

SUBMISSION TO SENATE ECONOMICS LEGISLATION COMMITTEE

In respect to the

COAG Reform Fund Amendment (No Electric Vehicle Taxes) Bill 2020

To the Committee Members,

I am writing on behalf of the Renewable Energy Policy Group (REPG) with our views on the proposed legislation concerning Electric Vehicle taxes. This matter is complex and the Bill in its current form barely addresses the range of issues which arise from the possible introduction of Road User Charges in some States, and which are to apply on Electric Vehicles only.

Our attached paper on Road User Charging and Electric Vehicles has already been presented (in a draft form) to one Senator and we welcome the opportunity to offer our analysis to you as well. As evident from our recommendations, we would prefer a more comprehensive legislative response.

The Renewable Energy Policy Group (REPG) is a number of persons with experience in the energy industry (both fossil fuels and renewable energy), have qualifications in engineering, economics, academia or other fields of endeavour and have years of experience as advocates for renewable energy. All members are based in South Australia.

Contact regarding this paper can be made with [REDACTED]

Yours sincerely,
Thanasis Avramis

ROAD USER CHARGING AND ELECTRIC VEHICLES

A view from the Renewable Energy Policy Group (REPG)

Context

Three State Governments have recently announced their intention to introduce road user charges on electric vehicles. The South Australian and Victorian governments have announced this in their State Budgets, and New South Wales is considering a similar initiative. This has resulted in considerable negative comment¹ at a time when Australia is not only falling behind the rest of the world in electric vehicle (EV) sales but also in seriously addressing climate change in line with most of its trading partners. However, there has also been some positive comment.

We agree in principle with the need for road user charging (RUC) for all vehicles including electric vehicles. However, the over-enthusiastic early introduction of such charges at present for EVs only sends the wrong signal towards encouraging the uptake of electric vehicles.

Summary of Findings and Recommendations²

This paper highlights several key issues associated with adoption of electric vehicles and provides some recommendations to regulate the introduction of RUC for electric vehicles:

1. Current proposals to introduce RUC ignore the existing substantive gains to government from each sale of an EV and the future benefits that may arise. There are potentially ample levels of direct revenue and externality gains to offset losses from fuel excise such that the immediate application of RUC need not occur.
 - *Recommendation: All Australian Governments, acting jointly, should commit to replacing current fuel excise and other vehicle charges by a road user charge for all vehicles. A comprehensive, uniform and national system is required.*
 - *Australian authorities should liaise with Norwegian and other governments to learn from international practices in developing and implementing an Australian RUC system. A working group of experts be established to assist in this process and to develop a proposal for an RUC system for Australia.*
2. A phased introduction of RUC may prove beneficial if such charges act as a disincentive against internal-combustion engine (ICE) cars; allows government to substitute fuel excises with RUC; and does not impede the adoption of EVs

¹ A public reaction that was predicted in a leaked report to the Board of Treasurers (Item 8 in references below). The report stated that road user charges on EVs "...would "maximise revenue recovery" but was likely to discourage EV uptake, slow emissions cuts and lead to strong opposition from the industry and environmentalists. It had the potential to skew the market towards fuel-efficient fossil fuel cars..."

² This paper should be read in conjunction with a companion paper from REPG on incentives for the adoption of electric vehicles. That paper also discusses the recent South Australian State Government initiatives that support the take-up of EV's.

- *Recommendation: An RUC system for Australia be phased in over a number of years so as to not penalise early adopters of EVs.*

3. International use of RUC is not purely a means of revenue raising. Road user charges can serve wider urban planning objectives as well as fiscal outcomes for government.

Recommendation: A fair and equitable road user charging system be implemented in such a manner as to support a number of objectives relating to transport, urban planning and environmental management.

DISCUSSION

EVs and Government Revenue

A recent report from Ernst & Young to the Electric Vehicle Council³ surveyed the costs and benefits to government from EVs.

