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Clean Car Discount Interim Report

Pūrongo Tōmua Hekeutu Motokā Parukore

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Transport Evidence Base report

Te Kāwanatanga o Aotearoa
New Zealand Government

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1. Highlights of the CCD monitoring interim report

This interim CCD monitoring report summarises the key indicators observed over the last 18 months. The key highlights of the report include:

- Changes in light vehicle purchasing behaviours has resulted in a decrease in the mean exhaust CO_2 emission of cars registered in New Zealand.
- The introduction of Clean Car fees in April 2022 has led to some "unusual" behaviours just before Phase 2 of the policy (e.g., an increase in high emission vehicles that would be subject to a fee from April).
- The commencement of Phase 2 appears to increase the number of rebate applications by expanding the eligibility criteria and imposing a fee on high emission vehicles.
- While the great cost of rebates were brand new vehicles with zero emissions, most of the vehicles qualifying for a rebate in Phase 2 were 1 to 146 grams WLTP CO_2.
- EECA's Consumer Monitor survey data found statistically significant differences in a few attitudinal and behavioural indicators organised by socio-demographics.
    - The proportion of adults aware of CCD was only 56% Māori and 25% Pacific Peoples, compared to 71% New Zealand Europeans.
    - Household income was also a determinant for their intention to purchase zero- or low emission vehicles and their interest in EVs.
- The scheme shows that there is widespread access to low (but not zero) emission used import hybrid and petrol vehicles between $10,000 and $15,000.

From a fiscal financial point of view, as of December 2022, the scheme is running at a negative balance of around $193 million, including implementation costs. A negative financial position is expected, given that Clean Car fees were introduced nine months after the rebates. However, to operate a fee revenue neutral scheme, we will continue monitoring the pattern of new car registrations (including imported new and used cars) and adjust the policy as necessary.

Apart from monitoring the progress of the CCD, the Ministry is also developing other monitoring and evaluation mechanisms to track the Emission Reduction Plan (ERP) Transport Chapter progress. This will include regular reporting against the Decarbonising Transport Monitoring Framework to monitor the delivery of ERP actions and evaluations of carbon reduction initiatives. This wider monitoring and evaluation work programme will enable us to take a systematic approach to monitor and assess the impacts of a range of transport emission reduction initiative.

2. Introduction

This is an interim monitoring report of the Clean Car Discount (CCD) scheme, covering period from July 2021 to December 2022. The CCD is designed to support the transition to zero- and low emission vehicles and reduce vehicle carbon dioxide emissions in New Zealand. This aims to increase consumer demand for zero- and low emission vehicles (new to the fleet) and decrease consumer demand for their high emission counterparts. This is in conjunction with other complementary initiatives included in the Transport Chapter of the Emission Reduction Plan (ERP).

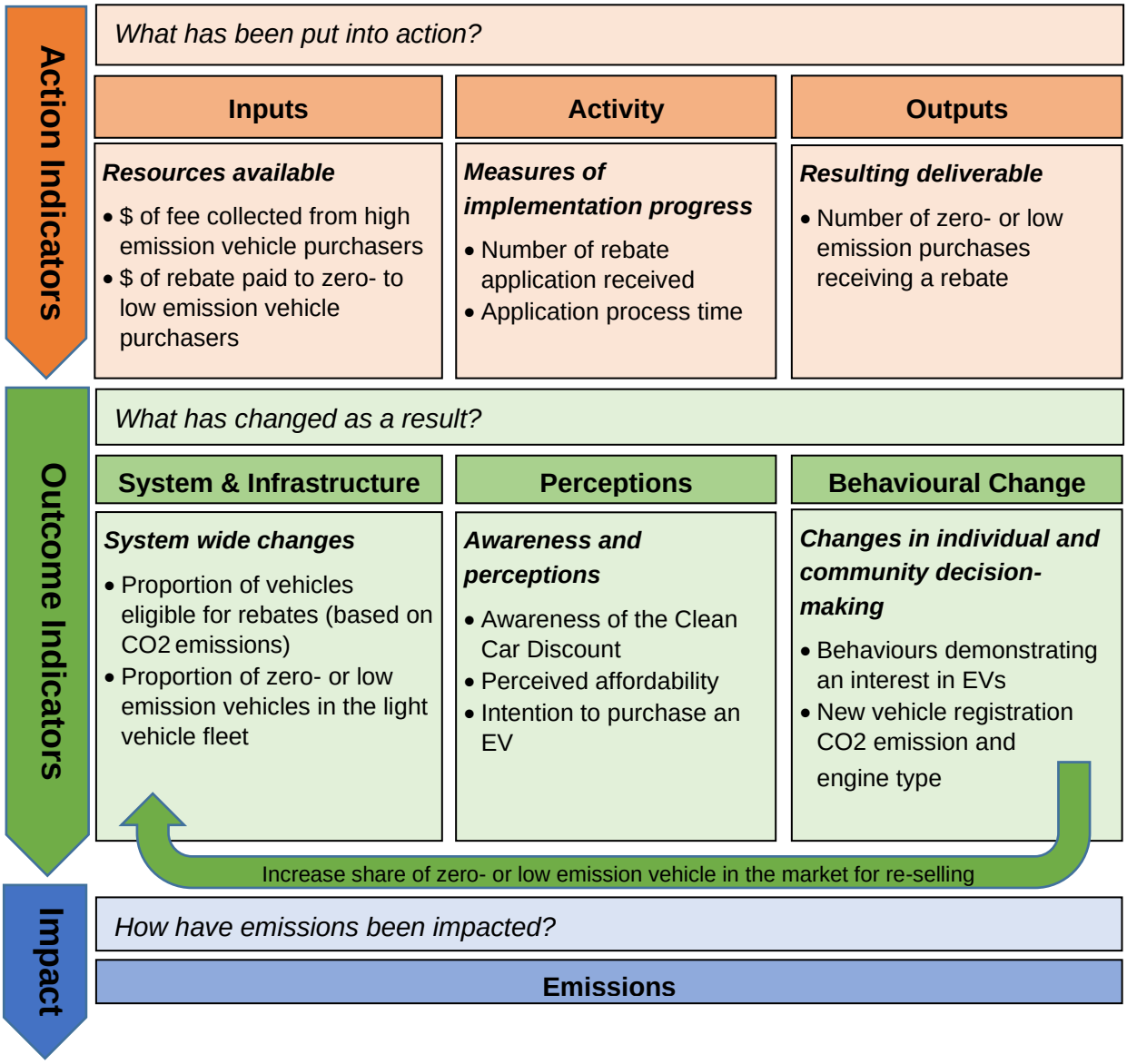


Figure 1 Monitoring framework for the Clean Car Discount

Figure 1 shows the indicator sets for each of the six components of the Ministry's Transport Sector Monitoring Framework to track the activities and outcomes we seek to achieve when delivering the CCD.

This document reports action and outcome indicators that are directly related to the CCD as well as other factors that might influence vehicle purchase decisions.

3. Background and policy overview

The CCD Phase 1, introduced in July 2021, provided a rebate to light battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV) that:

- were registered to New Zealand for the first time,
- had a safety rating of three stars or more at the time of registration,
- had a purchase price of less than $80,000 (including GST and on-road costs).

Nine months later, Phase 2 was introduced in April 2022, where vehicles registered for the first time in New Zealand are classified into three categories based on the grams of CO2 emissions per km travelled. Based on 3P-WLTP values, those with a carbon emission of 146 grams or lower receive a rebate, while those with a carbon emission of 192 grams or higher attract a fee. The remaining vehicles fall into the neutral category – they neither attract a fee nor receive a rebate. Requirements relating to safety rating and purchase price remain the same.

The scheme was established with a Crown Grant of approximately $300 million to be repaid over ten years. Revenue from high emission vehicles must cover ongoing rebates, implementation and administration costs, and repay the Crown Grant used to fund rebates paid out over 1 July 2021 – 1 April 2022.

Explanation of 3P-WLTP and CO2 test accuracy

3P-WLTP refers to an internationally recognised test procedure for measuring emissions (the 3-phase Worldwide Light-duty vehicle Test Procedure). Where a vehicle has been tested to another recognised test, the government stipulates conversion formulas to estimate their emissions under 3P-WLTP, to create a level-playing field. As of January 2023, only 5% of vehicles entering New Zealand are tested to 3P-WLTP (though the rates are much higher for brand new PHEVs and hybrid cars, and for diesel vans). Used imports from Japan manufactured since 2018-2020 were transitioned to this test, and the same is true of vehicles sold into Europe at a similar time. Most vehicles entering New Zealand are instead tested to standards prior to the adoption of WLTP. The low rate of 3P-WLTP adoption to date slightly reduces the accuracy of CO_2 emission assessment in the report and can lead to some inconsistences when determining rebate and charge levels of vehicles.

4. Action

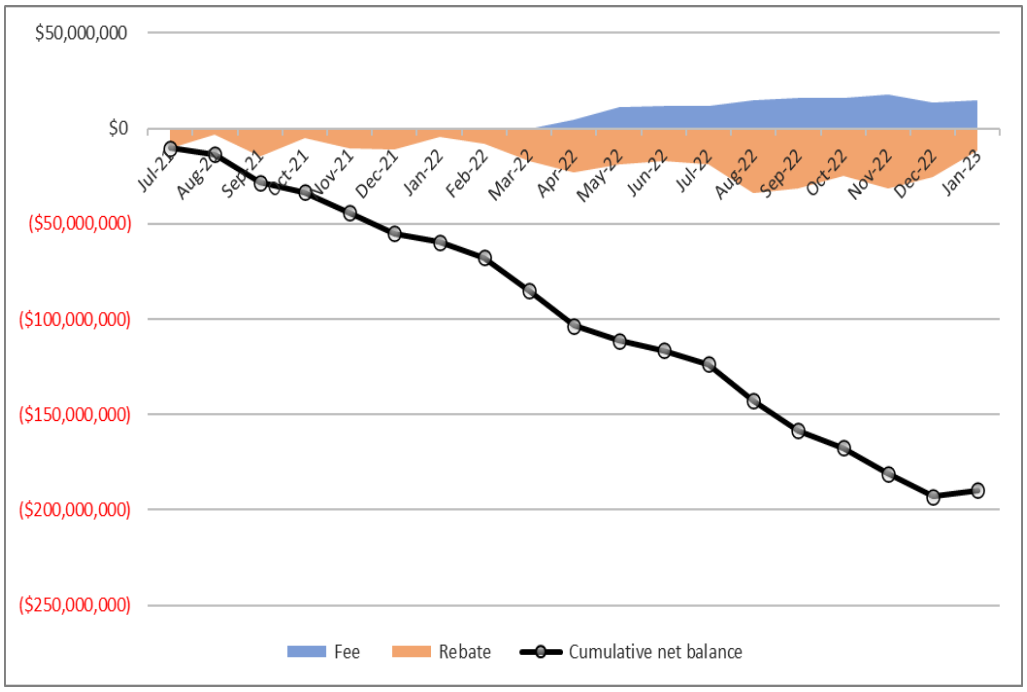
Action indicators include inputs (fees collected, rebates disbursed, and number and market share of registrations by engine type, vehicle type and import status), activity (application processing time), and outputs (vehicle types, purchase prices and regional differences for approved rebate applications).

4.1. Inputs

Tracking of rebates and fees

Apart from vehicles first registered during Phase 1 of the CCD,[1] there is no time limit for submitting a rebate application. Therefore, the input data presented in this section are based on the month of registration (not when a rebate application was submitted or processed). The dollar amount of rebates claimed by registration month will be different in subsequent reports as more applications are submitted and processed over time.

Based on rebate applications submitted and processed until December 2022, this policy resulted in a collection of $118 million in fees from high emission vehicles (from April 2022) and a pay-out of $288 million in rebate for zero- to low emission vehicles (from July 2021).[2] By December 2022, the scheme had a negative balance of $193 million, primarily due to a nine-month gap between the introduction of the Clean Car rebates and fees (see Figure 2 and Table 1), and a higher than forecast and growing rate of zero and low emission vehicle uptake.



[1] Eligible rebate applications for vehicles registered during Phase 1 of the CCD had to be submitted by 31 November 2022.

[2] The figures are correct to 27 January 2023. As more applications are submitted and processed the amount of rebate may change.

