Will cars go green under the ACT's reformed vehicle purchase tax?

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Abstract

This article revisits the Australian Tax Forum *research article, "Will cars go green in the ACT?" (2015). The Australian Capital Territory was the first jurisdiction in Australia to reform its vehicle purchase tax/duty on the basis of new vehicles' "environmental performance", in what was known as the Green Vehicle Duty Scheme (GVDS). The analysis of that tax instrument in 2015 concluded that it was not environmentally effective in influencing car purchasing trends towards lower CO_2–emitting vehicles. A later reform of the GVDS, reflecting the federal government's "Green Vehicle Guide", replaces the GVDS with a new instrument, the Vehicle Emission Reduction Scheme (VERS), which commenced on 29 June 2015.[1] This article considers whether the VERS instrument might usefully be adopted by other state and territory governments to improve fuel efficiency and reduce CO_2 emission from light vehicles. It concludes that the tax design and price signal reforms set out in the VERS do not promote environmental performance better than its predecessor GVDS.*

1 The *Duties Act 1999* (ACT) (the Act). Motor vehicle registration duty is imposed under s 208 of the Act.

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1. Introduction

This article revisits a 2015 research paper[2] which reviewed the ACT's vehicle purchase tax/duty, known as the Green Vehicle Duty Scheme (GVDS). The scheme was designed to reduce carbon dioxide (CO_2) emissions in the transport sector by encouraging consumers to choose low emission vehicles, providing an incentive to buy low-emitting vehicles and a disincentive to buy vehicles with poor environmental performance.[3] The ACT Government's "Transport for Canberra" policy stated that reducing emissions from vehicle fleets had the potential to be "a cost-effective way to help meet ACT Government's ambitious target of reducing emissions by 40% by 2020".[4] It promoted the GVDS by claiming that the "ACT remains the only jurisdiction to have a motor vehicle stamp duty based on environmental performance". Further, "the scheme is revenue neutral, with the best environmentally performing vehicles attracting a discount (or paying no duty) and the worst performing vehicles paying higher duty rates".[5]

In June 2014, the ACT Government released a "Low Emission Vehicle Strategy" (LEVS) discussion paper outlining the challenges in reducing vehicle emissions and exploring ways to encourage a "faster transition to lower emission vehicle fleet".[6] Public consultation and submissions on the proposed strategies, options and actions was encouraged. For the strategy "to promote the purchase and use of low emission vehicles", the ACT Government considered the option of revising the GVDS to "provide greater incentives to encourage the purchase of low emission vehicles".[7] The final LEVS was to be released once the ACT Government had considered the feedback from public submissions.[8] The government acknowledged that the strategy was still being "developed" and was expected to be released in 2015–16,[9] well after public submissions closed on 19 August 2014.

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2 A Mortimore (2015). "Will cars go green in the ACT?" 30(1) *Australian Tax Forum* 205–254 (referred to as "Mortimore 2015" below).

3 Australian Capital Territory (ACT) Government, (2013) "Green Vehicle Duty Scheme" at http://www.rego.act.gov.au/assets/PDFs/Green_Vehicle_A5_brochure.pdf. Accessed 16 May 2016.

4 ACT Government (2012) "2012 to 2031 transport for Canberra: transport for a sustainable city" 1–70, 49.

5 Ibid p 49.

6 ACT Government (2014), "Low Emission Vehicle Strategy discussion paper", 1–19:11, (hereafter LEVS 2014) at https://www.transport.act.gov.au/policy_and_projects/transport_planning_studies/Low-Emission-Vehicle-Strategy. Accessed 31 March 2016.

7 Ibid.

8 Ibid.

9 ACT Government (2015), "2015 Review of AP2, A new climate change strategy and action plan for the Australian Capital Territory", 1–53, 44, at http://www.environment.act.gov.au/__data/assets/pdf_file/0004/254947/AP2_Sept12_PRINT_NO_CROPS_SML.pdf. Accessed 6 May 2016 (hereafter ACT AP2 Review (2015)).

However, before the release of the final LEVS, in October 2015, the federal government reformed its "Green Vehicle Guide",[10] replacing its star rating scheme with a system that uses CO_2 emissions and fuel efficiency as the principal basis for ranking vehicles.[11] The result was that GVG star ratings no longer applied in the tax design of the ACT's GVDS. Mortimore 2015 found that the GVDS tax design was "inflexible" because it relied on the federal government's "Green Vehicle Guide" (stage 2) star rating scheme and new light vehicles' "environmental performance score" to determine the applicable vehicle tax/duty payable. Further, the tax design and price signal of the GVDS failed to meet the objectives of the ACT Government: to significantly reduce CO_2 emissions.[12] Mortimore 2015 recommended that the tax design of the GVDS adopt CO_2 emission bands and a stronger price signal.[13]

The GVDS was reformed and replaced (before the reform of the GVG) by an instrument called the Vehicle Emission Reduction Scheme (VERS), which commenced on 29 June 2015. This article considers those changes to determine whether the issues raised in Mortimore's 2015 assessment have been addressed in the VERS. The question is whether the VERS is now an environmentally effective instrument that meets the ACT's objective of encouraging the purchase of lower CO_2 emitting vehicles, and might stand as a model for other jurisdictions, since vehicle purchase duties registration is a state, rather than Commonwealth, responsibility.

Furthermore, the Australian Government established a Ministerial Forum to consider measures that reduce carbon dioxide (CO_2) emissions from the road transport sector.[14] The Australian Government released a "Vehicle emission discussion paper" (VE) in February 2016, seeking views on measures that can achieve a greenhouse gas (GHG) emission target of 26–28% of 2005 levels by 2030 and the National Energy Productivity Plan (NEPP) objective of a 40% improvement in energy productivity by 2030.[15] Reform of taxation measures, such as the state and territory governments stamp duty charges (vehicle purchase taxes) on new motor vehicles are being examined to assess their potential in delivering low-cost emission reduction by encouraging the purchase and supply of more fuel-efficient vehicles.[16]

The remainder of this article reviews the ACT Government's ambitious reduction targets, as set out in its "Canberra Transport" policy to encourage the purchase of

10 Australian Government, "Green Vehicle Guide", available at www.greenvehicleguide.gov.au/.

11 Australian Government, Department of Infrastructure and Regional Development, (2016) "Vehicles and the environment", available at https://infrastructure.gov.au/roads/environment/. Accessed 11 March 2016.

