EnergyWatch

The Journal of The Sustainable Energy Forum

Facilitating the efficient use and management of energy for economic, environmental, and social sustainability

Published by: The Sustainable Energy Forum (1235979), M309 Warkworth Oaks, 9 Queen Street, Warkworth 0910
Email: treasurer@sef.org.nz Web: - www.sef.org.nz; and www.energywatch.org.nz

The Sustainable Energy Forum is registered as a charitable entity under the Charities Act 2005 on 30th June 2008. Its registration number is CC36438.

Issue 88: October 2026

Editor: Stephan Heubeck

ISSN 1173-5449 (print) ISSN 1179-4054 (online)

EDITORIAL

Disconnected – Energy and the 2026 NZ general election

Published during the campaign for the 2026 New Zealand general election, a Consumer NZ report reveals that power bills have overtaken housing costs as New Zealander's second largest financial concern[1]. In parallel the October 2026 ASB business survey reports NZ businesses identify energy costs as a top cost concern and energy security as a key business risk[2]. Given an on-going oil war in the Middle East with all its flow-on effects, an ad-hoc (un-)managed decline of natural gas extraction in NZ, and steadily rising electricity bills and line charges, none of these survey results are surprising.

Much more surprising is the limited bandwidth, energy topics have occupied during the election campaign, and the high level of inconsistency and inadequacy the few energy policies the political parties have announced, do encompass. Numerous SEF members have analysed and discussed the announced (non-) policies on the SEF News online discussion forum in recent weeks, and despite our best efforts, no coherent strategy could be identified. This is primarily because most announced policies range from insufficient, via pointless to counter-productive. Irrespective of the final election outcome, there is therefore little reason to hope for an improving energy situation in New Zealand going forward.

Policy vacuum at the centre

As indicated by the merry-go-around of Energy Ministers over the last 3 years in government, the National Party does not appear to be prioritising energy policy. This is confirmed by the 9-point-plan (Electrify NZ 2.0)[3] presented for the campaign, which is largely an assemblage of token gestures, unfit to meet the energy challenges NZ faces. None of the listed points has the gravitas to compensate for any of the damaging government decisions committed over the last 3 years – from gutting the clean car discount and standard, to eliminating the GIDI fund and from laughable house insulation standards to LNG import plans. How the National Party sees their counter-productive non-actions to help the average New Zealander, and advance the country, appears to remain their secret.

CONTENTS

Editorial	1
Government Response to Shortages	4
An Attack on Energy Efficiency	5
Powertrain Evolution	7
ELA cancelled	11
Jevons mistake	11
Richard Heinberg remembered	12
Join our SEF News and Discussion Group	13

[1] https://www.consumer.org.nz/about-us/media-releases/power-bills-overtake-housing-as-new-zealanders-second-biggest-financial-concern

[2] https://www.rnz.co.nz/news/business/1800329/energy-ranks-as-top-concern-for-businesses-in-latest-asb-survey

[3] https://www.national.org.nz/policies/electrify-nz-2

The most noteworthy aspect of the Labour Party energy policy is the fact that it has hardly announced any. Other than support for home PV generation and a public transport fare cap, there have been few concrete announcements. Labour even remains silent about potentially continuing obvious success stories from the last term in government, and typical bread and butter labour topics, including a restart of the GIDI fund, a comprehensive rail and coastal shipping policy, home insulation, new green energy industry development, energy efficiency standards, etc.

Probably the worst oversight of the Labour Party is their refusal to revisit their needlessly abandoned 2013 policy for a single buyer electricity market[4]. Today, like over a decade ago, a single buyer market would be the most effective tool for addressing the very problems that have turned electricity costs and security into a top concern of NZ consumers and businesses today.

Minor parties consistent, and off the mark

The most positive aspect of the Act Party energy policies for the 2026 election is that they are remarkably consistent. In fact, they boil down to a single paradigm of hope: the invisible hand of the market will deliver. Exactly how an invisible hand is going to address the very visible problems of war induced fuel shortages, profiteering among the NZ electricity oligopoly, unmanaged gas production declines in the exhausted Taranaki petroleum province, New Zealand's high car dependency or energetically appalling housing stock, is not mentioned.

Likely better intentioned, but equally off the mark are the few energy policy announcements from the Opportunity Party. How exactly low interest loans for home generation and ringfencing of gentailer profits for renewables is going to square with an overarching policy goal of "strengthening competition", remains as mysterious as Opportunity's projections of NZ requiring 30 GW (~300% more than current) additional renewable generation by 2050.

