

Electric vehicle uptake in Dunedin

**Janet Stephenson and Felix Cook, Centre for Sustainability, University of Otago
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Summary

A study using the Ministry of Transport's fleet vehicle statistics found that Dunedin had the highest penetration of electric vehicles (EVs) of New Zealand's main cities at the end of 2018 (Dortans and Stephenson 2019). An update of their report is presented here with figures and insights from 2019 data.

By the end of 2019, Dunedin still had the highest penetration of pure electric vehicles per 1000 residents (5.16), well ahead of Wellington (4.39).

When considering both pure electric vehicles (e.g. Nissan Leaf, Tesla Model S) and plug-in hybrid electric vehicles (e.g. Mitsubishi Outlander, Toyota Prius), Dunedin is slightly ahead of Wellington (6.07 and 6.01 per 1000 residents respectively), similar to in 2018.

Additionally, Dunedin continues to have the highest proportion (5.38 per 1000 residents) of electric vehicles registered for personal use, well ahead of Wellington (4.39) and Christchurch (4.19).

Personal EV registrations in Dunedin are mostly pure electric vehicles with 4.60 registrations per 1000 residents compared to other cities at 3.6 or less. However, personal registrations of plug-in hybrids have increased markedly in 2019, at a rate nearly 40% greater than its closest rival, Wellington.

EV growth in New Zealand and Dunedin

The surge in EV registrations throughout New Zealand began in 2016 (Figure 1). The figure contains the annual registrations for both PHEV and PE vehicles for all of New Zealand, and a line tracking the cumulative total.

In 2019 there were 6954 electric vehicles added to the New Zealand fleet compared to 5495 in 2018. By the end of 2019 New Zealand had 18506 registered EVs.

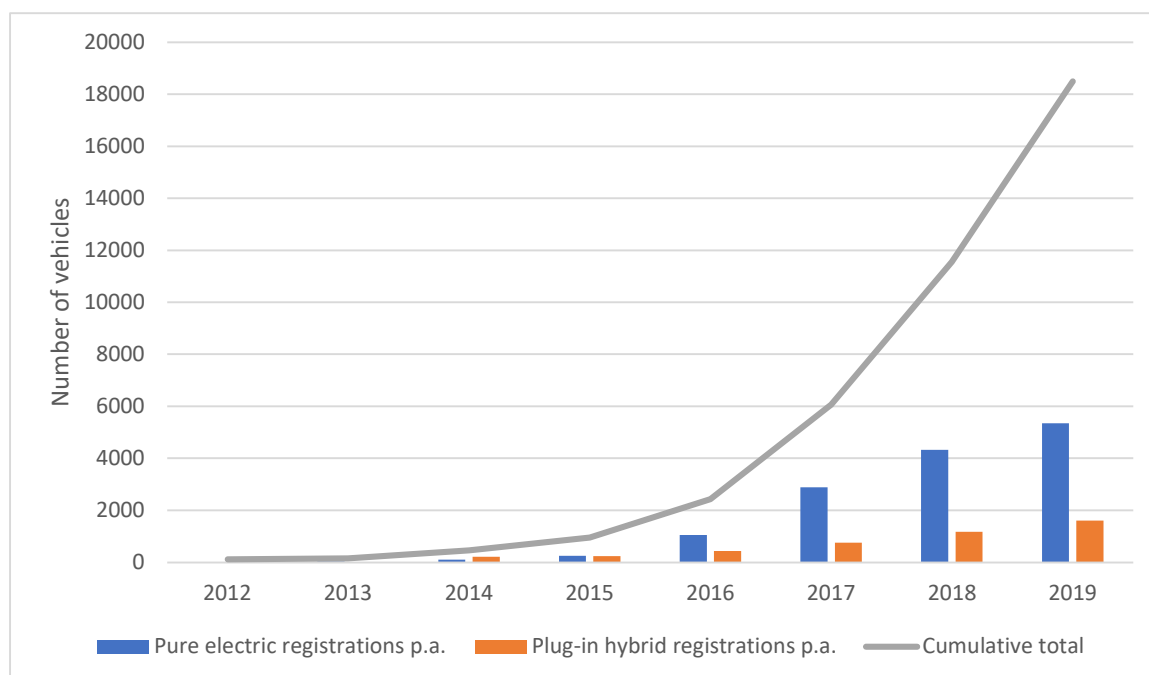


Figure 1. Annual EV growth in New Zealand (see Table 1 for details).