12 Ibid.

13 Mortimore (2015) above n 2, p 253.

14 Australian Government (2015), "Vehicle emissions discussion paper" p 1–43: p 2.

15 Ibid.

16 Australian Government (2015), "National Energy Productivity Plan", p 1–22, 12; Australian Goernment (2015) "Vehicle emissions discussion paper" above n 14, p 23.

more fuel-efficient vehicles and reducing vehicle emissions. It then considers whether the findings in the 2015 research paper concerning the tax design and price signal of the GVDS have been addressed in the VERS, and whether that instrument is environmentally effective in meeting the Australian Government's NEPP and the ACT Government's LEVS in promoting the purchase of low emission vehicles by influencing vehicle purchasing decisions.[17]

2. ACT Government's transport climate policy

The transport sector is a major contributor to greenhouse gas (GHG) emissions in the ACT.[18] It is the second-largest source of GHG emissions, increasing from 23% of ACT's emissions in 2011[19], to 26% in the 2013–14 financial year.[20]

The GVDS (introduced on 3 September 2008) was an important climate policy instrument to enable the ACT Government to meet its ambitious legislated emission reduction targets of 40% below 1990 levels by 2020 and zero net emissions by 2060 under the *Climate Change and Greenhouse Gas Reduction Act 2010* (ACT).[21] To help achieve these targets, the ACT Government updated its climate change strategy, releasing a report titled "2012 A new climate change strategy and action plan for the Australian Capital Territory" (known as the 2012 AP2 report), which detailed 18 actions, to "drive rapid emission reduction" and progess the strategy to its next review point in 2015.[22] In reducing transport sector emissions, the ACT Government would be required to implement the Transport for Canberra policy and develop a LEVS, which will build on ACT's "leading Green Vehicle Duty Scheme to encourage the uptake of low emission vehicles, including efficient petrol, electric and hybrid electric vehicles".[23]

The 2012 AP2 report discussed the benefits of "significant emissions and cost savings" associated with the move to fuel-efficient vehicles and of choosing "best in class vehicle."[24] To put this another way, if the average age of a motor vehicle in the ACT remains constant (in the period 2003–11, this age was approximately eight years), then by 2020, approximately 50% of the fleet will have turned over, creating significant

17 Ibid p 18.
18 ACT Government (2014), LEVS, above n 6, p 3
19 Ibid p 4.
20 ACT Government, (2015) AP2 review, above n 9 p 44.
21 ACT Government, (2014), LEVS, above n 6 p 5; ACT AP2 review (2015), above n 9 p 44. The ACT Climate Change Council is proposing to revise the above emission reduction targets and use the same base year as Australia's national targets: 55% reduction by 2025; 60% by 2030; 75% by 2040; and 85% by 2050 (from a baseline of 2005 levels in each case).
22 ACT Government (2012) "AP2: a new climate change strategy and action plan for the Australian Capital Territory", p 1–94.
23 Ibid p 58.
24 Ibid p 59.

opportunities for lower emission choices.[25] Notwithstanding that turnover, the 2012 AP2 report had forecast transport emissions to grow to 2020, as discussed further below.[26]

The first performance report of the GVDS was released for the period "late 2008 until mid-2011" in the 2012 AP2 report indicating only movement in vehicle sales between green vehicle ratings for the period.[27] The reduction in average emissions intensity for new vehicles acquired in this period was not provided, making it difficult to assess the environmental effectiveness of the GVDS. The 2015 research paper stated that, although the GVDS was introduced on 3 September 2008, it was not until 2012 that the ACT Government released the performance report. No review or changes were made to the tax design or price signal of the GVDS and no further performance report was released since June 2011.

The release of the report titled "Transport for Canberra, transport for a sustainable city, 2012–2031" in March 2012 provided a comprehensive policy on how the "Transport for Canberra" policy was to meet the ACT's ambitious emission reduction targets. The policy documented the government's actions and strategy from 2012 to 2031, with mode-shifting and increasing vehicle fleet efficiency as the primary mechanisms in meeting the government's transport emission reduction target. It was proposed that the LEVS would be released by June 2013, and build on the GVDS by evaluating the scheme, "to identify how it could be better encourage the purchase of lower emission vehicles including electric vehicles".[28] However, it was not until 24 June 2014 that the LEVS discussion paper was released for community consultation. Various strategies and options were proposed to encourage the purchase of low emission vehicles to which members of the public were invited to comment by 19 August 2014.[29] The feedback is being considered, and the final LEVS, "still under development",[30] and was expected to be released in 2015–16. Although the final LEVS was not released at the time of the articles publication.

2.1 Environmental effectiveness of the Green Vehicle Duty Scheme

The environmental effectiveness of the former GVDS in reducing road transport emissions is questionable given that in September 2014, the ACT's "Transport for Canberra report card" reported a 29.5% increase in transport emissions between 1990 and 2011, and a 3.5% increase between 2010 and 2011.[31] Since the introduction of

25 Ibid p 59.
26 Ibid p 18.
27 ACT Government, (2012) AP2, above n 22 p 58.
28 ACT Government, (2012) 2012 to 2031 transport for Canberra, above n 4, p 63. Action 26.
29 ACT Government, (2015) AP2 review, above n 9 p 17.
30 Ibid p 17.
31 ACT Government (2014) "Transport for Canberra report card September 2014" 1–24, 14.

the instrument on 3 September 2008, transport sector emissions have continued to increase from 23% of ACT emissions in 2011[32] to 26% in the financial year 2013–14.[33]

In effect, the GVDS has not effectively influenced consumers into choosing low emission vehicles when the ACT recorded an annual average increase of 2.6%, which (compared to other state and territory governments) was the third largest growth (13.1%) in fleet size over the five-year period 2009 to 2014.[34] Consumers in the ACT are reliant on passenger vehicles for transport, shown by the increasing number of passenger vehicles per 1,000 populations: from 576 in 2006[35] to 733 in 2015;[36] and recording the third highest average kilometers travelled of state and territories (13,600 kilometres per vehicle) in the twelve months ended 31 October 2014.[37]

Furthermore, before the release of the ACT Government's final LEVS, the ACT Government released (in November 2015) the review of the 2012 AP2 titled "2015 Review of AP2: A new climate change strategy and action plan for the Australian Capital Territory" (2015 AP2 Review) stating that the LEVS (under action 10) is expected "not to have a material impact on emissions until after 2020" and that transport emissions are "projected to increase by 5 percent and between 2012–13 and 2020".[38] It was stated that the highest emitting sector in 2020 will be transport (54%) and "addressing emissions reduction in this sector will be of high priority as the required emissions reductions solutions are complex and require longer lead times".[39] "Passenger vehicles dominate both in the number of vehicles (83.6%) and direct emissions produced (73.5%) in the ACT, which means that any future LEVS measure should focus on passenger vehicles as a priority."[40]

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32 ACT Government, (2014) above n 6, p 3.

33 ACT Government, (2015) AP2 review, above n 9 p 44. Transport emissions are projected to increase 5% from 1052 kt CO2-e to 1081 kt CO2-e between 2012–13 and 2020.

34 Australian Government, Australian Bureau of Statistics, 2014, "9309.0 – Motor vehicle census, Australia, 31 January 2014". The average annual growth in vehicle fleet size in Australia was 2.6%, with the Northern Territory recording the largest growth of 3.5%, followed by Western Australia of 3.3%. Available at www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/EBFEB56F96B02B1FCA257E8A001FD39D?opendocument, accessed 10 November 2016.

35 Australian Government, Australian Bureau of Statistics, 2013, "4102.0 – Australian social trends, July 2013". Available at www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4102.0Main+Features40July+2013#use, accessed 10 November 2016

36 Australian Government, Australian Bureau of Statistics, 2015, "9309.0 – motor vehicle census, Australia, 31 Jan 2015". Available at www.abs.gov.au/ausstats/abs@.nsf/lookup/9309.0Media%20Release131%20Jan%202015, accessed 10 November 2016.