Figure 2 Monthly cumulative total of CCD fees and payments, Jul 2021-Dec 2022 (based on registration month; black line is overall net financial position of scheme)

Table 1 Monthly balance and cumulative total of CCD fees and payments by vehicle registration date, Jul 2021-Dec 2022[3]

Month vehicles registered	Monthly balance (fee + rebate)	Cumulative total
Phase 1 started		
July 2021	-10,450,450	-10,450,450
August	-3,214,825	-13,665,275
September	-14,713,625	-28,378,900
October	-5,075,375	-33,454,275
November	-10,728,750	-44,183,025
December	-10,803,725	-54,986,750
January 2022	-4,550,375	-59,537,125
February	-8,299,725	-67,836,850
March	-17,271,700	-85,108,550
Phase 2 started		
April	-18,477,284	-103,585,834
May	-7,678,881	-111,264,714
June	-5,238,826	-116,503,540
July	-7,114,102	-123,617,642
August	-19,268,579	-142,886,221
September	-15,698,539	-158,584,760
October	-8,865,606	-167,450,366
November	-13,702,262	-181,152,628
December	-11,770,493	-192,923,122
January 2023	3,049,346	-189,873,776

The monthly balance table (Table 1) indicates that the rebates have always been a higher proportion compared to the fees.

[3] These figures are based on rebate applications submitted and processed by 3 February 2023. Figures in future extractions will be different as more applications are submitted and processed. For example, a vehicle registered in February 2021 may apply for a rebate in August 2022 and be approved in September. The updated monthly balance and cumulative total for February 2021 will be reflected in future extractions.

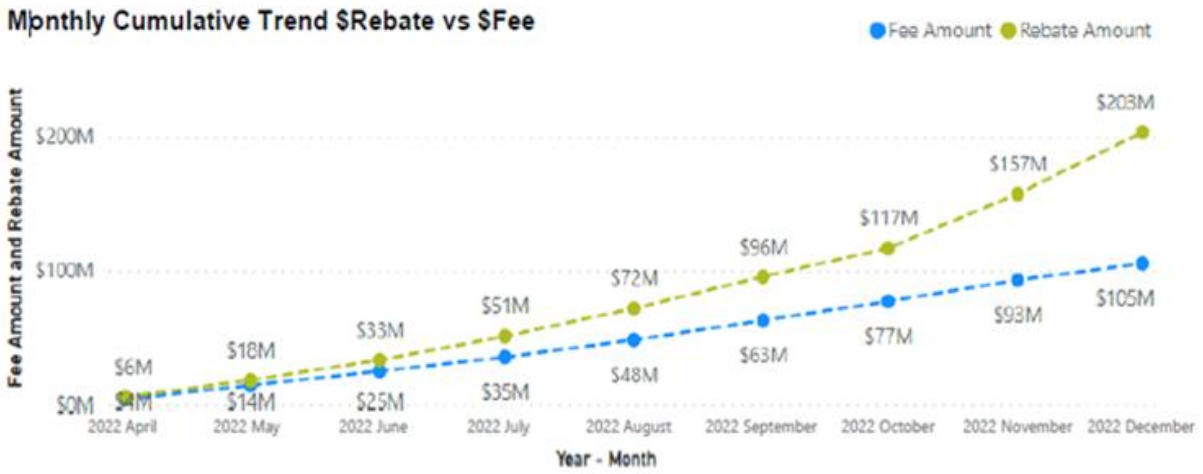


Figure 3 Monthly cumulative trend, $Rebate vs $Fee

Figure 3 shows the fees collected, and rebates paid out for Phase 2 of the CCD from 1 April – 31 December 2022. During this data period, the rebate expense is growing to roughly twice the income from fees. Since August 2022, the proportion of brand new EVs has risen significantly. The primary rebate cost is for brand new EVs (from which benefits also derive) and the second highest cost is from hybrids and low emission vehicles (split evenly between new and used).

Based on the monthly running totals of the net financial position, as of February 2023, Waka Kotahi has forecast that there are sufficient funds to last until April 2023.

Market share based on CO2 bands

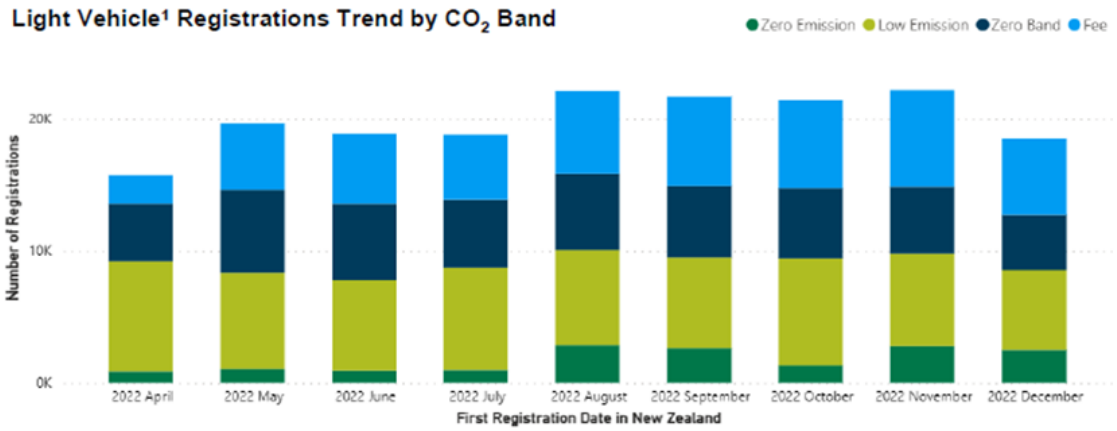


Figure 4 Light vehicle registrations trend by CO2 band

Table 2 Number and proportion of registrations % and mean WLTP CO2 emissions (g/km) by engine type and import status from Aug-Dec 2022

Row selected	Grand Total	Petrol	Hybrid Petrol	Diesel	Battery Electric	PHEV Petrol	Hybrid Diesel	LPG/Ot..	PHEV Diesel
New	67,556	26,255	8,567	18,886	10,859	2,980	9		
	100.0%	38.9%	12.7%	28.0%	16.1%	4.4%	0.0%		
	153	184	112	233	0	39	241		
Used	37,905	19,049	15,235	1,540	1,188	892	1		
	100.0%	50.3%	40.2%	4.1%	3.1%	2.4%	0.0%		
	140	177	102	207	0	66	149		

The data in Table 2 shows that the vehicle type with the highest sales volume is Petrol, with a mean WLTP CO_2 emission of 184g/km and 177g/km for new and used respectively. 26,255 new and 19,049 used petrol vehicles were registered in that band, but only one third contribute financially to the scheme: (disaggregated data shows that 13,836 petrol vehicles were obligated to pay a fee, compared to a much larger amount of 22,826 that were in the neutral zone, and 8,642 that had CO_2 emissions low enough to be eligible for a rebate).

Table 3 Number and proportion of registrations % and mean WLTP CO2 emissions (g/km) by scheme treatment and import status from Aug-Dec 2022

Row selected	Grand Total	Rebate	Fee	Neutral
New	67,556	25,984	26,803	14,769
	100.0%	38.5%	39.7%	21.9%
	153	59	232	174
Used	37,905	21,321	5,573	11,011
	100.0%	56.2%	14.7%	29.0%
	140	98	244	168

Table 3 shows that far fewer (in volume and relative shares) used imports are subject to fees than brand new vehicles. This is at least in part due to the higher average emissions of brand-new petrol vehicles (as shown in Table 2), and the popularity of brand new diesel utes.

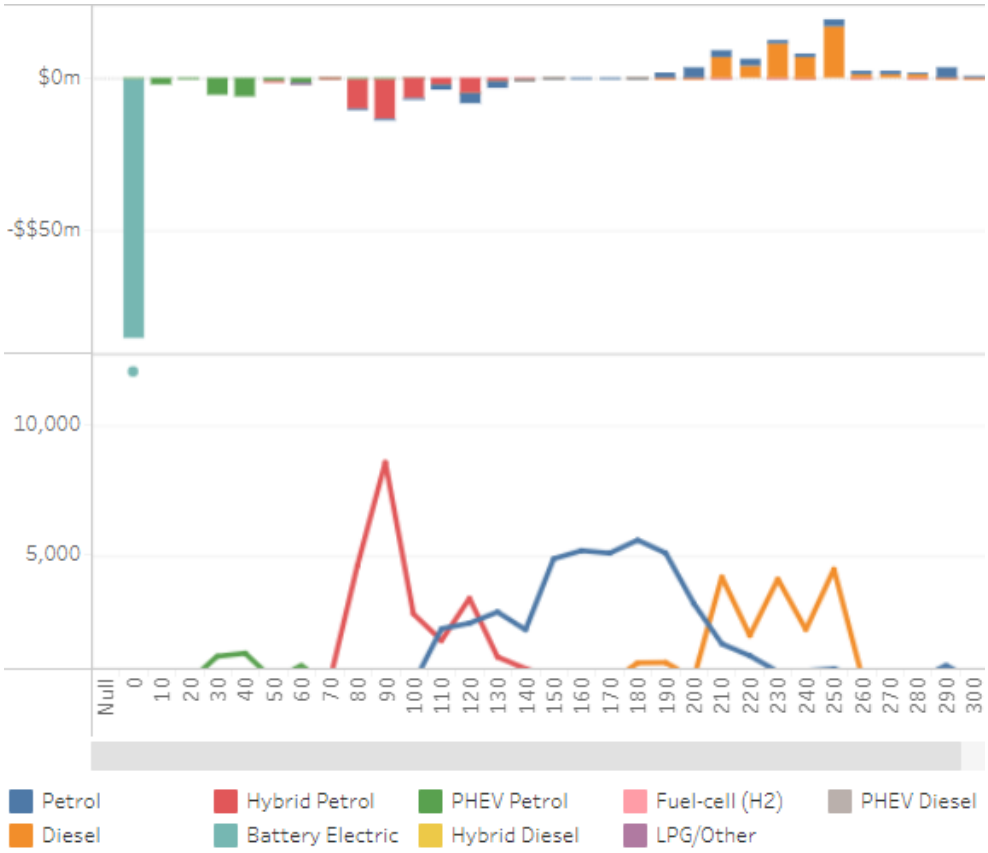


Figure 5 Distribution of CCD fees and rebates (in $M) (above) and number of vehicles (below) against WLTP CO2 emissions from Aug-Dec 2022

Figure 5 captures the distribution summary of the scheme fees and rebates as well as number of vehicles purchased, segmented by CO2 emissions band and fuel type from August to December 2022. This Figure indicates how the addition of rebates to hybrid (red) and some petrol (blue, if at

or below 146 grams) vehicles increased the total amount of rebates paid in phase 2. Also, the highest volume of vehicles by segment are the petrol vehicles, which fall just between the 150 and 200gm mark of CO2 emissions and primarily fall into a neutral classification (147-191gm), not receiving either a rebate or a fee.

Given the very high volume of vehicles in the 150-200gm band, if this band were to provide revenue to the scheme, it could potentially both increase the number of petrol vehicles providing revenue to the scheme, while simultaneously increasing the number of vehicles purchased falling below the emissions threshold required to receive a rebate.

Figure 5 also shows that the highest amounts of rebates paid are for BEVs, which only account for 8.8% of the total vehicles registered in the scheme (as shown in Table 3).

Figure 6 shows that the new BEVs segment accounts for the highest proportion of rebates paid both in Phase 1 and 2. Used hybrids, new hybrids, and new PHEVs for Phase 2 follow this.

