The NZ Electricity Market and Climate Change

Kapiti WEA

27 August 2022

Geoff Bertram

What was promised:

Geoff Bertram has followed developments in these fields for a number of decades. He has researched these issues and published widely on both topics. He will discuss what is going on in these sectors, problems and solutions.

Outline

- Electricity sector “reform” – neoliberal promises versus real-world outcomes
- The NZ Emissions Trading Scheme as a market-mechanism-based way of pricing carbon: neoliberal promises versus real-world outcomes
- Interaction of the broken electricity market with the corporate-captured and ineffective ETS
- Some comments on policy options

The big promise from the electricity "reformers"

- Back in the 1980s the proposition was that corporatizing, reorganising, and where possible privatising electricity, would bring gains for consumers because

  - Commercial, profit-driven management would (1) raise efficiency and (2) cut costs
  - Competition (or appropriate regulation) would (3) force efficiency and productivity gains to be passed through to prices
  - Consumers would therefore enjoy better service and lower prices, while profits could rise under an SOE or private model – sharing the gains from more productive use of resources

The outcome 1986-2022

- A greed-driven uncompetitive oligopoly/cartel has been entrenched in control of our most strategic sector
- Productivity is down 30% over three decades, gross profits are up 80%
- Construction of renewable generation has been slowed down and new entrants to generation are being blocked by anti-competitive practices supported by the "regulators" (Electricity Authority and Commerce Commission)
- Prices for residential consumers have doubled in real terms and will rise further as the carbon price rises (perverse incentive)
- Prices for industry are up just a couple of percent while prices for commercial users are down by a quarter – countervailing power is what really matters in uncompetitive markets
- The electricity industry's strategic goals are now hostile to equitable climate-change policy and will block progress unless the cartel is broken

The reason

- The reformers either lacked understanding of the economics of the New Zealand electricity system – or didn't care
- They were applying one-size-fits-all cookie-cutter notions imported from the UK and USA where the economics of electricity were different
- Ideology overwhelmed common sense

The big promise of the Emissions Trading Scheme promoters

- Market forces would be harnessed to trigger the most cost-effective options for emission reduction
- We would have a “cap and trade” system as a viable alternative to a carbon tax, given that the tax route was judged politically impossible
- All sectors/all gases would be covered by 2013 (including agriculture)
- New Zealand/Aotearoa would have a credible record to hold up for scrutiny at international gatherings

The outcome 2008-2022

- The Emissions Trading Scheme to date was from the start a massive scam designed (under corporate lobbying pressure) primarily to enrich corporate insiders – including the electricity gentailer cartel
- There was no cap placed on emissions so it was never “cap-and-trade”; there is still no true binding cap
- The door was left wide open for using “offsets” – both forests and often-dodgy overseas carbon credits - as a substitute for mitigation effort
- That might have worked if the Kyoto Protocol had been a success in establishing global carbon prices and markets, but the Protocol never flew
- Either price certainty or quantity certainty is required to incentivise behavioural changes. The ETS provided, and still provides, neither
- The 2020 ETS “reforms” have left the scam intact and the uncertainty unchecked
- New Zealand’s international reputation has been trashed

The reason

- Emissions trading was never sensible in New Zealand's tiny economy – carbon tax was always the better option but corporate stonewalling (channelled by New Zealand First in 2005) blocked that route
- ETS design was captured from the outset by corporate vested interests and climate change deniers (Business Round Table and Treasury)

$\Rightarrow$ An institutional innovation that was designed and destined to fail from the start

- Rent-seeking and vested interests overwhelmed common sense

So from here…

1. A quick over-view of my large-scale critique of the NZ electricity "market": why it's broken and why tinkering won't fix it
2. Focus in on the electricity-industry problems that are specific to climate change response:
   i. cartel-driven barriers to entry of renewable generation,
   ii. regulatory failure of government agencies, and
   iii. the perverse anti-electrification incentives of a carbon tax or price imposed on a misconceived industry structure
3. The New Zealand Emissions Trading Scheme: another failure that tinkering won't fix
4. A couple of modest suggestions for change…

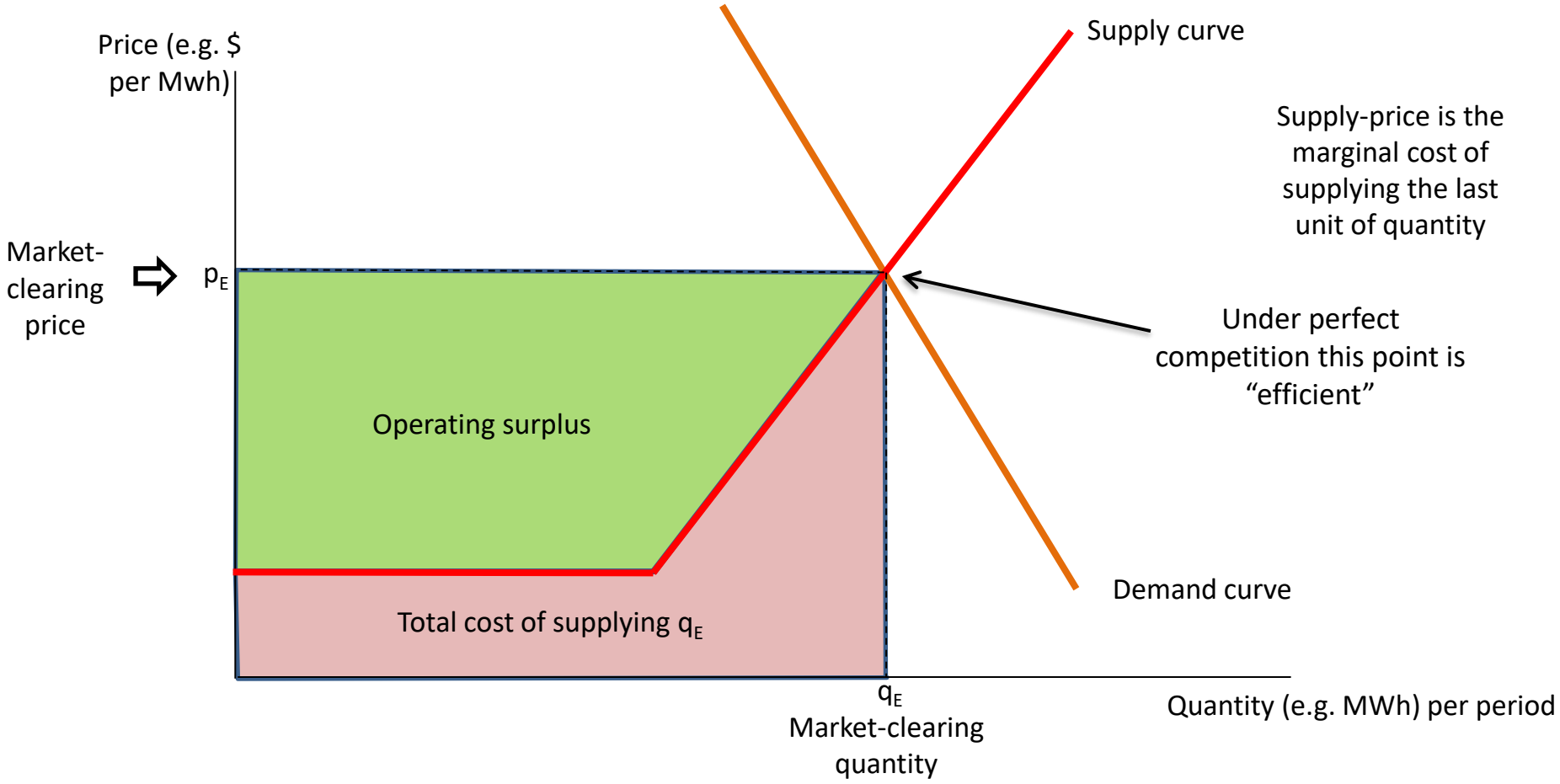
Three ways to organize big public utilities (electricity, gas, water, telecommunications, roads, ports,……

1. The American way: let private capitalists build them and then regulate to achieve socially acceptable outcomes
2. The old British/French way: set up state-owned enterprises with politically set priorities to deliver service on socially-acceptable terms
3. The free-market way: let private enterprise own and operate the industries, relying on nothing except "competition" to prevent socially-unacceptable outcomes

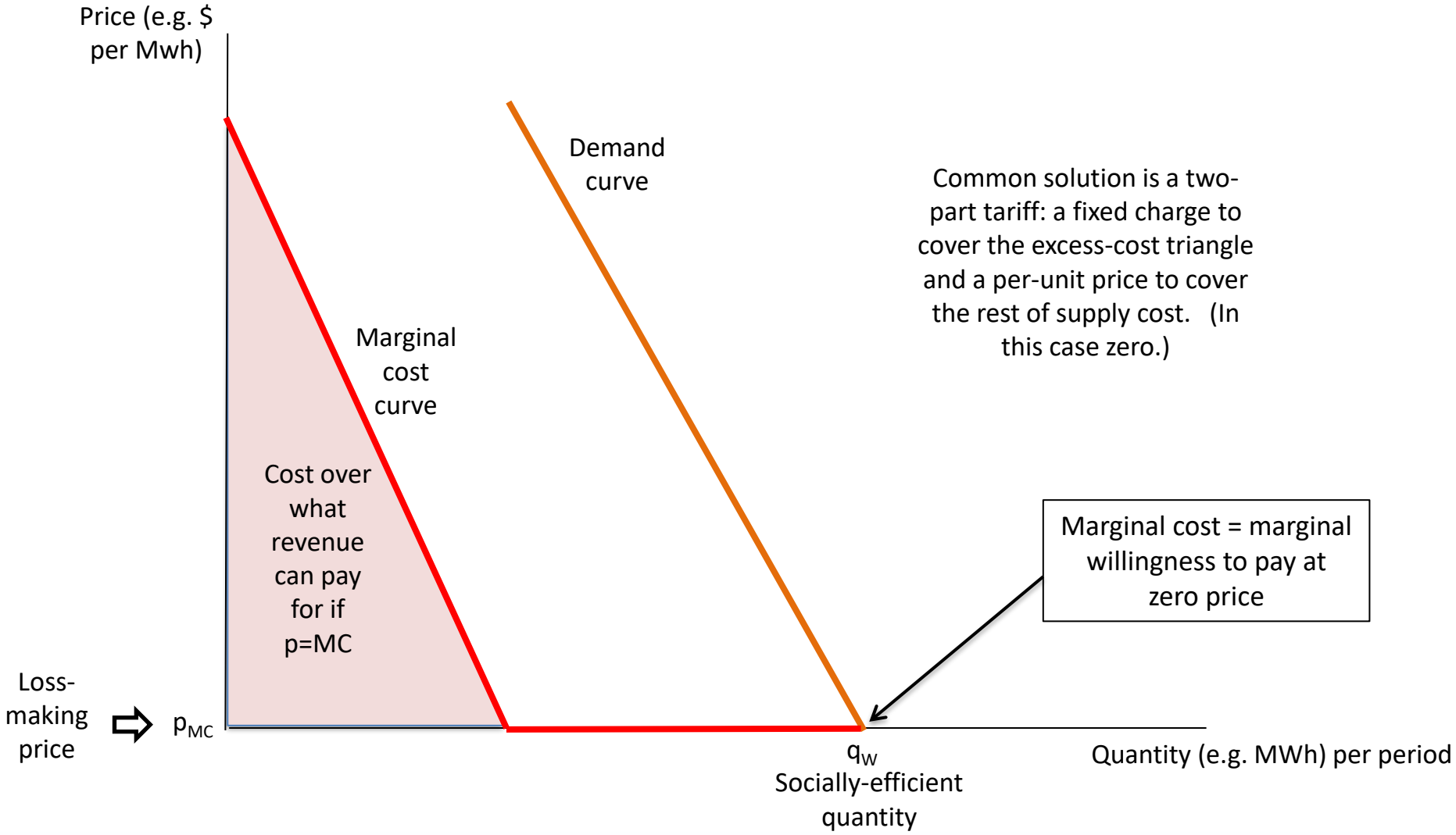
New Zealand did (2) until 1986, then switched to (3), has gradually and ineffectually drifted towards (1), and probably eventually will rediscover the virtues of (2).

Along the way, socially-acceptable outcomes went overboard.

Some stage-1 economics [pre-1984 variety]



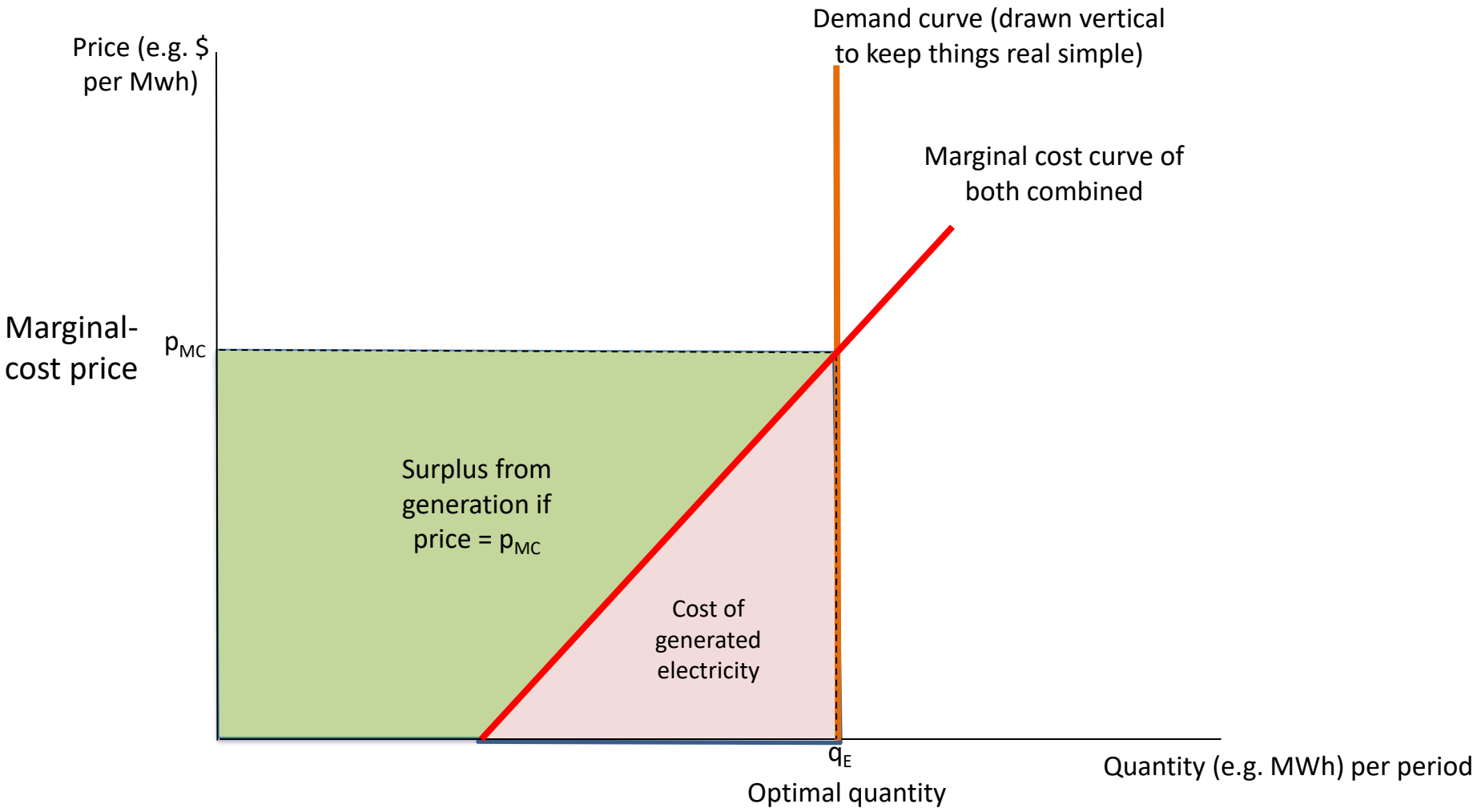
Here's the same diagram but drawn for a decreasing-marginal-cost activity (economies of scale)



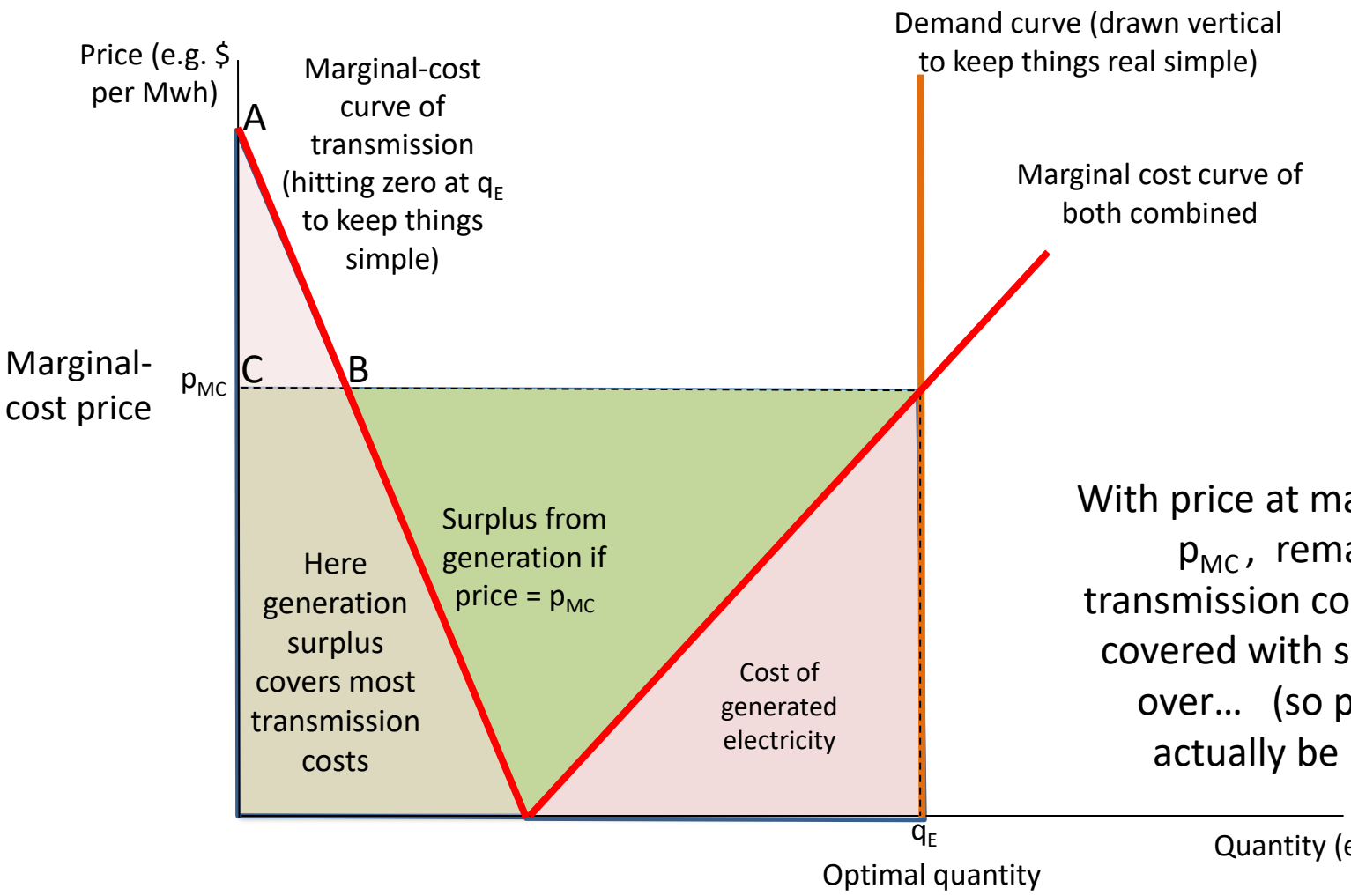
Now suppose that those two diagrams represent different stages in the supply chain for a final product (delivered electricity)

- The first diagram is like the supply of generated electricity
  - Generation in New Zealand has a strongly upward-sloping supply curve because some generation units (think big old hydro stations) are low-cost, and some (think Huntly) are high-cost => a spot market at p_E tends to deliver big operating surpluses to the low-cost plant
- The second diagram is like the transmission and distribution networks over which the electricity travels to reach the final user.
  - Transmission & distribution is a classic case of economies of scale – big fixed cost of creating the network, very low marginal cost of carrying an extra unit of electricity over it [up to the limit of capacity of course!] => downward sloping marginal cost => this activity makes a loss if p=MC
- So a sensible way to organise supply is to combine the two (vertical integration) so that generation surplus can pay for all or part of the excess costs of transmission.
- This is part of the reason why firms exist in the real world, as Ronald Coase explained back in 1937 (though his focus was not on this particular cost issue)