Unexpected surprises

Hidden under a mountain of inflammatory rhetoric and absurd ideas - including a NZ withdrawal from the Paris agreement and a NZ$ 1 billion fund for petroleum exploration - one can find New Zealand First's electricity sector policy[5]. Cunningly mislabelled as a policy for gentailer break-up, a measure easily identifiable as counterproductive, the NZF policy hides the, by far, most constructive and effective measure for improving New Zealand's electricity sector situation. Without providing further details, the stated goal of the policy is to: "replace the current system so that companies cannot hold back supply just to drive prices higher. We will guarantee long-term, fixed-price contracts for new-build generation projects, giving investors certainty. And we'll guarantee their power will be first to be used". In short NZF proposes structural electricity market reform to replace the current, dysfunctional spot market pricing system for electricity (that rewards profiteering from shortage), with a system based on long-term fixed price contracts and dispatch priorities set by a regulator.

This is by far, the most constructive, and beneficial (for the end user, the economy and the environment) policy announced by any party this election campaign. It remains to be seen if the NZF demands could survive any coalition negotiations, or if a reformed market structure could be prevented from being highjacked to prioritize ideologically driven coal and LNG generation over cheaper renewables. Furthermore, NZF appears to be lacking policies on many other energy topics, including energy efficiency, public transport, EV's, and more.

The Green Party also proposes to intervene in the NZ electricity market[6]. However, the Green Party plans differ from the NZF proposal in at least one crucial point: the Green Party does not propose to change the spot pricing-based market structure of the NZ electricity sector, which is the key reason for most of the current affordability and sustainability issues.

[4] https://www.rnz.co.nz/news/politics/133091/opposition-parties-propose-single-buyer-of-electricity

[5] https://www.nzfirst.nz/breaking_up_the_gentailers

[6] https://www.stuff.co.nz/politics/361008499/greens-take-plan-state-owned-power-entity-election

In fact, the Greens plans for a new SOE (Kiwipower), exclusively dealing in back-up capacity, could make the whole situation worse and more complicated, as it may require the establishment of a new capacity market in parallel the to current energy only market system, which may generate additional costs and could provide incumbents with more opportunities to game the system. Many other aspects of the Green Party electricity sector policy also remain unclear, for example what the benefit of maintaining retailers under the new regime would be, or how a new SOE could "legally compel" other SOEs to cooperate under a nominally still competitive market structure.

Other aspects of the Green Party policy platform appear as more positive. The Greens want to provide generous support for home PV generation as well as rail and public transport. The Greens are the only political party mentioning (residential) energy efficiency as a policy goal for the election. But despite these positive signals, the Green Party still leaves too many gaps and open flanks in the energy sector – an area which traditionally has been home turf. There are precious few pointers about a Green Party response for industrial energy use, support for bioenergy, a renewable gas transition, green individual transport options beyond the EV, energy use in commercial buildings, policies for aviation and shipping fuels of the future and more.

Better energy policies are critical

The need for better energy polices in NZ is clearer than daylight. New Zealand is more than ever dependent on imported petroleum and impacted by the weaponisation of petroleum, and irrational decisions made, halve a world away, with few alternative options and no strategy to mitigate the negative impacts. New Zealand closes productive, often energy intensive industries, rather than trying to find compromises and solutions, to base existing and new industries on the energy resources of the 21st century. Energy efficiency is not taken seriously, when it should be the most important pillar of any energy, resource or GHG emission reduction strategy.

The NZ electricity market remains little more than an accumulation of absurdities, that supposedly uses free market principles to determine that the price for 60 minutes electricity supply for the North Island is as high as NZ$ 770 million for one specific hour and comes at a negative price for another hour a mere few weeks later. Dominant generators collude in hydro lake spilling for price fixing and use the profits to out-compete productive industries for the last remaining and dwindling natural gas supplies, while hundreds of MW of wind generation capacity consented over a decade ago simply don't get built.

The mirage of a free and competitive electricity market is patched-up time and again with measures that are everything but free market, ranging from a secret and cheap consortium deal for the Bluff aluminium smelter, to the anti-competitive joint coal stockpile at Huntly, and a government backed LNG import facility. We have evidence ranging from the Wolak report to our national GHG emission statistics and from every home electricity bill to the unemployed mill worker on the street, that all clearly show that the current NZ electricity market simply does not work; not for the private customer, not for the environment, not for industry, not for economic development.

Overall, none of our current energy policies appear to really work for our country - and this would make it the government's (present or future) responsibility to urgently address these problems.

Voter engagement

During the election campaign politicians from all political parties will engage with the public. Make use of this opportunity. Take the time to engage with your candidate. Provide feed-back, demand more attention for energy topics, if possible, educate the candidates about potential solutions that another party might have in their manifesto, or other countries have successfully deployed. Given their depleted policy platforms, politicians from all NZ political parties should be grateful for any constructive energy policy, an engaged voter could educate them about.

Written by Stephan Heubeck

Government Response to Shortages Pushing up Power Prices

The government has finally produced their response to the energy market disfunction, which has resulted in a lack of electricity supply during periods of high demand. Minister Simeon Brown started well by identifying the lack of supply in 2024 as the problem which brought matters to a head, but he then stumbled badly by bringing out the old canard about when "the wind's not blowing and the sun's not shining, and we've got a dry year".