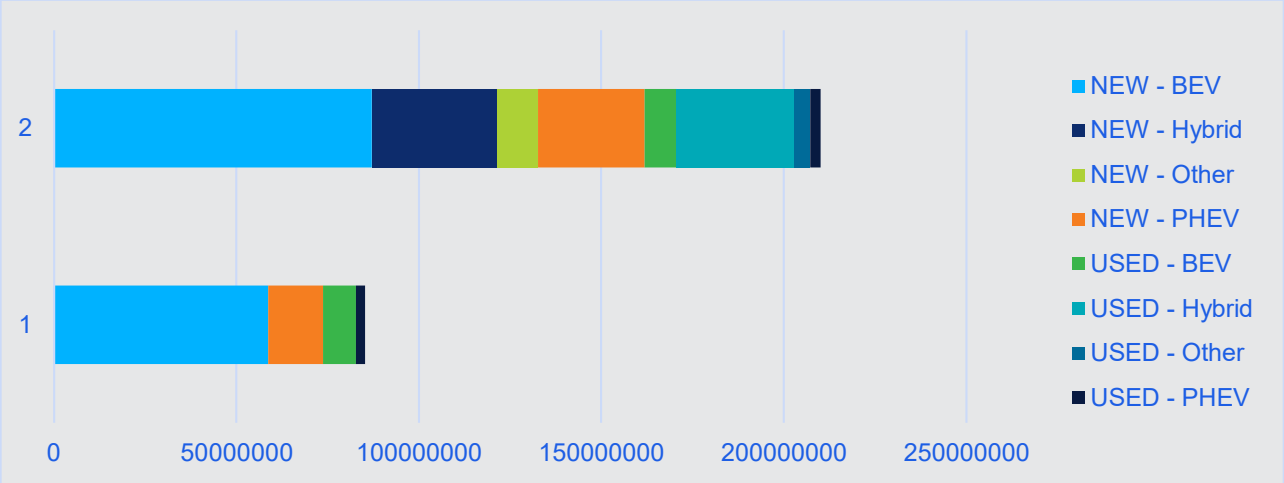


Figure 6 Total value of rebates paid by Phase

Table 4 Light Passenger Vehicles (LPVs): Number and proportion of registrations (%) and mean WLTP CO2 emissions (g/km) by CCD scheme treatment and engine type from Apr-Dec 2022

April – December 2022		Grand Total	Rebate	Neutral	Fee	Unknown
Battery Electric	**# of vehicle**	**15,529**	**13,461**	**7**		**2,061**
	%	*100.0%*	*86.7%*	*0.0%*	*0.0%*	*13.3%*
	CO2 value	0	0	0	0	0
Diesel	**# of vehicle**	**9,114**	**195**	**3,521**	**5,247**	**151**
	%	*100.0%*	*2.1%*	*38.6%*	*57.6%*	*1.7%*
	CO2 value	209	133	179	233	148
Fuel-cell (H2)	**# of vehicle**	**1**	**1**			
	%	*100.0%*	*100.0%*	*0.0%*	*0.0%*	*0.0%*
	CO2 value					
Hybrid Diesel	**# of vehicle**	**11**		**2**	**9**	
	%	*100.0%*	*0.0%*	*18.2%*	*81.8%*	*0.0%*
	CO2 value	227		164	241	
Hybrid Petrol	**# of vehicle**	**43,602**	**36,239**	**2,022**	**223**	**5,118**
	%	*100.0%*	*83.1%*	*4.6%*	*0.5%*	*11.7%*
	CO2 value	106	102	165	210	108
Petrol	**# of vehicle**	**78,130**	**11,467**	**41,500**	**19,910**	**5,253**
	%	*100.0%*	*14.7%*	*53.1%*	*25.5%*	*6.7%*
	CO2 value	176	128	171	223	135
PHEV Diesel	**# of vehicle**	**1**				**1**
	%	*100.0%*	*0.0%*	*0.0%*	*0.0%*	*100.0%*
	CO2 value	11				11
PHEV Petrol	**# of vehicle**	**7,791**	**6,844**	**5**		**942**
	%	*100.0%*	*87.8%*	*0.1%*	*0.0%*	*12.1%*
	CO2 value	45	45	110		46

Note: 'Unknown' vehicles are usually rebate-eligible vehicles that have not yet received an application for a rebate, or may never, if for example they are over the $80,000 purchase price eligibility cap.

Table 5 Light Commercial Vehicles (LCVs): Number and proportion of registrations (%) and mean WLTP CO2 emissions (g/km) by CCD Scheme treatment and engine type from Apr-Dec 2022

April – December 2022		Grand Total	Rebate	Neutral	Fee	Unknown
Battery Electric	# of vehicles	272	202			70
	%	100.0%	74.3%			25.7%
	CO2 value	0	0			0
Diesel	# of vehicles	21,848	8	91	21,687	62
	%	100.0%	0.0%	0.4%	99.3%	0.3%
	CO2 value	238	129	190	238	209
Hybrid Diesel	# of vehicles					
	%					
	CO2 value					
Hybrid Petrol	# of vehicles	8	4		4	
	%	100.0%	50.0%		50.0%	
	CO2 value	224	84		364	
LPG/Other	# of vehicles	1				1
	%	100.0%				100.0%
	CO2 value					
Petrol	# of vehicles	2,798	10	289	2,344	155
	%	100.0%	0.4%	10.3%	83.8%	5.5%
	CO2 value	271	136	169	285	196
PHEV Petrol	# of vehicles	36	24			12
	%	100.0%	66.7%			33.3%
	CO2 value		45			5

Tables 4 and 5 show the proportion of registrations for LPVs and LCVs. Notably, a significant proportion of petrol LPVs (53.1% of registrations) fall within the neutral category. This is followed by diesel LPVs, accounting for 38.6% of total registrations, which do not contribute to the scheme. The mean WLTP CO2 emissions for both are 171 and 179g/km, respectively. However, it is important to note that the above tables represent the combined data for new and used vehicles. The proportion of used diesel LPVs is much higher, ie, 59.2%, with mean CO2 emissions of 166g/km.

In the case of LCVs, about 10.3% of petrol vehicles fall under the neutral category with mean CO_2 emissions of 169g/km.

Table 6 Number and proportion of registrations % and mean WLTP CO2 emissions (g/km) by CCD scheme treatment and common vehicle body types, Apr-Dec 2022

April – December 2022		Grand Total	Rebate	Neutral	Fee
Cab-chassis	# of vehicles	1,531	11		1,520
	%	100.0%	0.7%		99.3%
	CO2 value	249	0		251
Campervan	# of vehicles	228			228
	%	100.0%			100.0%
	CO2 value	241			241
Convertible	# of vehicles	290	9	121	160
	%	100.0%	3.1%	41.7%	55.2%
	CO2 value	238	136	173	292
Hatchback	# of vehicles	55,573	41,606	12,791	1,176
	%	100.0%	74.9%	23.0%	2.1%
	CO2 value	112	93	164	216
Minibus	# of vehicles	526			526
	%	100.0%			100.0%
	CO2 value	263			263
Saloon	# of vehicles	10,512	5,812	3,018	1,682
	%	100.0%	55.3%	28.7%	16.0%
	CO2 value	132	81	167	249
Sports car	# of vehicles	1,243	37	103	1,103
	%	100.0%	3.0%	8.3%	88.7%
	CO2 value	261	120	170	274
Station wagon	# of vehicles	85,471	33,528	30,858	21,085
	%	100.0%	39.2%	36.1%	24.7%
	CO2 value	145	70	175	221
Utility	# of vehicles	18,902	99	97	18,706
	%	100.0%	0.5%	0.5%	99.0%
	CO2 value	241	16	170	243
Van	# of vehicles	4,043	245	363	3,435
	%	100.0%	6.1%	9.0%	85.0%
	CO2 value	215	21	174	234

Table 6 shows variation in vehicle registrations, and thus, likely availability, by body type. For example, the majority (almost 75%) of hatchbacks have emissions low enough to attract rebates. Saloon and station-wagons (which includes SUVs) also commonly attract rebates.

This contrasts to utes, where less than 1% of registrations had emissions low enough for attract rebates. The first electric ute, a 2WD model, first went on sale late 2022.

4.2. Activity

Between July 2021 and December 2022, the New Zealand Transport Agency (Waka Kotahi) received 81,889 applications for rebates (averaged at 4,549 per month). While it takes eighteen days on average to process an application, the processing time is dependent on the number of applications received. Since Phase 2 was implemented, the processing time has changed given the increased volume of rebate applications, increasing to 30 days before improving rapidly at the end of 2022 as demonstrated in Figure 7.

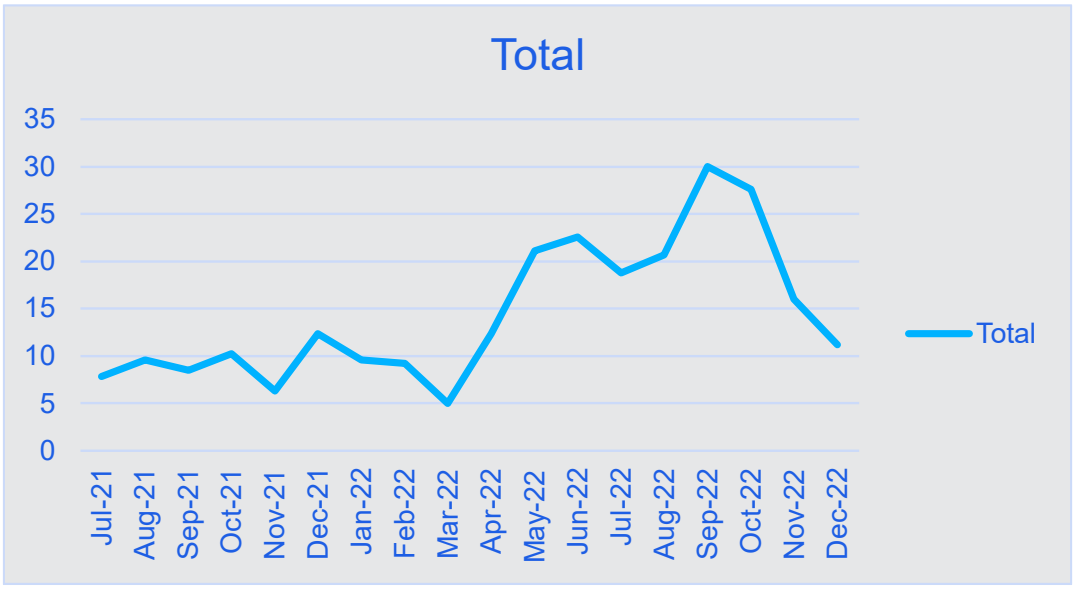


Figure 7 Average processing time (days) Jul 2021-Dec 2022

4.3. Outputs

Among the 81,889 total applications received, 79,434 were processed by the end of December 2022. 97% of these were approved (n=77,326), and 3% were declined (n=2,108), with the remaining applications still in process after December 2022. The figures and tables that follow provide further information on vehicle types, purchase prices and regional differences for the approved rebate applications (hereafter, approved applications).

Engine type and age of vehicles

During Phase 1 of the scheme, the number of approved applications was relatively stable during the first eight months, with an increase in March 2022 primarily driven by an increase in BEVs (see Figure 8). During Phase 1 of the scheme, hybrids were not eligible for a rebate.

Eligibility for Clean Car rebates changed on 1 April 2022, beginning Phase 2, and making hybrids eligible for a rebate. The number of approved applications increased notably, with hybrid vehicles dominating the number of approved applications (52%, Table 7). About 65% of these hybrid vehicles, compared to only a quarter of BEVs, were used imports.

Table 7 Number and % of approved rebate applications by engine type Jul 2021-Dec 2022 (by the month applications were submitted)

	Phase 1		Phase 2	
Engine type	No. approved rebates	% of rebates	No. approved rebates	% of rebates
BEV	9,029	73%	13,089	20%
PHEV	3,399	27%	6,780	10%
Hybrid			34,012	52%
Other			11,017	17%

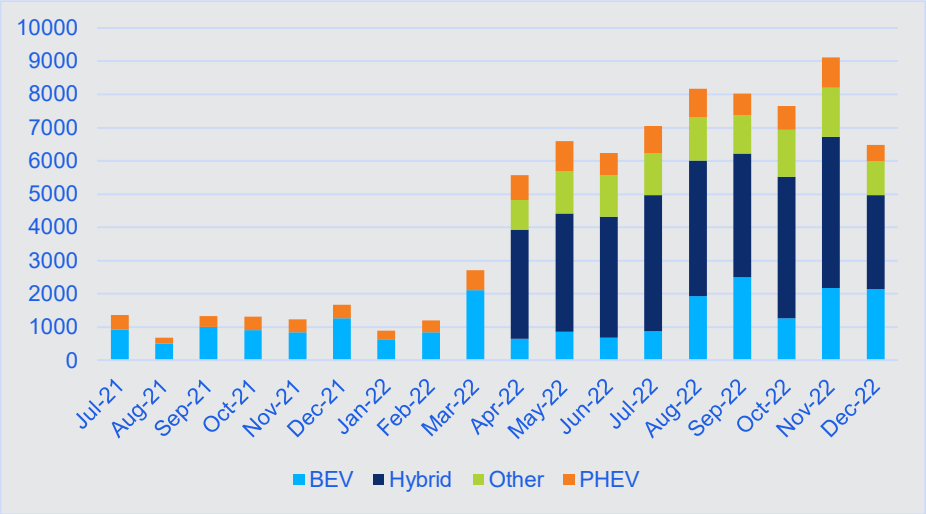


Figure 8 Monthly approved applications by engine type, Jul 2021-Dec 2022 (by the month applications were submitted)

