

Southland EV and Hybrid Uptake Research

15th July 2021



Strategic Insight for Social Good™

Research Commissioned by:

GREAT SOUTH



Southland Regional Development Agency

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Our team help you achieve both.

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Acknowledgements

THANKS TO:

Impact Consulting would like to thank the Southland residents and business owners who contributed to this research via survey responses and phone discussions. We hope it will prove to be a valuable resource for informing priority actions and local policy.

Please note that while care has been taken in research, reporting and subsequent recommendations, this is an independent report and as such has not had direct input from the organisations consulted. It therefore cannot be considered to represent the views of any of the individuals or organisations acknowledged or referenced.

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Executive Summary

1 Report Structure

This independent report has been compiled by Impact Consulting on behalf of Great South. The report is broken into three sections:

1. Context
2. Research Findings
3. Recommendations

2 Regional Context

Drivers for Action

Southland produces around 15% of New Zealand's tradeable exports, mainly from the primary sector. Action to address climate change is important for Southland as a global citizen and for the future prosperity of the region.

Environmental impact will increasingly become a critical factor, with a very real economic impact on the value, marketability and international appeal of Southland produce. Environmental factors will also influence the appeal of the region as a tourism destination, in years to come.

With decreasing global investment in fossil fuels, there is also a need to consider the long-term reliability of fuel supply for a region at the bottom of the world and the last stop on global supply lines. As such, electrification of transport is just as much an economic and industry supply line risk management issue, as it is an environmental consideration.

- Southland's total gross emissions equate to 8.9M tCO₂e p.a.¹.
- Transport accounted for around 6% of Southland's total carbon emissions in 2018 (501,031 tCO₂e)².

¹ [Net Zero Southland Report - EY - 2021](#)

² [Southland Regional Carbon Footprint 2018, AECOM, Oct 2019](#)

³ Based on BEV and PHEV ownership (figures exclude HEV)

⁴ [Ministry of Transport, NZ monthly EV Statistics](#)

Electric Vehicles

Southland currently has one of the lowest rates of EV (Electric Vehicle)³ ownership in NZ. In June 2021, the rate of EV ownership in Southland was of just 0.67 vehicles per 1,000 people. Compared to Auckland at 7.24 EV per 1,000 people, Wellington 6.11, Canterbury 6.04 and Otago 4.33. Of NZ's 14 main regions, only Gisborne and the West Coast have lower rates of EV ownership⁴.

In May 2021 EV and Plug-in Hybrid (PHEV) registrations made up 2.72% of total light vehicle registrations in NZ. There are currently 27,434 light electric and plug-in hybrid vehicles registered in New Zealand, 75% of these are full electric (BEV).⁵

- 99% of New Zealand's BEV and PHEV imports come from Japan.
- In 2020 58% of our BEV and PHEV vehicle imports were second-hand. As such historic registrations in Japan influence future supply.

Southland Road Registered Vehicles

- In 2019 there were a total of 107,118 vehicles in Southland.⁶
- Light Passenger Vehicles made up 70% of the total road registered vehicles in Southland. Light Commercial made up 21%.
- Over the 5 years 2015 - 2019 the total number of vehicles in the Southland fleet grew by an average of 2.7% per year.⁷

EV and Hybrid

- In May 2021 there were a total of just 178 BEV and PHEV in Southland.⁸
- In 2020 there were 442 conventional hybrid (HEV) vehicles in Southland.

⁵ [Ministry of Transport, NZ monthly EV Statistics](#)

⁶ [Ministry of Transport, NZ Fleet Statistics](#) - Southland all fuel types

⁷ [Ministry of Transport, NZ Fleet Statistics](#) - Southland all fuel types - Impact Consulting Analysis

⁸ [Ministry of Transport, NZ monthly EV Statistics](#)

3 Survey Results

Two online surveys were undertaken. One target toward businesses and the other toward individuals / households. In total 898 responses were received during the period 24 May - 20 June 2021.

- Personal / Household (742, including 77 self-employed respondents)
- Business (156 respondents)
- Survey respondents covered a wide geographic area and range of business sectors.

Environmental Views

- Approximately 79% of Southlanders acknowledge climate change as an issue to be considered and around 21% are skeptical or very skeptical.
- 31% of personal survey respondents indicated that climate change is an issue which we need to urgently address.
- The average climate change importance ranking given by Southlanders was 3.6/5, resulting in a net promoter score of -15.
- The average climate change importance ranking given by Southland businesses was 2.9/5 resulting in a net promoter score of -55.

Clean Car Subsidy

The Governments Clean Car Subsidy was announced part way through this research. Overall, 74% of business and 46% of households were not supportive, with a large number undecided. Most significantly, the announcement of the clean car subsidy reduced the likelihood that Southlanders would purchase an EV or Hybrid vehicle. This was even the case for those within the subset respondents with strong support for climate change action.

Household Vehicles

- Southland households own on average 2.4 vehicles.
- 49% of these are small-medium cars.
- 5% EV or Hybrid.
- 23% 4x4 and 14% SUV

- 20% of household vehicles are company or business owned.
- The average replacement timeframe is 10 years for personal vehicles.
- 10% of Southland households have an e-bike and 2% own an electric scooter.

Business Vehicles

- Southland business have on average 10.1 vehicles.
- Of these an average of 6.9 are road vehicles.
- 25% of all business vehicles in Southland are 4x4.
- 17% are small-medium cars.
- 5.3% are EV or Hybrid.
- 5.8% of business vehicles are leased.
 - The average lease timeframe is 3.5 years.
 - 50% of business who lease vehicles would be interested in EV or Hybrid options.
- The average replacement timeframe is 7.6 years for business vehicles.

EV Uptake Projections



Based on current survey responses, it is our assessment that within 6 years (2027) the total EV / Hybrid fleet in Southland will be around 4,100 vehicles and will grow to 10,000 by (2030), including conventional hybrid vehicles.

Assuming the current total fleet growth rate of 2.7% per annum is continued, EV and Hybrids will make up an estimated 3.1% of all road registered vehicles in Southland by 2027 and 6.8% by 2031.

6.8%

of Southlands road registered vehicles are likely to be EV or Hybrid by 2031 (assuming no significant changes in market conditions, attitudes or preferences of Southlanders).

Significant changes in market conditions, education, incentives, available vehicle types, towing capacity, battery life-cycle and policy would be required for the 92% EV adoption rate⁹ for light vehicles projected in the Net Zero Southland report to be achieved by 2050 in Southland.

Barriers to Uptake

The major barriers to uptake of EV and Hybrid vehicles for both households and businesses are:

1. Cost
 2. Battery related reservations
 - a. Replacement cost
 - b. Lifespan
 - c. Viable recycling options and environmental concerns
 3. Vehicle options
 - a. Range
 - b. Towing ability
 - c. 4x4 / suitability for gravel roads
- Across almost all factors there was very little difference between people who are likely to purchase an EV and those who are not. The main notable difference being a higher priority on climate change.
 - Fringe Benefit Tax limits uptake of EV fleet vehicles for some companies. With most EV vehicles being used as pool cars.

Small EV

- For EV farm bikes, the main barriers are the cost of stock holding for retailers, as well as available range and supply chain challenges.
- The main barriers to additional uptake of e-bikes are availability and supply chain issues.

⁹ [Net Zero Southland - Economic Mitigation Pathways Analysis to Net Zero Emissions for Southland](#)

4 Recommendations

There are wide range of factors which would potentially increase the uptake of EV and Hybrid Vehicles in Southland. Many of these are outside of the control of local entities and need advocacy to central government or partnership with business, suppliers and other organisations.

- Addressing battery end-of-life seems to be a key issue for Southlanders with 60% of business and individuals alike indicating that this is an important topic. Providing credible information on the environmental trade-offs and benefits is an important first step. However, many respondents would like to see proactive action toward viable NZ based recycling options. There are a number of possibilities in this space.
- People who have driven an EV are more likely to buy one. This is a clear correlation, although difficult to determine which comes first. Increasing exposure to EV is an important step in improving uptake. A possibility with wider exposure and additional benefits for the charging network and local tourism, is supporting rental companies to move a portion of their fleets to EV or Hybrid. Another possibility is gaining funding support for EV courtesy cars for use at garages.
- Survey respondents were very engaged in the EV topic, with 32% of all respondents requesting some form of follow-up.
- Providing credible information around options, charging requirements and cost savings would go a long way to supporting informed decision making.
- Acknowledging that the current EV and Hybrid vehicles available won't suit everyone is important, as cold temperatures, regular long drives and fast charging all have an impact on overall battery life span. Vehicles need to fit their intended use in order to maintain the credibility EV and Hybrid as valid options.
- It is important to ensure that policy changes and incentives, don't have unintended outcomes which are detrimental to their overall objectives.

SECTION 1

Context

Southland EV Research Context

5 Report Context

This research and report have been commissioned by Great South to provide an independent primary research assessment on the uptake of Electric Vehicles (EV) in Southland.

While many of the barriers and limitations to adoption of EV are anecdotally known, a need for research which was specific to the Southland Region and context was identified. Understanding localised views and motivations will help avoid assumptions, inform priority actions and provide a fact-based platform for advocacy and to support applications for regionally targeted funding.

6 Big Picture Context

- **Carbon Neutrality:** Great South in collaboration with EY have modelled for a transition for Southland to carbon neutrality by 2050¹⁰ or sooner, in line with the New Zealand Government's commitment to reaching net zero emissions of long-lived gases by 2050¹¹. The modelling and actions of other regions and cities around the world indicate that this is an achievable goal¹². The recent EY modelling identifying a range of potential carbon abatement pathways for the Southland region. One of which is electrification of transport. Increasing EV uptake in light vehicles was identified as one of several feasible and readily implementable mitigation strategies.
- **Progress to date:** Southland is proactively approaching environmental impact mitigation and already has a number of forward-thinking programmes in place, including the Carbon Neutral Advantage Project and others. Southland has already successfully reduced its carbon emissions by 500,000 tCO₂e per annum in the space of just a few years, making it a leader in New Zealand¹³.

- **Drivers for action:** Southland produces around 15% of New Zealand's tradeable exports, mainly from the primary sector¹⁴. Action to address climate change is important for Southland as a global citizen and for the future prosperity of the region. Environmental impact will increasingly become a critical factor, with a very real economic impact on the value, marketability and international appeal of Southland produce. Environmental factors will also influence the appeal of the region as a tourism destination, in years to come.

With decreasing global investment in fossil fuels, there is also a need to consider the long-term reliability of fuel supply for a region at the bottom of the world and the last stop on global supply lines. As such, electrification of transport is just as much an economic and industry supply line risk management issue, as it is an environmental consideration.

- **Primary Sector:** For a region with a high proportion of primary sector industries, there are clear tensions and differing views around the amount farming and related industries are contributing¹⁵ to this global issue and how much responsibility the sector should carry. However, anecdotally, there seems to be an increasing awareness, sense of environmental concern and consideration of the legacy left for future generations across all sectors.
- **Transport Emissions:** Direct emissions within the Southland region from transport accounted for around 6% of the regions total carbon emissions in 2018 (501,031 tCO₂e)¹⁶.

¹⁰ [Net Zero Southland - Economic Mitigation Pathways Analysis to Net Zero Emissions for Southland](#)

¹¹ Climate Change Commission, 2021

¹² Many other regions and cities around world are implementing much more ambitious targets, for example York & North Yorkshire, UK, aim to be carbon-neutral by 2034 and carbon-negative by 2040.

¹³ [Southland Leads the Way for New Zealand in Carbon Reduction Plans](#)

¹⁴ [Working together to make Southland Carbon Neutral](#)

¹⁵ [A 2018 carbon footprint report](#), indicated that agricultural related emissions across the region represent 69% of the overall gross emissions and are the region's largest emission source.

¹⁶ [Southland Regional Carbon Footprint 2018, AECOM, Oct 2019](#)

7 Research Objectives

This research project and report has four central objectives.

1. Identify current views and motivations of Southlanders in relation to EV's and vehicle selection, plus their general position regarding associated environmental issues.
2. Identify limitations and barriers to EV uptake.
3. Identify opportunities for increasing EV adoption within Southland.
4. Achieve research with a high level of confidence, 95% +/- 4%.

8 Research Scope

The research covered plugin EV's, plugin hybrids, non-plugin hybrids and other forms of electrified transport across the following six sectors:

1. Personal or residential vehicles.
2. E-bikes, electric scooters, electric skateboards.
3. Light Farm Vehicles, such as quads, motorcycles and utes.
4. EV hire vehicles, such as tourism and rental cars.
5. Company or fleet vehicles.
6. Light commercial vehicles and forklifts.

Phone discussions were undertaken with a range of Southland residents and businesses covering these sectors. Responses were used to gain insights and to help inform survey questions.

¹⁷ Climate Change Commission, 2021

¹⁸ [Net Zero Southland Report - EY - 2021](#)

¹⁹ [Southland Leads the Way for New Zealand in Carbon Reduction Plans](#)

²⁰ [Working together to make Southland Carbon Neutral](#)

²¹ [Southland Regional Carbon Footprint 2018, AECOM, Oct 2019](#)

**Net Zero
by 2050**

New Zealand Government commitment
and to reducing biogenic methane emissions by between 24-47%
by 2050 (Climate Change Commission, 2021) ¹⁶

**8.9M
tCO₂e p.a.**

Southland Total Emissions (CO₂e) ¹⁷

**2.45M
tCO₂e p.a.**

Off-set by exotic and native forests. ¹⁷

**500K
tCO₂e p.a.**

**Southland CO₂ reductions to date
via woodchip boilers. ¹⁸**

**15%
NZ Exports**

**Southland produces 15% of NZ's
total Tradeable Exports. ¹⁹**
Environmental action and status will have an
increasingly significant impact on the value of goods.

**6%
Transport**

**Transport accounted for around
6% of Southland's total carbon
emissions in 2018 (501,031 tCO₂e). ²⁰**

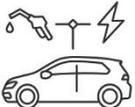
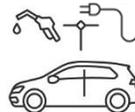
**Current
Position**

HYBRID

NZ EV Fleet Current Position

9 Vehicle Types

There are four main light vehicle fuel types currently operating in NZ.

	Name and Abbreviation	Power Source Summary
	Internal Combustion Engine (ICE)	Petrol, Diesel, LPG
	Hybrid Electric Vehicle (HEV)	<p>Have an electric motor, this is charged via braking and a secondary engine which usually runs on Petrol or Diesel.</p> <p>While these vehicles reduce emissions, they are currently <u>not counted within the NZ Ministry of Transport EV Statistics.</u></p>
	Plug-in Hybrid Electric Vehicle (PHEV)	These vehicles are similar to a conventional hybrid. However, also have ability to be plugged in to charge.
	Battery Electric Vehicle (BEV) or Full/All Electric	<p>These vehicles are 100% electric with no secondary engine. They are charged via being plugged in.</p> <p>Additional variations using fuel cells are under development. However, are much less common and not yet available in NZ.</p>

Data Source: The figures presented on this page are sourced from the Ministry of Transport monthly EV Statistics as of May 2021²².

10 NZ EV and Plug-in Hybrids Fleet Statistics

In May 2021 EV and Plug-in Hybrid registrations made up 2.72% of total light vehicle registrations in NZ. There are currently 27,434 light electric and plug-in hybrid vehicles registered in New Zealand.

Ownership	Pure EV	Plug-in Hybrid
Owned by Individuals	15,676	4,599
Company Owned	4,053	2,005
Other	957	144
Total NZ Light EV Fleet	20,686	6,748
% of Light EV Fleet	75.4%	24.6%

Figure 1



²² [Transport NZ monthly EV Statistics](#)

EV's Per Capita Current Position

Data Source: The figures presented on this page are sourced from the Ministry of Transport monthly EV Statistics as of May 2021²³.