Minister, 2024 was NOT a dry year, as in fact all the important hydro storage lakes were bursting at the seams at the end of the year!

Growth without a Plan

The problem was growth in national power consumption, and the lack of any national plan to anticipate this. Somehow, we have convinced ourselves that the invisible hand of the Market will magically deliver security of supply to meet a rapidly growing demand. So, the gentailers have concentrated on competing to meet past average demands, calling to mind Elon Musk's dig at Boeing: "Too many managers, not enough engineers."

Security of supply can be provided only by energy storage. In the past the gentailers have been able to rely on stores of thermal energy such as gas fields and coal stockpiles, but they seem unable to cope with the fact that such stockpiles are finite and will run out. Standard bookkeeping seems unable to cope with such items, where the cost for a year's supply (such as the $600 million mentioned for the proposed consortium coal stockpile) exceeds the capital costs of typical wind or solar farm projects designed to last decades.

Using the pumped hydro we already have

Returning to the lack of supply in 2024, this simply would not have occurred if pumped storage had been installed in the Tekapo A and B power stations[7] as I first advocated during the Tekapo canal commissioning in 1977. Then, Lake Tekapo would have been maintained full at least until shortage of lake storage reserves became apparent in August 2024, providing comfort to suppress the market gossip and rumours which caused unnecessary panic and ridiculous price peaks during the next two months.

There probably would have been no need to even begin drawing down Lake Tekapo if 100MW of intermittent (solar or wind) generation had been available with first priority to continue recycling water from Lake Pukaki. I have seen no claims that that the sun was not shining or the wind not blowing during early spring of 2024!

Revealing fossil generation cost

I see some green shoots of engineering thinking in the Government announcement. I like the idea of the Government calling for tenders for power supplies to major public services such as schools. With one foot in the buyer market instead of both feet in the seller market as now, government purchase officers can demand cheapest prices, which will inevitably force tenders to exclude any thermal generation. I hope government will then publish the winning tender prices, allowing the public to assess their own power bills.

Written by Alastair Barnett

[7] https://www.energywatch.org.nz/recent.html#86

An Attack on Energy Efficiency

The government's plans[8] for the introduction of petrol car road user charges (RUC) by 2027 are an attack on energy efficiency, will increase NZ GHG emissions, will provide support for the worst kind of (heavy, large, fuel wasting) cars, and represent a contradiction and/or breaking of several of New Zealand's international pledges, treaties and good-will initiatives. Therefore, the current plans of Transport Minister Chris Bishop[9] need to be stopped.

Penalising efficiency by rewarding waste

Currently a petrol excise duty of NZ$ 0.77344/L (including NZ$ 0.70024/L National Land Transport Fund, NZ$ 0.06/L ACC Motor Vehicle Account, NZ$ 0.0066/L Local Authorities Fuel Tax and NZ$ 0.0066/L Petroleum or Engine Fuels Monitoring Levy) is levied on every litre of petrol retailed in NZ. Including a 15% GST fraction on the levy, this totals NZ$0.89/L specific tax take per litre petrol consumed. Replacing the $0.89/L petrol excise tax, with the current EV and diesel vehicle RUC of $7.60/100km will lead to a high taxation of fuel-efficient vehicles, and progressive tax benefits (the larger the fuel consumption the larger the absolute and relative tax benefit) for fuel wasting vehicles, particularly SUVs.

For an EU 2030 emission standard compliant car (59gCO2/km; 2.5L/100km), the change would result in a 243% tax increase, while a 16L/100km gas-guzzler (379gCO2/km) would receive a -47% tax cut. Overall, the tax support for the most wasteful petrol vehicles, as well as the loss of de-minimis taxation revenue, would amount to roughly NZ$800million/y in tax cuts to support the most fossil fuel wasting vehicles and practices. This sum is equivalent to about 3/4 of the entire 2026 value of Emission Trading Scheme (ETS), which is supposed to drive down GHG emissions across the entire economy with this price signal. At an individual level, the NZ$0.89/L petrol excise tax cut would support wasteful fossil fuel consumption with >NZ$360/t$CO_{2equi}$, based on a NZ regular petrol GHG emission factor of 2.46kgCO_{2equi}/L[10].

Fuelling a global problem

Fuel inefficient vehicles, particularly SUVs, are not a side problem when it comes to global GHG emissions. According to a 2021 IEA report[11], GHG emissions from all OECD countries would have fallen since 2009, if it wouldn't have been for the uptake of fuel inefficient SUVs, needlessly increasing OECD country petroleum consumption by over 3 million barrel per day. This has overcompensated all public transport and transport electrification measures. The IEA states that the situation has worsened since, with CO_2 emissions from SUVs worldwide reaching almost 1 billion tonnes in 2022[12].