Start with just the generation of electricity



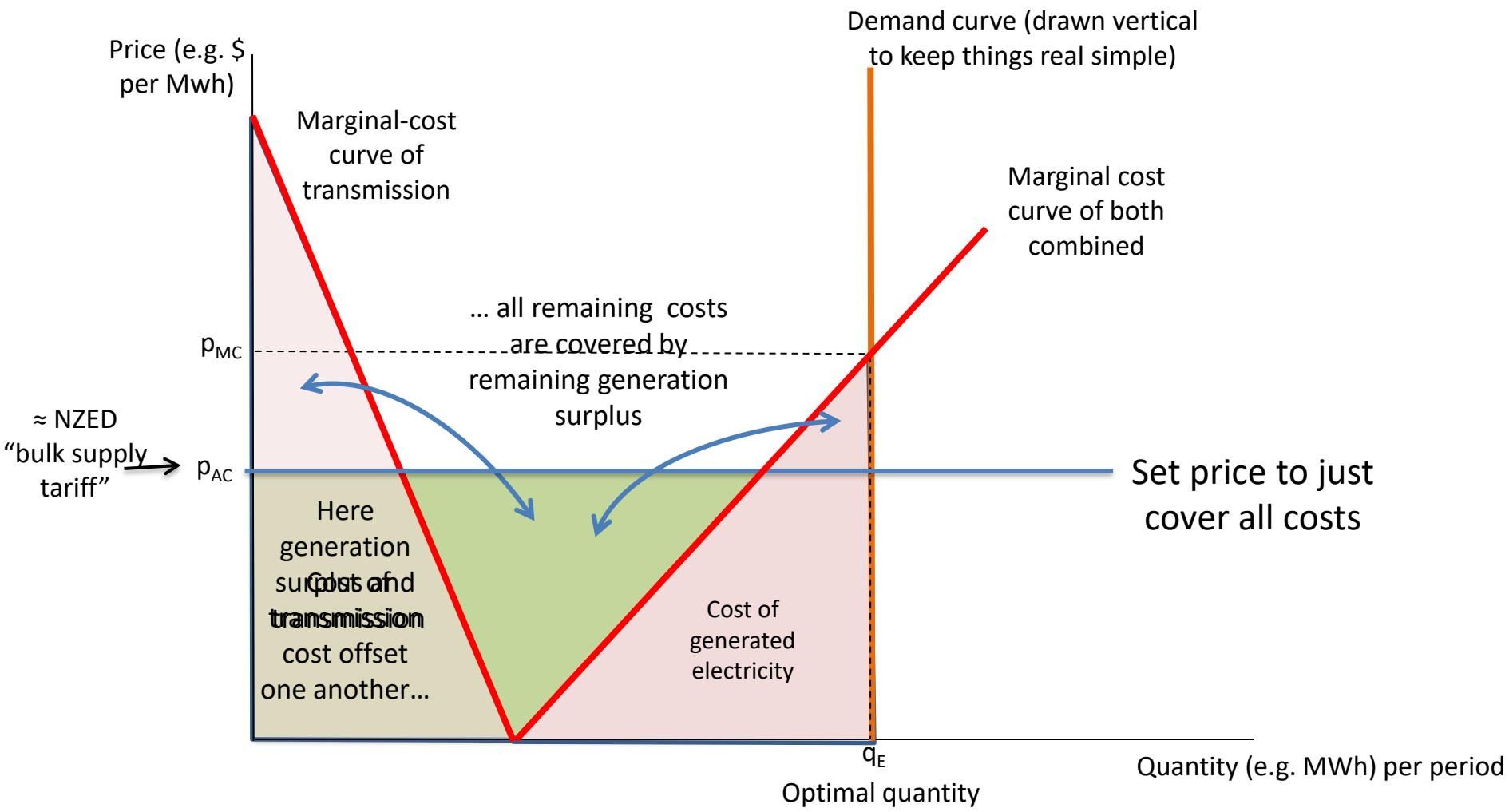
Start with just the generation of electricity
Then combine it with transmission (same quantity of delivered electricity)



With price at marginal cost, p_{MC}, remaining transmission costs ABC are covered with surplus left over… (so price can actually be lower!)

To cover all supply costs at the lowest possible single price to buyers:

The integrated operation can cover its total costs at a price below marginal cost

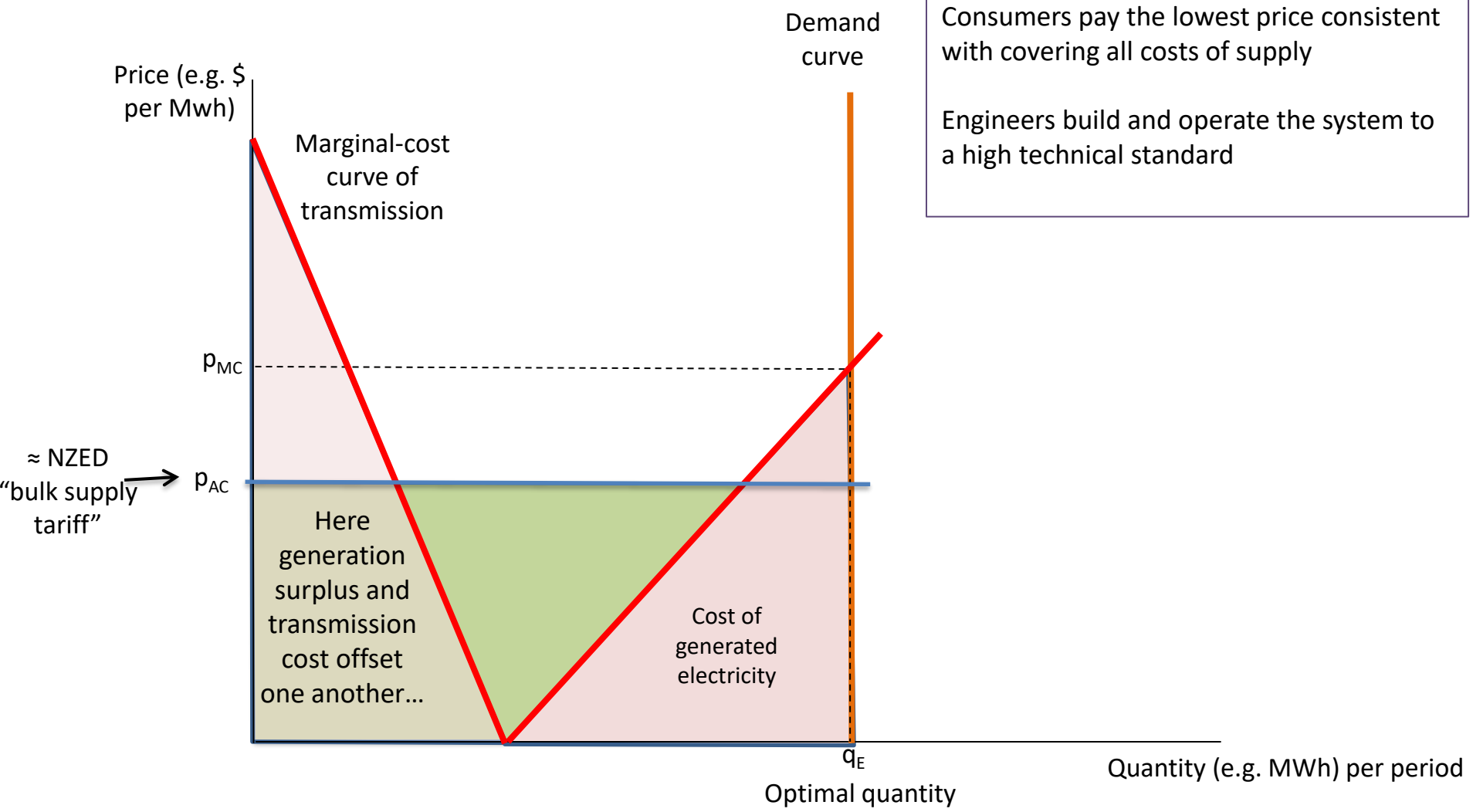


The outcome:

Bulk Supply Tariff covers all costs at a price below marginal cost

Consumers pay the lowest price consistent with covering all costs of supply

Engineers build and operate the system to a high technical standard



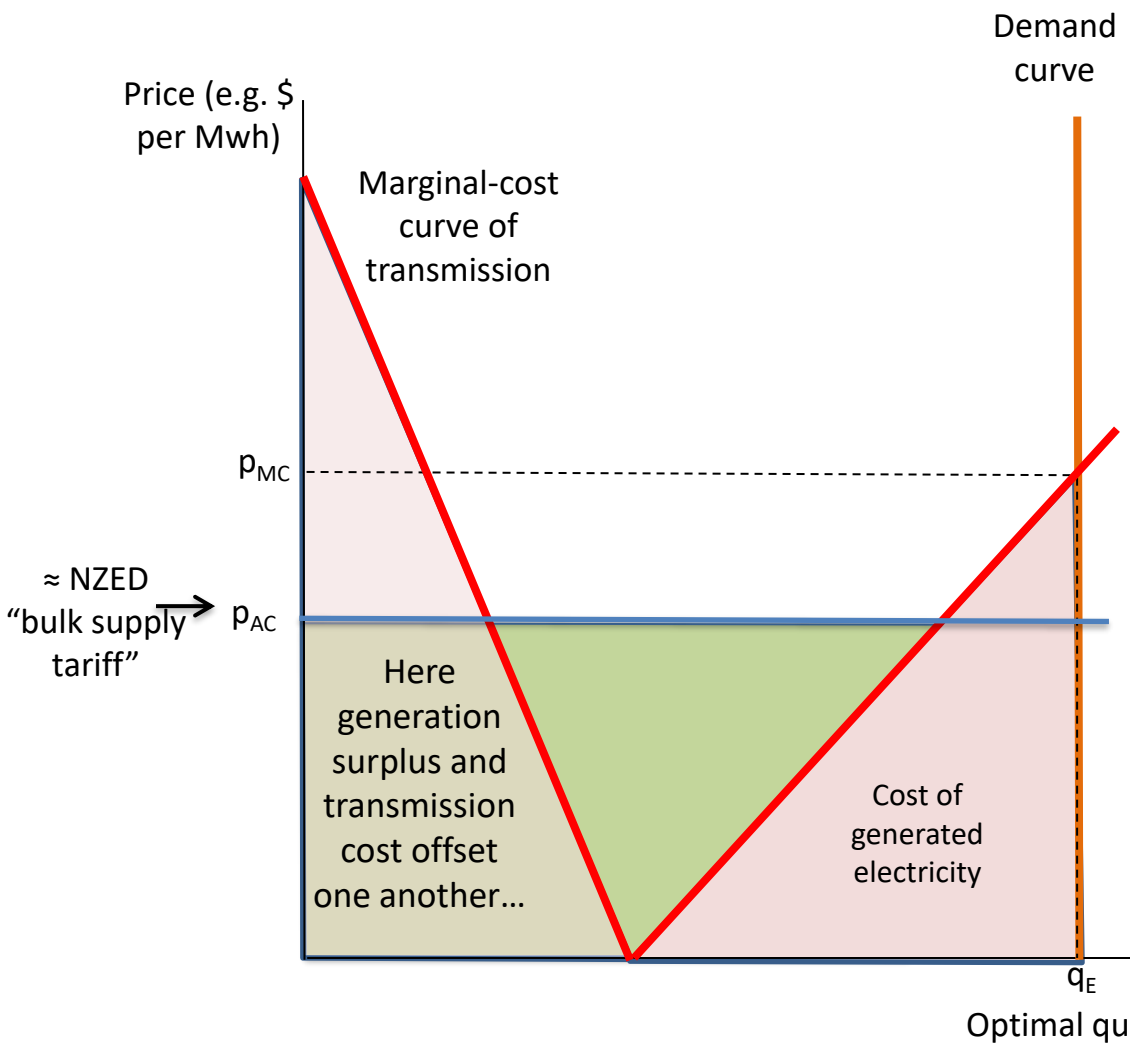
To get that outcome required two things:

1. Vertical integration of the supply chain so that increasing-cost activities were combined with decreasing-cost ones
   i. At wholesale level that meant generation and transmission were combined (NZED, then ECNZ)
   ii. At retail level it meant that distribution networks carried out retailing and customer services (ESAs and MEDs)

2. Public ownership with a non-profiteering objective, to avoid having that vertical (or at least, very steep) demand curve exploited by a monopolist to price-gouge consumers

Outcome: a Rolls-Royce electricity system charging among the lowest prices across the OECD

But then came rogernomics ….



Bulk Supply Tariff covers all costs at a price below marginal cost

Consumers pay the lowest price consistent with covering all costs of supply

Engineers build and operate the system to a high technical standard

BUT neoliberals hate this because

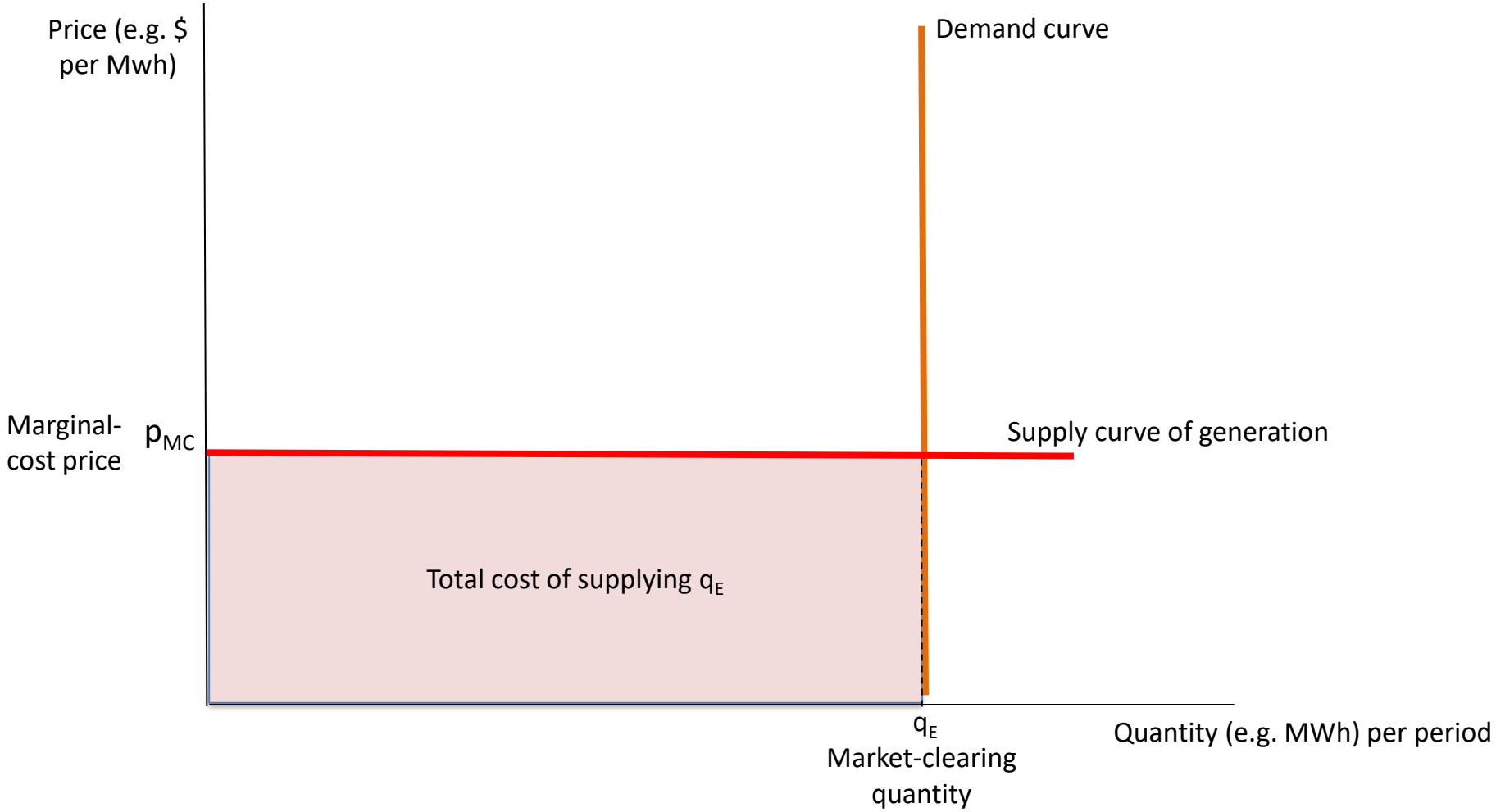
- It involves state ownership and control
- independent (private) generators can't enter because the market price is below their break-even entry cost
- price below marginal cost "must be allocatively inefficient" (neoclassical dogma from the single-product firm model)
- if privatised in this form it's a natural monopoly => regulation needed
- **And because privatisation is good, and regulation is bad, the structure has to be broken up**

How was New Zealand different from US and UK?

Answer: their cost curves looked quite different:

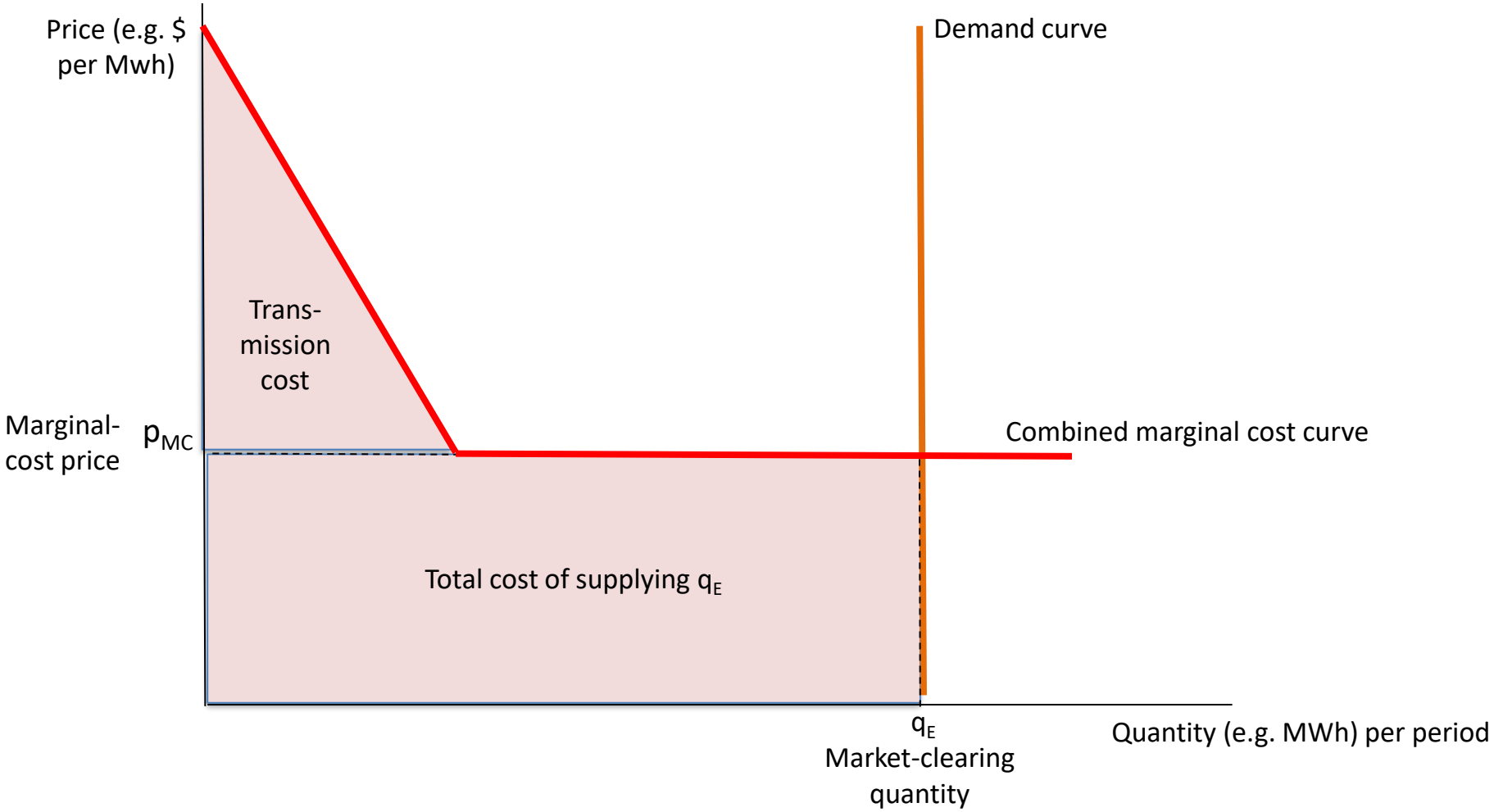
Some more stage-1 economics [pre-1984 variety]

Here's generation with no low-cost segment, just dominant fossil-fuel plants:

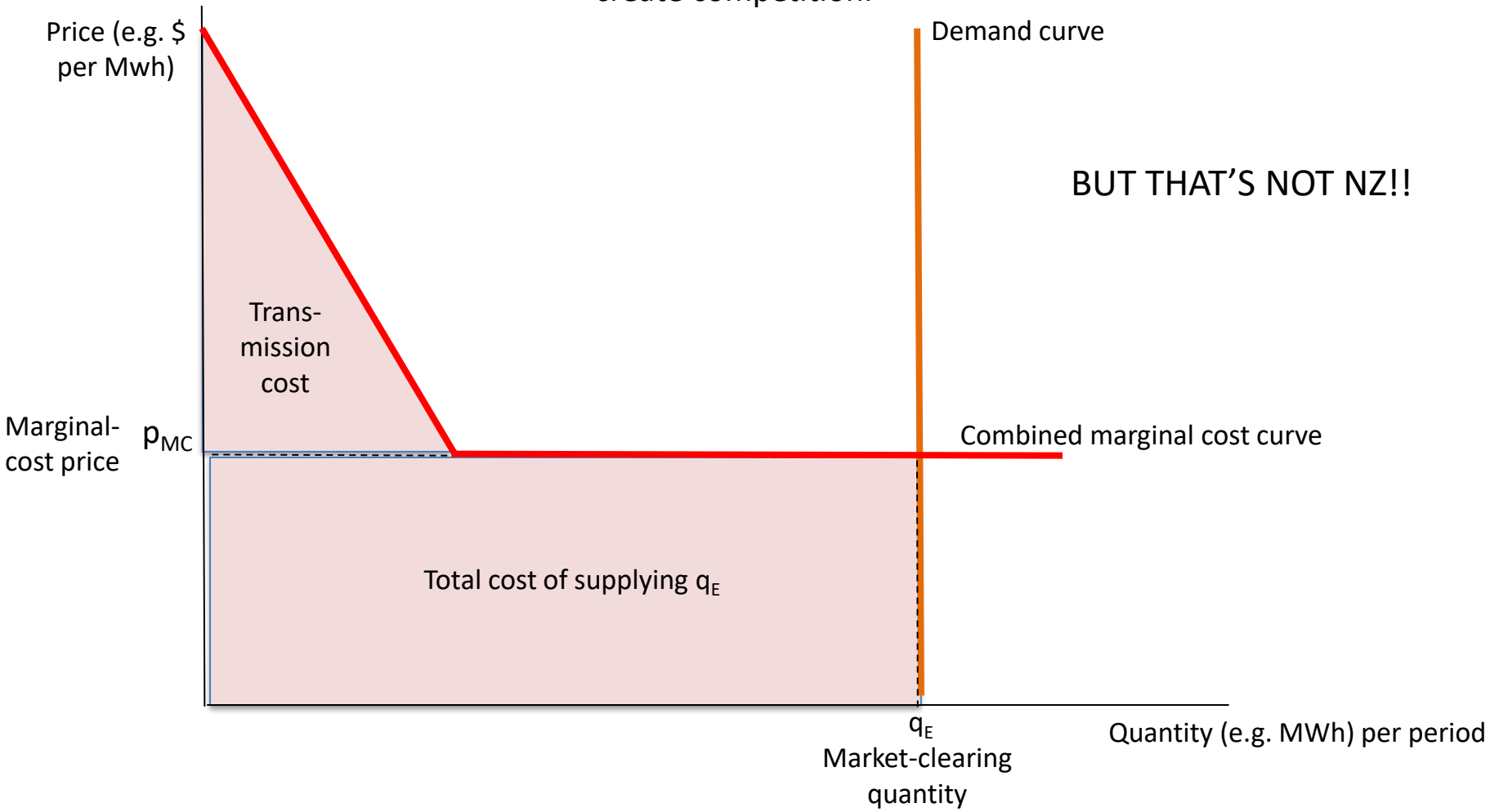


Some more stage-1 economics [pre-1984 variety]

Add transmission cost on top: p_{MC} won't cover all costs so more has to be charged

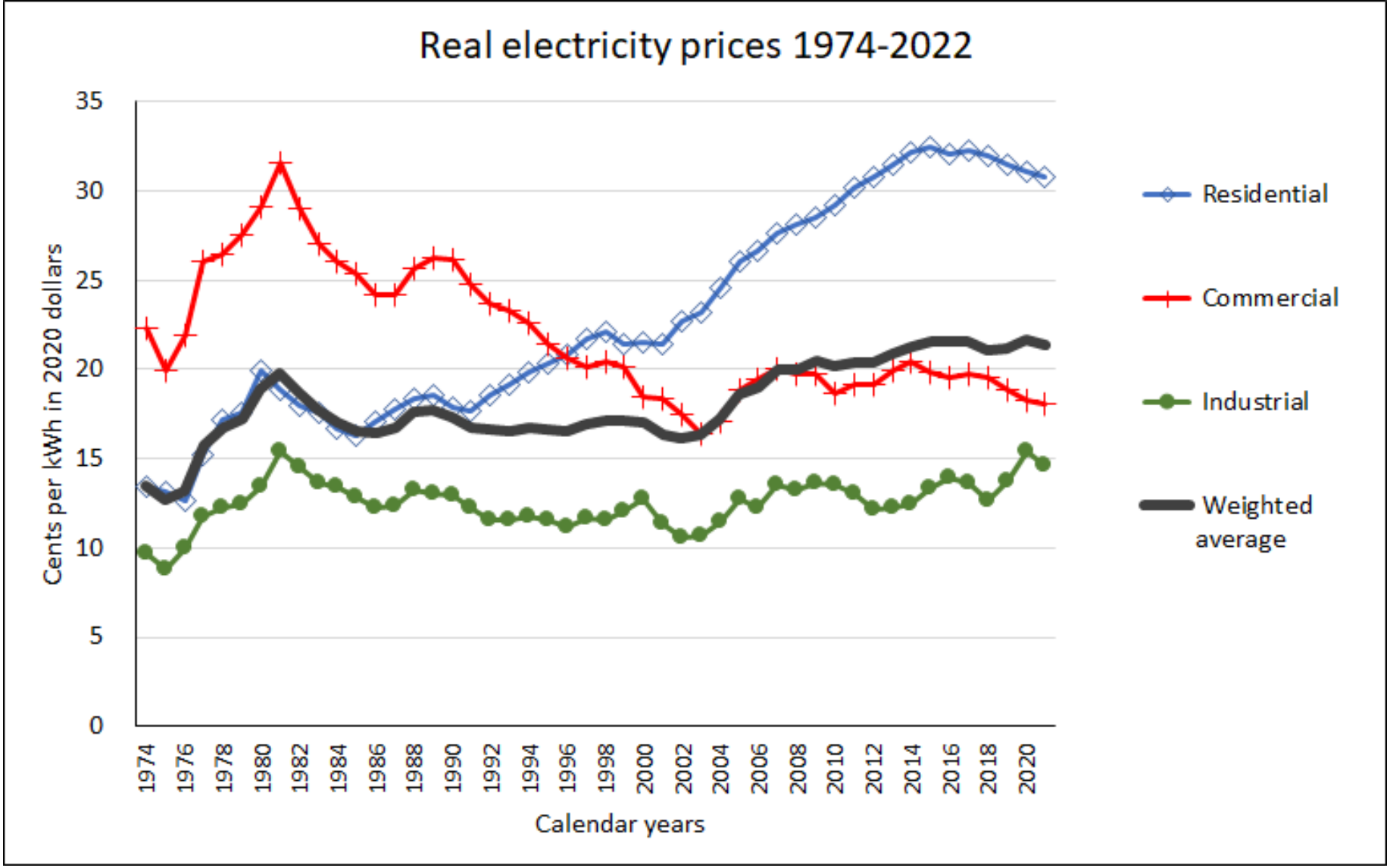


The least-cost way to price this is a marginal-cost price for generation and a fixed charge to cover transmission. Consumers pay the same whether the two are integrated or not. So (i) separation doesn't hurt consumers, and (ii) if private management can lower costs, it can reduce the total amount consumers have to pay, and (iii) independent generators can enter at the pre-existing price to create competition.



Key elements of neoliberal reform: (1) the lines-energy split

- Forced separation of generation from transmission, and of retail operations from local lines networks => in New Zealand the pricing (and operational) benefits of vertical integration vanished overnight
  - Generators collected the marginal-cost price and simply pocketed the surpluses – no longer had to cover lines costs
  - Lines networks, deprived of the cross-subsidy from generation or retail, had to pile on fixed charges to cover their costs
  - So the amount paid by final consumers had to rise even if there was no straight-out exercise of monopoly power
  - And once unregulated market power got going, monopolistic mark-ups meant that prices were going only one way: up
- The justification was that "generation and retail are competitive whereas lines networks are natural monopolies, so they need to be separated to allow competition to work"
- [OECD conventional wisdom/ideology prescribed competition for generation and retail, and regulation for lines – but NZ didn't regulate lines at all until 2008, and then just locked in monopoly prices and asset values.]
- The pricing outcome is history:

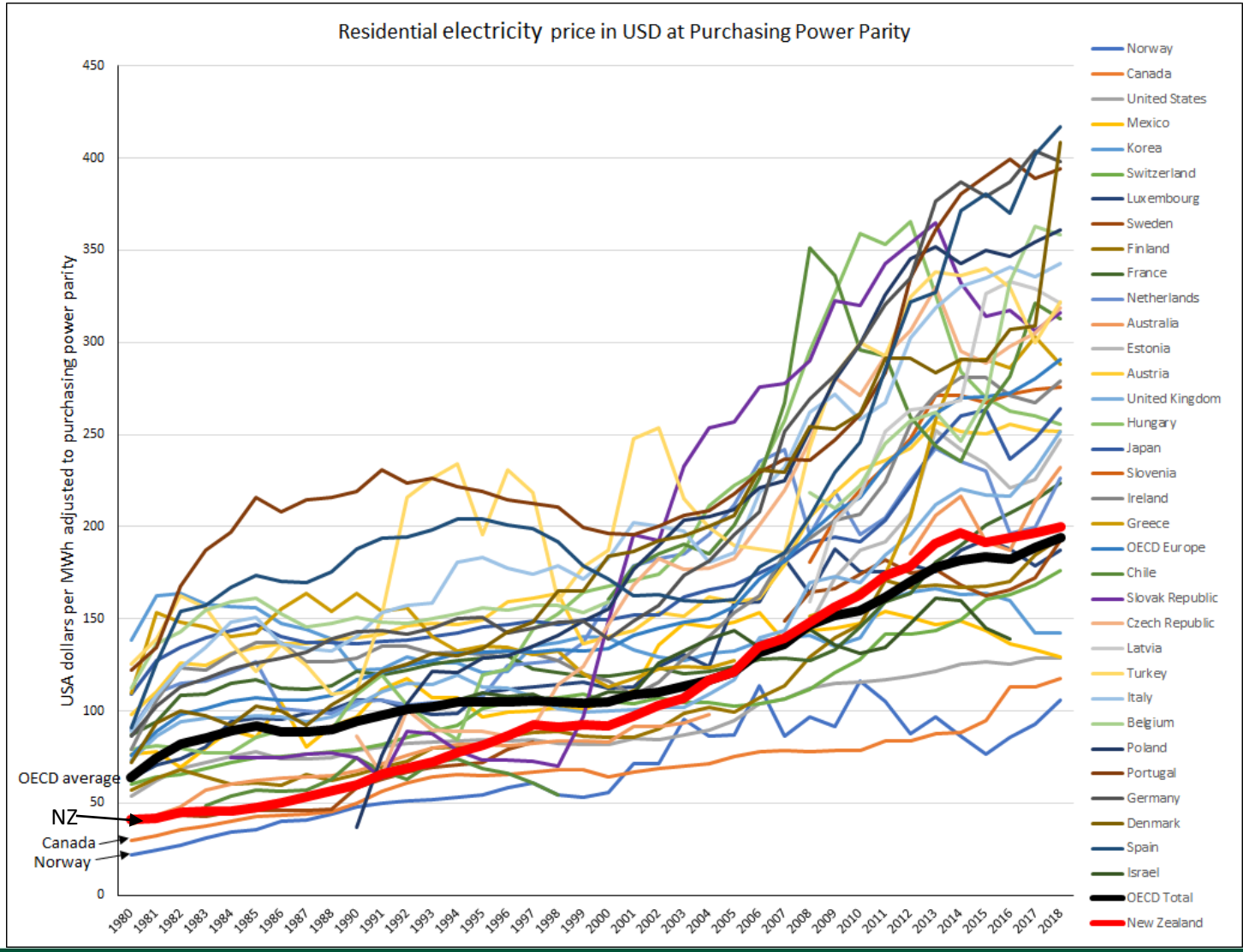


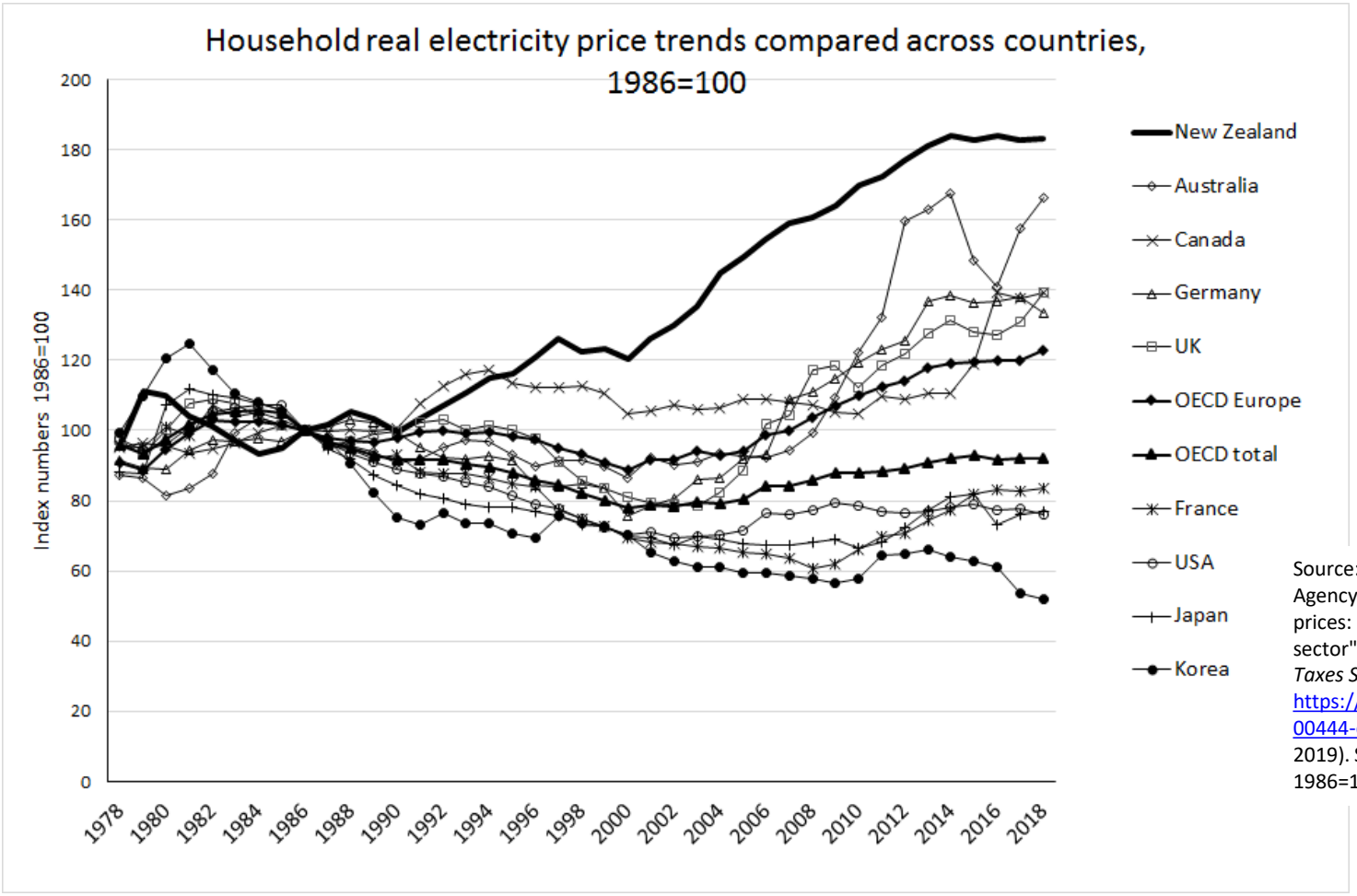
Constructed from MBIE data at https://www.mbie.govt.nz/assets/Data-Files/Energy/nz-energy-quarterly-and-energy-in-nz/prices.xlsx and https://www.mbie.govt.nz/assets/Data-Files/Energy/nz-energy-quarterly-and-energy-in-nz/electricity.xlsx at 25 August b2022

New Zealand used to be the third lowest, at 64% of the OECD average price.

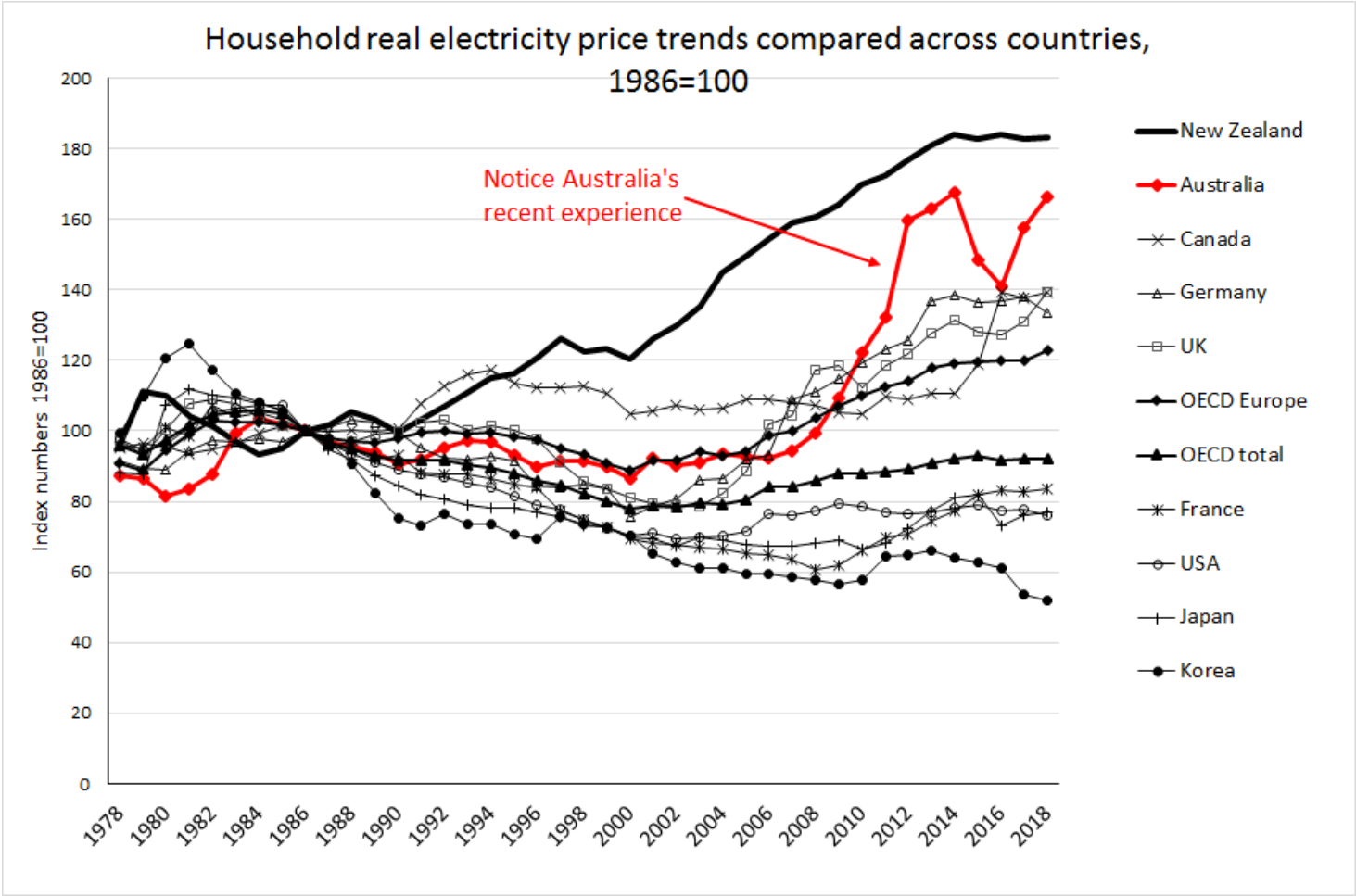
In 2018 NZ was eleventh lowest, at 103% of the OECD average.

Source: International Energy Agency database accessed 3 October 2019.





Source: International Energy Agency (2019), "End-use prices: Indices of energy prices by sector", *IEA Energy Prices and Taxes Statistics* (database), https://doi.org/10.1787/data-00444-en (accessed on 20 May 2019). Series rebased by author to 1986=100.