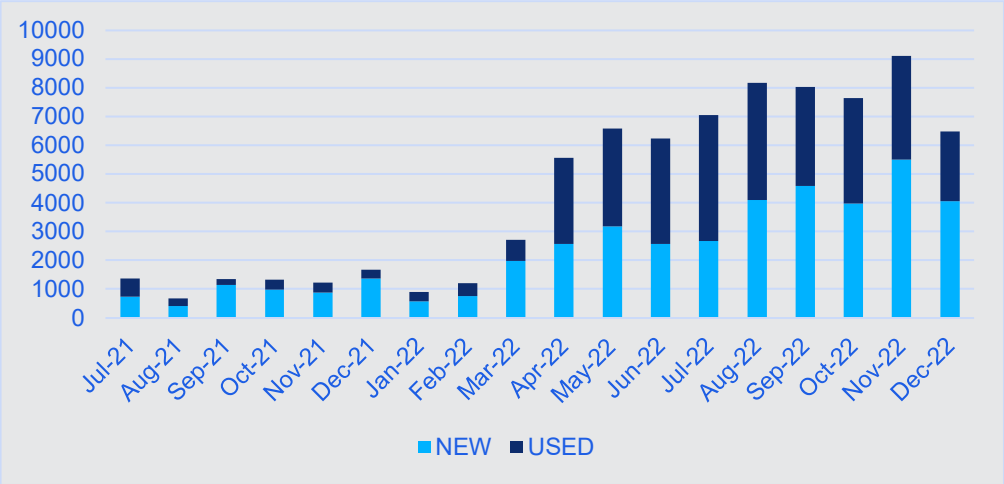


Figure 9 Monthly approved applications, by used/ new vehicles, Jul 2021-Dec 2022 (by the month applications were submitted)

Figure 9 provides more information about the age of vehicles imported to New Zealand. Overall, there is a relatively even split between new and old vehicles. However, when considering the two Phases separately, there is a higher proportion of approved applications for imported new vehicles (71%) received between July 2021 and March 2022, compared to 51% of applications from April to December 2022. The increased share of imported used vehicles after the commencement of Phase 2 is expected to reflect the actual vehicle market. BEVs are newer technologies, whereas hybrids have been around longer. Therefore, there are more used hybrids available to import to New Zealand. Table 8 shows more detail about the number and % of vehicles receiving a rebate segmented by age of vehicle, and Table 9 segments the same data further into number of vehicles and % for each engine type.

Table 8 Number and % of approved rebate applications by vehicle age Jul 2021-Dec 2022 (by the month applications were submitted)

Vehicle age at registration	Number of vehicles receiving a rebate	% of rebates
a. Import new	42,034	54%
b. Up to 3 years	1,037	1%
c. 4-5 years	3,146	4%
d. 6-10 years	24,718	32%
e. 10+ years	6,391	8%

Table 9 Number and % of approved rebate applications by vehicle age and engine type Jul 2021-Dec 2022 (by the month applications were submitted)

	Engine type							
Vehicle age at registration	BEV count	BEV%	PHEV count	PHEV%	Hybrid count	Hybrid%	Other count	Other%
a. Import new	16,967	77%	7,713	76%	11,396	34%	5,958	54%
b. Up to 3 years	567	3%	30	0%	389	1%	51	0%
c. 4-5 years	1,451	7%	162	2%	1,375	4%	158	1%
d. 6-10 years	3,044	14%	2,165	21%	15,745	46%	3,764	34%
e. 10+ years	89	0%	109	1%	5,107	15%	1,086	10%

Vehicle makes and models

After the implementation of CCD Phase 2, there was an increase in the mean number of new electric and new PHEV models receiving a rebate payment, as shown in Table 10.[4] The expansion of the scheme into other fuel types also vastly increases the number of makes and models receiving a rebate. There have been new BEV models brought to market since the start of Phase 2 as well.

[4] Models with fewer than three approved applications for a particular were excluded to remove potential bias in the data. Hybrid Diesel and Fuel-cell are not shown in this chart because there were fewer than 3 registrations for each of the models in these categories in any given month.

Table 10 Number of unique models receiving a rebate payment, Jul 2021-Dec 2022 (by the month applications were submitted)

	New					Used				
	Diesel	Electric	Petrol	Hybrid	PHEV	Diesel	Electric	Petrol	Hybrid	PHEV
PHASE 1 (mean)		**13**			**8**		**3**			**5**
Jul-21	-	9	-	-	6	-	5	-	-	8
Aug-21	-	9	-	-	5	-	2	-	-	3
Sep-21	-	10	-	-	7	-	1	-	-	3
Oct-21	-	13	-	-	9	-	5	-		4
Nov-21	-	12	-	-	9	-	3	-		4
Dec-21	-	15	-	-	7	-	2	-		4
Jan-22	-	15	-	-	10	-	2	-		4
Feb-22	-	14	-	-	10	-	3	-		8
Mar-22	-	17	-	-	11	-	3	-		7
PHASE 2 (mean)	**1**	**17**	**21**	**17**	**10**	**3**	**2**	**18**	**37**	**6**
Apr-22	-	15	21	13	8	1	2	15	35	3
May-22	-	16	24	15	11	2	4	17	33	7
Jun-22	-	14	19	14	10	3	2	17	38	7
Jul-22	-	15	23	17	12	4	1	21	41	6
Aug-22	-	18	19	17	11	4	3	23	39	6
Sep-22	-	18	21	20	9	3	2	17	39	7
Oct-22	-	19	20	20	9	3	4	21	37	4
Nov-22	-	21	22	21	9	3	2	18	39	7
Dec-22	1	16	20	17	9	1	1	17	33	3

Among all approved applications, the five most frequently purchased models were identified separately for new and used imports (Table 11). Month to month market share changes could result from consumer preference and the availability of eligible vehicles in the market.

Table 11 Top 5 models: number and % of approved applications, Jul 2021-Dec 2022

Make and model – top 5	No. of rebates	% of rebates
New vehicles (n=42034)		
TESLA MODEL 3 (BEV)	4,693	11%
TESLA MODEL Y (BEV)	3,803	9%
MITSUBISHI ECLIPSE CROSS (PHEV)	3,187	8%
TOYOTA RAV4 (Hybrid)	2,726	6%
MITSUBISHI OUTLANDER (PHEV)	2,447	6%
Used vehicles (n=35277)		
TOYOTA AQUA (Hybrid)	9,277	26%
TOYOTA PRIUS (Hybrid)	4,871	14%
NISSAN LEAF (BEV)	4,846	14%
TOYOTA COROLLA (Hybrid)	1,944	6%
MAZDA DEMIO (Petrol)	1,660	5%

Among new vehicles, Tesla Model 3 comprises the largest share of rebates at 11%. This model was available in high volume since the scheme began, whereas other models have only become available more recently. The spikes in September, December 2021 and March, August 2022 (Figure 10) likely reflect the timing of shipment arrivals, and the reduction in May to July was influenced by Tesla's production and exports out of Shanghai being restricted by COVID19. In addition, Tesla's Model Y SUV entry into the market may have affected Model 3 sales from September 2022 onwards. The prevalence of SUVs in Table 11 also reflects consumer demand for the new EV vehicle type.

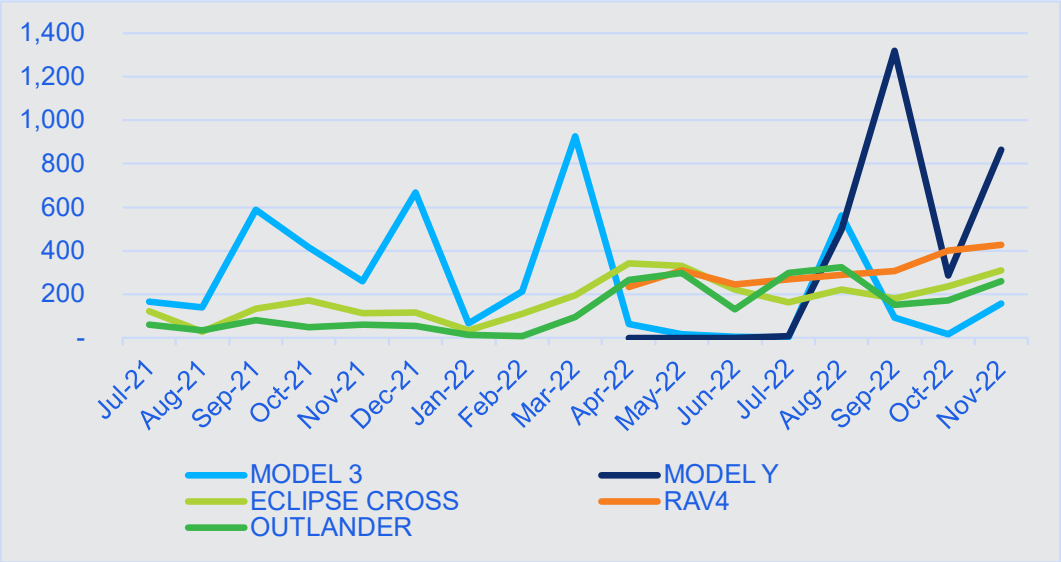


Figure 10 Monthly approved applications: top 5 models of new vehicles, Jul 2021-Dec 2022 (by the month applications were submitted)

Among used vehicles, Toyota Aqua was the most popular (a quarter of the share). When considering Phase 2, Toyota Aqua alone accounted for 31% of the approved applications, even though it was not eligible for the first nine months of the scheme (Figure 11). This was because the model was the most imported used vehicle in 2022.

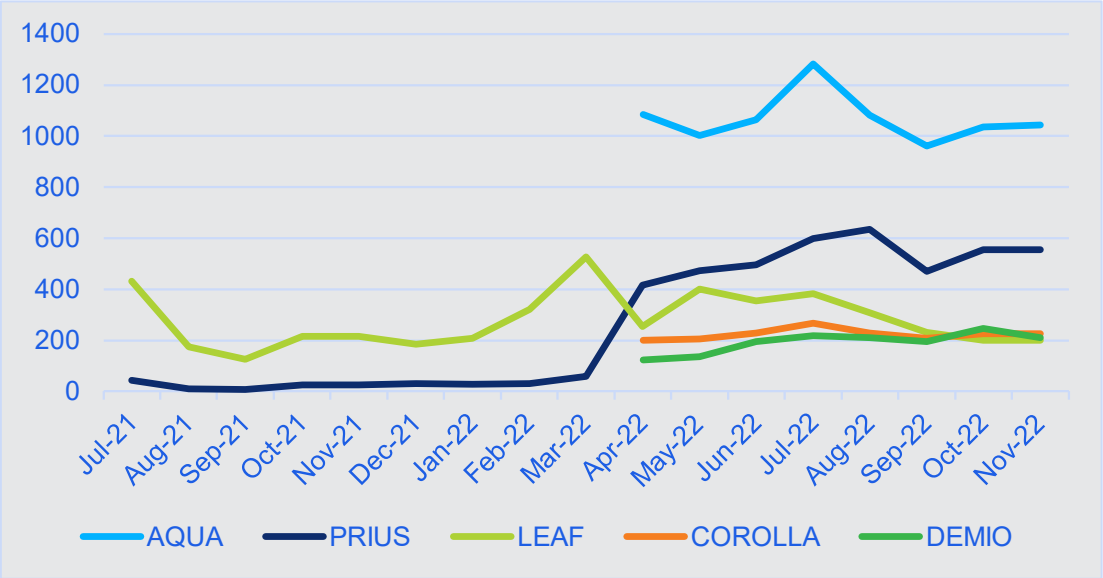


Figure 11 Monthly approved applications - top 5 models of used vehicles, July 2021 – Dec 2022 (based on the month applications were submitted)

Vehicle purchase price and rebate amount

There appears to be a drop in both the average purchase price and rebate amount after the implementation of Phase 2 for both imported new and used vehicles. In addition, as implied above, Phase 2 (after the Clean Car rebate changes in April 2022) saw a substantial rise in lower cost new and used imported hybrid vehicles entering the rebate scheme. Table 12 details average purchase price for imported new and used vehicles for each month across Phase 1 and 2 and average rebate paid for each month.