11 Electric Vehicle Uptake per Capita

Southland currently has one of the lowest rates of EV²⁴ ownership in NZ. In June 2021, the rate of EV ownership in Southland was of just 0.67 vehicles per 1,000 people. Many other NZ regions have much higher rates of ownership. For example, Auckland 7.24 EV per 1,000 people, Wellington 6.11, Canterbury 6.04 and Otago 4.33. Of NZ's 14 main regions, only Gisborne and the West Coast have lower rates of EV ownership.²⁵

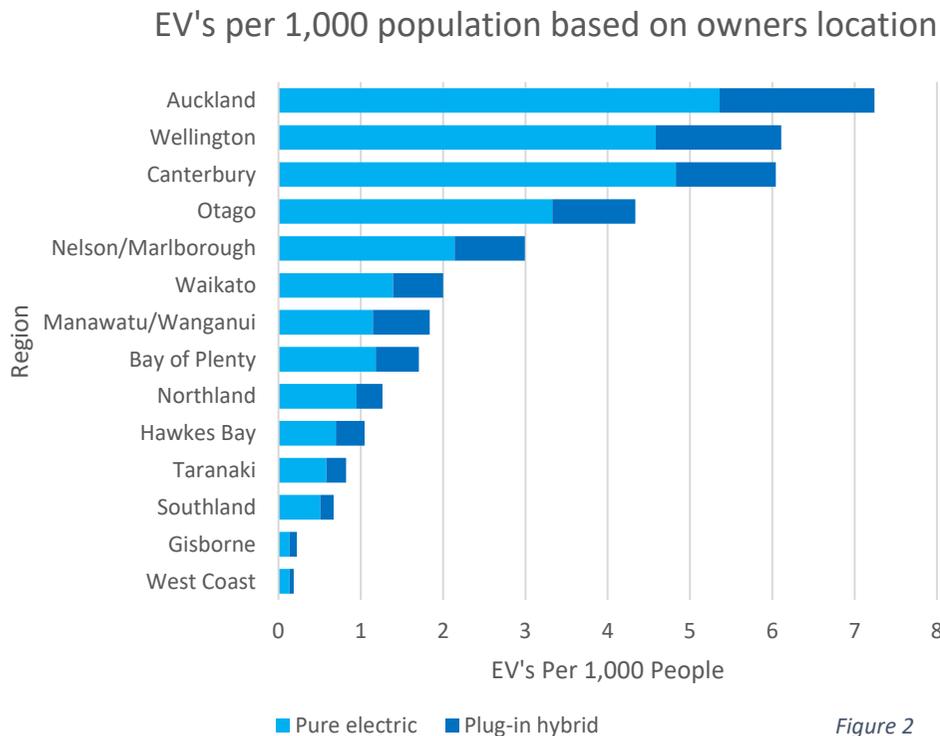


Figure 2

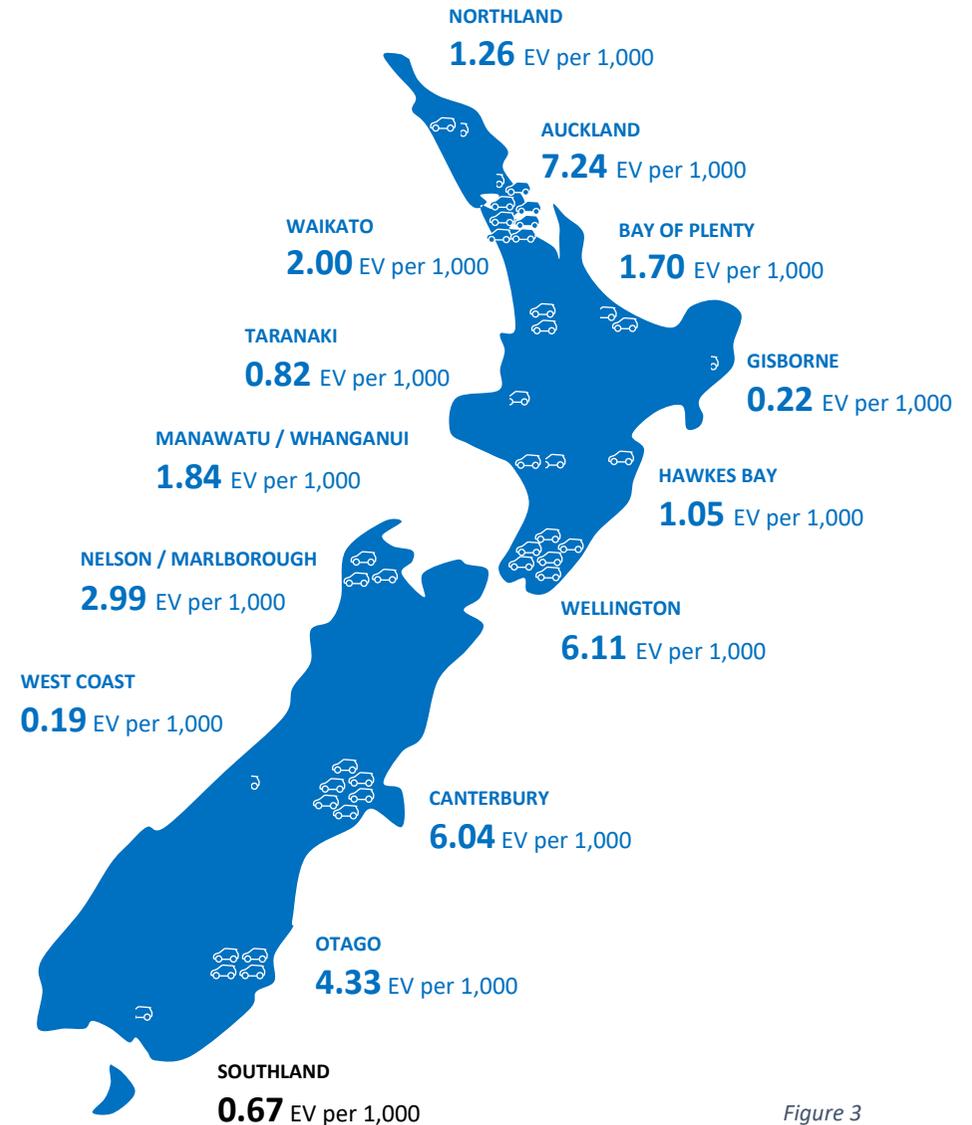


Figure 3

²³ [Transporz NZ monthly EV Statistics](#)

²⁴ Based on BEV and PHEV ownership (figures exclude HEV)

²⁵ [Transport NZ monthly EV Statistics](#)

EV Uptake Constraints

12 External Constraints

There are a number external factors which directly limit the uptake of electric vehicles in New Zealand regardless of cost or willingness of New Zealanders to adopt the vehicles. The main factors are:

1. **Production**, which is currently limited by:
 - a. The production transition timeframes for major automakers to move from traditional fuels to EV models.
 - b. The availability of semi-conductors (microchips or integrated circuits), which are currently in short supply globally.
2. **Supply**, which is currently limited by:
 - a. International demand from other markets / countries competing for the same vehicles (new and second-hand).
 - b. International shipping and logistics, which are still recovering from COVID-19 related disruptions.
 - c. The availability of second-hand vehicles due to historic production levels.

13 New vs. Used EV Imports

In 2020 58% of BEV and PHEV imports to NZ were second-hand vehicles.

NZ EV Imports	2018		2019		2020	
	Number	%	Number	%	Number	%
New Plug-in Hybrid (PHEV)	743	13%	949	14%	757	14%
New Pure Electric (BEV)	754	14%	1,867	27%	1,530	28%
Used Plug-in Hybrid (PHEV)	442	8%	656	9%	702	13%
Used Pure Electric (BEV)	3,603	65%	3,499	50%	2,466	45%
TOTAL	5,542	100%	6,971	100%	5,455	100%

Figure 4 ²⁶

²⁶ [Transport NZ monthly EV Statistics](#)

14 Country of Origin

Of the total 5,455 EV vehicles imported in 2020, 5,400 were from Japan, 37 were from the UK and 18 from other locations.

If the current vehicle mix continues, with used Japanese imports making up over 50% of our electric vehicle imports, then historic production and registrations in Japan will limit or define the availability of future imports of second-hand vehicles.

The following table shows historic EV and Hybrid vehicle registration in Japan over the past 10 years 2009/10 – 2019/20. This indicates that:

1. The total Japanese EV fleet ever registered is only growing by around 40,000 - 50,000 vehicles per year (2016 – 2020 and these figures do not seem to account for scrappage or resale overseas).
2. The ratio of Hybrid registrations per year in Japan, to EV registrations is currently around 38:1. Meaning traditional hybrid second-hand vehicles will remain available in significantly larger numbers than EV's for at least the next 5 years.

Japanese Registrations	Battery Electric EV	Plug-in Hybrid EV	EV's ever registered	Fuel cell	Hybrids
2009/10	1,078	0	1,078	0	347,999
2010/11	2,442	0	3,520	0	481,221
2011/12	12,607	15	16,142	0	451,308
2012/13	13,469	10,968	40,579	0	887,863
2013/14	14,756	14,122	69,457	0	921,045
2014/15	16,110	16,178	101,745	7	1,058,402
2015/16	10,467	14,188	126,400	411	1,074,926
2016/17	15,299	9,390	151,089	1,054	1,275,560
2017/18	18,092	36,004	205,185	849	1,385,343
2018/19	26,533	23,230	254,948	612	1,431,980
2019/20	21,281	17,609	293,838	685	1,472,281

Figure 5 ²⁷

²⁷ [Transport NZ monthly EV Statistics](#)

Southland Current Vehicle Fleet

15 Total Southland Road Registered Vehicle Fleet

- In 2019 there were a total of 107,118 vehicles in Southland.²⁸
- In 2019 Light Passenger Vehicles made up 70% of the total road registered vehicles in Southland. Light Commercial made up 21%.
- Over the 5 years 2015 - 2019 the total number of vehicles in the Southland fleet grew by an average of 2.7% per year.²⁹
- Assuming a consistent rate of growth there would be an estimated 113,000 road registered vehicles in Southland by the end of 2021.

Southland Road Registered Vehicle Fleet 2010-19 by Vehicle Type

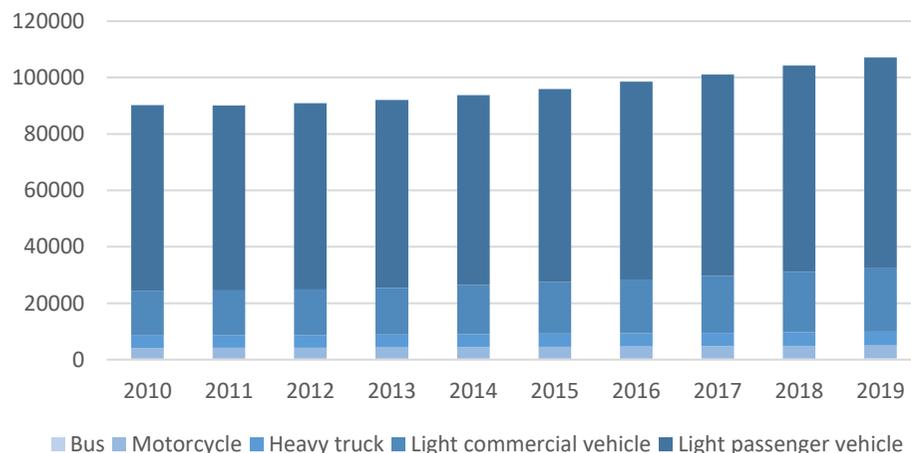


Figure 6 – Source *Transport NZ Fleet Statistics* - Southland all fuel types – September 2019

Southland Fleet	2015	2016	2017	2018	2019
Total	95,866	98,569	101,075	104,189	107,118
Growth	2,104	2,703	2,506	3,114	2,929
% Change	2.2%	2.8%	2.5%	3.1%	2.8%

Figure 7

²⁸ [Transport NZ Fleet Statistics](#) - Southland all fuel types

Southland Road Registered Vehicle Fleet 2010-19 by Fuel Type

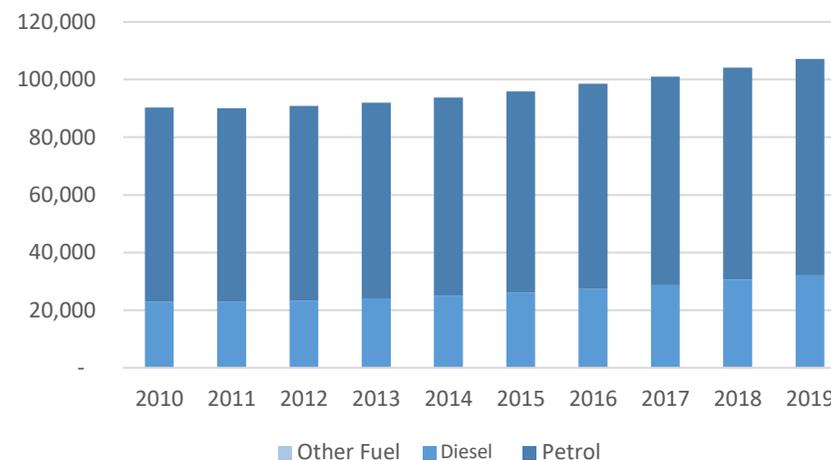


Figure 8

Fleet by Fuel Type	2015	2016	2017	2018	2019
Other Fuel*	121	146	170	245	395
Diesel	26,062	27,228	28,559	30,358	31,824
Petrol	69,683	71,195	72,346	73,586	74,899
Total	95,866	98,569	101,075	104,189	107,118

Figure 9 - Source *Transport NZ Fleet Statistics* – Southland by fuel type – September 2019

* Note: Other fuel includes electric and LPG

- Only 0.37% of the total Southland road registered vehicle fleet ran on other fuels in 2019 (including electricity and LPG).²¹

Fleet Growth

- Light commercial diesel vehicles (including cars, vans, utes, SUVs and 4WDs) grew by an average of 7.2% per year during the 5-years 2015-19. These additional vehicles accounted for 39% of the total growth in vehicle numbers in Southland over this period.²¹
- Light passenger petrol vehicles accounted for an average of 45% of vehicle number growth over the period 2015-19.²¹

²⁹ [Transport NZ Fleet Statistics](#) - Southland all fuel types - Impact Consulting Analysis

Southland Vehicle Fleet by Fuel Type

16 Southland Road Registered Vehicles by Fuel Type

	Pure Electric (BEV) & Plug-in Hybrid (PHEV)	Hybrid (HEV)	LPG	Diesel	Petrol	Total All Fuel Types
2010		37	74	22,809	67,350	90,270
2011		49	82	22,922	67,076	90,129
2012		63	92	23,276	67,435	90,866
2013	2	64	95	23,989	67,889	92,039
2014	4	81	110	25,036	68,531	93,762
2015	7	83	114	26,062	69,600	95,866
2016	13	97	133	27,228	71,098	98,569
2017	45	106	125	28,559	72,240	101,075
2018	78	161	167	30,358	73,425	104,189
2019	121	268	274	31,824	74,631	107,118
2020*	171	442				

Figure 10³⁰

* Note: 2020 Hybrid figures do not account for any scrappage.



³⁰ [Transport NZ Fleet Statistics](#) and [Transport NZ monthly EV Statistics](#) Impact Consulting analysis

17 Southland EV and Hybrid Vehicle Growth 2010-20

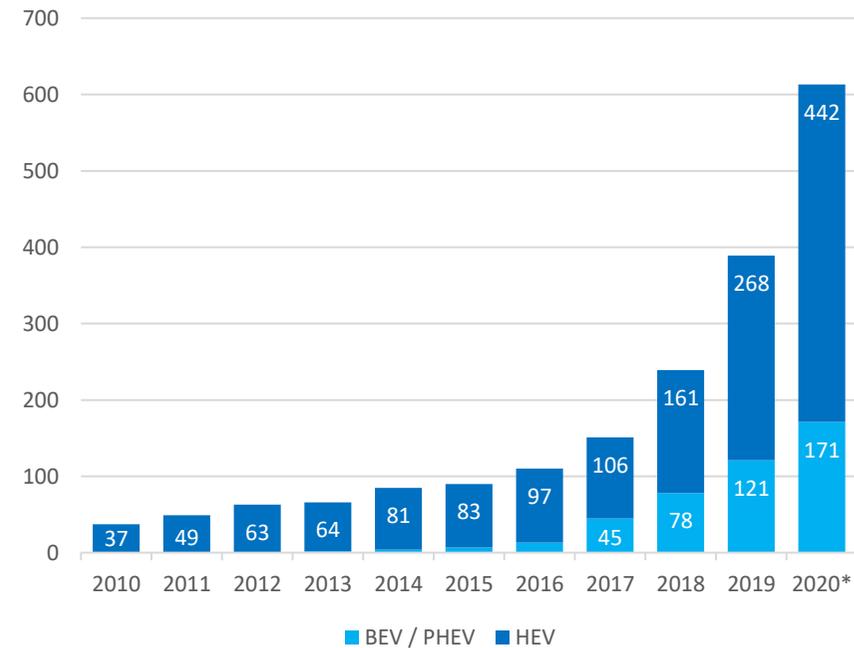


Figure 11³¹

³¹ [Transport NZ monthly EV Statistics](#) and Ministry of Transport HEV analysis

Southland EV & Plug-in Hybrid Fleet

18 Southland BEV and PHEV Vehicles (by WoF location)

The following table shows road registered EV and PHEV vehicles which had their last WoF inspection in Southland, by make and model.