In Dunedin, 308 electric vehicles were registered in 2019 compared to 235 in 2018.

Dunedin's total EV fleet was 799 by the end of 2019, made up of 680 pure electric vehicles and 119 plug-in hybrids.

Dunedin's percentage growth rate from 2018 to 2019 was 31%, a similar to Hamilton (34%) and Auckland (33%) but significantly less than Tauranga (47%).

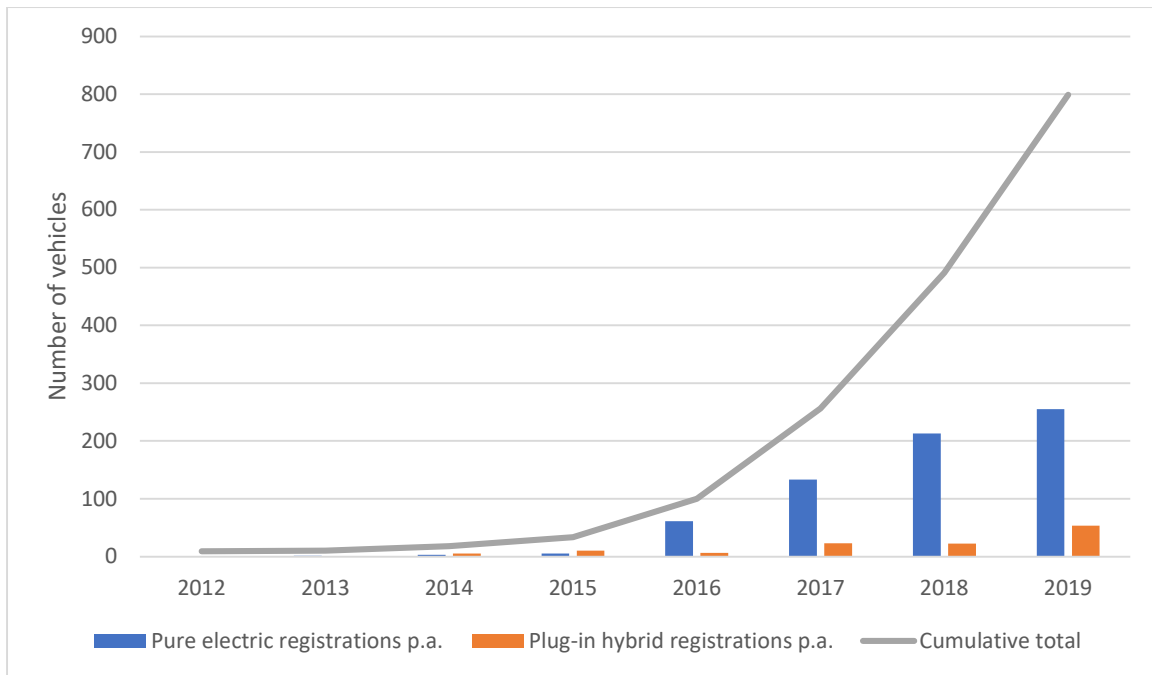


Figure 2. Annual EV growth in Dunedin (see Table 2 for details.)

Main cities compared: pure electric vs plug-in hybrids

We compared Dunedin’s per capita uptake of electric vehicles with that of other main cities in New Zealand.

The number of EVs per 1000 residents for NZ’s largest cities is shown in Figure 3, contrasting plug-in hybrid (PHEV) and pure electric (PE) vehicles.

Dunedin’s per capita EV uptake (6.07 per 1000 residents) is ahead of Wellington (6.01 per 1000 residents) and well ahead of all other cities.

