia: Senate Standing Committees on Rural and Regional Affairs and Transport, Inquiry, above n 41, at para 5.92. Recommendation 8.

¹⁹³ Mr Borthwick, National Transport Council, above n 32.

¹⁹⁴ National Transport Council, above n 50, at 21.

¹⁹⁵ National Transport Council, above n 50, at 18. Ford average vehicle CO2 emissions for the period Jan to Aug 2009 was 252g/km, and Holden was 245g/km.

Holden's average emissions remained unchanged for the period 2005 to 2008¹⁹⁶ and had the highest average emissions of 270 g/km with no improvement since 2005.¹⁹⁷ In fact, between 2005 and January-August 2009, Holden Commodore delivered an increase of 3 per cent in average emissions.¹⁹⁸

In effect, not only has the current FBT system failed to reduce road transport emissions, but it has allowed the local motor vehicle industry to continue manufacturing fuel inefficient, high emitting vehicles at cost to the environment and community as well as to the detriment of the industry, by failing to rise to the global challenge of significantly reducing vehicles emissions. This is in stark contrast to the situation in the UK, where the demand for low emission vehicles increased after the reform of the UK CCT system, leading UK car manufacturers to introduce more diesel models than would otherwise have been the case.^{199,200}

Clearly, if Australia reforms the current FBT system by linking the concession to vehicles' CO emissions, it will provide a financial incentive for employers and employees to choose cars with lower levels of CO₂ emissions. According to the NTC, if Australia can achieve the international best practice figure of 163g/km, the following reduction in emissions may result:²⁰¹

- 16.5 million tonnes fewer emissions over the vehicle life, considering that Australia's transport sector produced 80.6 million tonnes of CO₂ emissions in 2005; and
- An estimated \$9 billion in savings from fuel (assuming a fuel price of \$1.20 cents per litre) for Australian motorists over the vehicle life.

¹⁹⁶ National Transport Council, above n 50, at 20.

¹⁹⁷ National Transport Council, above n 50, at 21.

¹⁹⁸ The NTC reported that Australian-made vehicles by Toyota had the lowest emissions of Australian made National Transport Council, National Transport Commission, (NTC) "Carbon Emissions from New Australian Vehicles" vehicle manufacturers with emissions of 231 g/km in Jan-Aug 2009, a 6 per cent improvement since 2005; Ford was the second with emissions of 268 g/km in 2009, a 8 per cent reduction since 2005.

¹⁹⁹ HM & Customs, "Report on the Evaluation of the Company Car Tax Reform; Stage 2" (2006), above n 140, at 24.

²⁰⁰ Bracks Review, above n 42, at 9. In 2006, Australia local car manufacturers produced 388,985 vehicles, compared to 1.8 million vehicles produced in the UK.

²⁰¹ Mr Borthwick, National Transport Council, above n 32.

Like the UK, the Australian MVI must make the transition to low emission vehicles and not rely on the current FBT system for its existence and survival. Currently, Government's reluctance to reform the FBT car concession in an effort to protect the local MVI (which only represents 14 per cent of new car sales) will benefit mostly the importers of high emitting vehicles, making it difficult for Australia to significantly reduce road emissions.

7 Conclusion

This article has identified that a significant reduction in road transport emissions can be achieved through improvements in vehicle technology, and that this is dependent on increasing the supply of and demand for low emission vehicles. This will only occur, of course, through Government support by introducing fiscal measures that provide incentives for consumers to make an informed and responsible choice in purchasing a low carbon vehicle.

It is argued, then, that reforming the current car benefit FBT system on the basis of vehicles' carbon emissions is an effective instrument in encouraging behavioural change toward low emission vehicles, as evidenced in the UK with the introduction of the company car taxation system in 2002. This is particularly important given that over half of all new vehicles acquired are government and business fleet vehicles which are sold every two to three years onto the second hand market, and can remain on road for an average of 10 years. Therefore the FBT car subsidy can be seen as an effective measure in influencing the type of vehicle entering the market, and building up the country's fleet of low emission vehicles.

However, many submissions for reform of the FBT system were more concerned with reducing vehicle use and excessive kilometres travelled rather than encouraging the acquisition of low emission vehicles. For example, the 2009 Henry Report recommended a flat 20 per cent statutory rate regardless of kilometres travelled, which would reduce the incentive to increase kilometres travelled in order to reduce tax liability.

With the Australian Government adopting the recommendation of the Henry Report for a flat 20 per cent statutory rate, the perverse subsidy still remains and continues to have other harmful environmental effects such as distorting employees' choices toward larger, high emitting vehicles, because the subsidy lowers the costs of such vehicles. Therefore, it is argued that if the car FBT concession is a cost to the community in lost revenue each year, then this tax concession should benefit the community by increasing Australia's fleet of low emission vehicles. Linking the car FBT concession to vehicles' emissions will make the taxation measure environmentally sustainable by removing the incentive for unnecessary travel and encouraging behavioural change towards low emission vehicles. This is imperative if Australia is to significantly reduce its road transport emissions.

CHAPTER 7

CONCLUSION

7.1 Introduction

This chapter presents the key findings of the research questions for the purpose of determining which policy instruments are required to influence the car-purchasing trends of consumers in Australia, so that they select fuel-efficient lower carbon vehicles to ensure a significant reduction in road-transport emissions. The following are the two research questions:

1. Can economic instruments influence consumers' purchasing trends for new vehicles that are fuel efficient and lower carbon emitting for the purpose of reducing road-transport emissions?
2. Will economic instruments need to be combined with complementary instruments to obtain the optimal goal of encouraging a behavioural change in the uptake of lower emission vehicles to deliver the emission targets and reduce road-transport emissions?

The core research questions are first presented by examining the key findings of the research. The discussion then explains the lessons learnt, and whether these lessons can be adapted for Australia. The barriers to implementing the recommendations will also be discussed, followed by the presentation of the research contributions and considerations for future research.