Plug-in Hybrid (PHEV - 42% new, 58% used)		
BMW	I3	2
Mitsubishi	Outlander	35
Mitsubishi	Eclipse Cross	2
Toyota	Prius	10
Mg	Hs	1
Total		50
Pure Electric (BEV - 27% new, 73% used)		
BMW	I3	1
Hyundai	Kona	5
Hyundai	Ioniq	2
Lvvta	Roadster	1
MG	Zs Ev	6
MG	Zs	1
Mitsubishi	I-Miev	1
Nissan	Leaf	81
Tesla	Model X	1
Tesla	Model S	1
Volkswagen	E-Golf	1
Mercedes-Benz	B-Class	1
Mitsubishi	Minicab	1
Nissan	E-Nv200	8
Nissan	Vanette	1
Smart	Fortwo	1
Toyota	Corolla	1
Pre 2005	Pre 2005	2
Sub-total		116
Paxsters (NZ Post delivery carts)		12
Total		128

Figure 12 – Source Transport NZ ³²May 2021

³² [Transport NZ monthly EV Statistics](#) – Table 5.b WoF locations

³³ [Transport NZ monthly EV Statistics](#) – Table 5.b WoF locations

19 Total Southland BEV and PHEV Fleet

There are currently a total 178 road registered BEV and PHEV in Southland.

Southland	Count	Percentage
PHEV	50	28%
BEV	128	72%
Total Fleet	178	100%

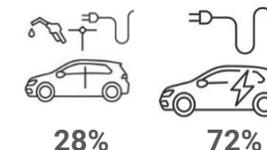


Figure 13 – Source Transport NZ ³³ May 2021

20 Southland BEV and PHEV Owner Locations

The following table shows Southland registered EV vehicles by owner location and includes x10 additional vehicles between May and June 2021. The table also shows a wide range of township locations. Potentially indicating that geography and vehicle range are more of a perception barrier than a physical one.

Owner Region	Owner Town	New light plug-in hybrid	New light pure electric	Used light plug-in h..	Used light pure electric	Grand Total	
Southland	BLUFF			1	1	2	
	EDENDALE				1	1	
	GARSTON	1	1			2	
	GORE	3	1	5	23	32	
	INVERCARGILL	19	18	23	68	128	
	LUMSDEN		1			1	
	MANAPOURI			1		1	
	MANDEVILLE				1	1	
	MATAURA			1	1	2	
	OBAN				1	1	
	OHAI				1	1	
	OTAUTAU	1		1		2	
	RIVERTON			2		2	
	STEWART ISLAND				1	1	
	WALLACETOWN				1	1	
	WINTON			1	4	1	6
	Total		24	24	36	100	184

Figure 14 – Source Transport NZ ³⁴ June 2021

³⁴ [Transport NZ monthly EV Statistics](#) – Table 5.a Owner Locations

SECTION 2

Research Findings

A scenic landscape featuring a large lake in the foreground, snow-capped mountains in the distance, and a cloudy sky. A car's side mirror is visible in the lower right, reflecting a person holding a camera. The text "Southland Views" is centered in a blue circle.

**Southland
Views**

Survey Results Overview

21 Methodology

Two online open submission surveys were used to gather the views of Southland residents and businesses. Both surveys were relatively similar with wording and some specific questions tailored to the respective audiences. Questions were informed by phone interviews and the survey distributed via email, Facebook and newsletters by a range of Southland organisations.

22 Minimum Sample Size

Southland has a population of approximately 100,000 people³⁵. To achieve the required confidence level of 95% +/- 4%, a minimum sample size of 597 responses will be required. This target was achieved with 898 responses.

23 Survey Response Rates

In total 898 responses were gathered during the period 24 May - 20 June 2021.

Survey	Responses
Personal / Household	742*
Business	156
TOTAL	898

Figure 15

* Personal / Household, Survey responses also include x77 responses from people who are self-employed.

24 Personal Survey Demographics

Personal Survey - Respondent Gender

(682 responses)



Figure 16

Personal Survey - Respondent Age

(681 responses)

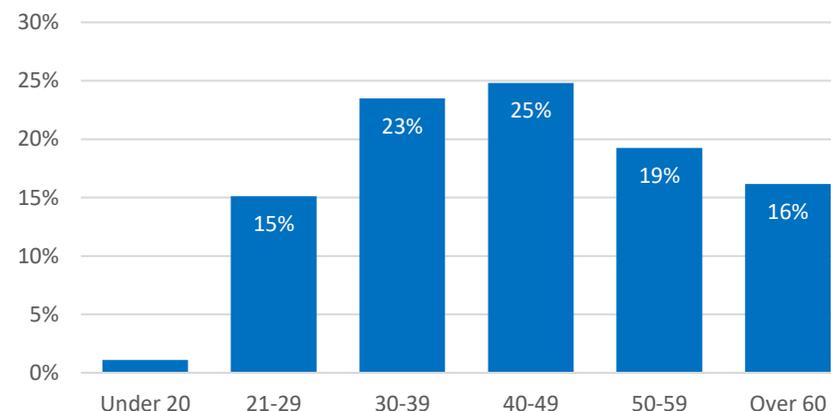


Figure 17

25 Business Survey

Business Survey - Industry Sectors Represented (153 Responses)

Agriculture	44	Mechanical	2
Construction and Trades	37	Public Sector	2
Accommodation & Tourism	12	Rental	2
Services	10	Seafood & Fishing	2
Automotive	5	Transport	2
Retail	5	Veterinarian	2
Food and Hospitality	4	Aviation	1
Health	3	Civil works	1
Contracting	2	Dairy processing	1
Dogs and Horses	2	Education	1
Engineering	2	Funeral	1
Forestry	2	Start-up	1
Horticulture	2	Other	3
Manufacturing	2		

Figure 18

³⁵ <https://www.mbie.govt.nz/dmsdocument/11452-regional-factsheet-southland-pdf>

26 Geographic Distribution – Personal Survey

The following table shows the geographic distribution of personal survey respondents based on postcode.

Location	Count
Invercargill	388
Gore	92
Winton	55
Riverton	30
Te Anau	27
Wyndham	22
Otautau	21
Bluff	13
Edendale	10
Mataura	10
Tuatapere	10
Wallacetown	8
Lumsden	7
Tokanui	5
Dipton	4
Ohai	4
Riversdale	4
Waikaia	3
Balfour	2
Garston	2
Makarewa	2
Nightcaps	2
Owaka	2
Stewart Island	2
Mossburn	1
Wyndham	1
Locations Outside of Southland	15
Total	737

Figure 19 - (742 Responses)

27 Geographic Distribution – Business Survey

The following table shows the geographic distribution of business survey respondents based on postcode. Note: some Southland business have head offices in other locations and/or work outside of the region.

Business Locations	Count	%
Invercargill	69	45%
Gore	25	16%
Wyndham	8	5%
Riverton	7	5%
Winton	6	4%
Otautau	5	3%
Te Anau	5	3%
Lumsden	4	3%
Tokanui	3	2%
Mataura	2	1%
Nightcaps	2	1%
Owaka	2	1%
Riversdale	2	1%
Tuatapere	2	1%
Balfour	1	1%
Edendale	1	1%
Sub-total	144	94%
Additional Business Locations	Count	%
Queenstown	3	2%
Cromwell	2	1%
Tapanui	1	1%
Wanaka	1	1%
Dunedin	1	1%
Christchurch	1	1%
Sub-total	9	6%

Figure 20 - (153 Responses)

Environmental Views

Environmental motivations are increasingly a primary motivator for the uptake of electric vehicles. A rating scale was utilised to help gauge the general views of Southlanders on climate change.

- The rankings indicate that around 79% of Southlanders acknowledge climate change as an issue to be considered and around 21% are skeptical or very skeptical.
- 31% of personal survey respondents indicated that climate change is an issue which we need to urgently address.
- The weighted average of all personal survey respondent rankings was a score of 3.56 out of 5.

These scores are helpful in evaluating how likely environmental motivations are to influence individual decisions. However, on their own they don't give a clear/simple gauge of the likelihood or regional level changes in behaviour.

28 Personal Views

Climate Change - Where do you sit on the following spectrum?

(707 Responses)

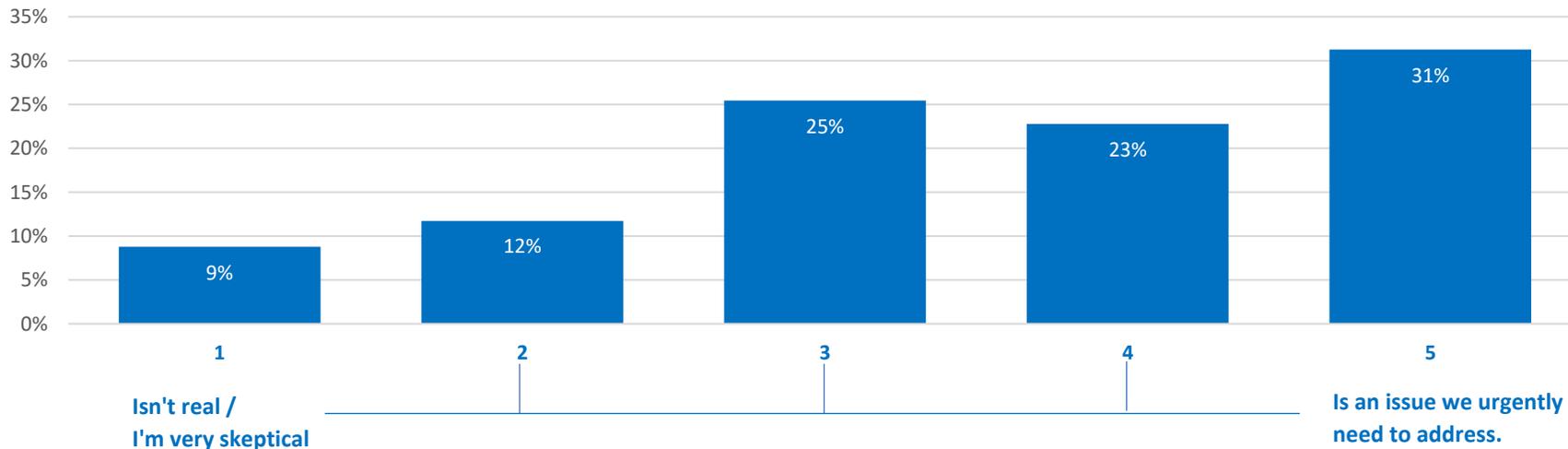


Figure 21

One possible way of evaluating if these rankings are strong or not from a regional perspective, is using Net Promoter Score methodology. Net Promoter Scores are usually ranked out of 10 and are used as a simple gauge for companies to measure customer loyalty and how likely customers are to refer friends to a business. If considering this topic from a net promoter score perspective all rankings 3 and below would be considered 'detractors'. Rankings of 4 would be considered 'neutral' and rankings of 5 would be considered 'promoters'. A net promoter score is calculated by subtracting detractors from promoters to give a net score.

While 31% of respondents indicating that climate change is an issue which we need to urgently address is positive from an emissions reduction perspective, the resulting score after subtracting detractors is a Net Promoter Score of -15.

Indicating that environmental views are not yet at tipping point. Making regional level behaviour change less likely at present.



29 Business Views

Southland Businesses gave lower climate change importance rankings than individual survey respondents. With an average ranking of 2.9 and net promoter score of -55.

Climate Change - Where does your business sit on the following spectrum?

(132 Responses)

2.9 Average Ranking

-55 Net Promoter Score

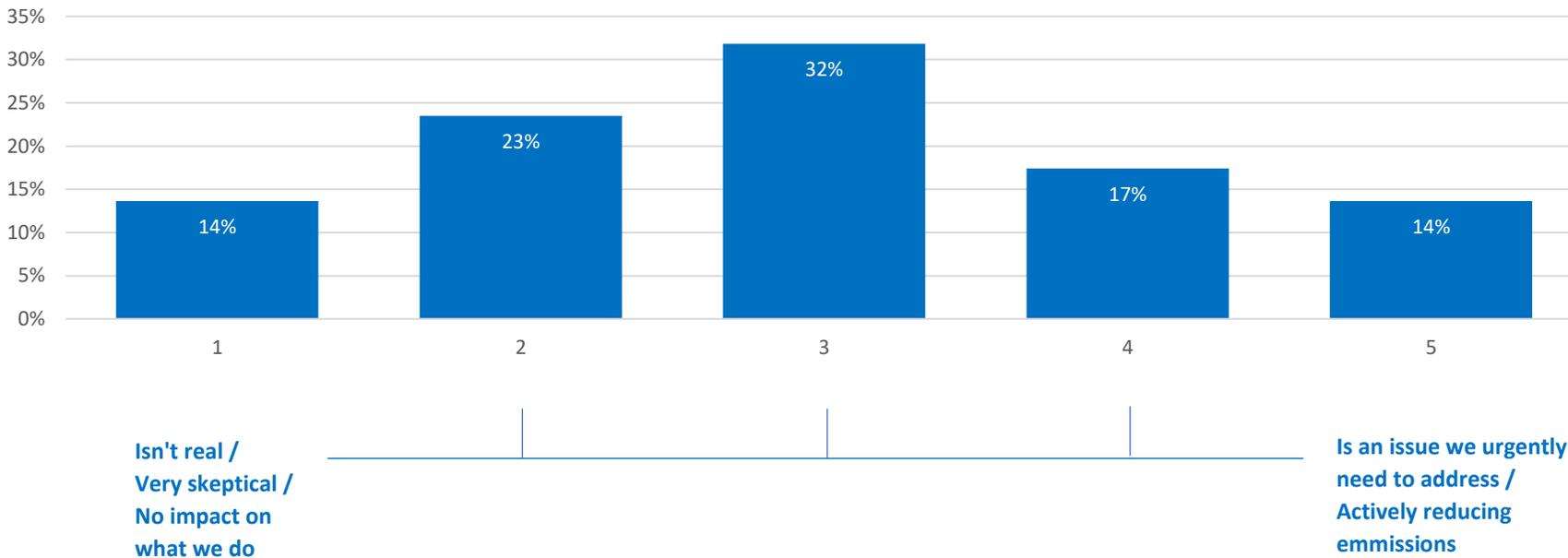


Figure 22

30 Additional Climate Change Comments

Personal Survey Respondents

The climate change spectrum question included a comments box. In total personal survey respondents provided 89 additional comments in relation to this question. Full comments can be found in Appendix 1.

Business Survey Respondents

In total business survey respondents provided 18 additional comments in relation to this question. Full comments can be found in Appendix 2.

Government Policy Changes

31 EV Policy Changes

On the 13th of June 2021 the New Zealand Government announced a clean car subsidy programme to be trialled 1st July to 31st December 2021. The subsidy applies to new and used EV and Plug-in Hybrid imports. From 2022 it is proposed that high emitting vehicles will be charged a levy to cover the subsidy.

