

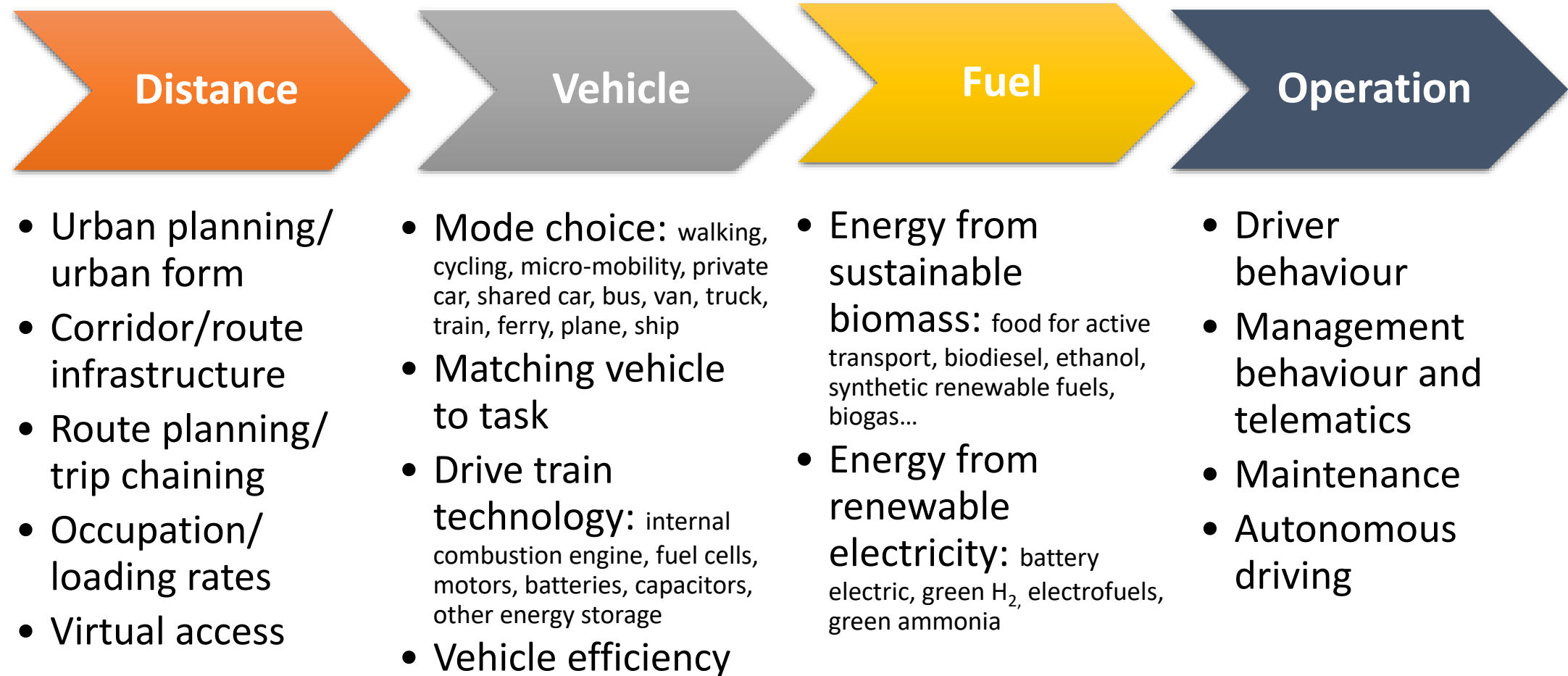


Electrifying Transport

Transportation Group, 10 May 2021, Auckland

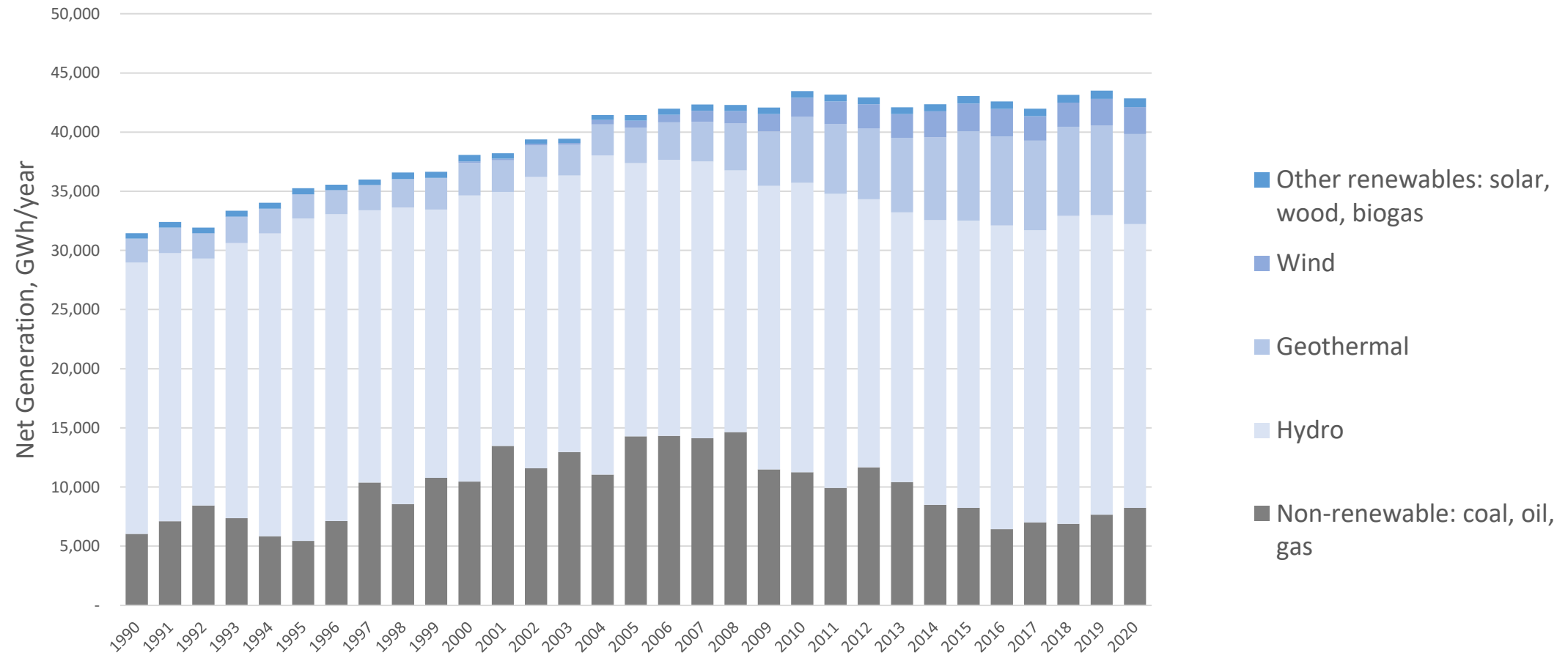
Elizabeth Yeaman, Managing Director, Retyna Ltd