Household real electricity price trends compared across countries, 1986=100
Index numbers 1986=100
Notice Australia's recent experience
New Zealand
Australia
Canada
Germany
UK
OECD Europe
OECD total
France
USA
Japan
Korea
0
20
40
60
80
100
120
140
160
180
200
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

Key elements of neoliberal reform: (2) Corporatisation and privatisation

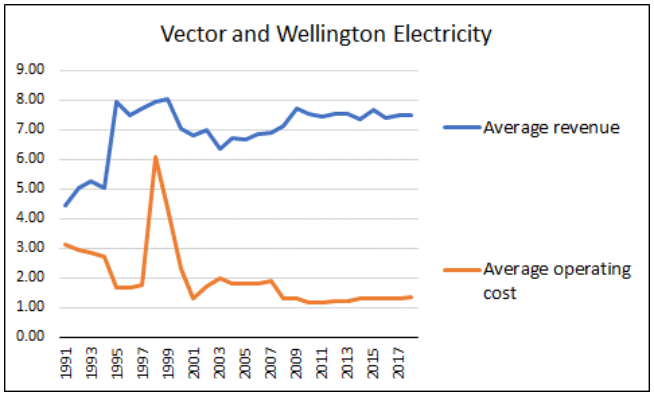
- At the start, profit-oriented management keen to
  - Cut costs like crazy
  - Then exploit any market power they could get to raise prices
  - So increase margins => maximise profit

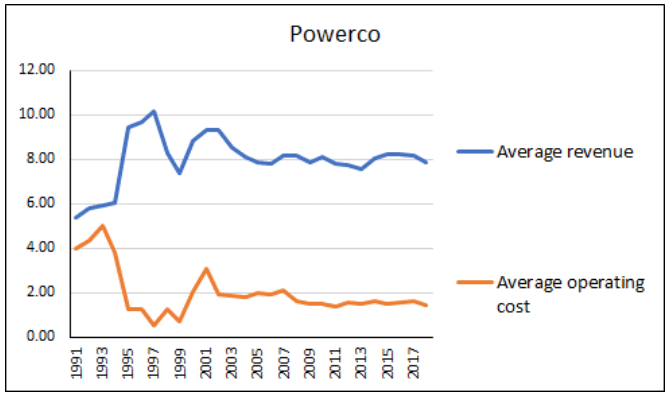
- But over time, rent-seeking opportunities for consultants, financial engineers, public-relations people, management-school graduates, ambitious CEO types

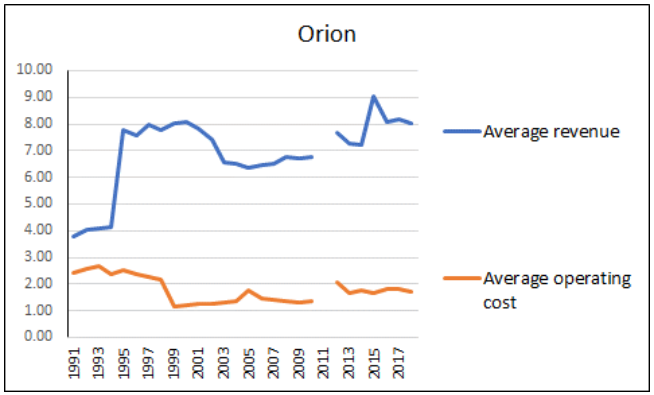
- Easy profits under captured non-regulators => increasingly fat and lazy sector with productivity drifting down steadily after 1999

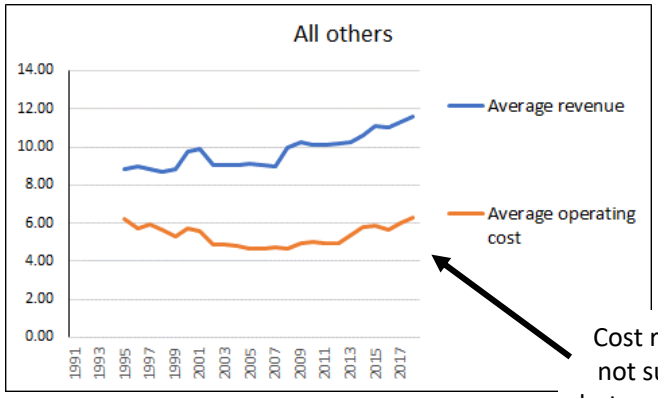
Cut costs and pass the gains through to prices?

Lines networks, real values in 2018 cents per kWh

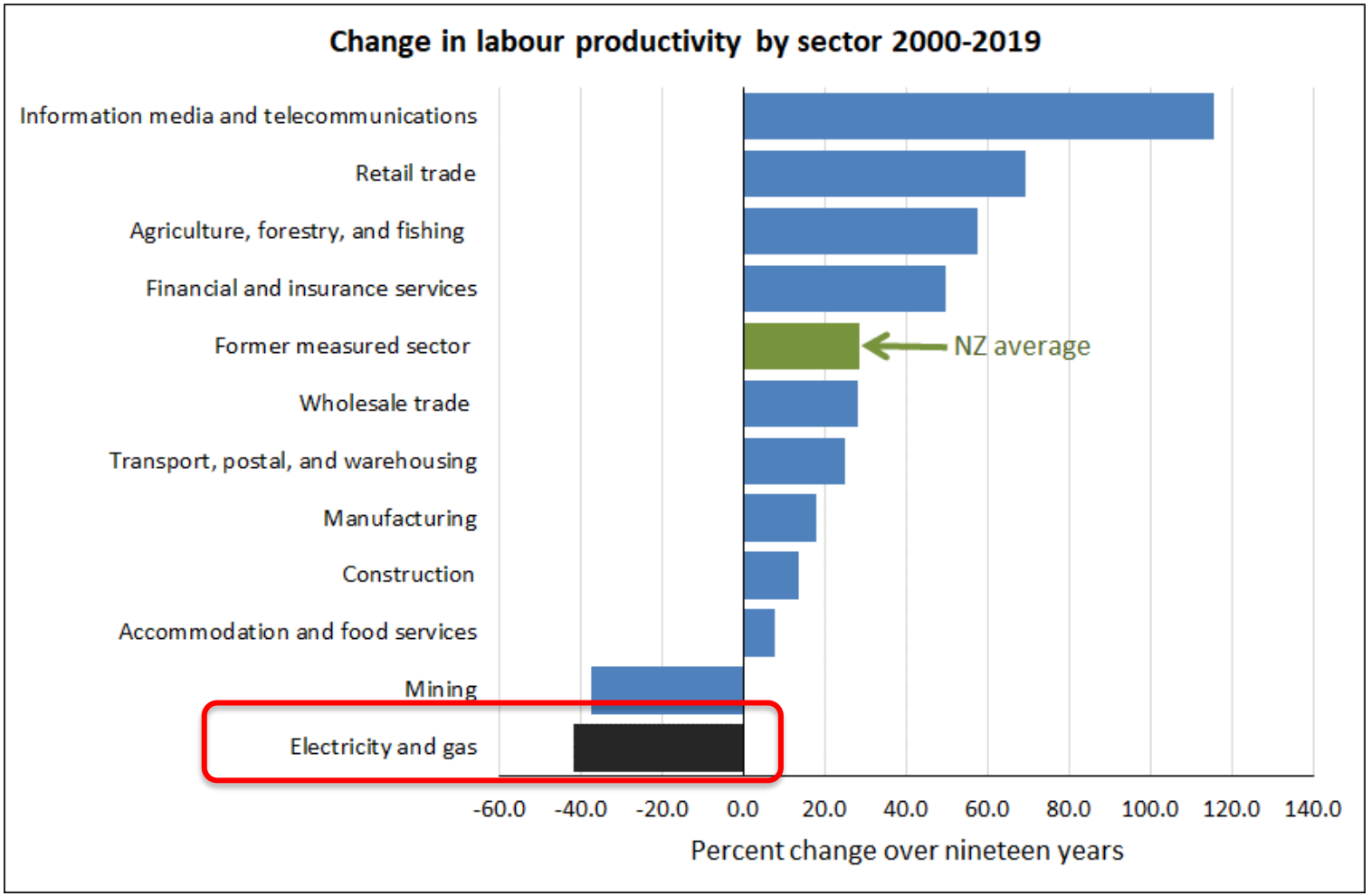


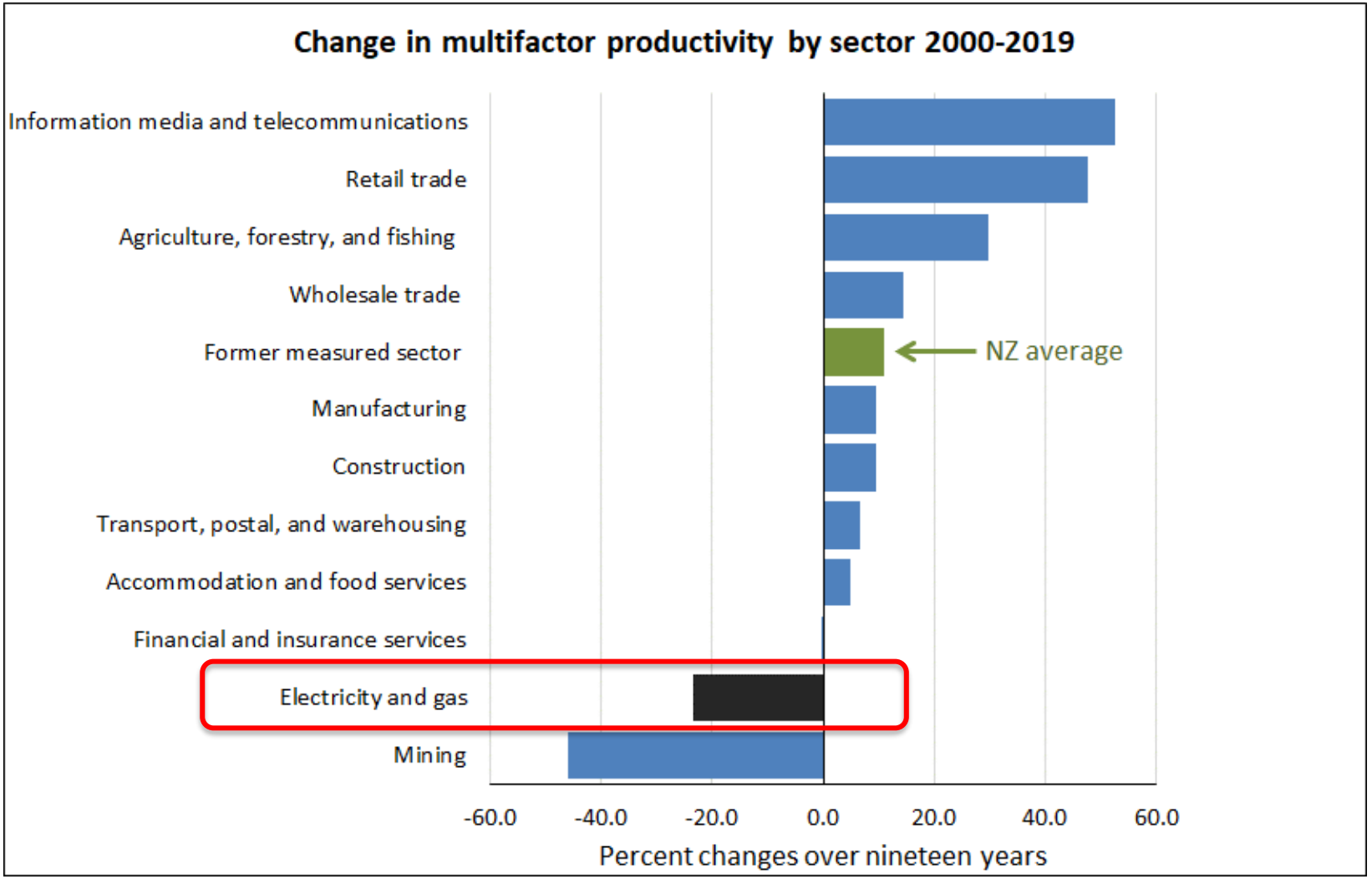




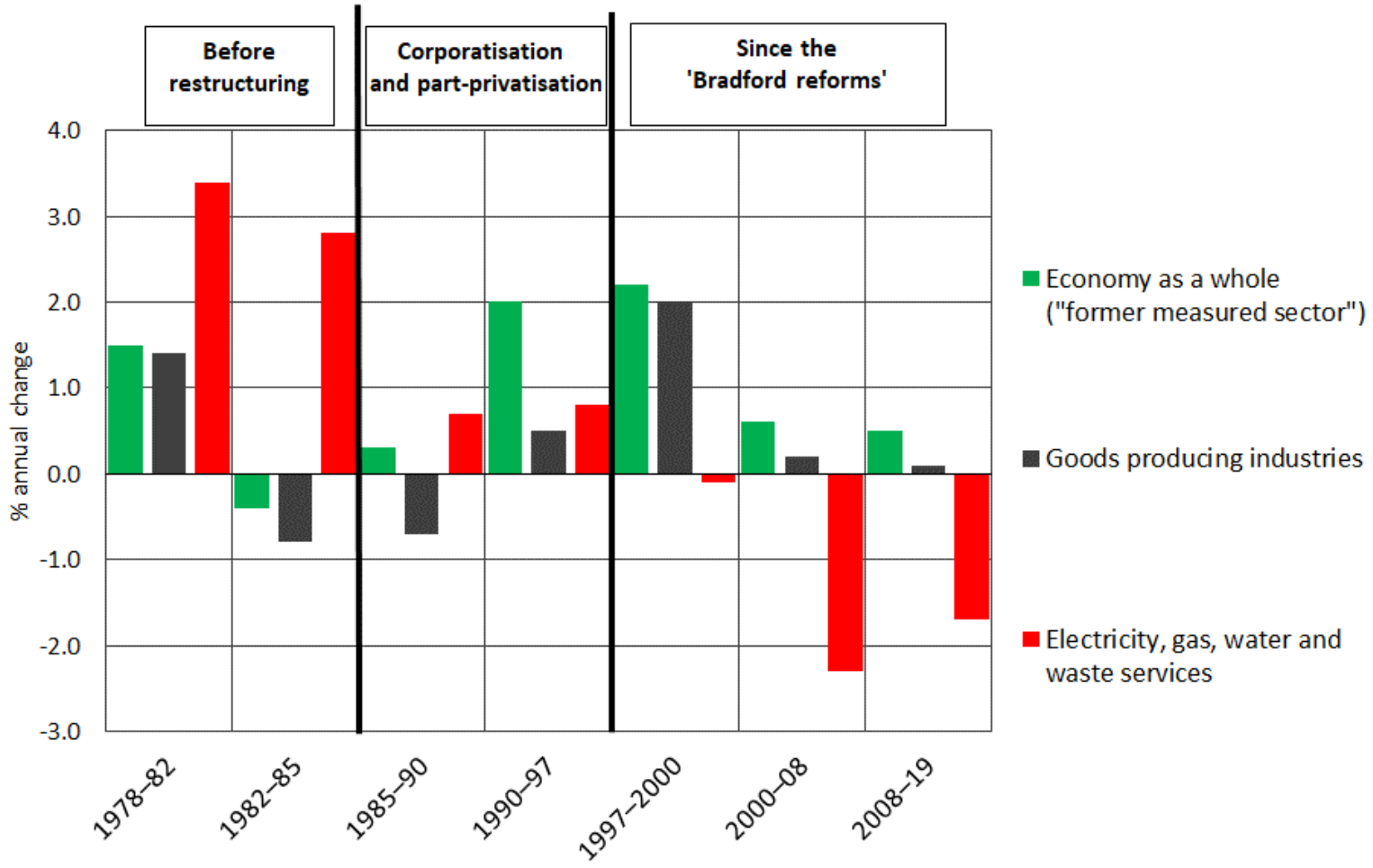


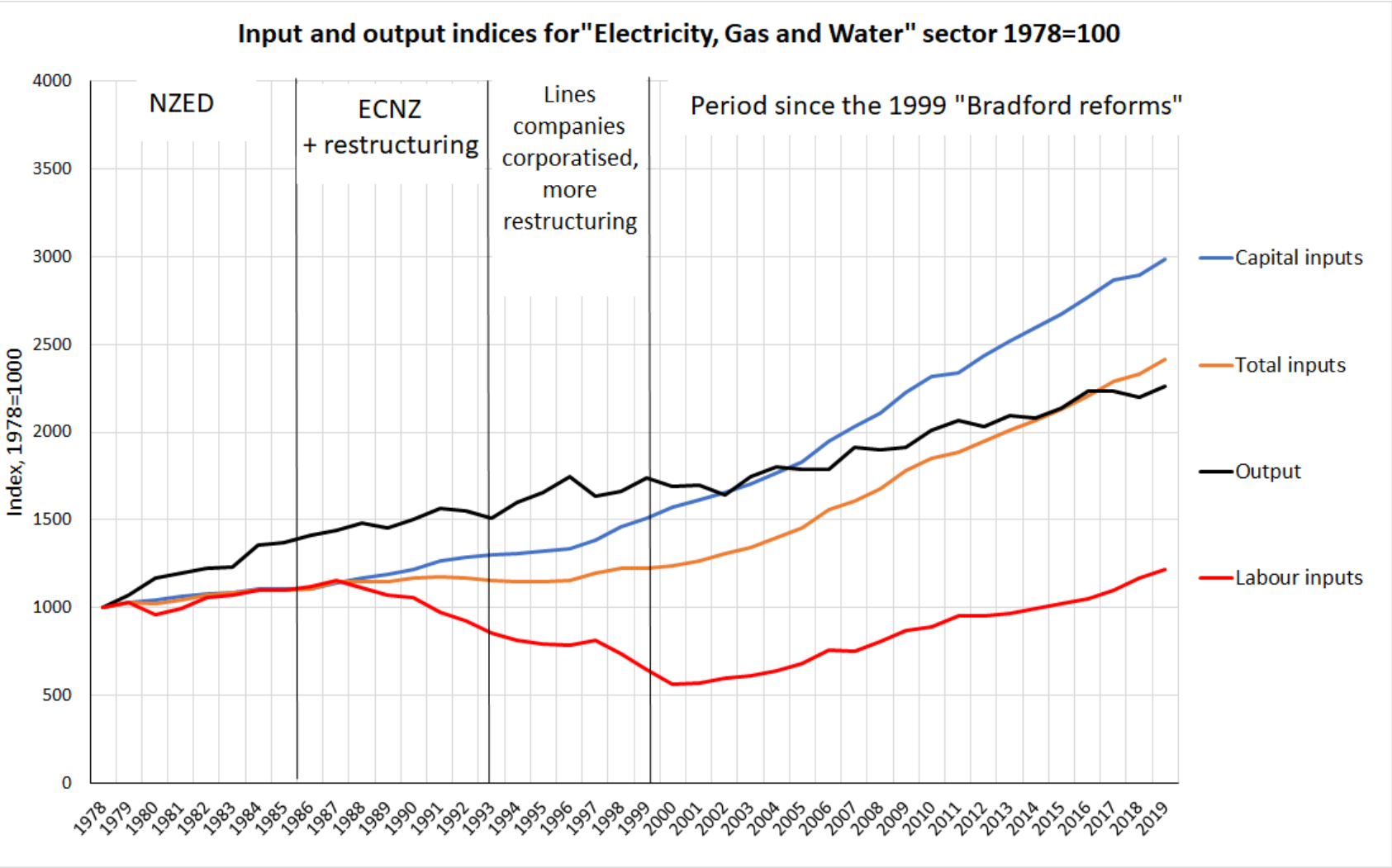
Cost reductions not sustained - but profit margins stayed solid