37 Australian Government, Australian Bureau of Statistics, 2014, "9208.0 – survey of motor vehicle use, Australia, 12 months ended 31 October 2014". Motor vehicles registered in Australia travelled an average 13,800 kilometres per vehicle. Available at www.abs.gov.au/ausstats/abs@.nsf/mf/9208.0, accessed 10 November 2016.

38 ACT Government, (2015) AP2 review, above n 9 p 44.

39 Ibid.

40 ACT Government (2014) above n 6 p 7.

Notwithstanding that reducing vehicle-generated emissions will be critical,[41] the above reports indicate that the former GVDS has not been an effective environmental instrument in reducing CO_2 emissions in the transport sector. This supports the 2015 research findings, which stated:

> "GVDS failure to significantly reduce CO_2 emissions in road transport is not an indication that the environmental tax policy measure is ineffective; rather it is a failure of tax design and price signal adopted by the ACT Government."

Nonetheless, given that the VERS (formerly the GVDS) is one of ACT's main policies directly affecting the uptake of low emission vehicles, then the tax design, price signal must be "environmentally effective" in significantly reducing transport emissions up to and after 2020. The discussion below considers whether the issues raised in the 2015 research paper have been ameliorated by changes in the tax design and price signal of the VERS.

3. Transition of instruments: from the former GVDS to the VERS

The 2014 LEVS discussion paper states the two main policies that can directly affect the uptake of low emission vehicles is the GVDS and a registration discount for electric and gas vehicles.[42] The ACT Government claims that both fiscal instruments are "one of the most effective ways of influencing people's behaviour", by providing greater incentives to encourage the purchase of low emission vehicles.[43] The GVDS was regarded as an "incentive mechanism" that provides a "differential stamp duty for green vehicles" at the time of vehicle sale. The proposed LEVS options included revising the GVDS and Green Vehicle Registration Scheme (fee discount). The public was encouraged to provide additional ideas for consideration, and was presented with the following consultation question on the GVDS (referred to as option 1):[44]

> "Should the ACT Government continue to use concessions to duties to increase purchase rates for new, low emission vehicles?
>
> If you answered yes, how could the Green Vehicle Duty Scheme be modified to make you more likely to buy a low emission vehicle?"

41 ACT Government (2014) "Transport for Canberra report card, September 2014" above n 31, p 14.

42 ACT Government (2014) LEVS, above n 6 p 8.

43 Ibid p 11.

44 Ibid p 17.

However, the transition from GVDS to VERS occurred before the release of the final LEVS, because the federal government reformed the "Green Vehicle Guide" by changing the GVG vehicle ratings from a "star rating" scheme, to a single "CO_2 emission rating" for each new vehicle sold in the market. The 2015 research paper observed, the GVDS tax design was inflexible because it was reliant on the GVG star rating scheme to determine the performance rating of the new vehicles. When the GVG star ratings became unavailable, the instrument could no longer apply, and the GVDS was then replaced with the VERS, as noted in the Introduction. The VERS commenced on 29 June 2015, before the release of the final LEVS.

4. Tax design: comparison of GVDS and VERS models

Policy instrument choice and design can be divided into two levels: the macro-policy and the micro-policy level.[45] The macro-policy level is the legislator's choice of instrument. In this case, at the legislative level, the ACT Governments chose to reform the fiscal tax (new vehicles stamp duty) to constitute a fiscal environmental tax (GVDS). At the micro level of policy, decisions involve choosing the appropriate CO_2 emission bands, the tax rate level to be set, and the vehicles to be exempted from the legislation. At this level, the tax design of the VERS continued to adopt the former GVDS vehicle performance rating of A, B, C, or D, which was based on the star rating system under the GVG (stage 2), and was then reformed to following differentiated CO_2 emission bands, as shown in Table 1.

At the time of introducing the VERS, the ACT Government stated that the territory:[46]

> "… is the only jurisdiction in Australia to have a differential duty scheme for new cars, utes and light commercial vehicles to provide an incentive for the purchase of lower operating emission vehicles and a disincentive against the purchase of vehicles with higher operating costs."

Whether the VERS will meet the ACT Government's ambitious reduction targets will depend on whether the micro-policy level decisions in the tax design achieves environmental effectiveness.[47] Analysis of the micro-level policy issues allows comparisons between different instruments to determine their relative transparency and trustworthiness.[48] In other words, the goal of environmental effectiveness requires analysis according to the micro-policy issues on the tax design of the VERS

45 K. Maatta (2006) "Environmental taxes", *Edward Elgar Handbook of Research on Environmental Taxation,* 1–114, 7.

46 ACT Government (2015), "Building an integrated transport network, reducing emissions", available at www.rego.act.gov.au/__data/assets/pdf_file/0004/744412/Vehicle-Emission-Reduction-A3-A4-29June.pdf. Accessed 1 June 2016.

47 Maatta (2006) above n 45, 8.

48 Ibid p 7.

to determine whether the tax design criteria of transparency, flexibility and neutrality have been met in the reform of the GVDS to a VERS.

Table 1: Tax design: vehicle performance rating in GVDS

Green Vehicle Duty Scheme		Vehicle Emissions Reduction Scheme	
Performance rating – Green Vehicle Guide	**Environmental performance score** (out of 20)*	**Performance rating**	**CO_2 emissions: grams emitted per km****
A – Environmental leading edge models	16+ 5-star rating	A – Environmental leading edge models	0–130
B – Models with environmental performance significantly above average	14+ 4 to 4½ star rating	B – Models with environmental performance significantly above average	131–175
C – Models with average environmental performance	9.5 + 3 star and 3½ star rating	C – Models with average environmental performance	176–220
D – Models with below average environmental performance	Under 9.5 2½ star to 1 star rating	D – Models with below average environmental performance	More than 220

* Score and star ratings provided under the "Green Vehicle Guide" (stage 2).

** CO_2 emissions bands determined by the ACT Government under the Taxation Administration (Amounts Payable-Motor Vehicle Duty) Determination 2015 (No. 1) S139 (Determination of amounts payable under tax laws).

4.1 Tax design criteria: transparency principle

For there to be certainty in influencing consumer's behaviour, the environmental tax instrument must be "transparent" to consumers. That is, the design of the policy instrument should meet the transparency principle, so the tax levied on a product is clear to taxpayers in terms of what is and what is not taxable, and the taxes related to attributes such as CO_2 emission can be monitored and observed.[49]

4.2 GVDS model: transparency of vehicle performance ratings

The 2015 research paper found that the GVDS tax design was not "transparent" to consumers, as shown in Table 1, because the tax/duty was based on "green vehicle

49 Ibid p 43.

ratings" listed in another policy instrument: the federal government's GVG (stage 2).[50] The effectiveness of the GVDS relied on the "green vehicle ratings" accurate assessment of the new vehicles "environmental performance" in reducing CO_2 emissions[51]It was not transparent to consumers that the "performance ratings" of the vehicles fuel efficiency in the former GVG (stage 2) were misleading and biased for petrol-fuelled vehicles and Australian-made vehicles (with high CO_2 emissions) because of "lower pollution ratings".[52] The author recommended that the tax design of the GVDS would be transparent and flexible if the scheme adopted emission bands differentiated on the basis of CO_2 emissions, which "offers certainty to buyers regarding the level of tax applicable for their choice of new light vehicle".[53]

4.3 VERS model: transparency of CO_2 emission bands

In Table 1, the tax design of the VERS satisfies the "transparency principle" with the adoption of CO_2 emission bands where it is clear to taxpayers what is and what is not taxable, and how the tax rate is based on the grams of CO_2 emitted by the vehicle with each kilometer travelled. This tax design is more flexible because it is easy to amend or correct the CO_2 emission bands at any given point in time.[54] Whether the tax design is "environmentally effective" in influencing consumers to choose low emission vehicles and achieve the government's emission reduction targets depends on the level of differentiation and price signal between each CO_2 emission bands.