Reducing CO₂ from transport



80-85% of NZ electricity generation is renewable

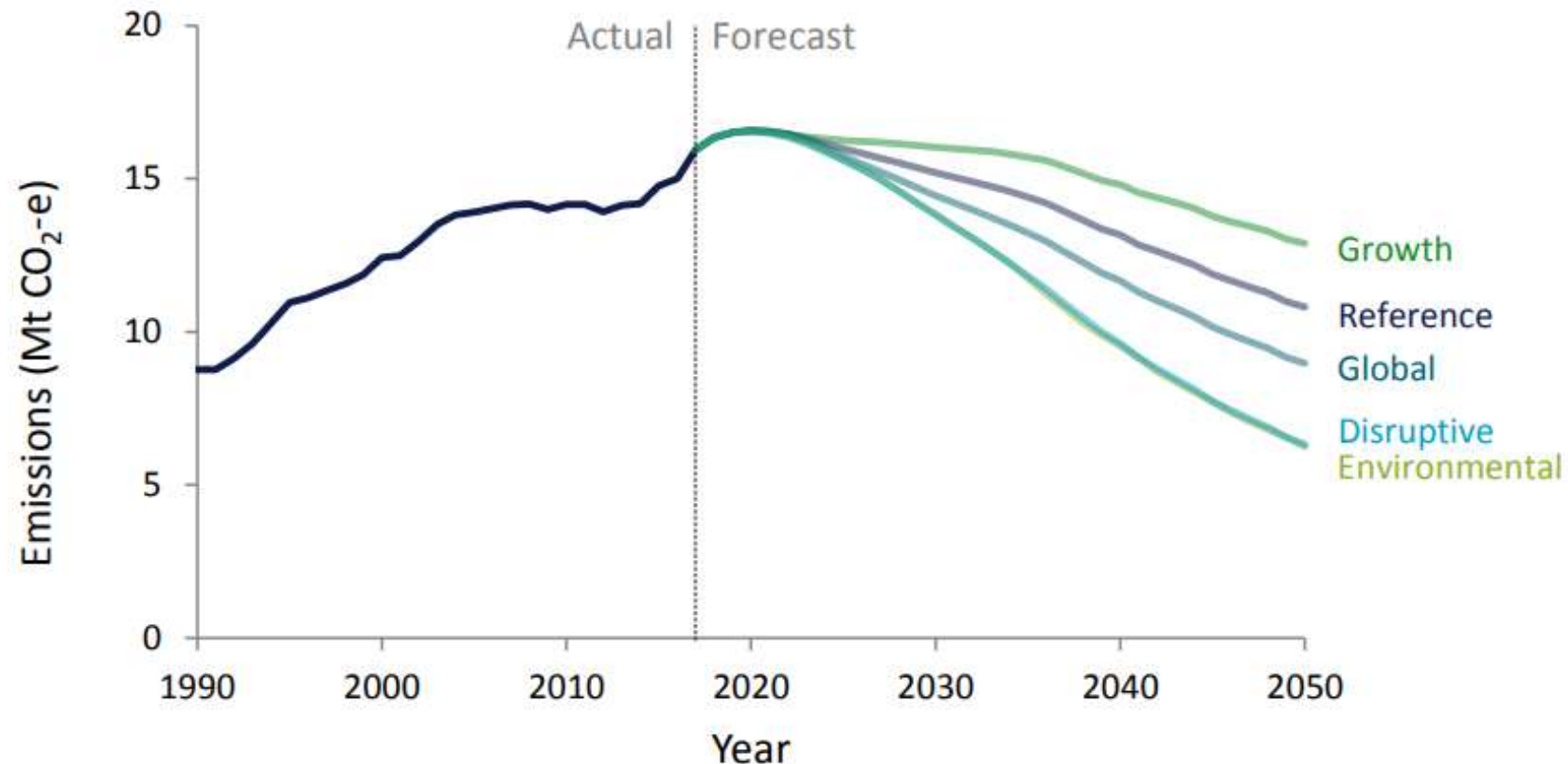
NZ electricity generation by source 1990- 2020



