

# THE FUTURE IS ELECTRIC



Sigurd Magnusson

# Overview

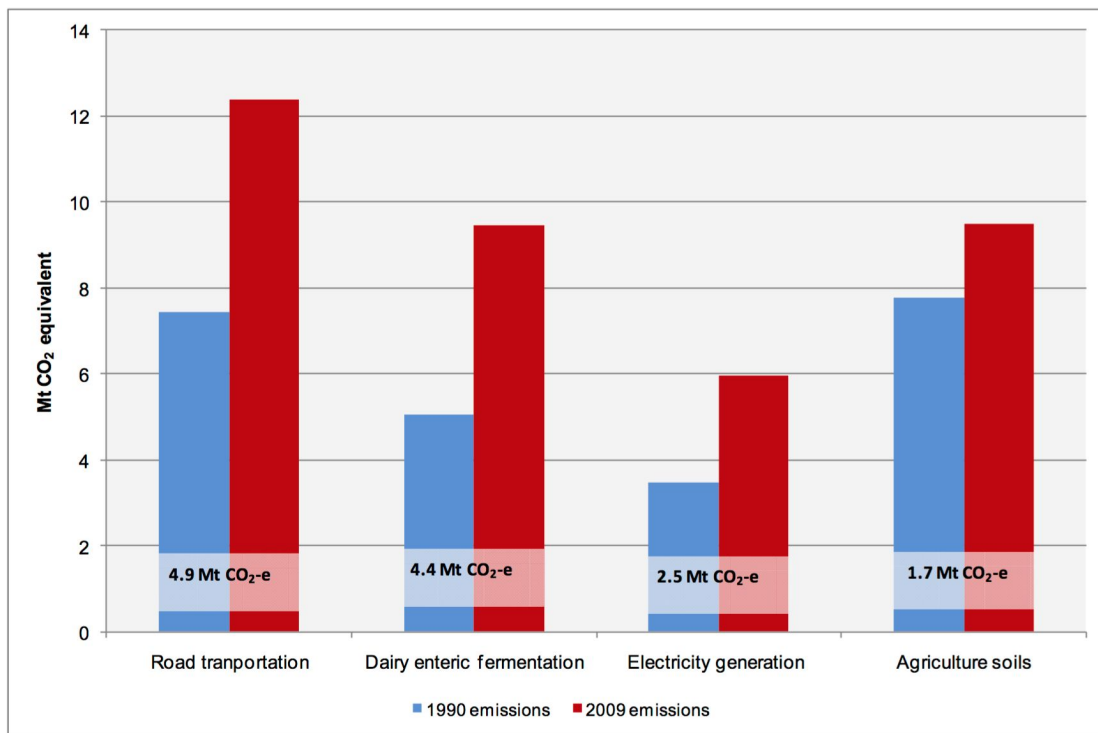
- New Zealand's almost 4 million vehicles contribute 17-23% of CO<sub>2</sub>
- Electric cars are “zero emission”, cheap, fantastic to drive, but missing.
- We need strong price signals, education, perks ... and what about Huntly?

# Transport is a fifth of our CO2 problem and solution

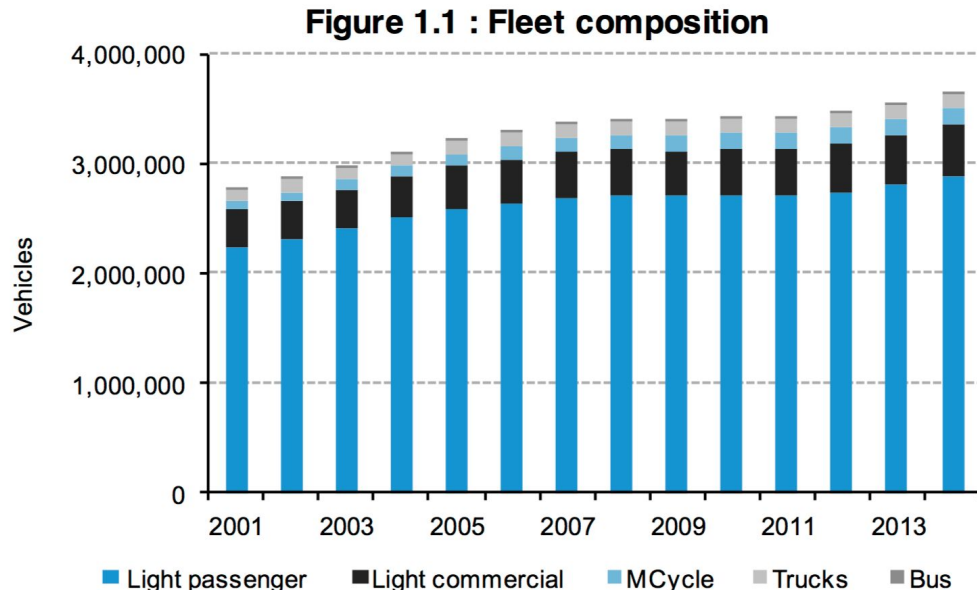
- 17% of total CO2 emissions  
(12 of 70 million tonnes, 2009)
- 23% of net CO2 emissions  
(12 of 53 million tonnes, 2009, i.e. -17Mt of forests etc)
- 100 kilometres of driving = 23 kilograms of CO2.
- Average car drives 12,000 km/year, i.e. 2.8 tonnes CO2.