7.2 The First Research Question

The key findings conclude that of the economic instruments being researched, the reform of certain existing fiscal taxes based on CO₂ emissions will be effective in targeting car-purchasing trends and influencing consumers to choose fuel-efficient lower carbon vehicles. The fiscal taxes that should be reformed are the employee car

benefits under the Australian FBT system,¹ and the state and territory governments' vehicle-purchase tax/stamp duty imposed on the purchase of new light vehicles.² The vehicle-purchase tax, commonly known as 'stamp duty' in Australia, is able to target consumers' choice of new vehicle at the point of purchase, and the FBT regime is able to influence car-purchasing trends in approximately 40 to 50 per cent of new-vehicle sales. The reform of both existing taxes based on CO₂ emissions will significantly reduce road-transport GHG emissions by improving the weighted average carbon emissions of new vehicles.

This thesis found it would be more politically and publically acceptable to reform an existing fiscal tax than to introduce a new environmental tax.³ Existing fiscal taxes can be reformed into fiscal environmental taxes that are primarily aimed at generating revenue, and that may have significant positive effects on the environment.⁴

7.2.1 Key Findings: Fringe Benefits Tax Car Benefit

The FBT system in Australia allows employers to offer employees a new car, which will be available for their private use, as part of their remuneration package. This car benefit is funded by the community because of the foregone revenue and the concessions for running expenses such as petrol, registration and insurance.⁵ Employers subsidising vehicle costs can create unnecessary travel because of the employer receiving free fuel, the trend to over-purchasing of new vehicles, and the influence this has on car-purchasing trends for larger higher carbon vehicles that will remain on road for an average of up to 10 years.⁶ As such, this system increases road-transport

¹ *Fringe Benefits Tax Assessment Act 1986* (Cth) Div 2: 'Car Fringe Benefits'.

² Australian Government, National Transport Commission, *Carbon Dioxide Emissions from New Australian Vehicles 2013* (2014) <[http://www.ntc.gov.au/Media/Reports/\(6B1DD6CF-FB2C-B934-74A8-47971CB09050\).pdf](http://www.ntc.gov.au/Media/Reports/(6B1DD6CF-FB2C-B934-74A8-47971CB09050).pdf)> (accessed 19 October 2014) 1–66, 9. 'Light vehicles' or 'vehicles' in this thesis refer to passenger vehicles (including SUVs) and light commercial vehicles (including light trucks).

³ Chapter 4: 80, 121.

⁴ Kalle Maatta, *Environmental Taxes: An Introductory Analysis* (Edward Elgar, 2006) 1–101, 20.

⁵ Wayne Gumley and Natalie Stoianoff, 'Carbon Pricing Options for a Post-Kyoto Response to Climate Change in Australia' (2011) 39*Federal Law Review* 131.

⁶ Chapter 6:189.

externalities because more fuel is consumed, it creates more traffic congestion, and leads to more CO₂ emissions.⁷

Given that half of all new vehicles sold annually are acquired by business and government buyers (generally under the FBT system), the key findings indicate that Australia is unlikely to reduce its road-transport emissions significantly without reforming the FBT system.⁸ Further, these vehicles are filling the second-hand car market every three years, before the expiry of the warranty period, supplying lower income earners with fuel-inefficient higher carbon vehicles.⁹

The effect and influence of the FBT system on the new-car market has been underestimated. Introducing additional economic instruments that impose additional taxes (or Pigouvian taxes or charges) to influence a behavioural change to low-emission vehicles may be inconsequential and superfluous if these subsidies are ill conceived and continue to result in further inequity between buyer types.

7.2.2 Lessons Learnt

Lessons were learnt in this research from the case study of the UK's CCT system, which was similar to Australia's FBT system until the fiscal tax instrument was reformed in 2002 by linking the company-car tax to the new vehicles' grams of CO₂ emissions per kilometre.¹⁰ In the UK, as in Australia, company cars constituted approximately half of the new-car market, and the UK tax reform had a substantial effect on reducing CO₂ emissions.¹¹ Further, the UK reform was politically and socially acceptable and did not attract any opposition from users when it was introduced.¹²

⁷ Chapter 6:187. This finding is supported by the high average CO₂ emissions of the new vehicles acquired by business (198 g/km) and government (210 g/km), which exceeded the national average of carbon emissions (192 g/km) and the lower average of emissions for private buyers (186 g/km) in 2013.

⁸ Chapter 6:188.

⁹ Chapter 6:189.

¹⁰ Chapter 6:207.

¹¹ Zia Wadud, 'New Vehicle Fuel Economy in the UK: Impact of the Recession and Recent Policies' (2014) 74 *Energy Policy*.

¹² Stephen Potter and Abukari Atchulo 2013, 'A Review of Ten Years of CO₂-Based Company Car Taxation: Impact and Potential' *Open Research Online* <<http://oro.open.ac.uk/id/eprint/35517>> (accessed 13 November 2014) 1–12, 6.

The reform adopted the ‘polluter-pays principle’, where the tax liability is linked to the CO₂ emissions of the new vehicle chosen—the lower the vehicle’s carbon emissions, the lower the tax liability.¹³ Additional discounts and surcharges were applied to influence the employee or employer to choose the lowest emitting vehicle, by either increasing or decreasing the tax rate depending on the type of fuel used.¹⁴ The policy design of the instrument is flexible, given CO₂ tax rates and the vehicle-emission bands can be revised each year to stimulate improvements in vehicles’ fuel efficiency.¹⁵ In addition, the instrument is transparent to taxpayers, clearly demonstrating the tax that will be levied on each CO₂ emission band.¹⁶ This instrument is also emerging as the principal economic instrument in the UK to diffuse alternative-fuel vehicles effectively (e.g., plug-in hybrids and extended electric vehicles) through reductions in the company-car tax rates, as well as through generous tax incentives for employees, firms and leasing companies.¹⁷

The key findings indicate that when reforming the FBT system, behavioural change to lower emission vehicles will depend on several factors:¹⁸ the policy design; whether the level of tax provides a strong signal; whether the tax is differentiated on the basis of the vehicle’s CO₂ emissions; the rate of differentiation between the lower carbon and higher carbon vehicles; and the extent to which the vehicle’s running expenses will be paid or reimbursed by the employer to determine the cost of any travel made by the employee.¹⁹

7.2.3 Adapt Key Findings: Fringe Benefits Tax Based on CO₂ Emissions

This research applied the lessons learnt from the case study to the Australian FBT system by recalculating the taxable value of the car fringe benefit under the statutory

¹³ Chapter 6:207.

