Tax Working Group
Te Awheawhe Tāke

Tax Working Group Public Submissions Information Release

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[1] 9(2)(a) - to protect the privacy of natural persons, including deceased people;

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In preparing this Information Release, the Treasury has considered the public interest considerations in section 9(1) of the Official Information Act.

Emissions, Road User Charges and EVs – A Strategy

The government wishes to reduce carbon emissions associated with road transport. This short paper explores a strategy that would:

- Reduce emissions through accelerated take up of EVs
- Provide a bridging path to universal road user charging and
- Improve NZs balance of payments by reducing fuel imports.

Some key factors to be considered are:

1. The eventual widespread adoption of electric vehicles, including passenger use, will mean road transport will continue to be a viable low emission transport option.
2. A key goal is the acceleration of migration to electric vehicles to reduce emissions.
3. Reduction in fossil fuel imports will improve NZs balance of payments.
4. An increasing proportion of electric vehicles will result in petrol tax not providing an effective source of road funding prior to introduction of road user charges for EVs in Dec 2021. Diesel vehicles are already subject to road user charges (RUCs).
5. Annual relicensing could provide an alternative source of road funding but in its present form it does not reflect road usage.
6. There is a desire to charge tolls on new highways to help fund the cost of construction and to set a price reflecting the value in the faster travel.
7. The transport industry is beginning to use technology that tracks distance travelled and the path of that travel. This technology will become widespread in commercial vehicles and could also eventually be deployed in some form for private vehicle usage.
8. Vehicles increasingly include GPS technology and autonomous vehicles inherently rely on GPS navigation.

The ultimate goal should be a regime where all vehicle operating taxes reflect the usage of roads. Such taxation could have two components:

1. A fixed annual charge reflecting the value of having local road access that then offers the opportunity to travel. This is much like the fixed charge for electricity connection that provides the facility to use energy from the national grid when required e.g. if solar energy is insufficient. If appropriate, this charge could include an allowance for local road usage.
2. A variable charge that reflects distance travelled, associated carbon emissions, the weight of the vehicle and the type of roads used. An automated collection system applying to all vehicles would be the end goal.

A migration strategy for achieving these goals goal might be:

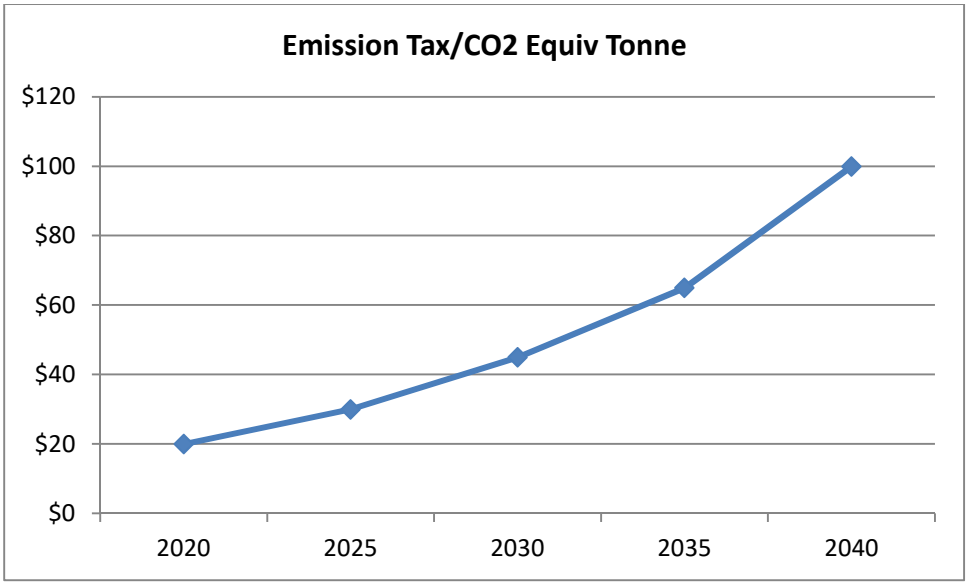
1. Add an emission tax to the current petrol taxes and use some or all of this to subsidise electric vehicle usage.
2. Apply a road user regime to electric vehicles, which in the early stages would provide a credit against distance travelled as opposed to a charge. There is presently no road user charge for EVs but the application of a user charge will ultimately be required in some form. This would be a way of getting early acceptance of a road user charge regime for EVs. Initially, the credit to EVs could be provided via distances recorded on an annual basis by vehicle testing stations and participating garages. New vehicles do not require testing for 3 years but the credit could still be acquired voluntarily by the owner having the travelled distance recorded by approved testing stations.
3. Apply tolls to key routes particularly where congestion occurs at peak times and provide an optional automated system based on GPS devices installed in the vehicles. To make adoption more attractive, a security option could be added to this system to enable stolen vehicles to be tracked quickly.
4. Develop the GPS based toll system into an automated road user charge system for all roads and vehicles. This system could be compulsory for all vehicles after a defined date sometime in the future.