Dunedin also has the highest penetration of pure electric vehicles per 1000 residents (5.16), significantly more than its closest rival Wellington (4.39) (see Figure 3 & Table 3).

Wellington is top in uptake of plug-in hybrids, with 1.5 per 1000 residents, followed by Auckland at 1.2, and Dunedin and Christchurch tied at 0.9 (Table 3).

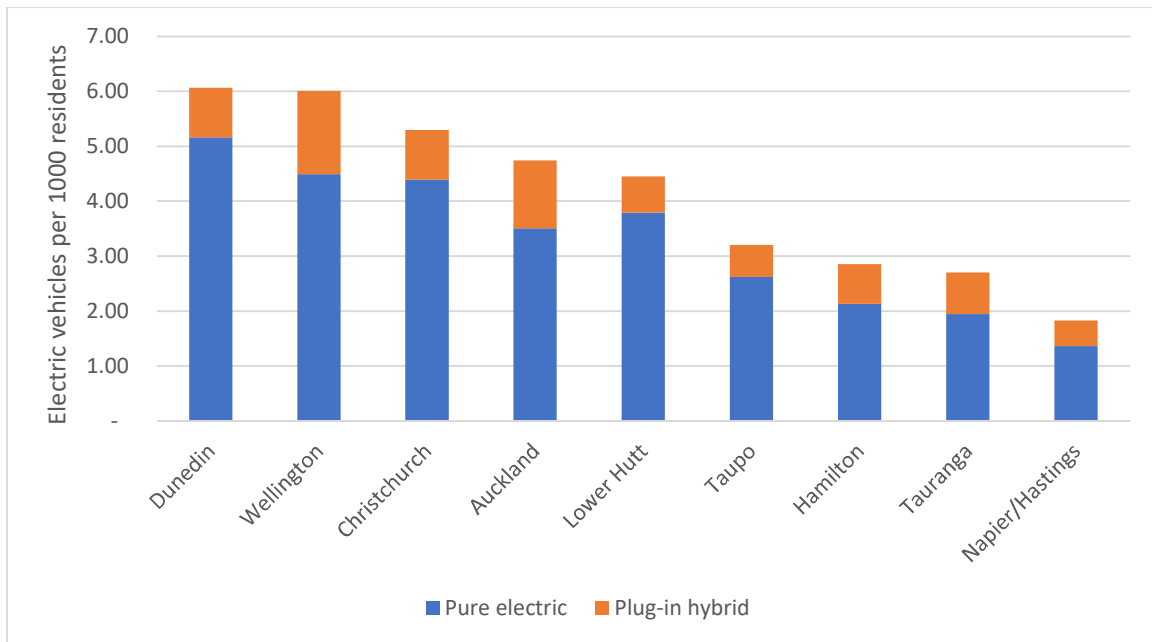


Figure 3. Electric vehicles per 1000 residents by type for main New Zealand cities as at the end of 2019 (see Table 3 for details).

Main cities compared: EV Ownership

There are three ownership types that EVs are categorised into by the Ministry of Transport:

1. Individuals (personal registrations)
2. Companies (business registrations)
3. Others (such as council fleets)

Figure 4 shows cumulative totals to the end of 2019.

The majority of EVs in the 9 cities are registered for personal use (see column cluster 3, Figure 4).

Dunedin has the highest proportion of electric vehicles registered for personal use (5.38 per 1000 residents), followed by Wellington (4.39) and Christchurch (4.19) (column cluster 3, Figure 4).

Dunedin has one of the lowest rates of company-registered EVs. This category is topped by Auckland, Christchurch and Wellington (column cluster 2, Figure 4).

Wellington has the greatest proportional uptake of EVs by 'Others' (column cluster 4, Figure 4).

Dunedin also has the highest per capita level of personally-registered pure electric vehicles (4.6 per 1000 people), followed by Christchurch, Wellington and Lower Hutt (column cluster 8, Figure 4).

For plug-in hybrid electric vehicles (PHEVs) Dunedin has the second highest individual ownership rate of PHEV per 1,000 residents (0.77) after Wellington (0.87) (column cluster 7, Figure 4).