¹⁴ Chapter 6:208.

¹⁵ Potter and Atchulo, above n 12, 4.

¹⁶ Chapter 6:207.

¹⁷ Alexandros Dimitropoulos et al, *Welfare Effects of Distortionary Tax Incentives under Preference Heterogeneity: An Application to Employer-provided Electric Cars* (Tinbergen Institute, 2014) 1–35, 2.

¹⁸ Chapter 6:205.

¹⁹ Y Shiftan, G Albert and T Keinan, ‘The Impact of Company-car Taxation Policy on Travel Behaviour’ (2012) 19(1) *Transport Policy* 139–146. The running costs of the vehicle, such as fuel, insurance, maintenance, parking fees and tolls, are a tax-deductible expense for the employer and non-taxable income for the employee. That is, this provides another opportunity to increase employee income at a low cost. It also means that the cost of any trip by an employee is zero.

formula method by adopting the former four-tiered statutory fraction rates that applied before 10 May 2011,²⁰ and linking the fractions to vehicle carbon emissions.

The effect on the taxable value of higher carbon vehicles was significant. The statutory fractions (pre May 2011) increased from seven per cent for high kilometres travelled (>40,000 km) to the statutory fraction of 26 per cent based on the new vehicle's CO₂ emissions of 240 g/km. However, the UK company-car tax regime provides a stronger price signal of 35 per cent for a higher carbon vehicle.²¹ Undoubtedly, employers and employees will consider the high tax burden of choosing higher carbon vehicles; thus, removing the disincentive to acquire lower carbon vehicles.²²

7.2.4 Carbon-differentiated Vehicle Taxes

The key findings to the first research question demonstrate that the reform of vehicle taxes based on CO₂ emissions constitutes a 'powerful instrument' that has assisted the Member States of the EU to achieve an average carbon emission from new passenger cars of 127 g/km by 2013, which is below the 2015 target of 130 g/km. The main objective of this economic instrument is to send a strong price signal to influence consumers' car-purchasing decisions to lower carbon vehicles.

7.2.5 Key Findings: Carbon-differentiated Vehicle Taxes

The key findings highlight the growing body of literature and empirical support for the reform of vehicle taxes differentiated on the basis of CO₂ emissions. Such reform should provide a strong price signal to influence the type of vehicle being purchased,²³ and to discourage the acquisition of higher carbon vehicles. The literature is divided about whether vehicle taxes are more effective in influencing demand for lower emission vehicles at the time of acquisition—commonly known as 'vehicle-purchase

²⁰ The Australian government replaced the four-tiered statutory fractions with a single rate of 20 per cent for new vehicle contracts entered into after 7.30 pm (AEST) 10 May 2011.

²¹ Chapter 6:208.

²² Chapter 6:213.

²³ Chapter 4:109, referring to Christian Brand, Jillian Anable and Martino Tran, 'Accelerating the Transformation to a Low Carbon Passenger Transport System: The Role of Car Purchase Taxes, Feebates, Road Taxes and Scrappage Incentives in the UK' (2013) 49 *Transportation Research Part A* 132–148, 134. In the EU, there has been a shift in the past 10 years from basing the vehicle taxes on engine power, volume and vehicle mass to basing it on fuel economy and CO₂ emissions.

tax’ in the EU, and ‘stamp duty’ in Australia—or during the time of ownership (i.e., paid annually)—known as ‘ownership tax’ in the EU and ‘registration tax’ in Australia.

This thesis found that it is important to target the economic instrument that has the greatest effect.²⁴ According to consumer surveys, purchase price is the most important factor when choosing a new vehicle.²⁵ Literature supports reforming vehicle purchase price as the instrument to encourage the uptake of alternative-fuel vehicles because ownership taxes/registration taxes can have a limited effect on the purchasing decision, as these are annual or monthly charges, and consumers pay more attention to the up-front purchase price at the time of acquisition, rather than on annual or monthly charges.²⁶ However, a comparative study of the EU Member States found reforming both vehicle taxes has had the greatest effect on reducing average CO₂ emissions from new passenger vehicles.²⁷

The key findings of this thesis demonstrate that both types of vehicle taxes have the ability to reduce CO₂ emissions, providing certain factors are considered when reforming the policy design, for example:

- the largest amount of CO₂ reductions occur when existing tax systems were replaced by purely CO₂-differentiated systems;
- simple increases of taxes to an existing tax base provide only very small amount of CO₂ reductions;
- the provision of strong tax differentials between the highest and lowest CO₂ emitting vehicles is of great importance.²⁸

Moreover, the key findings emphasise the importance of good policy design.²⁹ That is, the policy design of the vehicle tax needs to be transparent by differentiating the tax on the basis of CO₂ emission bands to promote awareness of what is (and what is not)

²⁴ Chapter 4:92.

²⁵ Australian Government, Australian Bureau of Statistics, *4102.0 Australian Social Trends, July 2013* <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features40July+2013#use>> (accessed 12 November 2014).

²⁶ V Gass, J Schmidt and E Schmid, ‘Analysis of Alternative Policy Instruments to Promote Electric Vehicles in Austria’ (2014) 61 *Renewable Energy* 96–101.

²⁷ Chapter 4:100.

²⁸ Chapter 4:100.

²⁹ Chapter 4:100.

taxable. Consumers must also be made aware of how much will be taxed depending on their choice of new vehicle and its level of CO₂ emissions. The policy design must also be ‘flexible’, allowing CO₂ emission bands and tax rates to be easily altered, amended or corrected at any given point of time.³⁰ Further, the design must be equitable and efficient if the purchasing trends of all new-car buyers are to be influenced.

7.2.6 Lesson Learnt: Carbon-differentiated Vehicle Taxes

A comparative analysis of the reformed vehicle taxes in the Member States of the EU indicate that the instrument has been effective in influencing the car-purchasing trends towards lower emission vehicles that reduce the average CO₂ emission intensity from new passenger vehicles.