Example Financial Model

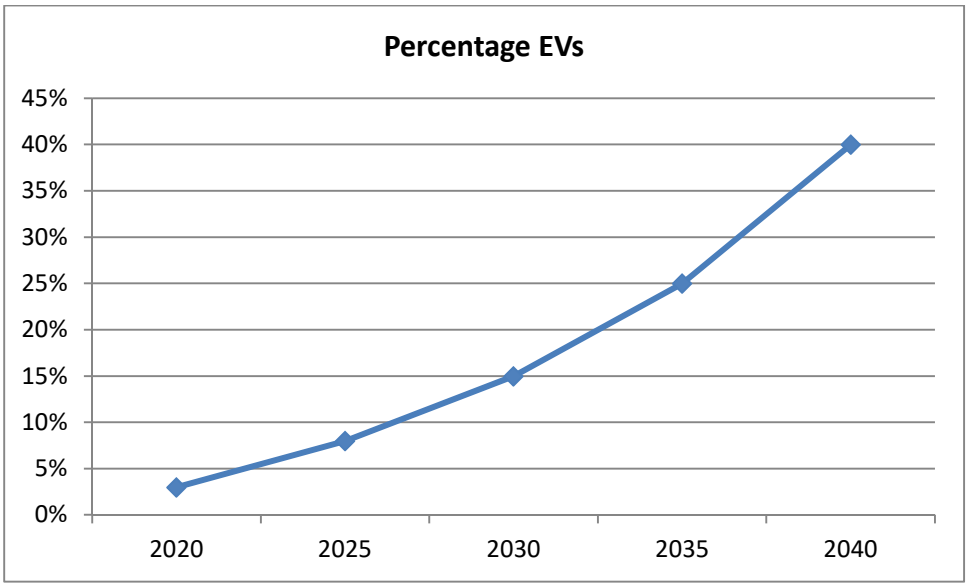
Assumptions used:

- Average distance travelled of 14,000km from AA data
- Average petrol usage of 8L/100km (mid way between the data provided by the AA for compact and medium cars).
- Carbon tax from petrol vehicles is 100% credited to EVs

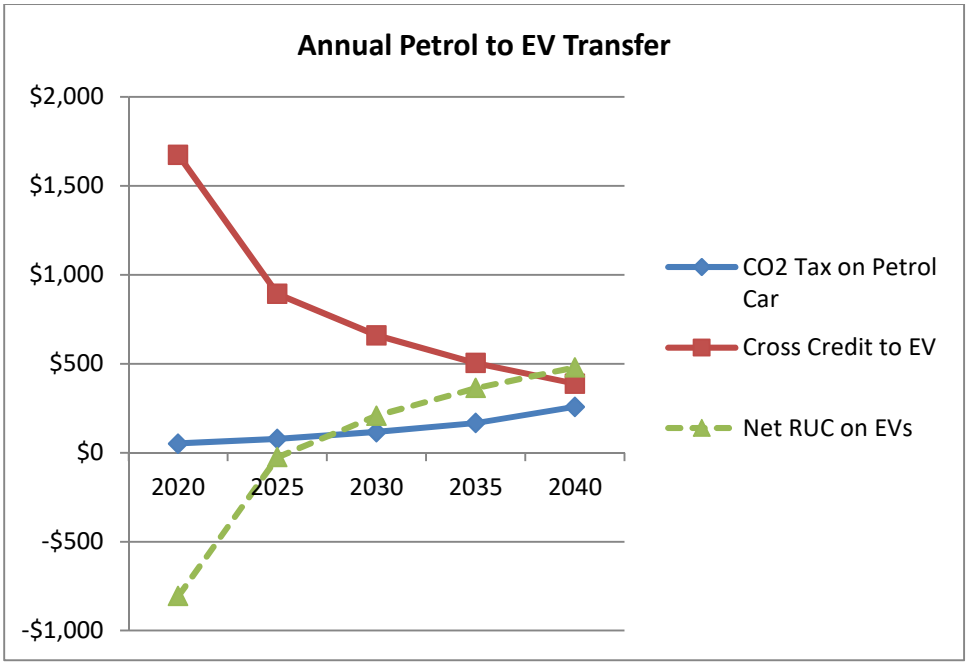
Carbon emission tax rates into the future have been modelled as follows:



The future penetration of EVs in the fleet is uncertain. One source quoted 2% by 2021. This model assumes a start of 3% by 2020 rising to 40% by 2040 per the chart below.