# Transport is a key CO<sub>2</sub> increase in recent decades

**Figure 2: Change in emissions for the largest drivers of an increase in New Zealand's total emissions**



# Vehicle count growing despite alternatives promoted

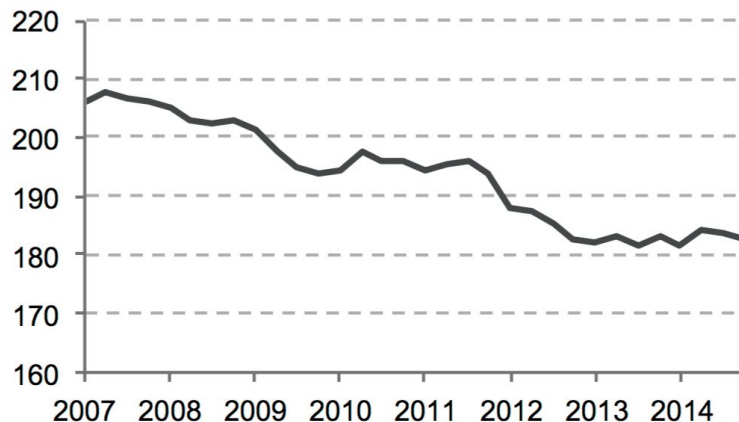


# Cars not getting cleaner

If we had vastly more than 1000 electric cars on our road, this would be different:

## CO<sub>2</sub> emissions of light vehicles registered

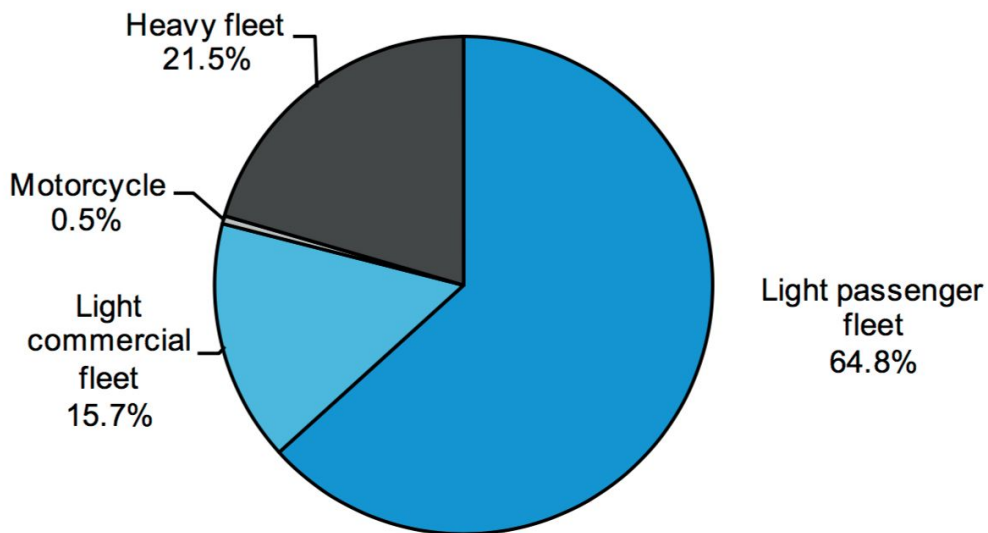
The CO<sub>2</sub> emissions (grams per km driven) of light vehicles entering the fleet dropped in 2011 and 2012 but have remained steady since then.