Vehicle taxes vary between Member States in the EU, making it difficult to compare the various models. Such models include the differentiated CO₂ emission taxes, and the bonus/malus or feebate schemes that provide a reward for the acquisition of fuel-efficient vehicles and a penalty in the acquisition of high-emission vehicles.³¹ Bonus/malus and feebate schemes provide special tax incentives and may be more politically and publically acceptable in encouraging consumers’ purchasing decisions to lower carbon vehicles.³²

In the case study of Ireland, it was found that the country had to address the growing preference for SUVs and the declining preference for smaller low-emission vehicles.³³ The Irish government changed the basis of vehicle taxation from engine size to differentiated CO₂ emissions per kilometre.³⁴ The price signal was strong, and the vehicle taxes were transparent to consumers, as they were linked to specific bands of CO₂ emissions, which could be upgraded at any time in the future.³⁵ The reform led to significant changes in car-purchasing patterns, and the response to the strong price

³⁰ Chapter 5:144.

³¹ Chapter 4:99.

³² Gass, Schmidt and Schmid, above n 25, 96–101. Vehicles above a certain threshold of CO₂ emissions have to pay a malus and vehicles under the threshold receive a bonus.

³³ Chapter 4:101.

³⁴ Chapter 4:102.

³⁵ Chapter 4:102.

signal (at the time of purchase) was greater than expected.³⁶ Within four years of the reform, the weighted average CO₂ emissions of new cars had reduced significantly by 22.7 per cent.³⁷ The vehicle-purchase tax based on CO₂ emissions was considered a ‘powerful instrument’ that could ‘drive consumer demand towards fuel efficient cars’.³⁸

In contrast, the case study of the ACT’s³⁹ reform of the vehicle-purchase tax/stamp duty, known as the GVDS was found to be ineffective in encouraging behavioural change to low-emission vehicles. The policy design did not constitute a complete redesign of the existing fiscal tax, the reform of the vehicle-purchase tax/duty was not based on CO₂ emissions but on the new vehicles’ ‘green vehicle ratings’ provided in the Commonwealth’s GVG, which was outdated and misleading.⁴⁰ The ‘green vehicle ratings’ were not transparent to consumers because they were not linked to vehicles’ CO₂ emissions. Neither were the green vehicle ratings flexible to policy makers because any amendments to the ratings could only be made by the Commonwealth Government. In addition, the price signal was not strong, with only a one per cent increase in duty for higher carbon vehicles.

7.2.7 Adapt to Australia: Vehicle-purchase Tax Based on CO₂ Emissions

Australian policy makers can examine the various models of reformed vehicle taxes available (e.g., differentiated CO₂ emission taxes, feebates or bonus/malus schemes) and determine which instrument would be most publically and politically acceptable in the Australian context. The key findings of this research recommend the adoption of Ireland’s model of vehicle-purchase tax in preference to the ineffectual GVDS adopted by the ACT government.⁴¹ The tax design could adopt CO₂ emission bands differentiated on the basis of carbon emissions, and a strong price signal, so that taxes for energy effective vehicles are lower than taxes for cars with poor energy efficiency.⁴²

³⁶ Chapter 4:105.

³⁷ Chapter 4:105.

³⁸ Chapter 4:98.

³⁹ Chapter 5:133. The ACT Government is the first and only jurisdiction in Australia to reform the vehicle-purchase tax/stamp duty, which it did on 3 September 2008.

⁴⁰ Chapter 5:139.

⁴¹ Chapter 5:139.

⁴² Chapter 5:174.

To reduce road-transport emissions effectively, all levels of state and territory governments would need to reform their existing vehicle-purchase tax/stamp duty. The COAG would need to develop (with all state and territory governments) a uniform model of CO₂-based vehicle taxes or alternative vehicle-tax models. Further, the initial reform of vehicle taxes may need to be limited to vehicle-purchase tax/stamp duty because differentiating the ownership tax/annual registration fee on the basis of CO₂ emissions is regressive and may not receive public acceptance. This is because it is generally recognised that lower income earners drive higher carbon vehicles and are not in a financial position to upgrade their vehicles.

7.2.8 Key Findings: Tradable Market Permits

The key findings highlight the difficulty for any government to introduce a market based cap-and-trade system of emission trading. The Rudd government proposed to introduce an emission trading system, known as a Carbon Pollution Reduction Scheme (CPRS), which was to commence on 1 July 2010, but failed to receive bipartisan support and was shelved by the government.

The CPRS was to have the broadest coverage and apply to the transport sector, because the Australian Government said this sector is “.... the second fastest growing category of emissions and excluding these emissions from the Scheme for an extended period will increase the costs of meeting Australia’s climate change objectives of other sectors.”⁴³

The key finding as to whether the CPRS would have achieved its objective is uncertain given the market-based instrument was not introduced. However the key findings in the literature on the EU emission trading system (ETS), showed that the transport sector was not introduced in the ETS because high fuel prices had not shifted consumers to fuel efficient vehicles, and increases in fuel prices through an ETS would not have the same impact on all fuel users types.⁴⁴ That is, for lower income earners, carbon pricing has a non-equitable regressive effect and will not encourage a behavioural change for

⁴³ Chapter 2: 35. [paragraph 14.23]

⁴⁴ Chapter 2: 44. [paragraph 14.53]

such fuel-users because they are unable to afford to switch vehicles or where they live and work.

Further the key findings from the modelling by the Garnaut Climate Change Review on 30 April 2007, found that a carbon price of \$20 per tonne of CO₂-e would increase the cost of petrol by around 5 cents a litre and an carbon price of \$200 per tonne of CO₂-e would increase the cost of petrol by around 50 cents a litre.⁴⁵ Moreover future increases in fuel prices could be cushioned by rises in personal income;⁴⁶ falling oil prices; or a volatile carbon price, which may have negligible effect in influencing behavioural change in the uptake of low emitting vehicles. The thesis highlights that this creates uncertainty to buyers who may be loss averse about the future of fuel prices and may undervalue the future fuel economy and fuel savings at the time when choosing to buy a new fuel-efficient vehicle.⁴⁷

The key findings does not recommend the inclusion of tradable market permits as an effective economic instrument in encouraging a transition to low emission road vehicles.