As far back as 2006, New Zealand's poor transport fleet energy efficiency was criticized by the OECD report[13] (page 13 & 18):

"Energy consumption in the transport sector makes up the largest share of total consumption and is growing faster than in any other sector. Efficiency in the transport sector is relatively low, in part because New Zealand has a large share of used vehicles and because petrol and diesel taxes are relatively low. Stronger policies that give incentives for substantially improved energy efficiency in the transport sector are necessary."

[8] https://www.rnz.co.nz/news/political/526491/petrol-cars-could-be-hit-with-road-user-charges-from-2027

[9] https://www.stuff.co.nz/politics/360782053/petrol-tax-getting-scrapped-road-user-charges-expand-all-vehicles-2027

[10] https://environment.govt.nz/publications/measuring-emissions-a-guide-for-organisations-2023-emission-factors-summary/

[11] https://www.iea.org/commentaries/carbon-emissions-fell-across-all-sectors-in-2020-except-for-one-suvs?utm_content=bufferbbdee&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

[12] https://www.iea.org/commentaries/as-their-sales-continue-to-rise-suvs-global-co2-emissions-are-nearing-1-billion-tonnes

[13] https://www.oecd.org/en/publications/energy-policies-of-iea-countries-new-zealand-2006_9789264109704-en.html

The OECD recommended to: "Introduce policies and measures – such as revised transport fuel tax rates and arrangements, tax incentives or fleet-wide fuel economy standards on new cars – designed to improve the fuel efficiency of New Zealand's vehicle fleet."

Fifteen years later, little has changed. In its 2023 New Zealand Energy Policy Review[14] (page 149 & 150), the IEA notes: "New Zealand's automotive diesel prices in the fourth quarter of 2022 were the sixth lowest among IEA countries……New Zealand's unleaded gasoline prices in Q4 2022 were ranked 8th lowest in an IEA comparison."

Breaking international agreements

Besides not restricting another very important GHG emission source, which will all but ensure that New Zealand will fail to meet its international obligations (NDC) under the Paris agreement[15], the removal of a petroleum consumption-proportional taxation measure, will contradict other commitments New Zealand has previously made and championed.

New Zealand is a member of the International Transport Forum (ITF), an OECD organisation headquartered in Paris. In their 2023 report[16] assessing the options for reforming vehicle and road use taxes, it is clearly recommended that:

"Fuel taxes are an efficient means of making drivers pay the climate-related costs of the use of fossil-fuel powered vehicles. Governments should continue to impose them for as long as these vehicles are in use. Revisions to their levels should ensure that the drivers of these vehicles pay the full cost of their carbon emissions, and of their air and noise pollution." None of these purposes will be served, by New Zealand replacing a $0.89/L petrol tax with a consumption independent RUC.

The proposed petrol excise tax policy change appears even more bizarre in light of and is contradictory to New Zealand's role as the co-ordinator of the Fossil Fuel Subsidy Reform (FFSR) Initiative at the WTO[17]. Laudably, "the FFSR Initiative seeks to rationalise and phase-out fossil fuel subsidies that encourage wasteful consumption and persuade WTO members to share information and experiences on how to eliminate fossil fuel subsidies". This is because: "subsidies for fossil fuel consumption and production create trade and investment distortions. ***Making greenhouse gas emitting fuels cheaper to produce or buy is an incentive to use more and discourages investment in renewable energy***".

The proposed change for petrol vehicles from a litre-based excise tax to a distance-based RUC will be an indirect subsidy for wasteful petroleum consumption, leading exactly to the negative outcomes described by the FFSR.

Abusing the plight of poor people

Lastly, over and above being bad for the environment and contradicting many of New Zealand's international obligations, the current campaign for the introduction of petrol car RUC misuses and abuses the plight of poor people and their struggle with transport cost in NZ. Comments like: "[It] will not result in poorer folk who drive fuel inefficient cars, cross subsidising wealthier folk"…."It isn't fair to have Kiwis who drive less and who can't afford a fuel-efficient car paying more than people who can afford one and drive more often"[18], could simply be interpreted as a sign of being misinformed. If, however, such a statement is made by the transport minister - someone with easy access to data that will conclusively show that fuel wasting SUVs are not primarily driven by New Zealand's poor, but by people like himself - then it is just a sign of cowardice, a disgraceful move abusing people who can't defend themselves to justify actions and positions that are simply indefensible.

