

# Coversheet: Moving to a low emissions light vehicle fleet

Advising agencies	Ministry of Transport
Decision sought	Agreement to introduce legislation for Clean Car Discount
Proposing Ministers	Associate Minister of Transport

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## Summary: Problem and Proposed Approach

### Problem Definition

**What problem or opportunity does this proposal seek to address? Why is Government intervention required?**

#### Problem

Road transport accounts for around 90% of total transport emissions and it is New Zealand's fastest growing source of emissions<sup>1</sup>.

The Productivity Commission in its report, *Low-emissions economy*, August 2018, concluded that current policy settings will be inadequate to support a transition to a low emissions light vehicle fleet<sup>2</sup>. It recommended that additional measures be put in place to realise the benefits from low emission vehicles sooner rather than later.

Transport's contribution to domestic gross emissions is substantial and transport emissions are continuing to rise with population and economic growth. Rising transport emissions are not expected to start declining until 2022. This occurs in the context of New Zealand having the Emissions Trading Scheme (ETS)<sup>3</sup>. The status quo brings emission reductions too late, and the rate of decline projected will be too modest for the transport sector to meaningfully contribute to New Zealand achieving its Paris emission target.

This slow rate of change has embedded supply and demand issues. Suppliers are somewhat hesitant to bring in low emission vehicles where there is uncertainty around Government policies, uncertainty around sustainable demand at current pricing points, and where supporting infrastructure and services are limited. For some suppliers the problem is that low emission models are just not available.

On the demand side, many consumers show interest in electric vehicles (EVs)<sup>4</sup> technology but are concerned about:

- price of low emission vehicles, particularly EVs
- range anxiety
- the limitations arising from the limited range of low emission vehicles now offered, and
- the limitations of infrastructure including recharging.

#### Ability to address the light vehicle<sup>5</sup> emissions problem at this time

Ideally, it would be desirable to address both supply-side and demand-side issues at one time with an orchestrated policy package. To this end, the Government consulted on its two preferred policy options in July-August 2019, being:

- A feebate scheme to stimulate demand [named: *Clean Car Discount*]
- A vehicle fuel efficiency standard to effect the supply of more efficient (low emission) vehicles [named: *Clean Car Standard*].

<sup>1</sup> Source: <https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/nz-greenhouse-gas-inventory-2019.pdf>

<sup>2</sup> Vehicles such as passenger cars and light commercial vehicles under 3.5 tonnes gross mass. New Zealand's light vehicle fleet exceeds 4.1million vehicles.

<sup>3</sup> Explained in the Impact Statement section 2.2

<sup>4</sup> These are pure electric vehicles, battery electric vehicles and plug in hybrid electric vehicles (PHEVs)

<sup>5</sup> Light vehicles are cars, SUVs, commercial vans, utes and small trucks: all under 3.5 tonnes.

Unfortunately, it has become evident that it is not possible to implement a vehicle fuel efficiency standard as quickly as a feebate scheme. However, the continual growth of emissions from the light vehicle fleet means it is environmentally damaging to defer action any longer.

It is feasible for the Government to start addressing demand-side incentives to accelerate the uptake of low emission vehicles at this time. The feebate scheme was reasonable widely supported by those that engaged with the Ministry of Transport's discussion document. Furthermore, it is reasonably widely supported by New Zealand's motor vehicle industry, so long as it is designed well. Also it is considered:

- relatively straight forward in design and implementation compared to a fuel efficiency standard
- that the legislative underpinning would be less complex for the feebate scheme
- desirable and a matter of strategy to implement the demand-side feebate scheme in advance of a fuel efficiency standard
- that industry strongly supports an acceleration in demand of low emission vehicles to lead supply shifts.

On the other hand, the supply-side incentive of a fuel efficiency standard will take more time to design and implement as it is a much more complex policy solution. At the time of finalising policy settings for the feebate scheme there remain significant design questions for the fuel efficiency standard. For example, the Ministry of Transport (the Ministry) has yet to settle on appropriate fleet emission targets, an appropriate level of penalties for scheme non-compliance and how best to implement the scheme, particularly in the used vehicle import sector.

The Ministry has been in discussion with the Associate Minister of Transport on this situation and as a result has been instructed to prioritise work on the feebate scheme. The risk of delayed action to reduce transport emissions is the high level of locked in emissions that arise from the fact the New Zealand's vehicle fleet turns over slowly. Once a new vehicle enters our fleet it is driven until it is around 20 years old.

In conclusion, the Government is to consider the policy for a feebate scheme ahead of possible consideration of a vehicle fuel efficiency standard, and therefore a legitimate policy problem definition for the Ministry's regulatory assessment is:

**The policy problem is to most effectively incentivise the demand for low emission light vehicles.**

Scope of this Regulatory Impact Assessment (RIA)

The policy that this RIA covers relates to Government incentivising the demand for light vehicles that have low emissions. This is the ambit of the Cabinet paper supported by this RIA.

This scope is narrower than the preliminary RIA that was prepared to support the release of the discussion paper that served as the basis for consultation. This is because the discussion paper covered the proposal for a Clean Car Discount (a feebate scheme) and a Clean Car Standard (a vehicle fuel efficiency standard).

The scope for this RIA is also narrower than the broader range of policies being considered by Government in the context of the cross-government low emissions work programme and on climate change. Therefore, this RIA does not assess policy options that have the objective of directly increasing the supply of low emission vehicles into New Zealand, nor the removal of higher emitting vehicles from the existing domestic fleet.

### Opportunity

Although the change required in transport is substantial, there are tangible opportunities to reduce transport emissions. We have already changed the direction of transport investment, through the Government Policy Statement on Land Transport 2018, to achieve mode shift from private vehicles to walking, cycling, ride-share and public transport.

There are growing opportunities to have vehicle models imported into New Zealand that have various forms of electric energy motive power. The Ministry recognises that now is the right time for New Zealand to accelerate the demand for low emission light vehicles.

If consumers are incentivised to buy low emission vehicles then this will lead supply. New Zealand can gain from leading edge low emission technologies from new vehicles. We can also benefit from the existing EVs and hybrid technology vehicles entering New Zealand as used vehicles.

### Why is Government intervention required?

New Zealand's 2030 Paris Agreement target is to reduce emissions to 30 percent below 2005 levels by 2030.

Without additional policy intervention, the Ministry's vehicle modelling forecasts that road transport emissions would grow until around 2023 where they plateau, and then make a slow decline. There is considerable uncertainty around the rate of reduction. The most optimistic status quo result is that transport emissions are projected to be 9 percent above 2005 levels by 2030, and it would take to 2038 to reach the target of a 30 reduction from 2005 levels<sup>6</sup> – that is a further decade beyond Government's agreed target. This is a significant under-achievement of Government's commitment.

Incentivising the demand for light vehicle fleet to change more rapidly to a low emission fleet presents the greatest opportunity to reduce transport emissions.

Consultation with industry has given the Ministry awareness that Government intervention would be best to start with the vehicles entering the fleet, first with demand-side incentives, then supply-side interventions, and then address the removal of high emitting vehicles already in the New Zealand fleet. This provides a simple strategic approach for New Zealand to transition the light vehicle fleet in favour of low emission vehicles.

We reiterate that this RIA has been prepared to support the Government's intention to introduce legislation to support a feebate scheme. This is a demand-side intervention and so this analysis and commentary is focused on demand-side options.

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<sup>6</sup> Vehicle Fuel Efficiency Standard and Feebate Scheme: Cost- Benefit Analysis. Ministry of Transport

## Proposed Approach

### How will Government intervention work to bring about the desired change? How is this the best option?

All newly imported light passenger and light commercial vehicles whether new or used, would be subject to the Clean Car Discount feebate scheme. Consumers would receive a rebate, or be required to pay a fee, depending on the emissions of the vehicle they are buying. There will also be some vehicles that have a level of emissions that fall in a 'zero-band' where no fee or rebate is payable.

There is a graph at the end of this section of a feebate schedule to give the reader an idea of the schedule and some examples of the vehicles that would attract a fee or rebate. This is for new vehicles. Above the line are rebates and below the line are fees. Please note that the level of the rebate or fee is determined by the emissions intensity (CO<sub>2</sub> grams/km measured at the tailpipe) of the vehicle.

The level of the rebates and fees, and the emission levels they apply to will be adjusted annually. This annual adjustment is intended to ensure that there is reasonable balance in the fees received and the rebates paid out in each year. This balancing is required to enable the scheme to be managed to be fiscally neutral<sup>7</sup>. The ongoing monitoring and annual review of the fees and rebates is a characteristic of feebate best practise (this is further discussed in section 7 of this RIA).

For the initial year<sup>8</sup>, the feebate modelled by the CBA that supports this RIA has the following key parameters:

#### Key Parameters for the Feebate Scheme

Feebate for New Light Vehicles	Maximum	Minimum	Emissions
Fees	\$3,000	\$500	181 plus
Zero Band	\$0	\$0	151-180
Rebates	\$8,000	\$1,600	0-150

Feebate for Used Light Vehicles	Maximum	Minimum	Emissions
Fees	\$1,500	\$500	181 plus
Zero Band	\$0	\$0	151-180
Rebates	\$3,000	\$600	0-150

It is proposed that there be a price-cap of \$80,000 on the value of a vehicle to receive a rebate. Fees would apply to all vehicles regardless of retail price. The price-cap on rebates was proposed to prevent the scheme benefitting New Zealanders who are able to buy higher value vehicles. The value of \$80,000 represents an informed judgement about the price level at which New Zealanders are likely to consider a vehicle to be a luxury vehicle.

Labelling (including electronic notices on websites) will clearly provide consumers with

<sup>7</sup> Note that the operational expenditure for implementing the scheme will be met from the fees received.

<sup>8</sup> The actual fees and rebates will be implemented using a linear function. The metrics for the function will be determined based on the most up-to-date data the Ministry has available at that time. Not the metrics available at the time of consultation (2016 figures). So the metrics shown here are only indicative and will not be those finally implemented.

information on a vehicle's emission profile and the amount of the feebate. Thus, the emissions impacts (fee or rebate) will be clearly brought to the attention of the consumer. The feebates will not influence all consumers but for some the conscious awareness of climate changes and the incentive provided by rebates could drive the purchase decision to a low emission vehicle. As a broader range of low emission vehicles steadily comes to market EVs will inevitably progress towards the mainstream of vehicle marketing.

Displaying the feebate and having rebates paid to (and paid by) customers will encourage the following buyer behaviours:

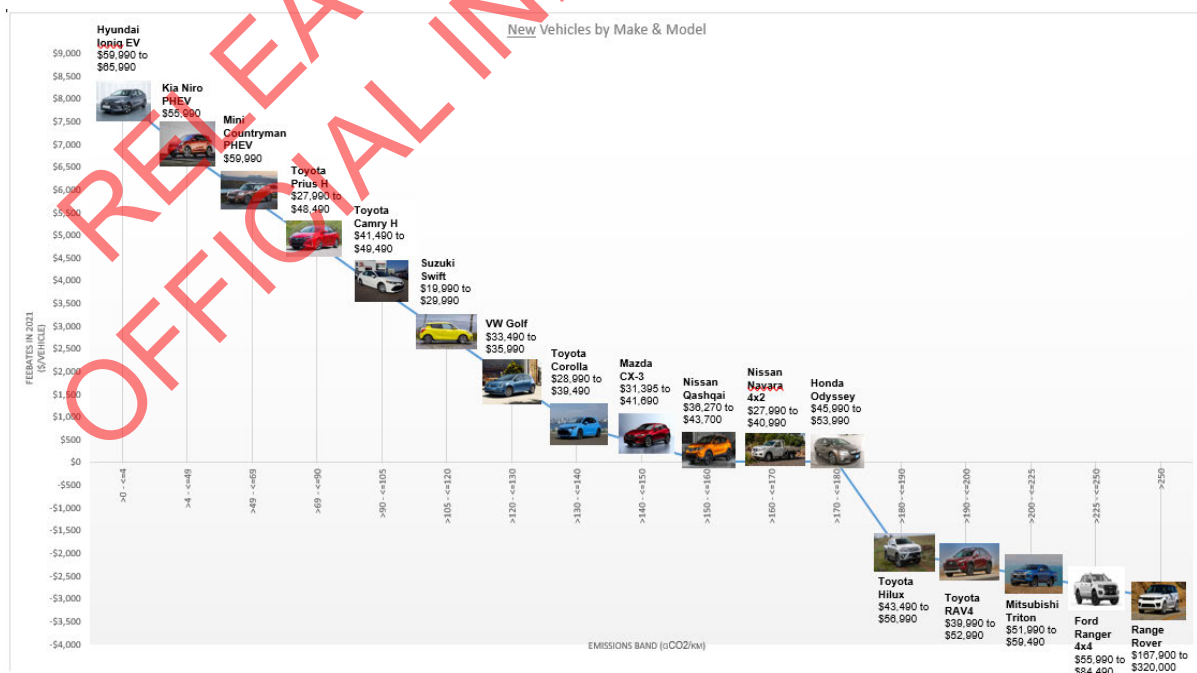
- emissions information and fees/rebates visible on imported vehicles will help inform consumers when choosing a vehicle to think about efficiency and the carbon emissions in their vehicle purchase decision-making
- fees discourage consumers from purchasing heavier vehicles that generate higher emissions
- rebates will help with the affordability of EVs and hybrids that are currently more expensive than conventional vehicles.

The scheme would be implemented so that the consumer pays the fee or receives the rebate. This would be at or about the time of vehicle registration and licensing for road use. Therefore, feebates are an immediate and direct driver for behavioural change.

Feebates will help accelerate demand and purchases of low emission vehicles, and that step-change in demand will provide more market certainty for vehicle suppliers to alter the model range towards lower emitting vehicles. Demand will lead supply change.

Thus the feebates will help improve the emissions profile of newly imported vehicles and in time this will progressively lower the emissions profile of New Zealand's light vehicle fleet.

**Graph: Example Feebate Schedule with vehicle examples**



**Key:**  
 EV = battery electric vehicle  
 PHEV = plug-in hybrid electric vehicle  
 H = hybrid

**Who are the main expected beneficiaries and what is the nature of the expected benefit?**

*Monetised and non-monetised benefits*

The feebate scheme has the objective of accelerating consumers' purchase decisions in favour of low emission vehicles. Thus it will stimulate demand for low emission vehicles and has a secondary economic response of helping support a shift in favour of low emission vehicle supply.

The Cost Benefit Analysis (CBA) supporting the feebate scheme estimates the following impacts:

- net CO<sub>2</sub> emissions improvements
- ownership cost savings
- changes in maintenance costs
- consumer welfare changes
- the capital and operating costs for the scheme.

There are three factors that affect the overall level of carbon dioxide emissions:

- an overall reduction in the use of fossil fuels when the number of low emission vehicles increase
- an increase in CO<sub>2</sub> emission from an increased demand for electricity due to increased uptake of EVs<sup>9</sup>
- a likely increase in CO<sub>2</sub> emission due to changes in the vehicle retention rate.

The net change in emissions equals the sum of all these three sources of changes in CO<sub>2</sub> emissions (in tonnes and dollars). Refer to Appendix A for a discussion of emissions benefits/impacts.

Lifetime energy costs from light vehicle imports include two components – fossil fuel costs and electricity costs. Estimates of fossil fuel use were obtained by converting the CO<sub>2</sub> emissions by an emissions factor (separate diesel and petrol factors weighted by total kilometres travelled for these two vehicle types). Estimates of electricity cost were obtained by multiplying the total kWh consumed by electricity prices (\$0.24 per kWh in 2020 increasing to \$0.28 by 2050). A sensitivity analysis was applied to electricity prices.