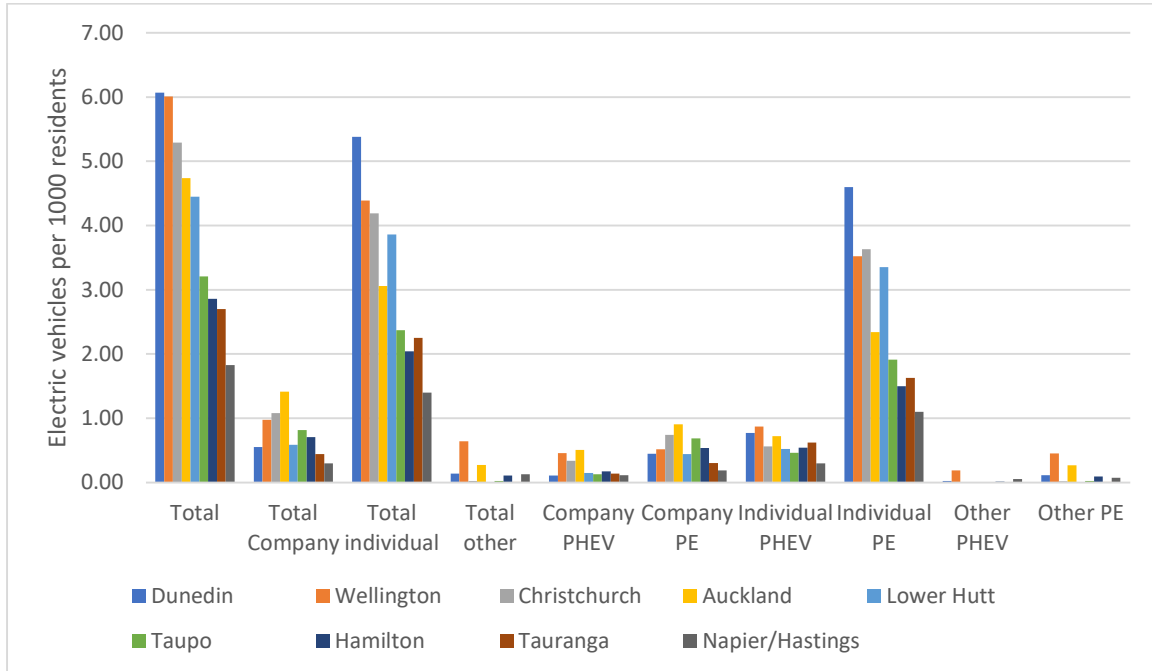


Figure 4. Electric vehicles per 1000 residents by ownership type for main New Zealand cities as at 31 December 2019 (see

Table 4 for details).

Figure 5 shows the EV uptake just for 2019.

Looking at 2019 registrations alone, Dunedin is still ahead of other cities for EVs per 1000 residents, individual ownership of EVs, and individual ownership of pure electric vehicles.

Of particular note is that Dunedin had the highest per capita rate of personal PHEV registrations during 2019 (0.34 per 1,000 residents) which is 38% higher than the next closest city Wellington (0.24) (see column cluster 7, Figure 5). If this continues Dunedin could pip Wellington for individual PHEV registrations in 2020.