Table 12 Average purchase price and rebate amount, Jul 2021-December 2022 (by the month applications were submitted) and CCD Phases

Month rebate application approved	Imported new		Used	
	Purchase price (average)	Rebate amount (average)	Purchase price (average)	Rebate amount (average)
Phase 1 started				
July 2021	$63,183	$7,566	$27,653	$3,139
August	$63,814	$7,887	$29,199	$3,127
September	$66,053	$7,912	$30,342	$3,041
October	$64,695	$7,654	$30,815	$3,124
November	$63,986	$7,703	$29,920	$3,067
December	$67,277	$7,980	$29,340	$3,024
January 2022	$65,986	$7,607	$29,504	$3,114
February	$65,143	$7,632	$29,684	$3,165
March	$67,951	$8,010	$29,793	$3,160
Phase 2 started				
April	$49,780	$4,461	$17,638	$1,558
May	$48,918	$4,151	$18,731	$1,615
June	$47,563	$3,964	$18,439	$1,563
July	$51,288	$4,279	$18,811	$1,564
August	$56, 434	$5,433	$18,945	$1,524
September	$59,142	$5,919	$18,496	$1,497
October	$49,426	$4,606	$18,036	$1,478
November	$52,723	$5,199	$17,977	$1,486
December	$55,790	$5,914	$17,343	$1,473
Phase 1	**$65,690**	**$7,798**	**$29,508**	**$3,119**
Phase 2	**$52,747**	**$4,969**	**$18,296**	**$1,526**

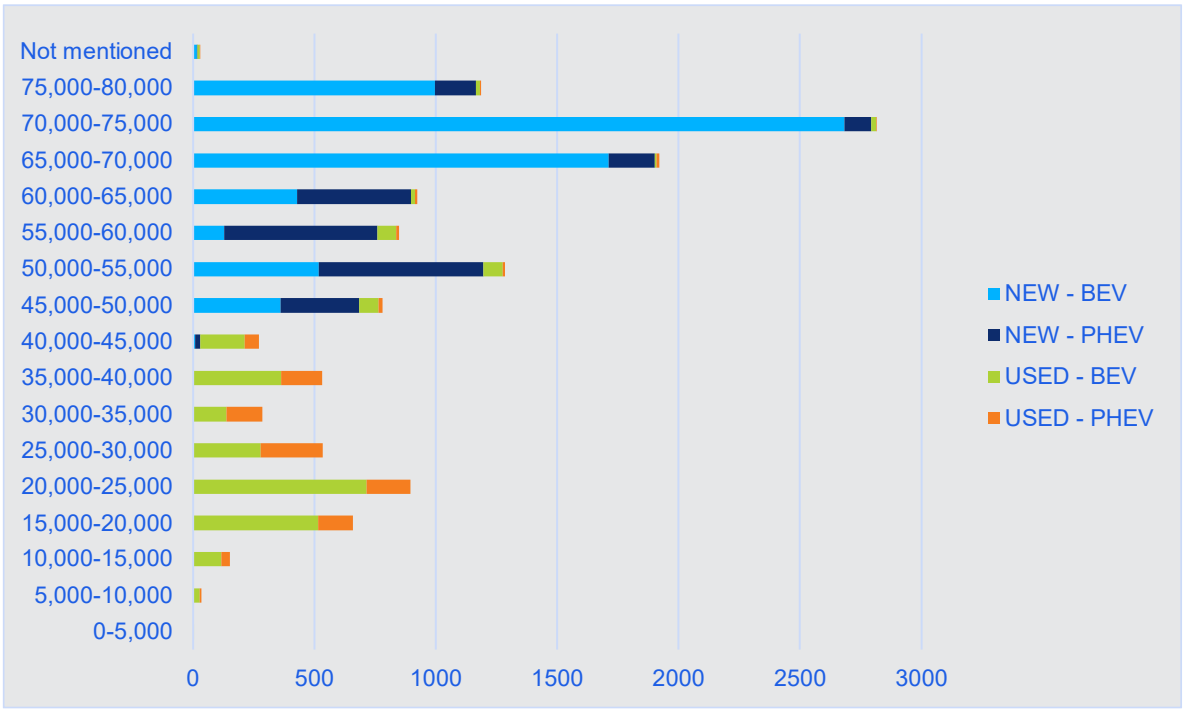


Figure 12 Phase 1: Number of vehicles with approved rebates by price and engine type

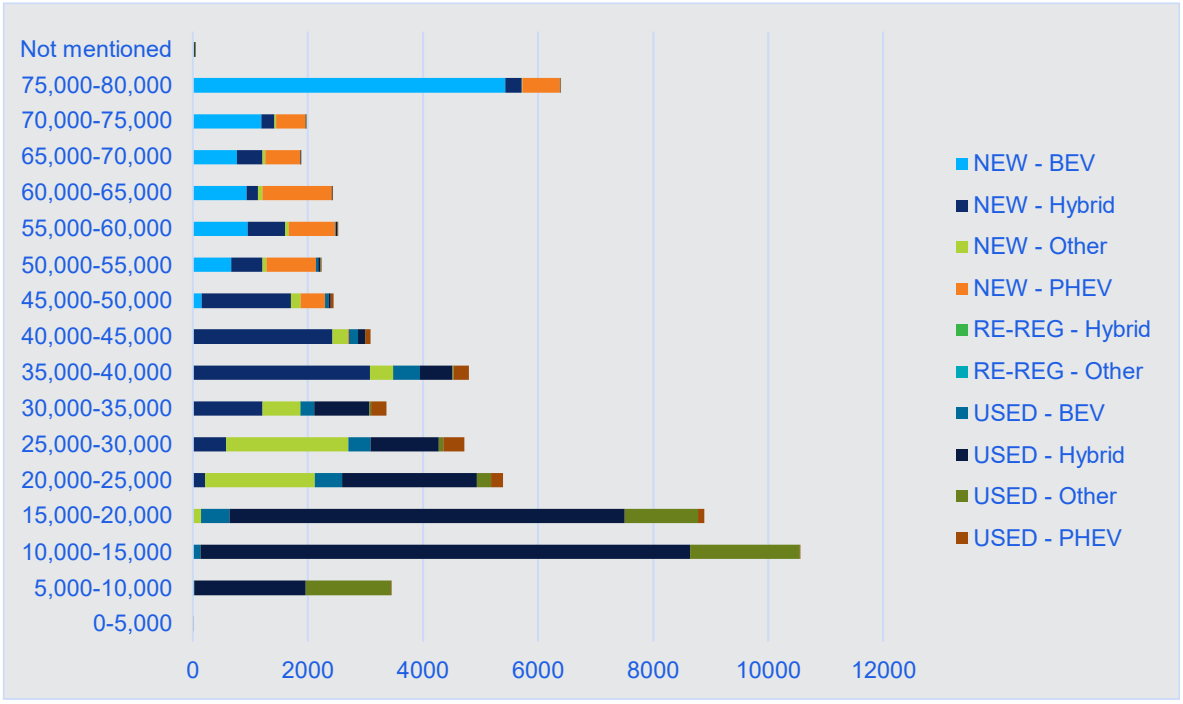


Figure 13 Phase 2: Number of vehicles with approved rebates by price and engine type

New vehicles approved rebate:
Figures 12 and 13 shows us that for new vehicles:

- The highest number of approved rebates were for BEVs, both in Phase 1 and 2, primarily in the price range of $70,000 to $75,000 in Phase 1, and $75,000 to $80,000 in Phase 2. This is likely due to the introduction of the popular Tesla Model Y into the market at the beginning Phase 2.
- The second highest number of approved rebates for new vehicles were for PHEVs in Phase 1 (Figure 12), primarily in the price range of $50,000 to $60,000, and hybrids in Phase 2 (Figure 13), primarily between $35,000 to $45,000.

Used vehicles approved rebate:

- The highest number of approved rebates were also for BEVs in Phase 1 (Figure 12), primarily in the price range of $20,000 to $25,000.
- In contrast, in Phase 2 (Figure 13), the highest number of approved rebates for used vehicles were for hybrids, primarily in the price range of $10,000 to $20,000.
- While these were both the ‘highest’ number of used vehicles with rebates approved in these respective categories for Phase 1 and 2, there were 1,231 rebates approved for used BEVs priced between $15,000 and $25,000 in Phase 1, and 15,364 rebates approved for used hybrids priced between $10,000 and $20,000 in Phase 2 – twelve times the number of vehicles.

Based on Figure 12 and Figure 13, the number of approved rebate applications is much higher in Phase 2 than in Phase 1. Moreover, there are proportionally more approvals in lower price ranges in Phase 2 than Phase 1. This is likely to be at least in part because Phase 2 extends the eligibility for a rebate to all vehicles whose carbon emissions are lower than 146gms (based on 3P-WLTP values), and hybrids and petrol vehicles are cheaper to manufacture then BEVs.

The highest quantity of rebates in terms of $5,000 price bands was granted to vehicles priced between $10,000 to $15,000. This indicates some confidence about the supply volume of vehicles that are affordably priced and at 146gm or lower. These vehicles are primarily hybrids, though petrol vehicles also feature. Used BEVs do not feature in volume until a price point of over $15,000.

Table 13 Brand new BEVs provided rebates during Phase 2, ordered by price

Price Rank	Make	Model	Average price
1	MG	ZS	$52,320
2	BYD	ATTO 3	$59,194
3	OPEL	CORSA	$59,375
4	RENAULT	KANGOO	$60,883
5	HYUNDAI	IONIQ	$61,036
6	PEUGEOT	208	$63,974
7	KIA	NIRO PLUS	$64,013
8	OPEL	MOKKA	$64,074
9	LDV	EDELIVER 3 (*Van*)	$65,765
10	MINI	HATCH	$66,012
11	VOLVO	C40	$66,105
12	NISSAN	LEAF	$68,050
13	KIA	NIRO	$68,395
14	TESLA	MODEL 3	$72,517
15	HYUNDAI	KONA	$72,562
16	PEUGEOT	2008	$73,825
17	LDV	ET60 *(Ute)*	$74,742
18	MAZDA	MX-30	$75,611
19	MERCEDES-BENZ	EQA	$76,235
20	FIAT	500	$77,572
21	POLESTAR	POLESTAR 2	$77,675
22	LDV	EDELIVER 9 *(Van)*	$78,410
23	KIA	EV6	$78,721
24	TESLA	MODEL Y	$79,026
25	LEXUS	UX300E	$79,286
26	HYUNDAI	IONIQ 5	$79,322

There were two new additions below $60,000 for Phase 2: BYD's Atto 3 and OPEL's Corsa. Despite its very recent introduction to the market, since Phase 2 in April 2022, the BYD Atto 3 is the second most purchased new BEV receiving rebates in New Zealand (Table 13), after the Tesla Model Y. The third and fourth most sold new BEVs are the Tesla Model 3 and the much cheaper MG ZS, respectively. Not shown is the price-leading brand new "Ora Cat" BEV manufactured by Great Wall Motors that is available for $50,000, but which did not go on sale until early 2023.

Table 13 also shows more generally that conventional hybrids or fuel efficient combustion engine vehicles are less expensive than BEVs.

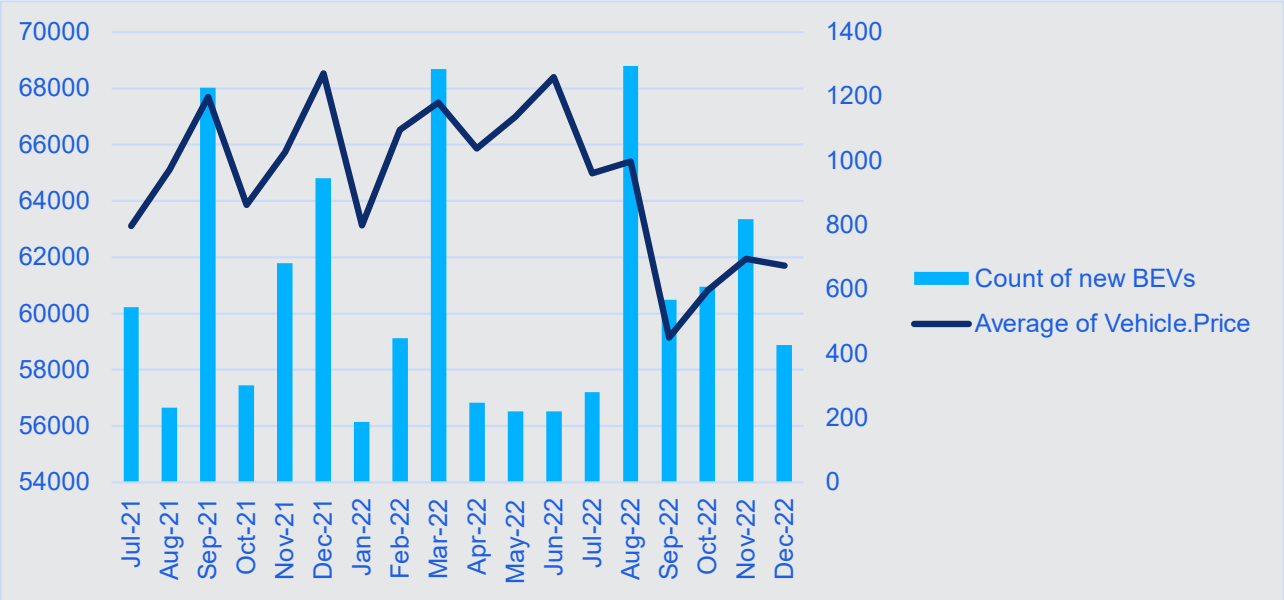


Figure 14 Monthly volume of new BEVs against the average vehicle price trend of vehicles below $75k

Figure 14 shows two types of data. The blue bar graph depicts the number of new BEVs registered in the scheme, and the line graph depicts the average price trend for the new BEVs. The trend for average vehicle price, although quite variable, shows an overall decline from August 2022 onwards.