All fuel and energy costs excludes the projected levy from the Emission Trading Scheme (derived from the projected carbon price) because this represents a transfer payment and is also internalised by vehicle owners.

Maintenance costs of vehicles are reduced as one would expect because EVs have around 20 moving parts compared with 2,000 to 4,000 for a fossil fuelled vehicles. Changes in vehicle maintenance costs are based on data from the 2019 Electric Vehicle Prediction Model. Total maintenance costs for the baseline imports fleet were calculated separately from the maintenance costs of the imports that would arise when the feebate scheme is in place. Also adjustments were made in the CBA to account for increased maintenance due to reduced vehicle scrappage.

*How benefits fall*

The benefits would not fall evenly across society. Some 60 to 70% of new car sales are by businesses who will enjoy the rebate benefit. In addition, the social impact work indicates that certain household types are more likely to benefit compared to others. Those

<sup>9</sup> This CBA has not included any electricity use from hybrid vehicles due to the lack of information on the likely usage. However, this is not expected to increase the CO<sub>2</sub> to any large extent.

benefitting in the shorter term may likely be urban dwellers until a broader range of low emission vehicle types are available.

The main non-monetised benefits would be from:

- New Zealand's improved security of energy supply from the need to import lower volumes of fossil fuel and the energy substitution of locally generated electricity
- longer term behavioural responses as awareness of emission impacts grows<sup>10</sup>
- lower noise and air pollution leading to national health benefits.

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<sup>10</sup> Research has found that average vehicle buyers typically have poor knowledge and a low technical understanding of the impact of low carbon, fuel-efficient vehicles and of low carbon technologies. It is considered that this level of knowledge will improve over time.



## Where do the costs fall?

*Monetised and non-monetised costs; for example, to local government, to regulated parties*

The main costs from feebates would be incurred by vehicle consumers who choose high emission vehicles as they will need to pay any relevant fee. This cost imposition is an essential part of the scheme designed to incentivise consumer choice towards low emissions vehicles.

The costs will not have an even societal spread, at least initially. This is because of the limited range of affordable low emission vehicles available that offer strong load carrying and towing capacity, and also off-road capability.

This means that where this type of vehicle functionality is needed, the consumer has little alternative but to purchase a vehicle that would likely have emission levels that would result in the vehicle incurring a fee. Although we anticipate that there will be some models of utility type vehicles that fall in or near the zero-band and so the cost imposition for those would not be high.

Furthermore for the volume of new vehicle sales that are utility type vehicles a significant majority are purchased by businesses that enjoy taxation advantages (around 30% of purchase cost is deducted in the first five years) and so the emissions fee is not likely to present a big financial burden.

The feebate scheme does not apply to vehicles already within the domestic fleet. As such, the scheme is not expected to have a big impact on the consumers who buy from the domestic fleet.

The extent to which any welfare loss occurs will depend on a number of factors, including consumers' responses to environmental concerns/awareness of climate change, vehicle price changes, how importers will alter their vehicle offerings following changes in consumers' purchasing preferences, and how manufacturers are responding to the global shift towards low emission vehicles.

There would also be compliance costs to industry in displaying the fees and rebates, helping to make consumers aware of them, and data entry/record keeping costs. These are not expected to be high. Detail of the scheme's design has yet to be finished but it is being developed using existing industry interfaces and will likely be reasonably straight forward for vehicle dealers and individuals to use.

There will be costs incurred by government for the implementation of the scheme. These costs will include the CAPEX of designing and building the implementation system and the ongoing operational and monitoring/audit OPEX of the scheme.

The New Zealand Transport Agency (NZTA) will be responsible for implementing the feebate scheme.

**What are the likely risks and unintended impacts, how significant are they and how will they be minimised or mitigated?**

Supply not meeting demand

A key risk is that the feebate scheme encourages demand for low emission vehicles that exceeds the industry ability to supply.

In mid 2019 there were only 30 models of new EVs offered in New Zealand. Most of these were either small passenger vehicles or luxury passenger vehicles. There were a few light commercial vehicles and no utes. Therefore, consumer choice was severely limited and this will continue to be the case at the time the feebate scheme is started.

The Ministry is aware that more EV choices are available overseas, but some of these are only manufactured left-hand drive to be driven on the right-hand side of the road. We are also aware that following the large investments made by manufacturers in EV research and design, that more models will be marketed in the coming years.

Vehicle model cycles are around five years, and even when a model exists it may take six months to a year for it to be tested and specifications adjusted<sup>11</sup> for the New Zealand market. Also for some manufacturers the New Zealand market is simply so small, they will not supply vehicles here unless there is confidence in demand.

The Government rebates for EVs will stimulate demand and allow our local distributors to make the strongest possible case to their manufacturer/suppliers to get EV models into New Zealand.

For used cars, the market supply can respond more quickly; but in essence the EV vehicle choices are also limited. They are limited by the specifications applied in the Japanese domestic market which may mean that some cars are not eligible for entry into New Zealand because they are a class unable to be used on our roads; or not eligible for entry because of poor safety specifications.

Any vehicle not meeting New Zealand's vehicle safety standards cannot be imported, and so cannot be incentivised by the rebates offered under the feebate scheme. Used vehicle supply is also limited by what was manufactured in Japan say five to ten years ago, and by the competition at auction from other territories such as the Middle East and Africa wanting to bolster their supply of low emission vehicles.

Through consultation, vehicle suppliers are aware of the feebate scheme. Once it is formally announced they will likely respond to ready supply where this is possible.

Social inequity concerns

There is also the perception that some low income households could be penalised because low emission vehicles may not be available at an affordable price. This risk is minimised in practical terms because the feebate scheme does not impact directly on the existing vehicle fleet and a significant majority of low income households buy from New Zealand's used vehicle market where there will continue to be a steady market for people movers.

The impact of the feebate scheme will be to accelerate the uptake and importation of low emission vehicles and in time, these will become available on the domestic used vehicle

<sup>11</sup> Modern electronic safety systems must be tested and adjusted to ensure they work with New Zealand's road markings, road signage etc; and motor tuning must be mapped for New Zealand fuel quality.

market. Thus the medium to long term advantage is to all consumers.

[Redacted]

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**Identify any significant incompatibility with the Government's 'Expectations for the design of regulatory systems'.**

The feebate scheme is able to be implemented in a manner consistent with the Government's 'Expectations for the design of regulatory systems'.

This includes the Government's expectations for the design of regulatory systems and Government's expectations for regulatory stewardship by government agencies, identifying the actions that regulatory agencies should take to discharge their regulatory stewardship obligations.

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## Section C: Evidence certainty and quality assurance

### Agency rating of evidence certainty?

*How confident are you of the evidence base?*

The Ministry is confident of the evidence base it has used in this analysis. However, as described in the section 'Key Limitations or Constraints on Analysis', due to a lack of data/information, time and resources. Such limitations include factors affecting behavioural change as well as various price or cost projections. These are described in the CBA.

To understand how various uncertainties affect the final results, the CBA includes a range of sensitivity analysis and a simulation analysis to derive the range of possible costs and benefits of the policy.

Official vehicle importation data has been used, and fuel efficiency and emission results for makes and models of vehicles are specified and widely reported on websites. The following table of source material has been extracted from the CBA [the footnotes/references have not been reproduced:

**Table 6: Key inputs and data sources used in the cost benefit analysis**

Data sources	Inputs for the CBA	Coverage
Trade Me vehicle sales data	<ul style="list-style-type: none"> <li>Average vehicle prices and help to establish vehicle price projections for vehicles with internal combustion engine (ICEVs)</li> <li>Price elasticity of demand</li> </ul>	Unit records data from 1 May 2018 to 24 June 2019 (654,700 records with 27,340 useable for estimating price elasticities)
NZ Auto Car <sup>28</sup> NZ AA <sup>29</sup>	<ul style="list-style-type: none"> <li>Average vehicle prices for new light vehicles and for establishing vehicle price projections</li> </ul>	Makes and models available for sales in 2019
EV Prediction Model <sup>30</sup>	<ul style="list-style-type: none"> <li>Average vehicle prices and projections for hybrids and EVs</li> <li>Implied range and variety penalties for hybrids and EVs</li> <li>Average vehicle maintenance costs for all vehicle types</li> <li>Carbon price projections</li> <li>Electricity price projections</li> </ul>	2018 - 2050
Motor vehicle registration Vehicle Fleet Statistics Vehicle Fleet Emission Model (VFEM)	<ul style="list-style-type: none"> <li>The number of vehicle imports disaggregated by new and used imports, emissions and tare weight bands baseline and projections</li> <li>Average emission values for vehicle imported and projections</li> <li>Average vehicle kilometre driven by vehicle age (separate data for new and used imports)</li> </ul>	2018 - 2050
MBIE fuel price projections and EV Prediction Model	<ul style="list-style-type: none"> <li>Baseline fuel price and projections</li> </ul>	2018 - 2050

Feebate type schemes have been implemented internationally and their effects are well-proven. Our analysis has been informed by such information and particular technical design has been developed in consultation with the International Council on Clean Transportation.

There is uncertainty around the implementation of a feebate scheme in New Zealand. This results from the inherent difficulty in modelling the degree rebates will incentivise the uptake of low emission vehicles and the degree fees will curtail the demand for high emission vehicles. Considering overseas examples has been valuable, but none compare directly with New Zealand's situation and none have such large reliance on the importation of used vehicles.

Quality Assurance Reviewing Agency:	
Date:	27/11/2019
Comment prepared by:	Louise Dooley (Maritime New Zealand) Megan Moffet (Ministry of Transport) Killian Destremau (The Treasury)
Comment reviewed by:	Denny Kudrna
Name of originating agency:	Ministry of Transport
Quality Assurance Assessment:	
<p>A Quality Assurance Panel with representatives from Maritime New Zealand, Ministry of Transport and the Treasury Regulatory Quality Team has reviewed the Regulatory Impact Assessment “Moving to a low emissions light vehicle fleet” produced by the Ministry of Transport and dated 26 November 2019.</p> <p>The Panel considers that it <b>partially meets</b> the Quality Assurance criteria.</p>	
Reviewer Comments and Recommendations:	
<p>The RIA reviews both demand and supply-side options with the attached CBA report describing the impact of the proposed policy options. The proposals have been consulted on and feedback from stakeholders has been incorporated.</p> <p>The RIA suffers from the limited discussion of assumptions and inclusion of results from the CBA on the different proposed options. This concern is partly mitigated by evidence being available through the CBA report attached to the RIA.</p> <p>The problem definition restricts the RIA to ultimately only considering demand-side options and the underlying problem could have been better framed around reducing road transport emissions. The grounds for restricting the problem definition, urgency of action coupled with the pending design of alternative options (supply side in particular), did not entirely convince the panel. Finally, the consistency between the ratings of the options in the Impact Analysis on one hand and the estimated costs and benefits of the proposed options in the CBA report on the other is unaddressed in the RIA.</p>	

# Impact Statement: Moving to a low emissions light vehicle fleet

## Section 1: General information

Purpose
<p>The purpose of this RIA is to assess the options to accelerate the demand for low emission light vehicles entering the New Zealand fleet.</p> <p>This analysis and advice has been produced to inform:</p> <ul style="list-style-type: none"><li>• policy decisions to be taken by Cabinet</li><li>• legislative design that will be provided to Parliamentary Council Office.</li></ul> <p>The Ministry of Transport is solely responsible for the analysis and advice set out in this RIA, except as otherwise explicitly indicated.</p>
Key Limitations or Constraints on Analysis
<p><u>Limitations on Scope of this RIA in comparison to the Cost Benefit Analysis</u></p> <p>The work that was the foundation for the Government’s consideration of incentivising an accelerated uptake and demand for low emission light vehicles was the cross-government low emissions work programme. The programme established 18 initiatives that were grouped into the following four focus areas:</p> <ol style="list-style-type: none"><li>1. increasing EV uptake</li><li>2. transitioning the government vehicle fleet to be emissions free</li><li>3. lowering the emissions of vehicles entering the fleet</li><li>4. lowering emissions from the existing vehicle fleet.</li></ol> <p>Officials from the Ministry of Transport, the Ministry for the Environment, the Ministry of Business, Innovation and Employment, the New Zealand Transport Agency and the Energy Efficiency and Conservation Authority came together and completed the policy stocktake. Inland Revenue and the Treasury were subsequently consulted. This exercise identified, prioritised, and sequenced the initiatives officials considered the most important to achieving the objectives of the work programme.</p> <p>The Productivity Commission’s report, Low-emissions economy, August 2018, that concluded that current policy settings will be inadequate to support a transition to a low emissions light vehicle fleet<sup>12</sup> was also informative. It specifically described and</p>

<sup>12</sup> Vehicles such as passenger cars and light commercial vehicles under 3.5 tonnes gross mass. New Zealand’s light vehicle fleet exceeds 4.1million vehicles.

recommended the implementation of a well designed feebate scheme for New Zealand. Other policy options were included in this report including a vehicle fuel efficiency standard.

The Ministry considered these matters, and subsequent advice to the Associate Minister of Transport led to the release of a discussion document on 9 July 2019 that canvassed two policy schemes: the Clean Car Standard and the Clean Car Discount. The submissions were considered separately for both proposals.

The subsequent workshops and direction from the Associate Minister of Transport resulted in the acceleration of the Clean Car Discount: the feebate scheme. Thus there is an inherent limitation in this RIA: it assesses only the demand-side options pertinent to support the policy decisions being sought at this time to establish a feebate scheme relating to imported light vehicles.

In contrast to this the Cost Benefit Analysis followed a broader scope and includes evaluation of the feebate scheme as a stand-alone scheme, the fuel efficiency standard as a stand-alone scheme, and options involving a coupled implementation of both feebate and fuel efficiency standard. The CBA results that are included in this RIA are only the results for the stand-alone feebate scheme, as this is the only policy consideration for Government decision-making at this time.

#### Limitations on the quality of the data used for the Cost Benefit Analysis

Due to a lack of information, time and resources, the associated cost-benefit analysis does not include the following items:

- road safety impacts associated with changes in vehicle mixes, new technologies and scrappage rates – these are outside of the direct impacts of this proposal.
- health impacts due to reducing air pollution and noise from lower fuel consumption or abatement technologies and the accelerated take-up of EVs
- effect of the mandatory Electronic Stability Control standard on the policies.

The following impacts are implicitly included in the CBA through the use of price elasticity of demand:

- vehicle downsizing behaviours over and above the impacts predicted for the baseline
- new imports switching to used imports.

#### Generally limitations/constraints for the Regulatory Impact Assessment

The key limitation on the analysis in this regulatory impact assessment concerns data limitations. The specific limitations identified in the analysis include the following:

- there is a high level of uncertainty about the rate at which the range of low emission vehicles, including EVs, will expand globally and in New Zealand. For example the world's leading manufacturers of EVs are in countries (China, America, continental Europe) that are left-hand drive markets, and many models are not [yet] being manufactured in right-hand variants as we drive in New Zealand.
- it is not known when New Zealand could expect to have reasonably priced low

emission alternatives for the full range of conventional vehicles currently available, particularly utility type vehicles.