7.3 Second Research Question

This thesis highlights that reducing road-transport emissions cannot be achieved with a single economic instrument. A more comprehensive approach is required to determine whether the economic instruments identified in research question one require integration with complementary instruments to obtain the optimal goal of encouraging a behavioural change in the uptake of lower emission vehicles to deliver emission targets and reduce road-transport emissions.

⁴⁵ Chapter 2: 42. [paragraph14.45]

⁴⁶ Chapter 2: 44. [paragraph14.49]

⁴⁷ Chapter 2: 44 [paragraph 14.50]

7.3.1 Key Findings

The beneficial effects of the economic instruments identified through research question one are by no means certain.⁴⁸ The economic instruments must be combined and integrated with complementary regulatory instruments to ensure sound policy design, and ensure that price signals are set at the right level to influence a behavioural change in consumers' purchasing trends. The following are the necessary complementary regulatory instruments:

- regulatory emission standards
- regulatory monitoring and reporting standards
- regulatory monitoring and reporting by buyer type
- regulation on information provided to consumers of new light vehicles' fuel efficiency and CO₂ emissions.

The goal of the above regulatory instruments is to reinforce the effectiveness of the economic instruments with policy makers by ensuring the economic instruments achieve any targets within a given timeframe, and have the desired effect of influencing a behavioural change in all buyers of new vehicles. Moreover, the above regulatory instruments may identify whether there are any distortionary incentives that affect any economic instrument's aim to reduce CO₂ emissions significantly.⁴⁹

7.3.2 Key Findings: Regulatory Emission Standards

Without economic instruments to influence car-purchasing trends to lower emission vehicles, consumers would most likely not choose fuel-efficient vehicles because they are prone to loss aversion and have a low willingness to pay for fuel-economy improvements, which may lead to market failure.⁵⁰

⁴⁸ Maatta, above n 3, 20.

⁴⁹ Maatta, above n 3, 6.

⁵⁰ Kurt Van Dender, 'Energy Policy in Transport and Transport Policy' (2009) 37 *Energy Policy* 37 3854–3862, 3857.

The key findings of this research indicate that some form of state intervention is necessary to address market failure⁵¹ caused by consumer ‘behavioural anomaly’, which is described as irrational.⁵² This behavioural anomaly, known as ‘loss aversion’, can influence consumers’ choice of new vehicle, as they substantially undervalue future vehicle fuel savings, and become reluctant to pay up front for uncertain reduction in fuel expenditure.⁵³ Behavioural anomalies can create uncertainty for manufacturers in deciding whether to increase the supply of low-emission vehicles, as well as reluctance to invest in energy efficiency when consumers are risk averse.⁵⁴

To control for consumer risk aversion, the regulator (the government) can introduce an emission performance standard that is imposed on the sale of all new light vehicles that are manufactured in the country or imported. The regulatory emission standards constitute ‘command and control’ policies that discourage high-carbon fuel-inefficient vehicles from entering the market by imposing a financial penalty on manufacturers and importers who disregard the standard.⁵⁵

The key findings of the research observe that even though regulatory emission standards are directed towards car manufacturers⁵⁶ or importers of new vehicles, such standards constitute a complementary measure to the economic instruments that are required to drive consumer demand towards low-emission cars and support ‘manufacturers to compete on the grounds of environmental performance’.⁵⁷ These regulatory standards will mean that manufacturers and importers are no longer concerned whether consumers will want to buy fuel-efficient vehicles or how competitors will respond to the same problem.⁵⁸ Moreover, the key findings of the research highlight that regulatory emission standards will provide the fleet average standard in CO₂ emissions (per grams of CO₂ per kilometre) as the benchmark for economic instruments (identified in the first

⁵¹ Arthur C Pigou, *The Economics of Welfare* (Macmillan, 4th ed, 1932).

⁵² Chapter 3:58.

⁵³ David L Greene, David H Evans, John Hiestand, ‘Survey Evidence on the Willingness of US Consumers to Pay for Automotive Fuel Economy’ (2013) 62 *Energy Policy*, 1538–1550.

⁵⁴ Chapter 3:58.

⁵⁵ Chapter 3:59.

⁵⁶ Martin Achtnicht, ‘German Car Buyers’ Willingness to Pay to Reduce CO₂ Emissions’ (2012) 113 *Climatic Change* 679–697, 694.

⁵⁷ Commission of the European Communities, *Results of the Review of the Community Strategy to Reduce CO₂ Emissions from Passenger Cars and Light-commercial Vehicles*, Communication from the Commission to the Council and the European Parliament, COM (2007) 1–10, 7.

⁵⁸ Van Dender, above n 50, 3857.

research question) to drive consumers' car-purchasing trends towards lower carbon vehicles.

7.3.3 Lessons Learnt: Regulatory Emission Standards

It was observed in the EU, that the European Parliament and Council had the 'political will' to mandate emission standards for all new passenger vehicles registered in the EU despite strong lobbying from the car industry.⁵⁹ However, Australia's government did not have the same 'political will' and succumbed to the powerful lobby group of the local car industry, which strongly opposed introducing regulatory standards that would discourage the acquisition of higher emission vehicles.⁶⁰ In effect, regulatory emission standards are unlikely to be introduced until after the industry ceases operations at the end of 2017.⁶¹

In Australia, it has been demonstrated that having no regulatory emission standard has meant that economic instruments (e.g., the ACT Government's GVDS) cannot integrate a fleet average standard as a benchmark in assessing the effectiveness of the economic instrument. Nor can this benchmark be applied for determining the 'green vehicle ratings' in the GVG, which are ranked according to the public authorities' assessment of the 'environmental performance' of all new light vehicles being sold in Australia.

