



Policy costing

Applying a road user charge to electric vehicles	
Person/party requesting the costing:	Senator Tim Storer, Senator for South Australia
Date costing completed:	7 December 2018
Expiry date of the costing:	Release of the next economic and fiscal outlook report.
Status at time of request:	Submitted outside the caretaker period <input checked="" type="checkbox"/> Confidential <input type="checkbox"/> Not confidential
<p>Summary of proposal:</p> <p>This proposal would introduce a road-user charge on battery electric vehicles and fuel-cell electric vehicles, levied on a per-kilometre-travelled basis. The road-user charge would be calculated as a proportion of the fuel excise that is currently paid by a driver of a passenger vehicle that has average fuel usage for Australia. For the purposes of this proposal average fuel usage is defined as the average passenger vehicle fuel usage in Australia in 2016, which was 10.5 litres of fuel per 100 kilometres, or 0.105 litres per kilometre. The proposed road-user charge per kilometre is therefore specified as the fuel excise paid on 0.105 litres of fuel (estimated to be around \$0.048 per kilometre in 2022-23). As the fuel excise rate is indexed annually by the consumer price index (CPI), the road-user charge would increase over time in line with movements in the CPI.</p> <p>The road-user charge would be phased in over time in accordance with the following profile.</p> <ul style="list-style-type: none"> • Year 1: road-user charge set at 20 per cent of the estimated fuel excise per kilometre driven. • Year 2: road-user charge set at 40 per cent of the estimated fuel excise per kilometre driven. • Year 3: road-user charge set at 60 per cent of the estimated fuel excise per kilometre driven. • Year 4: road-user charge set at 80 per cent of the estimated fuel excise per kilometre driven. • Year 5 and onwards: road-user charge set at 100 per cent of the estimated fuel excise per kilometre driven (estimated to be around \$0.053 per kilometre in 2026-27). <p>In order for the road-user charge to be collected, the number of kilometres travelled by electric vehicles would be reported monthly to the Australian Taxation Office (ATO). The ATO would then charge each vehicle's road-user charge liability to its owner on a monthly basis.</p> <p>The proposal contains four options for its start date:</p> <ul style="list-style-type: none"> • Option 1: 1 July 2022 • Option 2: 1 July 2023 • Option 3: 1 July 2024 • Option 4: 1 July 2025. <p>Estimates of the change in fuel excise that would result from increasing electric vehicle usage were also requested.</p>	

Costing overview

Option 1 of this proposal would be expected to decrease both the fiscal and underlying cash balances by \$20 million over the 2018-19 Budget forward estimates period. This impact is entirely due to an increase in departmental expenses for the ATO. Options 2 to 4 would not be expected to have an impact on either the fiscal or underlying cash balances over the 2018-19 Budget forward estimates period due to their start dates.

Table 1: Applying a road user charge to electric vehicles – Financial implications (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	Total to 2021–22
Option 1 – Introduce a road-user charge, start date 1 July 2022					
Fiscal balance	-	-	-	-20	-20
Underlying cash balance	-	-	-	-20	-20
Option 2 – Introduce a road-user charge, start date 1 July 2023					
Fiscal balance	-	-	-	-	-
Underlying cash balance	-	-	-	-	-
Option 3 – Introduce a road-user charge, start date 1 July 2024					
Fiscal balance	-	-	-	-	-
Underlying cash balance	-	-	-	-	-
Option 4 – Introduce a road-user charge, start date 1 July 2025					
Fiscal balance	-	-	-	-	-
Underlying cash balance	-	-	-	-	-

(a) A positive number represents an increase in the relevant budget balance; a negative number represents a decrease.

(b) Figures may not sum to totals due to rounding.

- Indicates nil.

All options would be expected to have impacts beyond the 2018-19 Budget forward estimates period. A breakdown of the financial implications of each option over the period to 2028-29 is provided at [Attachment A](#).

Departmental costs for each option would be expected to be significant over the period to 2028-29. These impacts include a \$20 million set-up cost for the ATO in the year before the start date, and ongoing administration and enforcement costs.