- it is also not known how quickly vehicle suppliers will alter their fleet profiles following changes in consumers' purchasing preferences, but industry has given the Ministry confidence that suppliers will respond to demand changes.
- the purchase price of EVs will be a key driver of uptake. However, it is not possible to project EV technology adoption and prices with confidence. In particular, there is a high level of uncertainty around when price parity will be achieved between EVs and their fossil fuelled equivalents.
- the Ministry's projections of EV uptake assume purchase price parity will occur around 2028. We expect this assumption is at the optimistic end.
- the analysis has assumed that the charging infrastructure for EVs will match the rate of EV uptake. Infrastructure will be commercially funded, there is no allowance for home or public fast-charge infrastructure funding by the Government in this analysis.

This RIA has been prepared to inform Ministers' decisions about approving policy for, and investment in, a feebate scheme to encourage the demand for low emission light vehicles.

**Responsible Manager (signature and date):**

Glen-Marie Burns  
Manager, Urban Development and Environment  
**Ministry of Transport**

30 November 2019

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## Section 2: Problem definition and objectives

### 2.1 What is the context within which action is proposed?

*The Government is committed to taking action on climate change*

- 1) In 1990, New Zealand's net greenhouse gas (GHG) emissions were 34,506.5 kt CO<sub>2</sub>-e.
- 2) Between 1990 and 2017, net GHG emissions increased by 22,388.5 kt CO<sub>2</sub>-e to 56,895 kt CO<sub>2</sub>-e, that was 64.9%.
- 3) In 2017, transport was responsible for 19.7 per cent of New Zealand's gross national greenhouse gas emissions.
- 4) Between 1990 and 2017, transport emissions increased 81.7%. However, the increase in road transport emissions between 1990 and 2017 was 93.4%.
- 5) Road transport accounts for around 90% cent of total transport emissions and it is New Zealand's fastest growing source of emissions<sup>13</sup>

Climate change poses significant risks to New Zealand's economic, cultural, social and environmental prosperity. Like other countries New Zealand is highly vulnerable to the impacts of climate change, which include sea-level rise, ocean acidification and the increased frequency and severity of flooding, wildfires and droughts<sup>14</sup>.

New Zealand is already beginning to experience significant costs and disruption from previously 'locked-in' climate change. More frequent and extreme weather events pose a significant risk to important infrastructure and assets. Climate change also presents a magnified security and economic threat in terms of increasing disaster risk management and migration pressures in the wider Pacific region<sup>15</sup>.

The specific economic costs of climate change impacts are difficult to estimate. However, a report, commissioned by the Treasury, found that climate change-related floods and droughts have cost the New Zealand economy at least \$120 million for privately insured damages from floods and \$720 million for economic losses from droughts over the last 10 years.

The Ministry for the Environment has estimated the economic impact of climate change on New Zealand and Australia, combined, is a one to two percent reduction in gross domestic product levels by 2060<sup>16</sup>.

The only way New Zealand can minimise these impacts and costs is by playing its part to ensure there is collective and effective global action to reduce GHG emissions.

<sup>13</sup> Source: <https://www.mfe.govt.nz/sites/default/files/media/Climate%20Change/nz-greenhouse-gas-inventory-2019.pdf>

<sup>14</sup> Reisinger et al, Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press. pp 1371-1438. 2014

<sup>15</sup> Ministry for the Environment, Regulatory Impact Statement, Zero Carbon Bill

<sup>16</sup> Ministry for the Environment. 2018a. Zero Carbon Bill Economic Analysis: A Synthesis of Economic Impacts. Wellington: Ministry for the Environment.

As a party to the Paris Agreement on Climate Change, New Zealand has endorsed the decision that the world reach net-zero GHG emissions by the second half of this century. Net zero means that GHG emissions are reduced to a level where the total amount emitted is no greater than the amount that can be removed from the atmosphere.

New Zealand has an interim target to reduce emissions to 30 percent below 2005 levels by 2030.

To bring New Zealand further in line with the global ambition set out in the Paris Agreement, Cabinet agreed to the Climate Change Bill [CAB-17-MIN-0547 refers] this year. The Bill will set a new 2050 reduction target in law that is consistent with New Zealand becoming a net-zero emissions economy.

Lowering emissions from transport is critical to meeting the net-zero challenge

Transitioning to a net-zero emissions economy will require significant economic change. The transport sector is expected to play a large part in this change. It accounts for 19 percent of New Zealand’s domestic emissions and it has been New Zealand’s fastest growing source of emissions (see Figure 1).

Between 1990 and 2016, overall transport emissions grew by 71 percent, with emissions from road transport growing by 82 percent. This compares with 20 percent for gross emissions across the total economy.

**Figure 1 – GHG emissions from transport 1990–2016**



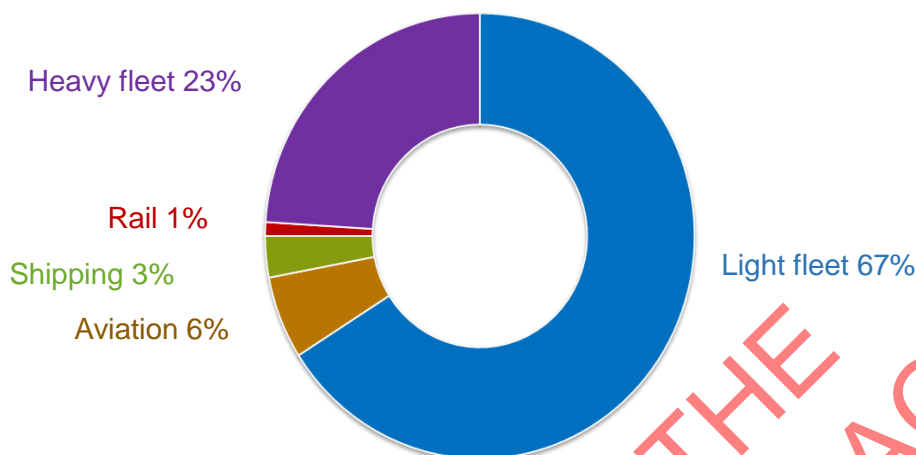
New Zealand’s use of transport is very emissions intensive when compared internationally. New Zealand’s per capita transport emissions are the fourth highest in the OECD and the ninth highest of all countries with a population over a million.

The transport emissions problem is predominately a road one

New Zealand’s high per capita transport emissions largely reflects the fact that our transport system is dominated by private road transport for moving people and freight.

Road vehicles are the primary cause of transport emissions growth, contributing 90 percent of transport emissions. The travel done in light vehicles accounts for 67 percent of transport emissions. This is 12 percent of New Zealand’s total gross emissions.

**Figure 2 – GHG emissions by transport mode**



To illustrate the significance of light vehicles, over the next 5 years over 1.2 million light vehicles are likely to enter New Zealand’s fleet. If powered by fossil fuels, these vehicles will lock-in up to 50 megatonnes of CO<sub>2</sub> emissions over the next two decades<sup>17</sup>. This is the equivalent of over half of New Zealand’s annual gross emissions.

What is expected to happen to transport emissions if no further action is taken?

Without any new road transport policies aimed at reducing emissions, light vehicle GHG emissions are projected to peak and plateau at around the year 2023 before falling<sup>18</sup>. There is considerable uncertainty about the pace of this eventual decline.

Even with the best case projections for the uptake of EVs, emissions will still be 9 percent above 2005 levels in 2030. It would take until 2038 to reach 30 percent below 2005 levels. The CBA that supports this RIA uses a relatively ambitious projection of un-incentivised EV uptake<sup>19</sup>. The best case projections, however, strongly illustrates the inadequacy of status quo.

Therefore, it is unlikely that our 2030 or 2050 climate targets will be met<sup>20</sup>. A regulatory solution is required in the public interest taking account of costs, benefits and other implementation issues.

Figure 3 compares the projected emissions trajectory for the light vehicle fleet, with the path that is consistent with New Zealand achieving net zero emissions by 2050 and transport’s reduction share that is in-line with the 2030 climate target. The blue line, emissions under the business-as-usual (BAU) is the counterfactual for the CBA supporting this RIA.

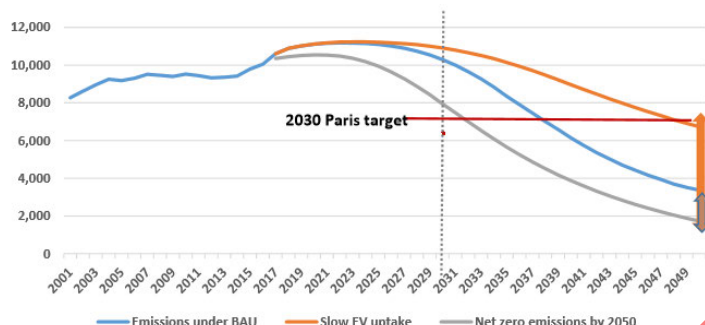
<sup>17</sup> New Zealand Productivity Commission (2018). Low-emissions economy: Draft report.

<sup>18</sup> Ministry of Transport (2016), Transport Outlook, <https://www.transport.govt.nz/mot-resources/transport-outlook/transport-outlook-future-state-model-results/transport-outlook-updated-future-state-model-results/>.

<sup>19</sup> Note that the preliminary CBA that supported the consultation document’s release used a slow EV uptake as the counterfactual. This assumption has been changed. This means that the CBA results that support this RIA are conservative so a BCR greater than one gives high confidence in scheme economic performance.

<sup>20</sup> Ministry of Transport (2019), Vehicle Fleet Emission Model.

**Figure 3: Greenhouse gas emissions (kilo-tonnes CO<sub>2</sub>-e) from New Zealand's light vehicle fleet**



Source: Ministry of Transport (2019), *Moving the light vehicle fleet to low-emissions: discussion paper on a Clean Car Standard and Clean Car Discount*, July 2019, Wellington.

### Nature of the Vehicle Market in New Zealand

Both the supply of new vehicles and the importation of used vehicles is a demand driven market. New Zealand imports around 300,000 vehicles into the fleet each year. About 60% are used imports and these are mainly purchased by private individuals. About 60 to 70% of the new vehicles are purchased by businesses, including leasing and rental companies.

As already noted, New Zealand is a right-hand drive market, limiting vehicle options. About a third of the world's population, and a quarter of its roads, are right-hand drive. The largest EV market is China and other significant markets such as the USA are left-hand drive. To date this has limited the range of EVs potential available to New Zealand.

### Demand

In recent years New Zealand has an increasingly strong demand for large, high tow rated, load-carrying, dual purpose utility and SUV type vehicles. Agricultural, contractors/trades businesses and tourism industries rely on these types of vehicles for specific applications. New Zealand's topography/terrain, relatively low urbanisation, and poor public transport system means driving distance between refuelling is an important concern for many vehicle owners.

The Clean Car Discount rebates will likely, in the shorter term, be taken up by early-adopters of EV technology in urban/suburban areas, primarily those with higher incomes, short distance-use profiles and potentially where a second vehicle is an option. This is mainly due to the current cost premium of EVs, relative low range, and the lower practicality of the older generation of EV in terms of size, towing capacity etc.

### New vehicle supply

The 27 suppliers of new vehicles negotiate with their parent companies for the models and volumes to be committed to the New Zealand market. Suppliers continually revise their product mix to stay in line with consumer demand. For most, New Zealand is seen as part of an Australasian market, so the model range can reflect the demand from Australia as well as New Zealand. For some technologies/models the relatively low quality of the fuels in

Australia and New Zealand limit the model variants that can be supplied.

Typically model life-cycles are in the order of five years. This means that there is a relatively slow but steady progression of technology adoption across new vehicle models. The market is strongly competitive so leading edge technology tends to sweep across all makes, initiating with luxury models and then filtering into more mainstream models. Technology change tends to start with passenger vehicles and then to commercial vehicles if appropriate.

#### Used imported vehicles

The Motor Vehicle Traders (MVT) register does not record how many traders are importers of used vehicles. The market is characterised by well established relationships between Japanese exporters/auctioneers/logistic managers and established New Zealand traders; and a large number of small importers, some not MVT registered. Small used vehicle importing is considered to be quite a transient type of business.

Vehicles for export to New Zealand are sold in a few large auction floors, where the importer places orders and agents bid on their behalf. These auction floors are competitive open markets with agents working for importers from many countries. New Zealand importers can not guarantee they will win any particular vehicle bid and so there is always an element of uncertainty around the planning of make/model selection for used vehicles.

Used vehicle importers need about six to eight weeks lead-time to select, inspect, repair, and ship a vehicle to New Zealand. There are about one to two weeks involved with importation certification and clearance requirements. The business needs upfront capital or a good line of credit (often provided by the Japanese exporter) to make purchases and secure various services along the way.

The majority of EVs in the New Zealand fleet have come in as used imports from Japan, and this source of EVs and other low emission models/variants will continue to be a crucial enabler of reducing GHG emissions from light vehicles.

## **2.2 What regulatory system, or systems, are already in place?**

The following measures are in place that impact on the consumer demand for low emission vehicles.

### *The New Zealand Emissions Trading Scheme (ETS)*

The ETS is New Zealand's principal policy tool for reducing GHG emissions. It establishes a price on GHG emissions that flows through to the cost of petrol and diesel. An objective of pricing GHG emissions is to moderate demand for transport fuel. This includes encouraging individuals and businesses to opt for more fuel-efficient vehicles.

The point of obligation for transport emissions sits with fuel importers and producers, however, the majority of the ETS cost is passed through to consumers. At the current New Zealand Unit price of around \$25 per tonne, the emissions component of fuel prices is just under 5 cents per litre for petrol and around 5.5 cents per litre for diesel<sup>21</sup>.

The measures analysed and supported by this RIA are designed to work with the ETS to lower emissions from light vehicles. The feebate scheme will provide financial incentive to

<sup>21</sup> New Zealand Productivity Commission, Low-emissions economy: Draft report, April 2018.

encourage the uptake of low emission light vehicles by reducing the financial barrier to their purchase. It will also send a clear message to the motor vehicle trade that Government is serious about New Zealand's pathway to a low emission economy.

#### The vehicle fuel economy labelling scheme

Motor vehicle traders are required to display fuel economy labels on all vehicles they are selling. The objective of the labels is to encourage vehicle consumers to consider fuel efficiency in their vehicle purchase decisions.

The labels use a star rating system and provide indicative fuel costs per year to help buyers easily compare the fuel efficiency of one vehicle to another. There is a star rating scale for all vehicles, with six stars for vehicles that are the most fuel efficient, and the least number of stars for the most fuel heavy vehicles. Fuel efficiency information also has to be displayed on trading websites if the vehicle is being sold online.

Some consumers may be aware that there is a direct correlation between fuel efficiency and tailpipe CO<sub>2</sub> emissions, others may not. The vehicle fuel economy label as currently prescribed, is intended to be expanded to include consumer-facing information about emissions and feebates.

#### The Electric Vehicle programme

This programme was put in place in May 2016 to help address the barriers to the demand/uptake of electric vehicles. Its key components are:

- exempting EVs from road user charges (RUC) until December 2021 for light vehicles and December 2025 for heavy, or until they make up 2 percent of their respective vehicle fleets<sup>22</sup>
- piloting aggregated EV procurement that combines EV demand from the public and private sectors
- supporting the development and roll-out of public charging infrastructure, including providing information and guidance
- providing \$1 million annually for a nationwide electric vehicle information and promotion campaign over five years
- the Low Emission Vehicles Contestable Fund that provides up to \$6 million per year until 2021/22 to encourage and support innovative low emission vehicle projects
- enabling road controlling authorities to allow EVs into special vehicle lanes on the state highway network and local roads.