The Clean Car rebates apply to both new and used import Battery Electric Vehicles (BEVs), and Plug-in Hybrid Electric Vehicles (PHEVs). They must be under \$80,000 including GST and on-road costs, be a new registration and have a 3-star safety rating or above. The Clean Car rebate scheme only applies to BEVs and PHEVs that are registered between the 1st July and 31st December 2021.³⁶

Currently, conventional hybrids are not eligible, but they may be introduced as part of the scheme in 2022. From 2022, the Clean Car programme will expand to offer a range of rebates for imported new and used low CO₂ emission vehicles. High CO₂ emission vehicles will be charged a fee. The programme is expected to prevent up to 9.2 million tonnes of CO₂ emissions and will help customers with the upfront cost of switching to an electrified or low emission vehicle.³⁷

1 July–31 December 2021 (GST incl)	New vehicle	Used import
Battery electric vehicle (zero emission)	\$8,625	\$3,450
Plug-in hybrid electric vehicle (low emission)	\$5,750	\$2,300

Figure 23 ³⁸

³⁶ www.toyota.co.nz/our-range/the-toyota-difference/hybrid/hybrid-electric-government-incentives/

³⁷ www.toyota.co.nz/our-range/the-toyota-difference/hybrid/hybrid-electric-government-incentives/

32 Southland Views

As this policy was only announced part way through our research, views on the changes were only gained from 71 personal survey respondents and 50 business survey respondents.

Personal Survey Respondent views on the government electric vehicle policy
(71 Responses)

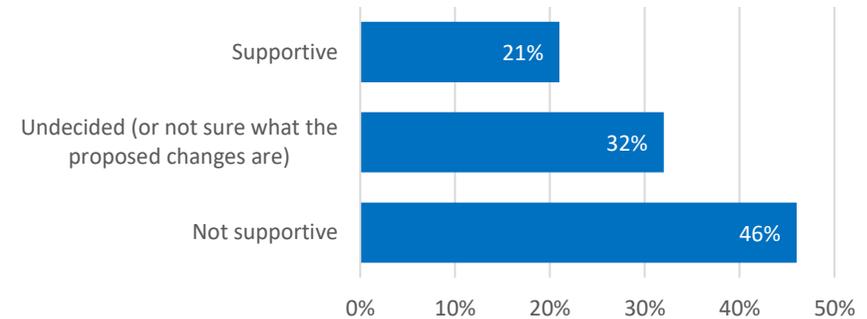


Figure 24 - A total of x32 additional comments were received. See Appendix 3.

Business Survey Respondent views on the government electric vehicle policy
(50 Responses)

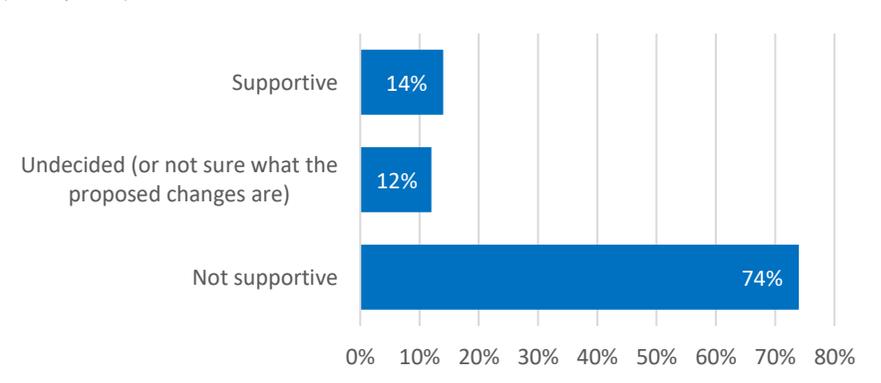


Figure 25 - A total of x22 additional comments were received. See Appendix 4.

³⁸ <https://driveelectric.org.nz/individuals/ev-incentives/>



**Current EV
Uptake Outlook**

Survey Fleet Sample

33 Current Household Vehicle Types

Personal survey respondent households collectively owned a total of 1,790 road registered vehicles. Over 742 respondents, this equates to an average 2.41 vehicles per household.

Road Registered Vehicles by Type

(1,790 Vehicles, 742 respondents)

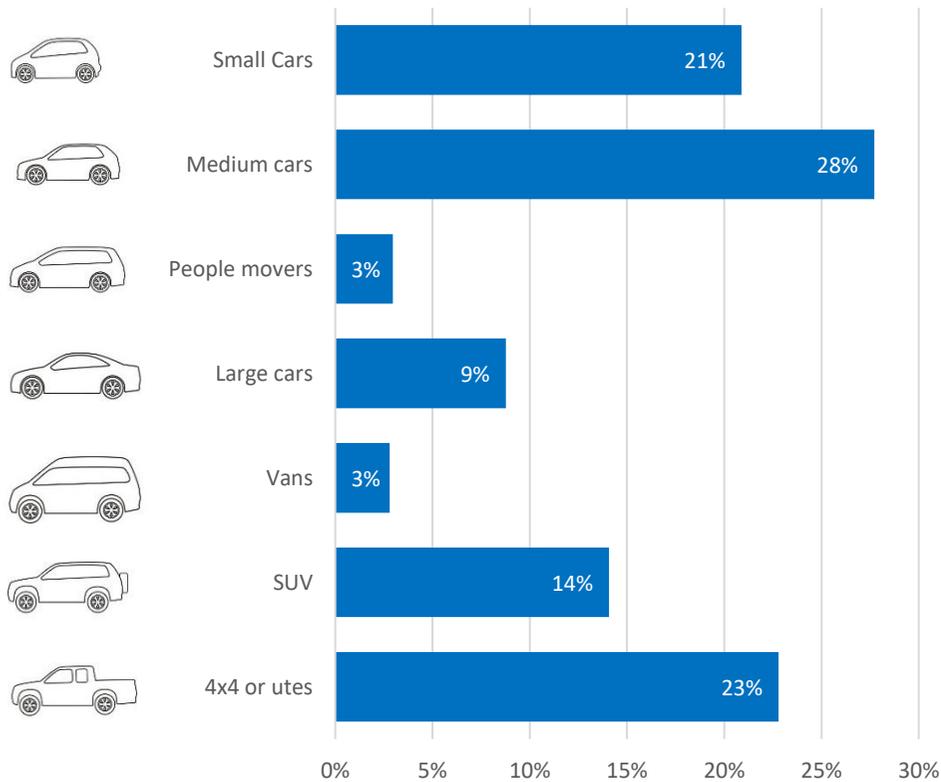


Figure 26

1,790 Survey Respondent Households Collectively Own 1,790 Vehicles

2.4 Vehicles per Household on Average

49% Small-Medium Cars

5% EV or Hybrid Vehicles (84)

23% 4x4 vehicles (408)

20% Household Vehicles are Company or Business Owned (353)

53% of these have fuel or mileage paid for by the business or company (186)

10% of Respondents were Self-employed (77)

34 Current Business Vehicle Types

Southland Business Vehicles by Type

(1,552 Vehicles, 153 respondents)

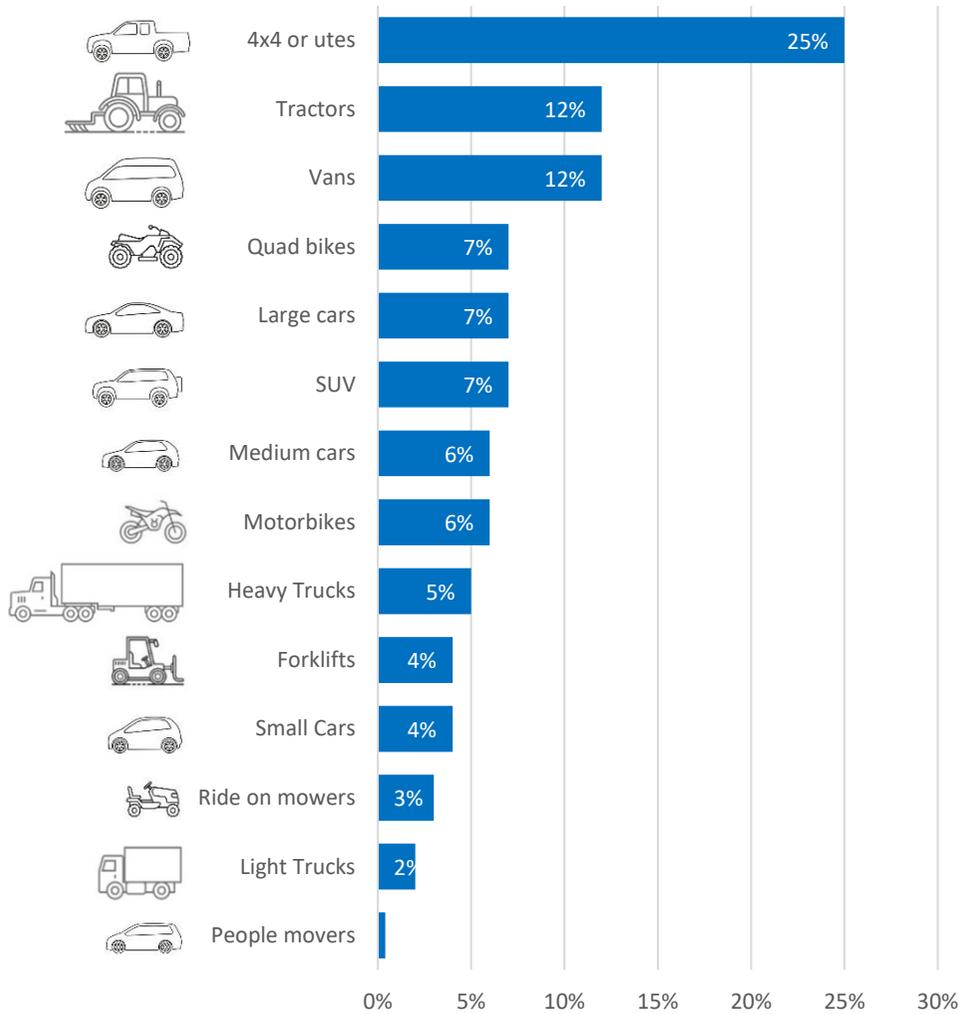


Figure 27

- 1,552** Business Survey Respondents Collectively Own 1,552 Vehicles
- 10.1** Vehicles per business on average
- 6.9** Road vehicles per business on average
- 25%** 4x4 vehicles (2.6 per business average)
- 17%** Small-medium cars and SUV (1.7 per business)
- 5.3%** EV or Hybrid Vehicles (82 vehicles over 18 business)
- 5.8%** Of Business Vehicles are Leased (92 vehicles over 16 businesses)
- 3.5 Years** Average lease renewal period
- 50%** of businesses who currently lease vehicles (8) would be interested in EV or Hybrid fleet options
- 12%** of businesses who currently lease vehicles (2) are interested in more info on EV or Hybrid fleet options

35 Personal Small Electric Vehicles

Does your family / household own any of the following?

(718 Respondents)

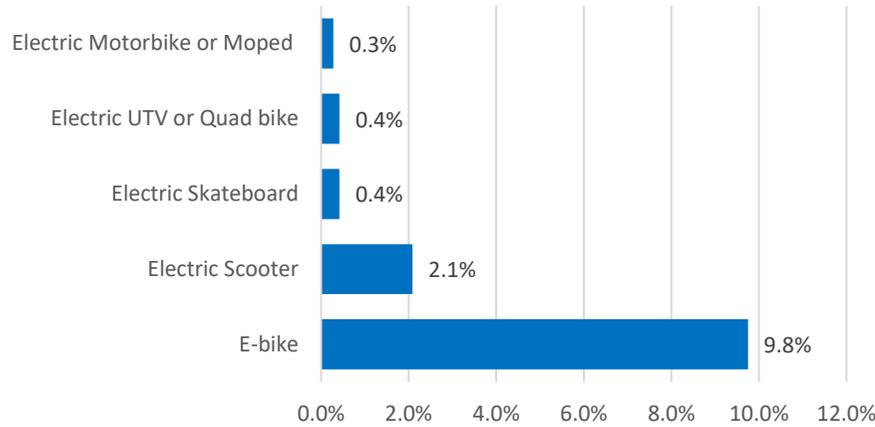


Figure 28

- 13% of Southland household survey respondents own a small EV.
- Approximately 10% of Southland survey respondent households currently own at least one electric bike.
- Electric scooters are the next most common small electric vehicle at 2% of household respondents.

Small EV Type – Household Survey Responses	Count	Percentage
E-bike	70	9.8%
Electric Scooter	15	2.1%
Electric Skateboard	3	0.4%
Electric UTV (Utility Terrain Vehicle or Quad bike)	3	0.4%
Electric Motorbike or Moped (ie. UBCO)	2	0.3%
TOTAL	93	13%

Figure 29

36 Business Small Electric Vehicles

Small EV's Owned by Southland Business

(137 Respondents)

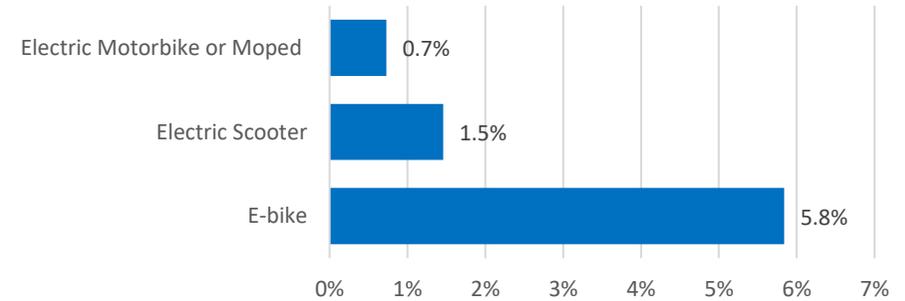


Figure 30

- 8% of Southland businesses indicated that they own a small EV.
- 5.8% of Southland businesses own an e-bike.

Small EV Type – Household Survey Responses	Count	Percentage
E-bike	8	5.8%
Electric Scooter	2	1.5%
Electric Motorbike or Moped (ie. UBCO)	1	0.7%
TOTAL	11	8%

Figure 31



Fleet Renewal Rate

37 Personal Vehicle Fleet Renewal Rate

For Southland households the average vehicle renewal period for those who replace their vehicles within a 10-year timeframe is 5.5 years. However, 58% hold their vehicles for much longer.

- 15% of household respondents hold their vehicles for 10+ years.
- 22% replace vehicles based on changes in family requirements.
- 21% only replace their vehicles when their current vehicle dies.

If the average renewal period for these three categories is assumed to be 15 years, then fleet turnover will take an average of 10 years.

Southland Personal Vehicles Upgrade / Replacement Cycle

(728 respondents)

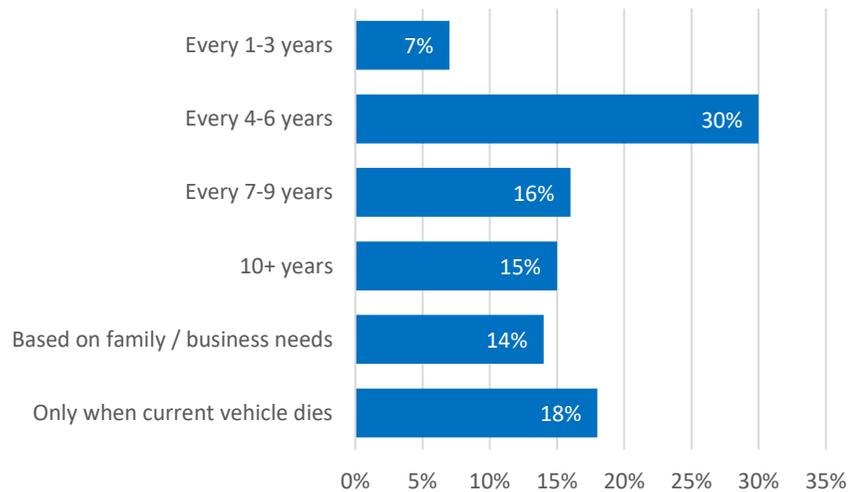


Figure 32

10
years

Average Personal Fleet Turnover Rate *

38 Business Vehicle Fleet Renewal Rate

For businesses who replace their vehicles within a 10-year timeframe the average renewal period is 4.6 years. However, 29% hold their vehicles for much longer.

- 9% of business respondents hold their vehicles for 10+ years.
- 12% only replace vehicles based on changes in business requirements.
- 8% only replace their vehicles when their current vehicle dies.

If the average renewal period for these three categories is assumed to be 15 years, then overall fleet turnover will take an average of 7.6 years.