Cost of new generation in New Zealand



MBIE: transport sector CO₂ emissions

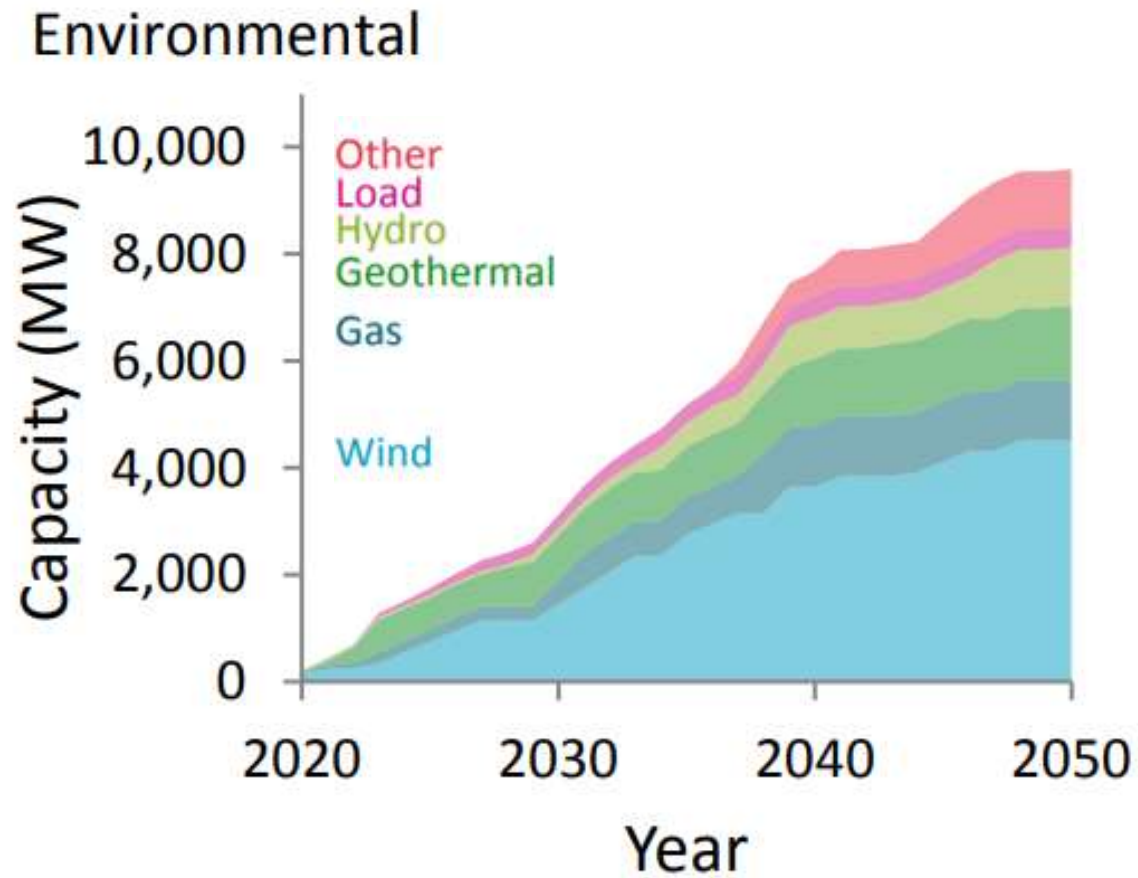


EVs by 2050:

44% light fleet
13% heavy fleet

75% light fleet
45% heavy fleet

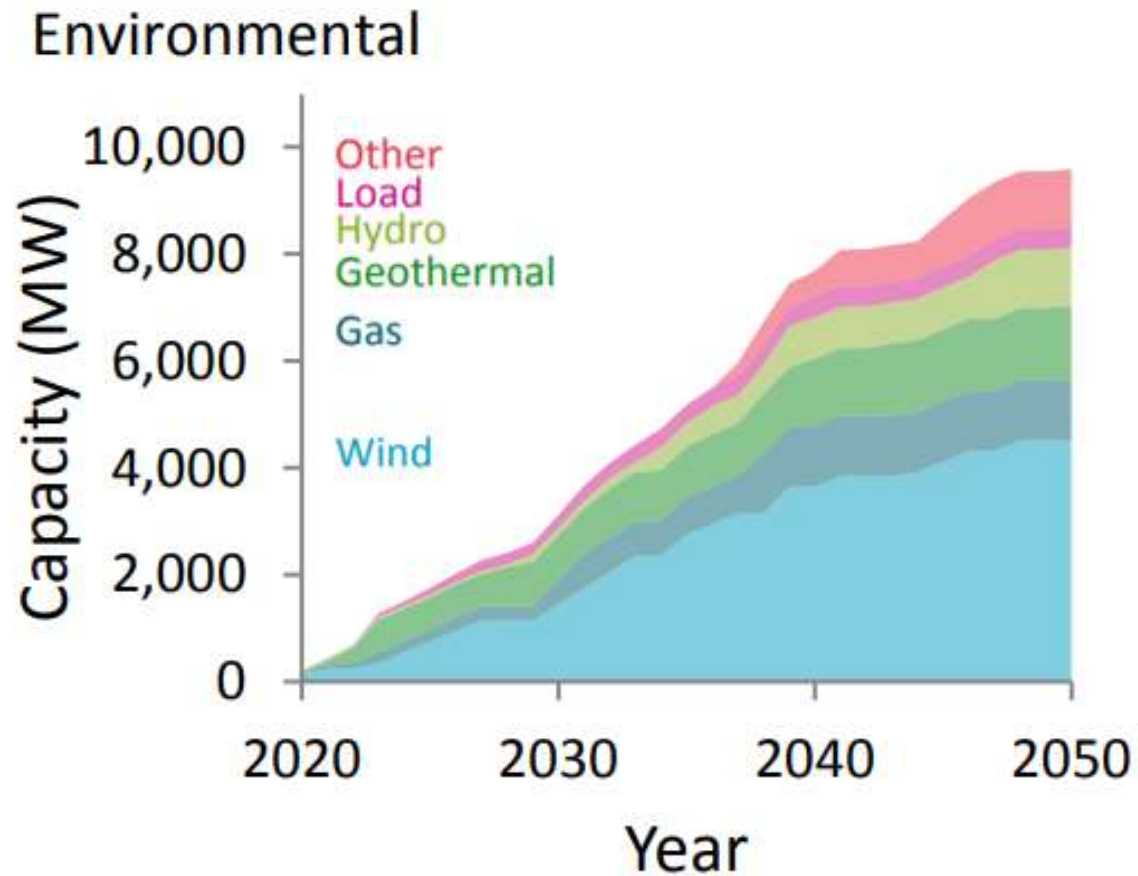
Where will all the electricity come from?