The average EV imposes net costs to government over its lifetime (10 years) of:

- *\$5,879 per vehicle, from lost fuel excise revenue*
- *\$858 per vehicle, from lost GST revenue that would have been spent on liquid fuels*

This is offset by net revenue over those 10 years as follows:

- *\$7,079 per vehicle, from additional GST, Luxury Car Tax (LCT) and stamp duty on capital cost as well as annual vehicle registration.*
- *\$131 per vehicle, from additional income taxation due to a redistribution of expenditure to more jobs intensive industries than fuel retailing*
- *\$892 per vehicle, from reduced expenditure on Strategic Fuel Reserve leasing*

And in addition, over the 10 years there is an estimated net market externality benefit of:

- *\$3,377 per vehicle, from reduced Greenhouse Gas emissions*
- *\$1,396 per vehicle, from reduced local air pollution*
- *\$2,624 per vehicle, from reduced noise*

Hence, the lost government revenue of \$6,737 per vehicle is offset by benefits of \$8,102 – a gain to direct government revenue of \$1,365 per vehicle. Combined with the additional externality benefit to society of \$7,397, each EV yields a benefit totalling \$8,762 over its 10-year lifespan.

In Australia, over 1 million new cars are sold each year.⁴ If for example, the 1 million vehicles sold in the year 2029 are 100% EV rather than ICE vehicles, then by the end of their lifespan

³ Final Report for the Electric Vehicle Council “Uncovering the hidden costs and benefits from Electric Vehicles”

⁴ Carsguide.co.au “Australian car market: Car sales, statistics and figures” <https://www.carsguide.com.au/car-advice/australian-car-market-car-sales-statistics-and-figures-70982>

in 2039, that cohort will yield benefits of up to \$8.7 billion. EVs sold in other years will also yield an associated benefit.

Although, corroboration of the methodology and conclusions would be welcome, it is already evident that assertions of EVs being a drain on government revenue are not a foregone conclusion. In this context the imposition of Road User Charges in the crude form being currently proposed has the implication of an undue and self-defeating tax grab. After all, the longer it takes for people to adopt EVs the longer it takes to accrue the net benefits given above.⁵

Two matters are not addressed in the Ernst & Young report.

- Firstly, another significant potential benefit is the positive role of EVs in smoothing out the difference between electricity supply and demand variations in a renewable dominated Australia future grid. The South Australian Government Electric Vehicle Plan specifically identifies better management of the grid as contributing benefit to SA from the adoption of EVs. Scenarios in the Plan quantify savings in electricity costs to households.⁶
- Secondly, the report does not clearly elucidate that proportion of costs or benefits which accrue to either the Federal Government or the State/Territory governments. This brings us to the discussion immediately below.

State vs Federal. Again!

The announced declaration by State Governments to introduce a road user charge on EVs is a reaction to both the declining revenue from fuel taxes and an opportunity to displace a major source of revenue from the Federal Government to the States. The ACT Government goes so far as to say that “the Commonwealth has no useful role to play here...”⁷

Indeed, the main reason for the declining fuel tax revenue is the move by auto manufacturers to reduce fuel consumption through energy efficiency measures, which has resulted in remarkable reductions over the last decade. According to the Australian Bureau of Statistics, the average fuel consumption trended down from 11.9 to 10.6 litre/100 km from 2000 to 2016. Many newer small ICE vehicles use less than 5 litre/100 km⁸. While the details of how the charges will apply are yet to emerge, there is the question of whether hybrid vehicles (both plugin and no-plugin) should be charged both the RUC and fuel excise.

There is some irony that a federal Government policy vacuum concerning vehicle fuel consumption targets and electric vehicles combined with the traditional Commonwealth

⁵ The same report notes that an average net benefit to government of \$40,051 where an EV bus replaces a diesel bus (both on an average vehicle age of 10 years).

⁶ Government of South Australia “Electric Vehicle Action Plan”, 2020, <https://www.renewablessa.sa.gov.au/topic/zero-emission-vehicles>

⁷ Ian Bushnell in the RiotACT! “**Barr rules out electric vehicle tax but road user charges are coming.**” (Item 5 in references below).