7.3.4 Key Findings: Regulate for Monitoring and Reporting of Average Carbon Emissions

The effects of reforming fiscal tax into fiscal environmental tax require regular review and monitoring to ensure the instrument is effective in reducing CO₂ emissions. Such

⁵⁹ Chapter 3:60. European Parliament and Commission, *Regulation (EC) No 443/2009 of the European Parliament and the Council of 23 April 2009 Setting Emission Performance Standards for New Passenger Cars as Part of the Community's Integrated Approach to Reduce CO₂ Emissions from Light-duty Vehicles* [2009]. In 2009, the European Parliament and Council mandated the most ambitious emission standards for all new passenger vehicles registered in the EU of 130 g CO₂/km by 2013 (later extended to 2015), including a long-term target of 95 g CO₂/km by 2020. With additional 10 g CO₂/km to be achieved with complementary measures such as efficient tyres, air-conditioning monitoring and gear-shift indicators.

⁶⁰ Chapter 5:157.

⁶¹ Australian Government, Climate Change Authority, *Light Vehicle Emissions Standards for Australia* (2014) <<http://climatechangeauthority.gov.au/reviews/light-vehicle-emissions-standards-australia>> (accessed 12 November 2014) ch 6, 61.

reforms may require the tax design or price signal to be adjusted or additional complementary measures to be introduced.⁶²

The lesson learnt in the EU is that the introduction of a regulatory instrument requires each Member State to monitor and report their progress in meeting their emission-reductions target, which would be reported to the European Commission for review and correction.⁶³

7.3.5 Lessons Learnt: Regulate for Monitoring and Reporting of Average Carbon Emissions of New Light Vehicles

In Australia, the requirement to monitor and report the average carbon emissions of new light vehicles could apply if all state and territory governments implemented economic instruments to reduce CO₂ emissions and were required to report their progress to COAG.

However, the ACT Government is the only jurisdiction that has reformed a vehicle-purchase tax/stamp duty (GVDS) and may not believe there is a need to introduce a complementary regulatory instrument to monitor and review the performance of the GVDS in reducing CO₂ emissions. However, the ACT Government has only performed one review of the economic instrument (GVDS) (in mid-2011) since it was introduced on 2 September 2008. In 2014, the ACT Government referred to the same review in its discussion paper supporting the economic instrument (GVDS) as an instrument that had ‘influenced a market shift in the new vehicle market’ to vehicles with higher green vehicle ratings.⁶⁴ However, the review was based on the movement of vehicle sales between the green vehicle ratings of the GVG (Stage 2) and not on the actual reduction in average CO₂ emissions of new vehicles acquired in the ACT. This makes it difficult to assess whether there has been any reduction in CO₂ emissions.⁶⁵ The alternative measurement based on the GVG (Stage 2) green vehicle rating proved to be an

⁶² Chapter 5:155.

⁶³ Chapter 5:155.

⁶⁴ Australian Capital Territory Government, Environment and Sustainable Development, *Low Emission Vehicle Strategy*, Discussion Paper (June 2014) 1–19, 9
<http://www.transport.act.gov.au/__data/assets/pdf_file/0006/608433/Low-Emission-Vehicle-Strategy-Discussion-paper_ACCESS.pdf> (accessed 11 November 2014).

⁶⁵ Chapter 5:153.

inaccurate measure of the true performance of the economic instrument, and failed to identify the weaknesses in the policy instrument.

Moreover, the lesson learnt from the ACT case study is that individual policies such as the GVDS are insufficient and may be ineffective in significantly reducing CO₂ emissions when they are not combined with a complementary regulatory instrument to monitor and review the instrument's performance in reducing the CO₂ emissions.⁶⁶

7.3.6 Key Findings: Regulate for Monitoring of Average Carbon Emissions of New Vehicles by Buyer Type

This thesis found no literature on regulating the monitoring of average carbon emissions of new vehicles by buyer type: business, government and private buyers. It is generally assumed that the effect of the economic instruments introduced or reformed to influence a behavioural change should be consistent for all buyer types of new vehicles. That is, the average weighted carbon emissions of new vehicles acquired by buyer types should be examined to determine the effectiveness of the economic instrument between buyer types. In the case study of the ACT Government's fiscal environmental tax (GVDS), the above monitoring of the movement in vehicle sales between the green vehicle ratings did not determine whether the instrument was effective in reducing the average CO₂ emissions of the new vehicles acquired in the ACT.

The information on the new vehicles acquired by buyer type in each state and territory of Australia is limited. However, the data are available for state and territory government buyers. These data demonstrate that the average CO₂ emissions of new vehicles acquired by the ACT government increased in 2013 (197 g/km), compared to 2012 (194 g/km), and were higher than the average national emissions (192 g/km) and for private buyers (186 g/km).⁶⁷ This contradicts the ACT government's report on the success of the GVDS, and indicates that the ACT government cannot lead by example. If the complementary regulatory instrument had been implemented, the ACT government would have found that the policy design and/or the price signal of its

⁶⁶ R Hickman and D Banister, 'Looking over the Horizon: Transport and Reduced CO₂ Emissions in the UK by 2030' (2007) 14(5) *Transport Policy* 277–387.

⁶⁷ Chapter 5:158.

vehicle-purchase tax/stamp duty (GVDS) needed to be reformed because the existing policy instrument was ineffective in influencing behavioural change in consumers.

Further, monitoring instrument by buyer type found that the average emissions of new vehicles acquired by all levels of government (197 g/km to 223 g/km) exceeded the national average of CO₂ emissions (192 g/km), the business buyers' average (198 g/km) and the private buyers' average (186 g/km).⁶⁸ The high average emissions for government buyers indicate that most vehicles bought by this group have high carbon emissions. The key findings of the research indicate that most government buyers adopted the 'buy Australian' policy when choosing a new vehicle, which explained the high average emissions.⁶⁹ The lesson learnt from reviewing average emissions by buyer types is the undeniable influence of the local car industry in exercising policy capture on political decisions that can adversely affect their economic interests.⁷⁰

Further key findings highlight the special treatment afforded to the car-industry lobby group, which is able to pressure the Australian Government into providing benefits for the car industry.⁷¹ For example, this thesis found that the Australian Government had introduced the Fleet Vehicle Selection Policy⁷² to support the local car industry. This policy requires all Commonwealth agencies to select passenger and light commercial vehicles manufactured by the local car industry, unless it can be demonstrated that no suitable vehicle is available.⁷³ The policy excludes 'environmental considerations such as fuel efficiency' for choosing a vehicle.⁷⁴ This thesis found that state governments had adopted the same policy. However, this policy will no longer apply when the automotive industry ceases its operations in Australia at the end of 2017.