Southland Business Vehicles Upgrade / Replacement Cycle

(142 respondents)

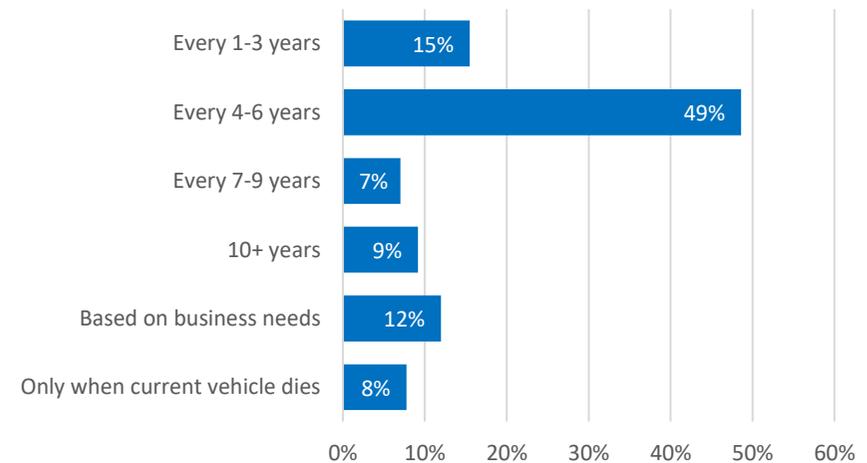


Figure 33

7.6
years

Average Business Fleet Turnover Rate *

* Important Note: This renewal rate is more accurately fleet 'turnover', as many of the replacement vehicles will be local or imported second-hand vehicles. The NZ Transport Agency, Waka KoTahi, indicate that on average cars in the NZ fleet are on the road for 20 years - [source](#).

Future Purchase Decisions

39 Likelihood of Future Household EV or Hybrid Purchase

Are you likely to buy an EV or hybrid when you next upgrade or replace your vehicle/s? (696 Responses)

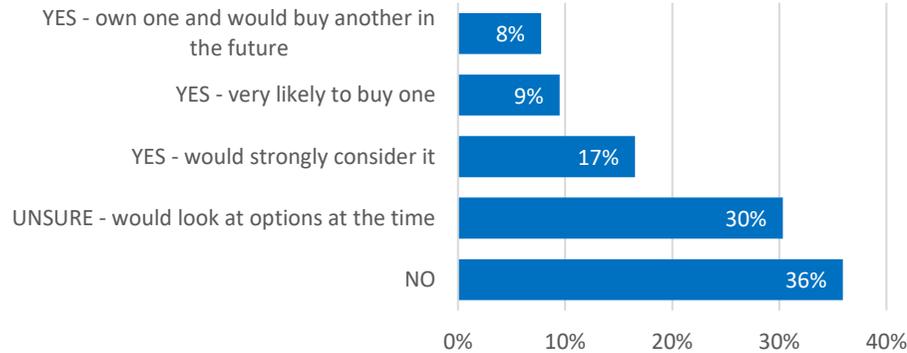


Figure 34

- 34% of household survey respondents (235) would strongly consider or look to purchase an EV or Hybrid when they next upgrade.
- These 235 households currently own 533 vehicles. Of which 299 are small to medium cars and SUV's and 64 are already Hybrid or EV's.
- 17% of households are likely to buy an EV or Hybrid when they next upgrade. If extrapolated for all of Southland this would equate to 6,618 households³⁹.

17% of Southland households are likely to buy EV or Hybrid



³⁹ Based on 17% of 38,931 households in 2018 – [Statistics NZ](#)

Vehicle estimates are based on 2.4 vehicles per household and 10 year fleet turnover. 6-year vehicle numbers are based on survey sample proportions (38%) for those likely to buy a Hybrid or EV. Small to medium car and SUV estimates based on 56% (299 out of 533) as per sample.

40 Likelihood of Future Business EV or Hybrid Purchase

Is your business likely to purchase (or lease) EV or hybrids when you next upgrade or replace your vehicle/s? (135 Responses)

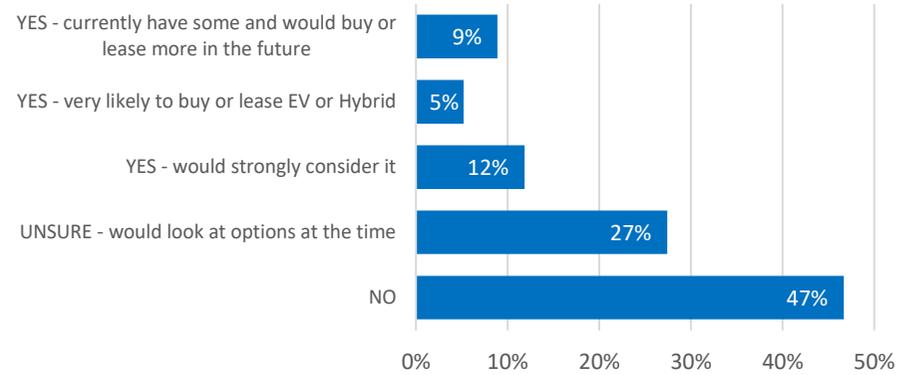


Figure 35

- 26% of business survey respondents (35) would strongly consider or look to purchase an EV or Hybrid when they next upgrade.
- These 35 businesses currently own 393 vehicles. Of which 100 are small to medium cars and SUV's and 25 are already Hybrid or EV's.
- 14% of businesses are likely to buy an EV or Hybrid when they next upgrade. If extrapolated for all of Southland this would equate to 711 business⁴⁰.

14% of Southland businesses likely to buy EV or Hybrid



⁴⁰ Based on 14% of 5,079 businesses (with employees) in Southland in 2020 – [MBIE Regional Data](#)

Vehicle estimates are based on 6.9 road vehicles per business and 7.6 year fleet turnover. 6-year vehicle numbers are based on survey sample proportions (68%) for those likely to buy a Hybrid or EV. Small to medium car and SUV estimates based on 25% of road vehicle as per survey sample.

EV and Hybrid Fleet Natural Growth

41 Southland EV and Hybrid Vehicle Fleet Growth Projection

Based on current survey responses, it is our assessment that within 6 years (2027) the total EV / Hybrid fleet in Southland will be around 4,100 vehicles and will grow to 10,000 by (2030), including conventional hybrid vehicles.

Assuming the current total fleet growth rate of 2.7% per annum is continued, EV and Hybrids will make up an estimated 3.1% of all road registered vehicles in Southland by 2027 and 6.8% by 2031. Significant changes in market conditions, education, incentives, available vehicle types, towing capacity, battery life-cycle and policy would be required for the 92% EV adoption rate⁴¹ for light vehicles projected in the Net Zero Southland report to be achieved by 2050.

Current EV Uptake Projections

Southland EV/Hybrid Fleet	June 2019	2027	2031
Personal	389 ⁴²	3,300	8,800
Business		820	1,200
Total EV / Hybrid Fleet	389	4,100	10,000
Total Southland Vehicle Fleet ⁴³	107,118	132,500	147,471
EV / Hybrid vehicles as a percentage of total fleet	0.4%	3.1%	6.8%

Figure 36

Projection figures are drawn from the previous page. These are based on:

1. The percentage of personal and business survey respondents who indicated that they are very likely or will buy an EV or Hybrid when they next upgrade their vehicle/s.

⁴¹ Net Zero Southland - Economic Mitigation Pathways Analysis to Net Zero Emissions for Southland

⁴² 121 BEV and PHEV, 268 HEV

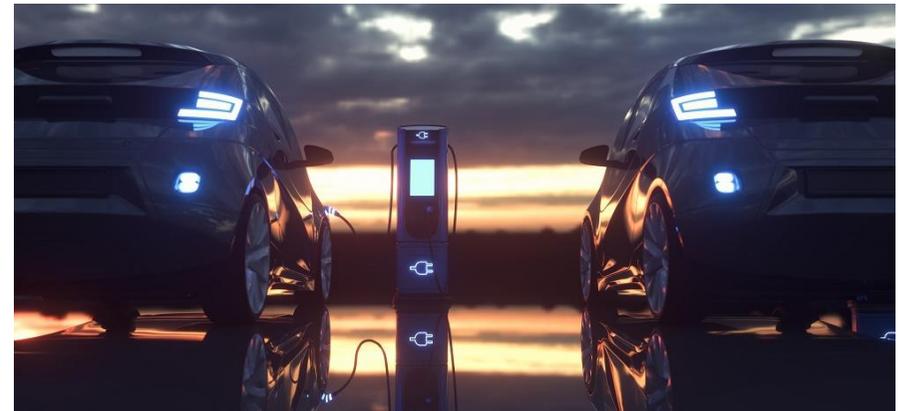
2. A total catchment of 38,931 households in Southland (2018 Stats NZ) and a total of 5,079 businesses in Southland with employees (MBIE 2020).
3. A ratio of 2.4 vehicles per household and 6.9 per business.
4. The proportion of the total vehicles owned by those who are likely to buy an EV or Hybrid, which are currently small-medium cars or SUV.

Assumptions made include:

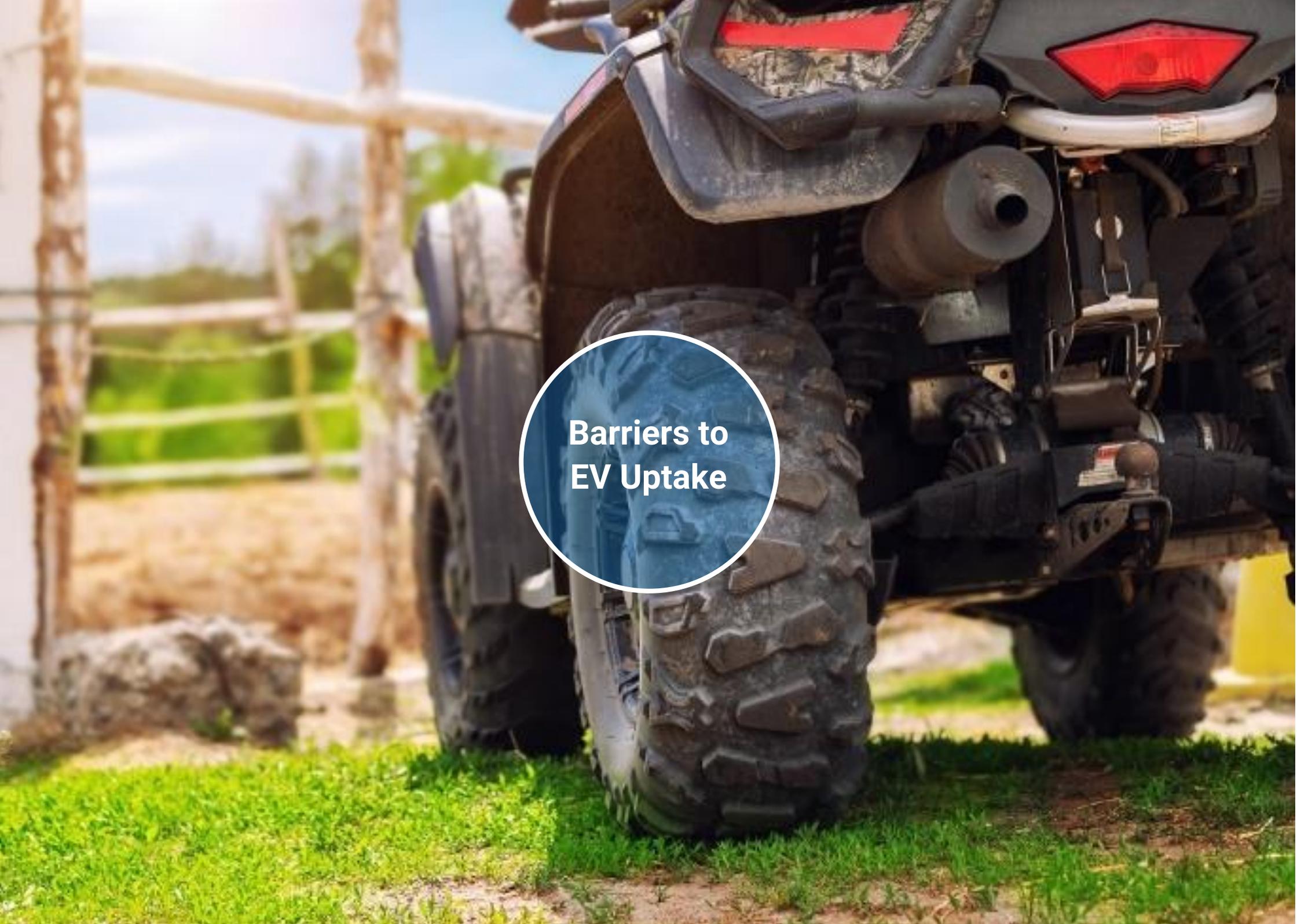
1. It has been assumed that the majority of the competitively priced EV and Hybrid vehicles available, continue to be small to medium cars and SUV's.
2. That fleet estimates include conventional hybrid vehicles (HEV) as well as plug-in hybrid (PHEV).
3. That the current views and likely purchase decisions of Southlanders and Southland business who participated in the survey, are an accurate representation of those of the wider Southland population.
4. That a competitively priced EV / Hybrid double cab ute option, with towing ability and comparable performance to a traditional vehicle isn't available.
5. That changes in government policy, don't significantly shift incentives.

6.8%

of Southland's road registered vehicles are likely to be EV or Hybrid by 2031, assuming no significant changes in market conditions, attitudes or preferences of Southlanders.



⁴³ Assumes continued fleet growth of 2.7% per annum.



**Barriers to
EV Uptake**

Household EV Uptake Barriers

For Southland households the main barriers to EV or Hybrid vehicle uptake were cost (76%) and battery related reservations (62%).

42 Personal Barriers to EV Uptake

Household survey respondents were asked to identify which of the following potential EV uptake barriers most put them off.

- **Cost**
Too high / don't think the savings are worth the investment.
- **Battery**
Have battery related reservations.
- **Options**
The available vehicles aren't suited to my location or needs.
- **Environment**
Not convinced enough of the environmental benefits to change.
- **Hassle**
Don't want the hassle of charging / prefer to stick with what I know even if it costs more.
- **Social perception**
Not cool or appealing to me.
- **Friends**
Negative experience / feedback from others.

Southland Barriers to EV Uptake Ranking

(688 responses)

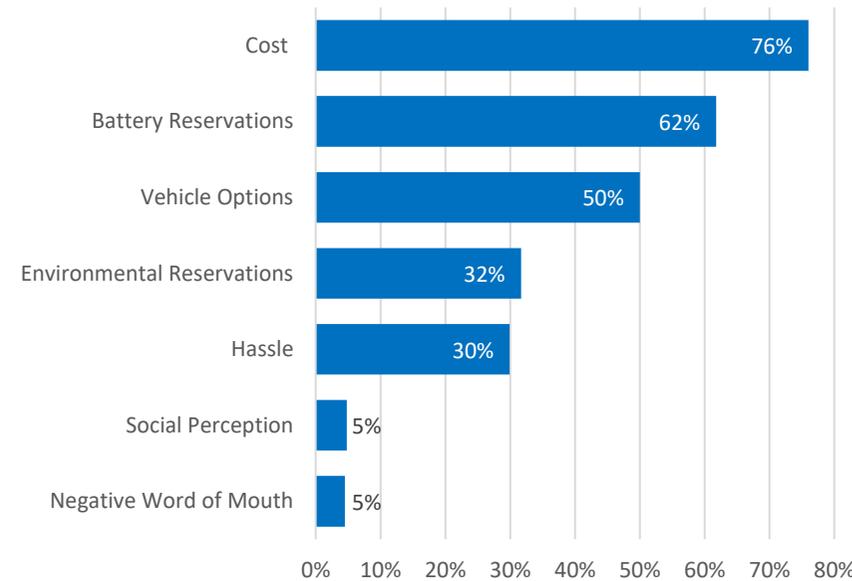


Figure 37 – Note percentages add to more than 100% as respondents could select multiple options.

43 Additional Comment

- 41% of survey respondents (283) provided additional comments around barriers to EV uptake. The large majority of these comments align with the categories above. For full comments see Appendix 5.