Written by Stephan Heubeck

[14] https://origin.iea.org/reports/new-zealand-2023

[15] https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/nationally-determined-contribution/

[16] https://www.itf-oecd.org/sites/default/files/docs/decarbonisation-pricing-road-transport.pdf

[17] https://www.mfat.govt.nz/en/environment/fossil-fuel-subsidy-reform-ffsr

[18] https://www.stuff.co.nz/politics/360782053/petrol-tax-getting-scrapped-road-user-charges-expand-all-vehicles-2027

Powertrain Evolution

Summary of global evolution of e-mobility 2019-2025-2030

	2019 Status	2025 Status	Expected for 2030
Light duty vehicle (LDV - 4-wheeler) sales/year	80 million	80 million 1.4 billion total LDV stock	80 - 100 million 180 million BEV stock
Electrified (BEV+ PHEV+ EREV+Hybrid) sales/year	2% - 0.5% - 6% = 8.5% new veh. electrified	16% - 6% - 21% = 43% of new vehicles electrified	30% - 10% -20% = 60% of new vehicles electrified
Top 10 sales BEV models. [Min. viable scale]	40,000 - 300,000/year [10,000/yr min sales]	130,000 - 450,000/year [50,000/yr min/platform]	200,000 – 600,000/year [100,000 min/platform]
NEV brands in China	500	120	15 (from 5 OEM's)
BEV battery capacity	24 – 40 kWh	10 – 80 kWh	25 – 100 kWh
Pack level energy density	120 – 200 Wh/kg	120 – 250 Wh/kg	150 – 500 Wh/kg
BEV (WLTP) max range	100 – 250 km	150 – 600 km	200 – 800 km
Main battery chemistries	Mainly high cobalt NMC. Some LMC	Largely LFP. Low C NMC for long range models	90% LFP/Sodium. NMC & Solid State for long range
Usable battery life	8 – 12 years	10 - 20 years	15 – 30 years
Battery pack cost (USD)	$150 - $250/kWh	$50 - $125/kWh	$35 - $150/kWh
BEV Max charging speed	50 – 150 kW	50 kW – 1 MW	50 kW – 2 MW
2/3W sales/year [total in use worldwide]	100 million [60 million highway capable]	100 million [700 million + 350 million low speed]	100 million
E-2/3W sales vs total	25%	30%	60%
e-bus sales vs total	20%	20%	65%
e-van/truck sales vs total	1%	8%	20%

This article follows on from the article in the September 2020 EnergyWatch 83 entitled "ICE > Hybrid > PHEV > EV" that argued that: (1) Internal Combustion Engined (ICE) vehicles were a mature technology produced at massive scale since the Ford Model T of 1908; (2) light duty vehicle sales were 81 million per year in a ferociously competitive and dynamic global marketplace; (3) hybrids were already a mature natural transitional electrification technology progression from ICE vehicles; (4) PHEVs were a further natural progression of hybrids that were already commercially available; (5) affordable EVs were just becoming available in the Nissan Leaf [Gen 2] and Tesla Model 3, at around twice the price of comparable ICE vehicles; (6) "There is a huge development of EVs underway in China and India, which is largely unrecognised in the West…..China is the key EV market with hundreds of new firms developing and selling a wide range of EVs."; (7) "$40k hatchback EVs can be expected by 2025".

The predictions more or less happened except (1) the Indian development of EVs has been focussed on 2/3-wheelers, not on 4-wheelers; (2) the West has finally recognised the EV dominance of China (but still underestimates this dominance); (3) the introduction of full RUCs to EVs and half rate RUCs to PHEVs by the National-NZ First-Act government was hinted at as a possibility but not stated explicitly as it was too stupid an idea to really take seriously.

The EW83 predictions need to be seen in the context of global trends as below. NZ had 86,000 new registered light duty vehicles in 2025 (new 42,000 and 44,000 used imports). So, NZ is a global electrification trend follower, with a tiny 0.06% of global new light duty vehicle sales.

In 2025 for light duty (under 3,500kg) vehicles, NZ had 59,000 (68%) hybrid vehicle registrations, 14,000 (16%) standard petrol vehicle registrations, 7,266 (8.5%) BEV) registrations, 6,014 (7%) plug-in hybrid electric vehicle (PHEV) registrations.

Key takeaways:

a) There are 1 billion 2/3 wheelers (350 million low speed) and 1.4 billion light duty 4-W vehicles in use globally. Low-cost 2 wheelers (motorcycles and scooter) are a key part of motorisation in Africa, South and Central America, South and East Asia

b) 100 million 2/3 W and 80 million 4-wheel light duty vehicles are sold globally per year

c) Electrified (BEV + PHEV + hybrid) vehicle sales likely now 50% of global vehicle sales

d) Battery costs keep reducing, maximum energy densities and usable life keep increasing

e) The minimum viable scale of BEV platforms keeps increasing for 2W, 3W, 4W, vans, trucks and buses – only luxury and specialist vehicles can be produced at small scale

f) Solid state batteries are already in limited production and can give ICE-like ranges

g) Most BEV batteries now long lasting and low materials recycling value LFP / sodium

h) Very low-cost new batteries means that 2nd life of batteries is no longer viable economically. Battery recycling cannot be funded from recovered materials values

i) NZ's newly registered vehicle sales are now 84% electrified, double global trends