4.3.1 VERS model: level of differentiation between CO_2 emission bands

The VERS tax design adopts the former GVDS instrument's vehicle performance rating criteria of A, B, C, or D, and replaces the 5-star rating of the former GVG (stage 2) with CO_2 emission bands per kilometer as shown above in Table 1.

The environmental effectiveness of the VERS CO_2 emission bands cannot be assessed against any national regulatory CO_2 emission standards for light vehicles because Australia has no such standards.[55] However, at a micro-policy level, such standards can be compared with a wide range of competing regulatory standards established in policy-making.[56] For instance, the Australian Government defined a "fuel-efficient" car, under the luxury car tax (LCT) regime in 2008, as a car having a fuel consumption

50 Mortimore (2015) above n 2, p 221.
51 Ibid p 222.
52 Ibid p 222.
53 Ibid p 253.
54 W J Baumol and W E Oates (1988). *The theory of environmental policy,* 2nd ed, Cambridge: Cambridge University Press, 192.
55 Vehicle Emissions discussion paper, above, n 14.
56 Maatta (2006) above n 45 p 8.

not exceeding 7 litres/100 kilometres or 162g of CO_2/km[57], which falls within the "B-rated" vehicle category as a having an environmental performance "above average" as shown in 2.

Table 2: VERS CO_2 emission bands

Performance rating	Environmental performance criteria	CO_2 emissions: grams emitted per km **		
		ACT emission bands	2013 ave CO_2 emissions	2015 ave CO_2 emission
A	Environmental leading edge models	0 – 130	127g (EU)	119.6g (EU)
B	Models with environmental performance significantly above average	131 – 175	162g (OECD) 165g (Global) 162g (LCT)	N/a N/a 162g (LCT)
C	Models with average environmental performance	176 – 220	188g (Aus)	184g (Aus)
D	Models with below average environmental performance	More than 220		

Source: FIA Foundation, Global Fuel Economy Initiative, "Fuel economy of the world 2016 time for global action".

That means a consumer may acquire a new vehicle that qualifies as either a "B-rated vehicle" (131g–175g) or a "C-rated vehicle" (176g to 220g), but will not qualify as a "fuel efficient" vehicle under the LCT regime if the CO_2 emissions are above 162g/km.

Moreover, the VERS performance ratings in Table 2 are not harmonised with European Union (EU) and global standards. The EU introduced mandatory CO_2 emission standards for new passenger vehicles in 2009, setting the average CO_2 emissions for all new vehicles sold in the EU at 130g/km by 2015.[58] The EU achieved a lower average CO_2 average of 127g/km in 2013, well before 2015.[59] Most of the new passenger

57 S 6(4) of the *Tax Laws Amendment (Luxury Car Tax) Act 2008* (Cth).

58 International Council on Clean Transportation (2014), "Emission standards for passenger and light commercial vehicles", available at www.theicct.org/sites/default/files/publications/ICCTupdate_EU-95gram_jan2014.pdf. Accessed 7 July 2016

59 Australian Government, National Transport Commission, (2015) "Carbon dioxide emissions intensity for new Australian light vehicles 2014", information paper, April 2015, 1–70, 2.

vehicles sold in the EU would fall within the above "A-rated" vehicles. The OECD's average CO_2 emissions for new passenger light duty vehicles of 161.9 g/km and the global CO_2 average of 165 g/km[60] in 2013 would fall within "B-rated" vehicles, as models with environmental performance "significantly above average".

In the same period, Australia's national average carbon dioxide emission intensity for new light vehicles[61] (188g/km) and for new passenger vehicles (182 g/km) would fall within the VERS "C-rated" emission band as "models with average environmental performance". However, the national average CO_2 emissions was 43% above the average in the EU (127 g/km),[62] 11% above the OECD average (161.9g/km) and 9.3% above the global average (165 g/km) — which means Australia's national CO_2 average for new light vehicles are behind international standards. Moreover, there is no change in 2015, when the nations average CO_2 emissions from light vehicles (184 g/km) and for new passenger vehicles (177 g/km) falls within the "C-rated" emission band and continues to be 43% higher in CO_2 emissions intensity than in the EU (124 g/km).[63]

The variation between national emission performance and international standards is attributable to Australia not adopting economic instruments and regulatory standards to influence consumer choice of vehicles. In the EU, member states are bound by regulatory emission standards, which they combine with economic instruments to change car purchasing behaviour. This is shown in the National Transport Commission case study in Table 3, which compares trends in consumers' choice of new vehicles by emission band in 2013, in the United Kingdom (UK) and Australia.

Table 3: Consumers' choice of vehicle by emission band, UK compared with Australia, 2013

CO_2 band	UK %	Australia %	Difference %
0 – 75 g/km	0.3	0.1	–0.2
76 – 130 g/km	39.5	6.7	–32.8
131 – 200 g/km	52.9	51.4	–1.5
Over 200 g/km	7.3	41.7	34.4

Source: National Transport Commission, *Carbon dioxide emissions from new Australian vehicles 2013,* 39.

60 Global Fuel Economy Initiative (2016), "Fuel economy state of the world 2016, time for global action", 1–72, 30. Accessed 14 March 2016.

61 Australian Government, National Transport Commission (2014), "Carbon dioxide emissions intensity for new Australian light vehicles 2014", information paper, April 2014, 1–70. New light vehicles includes passenger and light commercial vehicles.

62 Ibid p 2.

63 Australian Government, National Transport Commission (2016), "Carbon dioxide emissions intensity for new Australian light vehicles 2015", information paper, March 2016, 1–62, 2.

Table 3 shows that 41.7% of Australian consumers preferred higher CO_2 emitting vehicles (CO_2 emissions over 200g of CO/km) compared with only 7.3% of consumers in the UK, and 39.5% of UK consumers acquired lower CO_2 emitting vehicles (76 – 130g/km) compared with only 6.7% of consumers in Australia.

Consumer trends for high CO_2 emitting vehicles in Australia "continue to rise in popularity with sales of SUVs [sports utility vehicles], large passenger vehicles, and light commercial vehicles accounting for over 50 percent of the new car market".[64] In the same period, sales of fuel-efficient low carbon-emitting vehicles decreased by 10.6%.[65] This upward trend in consumer preference for bigger, heavier and more powerful cars has largely offset any fuel-efficiency gains from technological advances.[66]

The increasing consumer demand for higher-emitting vehicles is impacting on Australia's international ranking in terms of transport energy efficiency; Australia ranked last out of 16 major OECD countries in 2014.[67] Additionally, in 2016, the Global Fuel Economy Initiative (GFEI) reported that the average fuel economy of new vehicles improved by almost 20% in OECD markets, with the exception of Australia, which was the only country not to have fuel economy policies in place.[68] Thus, consumers' purchasing preferences are impacting on the national average of carbon dioxide emissions intensity for new vehicles.