The key findings on monitoring the average carbon emissions by buyer type revealed that no economic instrument will be effective in reducing road-transport emissions if

⁶⁸ Chapter 5:158.

⁶⁹ Chapter 5:159.

⁷⁰ Chapter 5:161.

⁷¹ GJ Stigler, 'The Theory of Economic Regulation' (1971) 2(1) *Bell Journal of Economic and Management Science* 3–21.

⁷² Chapter 5 indicated that the total number of Australian-made vehicles purchased by all governments together is less than 50,000 annually, which is a small amount given that over one million new vehicles are acquired each year.

⁷³ Chapter 5:159.

⁷⁴ Australian Government, Department of Finance, *Fleet Vehicle Selection Policy* (as at April 2012) <<http://www.finance.gov.au/vehicle-leasing-and-fleet-management/fleet-guidance-and-related-material.html>> (accessed 25 August 2014).

lobby groups are allowed to capture government policy. The key findings also highlight that such economic instruments should not be introduced when the effect of the instrument will not be equitable between all buyer types, and the government fails to lead by example by acquiring lower carbon vehicles to reduce road-transport emissions. Further, the Australian Government may be unable to introduce any economic instruments to reduce road-transport emissions until after the cessation of the car industry in 2018, making it challenging to meet the Kyoto Protocol commitment by 2020 due to increasing road-transport emissions.

7.3.7 Lessons Learnt: Regulate for Monitoring of Average Carbon Emissions of New Light Vehicles by Buyer Type

The proposal for the introduction of a regulatory instrument for monitoring the average emissions of new light vehicles by buyer type is for the purpose of assessing whether the economic instrument is effective in reducing yearly average CO₂ emissions for new light vehicles acquired for each buyer type. Any differences in average CO₂ emissions by buyer type should be examined to determine the factors that could be affecting the effectiveness of the economic instrument. Such factors include:

- whether the economic instrument only applies to certain buyer types (reform of the FBT system)
- whether perverse subsidies apply to select buyer types
- whether policy capture by buyer type has influenced the type of vehicles being acquired by select buyer types.

Once the reason has been identified, possible policy options may need to be considered to restore equity between buyer types.

7.3.8 Key Findings: Regulate Information on New Light Vehicles' Fuel Efficiency and CO₂ Emissions

Rubenstein states that a key assumption of the rational economic model is that consumers, as decision makers, should have a clear picture of the choices they have,

should be aware of any alternatives, and have the necessary skills to discover the optimal course of action.⁷⁵

The key findings of this research indicate that consumers may not always possess these requirements. This is significant when information could affect choices people make when buying a new light vehicle.⁷⁶ The literature review found several factors that are relevant to this issue: imperfect information for fuel economy is a form of market failure⁷⁷; there maybe scepticism about the accuracy and bias of official government estimates;⁷⁸ a lack of information and the complexity of available choices is a barrier to behavioural change.⁷⁹

The key findings of this research demonstrate that the information available on the Australian Government's official website (GVG [Stage 2]) fails to rank new light vehicles according to their CO₂ emissions. This thesis found a bias against diesel vehicles in favour of petrol-fuelled vehicles and certain locally manufactured high-carbon vehicles. Consequently, the information provided to consumers in the GVG (Stage 2) can be considered misleading, distorted, and outdated.⁸⁰

7.3.9 Lessons Learnt: Regulate Information on New Light Vehicles' Fuel Efficiency and CO₂ emissions

The lesson learnt in the EU is that the regulation of consumer information raises consumer awareness⁸¹ (i.e., on labels of new vehicles and in government websites) on the fuel efficiency and CO₂ emissions of new passenger vehicles. Such information assists consumers in making an informed choice about buying fuel-efficient low-

⁷⁵ A Rubenstein, *Modeling Bounded Rationality* (MIP Press, 1998).

⁷⁶ Georgina Santos et al, 'Part I: Externalities and Economic Policies in Road Transport' (2010) 28 *Research in Transportation Economics* 2–45.

⁷⁷ David L Greene, John German and Mark A Delucchi, *Fuel Economy: The Case for Market Failure* (Springer Science, 2009) ch 1, 181–205, 183. For example, if the buyer of a car does not consider the consequences of their oil consumption or its effect on climate change, the car they select will tend to consume more oil and produce more CO₂ emissions.

⁷⁸ David L Greene, 'Uncertainty, Loss Aversion, and Markets for Energy Efficiency', (2011) 33 *Energy Economics* 608–616, 611.

⁷⁹ Nicholas Stern, *Stern Review: The Economics of Climate Change: Report to the Prime Minister and Chancellor*, London: HM Treasury (2006) <http://hm-treasury.gov.uk/sternreview_index.htm>.

⁸⁰ Chapter 5:141.

⁸¹ European Parliament and Council, *Directive 1999/94/EC Relating to the Availability of Consumer Information on Fuel Economy and CO₂ Emissions in Respect of the Marketing of New Passenger Cars*.

emission vehicles.⁸² This information regulation influences the information that is made available, and how it is to be labelled, displayed, promoted, presented and reviewed.⁸³

7.4 Limitations of Research

This thesis focused on economic instruments that can influence the car-purchasing trends of consumers towards choosing lower carbon vehicles. The research was limited to the fiscal taxes identified in the thesis (i.e., the car-benefit FBT system and vehicle taxes). The research did not extend to other fiscal instruments that may have proven equally effective.

The publications were based on the economic instruments that had been proposed and/or adopted at the time of the research, and have been subject to change since the articles were published. The Australian Government's current proposed policy instrument, the Direct Action Plan, will not apply to new light vehicles. The Australian Government concedes that the direct-funding approach may not be the most 'efficient means of increasing the uptake of more fuel efficient vehicles' because large incentives may do little to change consumer preference. The government has stated other measures may be more appropriate. However, at the time of completing this thesis, no alternative policy instruments have been proposed.⁸⁴

The research was unable to confirm the most recent number of business and government buyers' fleet vehicles under the FBT system. It is expected that the number of these fleet vehicles will be approximately the same as the number reported by the Senate Committee for Rural and Regional Affairs and Transport reported in 2009.⁸⁵

⁸² Ibid, art 1.