There are also a number of fledgling schemes around the shared use of EVs. One example is the Mevo service in Wellington. All vehicles are PHEVs and clients book the use of these. Most client's are inner-city residents and businesses.

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<sup>22</sup> this policy is currently under review

## 2.3 What is the policy problem or opportunity?

### Policy problem

The Ministry considers that accelerating New Zealand's transition to a low emission light vehicle fleet is best approached in a strategic manner. The strategy is to start with the vehicles entering the fleet:

- first, with demand-side incentives
- second, with supply-side interventions.

Then it would be desirable to address the removal of high emitting vehicles already within the New Zealand fleet.

**The policy problem is to most effectively incentivise the demand for low emission light vehicles.**

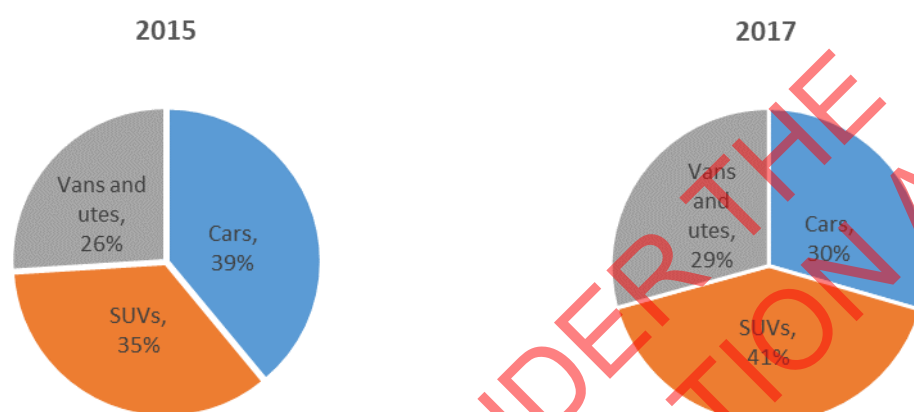
This will help New Zealand meet its 2030 and 2050 Paris Agreement emission targets.

At present the following challenges are limiting the demand for low emission vehicles:

- **Transition not fast enough.** The current demand-side interventions, including the ETS and the RUC exemption for EVs, have not encouraged a fast transition to a low emission light vehicle fleet. This is because consumers significantly discount future fuel costs in their vehicle purchase decisions.
- **The higher upfront cost of purchasing EVs.** New EVs are currently more expensive to make and buy than equivalent conventional vehicles. This is because the battery technology is relatively new in terms of mass utilisation for vehicles, and because global demand is in excess of supply. While battery technology is expected to follow a price maturity curve like other new technologies, main streaming is expected to be a decade or more ahead. The new vehicle suppliers in New Zealand have informed officials that at mid-2019, the EV variant of a model is priced on average around 1.5 to 1.7 times more expensive than its fossil fuel equivalent. For used EVs entering the fleet, price parity may be closer because EVs attracted subsidies when first sold in Japan which has meant their export price has captured some of this subsidy value for the New Zealand consumer.
- **Travel range anxiety.** Bigger battery packs increase an EV's range, but also increase price. The models of new pure EVs sold in mid-2019 with prices below \$70,000 can typically travel between 200 and 300 kilometres before they need recharging. For EVs over \$100,000 the range is typically in excess of 400 kilometres. Only one model, the Tesla Model S Long Range has a range exceeding 600 kilometres. However, even the more modest ranged EVs still have their place as a commuter and are especially suited to urban and suburban environments.
- **Availability of public charging infrastructure.** To date there has been a relatively strong response to the provision of public charging infrastructure. However, EV fast-charging units are hardly in the numbers or at the locations to be considered a mainstream network, yet.
- **A limited variety of EVs available in New Zealand.** This range has to compete with a much wider choice of conventional vehicles. Although more models will eventually become available, our market is very small and is not viewed as a priority market.

- **The burgeoning demand for a heavier type of vehicle.** A range of factors contribute to New Zealanders' preference for larger vehicles. Analysis of vehicle purchasing decisions shows that while fuel efficiency is valued by consumers, its benefits are less immediate and tangible than other considerations such as vehicle price, size, functionality, performance and safety. Also there is the effect of vehicle tax treatment. The trend to heavier vehicles can be seen in the changing vehicle mix (see Figure 4).

**Figure 4 – Composition of new vehicle sales**



Price support is justified

Providing price incentives through rebates for low emission vehicles to encourage demand is considered by the Ministry to be a necessary component for achieving a reduction in transport emissions thus helping New Zealand achieve its international climate change commitments.

The degree and pace of transition will require many New Zealanders who may still not be totally confident with EV technology to buy a low emission vehicle. Higher vehicle prices, battery range anxiety and limited vehicle choices and variety are also the key reasons for the slow uptake of EV technology.

Internationally, the uptake of EVs is still largely driven by the policy environment set by Governments. An uptake of EVs is rare in jurisdictions that do not have significant demand incentives to encourage the purchase of EVs<sup>23</sup>. An international review of EV uptake shows that financial incentives, and particularly reductions in up-front purchase costs, are the incentives that impact most strongly on EV purchase decisions. Non-financial incentives play a supporting, rather than a leading, role<sup>24</sup>. Examples of non-financial incentives include free parking, having a network of public charging stations and EV access to bus lanes.

<sup>23</sup> Barry Barton and Peter Schütte, Electric Vehicle Policy: New Zealand in a Comparative Context, Research Report, University of Waikato, November 2015

<sup>24</sup> Australian Electric Vehicle Market Study, Australian Government, May 2018.



## 2.4 Are there any constraints on the scope for decision making?

### What is out of scope?

#### *Variable annual vehicle licensing fees based on CO<sub>2</sub> emissions*

An approach of influencing the demand for low emission vehicles through variable annual vehicle licensing fees based on CO<sub>2</sub> emissions has been ruled out as instructed by the Associate Minister of Transport. This is because it could be seen as conflicting with the decision the Government took in December 2018 to end the ACC Vehicle Risk Rating programme. This programme applied different levy rates in the annual vehicle licensing fees to different makes and models of vehicles based on their safety ratings. This is analogous to varying licensing fees on the basis of their CO<sub>2</sub> emissions.

The vehicle risk rating has ended. Moreover, variable annual licencing fees would unfairly penalise vehicle owners for past purchase decisions. Also importantly, low-income households would be impacted more by the increase in motoring costs as a greater share of their income is spent on transport.

#### *Supply-side interventions to impact on the industry's selection of vehicles imported to New Zealand*

The Ministry's July 2019 consultation document '*Moving the light vehicle fleet to low emissions: discussion paper on a Clean Car Standard and Clean Car Discount*' deliberately covered the Government's preferred options for (1) encouraging suppliers to select more fuel efficient vehicles for importation and (2) for incentivising consumer demand for low emission vehicles. Including these two proposals in the same consultation paper may have given the impression that the schemes need to be implemented together. However, the desire to drive a reduction in light vehicle emissions can be delivered by policies that target demand, or supply, or by a combination of both. These could be coupled as two separate proposals to be legislated for and implemented at the same time, or coupled by integrating the essential elements of both schemes into one.

Through the consultation, a case was made for a combined scheme where the total penalty accrued from the standard in a year would be applied to vehicles as a fee, and this would fund the rebate to incentivise the demand for low emission vehicles. The fees and rebates would be paid to the importer and the market would serve to adjust sale prices up or down accordingly.

Any approach that couples the demand-side incentives with supply-side interventions has been determined to be out of scope by the Associate Minister of Transport who has instructed the Ministry to prioritise work on the feebate scheme. There are a number of pragmatic issues that support this direction:

- the feebate scheme is relatively straight forward in design and implementation compared to a fuel efficiency standard
- the legislative underpinning would be less complex for the feebate scheme
- it is desirable and an aspect of strategy to implement the demand-side feebate scheme in advance of a fuel efficiency standard
- the industry strongly supports an acceleration in demand of low emission vehicles to

lead supply shifts.

However, for completeness purposes this RIA includes supply side options in section 3.3 below.

*What are the interdependencies or connections to other existing issues?*

*Vehicle safety*

Some commentators have linked the feebate scheme to vehicle safety policies pointing out that the rebates will apply to some vehicle models/variants that have an ANCAP<sup>25</sup> safety rating of 1- or 2-stars on a 5-star scale. This application is correct. New Zealand's array of vehicle safety standards prevents unsafe vehicles from being imported into New Zealand. These standards are progressively strengthened over time. So by definition, only vehicles that are safe can receive a rebate (or fee).

*Electronic Stability Control*

One important policy that impacts on vehicle availability is the New Zealand standard relating to the safety requirement that vehicles have electronic stability control (ESC). This standard applies to new light vehicles and has been progressively applied to used imports. The last tranche of used vehicles to be banned under this standard are used smaller light passenger (under 2 litre engine capacity) vehicles and light commercial vehicles without ESC. This will apply from 1 March 2020. From that date, all light vehicles entering New Zealand will need to have a compliant ESC system. This will result in a reduction in the range of used vehicles able to be imported, including some of the cheaper model variants of passenger vehicles.

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<sup>25</sup> The Australasian New Car Assessment Program provides independent vehicle safety ratings. These ratings take into account the level of occupant and pedestrian protection provided by new vehicles through the conduct of physical crash tests and the assessment of collision avoidance technologies.

## 2.5 What do stakeholders think?

### Early consultation

The Ministry gained some information on the industry's perspectives on a feebate scheme from the public submissions on the New Zealand Productivity Commission's *Low-emissions economy: Draft report*. These were considered in the preparation of the public consultation document but greater weight was placed on the Productivity Commission's advice on design.

### Ipsoso consumer survey

Another early consultation initiative that related specifically to low emission vehicle demand was a small consumer survey commissioned by the Ministry and the Energy Efficiency and Conservation Authority (EECA). The survey was done by Ipsoso (Global research agency). They conducted 24 individual in-home interviews across Auckland and provincial Waikato with participants representing a range of household structures: for example self-employed/small-business owners, younger family, older family group needing a people mover. Fieldwork was done in February 2018.

Some key learnings from this survey were:

- While some viewed feebates as a tax, they did not see this necessarily as a negative as most really liked the idea of the money from the fees being retained within the system rather than being a tax that goes into general spending.
- Having fees (as opposed to just rebates) applying to high vehicle carbon emissions was seen as encouraging better decision making when purchasing a vehicle.
- The majority of participants felt that +/- \$5,000 would sway purchase decisions; +/- \$3,000 may encourage participants to look at other vehicles; anything less than +/- \$3,000 would not make them consider other alternatives.

### Formal public consultation

A discussion document was released on 9 July 2019. The document proposes two Clean Car Reforms: the Clean Car Standard and the Clean Car Discount. Consultation involved three processes:

- i. a public online survey with questions linked to the discussion paper
- ii. substantive written submissions on the discussion paper, and
- iii. a round of stakeholder workshops.

Submissions, including the online survey closed on 20 August 2019, although an extension to 10 September was allowed for core stakeholders including the Motor Industry Association (MIA), the Imported Motor Vehicle Industry Association (VIA), the Automobile Association (AA) and the Motor Trade Association (MTA) to allow them time to provide data in evidence of their views.

The Ministry received 860 online submissions, 196 email submissions and 1,624 emails from the National party's *Campaign Now* petition.

For the online survey 83.4% of respondents supported Clean Car Discount. For the 132 email submissions that clearly indicated support or opposition, 85.6% supported Clean Car Discount. Specific comments covered matters like the impact of timing of scheme implementation versus announcing the scheme, and the proposed price-cap.

A number of individual submitters evidently represented those with a strong concern about the environment and global warming. Often these submitted that the feebate scheme should be accelerated and offer greater incentives, including inclusion of electric bikes for example.

Virtually all *Campaign Now* emails were pro-forma submissions opposing Clean Car Discount although a few of these submitted in support of Clean Car Discount. Owing to the pro-forma approach to this, submitters gave no evidence of having read the discussion paper nor of understanding the proposal, and made no reference to any particular aspect of the scheme. Perhaps the key theme of opposition from the National party's wording was "the proposal will hurt New Zealanders, particularly those who don't have a low-emission vehicle options that fit their lifestyles" and that "New Zealanders can't afford another tax".

The industry submissions suggest a number of specific design modifications, mainly for the Clean Car Standard, with a few relating to Clean Car Discount.

#### Post consultation and workshops

The workshop that considered Clean Car Discount modifications was held on 8 October. It was attended by MIA, VIA, AA, MTA, EECA, NZTA, and Ministry officials. The workshop confirmed a number of design principles:

- consumer-led demand is critical for the transition to a low-emission light fleet.
- the feebate scheme will put fees on high emission vehicles, and provide for rebates on low emission vehicles.
- there will be a feebate schedule for new vehicles and a separate feebate schedule for used vehicles.
- the feebate schedules are emission based only (not weight-based or footprint-based, not targeting specified engine/fuel types, and not vehicle specification dependent). Note that this means the rebates would incentivise hydrogen vehicles and compressed air powered vehicles.
- the feebate scheme is to be fiscally neutral over the life of the scheme.
- consumer visibility of the amounts of the rebates and fees at the point of vehicle sales is critical and will be provided by clearly displayed vehicle labelling including for electronic sales.
- the feebate schedule should be in the form of a continuous formula function as opposed to stepped changes.
- the feebate schedule should complement and match the national emission target should the vehicle fuel efficiency standard proceed.

## Specific consultation results regarding the feebate scheme's design

### *The price-cap for rebates*

In the discussion paper it was proposed that vehicles with a retail price of \$80,000 or more would not be eligible for rebates. This was to prevent the scheme transferring wealth to New Zealanders who are able to buy higher value vehicles. Consultation confirmed that wealth transfer was a big concern for many, thus confirming the need for a rebate price-cap.

The MIA and a number of vehicle suppliers, and some others suggested that the price-cap should be removed or raised, even if this were for a limited period of time. Industry consider that increasing the price-cap would increase demand for new EVs, would help make models that have better ranges more affordable (helping the range anxiety issue), and could help persuade manufacturers to increase the model range of low emission vehicles made available in New Zealand.

### *Treatment of productive vehicles*

In the discussion document, the example feebate schedules vary fees and rebates only on the basis of emissions, there is no distinction between passenger vehicles and commercial vehicles and no special treatment for productive vehicles.

The appropriate treatment of productive vehicles was raised by several submitters. These included members of the public, Federated Farmers, and the MIA and several of its members including Ford, Isuzu and Holden, and *Campaign Now*. These submissions spoke of the high NZ demand for more productive vehicles, with higher load capacity, more utility such as 4x4, ability to tow and with multi-tasking capability – comfort and safety for 4/5 passengers. Submitters also described aspects of New Zealand geographic and the business economy that make these vehicle types so advantageous, particularly for non-urban use.

These types of vehicles currently have very limited low-emission offerings. There are no low emission one-tonne utes. From industry we understand that light commercial vehicles tend to be last in line for the adoption of leading edge technology. In the context of the Clean Car Discount, the purpose of these submissions was considered to be to exempt productive vehicles used in the agriculture, aquaculture, forestry, dairy, building, construction, transport, and logistics sectors from fees while there is no viable low emission alternative.

In contrast the International Council on Clean Transportation made the following general comment: “The technologies available to improve efficiency of both cars & SUVs and light-commercial vehicles comprising light trucks such as pickups and vans are largely similar. Hence, the best practice is to regulate all vehicles together...”