There would be a difference in the fiscal and underlying cash balance impacts for each option due to differences in when road-user charge liabilities are raised and when they are paid to the ATO.

There is a high degree of uncertainty in the estimates for each option of the proposal. The proposal is subject to a number of assumptions, including the average kilometres driven in electric vehicles each year, the take-up rates of electric vehicles, the fuel excise per kilometre driven, and the potential

behavioural responses to the proposal. There are also uncertainties around the total cost of administering the proposal, particularly the method by which monthly kilometres travelled would be reported to the ATO, and whether there would be issues with non-compliance with the road-user charge. The costing is highly sensitive to each assumption used.

Additional information requested

The additional information requested on fuel excise revenue in the absence of the shift to electric vehicles is not publically available in the Budget or elsewhere. In the 2018 report *Trends affecting the sustainability of Commonwealth taxes*, the Parliamentary Budget Office (PBO) found that as electric vehicles currently comprise only a small proportion of the market, they are having little effect on fuel excise receipts at the present time. Box 3 in the PBO's *2018-19 Budget Medium-Term Projections* report discussed the risk to the tax base of recent trends in several indirect taxes, including fuel excise.

Key assumptions

The PBO has made the following assumptions in relation to this proposal.

- The average kilometres driven per electric vehicle would be the same as the average for all passenger vehicles, and would not change over the period to 2028-29.
 - The average used in this costing is 13,230 kilometres per year. This is based on the average kilometres driven for all passenger vehicles in the Australian Bureau of Statistics (ABS) publication *Survey of Motor Vehicle Use Australia, 12 months ended 30 June 2016*. This average is based on data from 2007 to 2016.
 - These assumptions are highly uncertain as there are potential behavioural responses to the proposal and it is uncertain whether electric vehicles would be driven the same number of kilometres as other vehicles.
- There would be no behavioural responses to this proposal from consumers. In particular, it is assumed that the proposal would not affect future uptake of electric vehicles and would not affect the average kilometres travelled by electric vehicles relative to other vehicles.
 - There is limited information available about the effects of applying a flat road-user charge per kilometre driven. Typically, studies have focused on the effects of road-user charges applied at specific times of the day (for example peak travel times) rather than flat charges per kilometre driven.¹ In the analysis conducted for the *Fuel Indexation (Road Funding) Bill 2014*, the demand for transport fuel was found to be relatively inelastic with regard to price.² As an extension, the number of kilometres travelled is also relatively inelastic with regard to price.
- Electric vehicles would be kept on average for 10 years. This is based on the average age of passenger vehicles in the ABS *Motor Vehicle Census, Australia, 31 January 2018*.
- Battery electric vehicles and fuel-cell electric vehicles would make up approximately 7.5 per cent of total vehicle sales by 2028-29.

¹ See Martin and Thornton 2017, *Can Road Charges Alleviate Congestion?*

² See the *Fuel Indexation (Road Funding) Bill 2014*.

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- This is based on an estimate in Energeia’s report *Australian Electric Vehicle Market Study* that by 2028-29, 15 per cent of total vehicle sales will be electric vehicles. Currently, battery electric vehicles and fuel-cell electric vehicles comprise approximately 35 per cent of total electric vehicle purchases. This share is assumed to grow to reach 50 per cent by 2026-27.
- For the purposes of calculating estimated fuel excise rates, CPI growth beyond 2021-22 would be 2.5 per cent per annum.
- As the road-user charge would be paid monthly, approximately 11 months of the revenue would be collected from vehicle owners in the year in which the driving took place and one month of revenue would be collected in the subsequent year.
- Setting up ATO systems to ensure that relevant data could be collected on monthly distance travelled by electric vehicles would cost \$20 million. The ATO would then employ 65 full-time-equivalent employees on an ongoing basis to monitor and ensure compliance with the proposal.

Methodology

The expected revenue from the road-user charge was calculated by first estimating the fuel excise rate over the period to 2028-29. Using this rate, the assumed road-user charge per kilometre travelled under each option of the proposal was determined. The number of battery electric vehicles and fuel-cell electric vehicles was then estimated based on the existing stock of electric vehicles in Australia and expected vehicle sales to 2028-29.