⁸³ AEA, *Report on the Implementation of Directive 1999/94/EC Relating to the Availability of Consumer Information on Fuel Economy and CO₂ Emissions in Respect of the Marketing of New Passenger Cars* (2011) <http://ec.europa.eu/clima/policies/transport/vehicles/labelling/docs/final_report_2012_en.pdf> (accessed 16 October 2014). EU Member States could provide additional information to raise consumer awareness through implementing the following: promoting comparative information on new light vehicles' fuel efficiency and the effect on CO₂ emissions by categorisation vehicles according to 'best in class' and 'worst in class', showing similar cars with lower or higher emissions; including vehicle costs on labels or on websites that project annual fuel costs, vehicle-purchase taxes (stamp study) and annual registration fees differentiated on the basis of CO₂ emissions, as well as the electricity consumption for future uptake of electric vehicles. Such information on running costs, fuel economy and fuel consumption would assist consumers to make an informed decision at the point of sale.

⁸⁴ Chapter 5:129.

⁸⁵ Chapter 6:188.

The weighted average CO₂ emissions from new-vehicle sales by buyer types could not be extended to business buyers and private buyers in all states and territories of Australia because such information was not made available by the National Transport Commission.

7.5 Contributions of Research

The contributions of this research are important given there are no economic instruments, regulatory emission standards or targets to reduce road-transport emissions in Australia. This thesis identified key economic instruments that are politically and publically acceptable and effective in influencing the car-purchasing trends of consumers towards lower carbon vehicles. In addition, no support was found for the statement that ‘targeting fuel efficiency as a means of achieving reduced emission is a blunt instrument’.⁸⁶ On the contrary, the research found that reforming existing fiscal taxes into fiscal environmental taxes can be a ‘powerful instrument’ in influencing behavioural change in consumers.⁸⁷

The thesis highlighted the importance of policy choice when selecting an economic instrument that targets behavioural change to influence car-purchasing trends. For example, reforming the FBT system can affect the car-purchasing trends of approximately 40 to 50 per cent of new-vehicle sales each year. This means that more than one economic instrument will be required to influence a behavioural change on the sale of all new light vehicles. Combining the reformed FBT system and the vehicle-purchase tax will encourage a behavioural change in all buyer types. However, the research also highlighted that it is superfluous to introduce economic instruments, such as reforming vehicle taxes, when it is unlikely to have any effect on business and government buyers’ choice of higher carbon vehicles without reforming the FBT system.

⁸⁶ Australian Government, Australian Treasury, *Australia’s Future Tax System: Report to the Treasurer: December 2009* (2010) 363

<http://taxreview.treasury.gov.au/content/FinalReport.aspx?doc=html/publications/papers/Final_Report_Part_1/preface.htm> (accessed 14 November 2014).

⁸⁷ Chapter 4:98.

The thesis emphasised that the success of economic instruments in influencing a behavioural change in consumers' choice of new vehicle will depend on good policy design, a strong price signal based on CO₂ emissions rather than on any alternative measure, as well as the provision of accurate information to consumers. Failure to meet such criteria may lead to a policy that is ineffective in reducing the negative externalities of road transport.

The research findings build on the literature that individual economic policies are insufficient to reduce CO₂ emissions significantly,⁸⁸ and need to be integrated and combined with complementary regulatory instruments to ensure their efficiency and effectiveness. Such complementary regulatory instruments include regulatory emission standards, regulatory monitoring and reporting of the progress in reducing fleet average CO₂ emissions, and regulation for the provision of reliable information on new light vehicles' fuel efficiency and CO₂ emissions.

In the absence of regulatory emission standards, and not being able to measure the actual reduction in carbon emissions, a new contribution to the research was introduced by monitoring the performance of economic instruments by buyer types at the national, state and territory levels. For example, examining the average emissions in the car-purchasing trends of the government buyers (ACT Government) revealed that the ACT's economic instrument (GVDS) was ineffective in reducing CO₂ emissions despite the government's claim that the GVDS had 'influenced a market shift in the new vehicle market'.⁸⁹

A comprehensive assessment will be required if there are any significant differences in the average weighted CO₂ emissions between the car-purchasing trends of different buyer types in each state and territory. This assessment will need to identify the reasons for disparity and possible policy options for restoring equity. This new policy instrument is designed to monitor whether the effect of the economic instrument is equitable among all buyer types, (in each state and territory) and to ensure that interest

⁸⁸ Hickman and Banister, above n 66, 277–387.

⁸⁹ Australian Capital Territory Government, Environment and Sustainable Development, *Low Emission Vehicle Strategy*, Discussion Paper (June 2014) 1–19, 9
<http://www.transport.act.gov.au/_data/assets/pdf_file/0006/608433/Low-Emission-Vehicle-Strategy-Discussion-paper_ACCESS.pdf> (accessed 11 November 2014).

groups have not captured the policy instrument. However, the research findings provided evidence of policy capture in Australia and indicates that (most likely) no economic instrument (based on CO₂ emissions) will be introduced until 2018, after the local car industry has ceased its operations.

The research has contributed to the literature and adapted the lessons learnt in the Australian context, in the areas of policy choice; policy design; the importance of complementary regulatory instruments in setting targets; monitoring the performance of the economic instruments; ensuring consumers are provided with accurate information; and identifying the barriers to introducing economic instruments to reduce road-transport emissions.

7.6 Suggestions for Future Research

A suggestion for future research is to extend the research to other fiscal tax instruments and consider whether these instruments could be reformed into a fiscal environmental tax that will encourage a change in car-purchasing trends of new vehicles, and reduce the negative externalities of road transport.

The research results can be assessed against the average CO₂ emissions of new-vehicle sales by buyer type to assess whether all buyer types will be influenced if the fiscal measure is reformed on the basis of CO₂ emissions.

It is recommended that the car purchasing trends in Australia be identified, and for the National Transport Commission to provide data for the average carbon emissions from new light vehicles by buyer type for each state and territory.

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