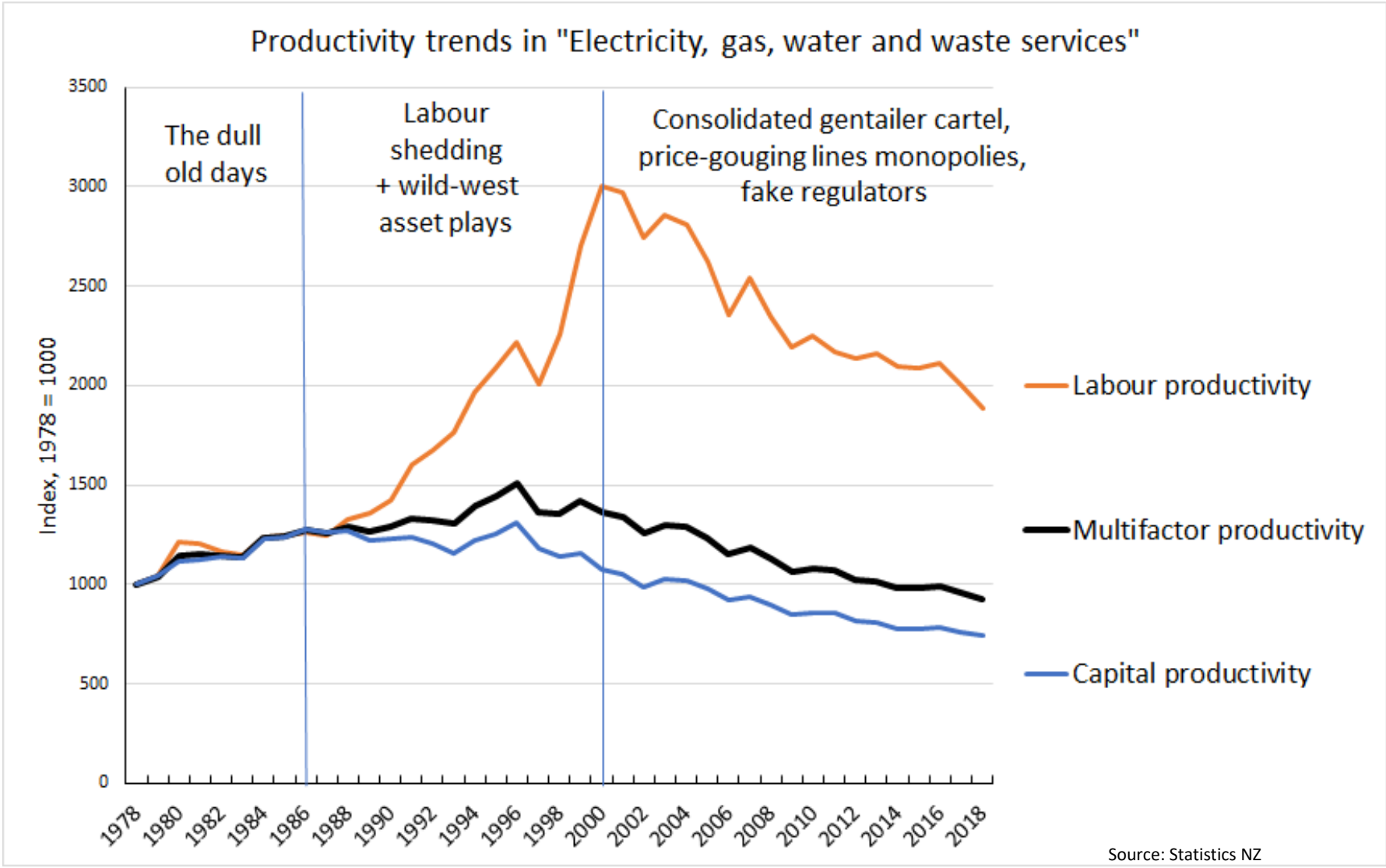

Change in labour productivity by sector 2000-2019
Information media and telecommunications
Retail trade
Agriculture, forestry, and fishing
Financial and insurance services
Former measured sector
NZ average
Wholesale trade
Transport, postal, and warehousing
Manufacturing
Construction
Accommodation and food services
Mining
Electricity and gas
-60.0
-40.0
-20.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Percent change over nineteen years


Change in multifactor productivity by sector 2000-2019
Information media and telecommunications
Retail trade
Agriculture, forestry, and fishing
Wholesale trade
Former measured sector
NZ average
Manufacturing
Construction
Transport, postal, and warehousing
Accommodation and food services
Financial and insurance services
Electricity and gas
Mining
-60.0
-40.0
-20.0
0.0
20.0
40.0
60.0
Percent changes over nineteen years

Annual average percent change in multifactor productivity over seven growth cycles 1978-2019




Input and output indices for"Electricity, Gas and Water" sector 1978=100
NZED
ECNZ
+ restructuring
Lines companies corporatised, more restructuring
Period since the 1999 "Bradford reforms"
Index, 1978=1000
4000
3500
3000
2500
2000
1500
1000
500
0
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Capital inputs
Total inputs
Output
Labour inputs



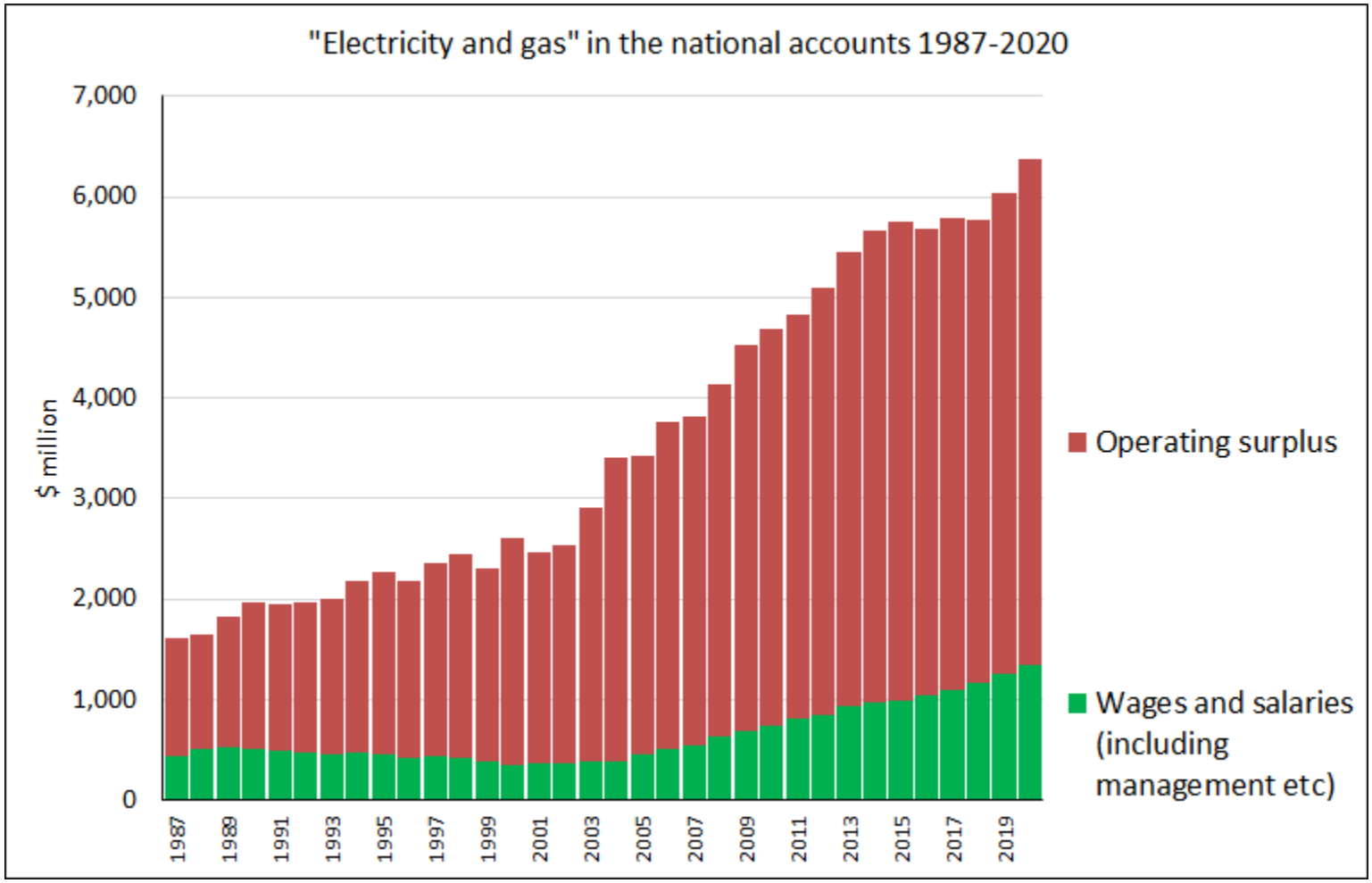
Source: Statistics NZ
Infoshare table PRD014AA

Bottom line: over the past two decades this sector has been loaded up with labour and capital engaged in unproductive activities

- Pursuit of profit combined with complicated “competition” games and financial engineering has meant that increasing amounts of labour and capital have been allocated to high-paid sales, marketing, financial management and administrative work that adds nothing to the volume or quality of the electricity reaching consumers

- Corporatisation and privatisation have culminated in a gigantic exercise in rent-seeking waste

Finally, profits



https://www.stats.govt.nz/assets/Uploads/National-accounts-industry-production-and-investment/National-accounts-industry-production-and-investment-Year-ended-March-2020/Download/national-accounts-industry-production-and-investment-year-ended-march-2020.xlsx downloaded 25 August 2022

Summary

- Multifactor productivity has gone down 30% (and capital productivity down 42%) since 1986
- Residential prices have roughly doubled since 1986 (while industrial prices hardly changed, and commercial prices fell 25%)
- Operating surplus has gone up 81% in real dollars since 1986 (compared with a 12% real increase in labour income)
- Redistribution of wealth from residential consumers to electricity asset owners and commercial users has been massive => increasing inequality and poverty (both child poverty and energy poverty in general)
- Residential consumers have gone from having no choice in a low-priced market to having lots of so-called “choice” [but no voice] in a high-priced market

Key elements of neoliberal reform: (3) Allow vertical integration of generation and retailing

- Huge increase in market power for the vertically-integrated firms ("gentailers")
- Independent retailers reduced to a tiny ineffectual fringe
- Competition promises evaporated immediately and never revived
- Now an entrenched gentailer cartel protected by the Electricity Authority

What does this mean for tackling climate change?

- Getting emissions down and moving towards a zero-carbon economy requires (among other things of course)
  - Rapid electrification of all possible areas of the economy to push out fossil fuels – so need the lowest possible electricity prices as incentive
  - Maximum possible deployment of renewable/nondepleting sources of electricity: wind, solar, tidal, waves, hydro, geothermal….
- Two essential requirements for success are that
  - Price incentives like carbon taxes or emission pricing penalise fossil fuel use while at the same time encouraging use of renewable electricity
  - Vested interests must not be able to place barriers to entry in the way of renewables (including small-scale distributed ones like rooftop solar and backyard wind)

The present electricity market setup ensures that

- Feed-in tariffs, retail pricing structure, and entry barriers to rooftop solar, have been manipulated by the gentailer cartel and its enablers to make ‘prosumer’ investments unprofitable
- Carbon charges drive up the price of grid-connected renewable electricity
- Parliament has repeatedly failed to confront these problems

Why so little distributed renewable generation?

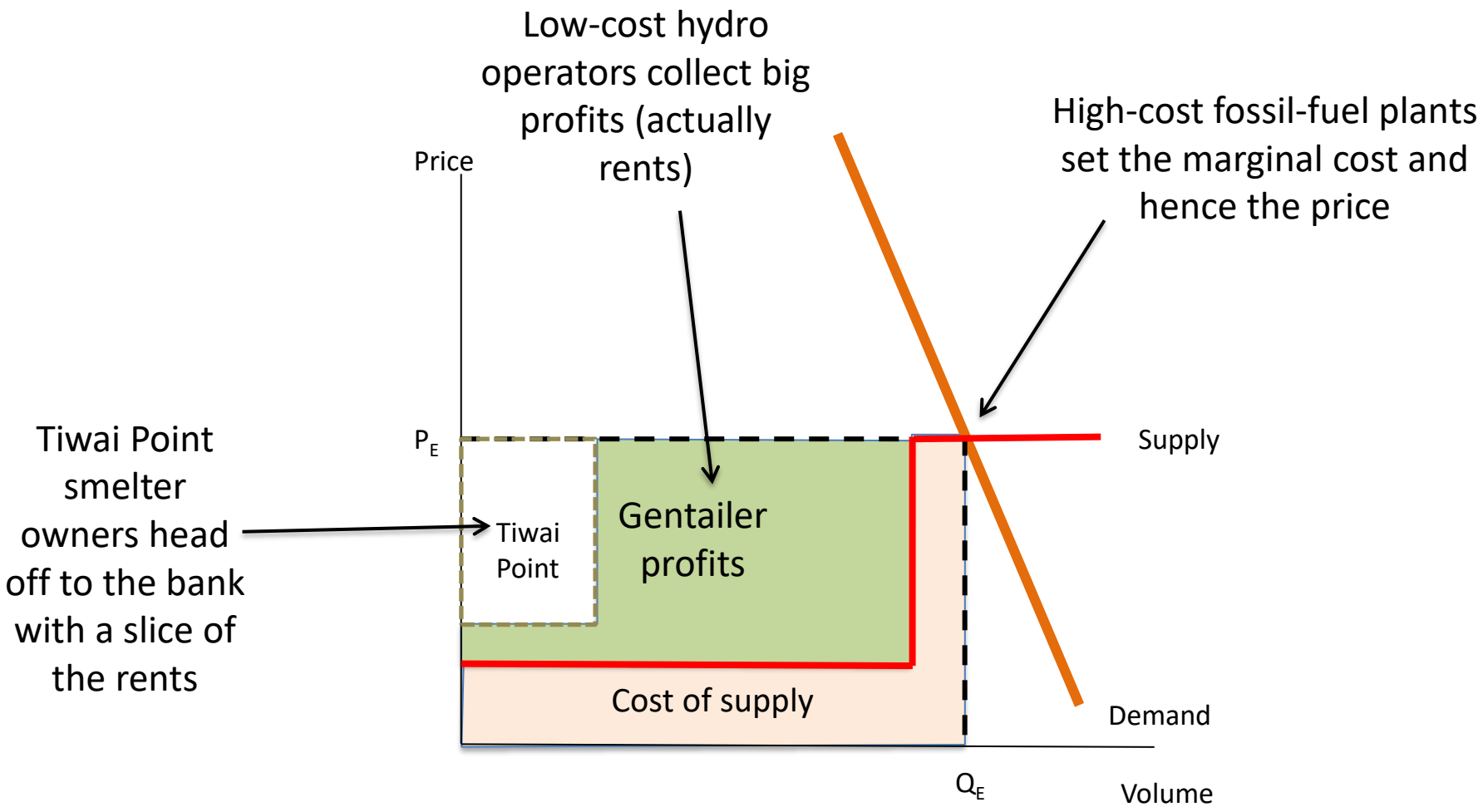
- For example rooftop solar, local community energy networks with wind, solar, micro-hydro and batteries

MY ANSWER:

because that threatens the profits of the gentailer cartel

and the so-called regulatory agencies have been captured by the big players

Here's the New Zealand wholesale electricity market:

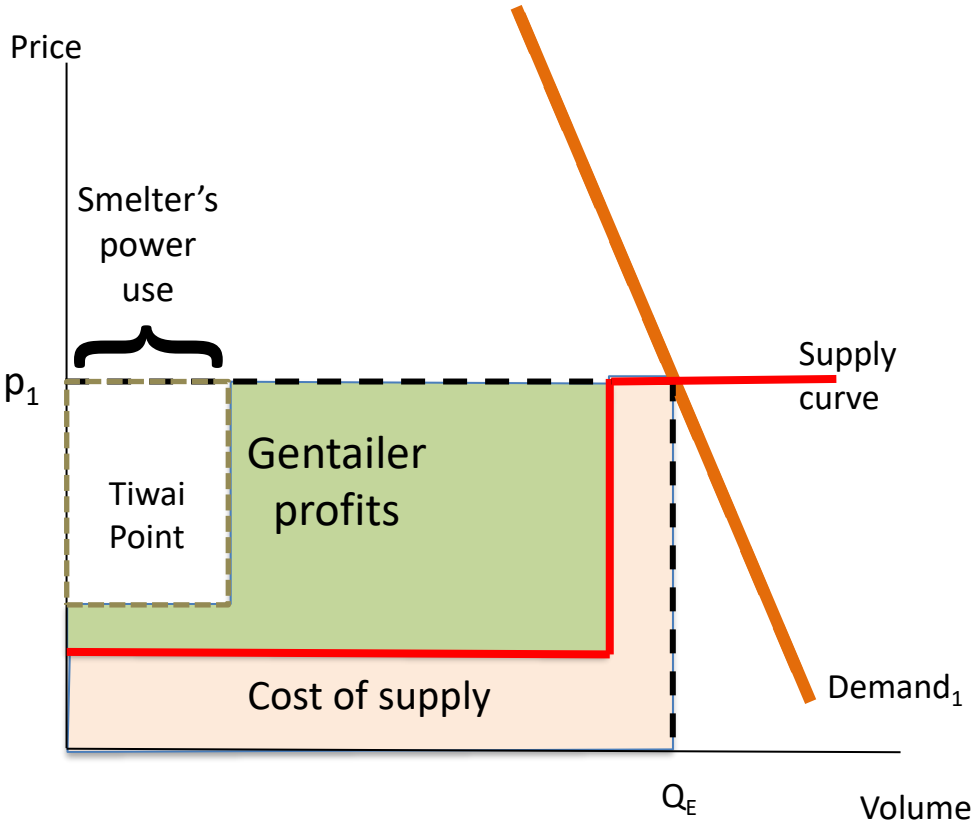


There are two big threats to those gentailer profits

1. A collapse in demand if Tiwai Point closes

2. An unwelcome increase in supply if lots of low-operating-cost renewables get installed

1. Suppose Tiwai Point closes…



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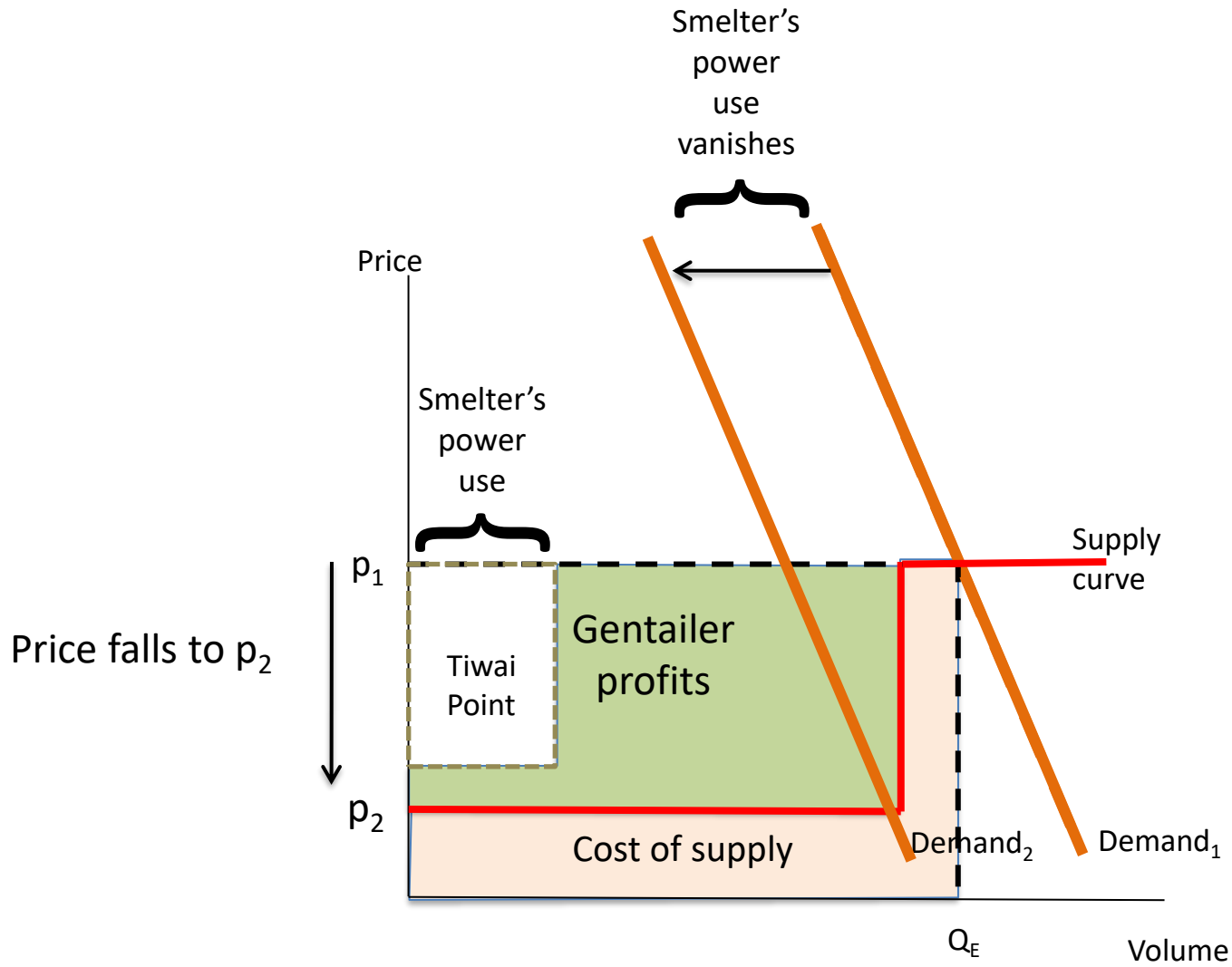