Further, the National Transport Commission has reported that if consumers had purchased new vehicles in 2015, with "best in class emissions", the national average CO_2 emissions intensity would have been reduced to 82 g/km — a 55% reduction.[69] To achieve such a CO_2 emissions reduction requires targeted tax changes to influence car-purchasing trends towards lower CO_2 emitting vehicles.[70]

64 Federal Chamber of Automotive Industries (2014)."Vehicle price and specification comparison", available at www.fcai.com.au/specification/vehicle-price-and-specification-comparison. Accessed 17 September 2014.

65 Australian Government, National Transport Commission, (2015), above n 59 p 26.

66 R Kok (2015), "Six years of CO2-based tax incentives for new passenger cars in the Netherlands: impacts on purchasing behavior trends and CO2 effectiveness", Transportation Research Part A: Policy and Practice 77.

67 American Council for an Energy-Efficient Economy (ACCEE) (nd), Australia, available at http://aceee.org/files/pdf/country/australia.pdf. Accessed 18 January 2016.

68 Global Fuel Economy Initiative (2016), "Fuel economy state of the world 2016, Time for global action", 1–72: 7. Accessed 25 March 2016.

69 Australian Government (2016), National Transport Commission, "Carbon dioxide emissions intensity for new Australian light vehicles 2015" information paper, March 2016, 1–62, 2.

70 Kok (2015), above n 66.

4.3.2 VERS model: fuel-efficient vehicles not transparent to consumers

The "transparency principle" that brings certainty to consumers when deciding whether a vehicle is "fuel efficient" may not be met under the VERS differentiated CO_2 emission bands. It is not transparent to consumers that the vehicle performance ratings for B- and C-rated vehicles may not necessarily indicate fuel efficiency under international and domestic standards (Australia's LCT regime). There needs to be consistency between competing standards because the effects of the standards and environmental taxes are not independent, but linked.[71] In effect, the CO_2 emission bands adopted in the VERS are not "environmentally effective" and are undermining the effectiveness of the tax instrument.

4.4 Price signal of GVDS

The former GVDS did not provide a "strong price signal" that was sufficiently differentiated to be capable of shifting buyer choice to lower CO_2 emitting vehicles,[72] and varied only slightly in comparison with state government price signals.[73] Nor did the former GVDS attach the highest vehicle purchase tax to the high-emitting vehicles.[74] For example, the vehicle purchase tax/duty for the high CO_2 emitting Commodore VF SS (8 cyl, 6.0L) a "D" ranked vehicle, attracted the highest vehicle purchase tax/stamp duty of 4.3% in the ACT, but this was lower than the 6.5% vehicle purchase tax/stamp duty in Western Australia — a rate that was not differentiated on the basis of environmental performance.[75] The GVDS did not adopt strongly differentiated price signals, which was evident when compared to the case study of Ireland's reformed vehicle purchase tax, with both reforms introduced in 2008. Under the GVDS, the price signal ranged from 0% to 6% compared with Ireland's vehicle purchase tax/duty (differentiated on the basis of CO_2 emission bands) of 14% to 36%.[76] Within the first year of reforming the vehicle purchase tax, Ireland found that the reform had "resulted in greater than expected CO_2 emission savings".[77] In contrast, there was only one performance report of the GVDS since the introduction of the measure on 3 September 2008, which was not reported until 2012 (for the period 3 September 2008 to June 2011). Unlike Ireland's report which was based on the annual reduction in average CO_2 emissions of new vehicles sold, the performance report of the GVDS was based on the movement of vehicles sales between the A

71 A Ajanovic, R Haas, and F Wirl (2015) "Reducing CO2 emissions of cars in the EU: analyzing the underlying mechanisms of standards, registration taxes and fuel taxes", *Energy Efficiency* DOI 10.1007/s 12053-015-9397-4.

72 Mortimore (2015), above n 2, p 230.

73 Ibid p 252.

74 Ibid p 252.

75 Ibid p 230.

76 Ibid.

77 Ibid p 234.

to D-rated vehicles for the above period, providing no review or assessment of the GVDS measure as to whether it was an effective measure in providing incentives for the adoption of low emission vehicles than for conventional vehicles, as discussed in section 2.

It was not until the 2014 LEVS discussion paper that the ACT Government asserted that the GVDS for the above period (3 September 2008 to June 2011) "had influenced a market shift in the new vehicle market" on the basis of movement in vehicle sales between A, B, C and D-rated vehicles.[78]

The 2015 research paper found that it was difficult to assess from the movement of vehicles sales for "B" and "C" rated vehicles whether there was an actual shift to fuel-efficient vehicles, because of the wide disparity in emissions for petrol- and diesel-fuelled vehicles, discussed further in section 4.5.1. The fact there was no movement in "D-rated" high CO_2 emitting vehicles supports the argument that the level of tax differentiation for the higher CO_2 emitting vehicles was not a "strong price signal" in discouraging consumers to choose such vehicles.[79] Yet the ACT Government failed to acknowledge this in its review in the 2014 VERS discussion paper and failed to propose a stronger price signal.

4.5 Price signal of VERS

Policy choice and price signal play a crucial role in meeting the objective of reducing road transport emissions.[80] The ineffective up-front price signal in the former GVDS was adopted in the VERS with minor changes to the price signal for "B-rated" vehicles (131 g/km to 175 g/km) reducing the price signal from 2% of dutiable value to 1% of dutiable value, as shown in Table 4.

78 Ibid.
79 Ibid p 233.
80 Ibid p 234.

Table 4: Tax design: price signal compared under GVDS to VERS

Rating	GVDS		VERS		
	Duty payable on vehicles < or equal to $45,000	Duty payable on vehicles > than $45,000	CO_2 emissions: grams emitted per km*	Duty payable on vehicles < or equal to $45,000	Duty payable on vehicles > than $45,000
A	Nil	Nil	0–130	Nil	Nil
B	**2%** of dutiable value	**$900 + 4%** of dutiable value exceeding $45,000	131–175	**1%** of dutiable value	**$450 + 2%** of dutiable value exceeding $45,000
C	3% of dutiable value	$1,350 + 5% of dutiable value exceeding $45,000	176–220	3% of dutiable value	$1,350 + 5% of dutiable value exceeding $45,000
D	4% of dutiable value	$1,800 + 6% of dutiable value exceeding $45,000	More than 220	4% of dutiable value	$1,800 + 6% of dutiable value exceeding $45,000

* ACT Government: ACT Revenue Office: Green vehicle rating for s 208(1) of the Act.

By adopting the same price signal, the environmental effectiveness of the VERS will most likely be no different from the former GVDS, which was found to be ineffective in shifting consumer's car purchasing trends to lower CO_2 emitting vehicles.

4.5.1 Disparity between diesel and petrol-fuelled vehicles under GVDS

The VERS tax design, in adopting CO_2 emission bands, did ameliorate the undesirable disparity between diesel and petrol-fuelled vehicles, under the former GVDS as shown in Table 5.