Business EV Uptake Barriers

For Southland businesses the main barriers to EV or Hybrid vehicle uptake were battery related reservations (67%), Vehicle Options (67%) and Cost (64%).

44 Business Barriers to EV Uptake

Business survey respondents were asked to identify which of the following potential EV uptake barriers most put them off.

- **Cost**
Too high / don't think the savings are worth the investment.
- **Battery**
Have battery related reservations.
- **Options**
The available vehicles aren't suited to my location or needs.
- **Environment**
Not convinced enough of the environmental benefits to change.
- **Hassle**
Don't want the hassle of charging / prefer to stick with what I know even if it costs more.
- **Social perception**
Not cool or appealing for our business.
- **Others**
Negative experience / feedback from others.
- **Fleet**
Limited fleet hire options or costs too much comparative to other options

Southland Business Barriers to EV Uptake Ranking

(132 responses)

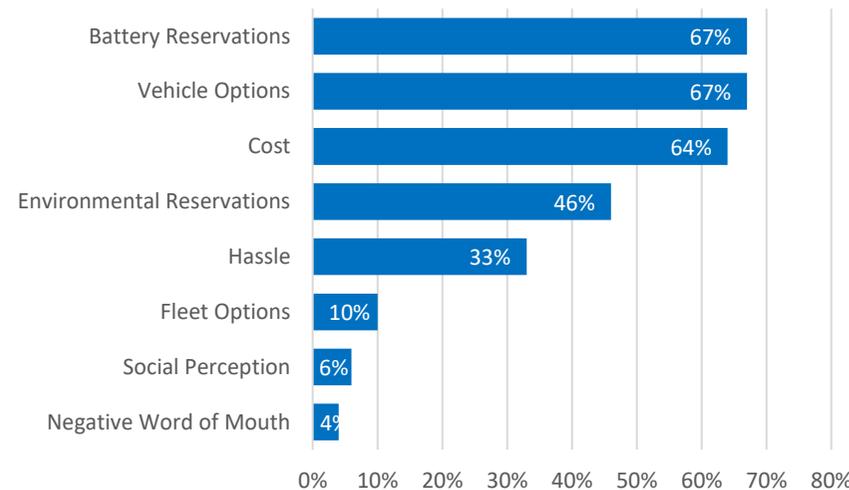


Figure 38 - Note percentages add to more than 100% as respondents could select multiple options.

45 Additional Comment

36% of survey respondents (48) provided additional comments around barriers to EV uptake. The majority of these comments align with the categories above. For full comments see Appendix 6.



**Required
Changes**

Changes to Improve EV Uptake

The EV and Hybrid vehicles currently available, do not suit all people or businesses. The following categories have been created in order to help evaluate which groups of people are most likely to transition to EV or Hybrid vehicles and identify the commonalities (if any) across these groups.

The key questions being “What factors make people more likely to say they will buy an EV or Hybrid?” and “For those on the fence, what changes to barriers or incentives would make the most difference.”

46 Category 1



COMMITTED

People in this category are those who indicated that they currently have an EV or Hybrid and would purchase another in future. (54 respondents, 7.8% of the total sample)

	Committed Respondents	All Respondents
Average Age	49 years old	44 years old
Gender	62% Female 38% Male	65% Female 35% Male
EV driving experience	BEV = 59% PHEV = 30% HEV = 78%	BEV = 18% PHEV = 9% HEV = 31%
Invercargill post codes	57%	53%
Climate Change Average Importance Rating	4.5 / 5	3.6 / 5
Households with at least one business vehicle	17%	27%
% of those with company car who are self employed	44%	39%
Average Upgrade Timeframe	8 years	10 years

Figure 39

- Are on average 5 years older than the average of the total sample.
- Have a higher climate change importance rating than the total sample.

- Less likely to have a business vehicle than the total sample.
- Have a 2 year shorter vehicle upgrade / replacement period than the total sample.

47 Category 2



LIKELY

People in this category are those who indicated that they are very likely to purchase an EV or Hybrid in the future. (66 respondents, 9.5% of the total sample)

	Likely Respondents	All Respondents
Average Age	43 years old	44 years old
Gender	61% Female 39% Male	65% Female 35% Male
EV driving experience	BEV = 33% PHEV = 21% HEV = 50%	BEV = 18% PHEV = 9% HEV = 31%
Invercargill post codes	71%	53%
Climate Change Average Importance Rating	4.7 / 5	3.6 / 5
Households with at least one business vehicle	20%	27%
% of those with company car who are self employed	43%	39%
Average Upgrade Timeframe	10.2 years	10 years

Figure 40

- Slightly more likely to be male than the total sample.
- The proportion of inclined respondents who have driven an EV or Hybrid is approximately double that of the total sample.
- Much more likely to live in Invercargill.
- Have a higher climate change importance rating than the total sample.
- Less likely to have a business vehicle than the total sample.
- Have a slightly longer vehicle upgrade / replacement period than the total sample.

48 Category 3



INCLINED

People in this category are those who indicated that they would strongly consider purchasing an EV or Hybrid in the future. (115 respondents, 17% of the total sample)

	Inclined Respondents	All Respondents
Average Age	43 years old	44 years old
Gender	60% Female 40% Male	65% Female 35% Male
EV driving experience	BEV = 22% PHEV = 7% HEV = 34%	BEV = 18% PHEV = 9% HEV = 31%
Invercargill post codes	58%	53%
Climate Change Average Importance Rating	4.3 / 5	3.6 / 5
Households with at least one business vehicle	29%	27%
% of those with company car who are self employed	42%	39%
Average Upgrade Timeframe	9.9 years	10 years

Figure 41

- Slightly more likely to be male than the total sample.
- Have a higher climate change importance rating than the total sample.
- Slightly more likely to have a business vehicle than the total sample.

49 Categories Summary

There is very little difference between those who are more likely to purchase an EV or Hybrid and the general population across most variables.

1. **All:** As would be expected, all groups who are more likely to purchase an EV or Hybrid place a greater importance on climate change than the general population.

Gender has no impact on most answers, as most are from a household perspective, however men are almost twice as likely to have driven a PHEV (15%) or BEV (26%) than women (6% and 26% respectively). Men also have a slightly lower climate change importance rating (3.5 compared to 3.7 for women).

2. **Committed:** Those who currently own an EV or Hybrid tend to be slightly older and have a shorter vehicle replacement / upgrade period than the general population.
3. **Likely:** Those who are likely to purchase an EV or Hybrid, are much more likely to have an Invercargill postcode.
4. **Inclined:** Those who will strongly consider purchasing an EV or Hybrid are very similar to the general population on all variables other than climate change importance ranking.

The “inclined” and “likely” categories with shorter term vehicle upgrade timeframes, are the most beneficial to focus any short-term efforts on.

50 Greatest Barriers for the Inclined and Likely Groups

The following graph shows the barriers for those who indicated they are 'very likely' or would 'strongly consider purchasing an EV when they next upgrade' AND have a vehicle replacement / upgrade timeframe of under 6 years, comparative to all respondents. The graph along with the majority of comments received, indicate that for this subset, cost is the major barrier.

EV and Hybrid uptake barriers for respondents who would “strongly consider” or are “likely” to purchase an EV or Hybrid AND have a replacement timeframe of 6 years or less vs. total sample.

(109 inclined respondents, 688 total respondents)

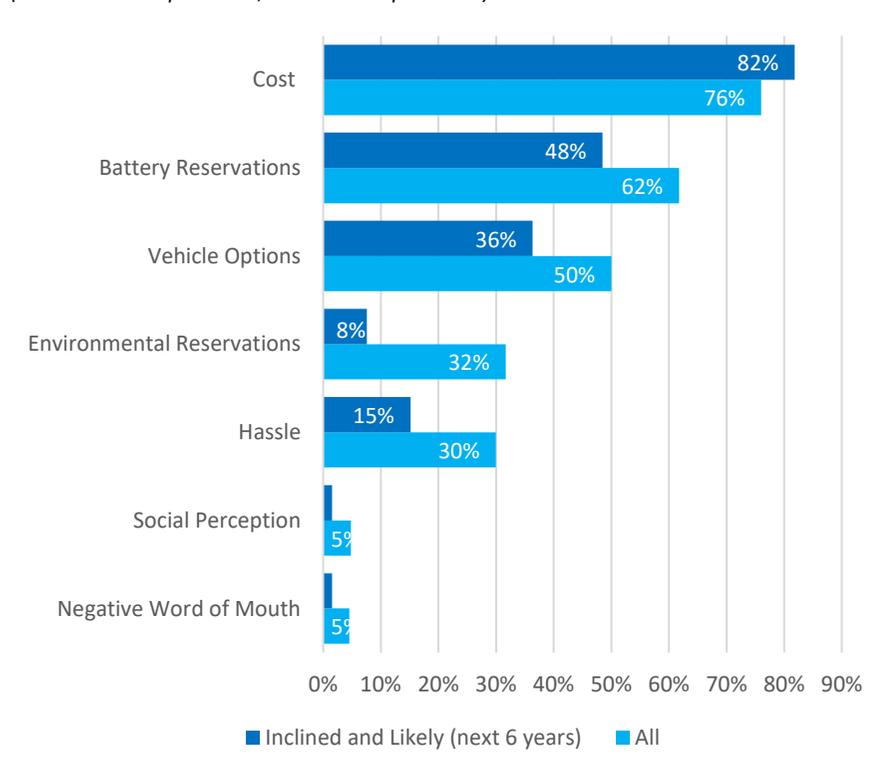


Figure 42

51 Small EV

- Approximately 10% of Southland survey respondent households currently own at least one electric bike and approximately 2% own an electric scooter.
- Discussions with bike shop owners indicated that the biggest limitation to the uptake of e-bikes in Southland is supply. One shop said that they used to stock x5 brands and are now down to x3 simply due to limited supply. Another indicated that it was extremely hard to get medium sized e-bikes from international suppliers. They could get extra large and small, but standard sizes were becoming hard to source.
- Shop owners report that the main motivations for e-bike purchases are not environmental, but more focused around:
 1. Increased range i.e. can see more in the same 2hrs and can bike trails which would have previously been beyond ability distance wise.
 2. Friends have e-bikes so need one in order to keep up.
- Despite Gore and Invercargill both being well suited to this mode of transport, with flat suburban areas and wide roads, shop owners report only observing a very small number of e-bike commuters or cycle commuters in general.

The main barriers to additional uptake are:

1. E-bike supply / availability.
2. Lack of a social norm around cycle commuting in Southland.
3. Coaching classes and skill sessions, for people who haven't ridden a bike for a number of years (particularly for women over 60).

- Cycling has a carbon footprint of about 21g of CO₂ per kilometre. That's less than walking or getting the bus and less than a tenth the emissions of driving⁴⁴.
- One survey respondent points out that regular bikes are much more sustainable than e-bikes. From a manufacturing perspective this is true. However, when taking into account the calories / additional food input required some articles suggest e-bikes are more sustainable.⁴⁵

52 Public Transport

A number of people questioned environmental benefit as a motive for moving to EV or Hybrid. Indicating that if we were serious about reducing emissions then the more effective the answer is actually to shift the mode of transport from cars to walking, cycling and high frequency zero emission public transport.

This is a valid point and one that needs ongoing consideration from a city and regional perspective in terms of potential incentives, barriers, viability and benefits. Modelling within the Net Zero Southland report estimated that 2,730 tCO₂e pa could potentially be saved via mode shift in commuter transport⁴⁶. For the purposes of estimates it was estimated that 30% of commuters in Southland live within 5km of work and still drive. The national average in 2016 was that 47% of New Zealanders lived within 5km of work and still drove.



⁴⁴ [How green is cycling? Riding, walking, ebikes and driving ranked, bikeradar.com](#)

⁴⁵ [How green is cycling? Riding, walking, ebikes and driving ranked, bikeradar.com](#)

⁴⁶ [Net Zero Southland - Economic Mitigation Pathways Analysis to Net Zero Emissions for Southland](#)

Business Barriers

53 Greatest Barriers for Business who are Open to EV

For the Southland business survey, the sample group was much smaller. For this reason, we have simply compared those businesses which are “Open” (ie. those which plan to buy or lease an EV or Hybrid, are likely to, or would strongly consider it) to the total sample. Cost is the major barrier.

EV and Hybrid uptake barriers for businesses who plan to, are likely to or would strongly consider purchasing or leasing EV or Hybrids vs. Total Sample.

(29 inclined respondents, 132 total respondents)

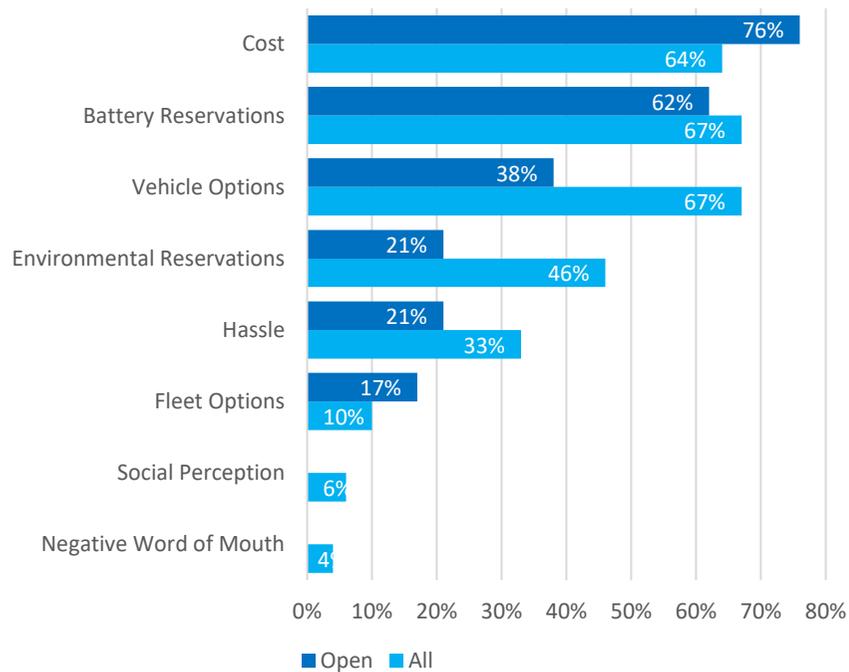


Figure 43

54 Fringe Benefit Tax

One barrier to greater EV and Hybrid vehicle uptake from businesses is fringe benefit tax.

Fringe benefit tax (FBT) is a tax paid by employers and covers the provision of company vehicles which are available for personal use. The tax is based on the number of days the vehicle is available for personal use and the GST inclusive purchase price.

As EV and Hybrid vehicles generally have a higher purchase cost, companies are required to pay more fringe benefit tax if the vehicle is to be allocated to an employee. This additional tax and the higher purchase price combined, erode some of the projected fuel cost savings and make some companies less likely to switch.

Fleet hire companies indicated that for this reason, the majority of companies adopting EV or Hybrid vehicles are using them as pool cars. In addition, there are a number of potential hassles and challenges to overcome in managing home based charging setup and power usage reimbursement.

55 Small EV

Suppliers of EV farm bikes indicated that interest is increasing. However, there is not yet high enough demand to warrant significant investment in stock on hand and there are a very limited range of options in the market. With the main options being:

1. HiSun UTV (Utility Terrain Vehicles).
2. UBCO electric motorbikes (NZ designed).

Similar to e-bikes, availability of stock is one of the major restricting factors, with many retailers being reluctant to invest in stock due to the infrequency of orders and then on the flip side not being able to source the bikes within a reasonable timeframe when they could sell one due to limited supply.

56 Fleet Vehicles

Car dealers and fleet hire companies indicated that range anxiety is a major barrier for the uptake of EV and Hybrid vehicles in the lower South Island. With Hybrids being much more common than the EV.

Some car dealers indicated that many of their fleet hire discussions had been put on hold since Covid-19. Moving companies to a different brand or type of vehicle is also challenging due to the length of existing lease agreements.

For fleet hire companies, the lease value of a vehicle is based on an agreed end of lease buy-back or residual value for the vehicle. Leases are normally 3-4 years and this is a long time for EV, as it is hard to predict battery condition or the future value of old technology, meaning some companies add an additional safety margin. This, in addition to the higher purchase price pushes up the comparative cost of the lease, when compared to other vehicle types with more stable resale values.