### *Timing of the feebate scheme*

The discussion paper suggested the scheme would come into effect in 2021. A reasonable number of submissions expressly commented on the desire to speed up implementation of the Clean Car Discount and/or to ensure that there be minimal delay between announcing the scheme and its commencement.

The MIA and a number of vehicle importers expressed a desire to see the Clean Car Discount implemented with a reasonable time period of operation before the Clean Car Standard is implemented. This is because of the industry's conviction that the shift to low emission vehicles must be consumer-demand led.

Other pertinent matters commented on but not directly related to the feebate scheme (this is not an exhaustive list)

#### *Taxation incentives*

[REDACTED]

Withheld under Section 9(2)(f)(iv) of the Official Information Act 1982

#### *Existing domestic light vehicle fleet*

A number of submitters covered a range of policy options for improving the emissions of the existing fleet and opening the way to accelerate the demand for newly imported low emission vehicles. The most popular policy was for a nation-wide scrappage scheme to get old high emission vehicles off the road. Other suggestions included having registration fees based on a vehicle's emission/or age – the higher emitting vehicles/older vehicles costing more to register; and that WOF checks should become more stringent and cost more for older vehicles.

#### *Infrastructure*

The submissions raised matters such as subsidies for home EV chargers, the provision of more public fast-chargers, and the provision of hydrogen infrastructure. Also, mentioned was the need for infrastructure to cover battery refurbishment, battery recommissioning, battery disposal, wider EV servicing capacity (mechanical and body repair).

#### *Modal shift*

Several submissions encouraged Government to be more active in encouraging modal shifts to active forms of transport and to help public transport to be more available and less costly.

## Section 3: Options identification

### 3.1 What options are available to address the problem?

As a result of the extensive consultation and international research, including direct communications with the International Council on Clean Transportation, we were able to rule out a number of options as inferior to a feebate scheme and hence these were not considered further (refer to section 3.3).

The options considered were the counterfactual (status quo), the feebate scheme (Clean Car Discount), grants for the purchase of EVs, and CO<sub>2</sub>-based registration fees applicable when a vehicle is registered for the first time in New Zealand.

#### Status quo

This option would see a continuation of the policies already in place (refer to section 2.2), but no further demand-side incentives at this time.

### Feebate scheme

This option would seek to shift consumer demand towards less emissions-intensive vehicles. Consumers would either receive a rebate, or pay a fee, depending on the CO<sub>2</sub> emissions of the vehicle they are buying. Low emission vehicles, like EVs, would attract rebates, while high emission vehicles would attract fees. Thus a feebate scheme has the advantage of both incentivising the uptake of low emission vehicles while at the same time discouraging the purchases of high emission vehicles.

The rebate/fee would be visible to the consumer at the point of purchase. Feebates would apply only to new and used vehicles sold for the first time in New Zealand. The scheme would not cover vehicles that have already been used in New Zealand.

The scheme would be managed to be self-financing with the rebates paid from the fees collected. So effectively the scheme works as a hypothecated fund – people buying low emission vehicles would receive a rebate paid for by the people buying high emission vehicles.

Based on international experience, feebates are likely to be effective in shifting consumer demand to low emission vehicles. This experience shows that financial incentives, particularly up-front reductions in purchase costs, are amongst the incentives that impact most strongly on EV purchase decisions<sup>26</sup>.

### Grants for the purchase of EVs

Many European countries provide grants, or subsidies, for the purchase of new EVs and plug-in hybrids<sup>27</sup>. California also has its well known discount scheme. These schemes have been effective, but several have run into budgetary/funding limitations that have reduced ultimate effectiveness. Grant schemes are like having the rebate side of feebates, but funded them directly by Government appropriation or other funding arrangements external to the scheme.

This option misses the opportunity to dissuade the purchasing of high emission vehicles through the fee side of feebates.

### CO<sub>2</sub>-based first registration fees (when vehicle is registered for the first time in NZ)

Internationally, fiscal measures like variable registration fees are seen as an effective way to encourage a shift towards less emissions-intensive vehicles<sup>28</sup>. Many countries, including the United Kingdom, Ireland, Japan, Sweden, the Netherlands and France have vehicle registration fees that include an element based on CO<sub>2</sub> emissions. We have noted that some of these countries have also implemented feebate or grant schemes, thus indicating that registration fees based on a vehicle's CO<sub>2</sub> emissions have limited behavioural impact by themselves.

<sup>26</sup> Australian Electric Vehicle Market Study, Australian Government, May 2018. D'Haultfoeuille, X (2016) et al, Disentangling Sources of Vehicle Emissions Reduction in France, CREST. [http://eupocketbook.org/wp-content/uploads/2017/11/ICCT\\_Pocketbook\\_2017.pdf](http://eupocketbook.org/wp-content/uploads/2017/11/ICCT_Pocketbook_2017.pdf)

<sup>27</sup> For example, in the United Kingdom grants of up to £4,500 off the price of a new pure EV car and up to £8,000 off the price of a new electric van are available. Lower grants apply to plug-in hybrids. See [www.goultralow.com](http://www.goultralow.com)

<sup>28</sup> International Energy Agency (2012) Improving the Fuel Economy of Road Vehicles: A policy package. OECD/IEA, Paris. <https://www.iea.org/publications/freepublications/publication/policy-pathways-improving-the-fuel-economy-of-road-vehicles---a-policy-package.html>

This option seeks to encourage the demand for low emissions vehicles by charging registration fees based on a vehicle's CO<sub>2</sub> emissions. With this option the cost of a vehicle's first registration fee would include a component reflecting the vehicle's CO<sub>2</sub> emissions. The registration fee would be higher for more emissions-intensive vehicles and would scale down for low emission vehicles. Pure EVs would not attract any CO<sub>2</sub> charge within the vehicle registration fee. Simply put, this includes the fee part of feebates (although the fees would apply right the way down to some predetermined emission level near zero) without the positive incentive provided by the rebates on low emission vehicles.

**Ministry Statement:**

The following two options are added for completeness despite the Ministry's view that they:

- are not options relevant for the scope of this RIA which is demand-side incentives for accelerating the uptake of low emission vehicles
- do not directly align with the problem definition presented in this RIA
- do not directly relate to the policy decision-making, legislative framework design or implementation approaches being considered by Government which have necessitated the requirement for this RIA
- are not yet complete as several key policy settings for the vehicle fuel efficiency standard have yet to be settled on. Of particular concern is the fleet average emission targets, the level of the penalties and the implementation approach(s). This means that the analysis for the following two options can only be considered broadly indicative at this stage
- the inclusion of the vehicle fuel efficiency standard at this time is pre-emptive of future policy decision-making by the Government.

Vehicle Fuel Efficiency Standard (VFES)

This option would reduce the average CO<sub>2</sub> emissions of new and used vehicles coming into New Zealand by regulating a national CO<sub>2</sub> emissions target. Vehicle suppliers would have to meet this target on average across the fleet of vehicles they sell in New Zealand in a given year. Suppliers would meet the target largely by selecting vehicles with better technology. For small volume importers the target would need to be met by the individual vehicles. Where the supplier's fleet average exceeds the target, or the individual vehicle for a low volume importer exceeds the national target, a penalty fee would be payable, thus the scheme provides a pecuniary incentive to comply and in this way would seek to increase the supply of low emission vehicles.

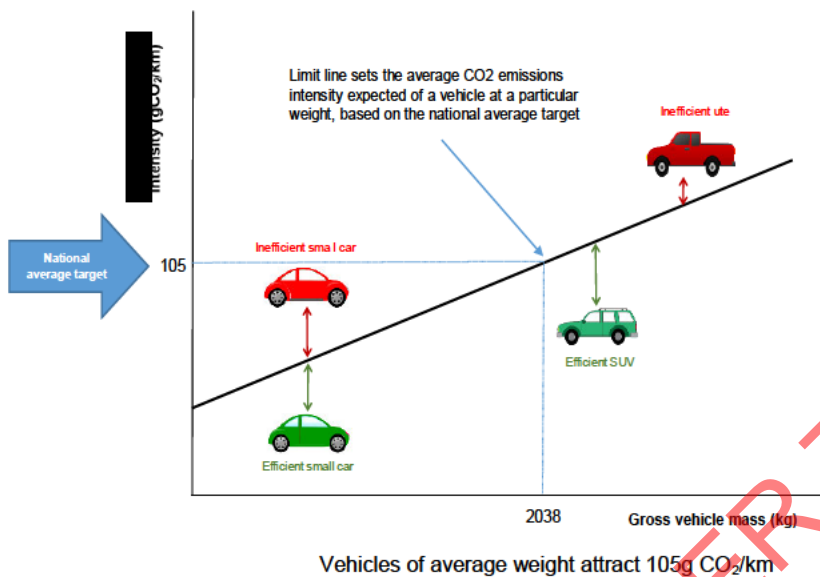
The fleet-averaging basis for larger volume suppliers means individual vehicles would not have to meet the CO<sub>2</sub> emissions target. This allows a broad range of vehicles to remain on sale, with vehicle suppliers deciding where they will make improvements across their fleets to ensure compliance with the national CO<sub>2</sub> emissions target.

In other words, high emission vehicles, like some models of commercial vans and utes that are not yet available in electric or hybrid variants, would still be offered to consumers. However, to achieve the average target, suppliers would have to balance these high emission vehicles with a sufficient number of low-emission vehicles.

In line with international best practice, the national CO<sub>2</sub> emissions target would be adjusted by vehicle weight. This recognises that heavier vehicles require more fuel to move and have more emissions. A weight driven formula for the target creates a continuous emission line, thus allowing the wide range of vehicles in the light fleet, from small cars to large utes, to all



have an appropriate average emissions target. This is illustrated in the following diagram.



Should this option be pursued, consideration will also be given to whether there should be more than one national target line. For example, should New Zealand follow the European approach and distinguish between light passenger vehicles and light commercial vehicles?

Internationally, vehicle fuel efficiency standards have been effective in mobilising the large, low-cost carbon mitigation opportunity available in vehicle efficiency technologies<sup>29</sup>. A 2015 evaluation of the vehicle fuel efficiency standard that regulates new light vehicles sold in the European Union, found that it is likely to have accounted for between 65–85 percent of the reductions seen in tailpipe emissions over the period 2009–2014<sup>30</sup>.

The caveat on this evidence is that it comes from countries that have a motor vehicle manufacturing industry, and New Zealand does not. Also, we are not aware of any international example where there would be the same reliance as New Zealand has on the importation of used vehicles. New Zealand's large volume of imported used vehicles may also require a unique approach to the implementation of a vehicle fuel efficiency standard in New Zealand so that administration/transaction costs are not burdensome on the sector.

#### Combination of Feebate scheme and Vehicle Fuel Efficiency Standard

Through the consultation process a case was made for a combined scheme where the total penalty accrued from the standard in a year would be applied to vehicles as a fee, and this would fund the rebate to incentivise the demand for low emission vehicles. The fees and rebates would be paid to the importer and the market would serve to adjust sale prices up or down accordingly. This approach seems practical and efficient on face value, but the Ministry is concerned that it could appear to focus on the fuel efficiency standard as a punitive measure designed for the purpose of gaining revenue. This perception misrepresents the role of the standard.

<sup>29</sup> International Energy Agency 2012, Technology Roadmap, Fuel Economy of Road Vehicles, OECD/IEA, Paris

<sup>30</sup> European Commission (EC) 2015, Evaluation of Regulations 443/2009 and 510/2011 on CO<sub>2</sub> emissions from light duty vehicles, Final Report, 8 April 2015  
[https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/docs/evaluation\\_ldv\\_co2\\_regs\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/vehicles/docs/evaluation_ldv_co2_regs_en.pdf)

An alternative is to simply implement the feebate scheme at the same time as the vehicle fuel efficiency standard. The CBA prepared by the Ministry has assessed various options for a combined feebate and vehicle fuel efficiency standard. These various options cover a range of emission targets, as the targets have yet to be determined.

### 3.2 What criteria, in addition to monetary costs and benefits, have been used to assess the likely impacts of the options under consideration?

In analysing the options we are seeking to ensure that they will achieve the objectives for climate change policy development and decision-making in the framework that Cabinet agreed in May 2018 [CAB 18 M0218 refers]. This framework is centred on the following three pillars:

1. **Leadership at home and internationally.** This includes placing primary reliance on domestic measures to reduce our emissions out to 2050 and beyond, and to meet our commitments under the Paris Agreement.
2. **A productive, sustainable and climate-resilient economy.** This includes encouraging innovation, diversification and the uptake of new technologies and identifying the best-value opportunities to reduce emissions.
3. **An equitable and inclusive society.** This includes considering the optimal speed and pathways for transition. As well as supporting the transitional shift to lower emissions and resilient sectors, and recognising and mitigating impacts on workers, regions, iwi/Māori rights and interests and wider communities.

This framework is reflected in the criteria used to assess the options.

#### *Leadership at home and internationally*

1. **Extent to which the initiative reduces emissions.** The initiative must achieve a significant reduction in carbon emissions from light vehicles and contribute to a reduction in air pollutant emissions.
2. **Extent to which the initiative supports a transition to a low emissions light vehicle fleet.** The primary objective of the Low Emission Vehicles Package is to help transition the light fleet to being low emissions. Any initiative must facilitate long-term change in the vehicle market by improving New Zealand's access to vehicle technology that reduces emissions. This includes increasing the supply of low emission vehicles and/or encouraging demand for those vehicles.

#### *A productive, sustainable and climate-resilient economy*

3. **Extent to which the initiative is a relatively efficient way to reduce emissions.** The initiative offers a cost-effective way of reducing transport emissions and provides co-benefits that are important to economic productivity, such as increased fuel efficiency, diversified fuel use, and reduced vehicle maintenance costs.
4. **Extent to which the initiative provides predictability and certainty to the vehicle market and energy suppliers.** The initiative improves business planning and facilitates investment in the vehicle and energy markets through predictable and certain regulation.
5. **The extent to which the initiative speeds the adoption of low emission vehicle technologies and responds to consumer demand.** The initiative increases the pace at

which low emission technologies are adopted in the fleet. It is also consistent with a vehicle market that responds to the diverse vehicle demands of consumers and businesses. This includes by offering a range of vehicles that are affordable to consumers.

6. **Extent to which the initiative has low implementation, compliance and administration costs.** The initiative must be as simple and low cost as possible to implement, comply with and to administer.

*An equitable and inclusive society*

7. **The extent to which the initiative's costs and benefits impact across society.** Consistent with an equitable and inclusive transition, the initiative's costs and benefits do not disproportionately impact, or focus, on any one group. If they do have disproportionate impacts that are unavoidable, there is a way that their impact can be managed or minimised.

### 3.3 What other options have been ruled out of scope, or not considered, and why?

#### Supply-side interventions

Other supply-side interventions than the vehicle fuel efficiency standard are outside of the scope of this policy decision-making, legislative design and implementation design, and so are outside of the scope of this RIA.

#### Additional information for consumers

Providing more information to consumers to influence their demand for low emission vehicles was ruled out of scope. Ongoing work on consumer information is being considered by the Ministry, the NZTA and EECA and so need not be formally considered as a new or separate policy option.

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[Redacted]

[Redacted]

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[Redacted]

[Redacted]

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[Redacted]

[Redacted]

[Redacted]

#### Variable emission based RUC or registration fees

These options were considered to be outside of the scope of this analysis. This is because the policy focus is regarding the vehicles entering the New Zealand fleet. It is possible that a future Government will look more closely at the need to introduce such policies to help drive out older, higher emission vehicles from the vehicle fleet.

