The NZ Light passenger vehicle fleet meets its pathway

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There were 3.2 Million cars in NZ in 2015[1] and the light passenger fleet emitted 64.8%[2] of the total transport fleet emissions, which were in turn 44%[3] of total energy emissions.

Transport emissions were 14.07 Mtns 2013[4], and are projected to be 13.86 Mtns in 2017[5]

What would be involved in reducing emissions from this sub-sector in line with the Climate First Required Emission Reduction pathway (RERP)?

A large number of petrol-powered cars would have to be removed from the roads in order for the light passenger vehicle fleet to achieve the required emissions reduction outlined in table 1 below.

Table 1. Annual emissions allowed by transport and LVF

year	Total	Energy	transport	Light veh
	Gross	22.70%	16.72%	64.8% of tran
	Mtns	red.0.63	red. 0.47	red .30
	less 2.8	Mtn/yr	Mtn/yr	Mtn/yr
2017	82.8	18.81	13.86	8.98
2018	80	18.18	13.39	8.68
2019	77.2	17.55	12.92	8.37
2020	74.4	16.92	12.45	8.07
2021	71.6	16.29	11.98	7.76
2022	68.8	15.66	11.51	7.46
2023	66	15.03	11.04	7.15
2024	63.2	14.4	10.57	6.85
2025	60.4	13.77	10.1	6.54
2026	57.6	13.14	9.63	6.24
2027	54.8	12.51	9.16	5.94
2028	52	11.88	8.69	5.63
2029	49.2	11.25	8.22	5.33
2030	46.4	10.62	7.75	5.02
2031	43.6	9.99	7.28	4.72
2032	40.8	9.36	6.81	4.41
2033	38	8.73	6.34	4.11
2034	35.2	8.1	5.87	3.80
2035	32.4	7.47	5.4	3.50
2036	29.6	6.84	4.93	3.19
2037	26.8	6.21	4.46	2.89
2038	24	5.58	3.99	2.59
2039	21.2	4.95	3.52	2.28

From column 4 of the table, the required annual reduction for the whole fleet would be .3 Mtn or 300,000 Tn year on year for 22 years. The average vehicle emits 2.5 Tn of CO2 per year, which means that 120,000 petrol-powered cars would need to be taken off the roads every year. This could be arranged as say 20,000 new EVs, 20,000 conversions to EV, 80,000 cars scrapped and no new or used petrol cars imported every year from now on. (Over the last 4 years an average of 80,000 extra cars has entered the fleet each year).

An alternative to this massive reduction in car numbers is for everyone to drive fewer kilometres.

If 120,000 cars drive an average of 11,400 km per year that means 1,386 million kilometres. This divided amongst the 3.2 million cars means that each car has to drive 427 km less every year until 2039.

What would be the effect of a carbon tax on the price of petrol?

The average light passenger vehicle emits 2.5 Tn per year[6], therefore the annual addition for a carbon tax of $100 would be $250 This average car uses 1094.4 litres per year, which comes to 22.8 cents per litre.

How much would a $100 carbon tax on petrol yield for the government?

$250 x 3.2 million cars = $800 million

Conclusion.

The above projected changes in order to follow the pathway would be enormous and would not be adequately incentivised unless by a very high carbon tax

Clearly other policies will need to be developed such as higher registration fees for cars using more petrol/ having bigger engines, or waiving registration fees on EVs. As stated above, a $100 /Tn carbon tax on petrol would make $800 million available annually to fund this.

The level at which a carbon tax is set needs careful consideration; a level is required which is the same for all sectors and activities but which results in the fairest outcome for them all.

References

1. http://www.transport.govt.nz/ourwork/tmif/transport-volume/tv004/
2. Page 11 http://www.transport.govt.nz/assets/Uploads/Research/Documents/NZ-Vehicle-Fleet-2014-final.pdf
3. Page 2 http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/publications/energy-greenhouse-gas-emissions/documents-image-library/NZ%20Energy%20Greenhouse%20Gas%20Emissions.pdf
4. NZ greenhouse Gas Inventory 2013 (pub 2015)
5. New Zealand Second Biennial report - Dec 2015
6. 1 litre of petrol releases 2.3 kg Co2 x 1094.4 litres average NZ car consumption = 2.51Tn emitted per year.