⁸ ABS Information sheet 91, Department of Infrastructure and Regional development, 2017

/State fiscal imbalance may come to harm Federal Government revenues. If only we can be sure taxpayers don't lose in the process.

We would prefer that a coordinated Federal and State response is agreed upon, which includes the coordinated use of toll roads, registration fees, and incentives to promote EV take-up.

Phased introduction of RUC

Road User Charges are practised by many nations in various forms and were implemented well before EVs came to market. RUCs are part of the "toolkit" for managing elements of urban planning and climate change mitigation. This is discussed further below. The proposed introduction of road user charging by State governments only on EVs is a major break from past practice in Australia and represents a significant advance in political willingness to tackle this issue.

We need not wait until car fleets are electric to introduce road user charging schemes for existing ICE vehicles. However, Australia has found the politics of introducing road charging particularly difficult⁹ and it is highly unlikely that such a cost will be imposed on ICE vehicles in the short term. However, it is not impossible that once the electric car fleet moves towards a substantial proportion of all vehicles, road user charging could extend to the remaining ICE vehicle fleet.

A possible model for phasing in RUC could have these features:

- No RUC for EVs until purchase price parity is achieved with ICE cars (possibly based on an average cost for particular classes of cars by weight/size). According to the SA State Government Electric Vehicle Plan, such parity might occur in 2025.
- At this point, RUC is introduced for EVs at a low rate for immediate adopters and a gradually increasing rate each subsequent year.
- The RUC rate will increase in 10% increments each subsequent year over 10 years until 100% of the eventual target rate is reached in 2035. This assumes that 2035 is the year in which all new vehicles will be EVs (by market forces or legislative requirement).
- An EV purchased in 2025 will continue to pay 10% and this rate will *stay the same* for both the original and subsequent owners. An EV purchased in 2030 will pay 50% and this rate will *stay the same* for both the original and subsequent owners.
- RUC will also be introduced for ICE cars purchased from 2025, *in addition to fuel excise*. This will also be incremented by 10% each year.
- In effect, EVs will pay more each year but ICE cars will pay even more. Hence, there is an advantage to buy EVs rather than ICE cars.

Clearly, this can be modelled in different ways with different rates. Such models might incorporate feedback mechanisms such that rates of RUC are adjusted with changes in the

⁹ Unlike Norway where "All political parties in the Norwegian parliament, except one, are in favor of exploring RUC as a replacement of toll roads. In contrast to toll roads, RUC is a tax that would be applied to the use of all roads in the country, not only certain ones." From "Introducing RUC to Norway" (Item 1 in references below).

availability and purchase price of EVs versus ICE cars, or based on the percentage of the growth of electric vehicles in the national car fleet.

RUC as part of a Transport/ Urban Planning Strategy.

The use of automobiles in the last century has resulted in many opportunities for personal mobility with associated economic and lifestyle benefits. But along with the benefits have come a range of negative impacts, some of which will not be solved by the coming replacement of internal combustion engines (ICE) by electric vehicles (EV).

The problems which EVs will solve, however, include:

- Direct pollution caused by the release of burnt fuel products from ICEs into the atmosphere. Lead and sulphur particulates, carbon monoxide, carbon dioxide, and other by-products will enormously reduce if not disappear entirely. The associated positive health impacts particularly in cities are enormous.
- As clean energy powered EVs displace ICE vehicles then the associated pollution from fuel refineries producing petrol and other conventional fuels will also substantially reduce.
- With regard to the electricity network, providing an additional source/sink for balancing the variation between supply and demand and providing a storage reserve for potential use during high demand periods.
- Reduction in noise pollution
- Reduction in heat build-up, particular the heat island effect in inner cities

However, issues, which EVs will not provide a solution for, include:

- In comparison with other modes of transport such as buses, trains and trams, cars are involved in a considerable number of accidents. In accumulation, these accidents cause much injury and many fatalities. However, increasingly, modern EVs will have autonomous or semi-autonomous facilities which will improve safety and reduce accidents caused by driver error. This has the potential to also reduce insurance premiums.
- Many people are unable to use cars for personal transport. This includes many elderly or disabled persons.
- As an unintended consequence, many persons who are unable to afford a car are often fated to live in those parts of a city or rural areas which are worst served by public transport. This restricts both personal mobility and economic opportunity.
- Reliance on cars has greatly reduced the level of walking and cycling that people do. Studies clearly show that walking and cycling provides a base level of good health that is not achieved by sitting in traffic for hours a week.
- The reshaping of modern cities around cars has also greatly increased the level of congestion. Much investment in freeway systems and car parking facilities tends to eventually fail as traffic density continues to increase.
- In comparison, motor cars use far more resources than would be required to move people by public transport. The environmental and social disruption caused by extracting natural resources, such as iron and lithium, will continue.

In general, a reduction in the use of motor vehicles for personal transport is a useful, healthy, environmentally responsible and cost-effective ambition.

For these reasons, many cities around the world have introduced measures to overcome these negative impacts. These measures include traffic calming, improving the walkability of cities, rezoning of commercial and industrial zones and increased investment in public transport – and by no means least, the application of road user charging.

A notable absentee from the serious use of such measures is Australia where historically almost all transport investment has favoured cars and trucks.

What are the features of a Road User Charging Scheme?

Charging practices may be based on one or all of the following elements:

- Charge for distance driven.
- Charge for axle weight of vehicle to reflect damage caused to roads.
- Charge to avoid congestion in city centres or during rush hours.
- Charge for emissions including exhaust and greenhouse gas emissions.

The current plan from Victoria only uses one of the elements – a distance charge of 2.5 c/km rate on EVs and a 2c/km rate for plug-in hybrid cars. The SA Government rates are not yet known and the features of the NSW plan are yet to be announced.

While the “distance travelled” option can act as a direct replacement for fuel excises, the introduction of RUC provides an opportunity to achieve some wider urban planning objectives and would require consideration of the other three charging elements. We note from The Conversation¹⁰ that:

“Distance-based road-user charging efficiently matches road use to its costs – of infrastructure, congestion, noise, pollution and deaths. It improves on fuel excise, which drivers can nearly completely evade by using a highly efficient vehicle. It also goes beyond tolling to fund major roads, which typically apply only to specific links.

Second, road-user charging can be varied in response to demand that exceeds road capacities. Higher rates can be applied at peak times to ensure free-flowing traffic and shift travel to other times and modes. Various taxation reviews, including the 2009 Henry Taxation Review and Productivity Commission reports, have promoted such policies.”

Unlike the above view, it might be better to direct the revenue thereby collected to specific public transport and/or walking and cycling projects rather than to new roads. As well:

¹⁰ Jago Dodson and Tiebei Li in The Conversation “Think taxing electric vehicle use is a backward step? Here’s why it is an important policy advance.” (Item 2 in references below).

“The Norwegian Institute of Transport Economics suggests that RUC should replace not only toll road [charges] but fuel taxes and vehicle registration fees too, as RUC alone would be sufficient to cover all road construction and maintenance costs in the country. The institute also states that RUC should vary based on a vehicle’s environmental footprint and axial load as well as the area (e.g., population density) and time (e.g., rush hours) at which a car owner is driving.”¹¹”

Use of Telemetry

Other than political will, one of the difficulties in implementing road user charging relates to the technical capacity to collect the necessary information. Recent advances in both telecommunication and intelligent vehicle technologies have made it possible to facilitate the provision of the input data necessary for determining the charges associated with a RUC scheme.

Current measures include wireless transponders which identify cars as they enter or exit designated parts of a city, for example, when cars in Singapore move into or out of the CBD. Electronic toll road collections are similar in nature.

More sophisticated policy objectives require more sophisticated means of monitoring car use, especially when long-distance or rural driving is involved. To this end, two pilot projects underway in Norway show potential.