[Redacted]

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## Section 4: Impact Analysis

Marginal impact: How does each of the options identified at section 3.1 compare with the counterfactual, under the criteria set out in section 3.2?

Criteria	No action	Feebate scheme (Option 1)	Grants for the purchase of EVs (Option 2)	CO <sub>2</sub> -based first registration fees (Option 3)	Vehicle Fuel Efficiency Standard	Combine implementation of Feebate and VFES
Reduces emissions	0	++	++	+	++	+++
Supports a transition to a low emissions light vehicle fleet	0	++	+	+	++	+++
Is an efficient way to reduce emissions	0	++	+	+	+	+++
Predictability and certainty to the vehicle market and energy markets	0	+	++	+++	-	+ -
Speeds adoption of low emission technologies and is responsive to consumer demand	0	++	++	++	+ (technology adoption)	+++
Implementation, compliance and administration costs	0	-	---	-	--	--
Costs and benefits are neutral in their distributional impact	0	--	-	-	--	---
Overall assessment	0	++	+	+	++	+++

### Key:

- +++ has the greatest impact compared with the status quo
- ++ much better than doing nothing/the status quo
- + better than doing nothing/the status quo
- 0 about the same as doing nothing/the status quo
- worse than doing nothing/the status quo
- much worse than doing nothing/the status quo
- biggest cost

### Weightings:

All criteria have been given equal weightings. No numerical formula was used to assess criteria.

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	Reduces emissions	Supports a transition to a low emissions light vehicle fleet	Is an efficient way to reduce emissions	Predictability and certainty to the vehicle and energy markets	Speeds adoption of low emission technologies and is responsive to consumer demand	Implementation, compliance and administration costs	Costs and benefits are neutral in their distributional impact
<b>No action</b>	<p>New Zealand's 2030 target is for emissions to be 30 percent <u>below</u> 2005 levels by 2030.</p> <p>If no policy action is taken, then road emissions are projected to be 9 percent <u>above</u> 2005 levels by 2030.</p>	<p>Pace and scale of change is too slow.</p> <p>The average emissions of vehicles entering the fleet of 182g CO<sub>2</sub>/km are projected to decline to 155 grams CO<sub>2</sub>/km by 2025.</p> <p>To achieve a fully electric light fleet, nearly all the vehicles entering in around 2030 need to be EVs. The Ministry projection is that around 40 percent of vehicles entering New Zealand will be electric in 2030.</p>	<p>The status quo is not achieving cost-efficient reductions in emissions.</p>	<p>There would be no change to the regulatory environment.</p> <p>However, as time progresses without effective emissions reductions the uncertainty of markets will increase as stakeholders and consumers would likely have growing expectations that the Government must eventually act to reduce GHG emissions.</p>	<p>New Zealand would continue to lag most other developed countries in accessing improved low emission vehicle technologies.</p>	<p>There will be no additional implementation, compliance and administration costs.</p>	<p>There will be no additional distributional effects.</p>
<b>Feebate scheme (Option 1)</b>	<p>Would contribute to a reduction in air pollutant emissions through an increase in the uptake of EVs and other low emission vehicles. This contribution would be similar to the grant and likely to be similar to the VFES assuming that the industry responds to supply the vehicles demanded.</p> <p>It has been estimated, based on international evidence, that a Clean Car Discount operating for six years from 2021 to 2028 would reduce emissions by 210,000 tonnes over the period 2020 to 2050.</p>	<p>Would accelerate the shift toward less carbon intensive vehicles at a faster rate than either the grant or the registration fee because of the dual rebate/fee components.</p> <p>The rebate element would speed EV uptake by helping to reduce the purchase price difference between EVs and an equivalent conventional vehicle, which is a key barrier to EV uptake.</p>	<p>Would accelerate the shift toward less carbon intensive vehicles at a faster rate than either the grant or the registration fee and so is a more efficient option because of the dual components. Efficiency is also high because the transaction point is the same for rebates (grants) and fees, thus the system costs of feebates is less than the sum of the system costs needed for the separate grants, or registration fee.</p>	<p>The feebate scheme would be designed to be self-financing. It would be difficult to strike the necessary levels to avoid over- or under- fee collection, but allowing adjustments each year should ensure reasonable balance is achieved. To avoid reducing predictability and certainty for the market from too frequent adjustments to the fees and rebates, the government would have to operate a fund that would enable smoothing out the effect of under and over revenue collection over the life of the scheme.</p> <p>Changes in the fees and rebates would have to be clearly communicated to vehicle suppliers and consumers.</p> <p>Could help increase market certainty of demand for vehicle suppliers with a business goal of diversifying their fleets towards more low emission vehicles.</p>	<p>Would speed the adoption of vehicles with better low emission technologies. The rebate element would help offset the increase in vehicle prices and lower the market risk to vehicle suppliers.</p> <p>Vehicle suppliers are likely to be more responsive to consumer demand effected by both Government rebates and the imposition of fees on high emission vehicles. This lowers the risks vehicle suppliers face in bringing new variants to the market in terms of whether they will sell well.</p>	<p>The feebate scheme would be managed to be self-funding/ fiscally neutral with rebates and administration costs funded from fees.</p> <p>There would also be compliance costs to businesses, but these would not be significant. Business would have to clearly display the fees and rebates labelling; but this would be the same/similar to the current fuel efficiency label.</p>	<p>The feebate scheme is designed to impact on those businesses and individuals that are able and wanting to buy a new vehicle or a newly imported used vehicle. The scheme does not directly impact on the existing domestic fleet market.</p> <p>There is a risk relating to the limited range of low emission vehicles and the price differential between conventional vehicles and EVs and petrol hybrids. Businesses reliant on affordable utes, vans and light trucks could be disadvantaged until low emission models are available.</p>
<b>Grants for the purchase of EVs (Option 2)</b>	<p>Estimated to have lifetime emissions reductions of less than the feebate scheme. This is because the grant omits the effect of fees on higher emission vehicles dampening their demand</p> <p>Would contribute less than the feebate scheme to a reduction in air pollutant emissions through</p>	<p>Would accelerate the shift toward less carbon intensive vehicles at a faster rate than the registration fee because of the direct link to consumer demand behaviour, but less of an impact than the feebate scheme.</p> <p>The grant would speed EV uptake by helping to reduce the purchase price difference</p>	<p>This options is less efficient than the feebate scheme as its impact to reduce emissions is less, while the implementation costs would be of a similar magnitude. Also it is not self-funding.</p> <p>However we assess it as being marginally better performing than CO<sub>2</sub>-based first registration fees</p>	<p>The grant could be more consistent than the rebates of the feebate scheme assuming that there is an adequate and continuing funding source. This is because this external funding could be more steady than the revenue generated by feebate fees.</p> <p>The grants would have to be</p>	<p>Would not accelerate the adoption of vehicles with better low emission technologies as well as the feebate scheme. The grant would help offset the increase in vehicle prices and lower the market risk to vehicle suppliers but there is no disincentive for high emission vehicles.</p>	<p>The cost of grants, and system and implementation costs would be meet by the Government. This scheme is the worst from a cost to Government perspective.</p> <p>System and implementation cost would be of a similar magnitude to the feebate scheme except that there would be no need to run accounting systems to</p>	<p>The distributional effects would not be as high as the feebate scheme as there is not the added impact of the feebate fees.</p>

	an increase in the uptake of EVs. This contribution would be greater than for the registration fee as the grant would be more visible/direct to consumers.	between EVs and an equivalent conventional vehicle, which is a key barrier to EV uptake.		clearly communicated to vehicle suppliers and consumers some time in advance.  Could help increase market certainty for vehicle suppliers with a business goal of diversifying their fleets towards more low emission vehicles.		balance rebates and fees.  Compliance costs to businesses would be similar to the feebate scheme.	
<b>CO<sub>2</sub>-based first registration fees (Option 3)</b>	Estimated to have lifetime emissions reductions of less than the feebate scheme. This is because the emissions registration fee only penalises high emission vehicles and omits the effect of rebates.  Would contribute less than the feebate scheme to a reduction in air pollutant emissions through an increase in the uptake of EVs.	Would have a limited impact, less than the feebate scheme and less than the grant.  The emissions registration fee does not provide a clear signal directly to consumers and may be perceived as just another on-road cost.	This option is assessed to be less efficient than the feebate scheme and marginally less than a grants scheme.  This is because its impact to reduce emissions is less than either of these options.	The emissions registration fee could be more consistent than the rebates of the feebate scheme. The emissions registration fee would be prescribed and likely not change for considerable periods.	Would not accelerate the adoption of vehicles with better low emission technologies as well as the feebate scheme. The emissions registration fee could be seen as just another on-road cost.	The emissions registration fee adds costs but would be the least cost option. would be met by consumers.	The distributional effects would not be as high as the feebate scheme as there is not the added impact of the feebate rebates.  Increased registration fees would be met by consumers. This scheme could be criticised as another tax and not an incentive scheme for low emission vehicles..
<b>Vehicle Fuel Efficiency Standard</b>	Would contribute to a reduction in air pollutant emissions through an increase in the supply of EVs and other low emission vehicles. This contribution would be similar to a feebate scheme.  The weakness of the standard is that it is not demand led, thus if consumers are prepared to pay a little more for high emission vehicles (the cost increment of the penalty) the importers would continue to provide high emission vehicles.	Directly supports a shift in supply, but the degree of response is highly dependent on the targets set under this policy and the level of penalties.  The degree that this option performs compared with the feebate scheme has been assessed as similar. Thus acknowledging that there is a demand-supply linkage in both the feebate and the VFES options.	Assessed as having a lower level of efficiency as the feebate scheme. The risk is that the consumers simply do not choose to buy low emission vehicles because they continue to consider range anxiety, charging infrastructure etc as barriers. The VFES does not guarantee the saleability of low emission vehicles.  Also this option has greater implementation costs than the feebate scheme.	The VFES run on a fleet averaging basis could be complex to implement particularly for used vehicle importers. At the time of preparing this RIA the best approach for implementation was not yet resolved.  The risk is that the consumers simply do not choose to buy low emission vehicles because they continue to consider range anxiety, charging infrastructure etc as barriers. The VFES does not guarantee the saleability of low emission vehicles.  There is a risk that if the targets are too stringent and the fees are too high, the VFES could have a very detrimental impact on the vehicle industry.	Would speed the adoption of vehicles with better low emission technologies. It does this directly.  The VFES is not a scheme responsive to consumer demand, it drives supply.	This scheme is assessed as having significant compliance costs. These are associated with implementation particularly for the importers of used vehicles where there a potential difficulties in forecasting supply, and thus determining whether the fleet average is going to meet the emissions target.  The VFES is also associated with high penalty costs, as it has been argued that it is the penalties that provide the stick for industry supply changes.  There is a risk that if the targets are too stringent and the fees are too high, the VFES could have a very detrimental impact on the vehicle industry.	The VFES creates costs and benefits that are not neutral in their distribution. The cost impact is directly on the importers but it is likely that some or most of this cost imposition will be passed onto consumers of new vehicles and newly imported used vehicles.  The benefits in terms of the reduced running costs of EVs and reduced maintenance costs are received by those who have opted for EVs and to a lesser extent those that opt for other forms of low emission vehicles.
<b>Combine implementation of Feebate and VFES</b>	As this combines demand side incentives and supply side interventions it gives the greatest impact compared with the status quo.	As this combines demand side incentives and supply side interventions it gives the greatest impact compared with the status quo.	As this combines demand side incentives and supply side interventions it gives the greatest impact compared with the status quo.	As this combines demand side incentives and supply side interventions it picks up the positive aspect of the feebate and the negative impacts assessed against this criterion for the VFES.	As this combines demand side incentives and supply side interventions it gives the greatest impact combining the demand side impacts of the feebate and the technology adoption benefits of the VFES.	As this combines demand side incentives and supply side interventions it has compliance and implementation costs that are larger than either.	As this combines demand side incentives and supply side interventions it has the potential to impact the greatest in terms of distributional impacts.

## Section 5: Conclusions

### 5.1 What option, or combination of options, is likely best to address the problem, meet the policy objectives and deliver the highest net benefits?

The Ministry's preferred policy for demand-side incentivising of low emission light vehicles into New Zealand's fleet is option 1: the feebate scheme (being promoted as the Clean Car Discount scheme).

For the purposes of the policy decision-making, legislative approval required, and work required for implementation, this RIA has first to compare the feebate scheme with the grant and the emission based registration fee as these represent viable alternative demand-side solutions.

#### Result for the demand-side options

As New Zealand's light vehicle fleet and emissions are growing, the status quo is not considered a viable situation to continue. It will not serve our country's emission targets.

Options 2 (grants) and 3 (emission based registration fee) are also not preferred as they both under-perform the feebate scheme. The grant under-performs in that it does not actively persuade buyers away from high emitting vehicles. The emission based registration fee under-performs in that there are no incentives to uptake EVs, just that a person buying a zero-emission vehicle won't have the imposition of a fee. The feebate is assessed to achieve a bigger shift in demand for low emission vehicles compared with option 2 or 3.

Also of note is that the grant scheme creates a significant funding cost for Government for a lower benefit realisation than the feebate scheme. The emissions based registration scheme is likely to be perceived as another tax and we assess it has having little effect on shifting consumer demand to low emission vehicles.

Option 1, the feebate scheme, is assessed as the most effective and efficient demand-side tool for Government to implement to help shift demand towards low emission vehicles. This is supported by a positive Cost Benefit Analysis result.

#### Feebate Scheme (CBA results)

The CBA report is attached as Appendix B.

A summary of the Ministry's CBA of the feebate scheme are provided below using the mean results from the 95 percent confidence interval of the estimated parameters.

#### *Benefits*

The feebate scheme estimates the societal benefits relating to net CO<sub>2</sub> emissions improvements over the lifetime of replacement vehicles and the changes in vehicle purchasing and maintenance costs. These are all monetised.

Total emissions reductions over the analysis period 2020 to 2050 are expected to be 210,000 tonnes of CO<sub>2</sub>.

#### *Costs*

Against these benefits, a feebate scheme would have costs associated with the implementation system and increased costs to the vehicle importing industry. For the consumer there is a welfare loss.



## Results

Our analysis estimates that the value of the benefits would outweigh these costs using the mean modelling assumptions:

- The calculated mean cost-benefit ratio is 1.1
- The calculated mean net present value (NPV) is \$14.8 million.

When the NPV is positive and the BCR is greater than one, even under the CBA's conservative assumptions, the policy can be considered cost beneficial as it is likely to generate a net benefit to the nation.

## Risks

The scheme is a demand-side incentive and there may be insufficient affordable EVs or other low emission vehicles to choose from to satisfy that demand. In time supply will expand and the market will mature, but we know that many countries are moving to incentivise low emission vehicle uptake. It may be many years before EVs become a mainstream product in a balanced, mature market. In the initial stages of EV market growth, demand could well exceed supply. A perverse consumer response could be to hold off purchasing a low-emissions vehicle and keep older vehicles longer or buy another replacement vehicle that is higher emitting despite the rebates.