# An issue for all vehicle owners, particularly at home

- Homeowners
- Fleet owners
- Public transport
- Freight

**Figure 1.10 : 2014 CO<sub>2</sub> emissions**



**Source : Vehicle Fleet Emissions Model**

# Be patient? Significant behavioural change needed.

Vehicle Age	Share
Up to 1 year old	3.7%
Up to 2 years old	6.9%
Up to 3 years old	9.9%
Up to 4 years old	12.5%
Up to 6 years old	17.3%
Up to 8 years old	25.1%
Up to 10 years old	35.8%
Up to 15 years old	58.5%
Up to 20 years old	81.5%

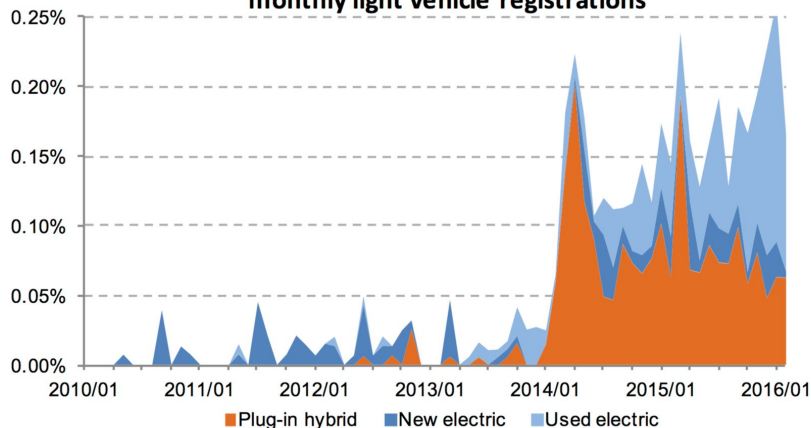
*(Light vehicles)*

Even if every car bought for the next 10 years was electric, we'd be only a third the way there.

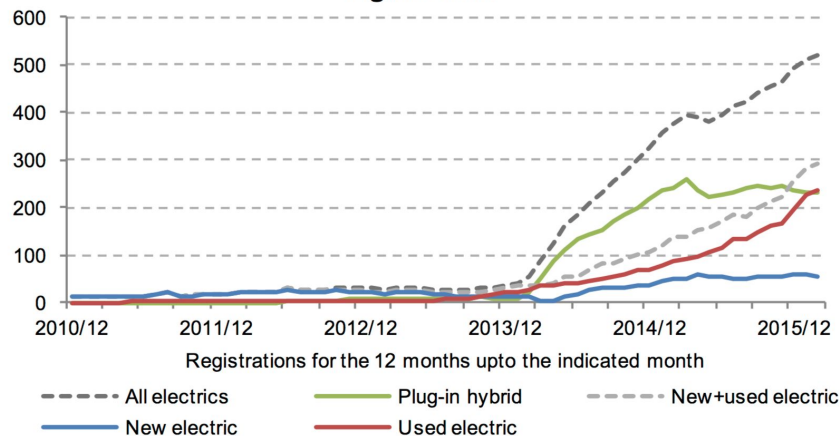


# Electric vehicle growth

**Figure 5: Electric vehicle share of monthly light vehicle registrations**



**Figure 8: Electric light vehicle rolling 12 month registrations**



Well under 1% car purchases are electric, but it's early days and growing.

# Carrots and Sticks

- High renewable mix
- “100% pure” brand
- Most drivers well below entry point car range (100km)
- No price signal
  - RUCs and import tax are insufficient
  - “Free travel” not enough (\$100 of electricity drives you 5000km)
  - Emissions standard needed with strong price signal  
(Google “University waikato ev policy 2015”).)
- No secondary incentives (carlanes, parking, charging stations et al)
- No awareness (or positive conceptions) nor mature coordination, yet.

# Linkage to renewable electricity generation

Since 1990, the demand for electricity has been met primarily by increasing fossil fuel-based thermal generation. Large scale EV adoption adds 8% to demand.