Table 5: Price signal of differentiated rates under GVDS compared with former duty rates

Vehicle	Retail price $*	Green Vehicle Duty Scheme			Vehicle Emission Reduction Scheme			
		GVG	Fuel	Stamp duty GVDS %	CO_2 g/km	ACT VERS rating	Stamp duty VERS %	GVDS v VERS savings/ extra taxes
Prius 1.8L 4cyc	37,389	A	Hybrid	0	89	A	0	0
Ford Focus 4 cycl, 2.0L	36,289	B	Petrol	2.0	154	B	1.0	**–363**
Citroen C4 e-HDI Seduction	30,690	**B**	**Diesel**	2.0	101	**A**	**0**	**–613**
Holden VF Commodore	40,690	**B**	Petrol	2.0	222	**D**	**4.0**	**+809**
Ford Focus 4cycl, 2.0L	40,139	**C**	**Diesel**	3.0	144	**B**	1.0	**–802**
Toyota Camry	35,002	C	Petrol	3.0	183	C	3.0	No change
Hyundai 2013 i30 Active	28,424	**C**	**Diesel**	3.0	122	**A**	**0**	**–852**
Ford Falcon G6E EcoBoost	51,408	C	Petrol	3.2	201	C	3.2	No change
Toyota Prado	61,589	D	Petrol	4.5	232	D	4.5	No Change

* Recommended retail price (inclusive of GST) from www.redbook.com.au.

Diesel-fuelled vehicles were disadvantaged under the former GVG (Stage 2), since a higher rate of duty applied to lower CO_2 emitting diesel-fuelled vehicles.[81] The ACT Government concedes that under the former GVDS, diesel powered vehicles were "less likely" to receive a duty reduction due to the combination of the two environmental ratings for CO_2 and pollution emissions.[82] Under the VERS tax design, diesel powered vehicles have gone from a "C-rated" vehicle (under the GVDS) to a "B-rated" vehicle, receiving a reduction in duty, and higher CO_2 emitting petrol-fuelled vehicles have been reclassified from a "B-rated" vehicle to a "C-rated" vehicle subject to higher duty as shown in Table 5. For example, the locally manufactured vehicle VF Commodore

81 Mortimore (2015), above n 2, p 252.

82 ACT Government (2015), "Building an integrated transport network, reducing emissions" above n 46, p 3.

(222 g/km) was reclassified from a "B-rated" vehicle to "D-rated" vehicle, as shown in Table 5.

4.5.2 VERS A-rated vehicle incentives for low emission vehicles

In the tax design of the VERS, the ACT Government attempted to incentivise the choice of low emission vehicles by exempting vehicle tax/duty for "A-rated" new vehicles with CO_2 emissions between 0 to 130 g/km. The exempt vehicle purchase tax/duty may provide a price signal to encourage consumers to choose "A-rated" vehicles with CO_2 emissions up to 130g/km, but the CO_2 emission band is broad and may fail to influence consumers into choosing alternatively fuelled vehicles, such as battery electric vehicles (BEVs) and plug-in hybrid vehicles (PHEVs).

Ex post analysis shows that low price signals can be set to influence people's purchase behaviour. For instance, Ireland applies differentiated vehicle purchase taxes/duty ranging from 14% to 36%, and new passenger vehicles with CO_2 emissions between 0 to 130g CO_2/km have vehicle purchase taxes/duty ranging from 14% to 18%, as shown in the following Table 6.

Table 6: Ireland's CO_2 emission bands between 0 to 130g/km

Vehicle purchase tax band	CO_2 emissions (g/km)	VRT rate (%)
A1	0–80	14
A2	81–100	15
A3	101–110	16
B1	111–120	17
B2	121–130	18
B3	131–140	19%
C	141–155	23%
D	156–170	27%
E	171–190	30%
F	191–225	34%
G	More than 225	36%

The Society of the Irish Motor Industry "Vehicle Registration Tax" applies from 1 July 2008. Available at www.simi.ie/Taxation/Vehicle+Registration+Tax.html. Accessed 11 July 2016.

According to Kok (2015), vehicle purchase taxes need to be adjusted by tightening CO_2 emission limits to keep track with autonomous CO_2 reductions from technological

advances.[83] This means the initial vehicle performance rating for "A-rated" vehicles with emissions between the ranges of 0 to 130 g/km is too broad, and does not attract consumers into choosing alternate vehicles such as BEVs and PHEVs.[84] In effect, the CO_2 emission limits of vehicle performance rating of "A-rated" vehicles (with emissions between 0 to 130 g/km) will need to be tightened to reflect the technological advances of alternate vehicles such as BEVs and PHEVs. In addition, failure to tighten the CO_2 emission limits may impact on the revenue neutrality of the fiscal environmental tax instrument.

4.5.3 VERS – low price signal

The low price signal and the insignificant level of tax differentiation for A, B, C, and D-rated vehicles will fail to discourage the acquisition of higher CO_2 emitting vehicles. The 2015 research paper found that the "D-rated" higher CO_2 emitting vehicles did not adopt a strong price signal and did not shift consumers' choice away from high-emitting new vehicles, the same price signal was adopted for the VERS CO_2 emission bands for "D-rated" vehicles, as shown in Table 5.

The upshot is that the "price signal" of the VERS cannot be expected to have any meaningful impact on consumers' choice of "D-rated" vehicles, where nationally over 41% of consumers are choosing new vehicles with emissions exceeding 200 g/km, as shown in Table 3.

5. Is the VERS an environmentally effective instrument?

The 2015 research paper findings supported those of the European Commission's 2002 COWI study, where simple increases in taxes that do not involve changes to the tax base provide only very small reductions in CO_2 emissions; strong up-front price signals need to be differentiated in such a way that taxes for all energy-effective cars are significantly lower than taxes for cars with poor energy efficiency.[85]

The VERS CO_2 emission bands continue to be limited to four environmental performance categories, differentiated with the same low price signal. The low price signal and the insignificant level of tax differentiation will fail to discourage the acquisition of higher CO_2 emitting vehicles. The environmental effectiveness of the VERS will therefore most likely be no different from the former GVDS, which

83 Kok (2015), above n 66, pp 140, 138.

84 Ibid p 139. BEV = battery electric vehicle, PHEV = plug-in hybrid electric vehicle, HEV = hybrid electric vehicle, ICEV = internal combustion engine vehicle.

85 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.

was found to be ineffective in shifting consumer's car purchasing trends to lower CO_2 emitting vehicles.

To sufficiently differentiate between the revised emission bands will require the ACT Government to introduce stronger price signals than the 1% to 6% currently obtaining under the VERS. The ex post analysis of the effectiveness of CO_2-based vehicle taxes indicates that the most stringent vehicle purchase taxes can successfully reduce the average CO_2 emissions of new vehicles.[86] Finding the right level of environmental taxes will require an iterative, trial-and-error process,[87] under which the tax is set at an arbitrary level, then raised until the most effective tax level is found.[88] Alternatively, state and territory governments can take guidance from the effective vehicle purchase taxes/duty adopted overseas, such as the rates adopted in Ireland, shown in Table 6, or in the Netherlands, shown in Table 7 in Section 6. The impact of the tax must be measurable and related to attributes such as CO_2 emissions that can be monitored and observed.[89] As Faure et al (2012) observe, environmental taxes require emissions to be monitored as closely as possible to ensure their effectiveness, even if this is difficult.[90] Failure to quantify and measure the linkage between the instrument and the level of emission reduction makes it difficult to assess the environmental effectiveness of the instrument or climate policy. As Smith (1995) notes, such a linkage between the environmental tax and the amount of pollution is crucial to environmental effectiveness.[91] To monitor the emission reduction, the National Transport Commission will be required to provide the average CO_2 emissions intensity for new passenger vehicles acquired in each state and territory.[92]

6. National Energy Productivity Plan – improve fuel efficiency

In exploring ways to reduce emissions from motor vehicles, the Australian Government released a VE discussion paper in February 2016, seeking consultations on initiatives and measures that could deliver low-cost emission reductions by encouraging the purchase of more fuel-efficient vehicles.[93] The VE discussion paper is considering

86 Ibid p 151.

87 Baumol William J and Oates Wallace E (1988), *The Theory of environmental policy* 2nd edn, Cambridge: Cambridge University Press, 161.