Average renewable generation (per cent)

| Scenario | Year | | |
|---------------|------|------|------|
| | 2017 | 2035 | 2050 |
| Reference | 81.7 | 90.6 | 94.9 |
| Growth | 81.7 | 91.2 | 95.4 |
| Global | 81.7 | 89.7 | 94.5 |
| Environmental | 81.7 | 91.6 | 96.0 |
| Disruptive | 81.7 | 91.0 | 94.9 |

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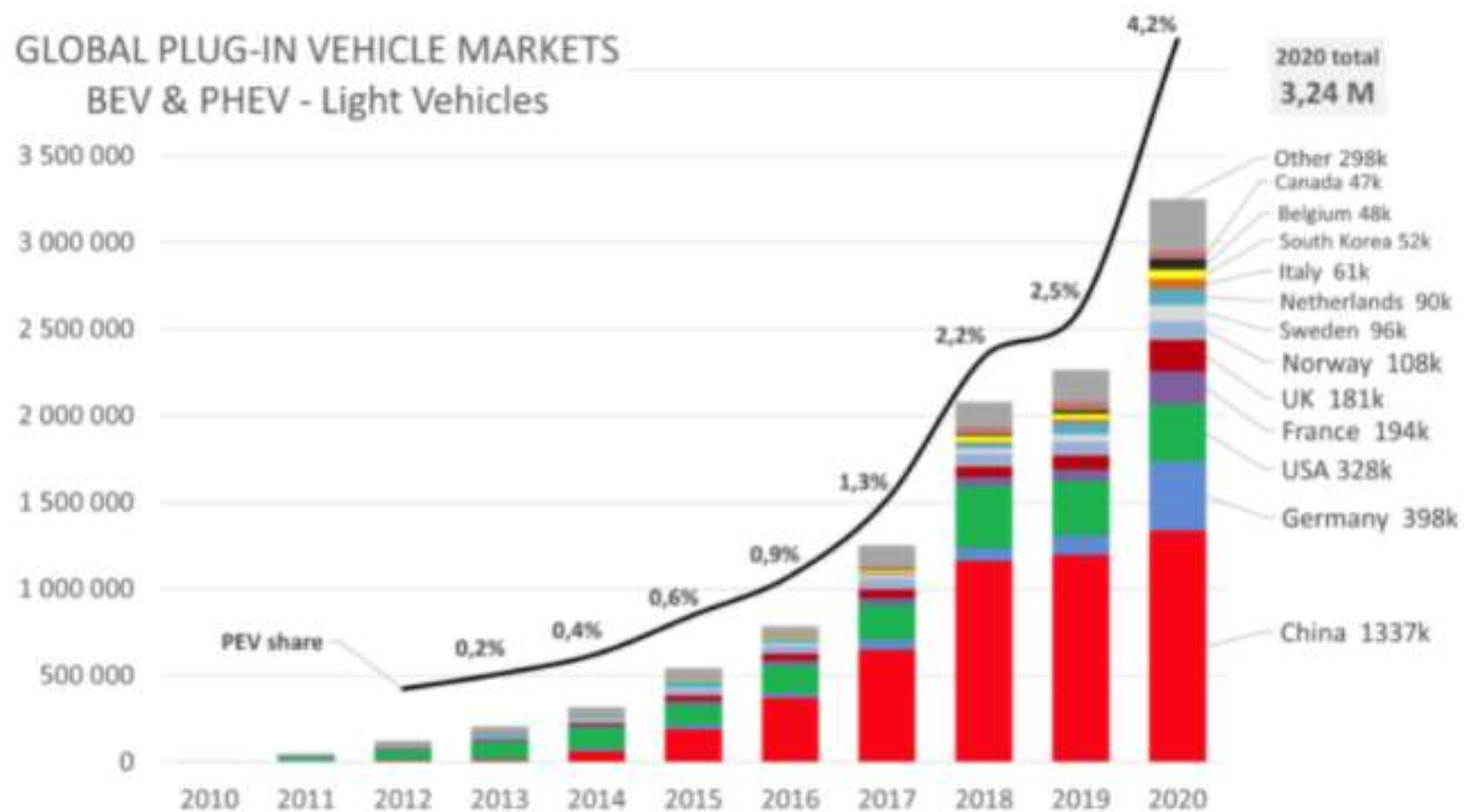
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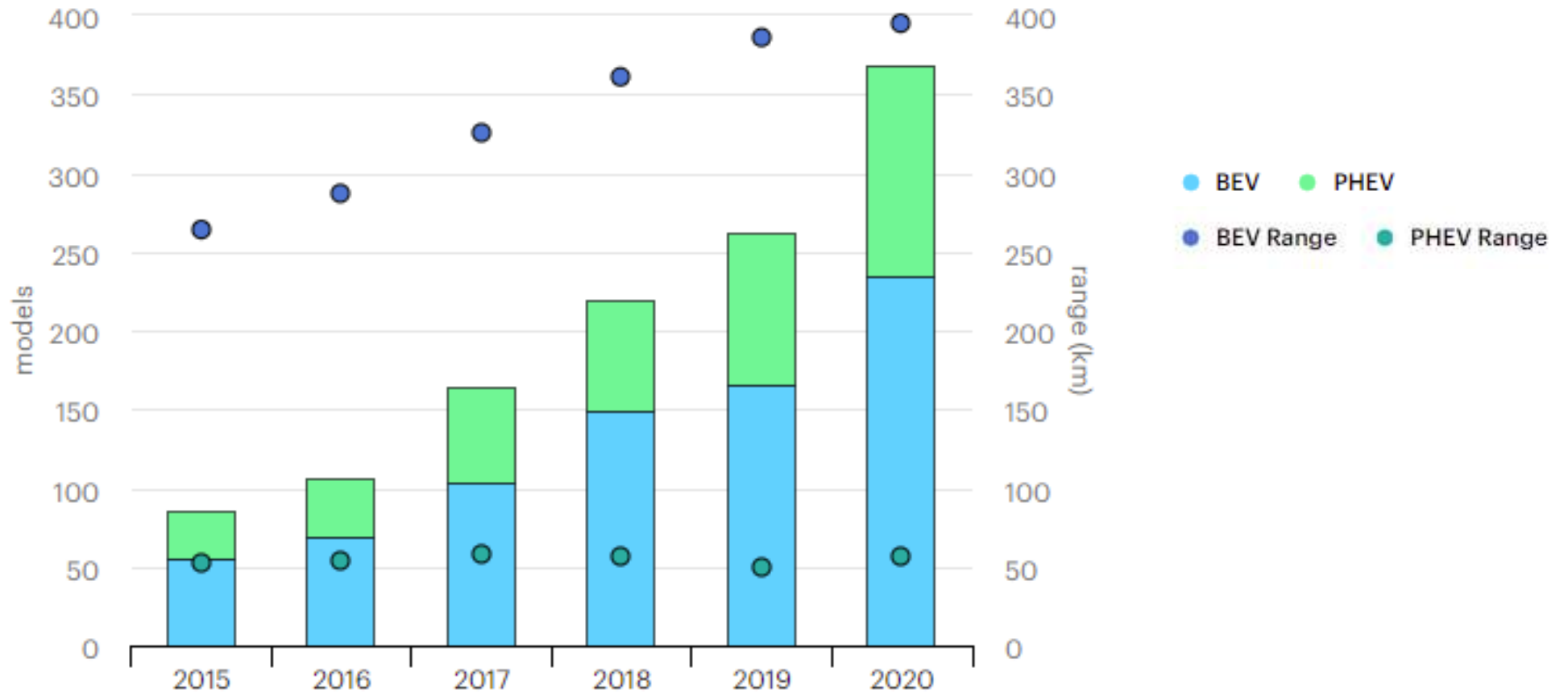