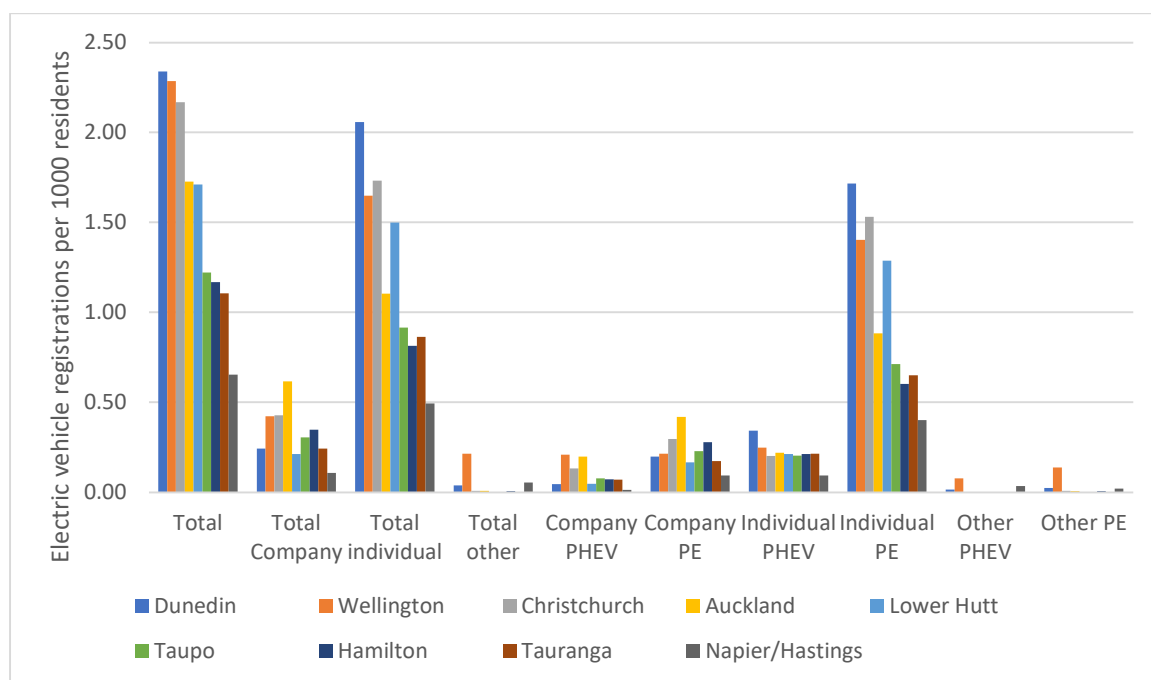


Figure 5. New electric vehicle registrations during 2019 per 1000 residents by ownership type for main New Zealand cities (see Table 5 for details).

Detailed Tables

Table 1. Annual EV growth in New Zealand.

Year	Pure electric registration p.a.	Plug-in hybrid registration p.a.	Cumulative total	Total registrations/month
Pre 2013	108	5	113	-
2013	29	6	148	3
2014	101	213	462	26
2015	252	234	948	41
2016	1049	429	2426	123
2017	2877	754	6057	303
2018	4318	1177	11552	458
2019	5351	1603	18506	580

Table 2. Annual EV growth in Dunedin.

Year	Pure electric registration p.a.	Plug-in hybrid registration p.a.	Cumulative total	Total registrations/month
Pre 2013	9	0	9	0
2013	1	0	10	0
2014	3	5	18	1
2015	5	10	33	1
2016	61	6	100	6
2017	133	23	256	13
2018	213	22	491	20
2019	255	53	799	26

Table 3. Electric vehicles per 1000 residents by type for main New Zealand cities as at the end of 2019.

City	Estimated Population	Total EV	PHEV per 1,000 residents	PE per 1,000 residents	Total EV per 1,000 residents
Dunedin	131,700	799	0.9036	5.1632	6.0668
Wellington	210,400	1,264	1.5162	4.4914	6.0076
Christchurch	385,500	2,041	0.9027	4.3917	5.2944
Auckland	1,642,800	7,788	1.2320	3.5086	4.7407
Lower Hutt	108,700	484	0.6624	3.7902	4.4526
Taupo	39,300	126	0.5852	2.6209	3.2061
Hamilton	169,500	484	0.7257	2.1298	2.8555
Tauranga	144,700	391	0.7602	1.9419	2.7021
Napier/Hastings	150,000	274	0.4667	1.3600	1.8267

Table 4. Details of electric vehicles per 1000 residents by ownership type for main New Zealand cities as at 31 December 2019.