j) NZ is at half the global rate of BEV uptake, at the world average for PHEVs, and at three times the word rate for hybrids. This low rate of NZ BEV uptake will continue until RUCs are reformed to have a lower BEV or lighter vehicle rate or to apply to all vehicles

k) By 2030 new BEVs will be likely be available for sale in NZ at around $20,000

l) Ultra-fast charging is being rolled out globally. BYD is aggressively rolling out its own charging network, targeting 20,000 stations in China and 6,000 overseas charging stations (including Europe, the UK, Malaysia, and Indonesia) by the end of 2026. They deliver a peak power output of 1,500 kW (or 1,000 kW per plug when dual-charging) via a liquid-cooled CCS2 connector. It can top up a compatible battery BEV (such as the Denza Z9 GT) from 10% to 70% in 5 minutes and 10% to 97% in 9 minutes – the BYD slogan is 'Ready in 5, Full in 9, Cold Add 3' [mins]. Ultra-fast charging is unlikely in NZ until the RUC discrimination against BEVs is sorted out.

m) With the global new vehicle market flat since 2017, the meteoric gain by Chinese manufacturers inevitable comes at the cost of legacy ICE focussed manufacturer sales.

n) Many legacy automotive manufacturers will disappear or end up selling Chinese designed BEVs. European and Japanese brands already do such badge engineering.

o) Surviving/profitable large scale vehicle manufacturers in 2030 [by 2026 sales][will be Toyota (#1 and strong in developing countries), VW (#2 and too big to be let fail), Hyundai/Kia (#3 and already making great BEVs and PHEVs), Stellantis (#4 and heading down the plughole - it's a multi-brand loss-making mess), Renault Nissan (#5, Renault will be bailed out by French government as needed, Nissan disappears), Honda (largest single 2-wheeler manufacturer), Mercedes (luxury), BMW (sporty), GM (#8) and Ford (#10) still selling big gas guzzling trucks in the US protected by trade barriers, and BYD, Geely, Chery, Changan and 1-3 others in China from GWM, BAIC, SAIC, Dongfeng and Wuling.

p) Stellantis, Suzuki, Mazda, Subaru will likely be sub-brands of major manufacturers

q) Tesla is unlikely to survive long term. Elon Musk's open fascist tendencies are turning off Tesla's progressive customers and Chinese manufacturers are producing as good or better BEVs at lower prices, while Tesla continues to rely on 2016 designed vehicles

r) Electric aviation requires energy densities exceeding 400 Wh/kg at the pack level for viable range and payload, this is now available. 711 Wh/kg batteries have already been achieved in laboratory demonstrations.

Real World 2026 Examples

One of the highest selling global single BEV models, the 740 – 870 kg 4-seat city-oriented Wuling (42% GM owned) Mini EV is made in RHD in Indonesia. The NZ$16,700 17 kWh 30kW model has 160km WLTP range, 100 kph

top speed, driver and passenger airbags, ABS brakes with front disc brakes, AC, heater, keyless entry, central locking.



A 26kWh battery 250km WLTP range LHD model is sold in China from Jan 2026 for NZ$12,700. The fun, larger Honda Super One 1090 kg city-oriented BEV has sold out in Australia and New Zealand before they arrived. With the one RUC rate for all under 3500kg BEV disincentive addressed, smaller and lighter BEVs would sell like hot cakes. In the meantime, Kiwis are buying used Toyota Aqua hybrids and avoiding RUCs and having the same petrol price per km as an EV's electricity + RUC cost.



Malaysia mass market consumer e-Scooters from NZ$1250 (NZ$250 after subsidy) with NZ$40 per month for battery leasing with unlimited (removable) battery swapping at select Petronas fuel stations. 2W motorcycle taxis are a huge market in African and SE Asian cities. Motorisation is largely 2/3W in Africa, SE Asia, South Asia, South America. e-2/3W are a huge and growing e-mobility market.

BEV delivery vans, heavy duty (HD) trucks and long-distance buses are now sold in large numbers, with the assistance of the high cost of diesel from the world's single most impactful energy transition change agent, US President Donald J Trump. Credit where is due.



A real fully autonomous delivery e-4W, Yulin (population 670,000), Shaanxi Province, China, May 2026. Not Tesla FSD vapourware, but real commercial applications in use in China.

Non-road developments

World's largest battery-electric ship, a 130-metre vessel made in Australia by Incat Tasmania, officially started ferrying passengers on 23 October 2026 – including cars and buses – between Argentina and Uruguay in South America (see photo below). Powered only by batteries, China Zorrilla is the largest electric ship ever built and can carry up to 2,100 passengers and 225 vehicles across the River Plate, a 30 nautical mile route.

A real hardware production battery powered conventional aircraft, the Pipistrel Velis Electro was ESAA daytime VFR type certified in 2020. More than 100 have been sold. Used in 30 countries for pilot training.