The revenue from the charge was calculated by multiplying the estimated number of vehicles subject to the road-user charge in each year by the rate of the road-user charge and the number of kilometres that would be travelled by each vehicle.

Departmental estimates were calculated using the Department of Finance’s departmental costing tool and were based on creating a branch of 65 full-time-equivalent employees to administer the proposal. This is based on PBO estimates of the overall complexity to the ATO of administering the proposal.

Revenue estimates have been rounded to the nearest \$10 million. Departmental expense estimates have been rounded to the nearest \$1 million.

Data sources

The ATO provided data on total vehicle sales in Australia, disaggregated by fuel type.

The Department of the Treasury provided estimates of CPI growth as at the 2018-19 Budget.

The Department of Finance provided their departmental costing tool as at the 2018-19 Budget.

PBO, 2018. *Trends affecting the sustainability of Commonwealth taxes*, PBO: Canberra.

PBO, 2018. *2018-19 Budget Medium-Term Projections*, PBO: Canberra.

ABS, 2017. *Survey of Motor Vehicle Use, Australia, 12 months ended 20 June 2016*, ABS Cat. No. 9208.0.

ABS, 2018. *ABS Motor Vehicle Census, Australia, 31 January 2018*, ABS Cat. No. 9309.0.

ClimateWorks Australia, 2018. *The state of electric vehicles in Australia*, Electric Vehicle Council: Sydney.

Energiea, 2018. *Australian Electric Vehicle Market Study*, Energiea: Sydney.

Martin, L, and Thornton, S, 2017. *Can Road Charges Alleviate Congestion?*, [online] available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3055522, accessed 6 December 2018.

The Parliament of the Commonwealth of Australia, 2014. *Fuel Indexation (Road Funding) Bill 2014 – Explanatory Memorandum*, [online] available at: parlinfo.aph.gov.au/parlInfo/download/legislation/bills/r5284_first-reps/toc_pdf/14120b01.pdf;fileType=application/pdf, accessed 6 December 2018.

Attachment A – Applying a road user charge to electric vehicles – financial implications

Table A1: Applying a road user charge to electric vehicles – Option 1: Introduce a road-user charge, start date 1 July 2022 – Fiscal balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Revenue</i>	-	-	-	-	10	40	80	150	260	340	440	-	1,320
<i>Departmental expenses</i>	-	-	-	-20	-10	-10	-10	-10	-10	-10	-10	-20	-91
Total	-	-	-	-20	-	30	70	140	250	330	430	-20	1,229

- (a) A positive number for the fiscal balance indicates an increase in revenue or a decrease in expenses or net capital investment in accrual terms. A negative number for the fiscal balance indicates a decrease in revenue or an increase in expenses or net capital investment in accrual terms.
- (b) Figures may not sum to totals due to rounding.
- Indicates nil.

Table A2: Applying a road user charge to electric vehicles – Option 1: Introduce a road-user charge, start date 1 July 2022 – Underlying cash balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Receipts</i>	-	-	-	-	10	30	80	150	250	340	430	-	1,280
<i>Departmental payments</i>	-	-	-	-20	-10	-10	-10	-10	-10	-10	-10	-20	-91
Total	-	-	-	-20	-	20	70	140	240	330	420	-20	1,189

- (a) A positive number for the underlying cash balance indicates an increase in receipts or a decrease in payments or net capital investment in cash terms. A negative number for the underlying cash balance indicates a decrease in receipts or an increase in payments or net capital investment in cash terms.
- (b) Figures may not sum to totals due to rounding.
- Indicates nil.

Table A3: Applying a road user charge to electric vehicles – Option 2: Introduce a road-user charge, start date 1 July 2023 – Fiscal balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Revenue</i>	-	-	-	-	-	20	50	110	210	340	440	-	1,170
<i>Departmental expenses</i>	-	-	-	-	-20	-10	-10	-10	-10	-10	-10	-	-81
Total	-	-	-	-	-20	10	40	100	200	330	430	-	1,089

- (a) A positive number for the fiscal balance indicates an increase in revenue or a decrease in expenses or net capital investment in accrual terms. A negative number for the fiscal balance indicates a decrease in revenue or an increase in expenses or net capital investment in accrual terms.
- (b) Figures may not sum to totals due to rounding.
- Indicates nil.