Clean Car Subsidy

57 What difference did Government policy make?

Due to the timing of the Clean Car Rebate Scheme announcement, the research survey sample covers both before (61%) and after (39%) the announcement. The graph on right shows the proportion of people who are likely to buy an EV or Hybrid before and after the Clean Car Rebate Scheme announcement.

Surprisingly, fewer Southlanders are likely to purchase an EV or Hybrid after the Clean Car Rebate Scheme announcement.

It was our initial assessment, that the reason for the decrease in likely EV or Hybrid uptake, is a change in the type of people who answered the survey after the announcement.

This is based on the fact that the average climate change importance ranking fell from 3.8/5 for respondents before the announcement, to 3.2/5 for respondents after the announcement. Indicating that the survey with the government policy question added, had more appeal or relevance for people who disagreed with the policy and may not have otherwise completed the survey.

The overall research benefit is that this means the overall survey has a reduced self-selection bias (e.g. only answered by people already interested in EV's) and more accurately represents the views of the Southland population as a whole.

A large number of survey comments also indicated that Southlanders don't like being told what to do and also take a holistic view of issues (such as considering whole of life environmental cost of vehicles). As a result, policies which force or coerce change are a disincentive for many people. A large number of comments also expressed frustration at the prospect of effectively being taxed for 'dirty' vehicles while having no viable alternatives.

Are you likely to buy an EV or hybrid when you next upgrade or replace your vehicle/s? (Before and After Clean Car Rebate Scheme announcement, 424 responses before the announcement and 271 after)

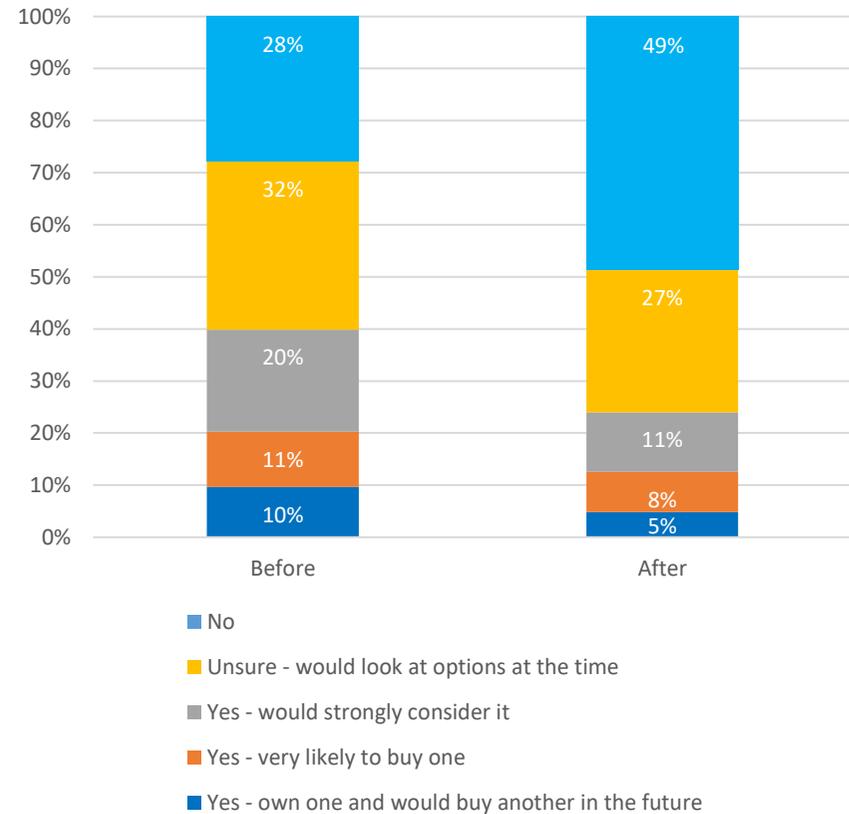


Figure 44

Understandably, people who own an EV, are likely to buy an EV or would strongly consider buying an EV, were much more likely to be supportive of the Clean Car rebate scheme than the general Southland population.

58 Policy Impact within Environmentally Orientated Subset

In order to evaluate if the Clean Car Rebate Scheme influenced the likely EV uptake within a comparable sample group, the graph on the right includes only those who indicated a climate change importance rating of 4/5 or above.

Again, even within this subset the proportion of Southlanders who are likely to buy an EV or Hybrid vehicle in the future decreased after the Clean Car Rebate Scheme announcement.

Within the subset of those who view climate change as an important issue, there were mixed views and varied support for the proposed Clean Car Rebate Scheme.

What is your view on the recently announced government electric vehicle policy changes? (71 respondents in total to this question, 31 respondents with climate change importance rankings of 4 or above)

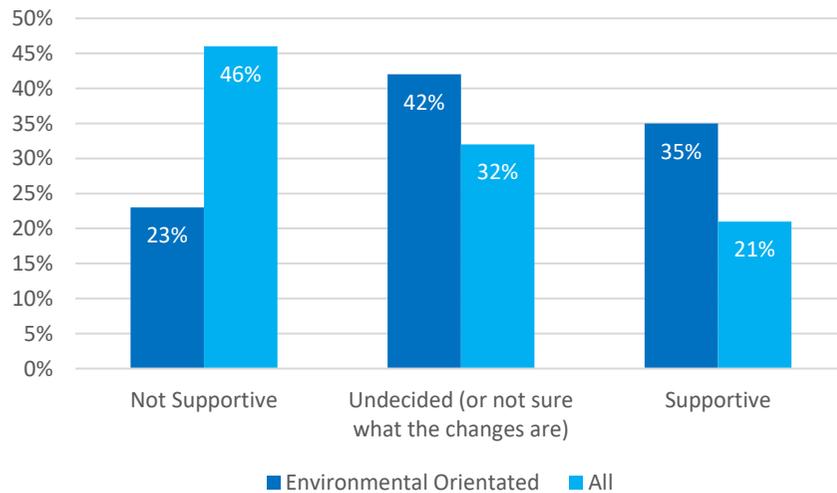


Figure 45

Are you likely to buy an EV or hybrid when you next upgrade or replace your vehicle/s?

(Before and After Clean Car Rebate Scheme Announcement, for those with a Climate Change Importance Ranking of 4/5 or above. 260 responses before the announcement and 104 after)

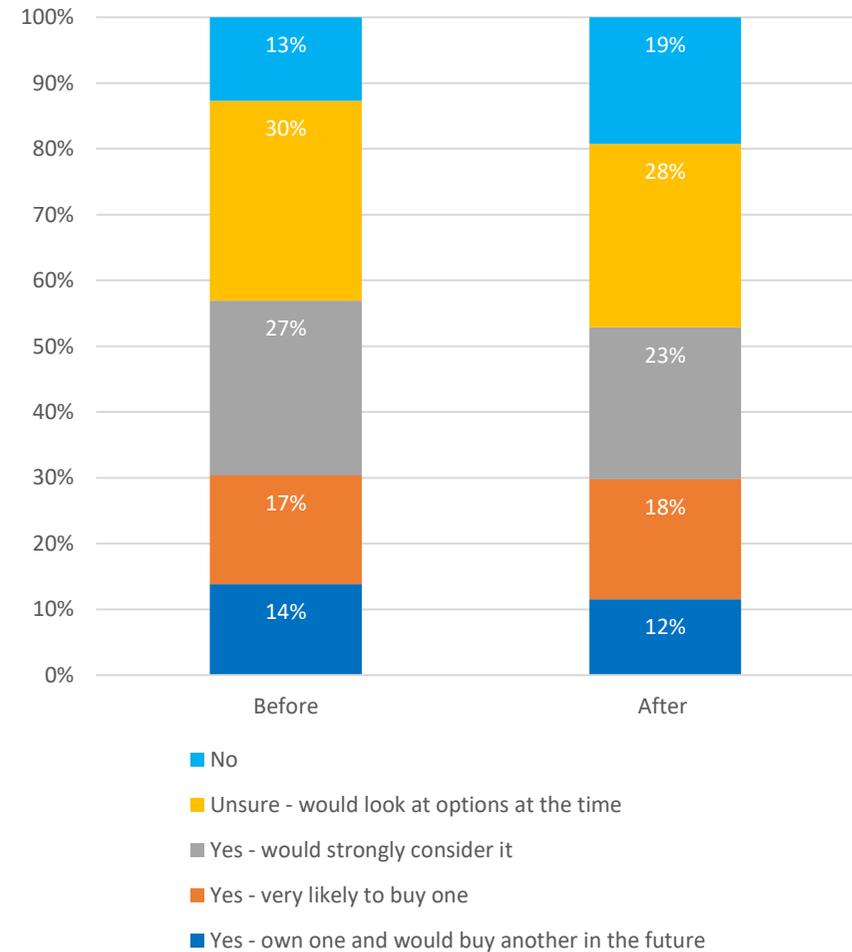


Figure 46

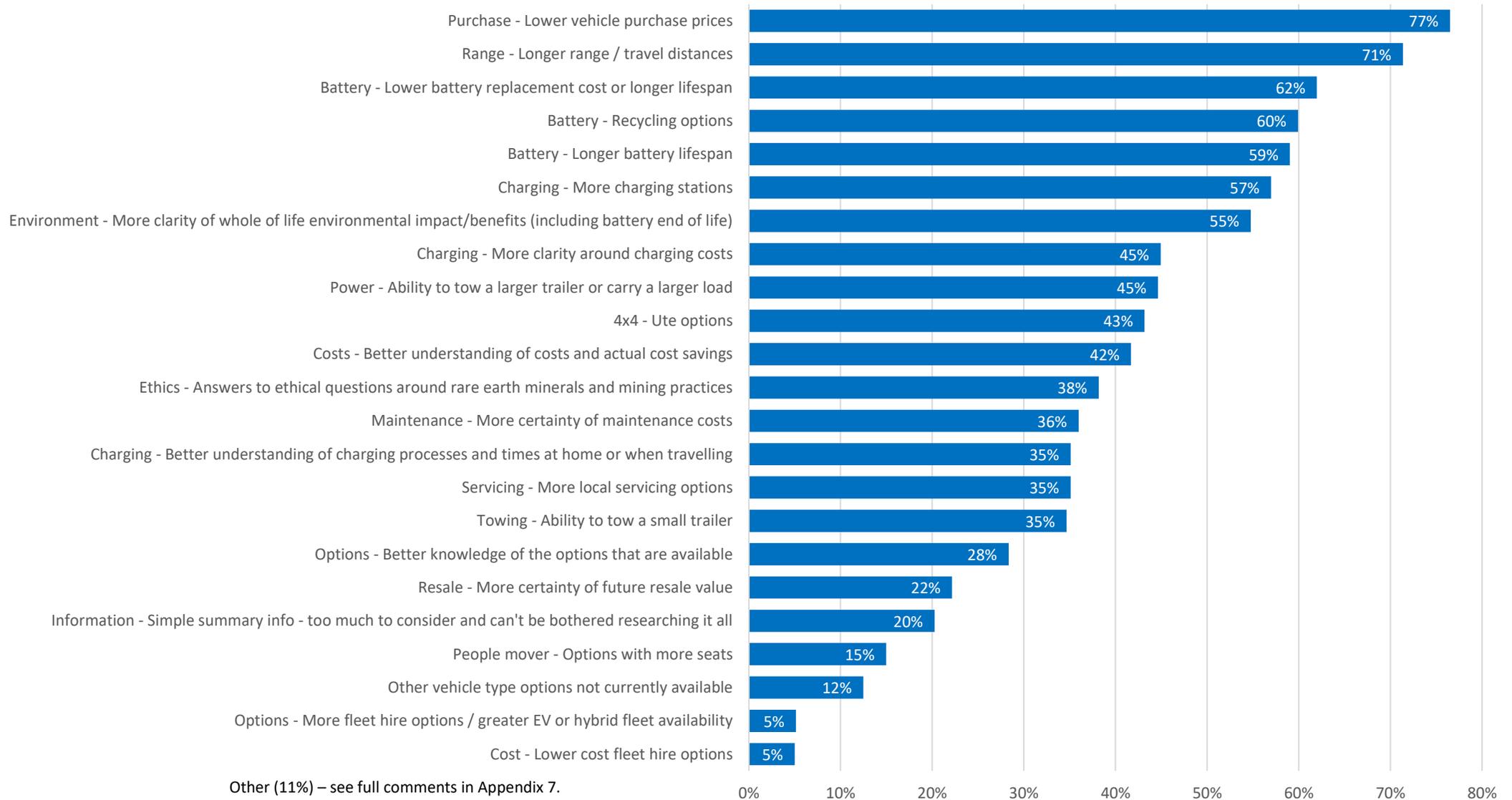
Factors to Increase EV Uptake

59 Factors Which Would Increase Southlander's EV Uptake

At the end of the household survey respondents were asked:

Which of the following factors (if any) would increase the likelihood of you purchasing an EV or Hybrid in the future?

Figure 47

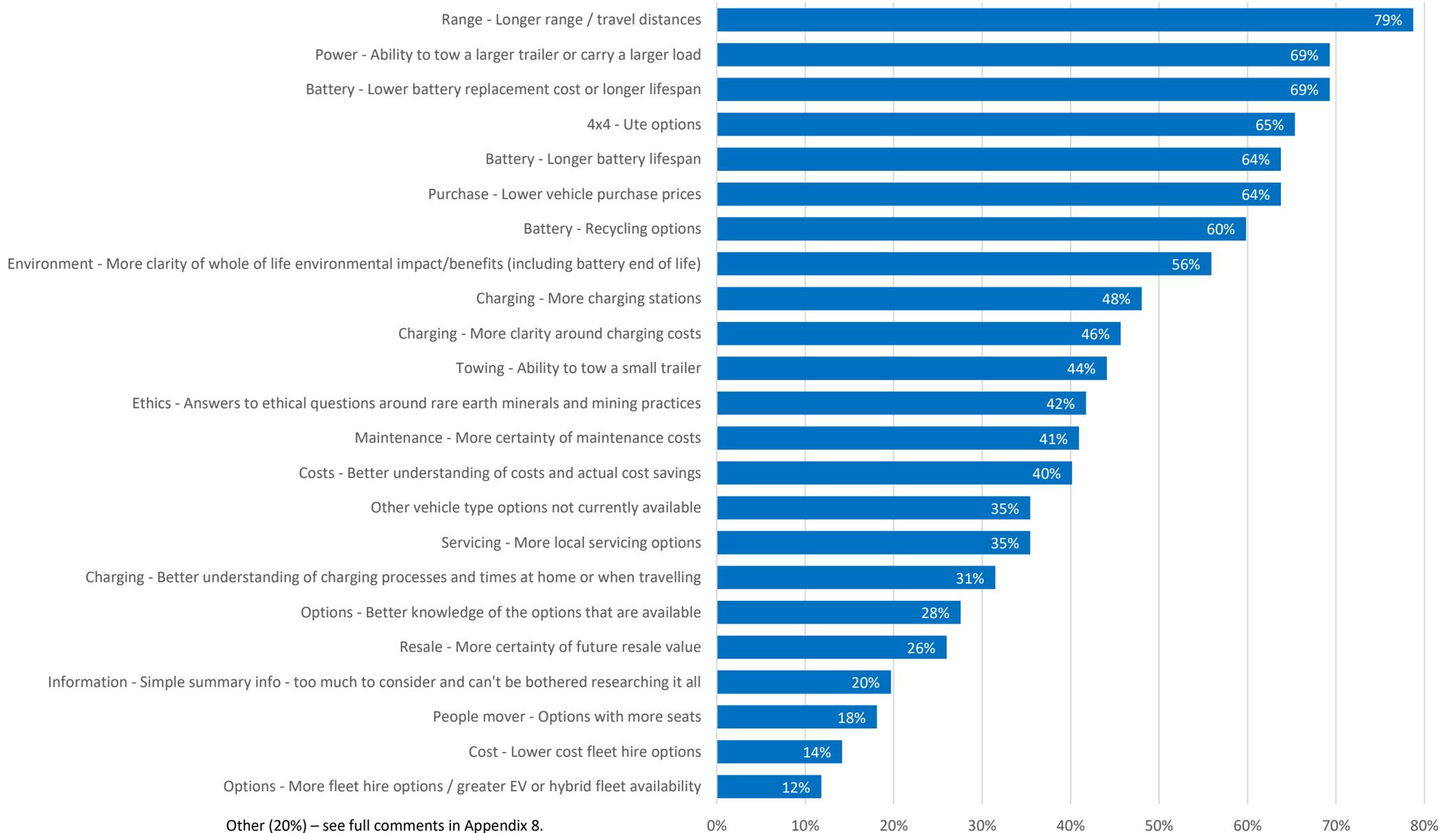


60 Factors Which Would Increase Business EV Uptake

At the end of the Business survey respondents were asked:

Which of the following factors (if any) would increase the likelihood of you purchasing an EV or Hybrid in the future?