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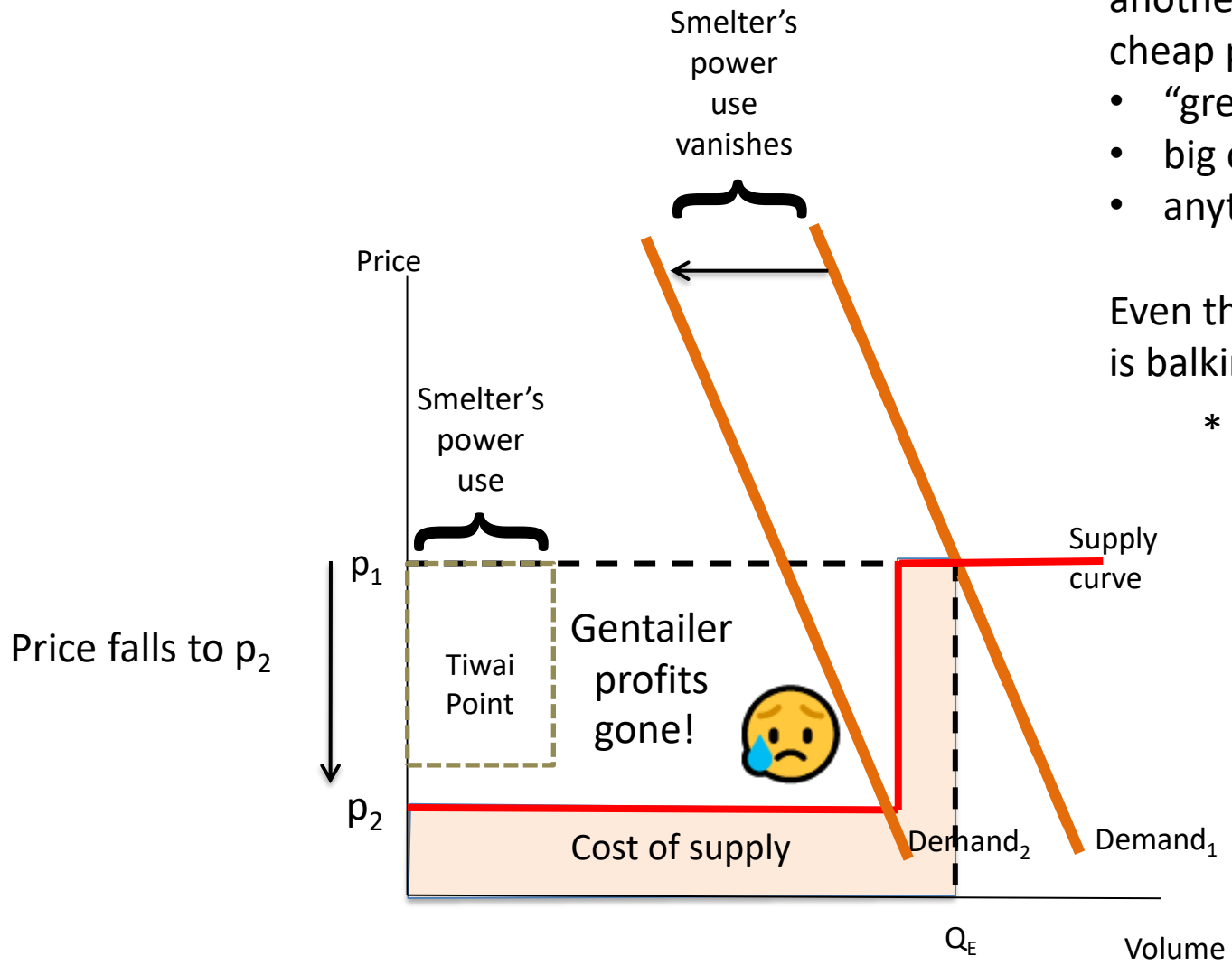


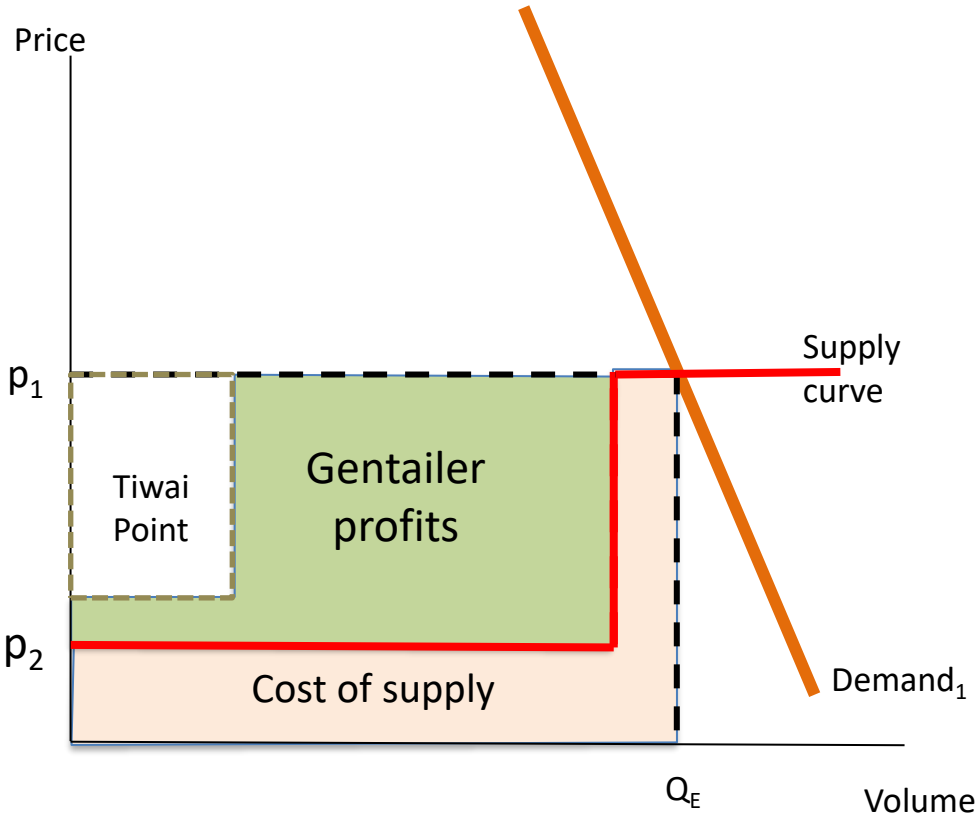
How to stop this: sign up another big user with a cheap power contract asap:

- "green hydrogen"
- big data centres
- anything…..

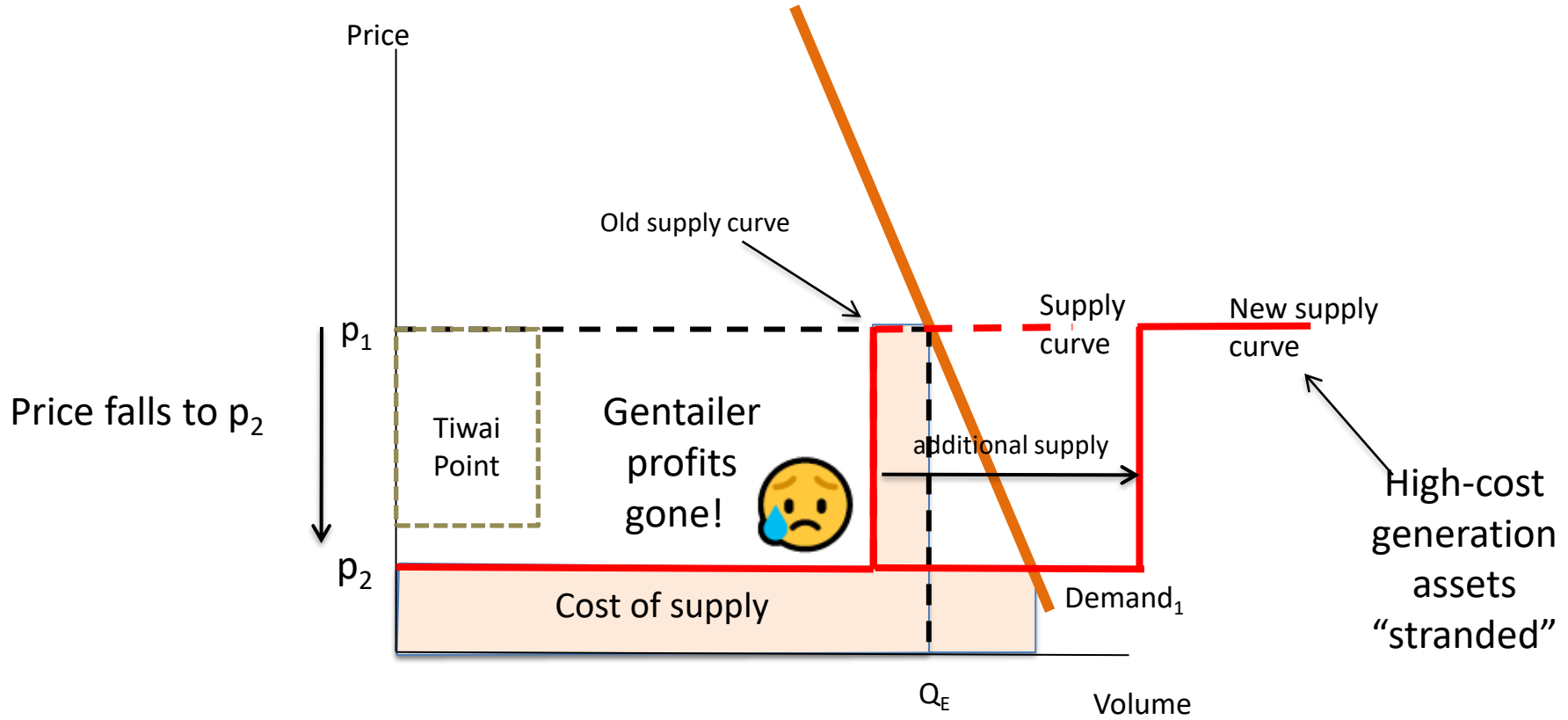
Even the Electricity Authority is balking at this! *

* *Inefficient Price Discrimination in very large electricity contracts: Proposed Code Amendment* 18 August 2022, https://www.ea.govt.nz/assets/dms-assets/30/Inefficient-Price-Discrimination-in-very-large-electricity-contracts-Consultation-paper.pdf

2. Suppose heaps of households install rooftop solar..



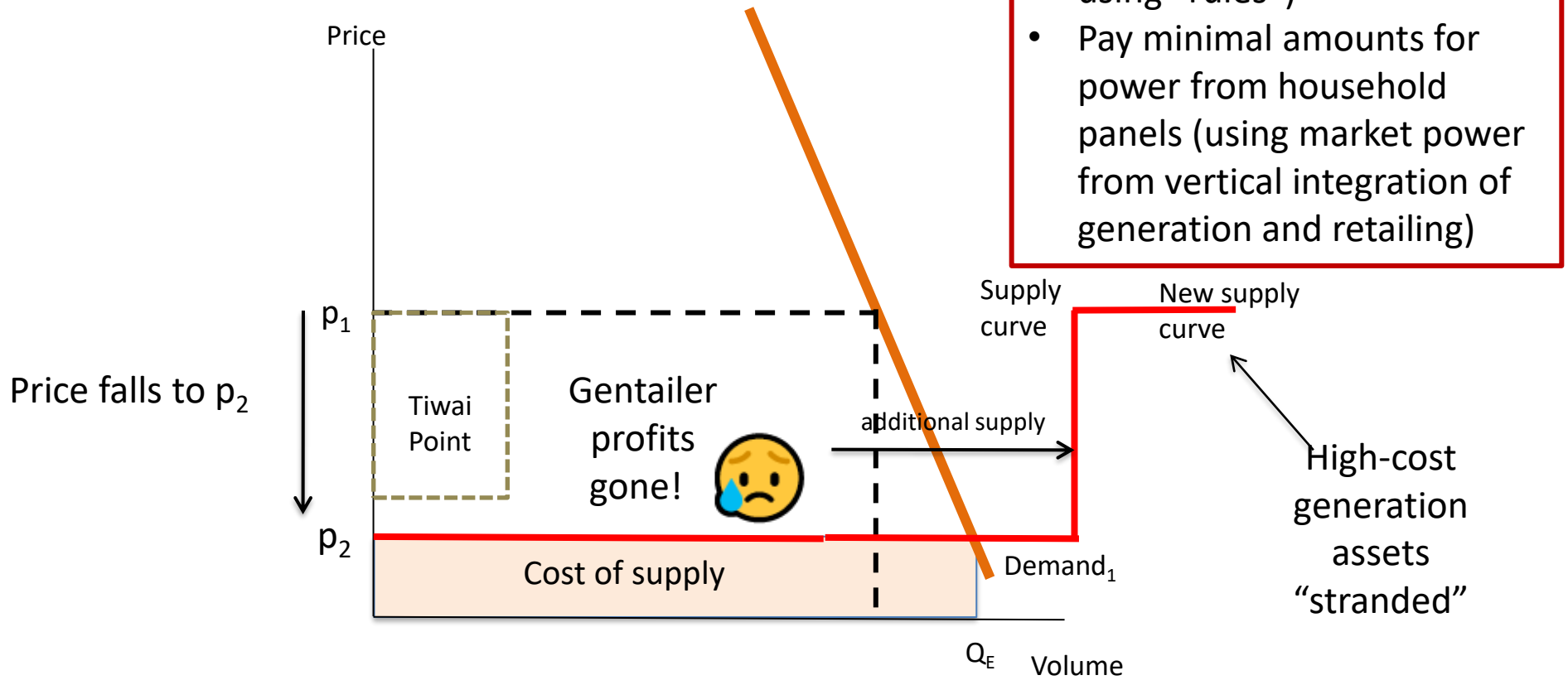
2. Suppose heaps of households install rooftop solar..



2. Suppose heaps of households install rooftop solar..

How to prevent or limit the supply shock:

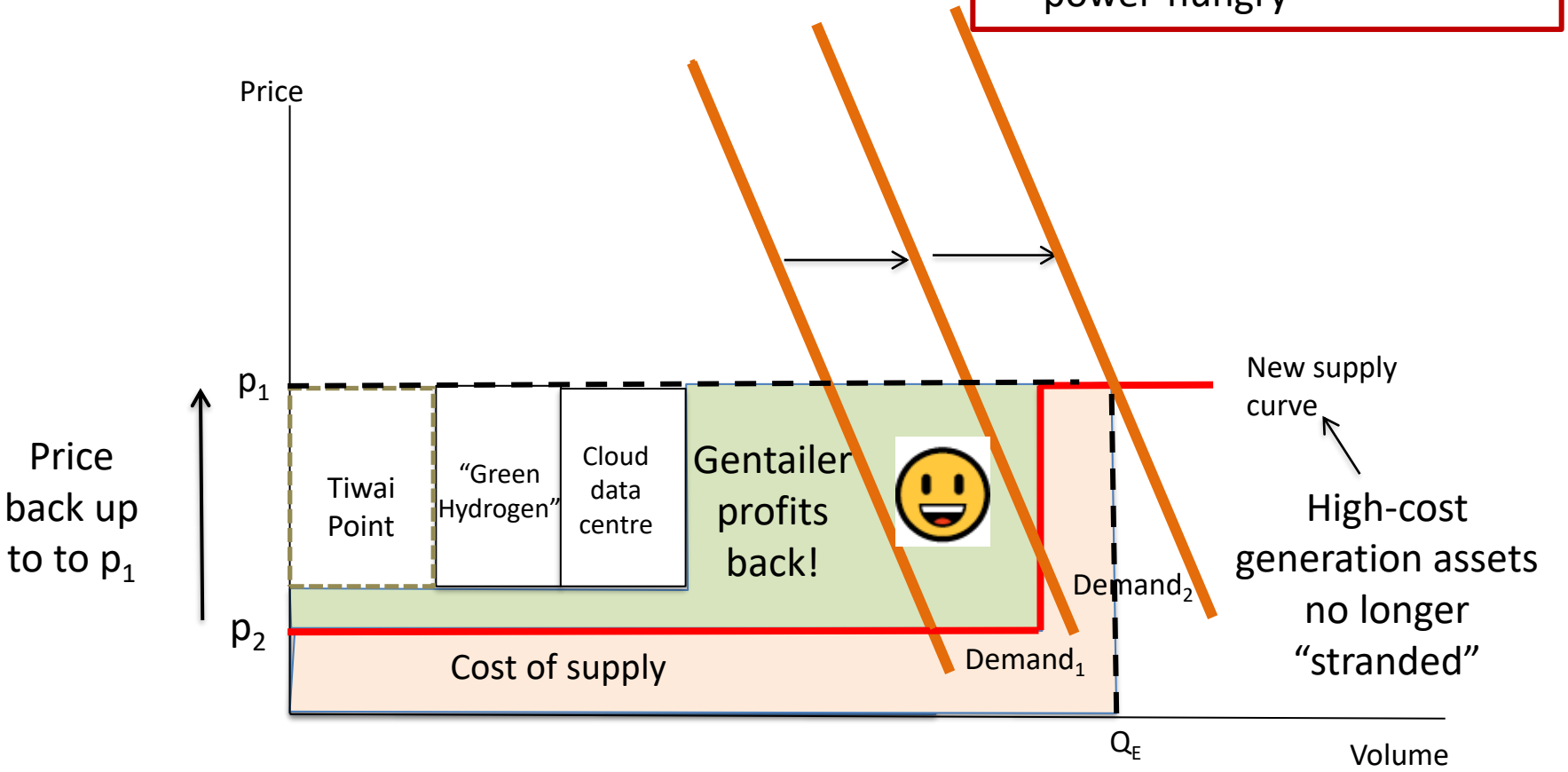
- make it really hard for distributed renewables to get connected to users (regulatory obstruction using "rules")
- Pay minimal amounts for power from household panels (using market power from vertical integration of generation and retailing)



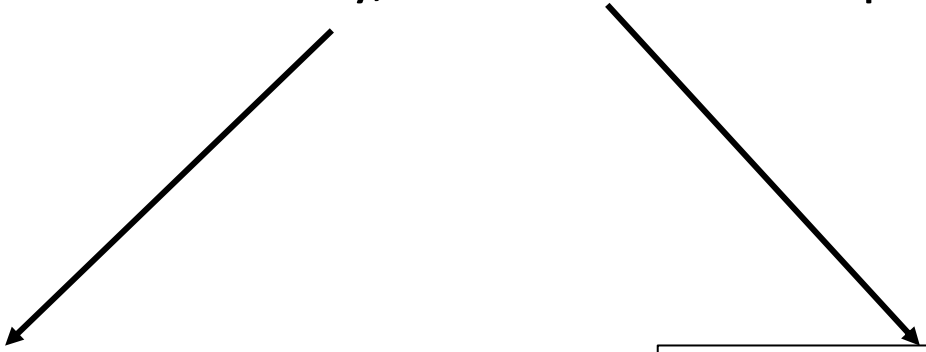
2. Suppose heaps of households install rooftop solar..

How to counteract the supply shock create a demand shock:

- Sign up hydrogen plants, cloud data centres, anything power-hungry



So core strategy for Contact, Meridian, Mercury, Genesis and Trustpower is:

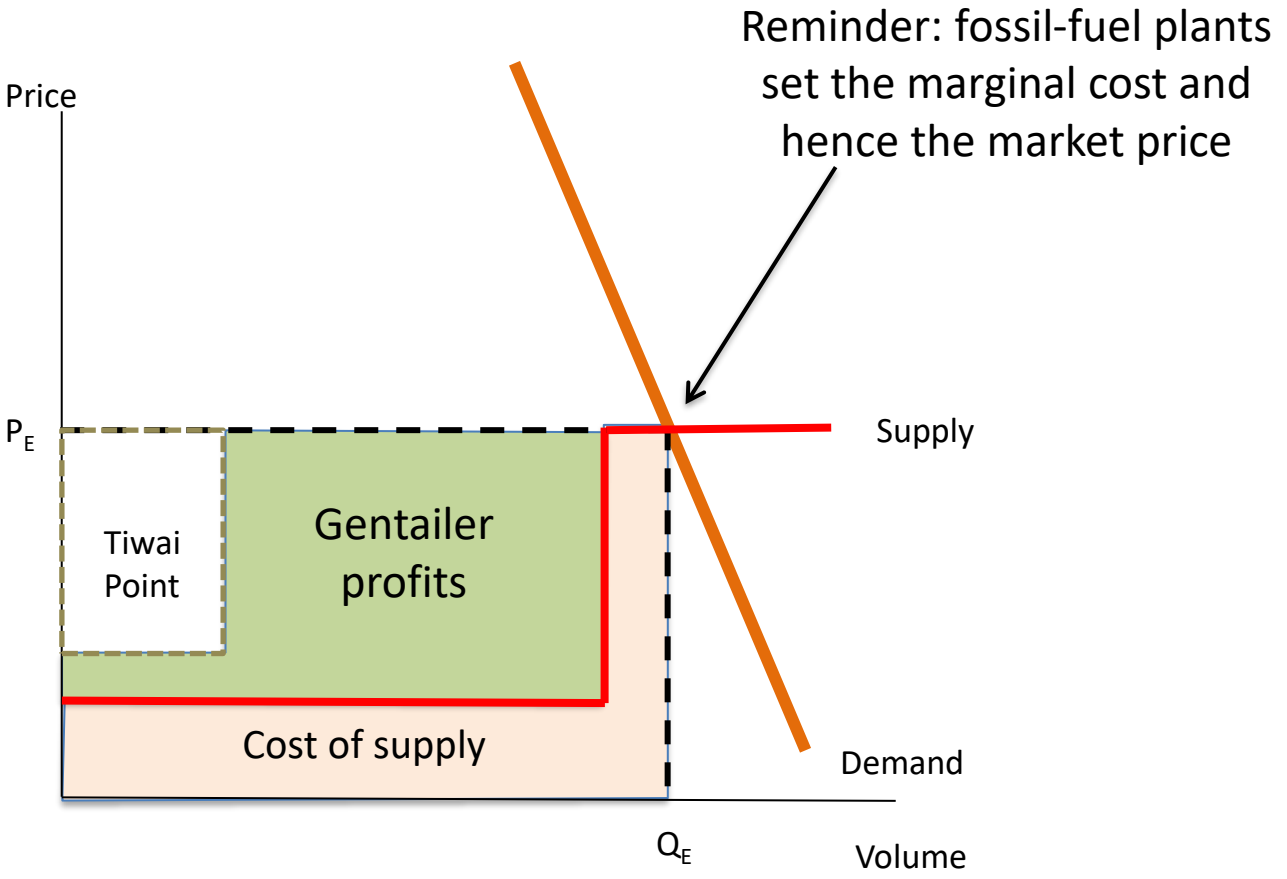


Keep demand up
(keep the Tiwai Point smelter open!)
(or have a huge hydrogen plant built!)
(or anything!)