Source: Roadmap to climate friendly land freight and buses in Europe, Transport and Environment, June 2017
[https://www.transportenvironment.org/sites/te/files/publications/Full %20Roadmap%20freight%20buses%20Europe 2050 FINAL%20VERSION corrected%20282%29.pdf](https://www.transportenvironment.org/sites/te/files/publications/Full%20Roadmap%20freight%20buses%20Europe%202050%20FINAL%20VERSION%20corrected%20282%29.pdf)

EV uptake globally



Electric car models globally and driving range

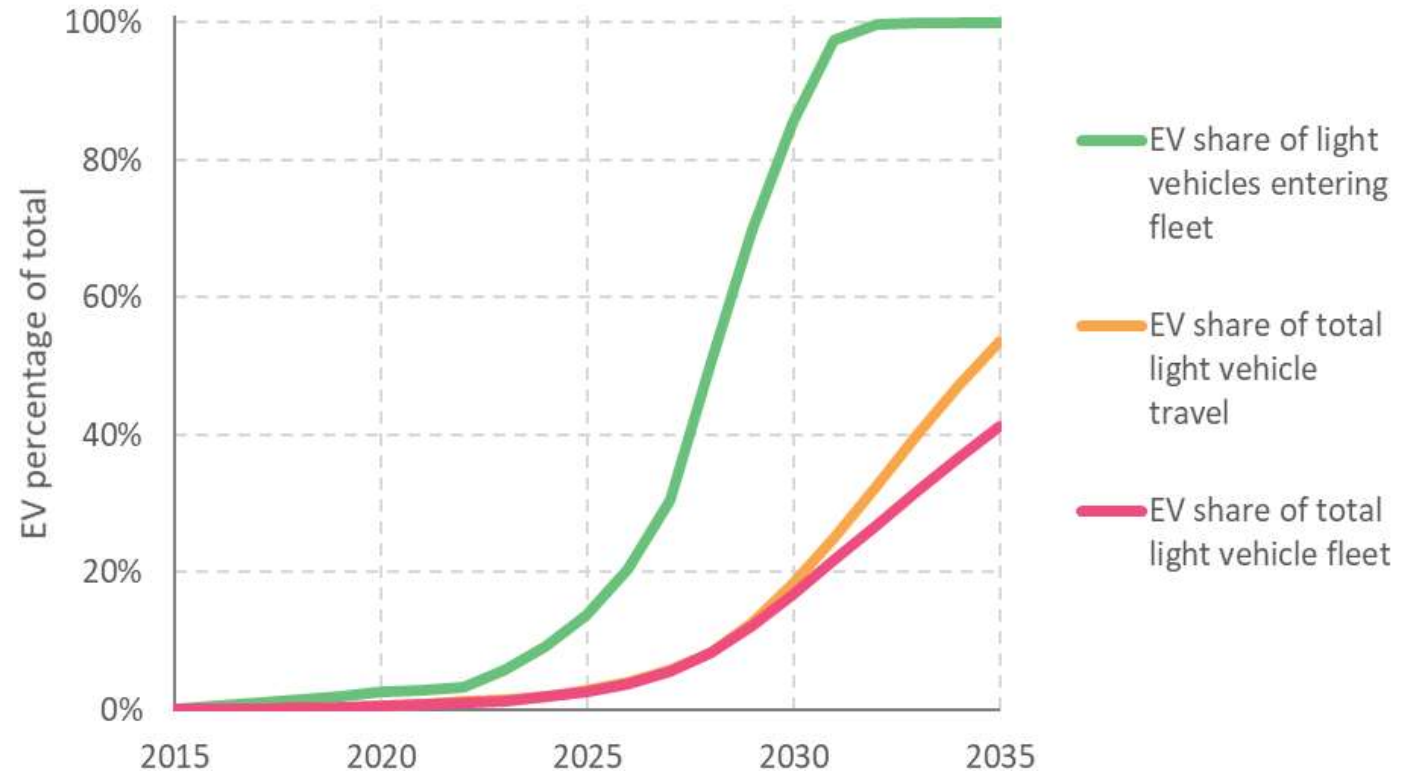


End of the ICE age

| No more new ICE vehicles | Countries/states | Light vehicle manufacturers |
|--------------------------|--|-----------------------------------|
| 2025 | South Korea, Norway | Jaguar |
| 2026 | Belgium | VW, Audi, Porsche |
| 2027 | Austria | |
| 2030 | UK, Ireland, India , Germany, Denmark, Iceland, Israel, Netherlands, Slovenia, Sweden | Volvo, Ford Europe, Land Rover UK |
| 2035/36 | Japan | GM, Land Rover, Land Rover Global |
| 2040 | Singapore, Sri Lanka , Canada, China, France, Spain, Portugal, Egypt, Taiwan | Daimler |