Based on these assumed forecasts, the modelled result for a carbon tax on petrol consumption and cross credit to EVs would be as follows. If the present road user charge of $62 per 1000km for a light vehicle was applied to EVs the net annual cost would be as shown, being a credit until about 2025 when EVs would begin to pay road user charges. A full RUC for 14,000km pa would be $868 and this would be reached as EV penetration approached 100%. When EV penetration has reached an acceptable level the full RUC could be phased in more quickly than shown in this model.

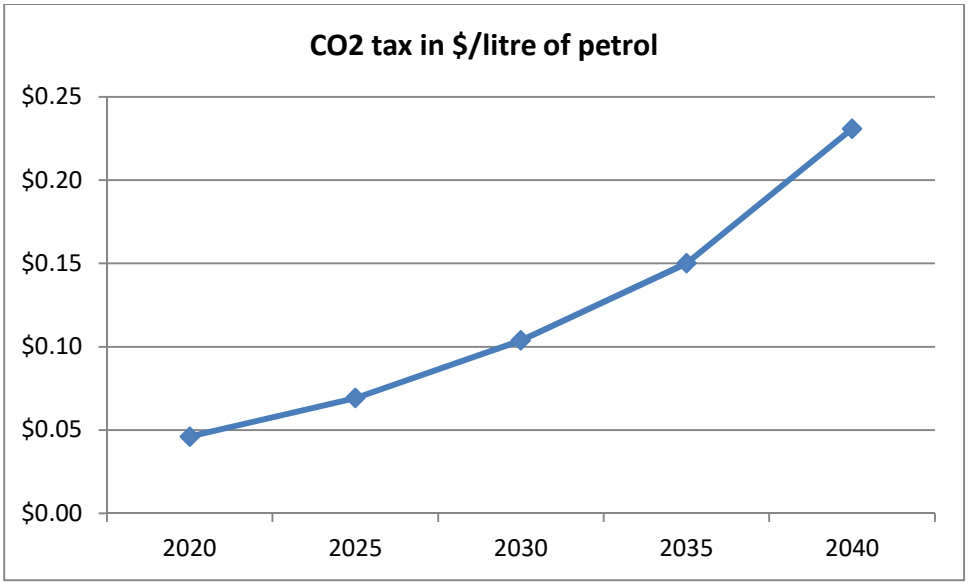


The above chart is simply one modelled scenario but it does show the possibility of greatly improving the attractiveness of owning an EV while providing a modest price signal to reduce petrol consumption. An advantage of an annual cross subsidy is that the current owner receives the benefit rather than just the initial owner. The annual cross subsidy would be proportional to the distance travelled and therefore the saved emissions from an alternative fossil fuelled vehicle. The cross credit could be adjusted such that it made the cost of running slightly positive to avoid a perverse incentive to drive more. In the model used here the credit was in the order of 5cents/km in the first year. Such a credit in early years would go a long way to making purchase of something modest like a Nissan Leaf EV more attractive and would target those who use a significant volume of petrol.

The implementation of this cross transfer could be achieved by simply adding EVs into the existing RUC systems. The distances travelled would be collected voluntarily until such time as the net charge became positive. Most EV owners would be only too happy to collect a credit.

Impact on Petrol Prices

At least in the early years, the impact on petrol prices would be small as shown below. The rising cost is solely driven by the expected increase in the price of carbon emissions.



Potential Obstacles:

1. A significant barrier to GPS based usage data might be that the data collected could have an impact on privacy and also the potential use for speed monitoring. A partial counter is the already pervasive use of location equipment in commercial vehicles. Private usage is the real issue and some ring fencing may be required, at least until the whole private transport sector moves toward autonomous vehicles or other similar modes.
2. There is a risk that GPS devices would be detached from vehicles or deactivated. This could be policed automatically through number plate recognition by roadside cameras matched to location of the vehicle from the GPS in the vehicle. If there is no match then the GPS is inactive or missing.
3. The additional carbon tax on petrol could be politically difficult but a carbon tax is inevitable at some stage and the initial impact is small at today's carbon prices. There is already the precedent of the Synthetic Greenhouse Gas Levy on some types of vehicle air-conditioning as an environmental tax. The suggested initial rate of carbon tax is less than the weekly movements in petrol prices.

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