Figure 48



61 Required changes to move to EV or Hybrid in the next 3-5 years

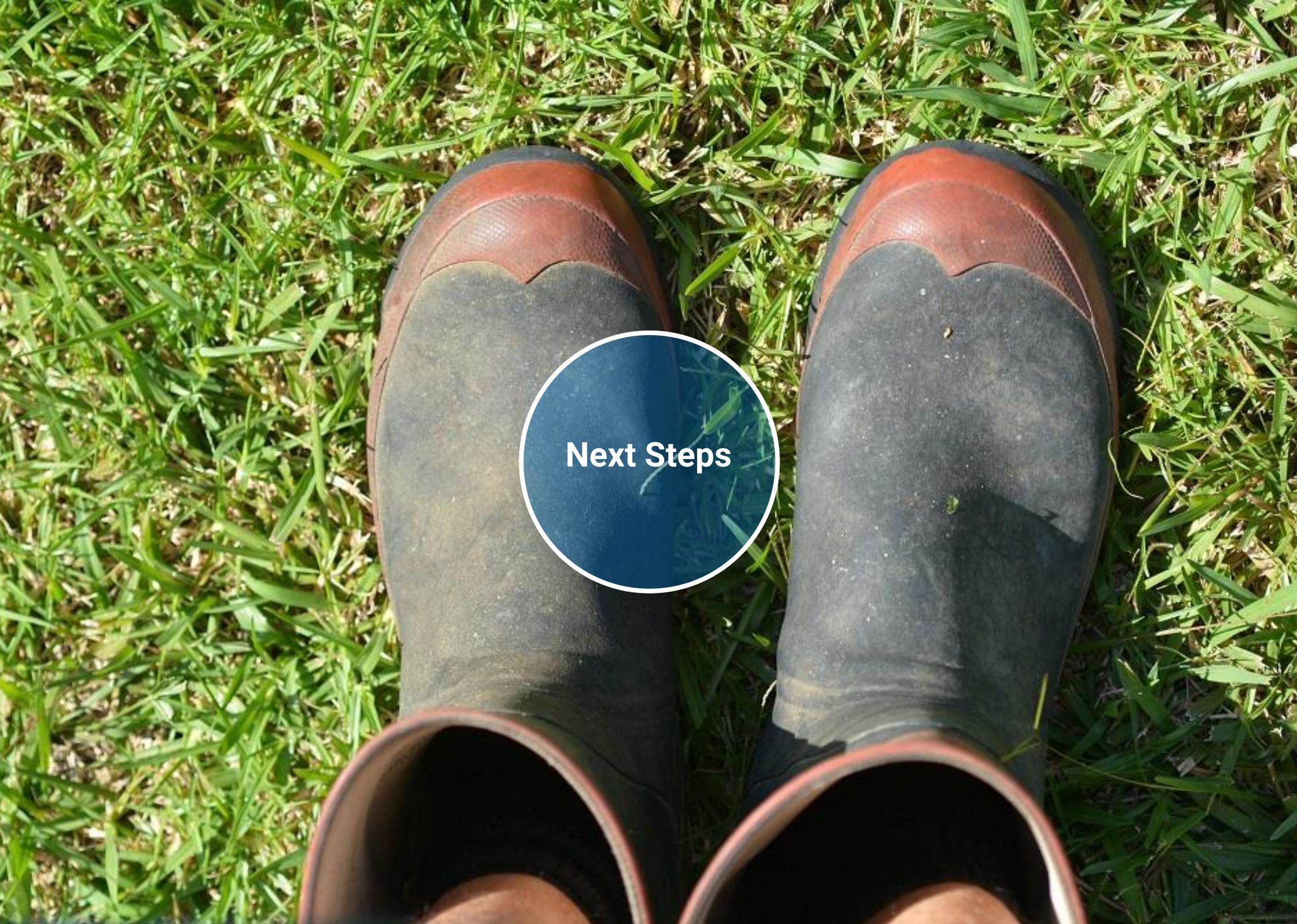
Respondents for both the business and personal / household surveys were asked “what would need to change, for your family or business to move to an EV or Hybrid over petrol or diesel in the next 3-5 years.”

The large majority of comments were aligned with the categories in the graphs on the previous pages. Cost, range, batteries, towing capacity and vehicle options being the main themes. Full comments can be found in Appendices 9 and 10.

SECTION 3

Recommendations

Note: This project and report is focussed mainly on primary research. The recommendations provided are intended to be preliminary suggestions and starting points and based on research outcomes. These have not yet been evaluated in detail.



Next Steps

Potential Next Steps

62 Uptake Factors which can be Influenced

The following table is a summary of factors which would increase EV and Hybrid vehicle uptake in Southland, broken down by who may have influence over the factor and/or may need to be advocated to for change.

The figures listed are the percentage of total personal / business survey respondents who identified the factor as one which would increase their likelihood of purchasing an EV or Hybrid in the future.

Vehicle Manufacturers	Personal (681 respondents)	Business (127 respondents)
Range - Longer range / travel distances	71%	79%
Battery - Lower battery replacement cost or longer lifespan	62%	69%
Power - Ability to tow a larger trailer or carry a larger load	45%	69%
Battery - Longer battery lifespan	59%	64%
4x4 - Ute options	43%	65%
Towing - Ability to tow a small trailer	35%	44%
Other vehicle type options not currently available	12%	35%
People mover - Options with more seats	15%	18%

Figure 49

Central / Local Government	Personal (681 respondents)	Business (127 respondents)
Purchase - Lower vehicle purchase prices	77%	64%
Battery - Recycling options	60%	60%
Charging - More charging stations	57%	48%

Figure 50

Local Businesses	Personal (681 respondents)	Business (127 respondents)
Maintenance - More certainty of maintenance costs	36%	41%
Servicing - More local servicing options	35%	35%
Resale - More certainty of future resale value	22%	26%
Cost - Lower cost fleet hire options	5%	14%
Options - More fleet hire options / greater EV or hybrid fleet availability	5%	12%

Figure 51

Great South via Partner Organisations	Personal (681 respondents)	Business (127 respondents)
Charging - More clarity around charging costs	45%	46%
Costs - Better understanding of costs and actual cost savings	42%	40%
Charging - Better understanding of charging processes and times at home or when travelling	35%	31%
Options - Better knowledge of the options that are available	28%	28%
Information - Simple summary info - too much to consider and can't be bothered researching it all	20%	20%

Figure 52

Universities	Personal (681 respondents)	Business (127 respondents)
Environment - More clarity of whole of life environmental impact/benefits (including battery end-of-life)	55%	56%
Ethics - Answers to ethical questions around minerals and mining practices	38%	42%

Figure 53

63 Information and Follow-up

Survey respondents were very engaged in the EV topic. In total 284 people (32%) of all respondents were keen for additional information. The resulting contact list provides a strong basis for next steps and helping to ensuring credible information is available to the community.

Business Survey Follow-up Requests

(44 Responses)

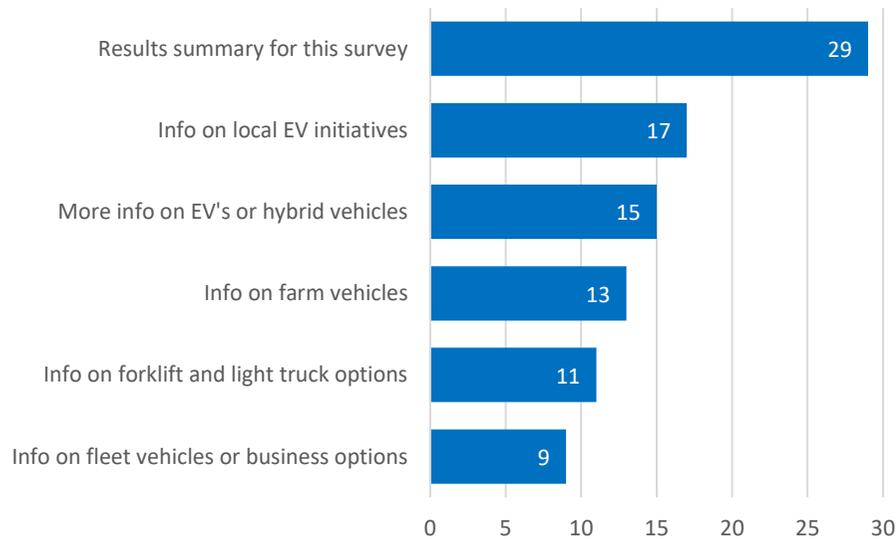


Figure 54

Southlanders across the spectrum are interested and engaged with this topic, regardless of their views on Climate Change. Of those businesses and households who requested follow-up info, 38% gave a Climate Change importance ranking of three or less out five.

Personal / Household Survey Follow-up

(240 Responses)

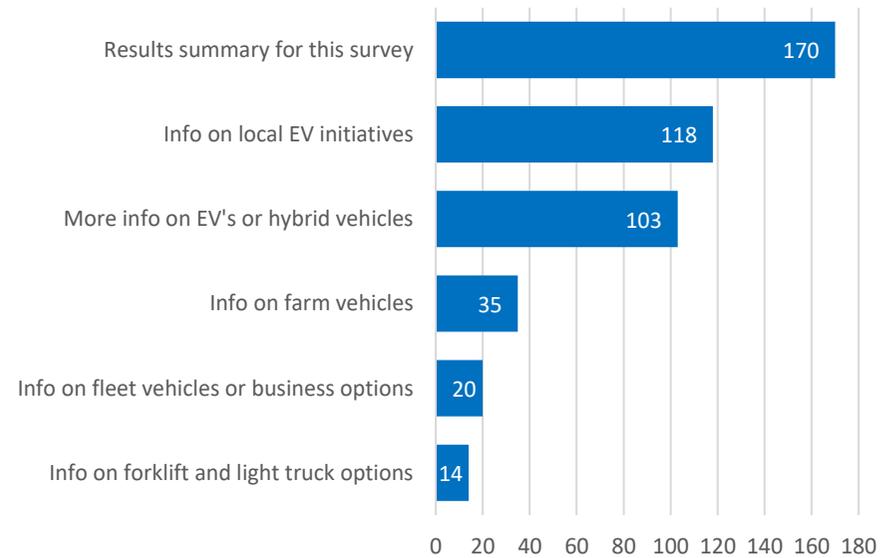


Figure 55

64 Potential Actions Based on Survey Comments

1. Validate the capacity of the power supply network to handle fast charging infrastructure at the required scale.
2. Advocate for free, high frequency, zero carbon public transport.
3. Clarify the environmental benefits, costs, trade-offs and end-of-life options for batteries.
4. Acknowledge the reality that the current EV's available won't suit everyone, while also sharing positive stories and helpful information.
5. Avoid a 'one size fits all approach' and continue to explore a range of options, including hydrogen.

65 Potential Possibilities to Explore

1. A few comments related to gaining subsidies to put solar panels on farm shed roofs to power EV motorbikes and UTV's.
2. A waste disposal company indicated a desire to convert their entire fleet of trucks but are limited by current options being very expensive.
3. Some household survey respondents indicated that they were reluctant to purchase an EV, due to living in a rental property and not knowing the requirements for installing a charger.
4. If aiming to increase the uptake of small farm EV's then reducing the stock carrying cost for motorbike retailers would be a simple way of achieving this. Effectively sourcing funding to purchase demo bikes and enable stores to have these available as stock on hand.



66 Driving Experience Possibilities

People who have driven an EV or Hybrid are much more likely to indicate that they are likely to purchase one or would strongly consider it.

While it is impossible to determine which factor is the cause for the correlation (ie. do people drive EV's because they are interested in buying one? Or do they become more open to buying having driven one?) exposure is an important part of informing people's purchasing decisions.

Potential Approaches to Increasing EV Exposure

1. Courtesy Cars

As part of this research, some mechanics were asked their view on having an EV as their courtesy car. The main barrier expressed, was the upfront investment and risks involved in having a \$60,000 car as a loan vehicle. For this approach to work the initial vehicle cost would most likely need to be underwritten as part of a regional funding programme. Vehicles could potentially be provided on a rotating basis in association with local car dealers or as a national level programme in association with a range of vehicle brands.

2. Rental Cars

Policy, or incentives, which required, or supported, rental car companies move towards EV and Hybrid fleets would have an instant impact, in terms of improving the viability of installing additional charging stations and enhancing the charging network within Southland (especially along tourist trails, which link many parts of rural Southland). Additional benefits would include carbon neutral or 'green tourism' opportunities, as well as a significantly increased supply of ex-rental second hand EV and Hybrid vehicles entering the NZ market. Timing for a policy of this nature is good, due to many companies scaling back their fleets during Covid-19 lockdown.

⁴⁷ [Bloomberg Dec 2020](#)

67 Battery Stewardship and Cost Reduction Possibilities

One potential approach to reducing the cost of EV vehicles is to require or incentivise a battery stewardship programme.

In terms of the cost of manufacture, batteries are currently the single most expensive component of an EV. Estimated to be around 30% of the cost of manufacture in 2020⁴⁷ (however, this is reducing rapidly on a \$ / kWh basis).

Theoretically the cost of the vehicle could be reduced via the battery ownership (and recycling responsibility) being retained by the manufacturer or a battery leasing company. The owner has a reduced upfront investment in the vehicle and the manufacturer or battery leasing company has ongoing revenue, plus end-of-life recycling responsibility (credible recycling is important).

68 Battery Recycling Possibilities

Viable battery recycling options was an important factor for 60% of Southland businesses and households alike. Many stated that their concerns and uncertainty over battery related pollution currently outweighed their environmental concern in relation to CO₂ emissions.

As one survey respondent phrased it *"when the EVs are at end of life, they won't be recycled, we can't even recycle an ice cream container in NZ let alone a toxic lithium-ion battery! We'll pay a third world country to take them, and they'll end up in the Indian Ocean killing and poisoning eco systems."*

Globally this is going to be a massive challenge (or opportunity) in years to come. Rather than being a passive observer and contributor to the down stream environmental issues, there is an opportunity for NZ to invest in research and development at a global level. The European Union currently aim to recover 95% of cobalt, nickel and copper, and 70% lithium from recycled batteries by 2030 and are planning on mandating the proportion of recycled material in new batteries⁴⁸.

⁴⁸ [European Federation for Transport and Environment](#)

69 Clean Car Subsidy Considerations

Southlanders tend to be pragmatic and principled. Additional consideration needs to be given to how to advocate for viable EV / Hybrid options for Southlanders and/or work to ensure that current policies don't end up being detrimental to the intended long term environmental outcomes.

The research sample indicated that the Clean Car Subsidy announcement did not have the desired outcome for the Southland region, with Southlander's propensity to purchase an EV or Hybrid decreasing, rather than increasing post the announcement.

The main factors seem to be:

- Many trades, primary sector occupations and rural locations with gravel roads, need durable or 4x4 vehicles with good ground clearance and towing ability.
- There are currently no viable EV and Hybrid options available in the market.
- Southlanders therefore feel like they are being forced to subsidise EV's for people in urban locations who can most likely already afford the vehicles.
- There is a general feeling that the proposed subsidy programme is simply an extra tax. Especially when inefficient and high fuel consumption vehicles are already taxed via fuel related levies.
- Among Southlanders who place a high importance on climate change action, there were mixed reactions to the announcement, with an equal number against the proposed subsidy programme as for it. Some feel that it is a false economy and 'green' washing rather than a viable environmental policy.
- Another 'possible' reason for the decrease in the proportion of people likely to purchase an EV in Southland, is that it is less appealing to drive a discounted vehicle which your friends and family feel they were 'taxed' to help fund.





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