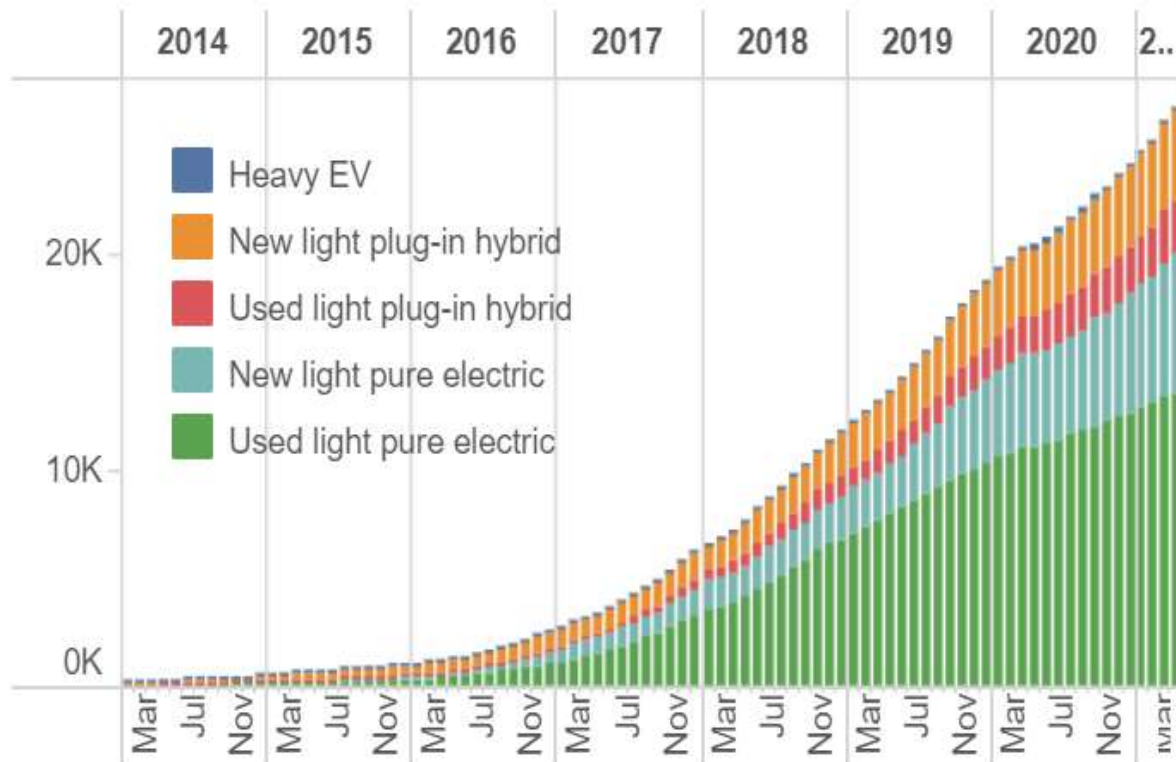
Climate Change Commission view

- » “...phase out imports of light internal combustion engine vehicles sometime between 2030-2035”
- » “...travel distance per person can be reduced by around 7% by 2030, walking, cycling and public transport can be increased by 25%, 95% and 120% respectively by 2030.”