Would CO<sub>2</sub> reduction via electric car adoption be offset by increased thermal generation?

Countries with high and growing renewable generation show better EV growth.



## Mitsubishi iMiev

2009+

Very small (4 seats)  
and short range  
(under 100km)

Aesthetics and  
specifications  
counterproductive  
to consumer  
acceptance?





## Nissan Leaf

**2011+**

Roomy hatchback  
(5 seats) and better  
range (117-175 km)

Best selling globally  
and in New  
Zealand.

\$20,000+ used  
(Nissan has sold all  
its stock)



## Tesla Model S

**2011+**

400km range

\$120,000+

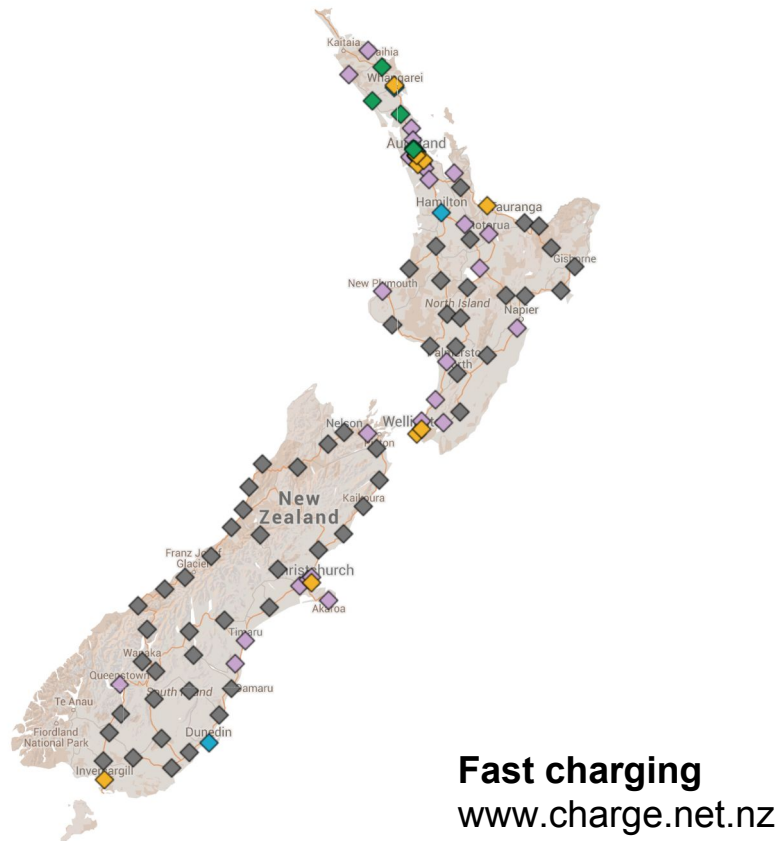
5-7 seats & faster  
than a \$900,000  
performance car.

Hi-tech (auto pilot)

Selling faster than  
the Leaf. Owners  
obsessively happy.



# Nationwide car charging locations well underway...



# Global context

- Market is supply constrained (more customers than the forecast 1 million EVs)
- High car price and “range anxiety” is temporarily due to battery prices
- Battery prices falling dramatically (us\$1000 to \$145 per kWh, last 8 years)
- Watch “Tesla Model 3” and competitors in coming weeks, months.
- Leading countries have significant interventions (eg. Norway’s successful EV incentives maturing to 2025 policy discussion on ending petrol car purchases)



# In summary

- Electric cars 20% of reducing CO2
- Cars and charging rapidly growing
- Purchase price a barrier; need a "feebate" (Uni of Waikato EV policy)
- Electric cars just as much about savings and fun as about being clean
- Adds electricity demand (8%) yet motivates for increased renewables
- EV initiatives new, lack co-ordination

And I will be contacting you about going for a test drive.

[SigurdMagnusson@gmail.com](mailto:SigurdMagnusson@gmail.com)

021 42 12 08 (Based in Wellington)

THEY DO NOT MAKE  
IT ALL STINKY.  
THEY ~~DONOT~~ ~~DESTROY~~ THE  
WORLD. YOU CAN PLUG  
THEM IN, ANYWHERE.

