

Energy Centre Energy Research Briefings

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The Energy Centre's research team targets top international peer-reviewed journals as their benchmark. The Energy Research Briefings series translates their work into plain language summaries for businesses, government agencies and the community, highlighting the impacts for practice and policy.

Ripple effects on electric vehicle uptake in New Zealand

What would entice you to buy either a pure battery electric vehicle (BEV) or plug-in hybrid (PHEV)? Drawcards include near-instant torque, low maintenance – and now a rebate under the 2021 Clean Car Package for EVs priced below \$80,000, which would cover an entry-level Tesla. Yet uptake is still a tiny 1.2% of New Zealand's (NZ's) light fleet. Worse, even EVs' expected 50% share of NZ sales by 2040 would not meet the 2015 Paris Climate Accord targets necessary to keep global temperature rises well below 2°C. While, crucially, public transport is climate-friendlier, in a nation with consistently among the OECD's highest per capita car ownership, electric propulsion at least offers zero tailpipe emissions.

New research* on Auckland helps break ground concerning subtle ripple effects in space and time on EV uptake. Our purchase decisions are influenced by ripples or "spillovers" from people and things around us. Spatially, the researchers reasoned that would-be buyers worried about venturing far from home would care more about chargers in *neighbouring* areas than their own. Temporally, early adopters might effectively "road-test" EV ownership and trigger a trend.

Sure enough, dicing the region's roughly 5,000 km² and 1.7 million people into 150-odd areas showed that over 2018-20 a 1% increase in public EV charger installation in neighbouring areas boosted uptake by 15%. (The region had only 32 public chargers.) Increases in the home area had no effect, perhaps also because a quarter of dwellings, mostly in the CBD, were multi-family residences like flats in blocks. As these less often have garages, drivers must seek chargers in nearby areas. A 1% rise in early adopters raised uptake by 1.034% – less, but still statistically significant.

Uptake was also higher, first, for people living nearer the CBD. The CBD is a common destination, and a longer journey to it would deter drivers with range anxiety. Plus, already financially stretched home buyers pushed away from the CBD by Auckland's property market might be more put off by EVs' high upfront price. Second, more

people who drove alone bought EVs. Third, so did two-car households, which can keep a conventional vehicle for longer trips.

This study extends to EVs prior evidence for spatial effects on the uptake of other alternative fuels. It shows the benefit of breaking areas down to study the frequency/usage of public chargers, daily distances travelled, and, potentially very importantly, proportions of multi-family households. There may also be links between early adoption of solar and EV uptake.

Spatio-temporal spillovers thus suggest subtle ways to prioritise both financial and non-financial policy initiatives area by area, for instance, urban charging initiatives coordinating lines companies, shopping malls and local government planners. Better charging might even tip the scale from PHEVs to environmentally superior BEVs. And incentives should also target early adopters, whose seal of approval might coax more car-loving Kiwis into EVs sooner.

**For the full article by Mingyue Selena Sheng, Le Wen, Basil Sharp, Bo Du, Prakash Ranjitkar and Douglas Wilson, see "A spatio-temporal approach to electric vehicle uptake: Evidence from New Zealand", Transportation Research Part D: 105 (2022) 102356.*