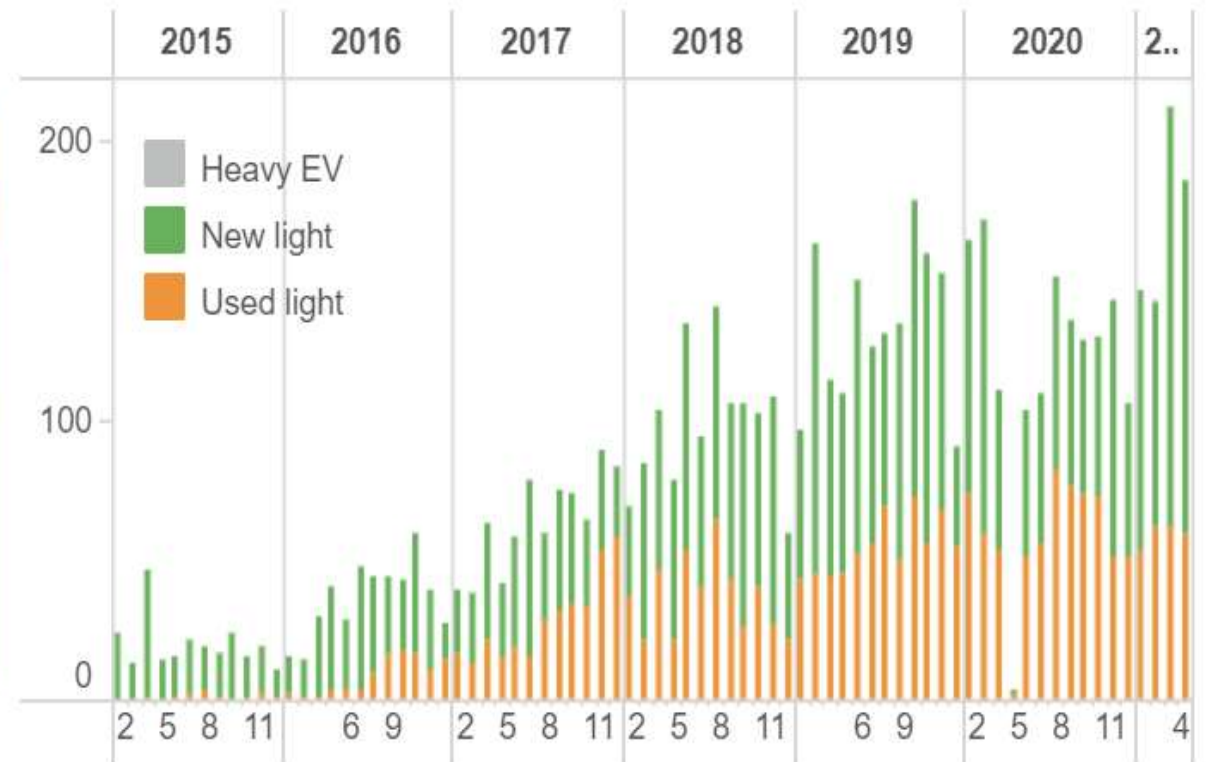


EV uptake in New Zealand

EV fleet size



Monthly EV registrations



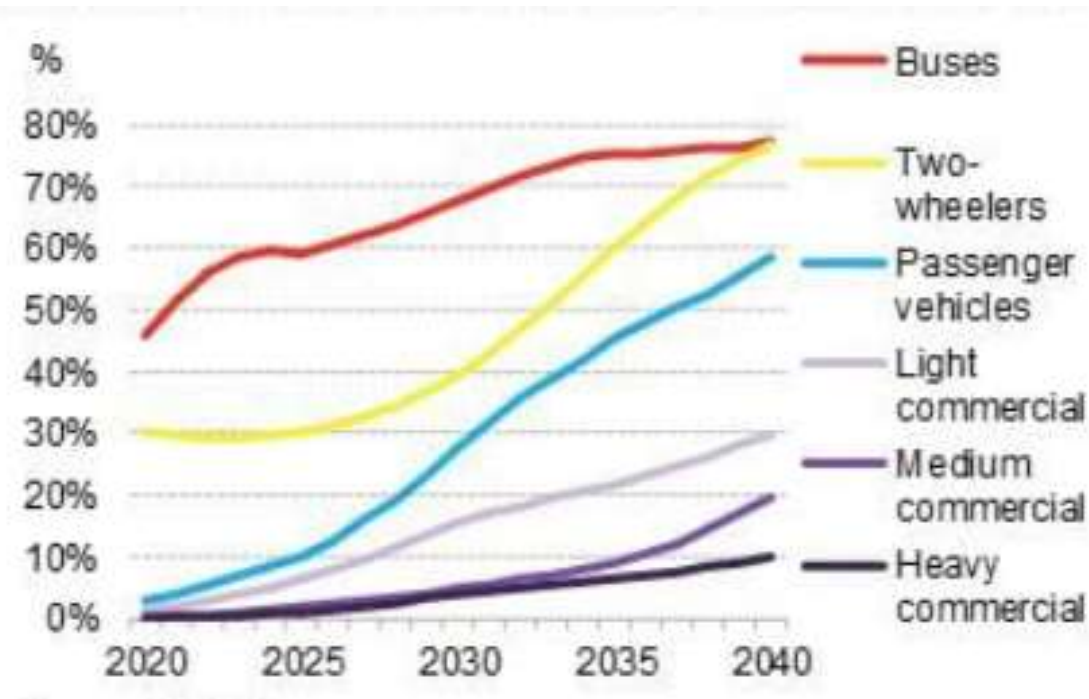
Public fast charging

- » 260+ locations for public fast charging
- » 95% of state highway system has charger every 75km
- » www.plugshare.com
- » www.charge.net.nz
- » www.openloop.co.nz