88 Maatta, (2006) above n 45, p 48.

89 Ibid.

90 M G Faure and S E Weishaar (2012), "The role of environmental taxation: economics and the law", *Edward Elgar Handbook of Research on Environmental Taxation* 399–408.

91 S Smith (1995) "Green taxes and charges: policy and practice in Britain and Germany", *London: The Institue for Fiscal Studies.* 21–23.

92 Mortimore (2015), above n 2, p 234.

93 Australian Government (2015), "Vehicle emissions discussion paper" above n 14, 2.

whether reforming state and territory vehicle purchase taxes/duty can encourage improvements in vehicle efficiency:[94]

> "How could taxes and charges for motor vehicle purchase and/or use be reformed to encourage the purchase and supply of more fuel efficient vehicles?"

The VE discussion paper referred to ACT's VERS as an instrument "to encourage the purchase of more efficient vehicles".[95]

This article does not recommend ACT's VERS to the Australian Government's NEPP as a model of how state and territory taxes could be reformed to "encourage the purchase and supply of more efficient vehicles".[96] The article has shown that the VERS will most likely not increase fuel efficiency and contribute to the NEPP objective of a 40% improvement in energy productivity by 2030.[97]

Nonetheless, the Australian Government needs to discourage the increasing consumer preference for larger, higher-emitting vehicles because that choice is offsetting any fuel-efficient gains from technological advances. The VE discussion paper acknowledged that state and territory vehicle taxes/duty could influence vehicle-purchasing decisions.[98] Notwithstanding that the VERS (former GVDS) may be ineffective in meeting ACT's emission reduction targets, the literature continues to support the environmental effectiveness of vehicle purchase taxes/duty (reformed on the basis of CO_2 emissions) to influence consumer's purchase of more fuel efficient lower emitting vehicles and significantly reduce transport emissions. The growing ex-post evidence indicates that consumers respond more effectively to up-front price signals and supports the reform of vehicle purchase tax/duty on the basis of CO_2 emissions. Whether or not the vehicle purchase tax is environmentally effective in encouraging consumers to choose the lower CO_2 emitting vehicle will depend on the tax design and whether the price signal is stringent.

The former GVDS may have been environmentally ineffective in reducing transport CO_2 emissions (discussed in section 2), but Ireland's vehicle purchase tax (introduced in the same year as the GVDS) reduced the country's average CO_2 emissions for new passenger cars from 166 g/km in 2007 to 145 g/km in 2008. This represented a 13% reduction in CO_2 emissions in the first year the tax policy measure was introduced relative to average CO_2 emissions before the vehicle purchase tax change.[99] By 2015,

94 Ibid p 6. Question 24. Submissions closed on 8 April 2016.
95 Ibid p 23.
96 Ibid p 24.
97 Ibid p 2.
98 Ibid p 22.
99 Mortimore (2015), above n 2, p 237.

the average CO_2 emissions for new passenger cars had been reduced further to 114.3 g of CO_2/km in 2015.[100]

Kok's (2015) six-year ex post evaluation on the effectiveness of CO_2-based vehicle taxes in the Netherlands (in the period from 2008 to 2013) supports earlier ex post literature that, for the most part, covers only first-year effects.[101] The gradual introduction of CO_2-based fiscal incentive schemes in 2008 has shifted Dutch consumer preferences for bigger and more powerful cars to lower CO_2 emitting vehicles. Thus, the Netherlands has moved from 12th position in 2007 to become Europe's number one in terms of lowest average CO_2 emissions and the highest share of electric vehicles.[102] The Dutch fiscal policies are expected to have contributed to 13 g/km or 11% lower average type approval CO_2 emissions of new cars sold in 2013.[103]

The Netherlands' higher CO_2-based vehicle taxes has reduced its average CO_2 emissions to 101 g CO_2/km in 2015, the lowest in the EU, and the EU as a whole achieved an average CO_2 emission for new passenger vehicles in European countries of 119.6 in 2015, a 3.5% reduction on 2014 emissions (124 g/km).[104]

The Netherlands vehicle purchase tax used to be primarily based on the price of the car, with a vehicle purchase tax/duty rate being 45.2% of the net list price.[105] By 2013, Netherlands reformed its vehicle purchase tax/duty to become 100% based on CO_2 emissions, as shown in Table 7.

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100 ACEA, European Automobile Manufacturers Association (2016–17), "The automobile industry pocket guide 2016/17", available at www.acea.be/uploads/publications/POCKET_GUIDE_2016–2017.pdf. Accessed May 2016.

101 Kok (2015), above n 66; see also T Klier and J Linn (2012), "Using vehicle taxes to reduce carbon dioxide emission rates of new passenger vehicles – evidence from France, Germany, Sweden. LE Paper, Resources for the Future. Washington, DC; L Ryan, S Ferreira and F Covery (2009), "The Impact of fiscal and other measures on new passenger cars sales and CO2 emissions intensity: evidence from Europe". *Energy Economics* 31, 365–374; J Zimmermannova (2012), "Ex-post analysis of impacts of the car registration fee in the Czech Republic", *Transport Research Part A*, 1458–1464; F Rogan, E Dennehy, H Daly, M Howley, and B Gallachoir (2011) "Impacts of an emission based private car taxation policy – first year ex-post analysis" 45 *Transportation Research Part A* 583–597 at 588.

102 Ibid. ACEA, European Automobile Manufacturers Association, 2016, "The automobile industry pocket guide 2015/16", available at www.acea.be/uploads/publications/POCKET_GUIDE_2015-2016.pdf. Accessed 3 April 2016. The Netherlands 2014 average emissions was 107.3 g CO2/km.

103 Kok, (2015) above n 66.

104 ACEA, European Automobile Manufacturers Association (2016), "The automobile industry pocket guide 2016/17", available at www.acea.be/publications/article/acea-pocket-guide. Accessed 8 June 2016.

105 Kok (2015), above n 66, p 139.

Table 7: The Netherlands' vehicle registration tax[106]

Thresholds for CO_2 (g/km)				Additional tax applies outside of the threshold
I	II	III		IV
From	Up to and including	Vehicle purchase tax € (Euro)	Vehicle purchase tax $ (AUD)	Tax per g CO_2/km exceeding the threshold in I € (Euro)
0 grams/km	0	0		0 (exempt)
1 gram/km	79	175	251	6
80 grams/km	106	649	932	69
107 grams/km	155	2,512	3,609	124
156 grams/km	174	8,588	12,339	239
175 grams/km		13,129	18,863	478

Source: *ACEA tax guide 2016,* European Automobile Manufacturers Association.