Geographical location

About half of the approved applications came from the Auckland region, followed by Wellington and Canterbury (Figure 15). Although rebate applicants could be an individual or an entity, the average number of rebates per 10,000 population for each region was calculated to standardise the measure for regional comparison. Compared to the national figure of 151 rebates per 10,000 population, Auckland, Wellington, and Canterbury regions have a higher uptake rate, at 219, 151 and 162 rebates per 10,000 population.

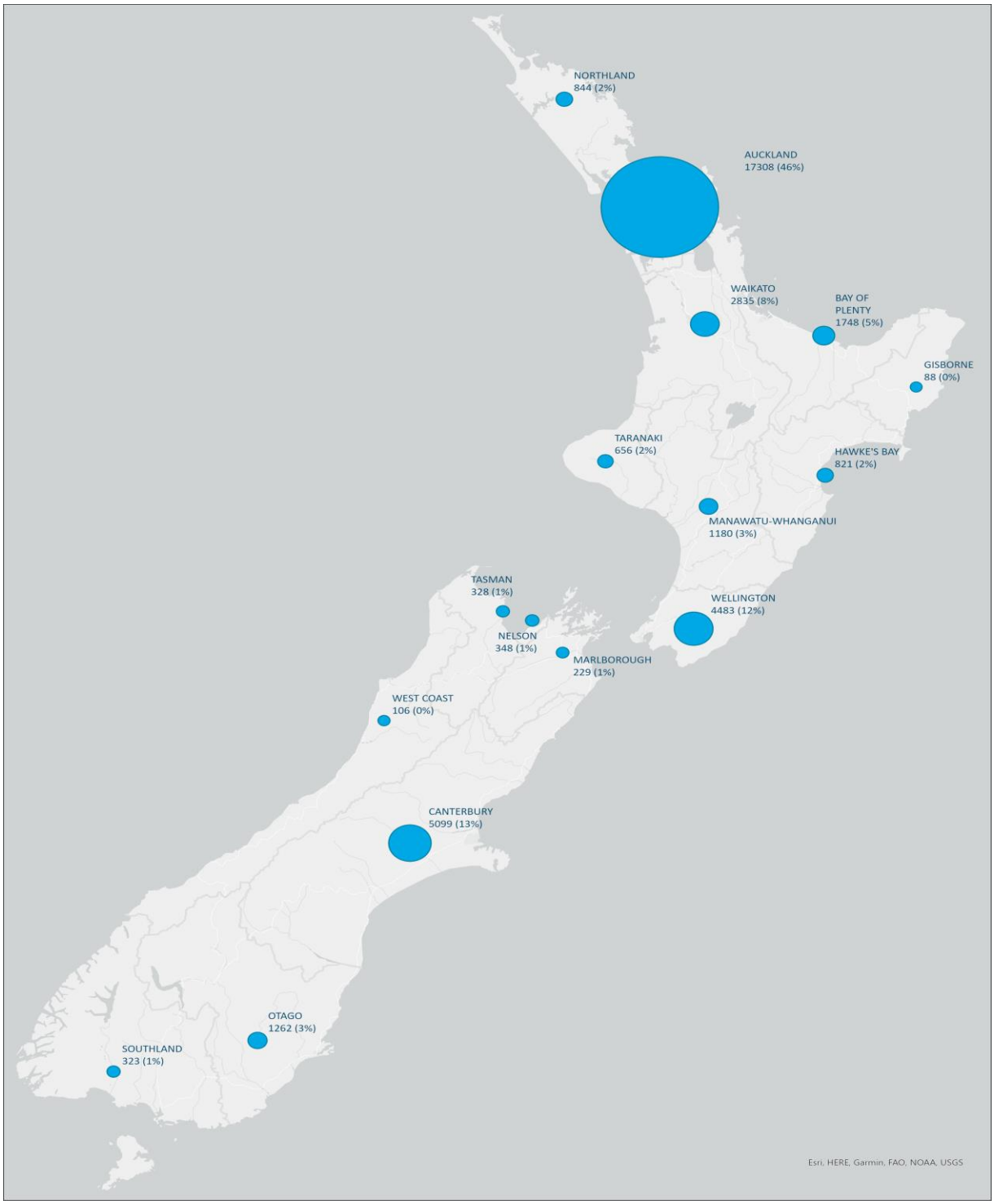


Figure 15 Geographical distribution of approved rebate applicants, Jul 2021 – Jul 2022 (by the month applications were submitted)[5]

[5] n=113 (0.3%), approved applications do not contain regional data

5. Outcome Indicators

The outcome indicators are sourced from EECA's Consumer Monitor[6], Motor Vehicle Register (MVR) administered by Waka Kotahi and Waka Kotahi's EV Purchasing Survey.

5.1. Awareness and perceptions

Awareness of Clean Car Discount

Since the introduction of CCD in July 2021, 64-73% of the survey respondents reported their awareness of the scheme (Figure 16). During 2021/22, a higher level of awareness was found among:

- respondents 50 years old or older
- males
- New Zealand Europeans (71% compared to 56% Māori and 25% Pacific Peoples)[7]
- respondents with a total household income over $100,000
- city dwellers.

However, there were no differences by region.

6 EECA's Consumer Monitor IS a quarterly survey of the public to track New Zealanders' climate change attitudes and actions. Survey respondents comprise a nationally representative sample of 750 adults per quarter (across age, gender and region). Responses collected in 2021/22 were compared by age, gender, ethnicity, region, living in a city/town/rural area, and household income to understand the differential responses to CCD by population group. This report covers data collected to June 2022.

7 66% of respondents from Asian communities reported awareness of the Clean Car Discount. Their level of awareness is not statistically significantly different from other ethnic groups.

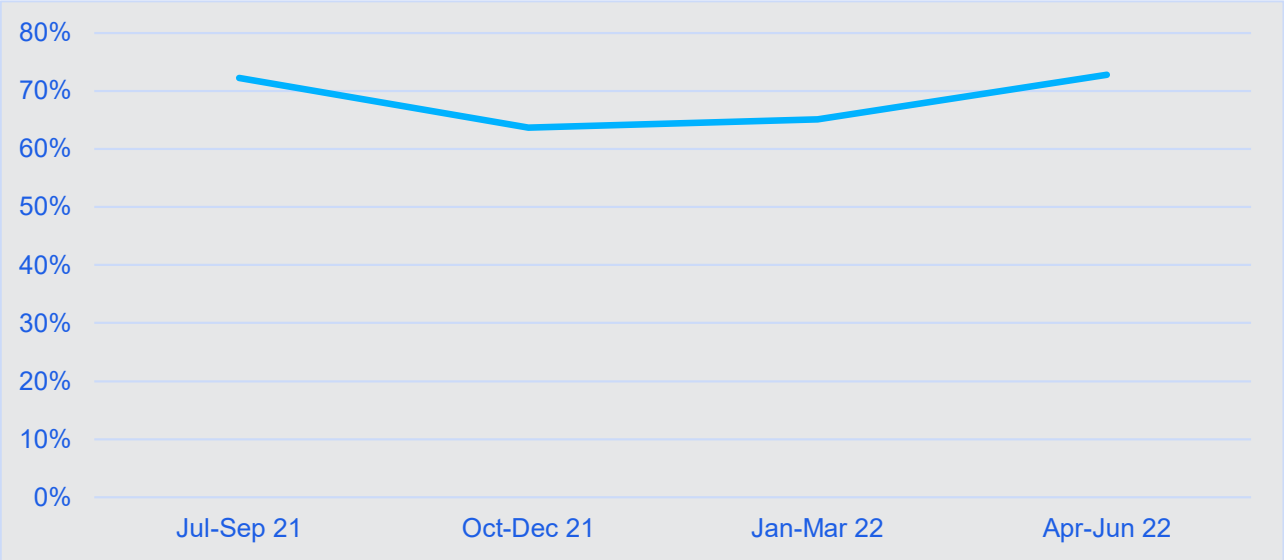


Figure 16 Proportion of adults who are aware of Clean Car Discount, Jul 2021-Jun 2022

Waka Kotahi's EV Purchasing Survey found that 33% of respondents agreed that the CCD has made them more aware of vehicle emissions (24% neutral, 23% disagree, 2% unsure). In addition, one-half of the respondents agreed that the policy would get them to buy a car that avoids high pollution fees (21% neutral, 27% disagree, 2% unsure).

The survey also found that respondents from Hawke's Bay and Gisborne regions disagreed that the CCD scheme would get them to buy a car that avoids high-pollution fee. In Gisborne 100% disagreed and in Hawke's Bay 54% disagreed – in both cases, well above the percentage who disagreed with this statement in other regions.

Intention to purchase a BEV, PHEV or hybrid

The EECA report shows there was a steady increase over the past six years in the proportion of people who said they would consider a zero- or low emission vehicle (BEV, PHEV or hybrid) in their next vehicle purchase (Figure 17). Between 2020/21 and 2021/22, there was a statistically significant increase from 54% to 58%.

In 2021/22, those more likely to consider purchasing low emissions vehicles included the following groups:

- 18-29 year olds
- males
- Asian communities
- household incomes over $70,000
- people living in the Auckland region
- city dwellers.

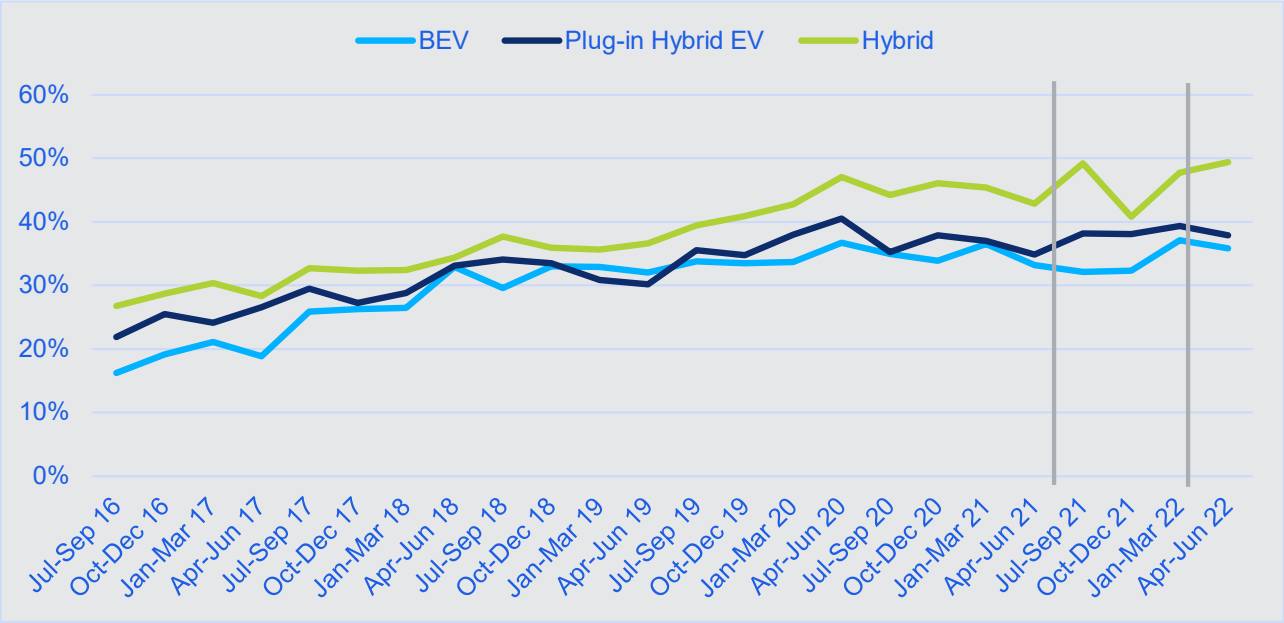


Figure 17 Proportion of adults who would consider a BEV, a plugin hybrid EV, or a hybrid for their next purchase, Jul 2016-Jun 2022

Barriers to buying an EV

While the rebate is designed to make EVs more affordable, the proportion of respondents in the EECA report who identified cost as a drawback for buying an EV has increased from 58% (before introducing the rebate) to 65% (Table 14).