Should people hold older vehicles longer, there is an associated risk to road safety outcomes as older vehicles tend to be less safe (not necessarily unsafe). These vehicles do not have active electronic safety features to help avoid crashes, nor do they protect their occupants in the event of a crash as well as a modern vehicles that have safety systems mandated. [REDACTED]

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There is a perception risk that feebate rebates would favour the well-off. Many vehicles that would receive a rebate would be at prices out of the reach of lower income households. While there would still be an adequate selection of vehicles from the domestic market, it will take some time before reasonable numbers of affordable EVs and hybrids will become available.

There is a fairness risk related to the limited range of the types/functionality of vehicles available that are low emission. At the time planned for implementation of the feebate scheme there will not be many, if any, affordable low emission utes, vans, light trucks and people movers. The risk could be mitigated by delaying the introduction of the feebate scheme, but the overall impact on New Zealand's emissions is very undesirable.

In terms of feebate scheme implementation, there are risks that the system will cost more than budgeted. Also, as the feebate scheme is to be self-financing, there is a risk that it will be difficult to strike the fees and rebates at the right levels to avoid large overs or unders in any given year. If the fees and rebates are adjusted too frequently this would reduce predictability and certainty in the vehicle market. This risk could be mitigated by the government operating a fund that would smooth out the effects of under and over fee collection.

*Comment on the vehicle fuel efficiency standard and the combined feebate and vehicle fuel efficiency standard options*

These options have been considered for completeness although there is no policy decision-making, legislative framework design or implementation approaches being considered by Government at this time.

The Ministry considers that policy development and implementation design should continue. There remain a number of significant issues to resolve including the setting of targets and level of penalties that will impact on the eventual assessment of these options. Furthermore the way of implementing the VFES for the used vehicle import sector is still under discussion and whether or not the solution for the new and used sectors need to be exactly the same.

The Ministry considers that only after these important issues are resolved would the vehicle fuel efficiency standard, and the combined feebate and VFES options be ready for full assessment and consideration by Government. Noting that should the feebate scheme be agreed, that the VFES as a stand-alone option no longer exists.

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## 5.2 Summary tables of costs and benefits of the preferred approach

The CBA derives the incremental changes in the number of vehicle imports, prices and resulting energy use and emission impacts using the latest data sources. The impact of the feebate scheme is estimated based on the feebate formulae, the average vehicle prices and price elasticities estimated from Trade Me vehicle sales data from May 2018 to June 2019.

The following table has been copied from the CBA analysis, and provides the source of key inputs and data:

Data sources	Inputs for the CBA	Coverage
Trade Me vehicle sales data: ALSO <ul style="list-style-type: none"> <li>Ecotricity (2017) New Zealand Electric Vehicle Buyers Guide (<a href="https://ecotricity.co.nz/wp-content/uploads/2017/07/View-2017-SPECIFICATIONS.pdf">https://ecotricity.co.nz/wp-content/uploads/2017/07/View-2017-SPECIFICATIONS.pdf</a>)</li> <li><a href="https://www.driveev.co.nz/vehicles">https://www.driveev.co.nz/vehicles</a></li> <li>Car manufacture company websites</li> </ul>	<ul style="list-style-type: none"> <li>Average vehicle prices and help to establish vehicle price projections for vehicles with internal combustion engine (ICEVs)</li> <li>Price elasticity of demand</li> </ul>	Unit records data from 1 May 2018 to 24 June 2019 (654,700 records with 27,340 useable for estimating price elasticities)
NZ Auto Car <sup>31</sup> NZ AA <sup>32</sup>	<ul style="list-style-type: none"> <li>Average vehicle prices for new light vehicles and for establishing vehicle price projections</li> </ul>	Makes and models available for sales in 2019
EV Prediction Model <sup>33</sup>	<ul style="list-style-type: none"> <li>Average vehicle prices and projections for hybrids and EVs</li> <li>Implied range and variety penalties for hybrids and EVs</li> <li>Average vehicle maintenance costs for all vehicle types</li> <li>Carbon price projections</li> <li>Electricity price projections</li> </ul>	2018 - 2050
Motor vehicle registration  Vehicle Fleet Statistics  Vehicle Fleet Emission Model (VFEM)	<ul style="list-style-type: none"> <li>The number of vehicle imports disaggregated by new and used imports, emissions and tare weight bands baseline and projections</li> <li>Average emission values for vehicle imported and projections</li> <li>Average vehicle kilometre driven by vehicle age (separate data for new and used imports)</li> </ul>	2018 - 2050
MBIE fuel price projections and EV Prediction Model	<ul style="list-style-type: none"> <li>Baseline fuel price and projections</li> </ul>	2018 - 2050

### NOTES:

- The model uses constant depreciation rates and higher rates for BEVs, reflecting the current ongoing technological development and the relatively high costs of battery replacement. Some references:
  - <https://www.nimblefins.co.uk/nissan-leaf-vs-pulsar-depreciation>
  - Lebeau K, Lebeau P, Macharis C and Van Mierlo J (2013) How expensive are electric vehicles? A total cost of ownership analysis. EVS27 International Battery, Hybrid and Fuel Cell Electric Vehicle Symposium, Barcelona, Spain, November 17-20, 2013
- EVs are not available to meet all vehicle demand niches in New Zealand. Energeia (Energeia (2018) Australian Electric Vehicle Market Study. Prepared by ENERGEIA for ARENA and CEFC) suggests that model choice is a key driver of EV uptake, as reflected in the relative uptake in Australia and New Zealand. The model applies a variety penalty to EV uptake
- Driving (kilometre) range limitation is expected to limit demand for BEVs in New Zealand and would decline over time. The model applies a “driving range penalty” to purchase prices of EVs when a vehicle’s estimated driving range is below some threshold (an acceptable minimum range for an EV). The report contains various penalty estimates which are based on assumptions that vary by size of vehicle and annual VKT. It also has different penalties for new and used imports.
  - RTI International (2018) *Consumer Willingness to Pay for Vehicle Attributes: What is the Current State of Knowledge?* EPA Contract No. EP-C-16-021. US Environmental Protection Agency.
  - UBS (2017) Q-Series UBS Evidence Lab Electric Car Teardown – Disruption Ahead? UBS Global Research 18 May 2017

<sup>31</sup> <http://www.nzautocar.co.nz/>

<sup>32</sup> <https://www.aa.co.nz/cars/buying-a-car/car-buying-guide/new-cars/new-car-prices/>

<sup>33</sup> Infometrics (2019), Electric Vehicle Prediction Model.

The general assumptions, as extracted from the CBA, are:

		CBA (November 2019)	
		Base case assumptions	Sensitivity analysis
<b>Discount rate</b>		6%	3%
<b>Evaluation period</b>		2020 to 2050	n/a
<b>Implementation cost</b> (Source: NZTA)	Feebate CAPEX year 0	\$2.28 m	\$1.83 m - \$2.74 m
	Feebate OPEX year 0	\$3.04 m	\$2.43 m - \$3.64 m
	Feebate OPEX p.a.	\$5.21 m	\$4.24 m - \$6.19 m
	VFES CAPEX year 0	\$6.75 m	\$5.40 m - \$8.10 m
	VFES OPEX p.a.	\$1.50 m	\$1.20 m - \$1.80 m
<b>Price level</b>		2018 \$	n/a

A list of all the modelling assumptions used in the CBA is provided in Annex 2 of the CBA. The CBA report is attached to this RIA – see appendix B

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Affected parties	Comment	Impact
<b>Expected costs of proposed approach, compared to taking no action</b>		
Vehicle consumers	Consumer welfare loss	\$45.0 million
Vehicle importing industry	Increased compliance (search cost)	\$17.6 million
Regulator NZTA	Initial capital costs to implement and ongoing costs to administer the scheme. This includes the costs of fee collection and rebate payment and to monitor the balance of the feebates fund.	\$37.7 million
<b>Total Monetised Costs</b>		\$100.3 million
<b>Non-monetised Costs</b>		Sector infrastructure costs

<b>Expected benefits of proposed approach, compared to taking no action</b>		
Vehicle consumers	Reduction in resource cost (vehicle purchasing cost)	\$21.0 million
	Reduction in vehicle maintenance costs	\$80.3 million
	Reduction in costs of energy used	\$3.0 million
New Zealand	Reduction in GHG emissions	\$10.8 million
	Total CO2 reduction:	210,000 tonnes
	Average reduction per year:	7,000 tonnes
	Marginal abatement cost of carbon:	-\$71/tonne
<b>Total Monetised Benefit</b>		\$115.1 million
<b>Non-monetised benefits</b> (explained further in the CBA – see Appendix B)	<ul style="list-style-type: none"> <li>Improved energy security as New Zealand reduces reliance on fossil fuels</li> <li>Longer term behavioural response, awareness of emissions</li> <li>Additional altruistic and bequest values</li> <li>Reduction in the social costs of air pollution</li> </ul>	

<b>Sensitivity analysis for CO<sub>2</sub> reductions</b>
<p>As with other conventional policy appraisals, analysing the effects of the feebate scheme requires a range of assumptions. The effectiveness of the policy options in accelerating the uptake of low-emission light vehicles and in reducing green house gas emissions are affected by a large number of factors (including supply constraints, macroeconomic conditions such as exchange rate) many of which are also subject to a high degree of uncertainty.</p> <p>According to the CBA, the following assumptions have the highest influence on the estimated NPV, BCR and carbon dioxide reductions:</p> <ul style="list-style-type: none"> <li>Price elasticity of demand for light vehicles (of different categories)</li> </ul>

- Annual change in vehicle kilometres driven as vehicle ages
- Price of light vehicles (of different categories)

Other factors such as fuel price, carbon price (as a proxy for social cost of carbon), electricity price and additional search cost to the industry only have small to moderate impact on the results.

To illustrate the level uncertainty associated with the three key parameters, the table below shows examples of scenarios with different inputs and results.

Option 1 Feebate only	Default assumptions (The CBA result)	Scenario 1	Scenario 2 (this scenario was used in the Cabinet paper to show sensitivity)	Scenario 3	Scenario 4 (outside the assumption range used in the CBA)
<b>Inputs</b>					
Price elasticity of demand for light vehicles					
Electric vehicles	-1.6 reducing to -0.54	No change	-3 reducing to -1	-3 reducing to -1	-6 reducing to -1
Hybrid and other low-emission vehicles (<=105g)	-1.6 reducing to -0.54	No change	-3 reducing to -1	-3 reducing to -1	-6 reducing to -1
Conventional vehicles (>105g)	-0.54	No change	-1	-1	-2
Annual change in vehicle kilometres driven as vehicle ages	4% p.a.	No change	No change	3% p.a.	No change
Price of light vehicles	See Error! Reference source not found.at beginning of this section	20% lower	No change	20% lower	No change
<b>Results</b>					
NPV	\$14.8 m	\$44 m	\$210 m	\$326 m	\$652 m
BCR	1.1	1.4	2.4	3.2	3.4
Total CO <sub>2</sub> emission reduction (2020-2050)	210,000 tonnes	197,500 tonnes	841,100 tonnes	983,400 tonnes	2.2 m tonnes
Increase in the number of EVs/PHEVs (2020-2041)	30,000	34,500	55,100	63,100	110,300
Average CO <sub>2</sub> value in 2025	149.3	148.9	146.7	145.9	140.4
Marginal abatement costs per tonne of CO <sub>2</sub>	-\$71	-\$222	-\$249	-\$332	-\$291
Scheme deficit (first three years to 2023) (note)	\$20 m surplus	\$10 m surplus	\$52 m deficit	\$70 m deficit	\$210 m deficit

Note: This table summarises the results of the CBA with all other assumptions and the feebate schedule remain unchanged. The total surplus required to fund the operation of the scheme from 2020 to 2023 is estimated at \$21m.

#### Discussion:

- Scenario 1 shows that if vehicle prices are lower than those used in the CBA, this means the financial incentive relative to the vehicle prices is higher than estimated and therefore result in higher uptake of low emission vehicles. Emissions could reduce slightly due to changes in vehicle mix.

- Scenario 2 shows that price elasticity of demand is by far the most influential variable. Doubling the price elasticity would increase the uptake of EVs and PHEVs by 25,100 but quadruple the estimated carbon emission reduction due to the reduction in high emission vehicles. However, in this case, the scheme could run a deficit over the first three years – and so illustrates vividly why annual operational and financial performance monitoring is crucial (as do scenarios 3 and 4).
- Scenario 3 shows that when the most favourable assumptions on vehicle kilometres travelled (VKT), vehicle prices and price elasticity are used, the estimated carbon emission reduction (due to large substitution between EVs/PHEVs and HEVs) would further increase.
- Scenario 4 shows the case when the price elasticity is very high (a scenario that could be consistent with an accelerated uptake of technology), the feebate scheme could reduce total carbon emission (2020 to 20250) by up to 2.2 million tonnes.

To sum up, the scenario analysis shows that the higher the behavioural response (that comprises of a high level uptake of EVs and PHEVs and a sufficiently high reduction in the purchase of high emission vehicles, the higher the estimated carbon emission. At the same time, the higher the behavioural response will also mean an increase in the risk of running a scheme deficit with the proposed feebate schedule.

Marginal abatement cost (based on \$8,000 max rebate and \$3,000 max fee for new imports)

A marginal abatement cost (MAC) is a measure of the cost-effectiveness of the policy intervention in reducing GHG emissions. It is calculated by dividing the net present value (NPV) of the intervention with the expected reduction in emissions from implementation of the intervention. When the estimated MAC is negative, it indicates the policy intervention has a net benefit from implementation.

The estimated MAC for the feebate scheme is estimated at between -\$71 and -\$332 per tonne of CO<sub>2</sub>.

### 5.3 What other impacts is this approach likely to have?

The feebate scheme will help increase the demand for low emission vehicles and in turn help New Zealand have a greater supply of EVs and hybrids. This change in motive power towards more EVs that plug in to a power source and possibly to alternative fuels such as hydrogen requires supporting infrastructure from the public and private sectors.

#### Ensuring there is adequate EV charging infrastructure

To date the provision of public charging infrastructure is largely staying ahead of EV uptake. However there are some regions with inadequate infrastructure. Ideally, the charging network will continue to expand as the number of EVs increases. Where it does not, there is a risk that the lack of infrastructure will limit the effectiveness of the feebate scheme.

It is also possible that the variety of charging formats and plugs creates a concern for EV motorists. While more and more public charging stations are appearing in New Zealand, courtesy of companies like Juicepoint, Charge Net and power providers like Vector, any particular fast-charge unit may not offer the right plug for all EVs.

To mitigate this risk, additional Government investment is likely to be required to address gaps in the public charging network that are not commercially attractive for the private sector to fill. The infrastructure should ensure that:

- there is sufficient charging infrastructure in residential streets with on-street parking
- all new residential homes, non-residential buildings and carparks are built to be EV ready
- workplaces have adequate access to charge-points.

#### Measures will be needed to encourage off-peak charging

The Productivity Commission has highlighted that a large EV fleet would add significant load to the electricity grid and depending on the time at which vehicles are charged, could lead to much higher emissions from electricity generation. High uptake combined with greater use of fast chargers could put substantial pressure on electricity networks.

Smart metering and more cost-reflective pricing of electricity will be needed to address these issues.

#### A market needs to develop to provide for EV servicing

Consumers need to have confidence that their EVs can be serviced by skilled technicians. In particular the transmission complexities of plug-in-hybrids and extended range EVs may require vehicle technicians to receive significant training. Franchise dealers offering EVs will meet the demand for service provision. For many smaller New Zealand towns the traditional mechanic at the local service station remains the only servicing option. It is unclear to what extent EVs will be able to be serviced by the generalist mechanics or even auto-electricians.