City	Dunedin	Wellington	Christchurch	Auckland	Lower Hutt
Est. population	131,700	210,400	385,500	1,642,800	108,700
Total	6.0700	6.0100	5.2900	4.7400	4.4500
Total Company	0.5543	0.9743	1.0791	1.4147	0.5888
Total Individual	5.3800	4.3900	4.1900	3.0600	3.8600
Total Other	0.1367	0.6416	0.0234	0.2709	0.0000
Company PHEV	0.1063	0.4563	0.3372	0.5083	0.1472
Company PE	0.4480	0.5181	0.7419	0.9064	0.4416
Individual PHEV	0.7700	0.8700	0.5600	0.7200	0.5200
Individual PE	4.6000	3.5200	3.6300	2.3400	3.3500
Other PHEV	0.0228	0.1901	0.0026	0.0037	0.0000
Other PE	0.1139	0.4515	0.0208	0.2672	0.0000
City					
	Taupo	Hamilton	Tauranga	Napier/Hastings	
Est. population	39,300	169,500	144,700	150,000	
Total	3.2100	2.8600	2.7000	1.8300	
Total Company	0.8143	0.7080	0.4423	0.3000	
Total Individual	2.3700	2.0400	2.2500	1.4000	
Total Other	0.0255	0.1062	0.0069	0.1267	
Company PHEV	0.1272	0.1711	0.1382	0.1133	
Company PE	0.6870	0.5369	0.3041	0.1867	
Individual PHEV	0.4600	0.5400	0.6200	0.3000	
Individual PE	1.9100	1.5000	1.6300	1.1000	
Other PHEV	0.0000	0.0118	0.0000	0.0533	
Other PE	0.0255	0.0944	0.0069	0.0733	

Table 5. Details of new electric vehicle registrations during 2019 per 1000 residents by ownership type for main New Zealand cities (continued next page).

City	Dunedin	Wellington	Christchurch	Auckland	Lower Hutt
Est. population	131,700	210,400	385,500	1,642,800	108,700
Total	2.3386	2.2861	2.1686	1.7263	1.7111
Total Company	0.2430	0.4230	0.4280	0.6166	0.2116
Total Individual	2.0577	1.6492	1.7328	1.1030	1.4995
Total Other	0.0380	0.2139	0.0078	0.0067	0.0000
Company PHEV	0.0456	0.2091	0.1323	0.1978	0.0460
Company PE	0.1974	0.2139	0.2957	0.4188	0.1656
Individual PHEV	0.3417	0.2471	0.2023	0.2191	0.2116
Individual PE	1.7160	1.4021	1.5305	0.8839	1.2879
Other PHEV	0.0152	0.0760	0.0000	0.0012	0.0000
Other PE	0.0228	0.1378	0.0078	0.0055	0.0000

City	Taupo	Hamilton	Tauranga	Napier/Hastings
Est. population	39,300	169,500	144,700	150,000
Total	1.2214	1.1681	1.1057	0.6533
Total Company	0.3053	0.3481	0.2419	0.1067
Total Individual	0.9160	0.8142	0.8639	0.4933
Total Other	0.0000	0.0059	0.0000	0.0533
Company PHEV	0.0763	0.0708	0.0691	0.0133
Company PE	0.2290	0.2773	0.1728	0.0933
Individual PHEV	0.2036	0.2124	0.2142	0.0933
Individual PE	0.7125	0.6018	0.6496	0.4000
Other PHEV	0.0000	0.0000	0.0000	0.0333
Other PE	0.0000	0.0059	0.0000	0.0200

Sources

1. Previous study:
Dortans, C. and Stephenson, J., 2019. Electric vehicle uptake in Dunedin. Centre for Sustainability, University of Otago.
2. Population estimates:
<http://archive.stats.govt.nz/infoshare/SelectVariables.aspx?pxID=d6b197a9-683f-4a83-bda9-723f060df01d>
3. Data on city boundaries:
<http://statsnz.maps.arcgis.com/apps/webappviewer/index.html?id=6f49867abe464f86ac7526552fe19787>
4. Data on EV registrations and fleet statistics:
<https://www.transport.govt.nz/mot-resources/vehicle-fleet-statistics/monthly-electric-and-hybrid-light-vehicle-registrations-2/>