Table 14 Proportion of adults who consider cost a drawback for buying an EV, Jul 2018-Jun 2022

Annual %	2018/19	2019/20	2020/21	2021/22
Cost as a drawback	58	58	58	65

In 2021/22, those who were more likely to perceive cost as a drawback for buying an EV were:

- respondents aged 50 years or over
- New Zealand Europeans
- respondents not living in the Auckland region.

No differences were found by gender, household income or whether they live in a city, a town or a rural area.

This unexpected increase in perception is counter intuitive and may be driven by a range of factors outside the policy setting, such as the general increase in living costs that may affect discretionary spending. Furthermore, this question is specifically about the cost of vehicle purchase and does not consider the perception of ongoing maintenance and petrol cost (lack of).

52% of Waka Kotahi's EV Purchasing Survey participants mentioned that they would need more financial assistance before buying an EV or Ebike. Furthermore, those who considered they needed more financial assistance were more likely to have heard about the CCD than the overall

sample (69% vs 62%). This finding may suggest that cost is still a barrier for most respondents, even at the current rebate level.

The same survey provided some perspectives on price points, finding that 81% of adults might consider buying a BEV for under $80,000, which is the current cap for applying a rebate (and 69% for under $50,000). The more a respondent is willing to spend on their next vehicle purchase, the more likely it is to be a low emission vehicle.

The following table reports on the proportion of people who reported on other factors (non cost) that they think are drawbacks to purchasing an EV. These had not changed significantly over time. Among these six factors, the cost of an EV was the most common barrier (identified by 65% of adults in 2021/22, see Table 15), followed by the availability of public chargers (38%) and travel range not suitable for long distance travelling (33%). This is despite New Zealand now having public chargers operating at frequent (under 75km) intervals on highways nationwide. In addition, almost all brand new EVs can now achieve long distance travel.

Table 15 Proportion of adults who consider these factors a drawback for buying an EV, Jul 2018-Jun 2022

Annual %	2018/19	2019/20	2020/21	2021/22
Travel range unsuitable for long distance travelling	32	38	32	33
Travel range unsuitable for daily travel needs	14	16	12	19
Not a wide range of body types or models available	20	20	21	23
No suitable vehicle type to meet their needs	13	13	14	11
Take a long time to charge	26	23	23	25
Not enough public chargers available	–	–	–	38

5.2. System and Infrastructure and behavioural change

In this section, indicators of system architecture and behavioural change are reported together as they are closely linked. For example, while an increase in purchases that are eligible for the Clean Car rebate directly affects emission reduction, it also increases the share of zero- and low emission vehicles in New Zealand's light vehicle fleet, creating a system change.

Interest in EV

After introducing the CCD, the proportion of people who self-reported talking with someone they knew and looking for more information about EVs in the past 12 months increased (Figure 18). However, the proportion of those who visited an EV government website, a dealership and test drove an EV remained small, at about 5% (Table 16).

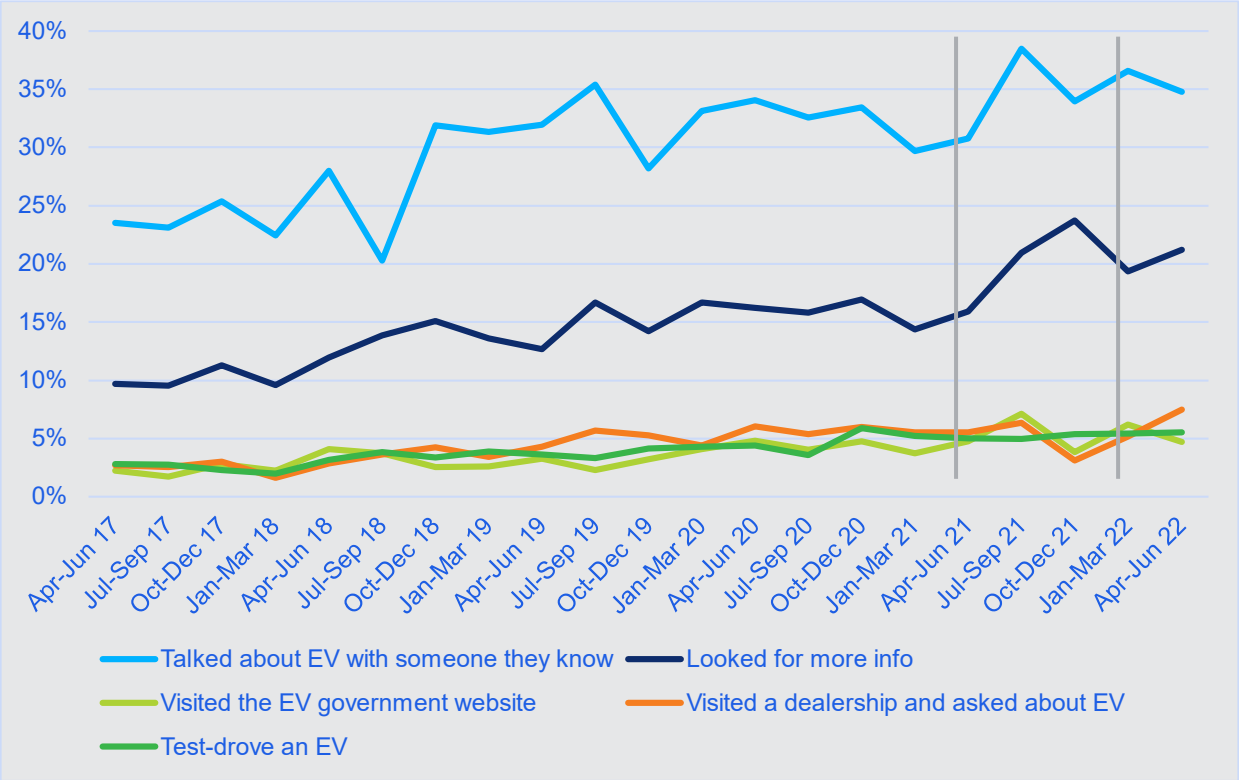


Figure 18 Proportion of adults demonstrating an interest in EVs, Jul 2017-Jun 2022

Table 16 Proportion of adults who have shown an interest in EV, Jul 2017-Jun 2022

%	2017/18	2018/19	2019/20	2020/21	2021/22
Talked about EV with someone they know	25	29	33	32	36
Looked for more information	11	14	16	16	21
Visited the EV government website	3	3	4	4	5
Visited a dealership and asked about EV	3	4	5	6	6
Test drove an EV	3	4	4	5	5

In 2021/22, respondents more likely to have visited a dealership and asked about EVs in the past 12 months were:

- male
- respondents with a household income over $100,000.

There are no differences by age, ethnicity, or region, whether they live in a city, town or rural area.

Those who were more likely to have test driven an EV in the past 12 months were:

- male
- had a household income over $100,000

- lived in the Auckland region.

There were no differences by age or ethnicity, whether they live in a city, town or rural area.

The next few graphs examine purchasing behaviours using car registration data extracted from the MVR. This data covered light vehicles only.

Figure 19 shows the share of the entire light vehicle fleet (not just new registrations) within the carbon emission range that would be eligible for a rebate today. As of mid January 2023, these vehicles accounted for just over 8% of the light vehicle fleet. When considering zero- emission vehicles alone, its share in the entire light vehicle fleet is relatively small (just over 1%). Overall, the number of vehicles with a carbon emission of 146 grams or lower is increasing. This is above the trend of the previous years, and the current rate of increase is around 2% growth every 18 months.

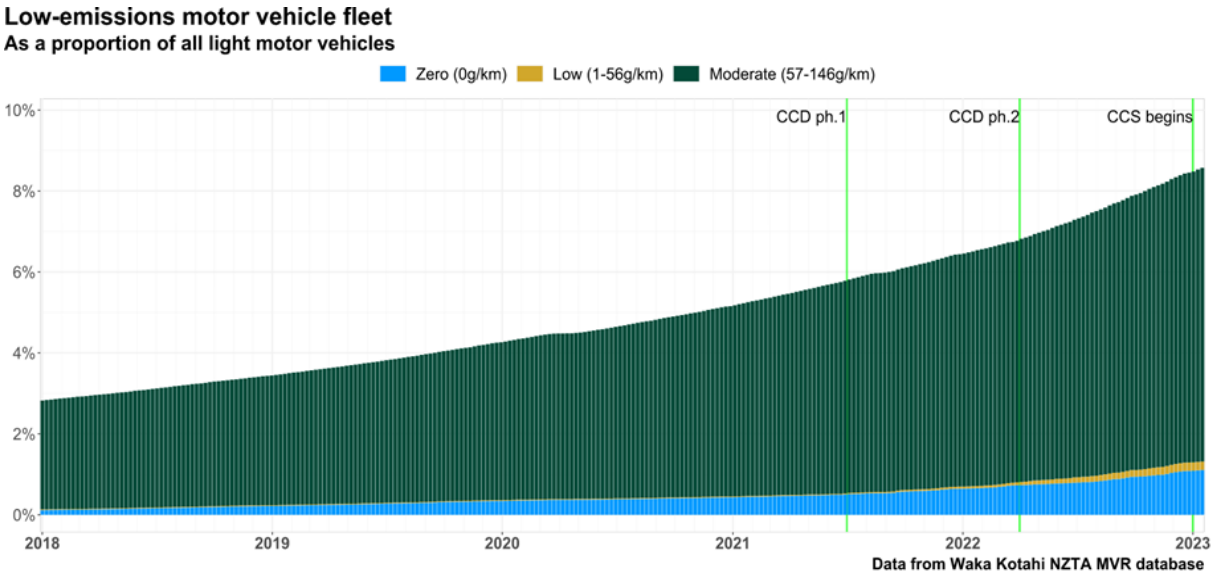


Figure 19 Proportion of zero- to low emission vehicles in the light vehicle fleet, Jan 2018-Jan 2023

The Government's Emission Reduction Plan has set a target for 30% of vehicles in the fleet to be zero emission by 2035.

Since mid 2022, for the first time, the number of petrol vehicles in New Zealand has begun to decrease (ie, the number of petrol vehicles reaching their end of life is exceeding the number of new petrol vehicles entering the country).

We also examine the market share of light vehicles registering in New Zealand for the first time, before and after CCD was implemented. Figure 20 shows that light vehicle registrations generally trend towards higher numbers of zero- and low emission vehicles, typically BEV or PHEV vehicles. However, the moderate band (predominantly conventional hybrids) are still dominating registrations.

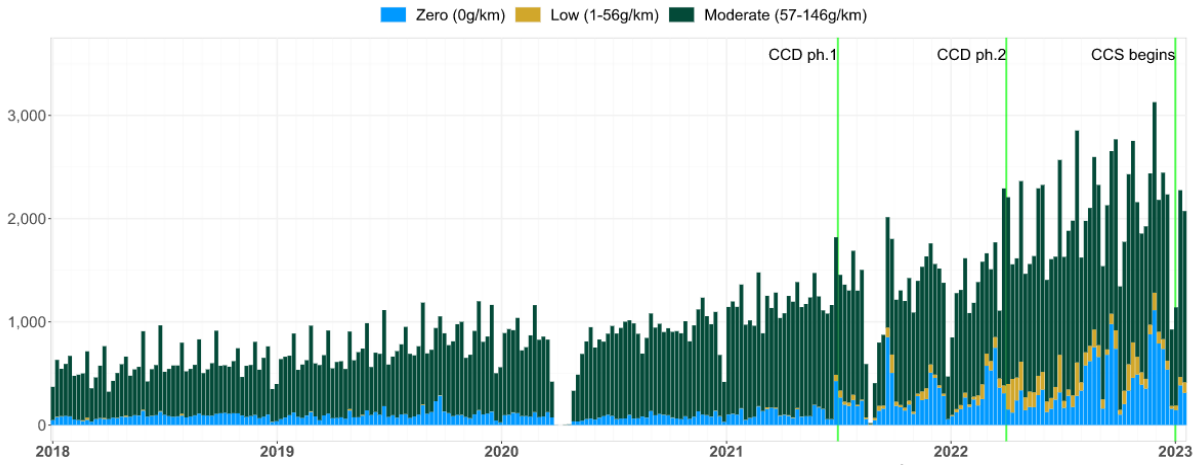
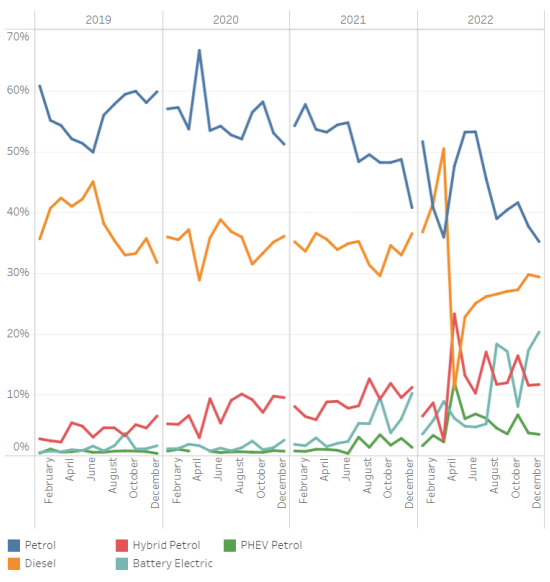