An extension of EV servicing could be the potential for businesses to develop in New Zealand that are able to convert fossil fuelled vehicles to electric power. If a person was looking at a fossil fuelled motor reconditioning or replacement, the option of converting to



an electric power train might appeal.

EV damage repair servicing also needs to adjust. It is reported that EVs present a risk of electrocution and fire for panel beaters. EVs contain lithium in batteries which is highly flammable meaning that they cannot be put into paint spray booths. We understand the Collision Repair Association of New Zealand is bringing in new international, service quality standards which will see repairers commit to ongoing training, equipment upgrades, annual inspections and audits including particular requirements for repairing EVs.

Some countries have developed first-response vehicles with a tent-like device to encompass an EV and starve any fire of oxygen.

*A market needs to develop to provide and recycle batteries*

As half of all vehicles entering the fleet are used-imports, it will be important that a market for replacement batteries develops. Currently, it is difficult to source a replacement battery. We understand Nissan New Zealand does not offer them because imported Nissan Leafs are not “their cars”. However, importers of used-EVs will eventually have to support the vehicles they sell by developing a market for replacement batteries and other specialised parts.

The increase in EVs will result in an increase in used lithium batteries. The Ministry for the Environment has begun working with industry stakeholders to develop a proposal for a mandatory product stewardship scheme for lithium batteries, to ensure that spent batteries are recycled or reused instead of becoming potentially hazardous waste.

**5.4 Is the preferred option compatible with the Government’s ‘Expectations for the design of regulatory systems’?**

The preferred options are consistent with the Government’s ‘Expectations for the design of regulatory systems’.

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## Section 6: Implementation and operation

### 6.1 How will the new arrangements work in practice?

#### How could the preferred option be given effect?

It is proposed that the feebate scheme will be implanted with the backing of legislation. Primary legislation will likely be supported by regulations to give full effect to the policy.

#### Once implemented, who will be responsible for ongoing operation and enforcement of the new arrangements?

The NZTA would be responsible for the ongoing administration, operation and enforcement of the feebate scheme.

EECA would continue to take responsibility for the Vehicle Fuel Efficiency labelling requires and have oversight over any change to include emissions information and feebate information.

#### When will the arrangements come into effect? Does this allow sufficient preparation time for regulated parties?

The timing of the feebate scheme's commencement will ultimately be determined by the timing for the legislation. There is a significant system development project required by NZTA for implementation. NZTA considers systems will be doable within the likely timetable for the legislation.

As a general target we are aiming for the feebate scheme to start 1 July 2020 or thereabouts.

#### How will other agencies with a substantive interest in the relevant regulatory system or stakeholders be involved in the implementation and/or operation?

EECA is already working with the NZTA to design and change the labelling requirements for vehicle sales. The objective is to have the vehicle fuel efficiency label modified so that it includes consumer facing information on a vehicle's tail pipe emissions, the test used to establish that figure (of value even if the feebate scheme is not implemented), and the resulting rebate or fee.

The feebate implementation system, as currently planned, will link into existing databases where it can, so that there is no unnecessary data entry or system duplication. The NZTA is already in discussions with the administrators/operators of those databases.

Consideration of feebate implementation system design has highlighted some areas of existing operational practice that are done with a less than desired level of accuracy or consistency. For example these include how some vehicle specifications are coded/recorded in the motor vehicle register. There may have been no negative consequence of the practice, but with the implementation of the feebate scheme where fees will be sort from customers and rebates paid, any area of poor operational procedure will be addressed and fixed.

#### How does the feebate scheme impact on consumers?

The consumers will be able to see the emission level of the vehicle they are considering buying, whether it is new or a newly imported used vehicle. The information notice will also clearly display the level of the rebate or fee or that the vehicle is zero rated. As a

result of having this information, the consumer can make a purchase decision aware of the environmental impacts and the feebate.

The fee is paid or rebate applied for at the time the vehicle is first registered for road use and licence plates are issued. The NZTA are working to implement payment within 48 hours. They are also looking to implement an arrangement whereby the consumer can request that the rebate be paid directly to the vehicle trader, thus enabling it to be used as a deposit or part deposit.

How does the feebate scheme impact on the vehicle importer/trader?

The consumer notice creates no additional compliance cost as the intention is to expand the fuel efficiency label, something already required. Registration as the point of application of the feebate should be convenient for traders and have little compliance impact.

There has been some suggestion by industry that there is a greater search cost associated with the selection of low emission vehicles compared with other vehicles entering the auction process.

## 6.2 What are the implementation risks?

The feebate scheme would be a significant regulatory change that would be new in the New Zealand context. This brings several implementation risks.

Risk of delayed implementation

In the discussion document, the date originally proposed for implementing the feebate scheme was 2021. Over 30 written submissions expressly commented on the need to bring implementation forward. Environmental concerns focussed on the fact that New Zealand is lagging well behind other countries in reducing road transport emissions and the need to make a start immediately to address this.

Announce and implement

A concern of industry submitters is that there could be a significant disruption in vehicle sales in the period between the announcement of the details of the feebate scheme and its implementation. Submitters expect that people intending to purchase a low emissions vehicle will delay their purchases, and people intending to purchase a high emissions vehicle will advance their purchases, before the Clean Car Discount comes into effect. The industry workshops confirmed a strong desire of the vehicle industry to implement demand incentives to accelerate buyer interest in low emissions vehicles, and to minimise any delay between the announcement of the Clean Car Discount and its implementation.

In Sweden, where a feebate scheme was introduced on 1 July 2018, passenger car sales in June 2018 jumped by 70 percent compared to June 2017, and dropped by 50 percent in July 2018 compared to July 2017. Sales of EVs dropped in June 2018 then surged to historic highs in July 2018. EVs were 18 percent of vehicle registrations in July 2018, compared with a monthly average of six percent in the preceding six months. This gives a lesson that there needs to be minimum time between scheme announcement and implementation.

### Global or New Zealand economic performance

There is always a risk that a global or New Zealand centric economic downturn could cause the Government to reconsider the emissions objectives in light of the need to change macro-economic policy settings to stimulate growth as a priority over environmental outcomes. For example, the recent increases in petrol prices have resulted in the Government stopping any extension of regional fuel taxes beyond Auckland. Such exogenous factors are a significant risk, but very hard to foresee and measure in terms of the domestic policy response. Furthermore, the proposed climate change legislation with embodied targets and the establishment of the Climate Change Commission give evidence of strong multi-party support for enduring changes to support the reduction of GHG emissions.

### Regulator risks if not adequately resourced

From the perspective of the NZTA, significant investment would be needed in its people capability, information technology systems, and business processes to ensure that it can fulfil the role of administering the feebate scheme. Another area of cost and time will be system testing to ensure that when the scheme commences, the Day-One implementation sees the system and staff handling the workload.

Policy development and implementation design have been working in parallel for several months leading up to the publishing of this RIA. This parallel work approach is beneficial as it means that the implementation approach has been able to inform policy development and lead to a high degree of confidence around scheme design. It also means that as the detail of the legislation is developed through the drafting process, this too will be informed by real world implementation requirements.

Resourcing of the scheme on day-one will be challenging since no-one can be confident of what the actual market response to the fees and rebates will be. The NZTA could be either under or over resourced to meet the demands on the new functions. Good quality education material to support industry and consumers will help reduce the demand for direct involvement by NZTA.

### Industry not compliant (don't understand their obligations)

The feebate scheme will rely on a high level of compliance from the vehicle industry, although the actual 'tasks' would not be difficult or complex.

For the feebate scheme vehicle retailers would have to accurately show the fees and rebates that apply to each vehicle. This would involve on car-yard labelling and fixing an electronic label to web advertising. Their role is essential one of helping (educating) customers so that they are aware of the feebate and how to pay/receive the fee/rebate.

Sufficient information and guidance will need to be available to the industry to ensure a high level of compliance. The NZTA and EECA are working on this together. A campaign to inform the public about the feebate scheme will also help consumers to be aware of their rights and obligations.

### Feebates – risks of under and over revenue collection

The feebate scheme is intended to be self-financing, with the fees and rebates set so that the rebates can be paid for out of the fees. To achieve this they require the 'pivot point'

that divides vehicles into those that receive rebates and those that attract fees to be regularly reviewed. This point is defined in grams CO<sub>2</sub>/kilometre.

However, to provide a sufficient level of predictability for consumers and vehicle suppliers the pivot point can not be reviewed too frequently. This means that in practice feebate schemes have a risk of trending to over- or under-revenue collection. For example, if demand for low emission vehicles is too low, more fees will be collected than rebates are paid. Similarly, if demand is higher for low emission than expected more rebates will be paid out and the scheme could be under-funded. To mitigate this risk, the incomings and outgoings will need to be monitored in the context of what is known about the present and future vehicle offerings, market prices, demand and supply elasticities of demand etc.

It is prudent that the regulator operates a reserve fund as a buffer, particularly for the outcome of rebates-out exceeding fees-in. Further it is proposed that the feebate will be reviewed annually and able to be modified annually if required.

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## Section 7: Monitoring, evaluation and review

### 7.1 How will the impact of the new arrangements be monitored?

The very design of this feebate scheme and the need to alter some metrics through time means that the regular ongoing monitoring of operational performance (for example the emissions and feebate labelling) along with the financial performance (the balance of fees-in compared to rebates-out) is a core part of implementation design. The performance monitoring will be done by the NZTA and is a vital part of its administration responsibility.

In addition, there will be regular, probably targeted, system-wide audits to evaluate the effectiveness of the feebate scheme. The intention is that these would be done annually.

The NZTA would monitor the level of fees received versus rebates paid out. This would be used to inform:

- whether the amount of the fees and rebates, and the placement and width of the zero-band requires review to ensure the scheme is self-financing. This band divides vehicles into those that receive rebates and those that attract fees.
- an assessment of the degree to which the scheme is being effective in influencing consumer demand for lower emission vehicles.

This operational and financial performance data will be reviewed annually with the intention of confirming the feebate fees, rebates and zero band for the following year or revising such metrics for the coming year. This will help keep the financial fund at an acceptable level of balance throughout the life of the scheme. Of course any decision to review the metrics will be a trade-off between keeping a measure of consistency for consumers and the industry in rebate and fee amounts, and striking an adequate annual scheme fund balance.

## 7.2 When and how will the new arrangements be reviewed?

- *How will the arrangements be reviewed? How often will this happen and by whom will it be done? If there are no plans for review, state so and explain why.*
- *What sort of results (that may become apparent from the monitoring or feedback) might prompt an earlier review of this legislation?*
- *What opportunities will stakeholders have to raise concerns?*

Stakeholders and customers will have the opportunity to raise concerns with NZTA. To facilitate this, part of the implementation design is for a help desk and complaints service.

The operation of the feebate scheme would be reviewed after it has been in effect for three years (this is not the annual review of fees, rebates and the zero-band as described under monitoring, nor the annual NZTA system audit). In the year that this review is done there would be no need for NZTA to conduct the regular system audit.

The review terms of reference would be informed by the preceding periods' annual reviews and annual system audits. The review would seek to ensure the system has integrity in terms of matters such as:

- vehicle suppliers accurately displaying the fees and rebates that apply to each vehicle
- consumers having confidence in the system in that it is being implemented appropriately
- it being easy for consumers to claim rebates from the regulator and for businesses to collect fees from consumers on behalf of the regulator.

The Ministry would be responsible for the review.

Finally, the Government's intention is that the feebate scheme will run for a finite period of time. The legislation will include a provision setting out a process for the termination of the scheme (not a termination date). The process is to be built around a review based on criteria.

The criteria could include matters such as:

- vehicle supply/body type and functionality
- technology advancements, including EV range
- relative pricing for vehicles of different motive power
- New Zealand vehicle fleet makeup, and
- road transport emissions profiles.

## Appendix A: Further discussion of the emissions benefits

### *Emissions reduction due to reduced fossil fuel uses*

The key steps to estimate the GHG emissions are:

1. Multiplying the estimated weighted average emission value (after converting to tonnes of CO<sub>2</sub>/km) by the number of vehicles imported for each year and average annual vehicle kilometres travelled (VKT) per vehicle<sup>34</sup>. For used imports, the average VKT of a 10 year old vehicle was used in the counterfactual and between 8 and 10 years for the policy options.
2. Calculating the difference the weighted average emission value obtained in (1.) between the counterfactual and the policy scenario. This difference is then converted into tonnes of emissions and subsequently multiplied by the carbon price<sup>35</sup> to obtain the total social cost of carbon reduction in dollar terms.
3. Summing up (with appropriate discounting) the cumulative CO<sub>2</sub> emissions savings over the economic life of the vehicle imports.

The above steps were conducted for new and used imports separately.

### *Emissions increase due to increased electricity use from EVs*

The method to estimate the likely increase in emissions due to increased electricity use from EVs is similar to that for estimating the CO<sub>2</sub> emissions from fossil fuel use. In this case, the VKT estimates were multiplied by the number of EVs, the electricity and emission factors<sup>36</sup> (18.18 kWh/100 km (source: RightCar) and 0.001 tonne CO<sub>2</sub>/kWh (source: MBIE)). The resulting estimates were adjusted upward by 10 percent (8 and 12 percent were tested in the sensitivity analysis to the CBA) to account for any increase in VKT due to reduced energy cost (known as rebound effect).

Again estimates of changes in carbon dioxide emission/GHG emissions were obtained by taking the difference between the baseline estimates and that of the policy options. The estimated increase in CO<sub>2</sub> emissions in tonnes from increased electricity demand were then multiplied by carbon price to obtain the social cost of carbon emission.

### *Estimated changes in emissions due to changes in vehicle scrappage*

Some of the older vehicles might remain in the domestic fleet for longer. These vehicles tend to use more fuel per kilometre travelled but are used less often and shorter distances. On the other hand, some of the would-be vehicle buyers might change their travel behaviour (e.g. change modes or increase the use of rideshare services) to adapt to the reduced access to vehicles.

Since the reduction in the number of vehicle imports is relatively small and due to the lack of information, a simplified approach has been used to estimate these effects. It was assumed that:

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<sup>34</sup> Based on historical data, the economic life of a new import is assumed to be 17 years and 10 years for a used import and with a 4 percent annual reduction in VKT per annum.

<sup>35</sup> See **Error! Reference source not found.** in Annex 2.

<sup>36</sup> A possible change would be to adopt a time varying emission factors to account for improvements in electricity generations (Infometrics 2019). However, this change is unlikely to materially affect the results of the analysis



- Half of the reduction in the number of vehicle imports would correspond to a reduction in the number of vehicles scrapped (0 and 100 percent are used in the sensitivity analysis to the CBA).
- Vehicles that would be retained would stay in the fleet a few years longer (between 5 and 10 years). They would only be driven between 25 and 75 percent (mid-range 50 percent) of the annual VKT compared to their counterparts.
- These vehicles would emit 10 to 30 percent (mid-range 20 percent) more CO<sub>2</sub> per kilometre travelled than the average for the counterfactual.

Using these simplified assumptions and the same approach for estimating the GHG emissions, an increase in GHG emissions (both in tonnes and in dollar terms) were estimated.

#### *Estimated net changes in CO<sub>2</sub> emissions*

The net change in carbon emissions equals the sum of these three sources of changes in CO<sub>2</sub> emissions (in tonnes and dollars). For any given year, the net change could be positive or negative, depending on changes in the vehicle mix over time.

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**Appendix B: Cost Benefit Analysis report**

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