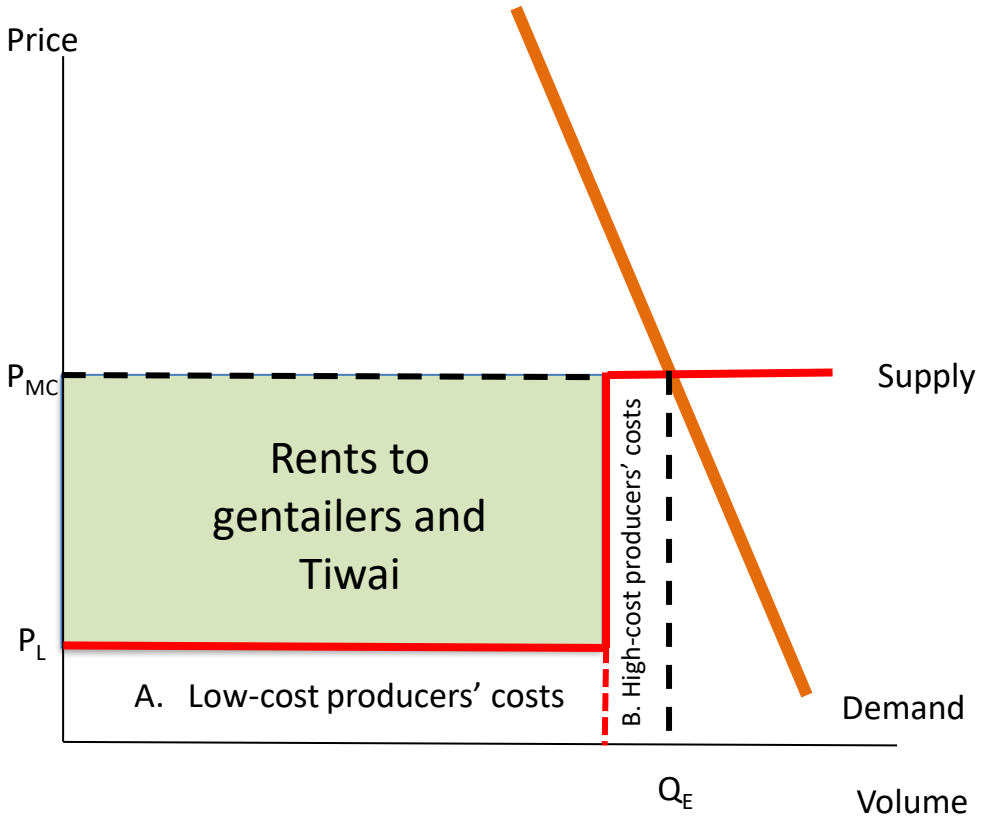
Keep supply constrained
(don't build too many windfarms, and block rooftop solar if possible

Turn now to carbon charges and the price of renewable electricity

Here's the New Zealand wholesale electricity market again:

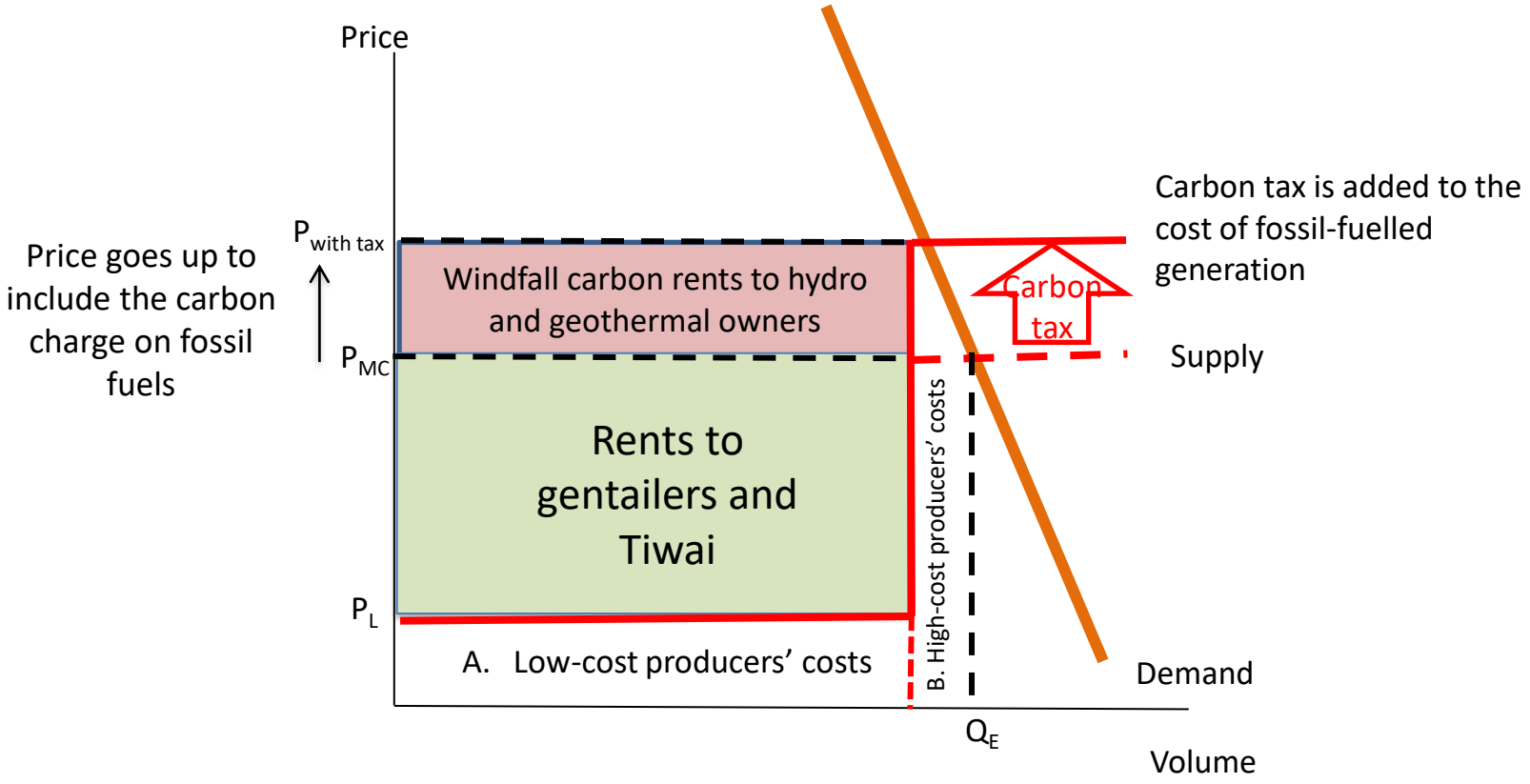


Now impose a carbon charge on fossil-fuel generation



Now impose a carbon charge on fossil-fuel generation

That's a major disincentive to electrification of the wider economy, which gets worse as the carbon price increases



So who saw that carbon-price-driven-price hike coming?

- Answer: the big corporate electricity users, right back in 2008 when the NZETS started up
- Their solution: get the Government to hand them out free carbon credits sufficient to offset to extra cost of using electricity when the carbon price went up
- The scheme is called the Electricity Allocation Factor
- Government agreed and since 2010 has handed out the free credits each year even though the carbon price did not go up as much as was expected => yet another corporate windfall at the expense of the rest of the population

"An emissions cost increases the variable (or short-run) costs of all generating stations that are greenhouse gas emitters. In a competitive market, all such emitting stations will attempt to increase the price of their offers into the spot market to recover that cost. If one of these emitting stations is the marginal plant called to operate in any given half hour, then that offer price will be the price for the whole market for that half hour (ie, **non-emitting stations will also receive this price**).

An EAF was **first developed in 2009** and was included in Cabinet decisions on industrial allocation levels in 2010." *[Emphasis added GB]*

Ministry for the Environment *The New Zealand Emissions Trading Scheme: modelling the electricity allocation factor – Issues Paper* November 2019
https://environment.govt.nz/assets/Publications/Files/modelling-eaf-issues-paper.pdf
p.5.

“The indirect cost of the NZ ETS passed on by electricity generators affects operating costs for these eligible activities. The impact of the NZ ETS on electricity prices is measured by the electricity allocation factor (EAF)… Currently about one third of all industrial [free] allocation [of emission permits] is attributable to the cost of electricity. The EAF is the means by which the electricity costs can be considered in setting allocative baselines….

It is calculated as shown below, where the prices used are load-weighted means calculated over any required period:

$$EAF = \frac{Electricity\ price\ with\ ETS - Electricity\ price\ without\ ETS}{NZU\ price}$$

Regulatory Impact Statement: Updating the electricity allocation factor used in the NZ ETS 28 July 2021
https://environment.govt.nz/assets/publications/ris-updating-the-electricity-allocation-factor-used-in-the-nz-ets.pdf

The EAF is used to calculate free allocations of NZUs to eligible activities that are emissions-intensive and export-exposed (EITE). The EAF is stated in clause 6 of the Climate Change (Eligible Industrial Activities) Regulations 2010 and currently its value is 0.537 tCO2/MWh. **This number is a key parameter used in calculating the free allocation of approximately 2.9 million NZUs to EITE industries, currently valued at around $70 million per annum.**

Energy Link, *Electricity Allocation Factor Review Background Information June 2019,* https://environment.govt.nz/assets/Publications/Files/eaf-review-background-information-report.pdf p.1.

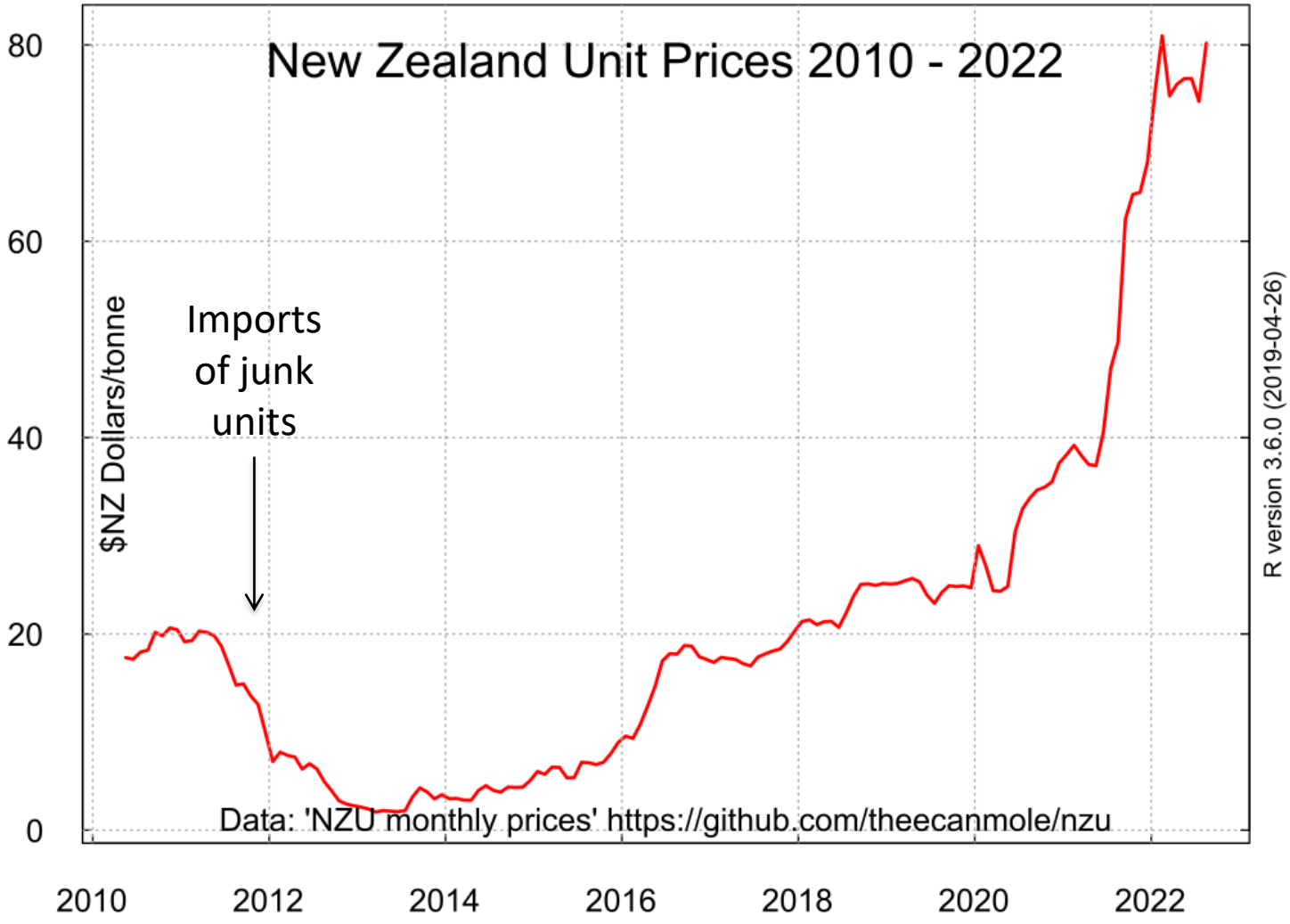
A quick rough look at who got the EAF benefits in 2020…

Final Allocation Decisions

Environmental Protection Authority
Te Mana Rauhi Taiao

Activity	Applicant's name	2020 allocation	Value at $25 price in $m	One third of that $m
Iron and steel manufacturing from iron sand	New Zealand Steel Development Limited	2,030,166	50.8	16.9
Aluminium smelting	New Zealand Aluminium Smelters Limited	1,558,268	39.0	13.0
Methanol	Methanex New Zealand Ltd	1,181,995	29.5	9.8
Cementitious products	Fletcher Concrete and Infrastructure Limited	640,351	16.0	5.3
Carbamide (urea)	Ballance Agri-Nutrients (Kapuni) Limited	349,257	8.7	2.9
Market pulp	Oji Fibre Solutions (NZ) Limited	278,907	7.0	2.3
Packaging and industrial paper	Oji Fibre Solutions (NZ) Limited	260,505	6.5	2.2
Market pulp	Pan Pac Forest Products Limited	212,436	5.3	1.8
Newsprint	Norske Skog Tasman Ltd	202,858	5.1	1.7
Market pulp	Winstone Pulp International Limited	171,889	4.3	1.4
Cartonboard	Whakatane Mill Limited	169,786	4.2	1.4
Burnt lime	Graymont (NZ) Limited	145,002	3.6	1.2
Glass containers	ACI OPERATIONS NZ LIMITED	65,621	1.6	0.5
Lactose	Fonterra Limited	53,229	1.3	0.4
Another 64 recipients		395,452	9.9	3.3
TOTAL		**7,715,722**	**193**	**64.3**

https://www.epa.govt.nz/assets/Uploads/Documents/Emissions-Trading-Scheme/Reports/Industrial-Allocations/Industrial-Allocations-Final-Decisions.xlsx downloaded 25 August 2022.



https://en.wikipedia.org/wiki/New_Zealand_Emissions_Trading_Scheme#/media/File:NZU-NZ-emission-unit-720by540.svg at 25 August 2022

The electricity industry's central strategic goal: maximize electricity demand while blocking the path to 100% renewables

- So long as fossil fuels stay in the mix, they are at the wholesale market margin and so set the spot price way above the supply cost of hydro, geothermal and wind
- So long as fossil fuels are on the margin, every increase in the carbon price - whether via the ETS or otherwise - pushes up the price of all electricity, including renewables
- That means wealth transfers to the gentailers as other desperate policy measures drive electrification against the electricity-pricing tide
- The commercial (as distinct from lifetyle) viability of small-scale distributed generation such as rooftop solar and small windfarms is quite sensitive to the price structure facing households: removing the low-fixed-charge regulation was a quick way to make rooftop solar less economic.
- A big threat to gentailer profits is the huge potential wind resource, but the gentailer cartel has locked up and "banked" the best sites (plus several hydro options)
- Without institutional change, Government policy is hostage to the cartel's stranglehold

Two key problems preventing a well-being-focused policy response

1. The electricity industry structure is firmly entrenched by legislation passed by our Parliament over the three decades:
   - Commerce Act 1986
   - SOE Act 1986
   - Energy Companies Act 1992
   - Energy Industry Reform Act 1998
   - Commerce Amendment Act 2008
   - Electricity Act 2010

2. The Government's fiscal surplus depends heavily on a continued flow of profits and taxes from the electricity industry

Some policy implications?

- Tell Tiwai Point to pay market price or get lost
- Don’t approve huge new cheap contracts for big power-hungry corporates (especially transnationals) to replace the smelter just to keep Huntly running
- Revoke the lines-energy split at retail level to allow local Electricity Supply Authorities to be reconstituted to run local pools, build renewable generation, and act as buyers/traders/coordinators/brokers for rooftop solar etc

What in general is to be done? Part 1

- Reclaim electricity as an essential service and a "commanding height" of the economy, to be controlled by the people for the people and given a central role in driving the economy to zero carbon
- Scrap the profit-driven market model, re-nationalise the big hydro assets, re-integrate the generation and transmission sectors under efficient planning, return local networks to local control and take the shackles off their ability to build and operate distributed generation, drop the charade of "what's my number" retail "competition"
- Establish a mechanism to install reserve generating capacity on the market margin without requiring all prices to rise to long-run marginal cost. E.g. contract for reserve capacity as such, or build (or buy up) reserve capacity owned by the state to backstop predominantly low-priced renewable supply
- Instantly get rid of the perverse flow-through from carbon price to renewable price and rents
- At retail level, rebalance prices so that household prices come back down from their current heights, as
  1. rents and excess profits are stripped out of the supply chain;
  2. industrial and commercial users pick up a bigger share of whatever supply-cost burden remains

  ⇒ Either regulate household prices down, or have a state-owned retailer competing with the other retailers and providing a low-priced option, or go back to community-owned local not-for-profit retailers alongside independents, all with access to bulk contracted supplies of cheap hydro
- Make net metering mandatory with generous feed-in tariffs to allow small independent suppliers of distributed renewable electricity such as rooftop solar a share of the market and a role as disruptor of incumbents' market power

What less ambitious things could be done? Part 2

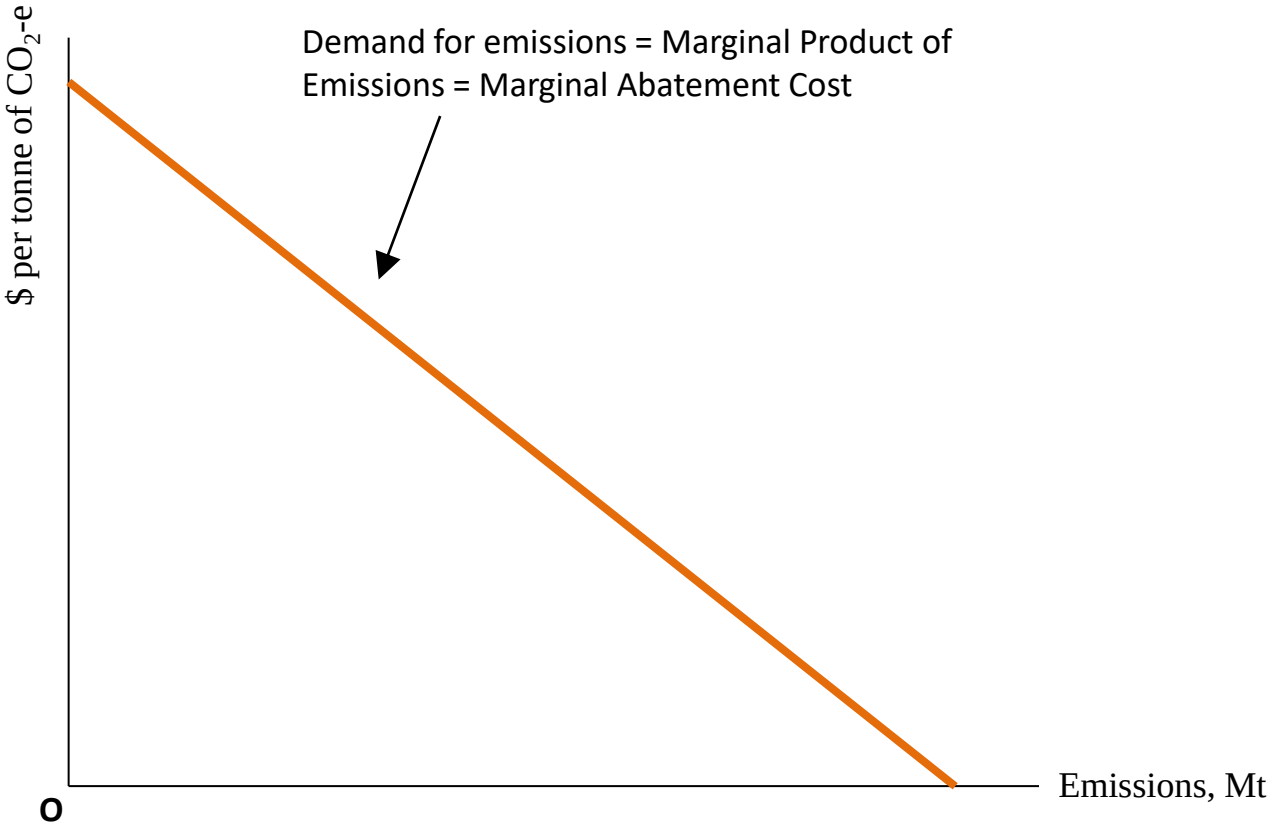
- Break up the gentailers by forcing divestment of their retail operations
- Abolish the lines/energy split at distribution level to allow local community-focused energy operations to emerge with secure access to distribution networks and retail customers
- Abolish the limit (or impose a less restrictive limit) on local lines operators' investment in distributed generation
- Amend the ETS to allow renewables to bring down the electricity price
- Overhaul the Commerce Commission's approach to lines company regulation by switching it from a floor price to a ceiling price, and with a ruthlessly sinking ceiling. Even better, immediately take the ratebase back down to historic cost.
- Amend s.52A of the Commerce Act 1986 to prescribe elimination, not just token "limitation", of excess profits
- Give the Electricity Authority explicit instructions to genuinely advance the interests of consumers and make sure it gets cracking
- Install a single buyer or similar mechanism in the wholesale market and compel generators to offer arms-length hedge contracts
- Open the way for local electricity pooling (e.g. rooftop solar with battery backup on a community scale) with a workable boundary interface with the grid, including net metering
- ….. and plenty more…….