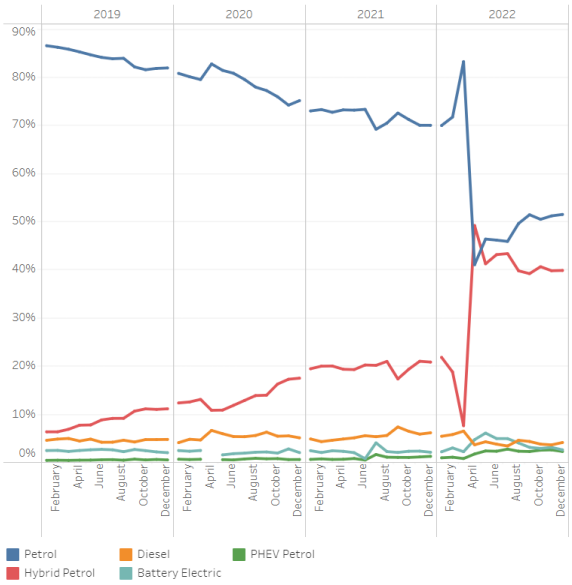
Figure 20 Weekly registrations of zero- to low emission vehicles, Jan 2018 –Jan 2023

Since July 2021, the proportion of brand new BEVs and PHEVs has risen greatly, and since April 2022, the share of hybrids has risen after a dip in March (see Figure 21, left graph). This is expected, given the anticipated change to rebate eligibility from April. There was also a sharp increase in the proportion of new BEVs, mirrored by a dip in new petrol vehicles. However, continuous monitoring is needed to understand the ongoing impact of Phase 2 of CCD.

Since April 2022, with the commencement of rebates on hybrids, together with high emission charges, the number of used hybrids jumped to roughly match used petrol cars (Figure 21, right graph), which simultaneously dropped at that point. However, the drop in high emission vehicles could be partly induced by an increase in purchases of this vehicle type in the month prior. By contrast, with the new vehicle segment, the introduction of rebates on used BEVs in mid 2021 was less pronounced, understood to be partly due to a lack of options other than the one model that is available only in limited volume from Japan (Nissan Leaf).



Brand new vehicles (growth in BEVs)



Used import vehicles (growth in hybrids)

Figure 21 Market share of initial registrations, Jan 2019 to Dec 2022

Figure 22 shows in Phase 2 (April 2022 onwards) how the combination of Zero emission vehicles (green), the 'new normal' of Moderate emissions (aka hybrids) at 30-40% share since April (red) and the 'High emission' neutral bands (orange) are dominant. Hence, the segment providing income ('very high emissions', blue, at around 30%) cannot provide sufficient income into the scheme.

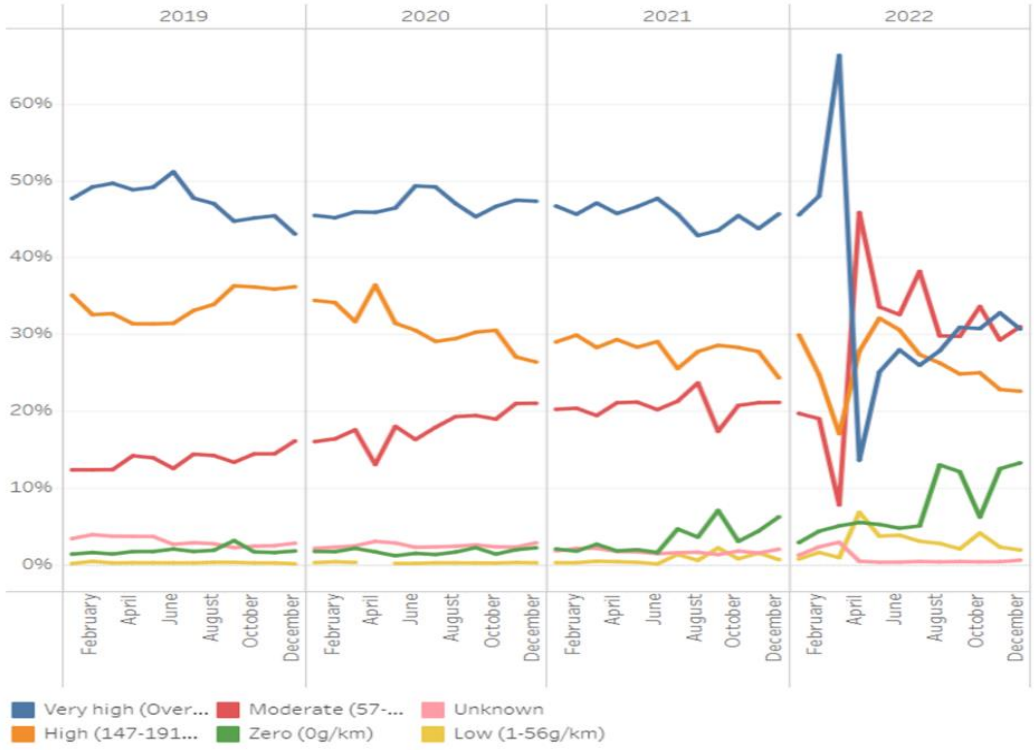


Figure 22 Market share based on CO2 bands

There was also a reduction in mean CO_2 emissions of new vehicle registrations (for both imported new and used) when a rebate was introduced in July 2021, and a sharper reduction when rebates were expanded and high emission charges were introduced in April 2022 (Figure 23).

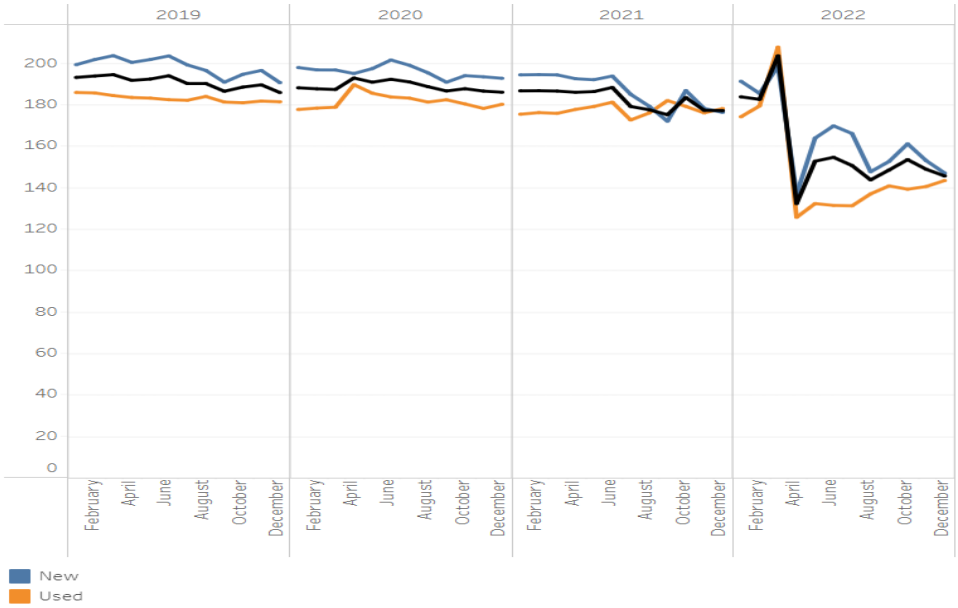
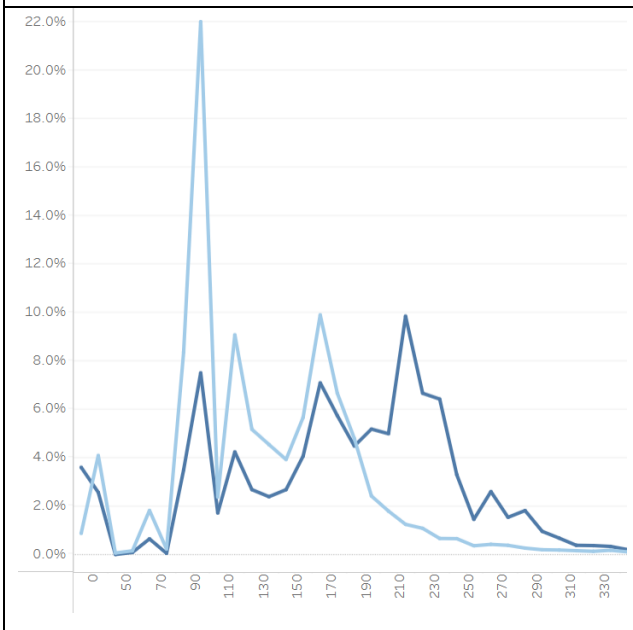
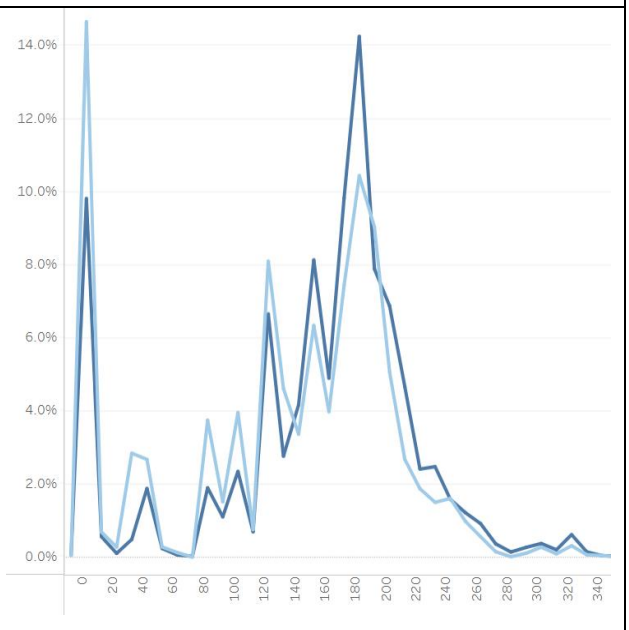


Figure 23 Mean exhaust CO2 emission of initial registrations (gram per kilometre travelled – 3p-WLTP), Jan 2019-Dec 2022. (The black line shows an overall average of new and used vehicles.)

Average emissions rose and fell sharply with the introduction of Phase 2. Importers will also be looking to adjust their average emissions towards targets of the Clean Car Standard which commenced January 2023 to avoid paying charges under that scheme. Passenger cars, which comprise most vehicles, will need to achieve a target of 145grams on average, which is like the average performance after Phase 2 began.

Detailed changes to vehicle emission levels following the full scheme

The following graphs show percentage market share in 10 gram increments for passenger car sales in the 9 months before (up to 31 March 2022) and 9 months after (April to December 2022) the introduction of the full scheme. Rebates were offered on vehicles at 146 grams and below, and from April 2022, charges were imposed on vehicles at 192 grams and higher. Rebates on BEVs and on most PHEVs were unchanged over the entire period.

Used passenger vehicles:	**New passenger vehicles:**
• Almost a total removal of vehicles emitting 190 grams and higher • A pronounced increase in vehicles just below 100g (ie, hybrids), roughly tripling. • Small increase to BEVs (now 4%) and PHEVs (now 2%). • Reducing rebate eligibility below 146 grams, and lowering the start point charges below 192 grams could therefore cause a similar positive effect, given the availability of suitable vehicles.	• Reasonable reduction in vehicle sales in the high emission 180-189 gram band. • A noticeable increase in vehicle sales in the low emission 80-149 gram bands (hybrids, efficient petrol) • A large increase in BEVs, which averaged 15% of market share (and even higher late 2022). • Reducing rebate eligibility to below 146 grams and lowering the starting point for charges below 192 could accelerate this trend of increased BEV and hybrid uptake, and a further reduction of the very high (180-189 gram) band, if suitable vehicles are available in sufficient volume.
	

Key: dark blue = Phase 1 (before full scheme introduced); light blue = Phase 2 (full scheme introduced).

Figure 24 Proportion of passenger car sales by CO2 emissions in the 9 months prior and 9 months after Phase 1 (used imports on left; brand new vehicles on right)

TE MANATŪ WAKA
MINISTRY OF TRANSPORT