When compared to the ACT's VERS full exemption for "A-rated" new vehicles with CO_2 emissions between 0 to 130 g/km, the Netherlands only provides full exemption for passenger vehicles with zero CO_2 emissions, such as the battery electric vehicles. For passenger vehicles with emissions between 1 g CO_2/km to 130 g CO_2/km, the vehicle purchase/duty tax can vary from $251 to $7,885 (AUD).[107] With significantly higher vehicle purchase taxes/duty for high CO_2 emitting vehicles as shown in Table 7. In addition, as from 1 January 2015, a fixed vehicle purchase surcharge of €175 (Euro) or $250.35 (AUD) applies for all new passenger vehicles sold that have CO_2 emissions of 1 g/km or more; and a diesel charge applies to vehicles with CO_2 emissions of more than 70 g/km.[108]

106 European Automobile Manufacturers Association (ACEA) 2016, "Annual tax guide", available at www.acea.be/uploads/news_documents/ACEA_TAX_GUIDE_2016.pdf. Accessed 14 November 2016.

107 Netherlands Government, "Belasting Personenauto's Motorrijwielen or Bpm registration tax". If the CO_2 emissions of your car is 130 g/km, this value falls between 107 and 155 g/km (deduct 106 g/km from the emissions of the car: 130 – 106 = 24; multiply that sum by the amount from column IV in the same row: 24 x €124 = €2976; add to the sum from column III in the same row: €2,976 + € 2,512 = €5,488 ($7,885AUD). For diesel vehicles emitting 67g CO2/km or more, a surcharge of € 86.43 ($124.18 AUD) applies to vehicles. Available at www.belastingdienst.nl/wps/wcm/connect/bldcontenten/belastingdienst/individuals/cars/bpm/calculate_and_pay_bpm/bpm_tariff/bpm_tariff_passenger_car. Accessed on 11 November 2016.

108 European Automobile Manufacturers Association (ACEA) 2016, above n 106. The diesel surcharge per gram of CO_2 above 67 g/km is €86.43 (Euro) or $123.65 (AUD) in 2016.

Besides having the lowest average CO_2 emissions in Europe, the Netherlands also had the highest market share for sales of electric vehicles (PHEVs and BEVs) in Europe in 2013[109] In other words, CO_2 emission bands differentiated by stronger price signals provide a stronger incentive for consumers to purchase lower CO_2 emitting vehicles.[110] The ex post evidence indicates that the average CO_2 emissions of new vehicles declined at a much faster rate for countries that adopted much higher CO_2 vehicle taxes (eg the Netherlands, Denmark, Ireland and Portugal).[111]

7. Vehicle purchase taxes are complimentary measures

Ajanovic et al (2015) points out that climate policy instruments do not operate independently.[112] In the EU, as policy measures, vehicle purchase taxes are complementary to mandatory CO_2 emission standards. According to Maatta (2006), environmental taxes are often applied in conjunction with direct regulation such as mandatory CO_2 emissions or fuel efficiency standards[113] and monitoring and reporting mechanism known as the monitoring mechanism regulation (MMR).

The European Commission encouraged member states in 2007 "to adapt their car taxation policies so as to promote the purchase of fuel efficient cars throughout the EU" to help manufacturers to meet the regulatory fuel efficiency standards.[114] The 2015 research paper found that the EU had been able to regulate the MMR on 8 July 2013, which requires member states to monitor their own GHG emissions as part of their annual reporting requirements in meeting their emission reduction targets.[115]

8. Conclusion

The ACT Government claims that "ACT is leading Australia through its ambitious carbon emissions reductions target of 40% below 1990 level by 2020" and that "ACT is positioning itself not just as a leader of Australian cities in acting to address climate change, but also on the global stage".[116] Be that as it may, for the reasons already discussed, the ACT's ambitious CO_2 reduction targets will certainly not be

109 Kok (2015), above n 66, p 143.

110 Ibid pp 140, 138.

111 Ibid, p 143.

112 A Ajanovic, R Haas, and F Wirl (2015) "Reducing CO2 emissions of cars in the EU: analyzing the underlying mechanisms of standards, registration taxes and fuel taxes", *Energy Efficiency* DOI 10.1007/s 12053-015-9397-4

113 Maatta (2006), above n 45 p 23.

114 Commission of the European Communities, 2007, "Communication from the Commission to the Council and the European Parlliament" *Com (2007) 19 Final*

115 Mortimore (2015), above n 2, p 237.

116 ACT Government (2015), AP2 Review (2015), above n 9, p 33.

met by significant cuts to road transport emissions achieved through the VERS fiscal environmental tax.

In brief, the VERS replaced the former GVDS, making only minor changes to the price signal and adopting CO_2 emission bands in Vehicle Performance ratings in place of the star ratings under the former GVG (Stage 2). It is not transparent to consumers that new vehicles under the Vehicle Performance rating of 'B' and 'C' may not be 'fuel efficient' under domestic or international standards. The CO_2 emission band for 'A ranked' vehicles is too broad to encourage consumers to choose lower CO_2 emitting vehicles such as BEVs and PHEVs. The limits of CO_2 emission bands must be tightened to reflect the technological advancement of such vehicles.

However, the ACT Government will not be able to differentiate sufficiently between the revised emission bands on a price signal ranging from 1% to 6%. The same price signal applied to the former GVDS, and was found to be ineffective to shift consumers' preference to fuel efficient vehicles. The environmental effectiveness of the VERS will depend on whether the ACT Government adopts a strong and stringent price signal. The impact of the price signal of the vehicle purchase tax must be measurable and related to attributes such as CO_2 emissions, and reviewed annually.[117] To assess the environmental effectiveness in CO_2 emission reduction, the National Transport Commission will need to supply the average fuel efficiencies and CO_2 emissions of new vehicles acquired in each state and territory.

Furthermore, the VERS should be treated as part of a suite of complementary measures such as fuel taxes; vehicle registration fees; goods and services tax; that can be differentiated on the basis of CO2 emissions and be combined to support regulatory CO2 emission standards. In effect such complementary measures are ineffective until regulatory CO2 emission standards are introduced for the purpose of setting and achieving CO2 emission reduction targets. Failure to achieve such targets may indicate that complementary measures (such as the VERS) policy design and price signal are not set at the right level to influence a behavioural change in consumers' purchasing trends. Thus undermining the environmental effectiveness of the instrument, which is essential if CO_2 emission reduction targets are to be met.

Table of abbreviations

BEV Battery electric vehicle

GFEI Global Fuel Economy Initiative

GHG Greenhouse gases

117 Maatta (2006), above n 45, 43.

GST	Goods and services tax
GVDS	Green Vehicles Duty Scheme
GVG	Green Vehicle Guide
HEV	Hybrid electric vehicle
ICEV	Internal combustion engine vehicle
LCT	Luxury car tax
LEV	Low emission vehicle
LEVS	Low Emission Vehicle Strategy
NEPP	National Energy Productivity Plan
PHEV	Plug-in hybrid electric vehicle
SUV	Sports utility vehicle
UK	United Kingdom
VE	Vehicle emissions
VERS	Vehicle Emissions Reduction Scheme