The JV between CATL (40% of global batteries) & COMAC (25% of 2024 global single aisle jet orders) aims for an 8-tonne business jet sized plane with a 2,000 - 3,000 km range by 2027-2028 using existing 500Wh/kg CATL "condensed" solid state batteries.



Following the successful test flight of the 4-engine ES-30 demonstrator in August 2026, US carrier JSX (36 aircraft, 28 destinations, with JetBlue and Qatar Airways as minority shareholders) has committed to 50 of the 2-engine hybrid ES-36 successor design, with purchase rights for another 50 (see image below).

FAA Part 25 certification and entry into commercial service is targeted for 2031. The claimed all-electric range is 200 km, including reserves, and a hybrid range of 1,200 km. With lab scale proven 700Wh/kg batteries, all-electric regional aircraft (e.g. Air NZ 50-seat Q-300 and 68 seat ATR-72 replacements can be expected to be technically viable for use in NZ by 2030.

Written by Frank Pool

Frank Pool is a Fellow of Engineers NZ. Frank has worked professionally on EE/RE GHG mitigation projects and program design, implementation, and evaluation in 51 countries for the NZ government, the Asian Development Bank, the UN, EU, APEC and bilateral donors.





ELA cancelled

One move by the government in its "war on nature" that has been given little attention is cancellation of the Environmental Law Assistance (ELA) fund. A mere $600,000 a year (down from $1m a few years ago), the fund was a lifeline for small community groups battling often big corporations with unlimited resources through the Environment Court. The maximum allowable grant from the fund was $50,000 although few groups scored this much.

There was a short article in the Listener which featured a hapu being affected by toxic air discharges from an asphalt plant in Mt Maunganui relying on the ELA to force some action. Taranaki Energy Watch first used the fund to oppose an idiot project by the then Natural Gas Corporation to build a second 400MW CC power station at Stratford, to be fired on Kapuni gas, back in 2002. We have since been able to hold the oil and gas industry to account in terms of ensuring safety to Taranaki residents from their operations thanks to the ELA bolstering our generous donors to enable a ridiculously long battle through the Environment Court. Currently we are assisting residents of the Ureti Valley north of New Plymouth in a battle with Revital, a composting business that has accepted 20,000 tonnes of toxic oil and gas drilling waste. These may seem like relatively small issues affecting a limited number of people, but the ELA has also assisted in much bigger cases such as seabed, coal and gold mining.

It's not the money. The government clearly wants to crush any semblance of community dissent in its mission to allow (especially foreign) corporations to do what they want. The question remains, what will people do when their health is affected, or community resources destroyed by corporations and all legal avenues are blocked?

Written by Alan Thatcher

Jevons mistake

Energy Efficiency (EE) has always been a difficult subject matter, vigorously opposed by vested interests like the fossil fuel industry. However, a very worrying new level of ignorance and opposition to energy efficiency has been growing from within the environmental movement around the world over the last few years.

Many champions of specific environmental measures or goals, like EVs, minimisation of in-built energy use, or total electrification of homes and industry, are not only willingly ignoring EE as a valuable tool for reducing energy consumption and GHG emissions but are prepared to actively forego and hinder EE to further their other goals. All too often "Jevons Paradox" is quoted as justification as to why EE supposedly cannot provide sustained energy use and GHG emissions reductions, and why a promotion of alternative environmental measures to the detriment of EE is justified.

In a nutshell, "Jevons Paradox" postulates that EE measures lead to an energy cost reduction, which in turn leads to a renewed increase in (now cheaper) energy use, often overcompensating all initial energy savings. However, there is no empirical evidence that “Jevons Paradox” is reversible, and the postulated mechanisms can supposedly operate in contradiction to Justus von Liebig's law of the minimum. Since neither can be true of a universal law, it is much more likely that William Stanley Jevons observations at the height of the industrial revolution fell victim to a mix-up of correlation and causation.

Jevons mistake and several other misunderstood, out-of-context and invalid analysis concepts undermining renewable energy and GHG emission reduction progress around the globe were showcased during the 2025 SEF AGM presentation [19] and are well worth another look.

Written by Stephan Heubeck

[19] https://www.sef.org.nz/papers.html#june2025

Richard Heinberg remembered

On Sunday the 19th of July 2026, Richard Heinberg died, aged 75, only a few weeks after being diagnosed with pancreatic cancer. This means that the world has not only lost a pioneer and one of its foremost thinkers on energy, efficiency, resource use and the energy transition, but even more importantly a brilliant writer and educator, and an activist who had the rare gift of being able to build bridges across incredibly deep canyons of opposing opinions.

I met and talked with Richard Heinberg in Auckland in 2012, when he was on an international speaker tour on the topic of resource depletion. That was at a time when the discussion around peak oil was still dominated by serious analytical people like Collin Campbell, rather than doomers and nihilist. But even back then, among all the writers and thinkers on the resource depletion and peak oil topic, Richard Heinberg stood out for me, because of what could be best summed up as an "adequately measured handle" on the problem, and possible mitigations.