Table A4: Applying a road user charge to electric vehicles – Option 2: Introduce a road-user charge, start date 1 July 2023 – Underlying cash balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Receipts</i>	-	-	-	-	-	20	50	110	200	330	430	-	1,130
<i>Departmental payments</i>	-	-	-	-	-20	-10	-10	-10	-10	-10	-10	-	-81
Total	-	-	-	-	-20	10	40	100	190	320	420	-	1,049

- (a) A positive number for the underlying cash balance indicates an increase in receipts or a decrease in payments or net capital investment in cash terms. A negative number for the underlying cash balance indicates a decrease in receipts or an increase in payments or net capital investment in cash terms.
- (b) Figures may not sum to totals due to rounding.
- Indicates nil.

Table A5: Applying a road user charge to electric vehicles – Option 3: Introduce a road-user charge, start date 1 July 2024 – Fiscal balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Revenue</i>	-	-	-	-	-	-	30	80	160	270	440	-	970
<i>Departmental expenses</i>	-	-	-	-	-	-20	-10	-10	-10	-10	-10	-	-71
Total	-	-	-	-	-	-20	20	70	150	260	430	-	899

- (a) A positive number for the fiscal balance indicates an increase in revenue or a decrease in expenses or net capital investment in accrual terms. A negative number for the fiscal balance indicates a decrease in revenue or an increase in expenses or net capital investment in accrual terms.
- (b) Figures may not sum to totals due to rounding.
- Indicates nil.

Table A6: Applying a road user charge to electric vehicles – Option 3: Introduce a road-user charge, start date 1 July 2024 – Underlying cash balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Receipts</i>	-	-	-	-	-	-	20	70	150	260	430	-	930
<i>Departmental payments</i>	-	-	-	-	-	-20	-10	-10	-10	-10	-10	-	-71
Total	-	-	-	-	-	-20	10	60	140	250	420	-	859

- (a) A positive number for the underlying cash balance indicates an increase in receipts or a decrease in payments or net capital investment in cash terms. A negative number for the underlying cash balance indicates a decrease in receipts or an increase in payments or net capital investment in cash terms.
- (b) Figures may not sum to totals due to rounding.
- Indicates nil.

Table A7: Applying a road user charge to electric vehicles – Option 4: Introduce a road-user charge, start date 1 July 2025 – Fiscal balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Revenue</i>	-	-	-	-	-	-	-	40	100	210	350	-	700
<i>Departmental expenses</i>	-	-	-	-	-	-	-20	-10	-10	-10	-10	-	-61
Total	-	-	-	-	-	-	-20	30	90	200	340	-	639

(a) A positive number for the fiscal balance indicates an increase in revenue or a decrease in expenses or net capital investment in accrual terms. A negative number for the fiscal balance indicates a decrease in revenue or an increase in expenses or net capital investment in accrual terms.

(b) Figures may not sum to totals due to rounding.

- Indicates nil.

Table A8: Applying a road user charge to electric vehicles – Option 4: Introduce a road-user charge, start date 1 July 2025 – Underlying cash balance (\$m)^{(a)(b)}

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	Total to 2021–22	Total to 2028–29
<i>Receipts</i>	-	-	-	-	-	-	-	30	100	200	340	-	670
<i>Departmental payments</i>	-	-	-	-	-	-	-20	-10	-10	-10	-10	-	-61
Total	-	-	-	-	-	-	-20	20	90	190	330	-	609

(a) A positive number for the underlying cash balance indicates an increase in receipts or a decrease in payments or net capital investment in cash terms. A negative number for the underlying cash balance indicates a decrease in receipts or an increase in payments or net capital investment in cash terms.

(b) Figures may not sum to totals due to rounding.

- Indicates nil.