The primary project is the Aventi’s company ***Pilot-T ASAM project*** which is described as follows¹²:

Aventi is a road infrastructure company that offers a digital platform for Cooperative Intelligent Transportation Systems (C-ITS). C-ITS allows cars to communicate with each other (V2V communication) as well as with their surrounding road infrastructure (V2I communication).

Since the Pilot-T ASAM project started in July of last year, Aventi has developed and tested its RUC solution on real vehicles across the country.

“The goal of our RUC program is to provide a fair and accurate tax solution,” said Aventi Systems Engineer Bjørn Elnes. “At the same time, we want to reduce traffic congestion and incentivize environmentally-friendly driving habits.”

To achieve this goal, Aventi follows the Institute of Transport Economics’ suggestion to charge vehicle owners different rates depending not only on their mileage but also on the type of car, location, and time of driving. For example, drivers of fuel cars pay more than EV owners, drivers of large trucks pay more than those who own small passenger cars, and people who drive in urban areas during rush hours pay more

¹¹ “Introducing RUC to Norway” (Item 1 in references below).

¹² “Introducing RUC to Norway” (Item 1 in references below).

than those who drive in rural areas during off-peak hours. Aventi calls this pricing model “dynamic pricing with green geofencing.”

“This approach is unique to RUC programs in Norway,” said Elnes. “Most other countries charge a flat mileage fee that doesn’t vary based on the type of vehicle, location, or time.”

In parallel with this, the **Smartcar** project is used with drivers’ smartphones¹³:

“...to locate vehicles, read their odometer, and retrieve their make, model, year of production, and VIN in order to verify exactly which car a person is driving at a given time.

The Smartcar platform is compatible with most new vehicle models. As it communicates directly with each vehicle’s embedded telematics system, it returns actual, accurate information in real-time. This has helped Aventi alleviate all of the challenges involved in using C-ITS technology and smartphone telematics.”

Subject to the outcomes in Norway, it may be beneficial to advocate for Federal or State grants to run a pilot project of C-ITS in one or two states. This may be overseen by Infrastructure Australia or one of the transport departments.

-----00000-----

¹³ “Introducing RUC to Norway” (Item 1 in references below).

References

1. *"Introducing RUC to Norway"* from the staff writers in Traffic Technology Today:
<https://www.trafficechnologytoday.com/features/introducing-ruc-to-norway.html>
2. Jago Dodson and Tiebei Li in The Conversation *"Think taxing electric vehicle use is a backward step? Here's why it is an important policy advance."*
<https://theconversation.com/think-taxing-electric-vehicle-use-is-a-backward-step-heres-why-its-an-important-policy-advance-150644>
3. Ian Bushnell in the RiotACT! *"Barr rules out electric vehicle tax but road user charges are coming."*
<https://the-riotact.com/barr-rules-out-electric-vehicle-tax-but-road-user-charges-are-coming/422771>
4. Renew Economy *"2020 was the starter pistol on EVs – now the world looks to Norway for inspiration"*
<https://thedriven.io/2020/12/03/2020-was-the-starter-pistol-on-evs-now-the-world-looks-to-norway-for-inspiration/>
5. ABS Information sheet 91, Department of Infrastructure and Regional development, 2017
6. The Guardian, Dec 8, 2020 *"Australian states were warned road user tax on electric vehicles could discourage uptake."*
7. Renew Economy *"Biggest change since Model T": South Australia wants all new car sales to be electric by 2035"*
<https://thedriven.io/2020/12/20/biggest-change-in-model-t-south-australia-wants-all-new-car-sales-to-be-electric-by-2035/>
8. Final Report for the Electric Vehicle Council *"Uncovering the hidden costs and benefits from Electric Vehicles"*
<https://electricvehiclegouncil.com.au/wp-content/uploads/2020/09/EV-True-Value.pdf>.
9. Australian car market: Car sales, statistics and figures
<https://www.carsguide.com.au/car-advice/australian-car-market-car-sales-statistics-and-figures-70982>
10. Government of South Australia *"Electric Vehicle Action Plan"*, 2020,
<https://www.renewablessa.sa.gov.au/topic/zero-emission-vehicles>