Unlike Dmitry Orlov, Vaclav Smil and Gail Tverberg, Richard Heinberg was able to assess the seriousness of resource depletion without falling for doomerism. He could adequately evaluate the strengths and weaknesses of workable energy and resource alternatives without having to invoke visions of techno-utopia or "back to the stone age", and without preaching "the necessity of total societal revolution" before alternatives can make any sense. Richard Heinberg maintained that adequately measured approach not only in regards to the resource depletion problems and the alternatives, but also throughout time. Richard Heinberg simply kept thinking, writing, analysing and exploring, while others like Kjell Aleklett fell silent, and still others like James Howard Kunstler and Ugo Bardi - very sadly - went completely off the rails, needlessly discrediting, even contradicting, their own excellent work from 20 years ago, while hallucinating about non-existent issues and invented enemies.

And therefore another question has to be asked following Richard Heinberg's passing: If it was impossible even for him, to really take the discussion about resource depletion and adequate responses truly mainstream, while at the same time not being able to reign in the more radical elements of the environmental movement before they turn into their own worst enemies - who then will ever be able to provide adequate guidance and leadership, for the inevitable, monumental and serious changes, which resource depletion and environmental destruction will force upon humanity over the coming decades?

Richard Heinberg himself would probably have replied to this question, that since there can never be the one silver bullet solution for our resource and environmental problems, and lots of half-measures and compromises will be required to achieve anything, there can also never be the one person or the one agenda that can single-handedly improve our global resource and environmental predicament. Only many adequate and measured steps, and people, and ideas, and improvements will be able to achieve something in aggregate.

And maybe that is the best way to honour Richard Heinberg's memory, by taking on the problems and responses - even the tricky ones like aviation, active atmospheric carbon removal, or nitrogen fertilizer - one by one with an open mind, without trying to fully rely on, nor fully dismiss any of the problems and solutions, while minimizing harm and side effects as far as possible.

Either way, Richard Heinberg's adequately measured approach will be sorely missed by anyone continuing on this journey from here on forwards.

Written by Stephan Heubeck

Join our sustainable energy news & discussion group

SEF membership currently provides a copy of our periodic EnergyWatch magazine. In addition, many members find the SEFNZ email news and discussion facility an easy way to keep up to date with news as it happens and the views of members. The discussion by the group of sustainable energy commentators who respond to the SEFNZ email service offers an interesting perspective.

The SEFNZ service provider has been changed from YahooGroups (SEFnews) to SEFNZ.Groups.io. Non-members are invited to join the SEFNZ email news service for a trial. To do this send a blank email to: SEF+subscribe@SEFNZ.groups.io. To help us stop spammers, non-members need to supply a name and contact details, and a brief statement of their interest and/or involvement in sustainable energy issues, before their trial is approved.

SEFNZ emails can be received "individually" (as they are sent) or as a daily summary (grouped into one email per day). Emails can be switched on and off, or read via a website, which is a handy option for travelling Kiwis. Groups.io saves all our text emails for later reference, and there is a search function so that you can review the emails stored since the changeover. For further details contact the administrator <office@sef.org.nz> to help set up your profile.

EnergyWatch

Permission is given for individuals and educational or not-for-profit organisations to reproduce material published here, provided that the author and EnergyWatch are acknowledged. While every effort is made to maintain accuracy, the Sustainable Energy Forum and the editor cannot accept responsibility for errors. Opinions given are not necessarily those of the Forum.

Publication is now periodic, and EnergyWatch is posted on the SEF website (www.energywatch.org.nz) as a PDF file, shortly after individual distribution to SEF members.

Contributions Welcomed

Readers are invited to submit material for consideration for publication.

Contributions can be either as Letters to the Editor or short articles addressing any energy-related matter (and especially on any topics which have recently been covered in EnergyWatch or SEFnews).

Material can be sent to the SEF Office, by email to editor@sef.org.nz, or by contacting Stephan Heubeck by email (heubeck@xtra.co.nz)

SEF membership

Memberships are for twelve months and include EnergyWatch.

Membership rates are:

Low income/student	$30
Individual	$50
Overseas	$60
Library	$65
Corporate	$250

Mail the form here, with your payment or order, to The Sustainable Energy Forum, M309 Warkworth Oaks, 9 Queen Street, Warkworth 0910.

Bank transfers, with your name, can be sent to the SEF account at 03-1538-0008754-00, with a confirming email to treasurer@sef.org.nz.

A receipt will be sent on request.

Name: ....

Organisation:.....

Address: .....

.....

Home Phone:..... .....

Work Phone:..... .....

Mobile Phone:.....

E-mail.: ....

Membership type:.....

Amount enclosed: $.....