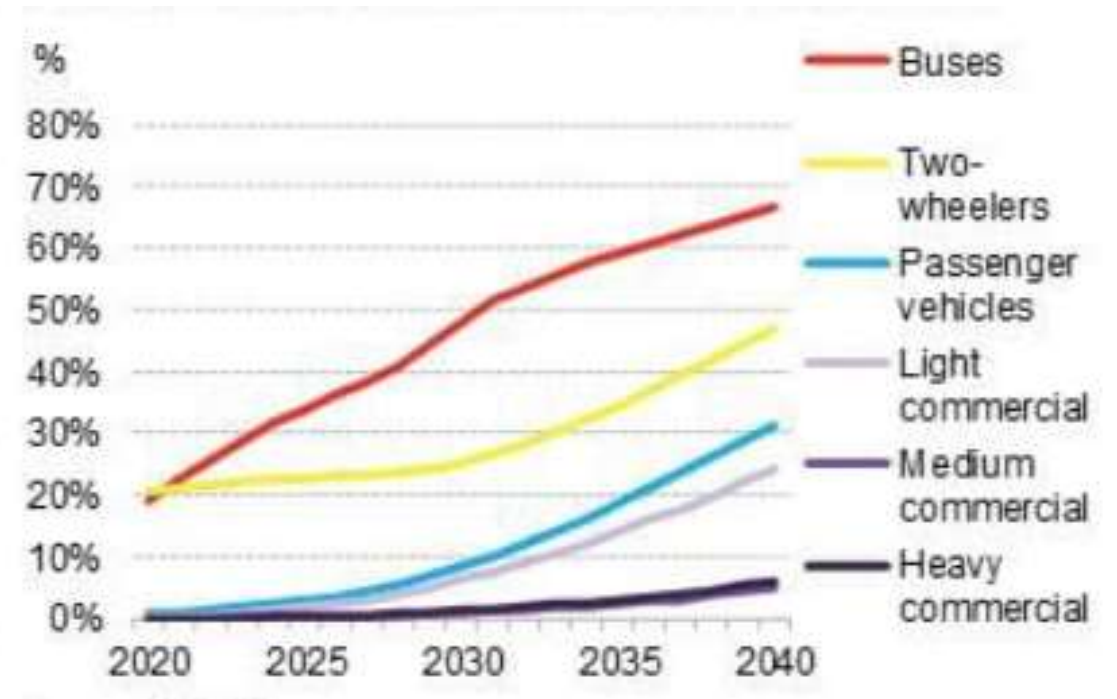


Forecast global EV share of sales and fleet

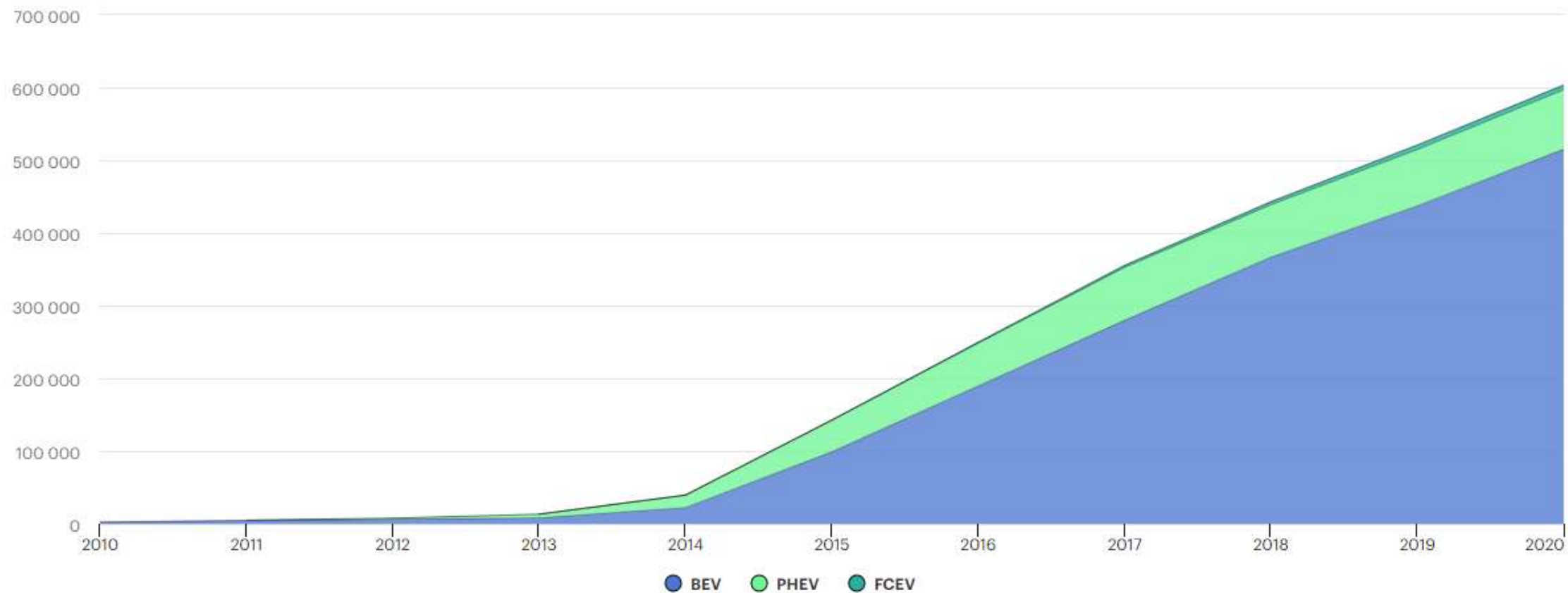
EV share of global new vehicle sales



EV share of global vehicle fleet



Global electric bus fleet

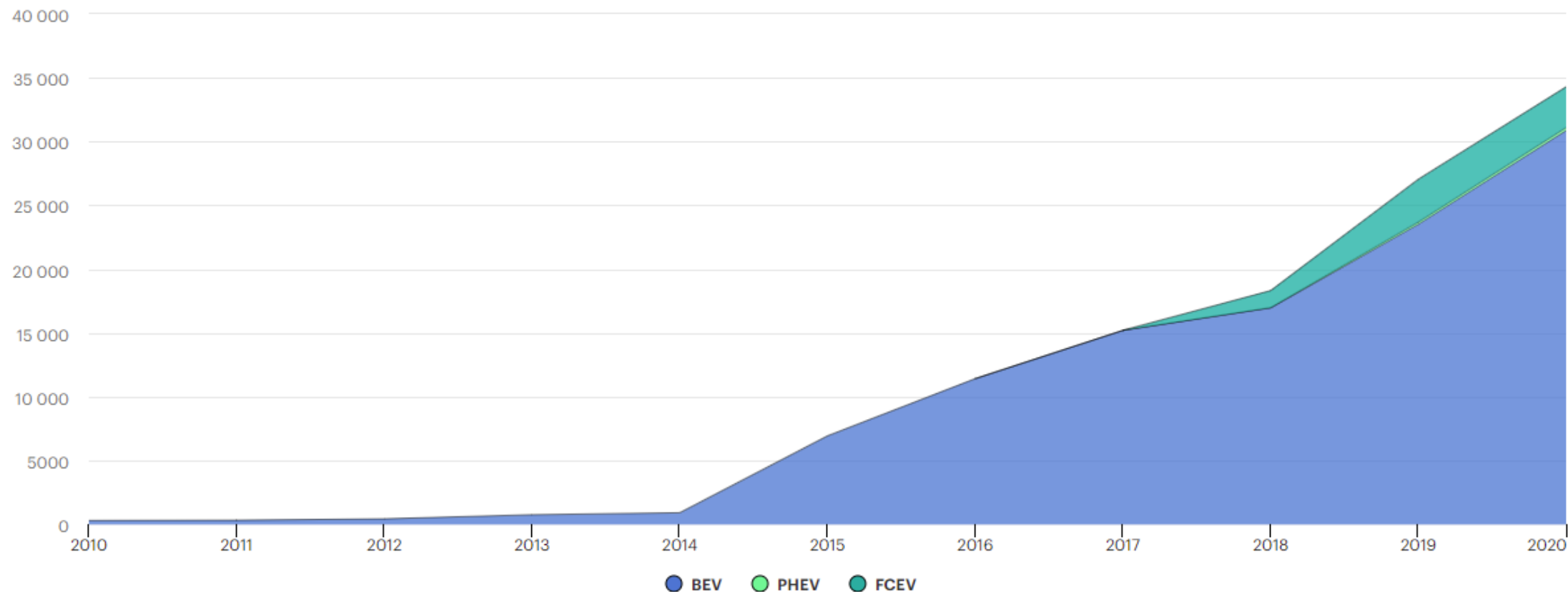


Data source: <https://www.iea.org/articles/global-ev-data-explorer>

Electric buses in New Zealand



Global electric truck fleet



Electric trucks in NZ





Electric ferry activity worldwide



Electric ferries – New Zealand





Proposed e-ferry service to Miramar/Wellington Airport





Data source: SOUNDS AIR GROUP LTD. | Heart ES-19 Courtesy of Heart Aerospace





A lens on renewable energy for transport

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