Some immediate policy suggestions

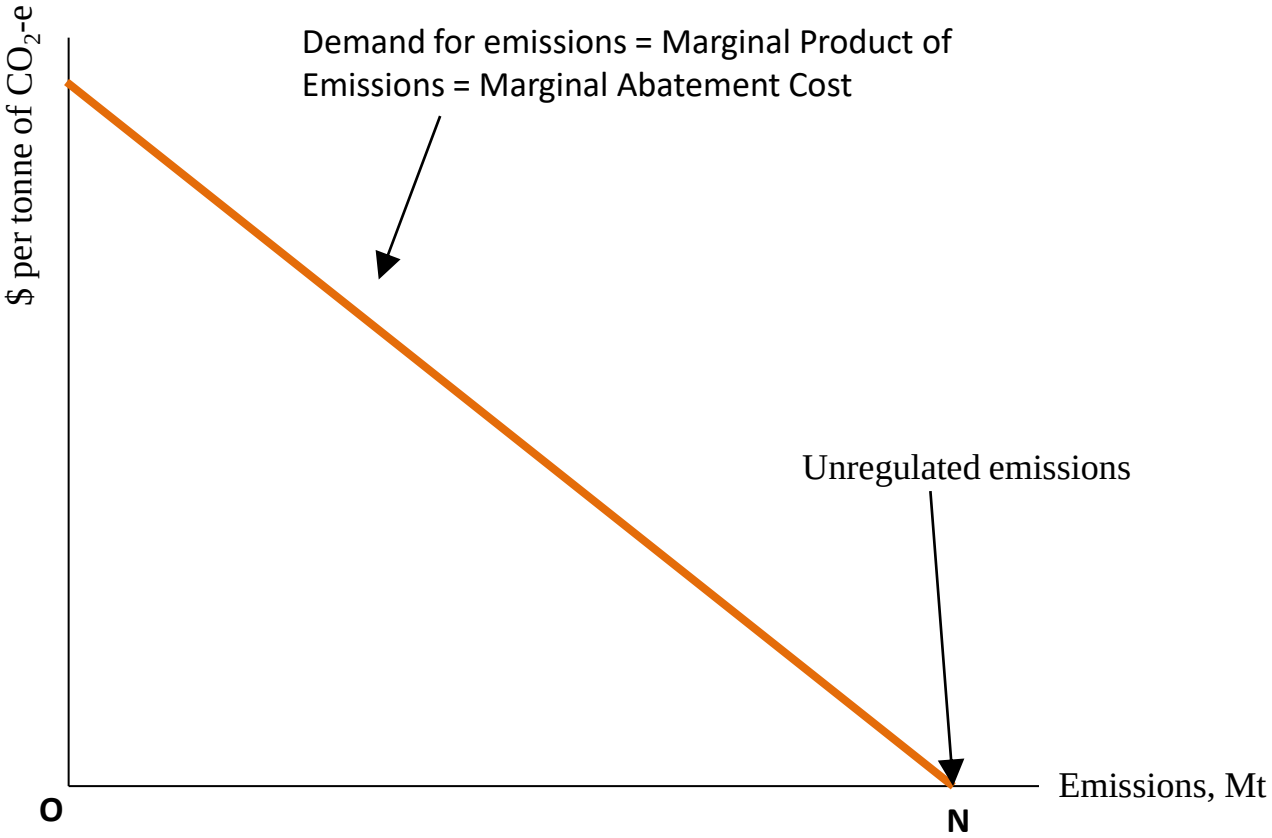
- Get distributed renewables online as fast as possible to drive fossil fuels right out of the electricity generation mix
- Impose low-price contracts on established hydro generators (effectively tax away their rents)
- More fundamental: get ready to renationalise hydro into a single integrated operation and use it to counterbalance intermittent renewables – especially if in the meantime you have got local energy pools/networks going
- Even more fundamental: plan to re-integrate large hydro and geothermal generation with the Transpower grid to hold final price down while covering all costs

Economics of emissions reduction

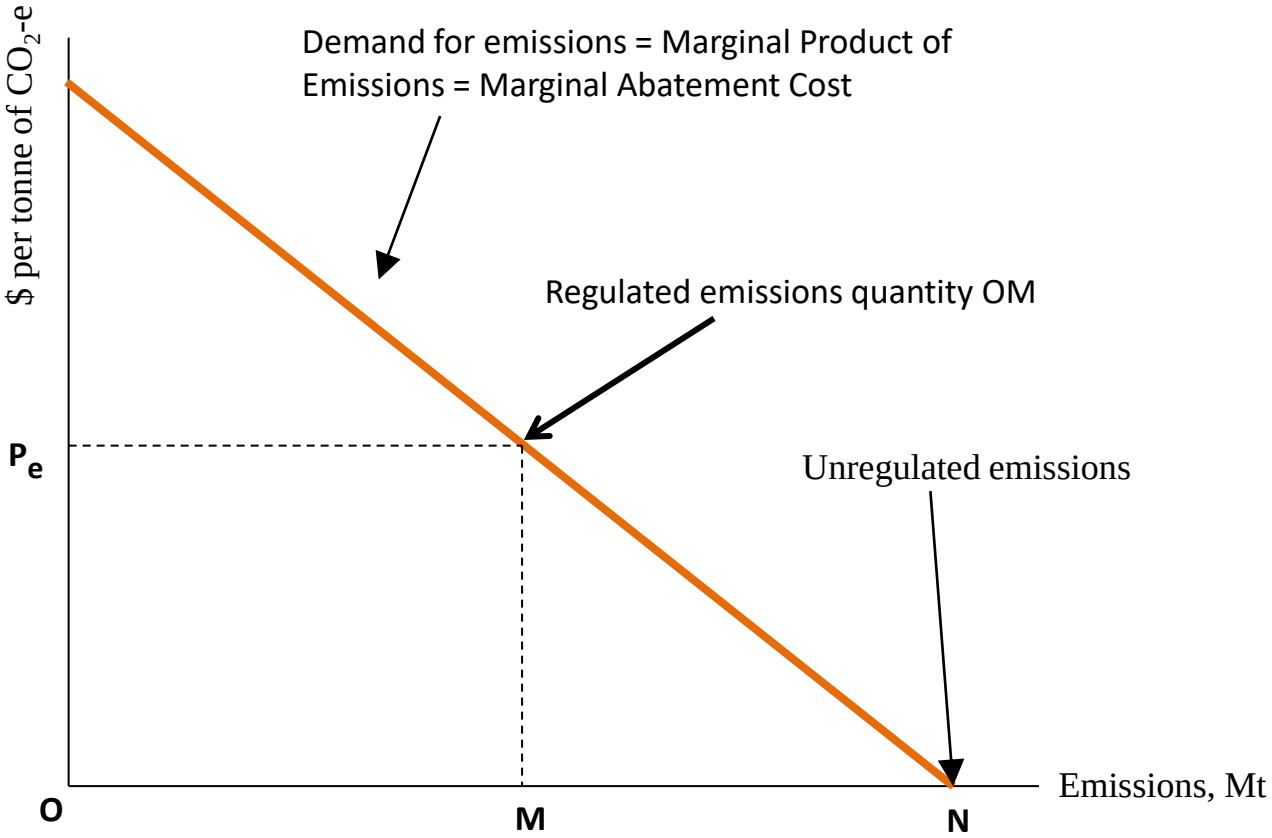
The “carbon market”



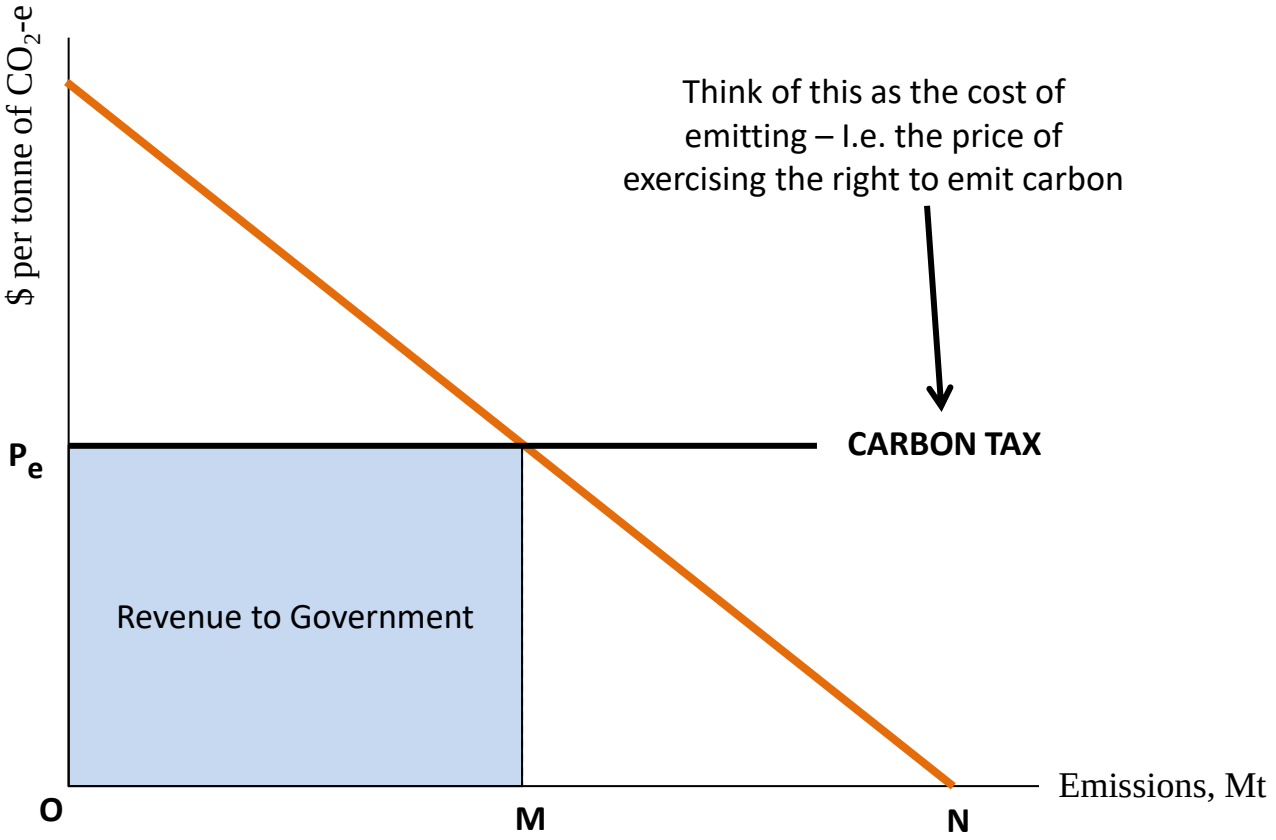
With emissions unpriced, the economy emits ON



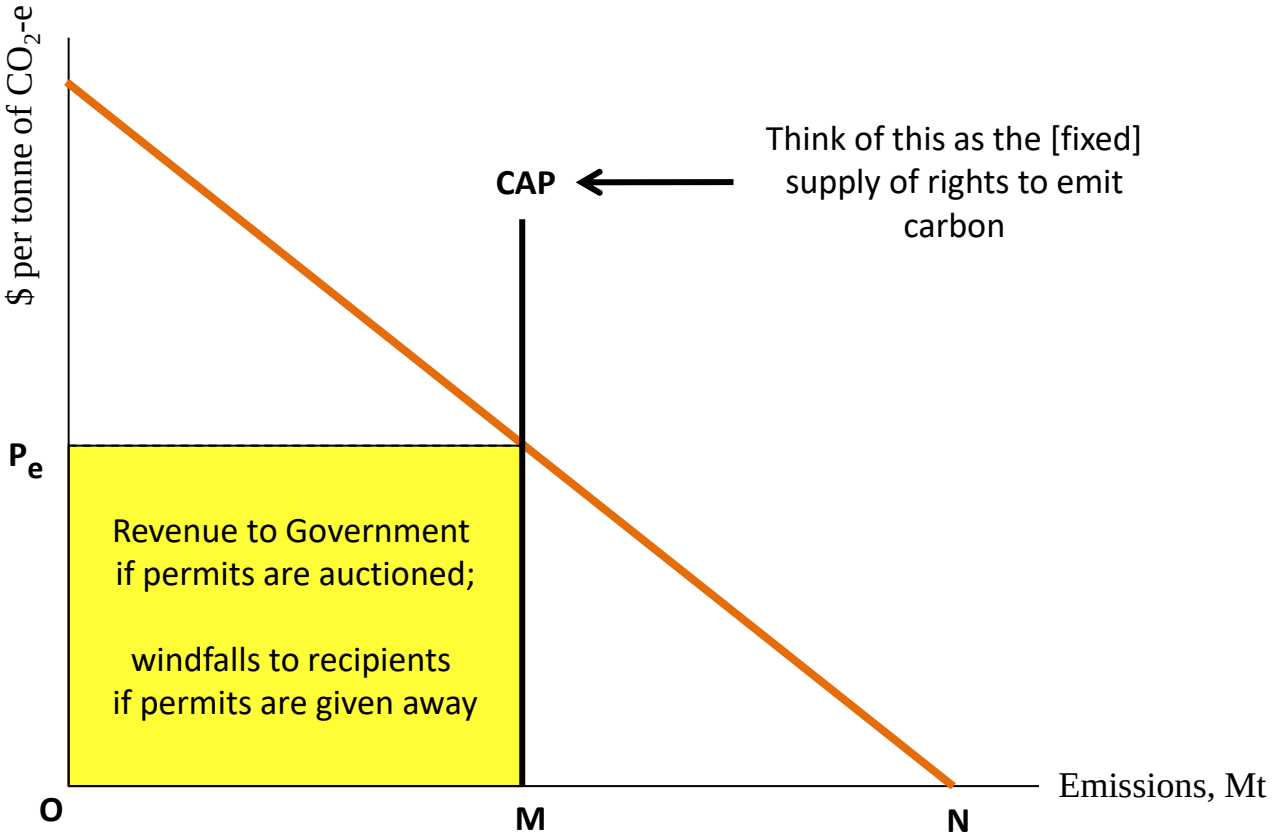
If the price of emissions rises to P_e then the quantity [eventually] falls to OM and the emissions reduction ("abatement" or "mitigation") is MN



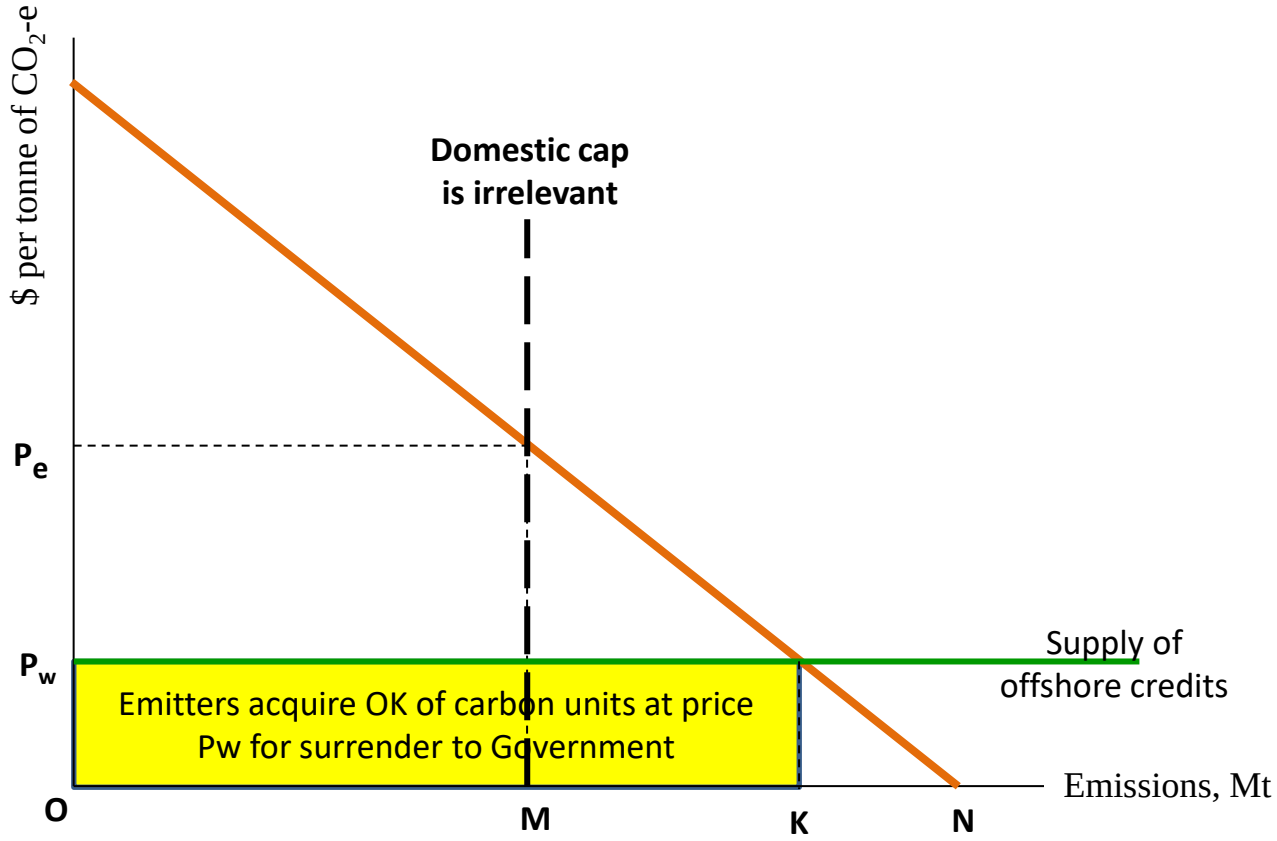
One way of doing it: a carbon tax of P_e would lead to MN of abatement



Or the Government could impose a cap at M, issue permits, allow trading, and the carbon price would be bid up to P_e



With international emissions trading there is neither a cap nor a locally-set price



The ETS: If open to imported units, the NZU price can't go above the world price of credits

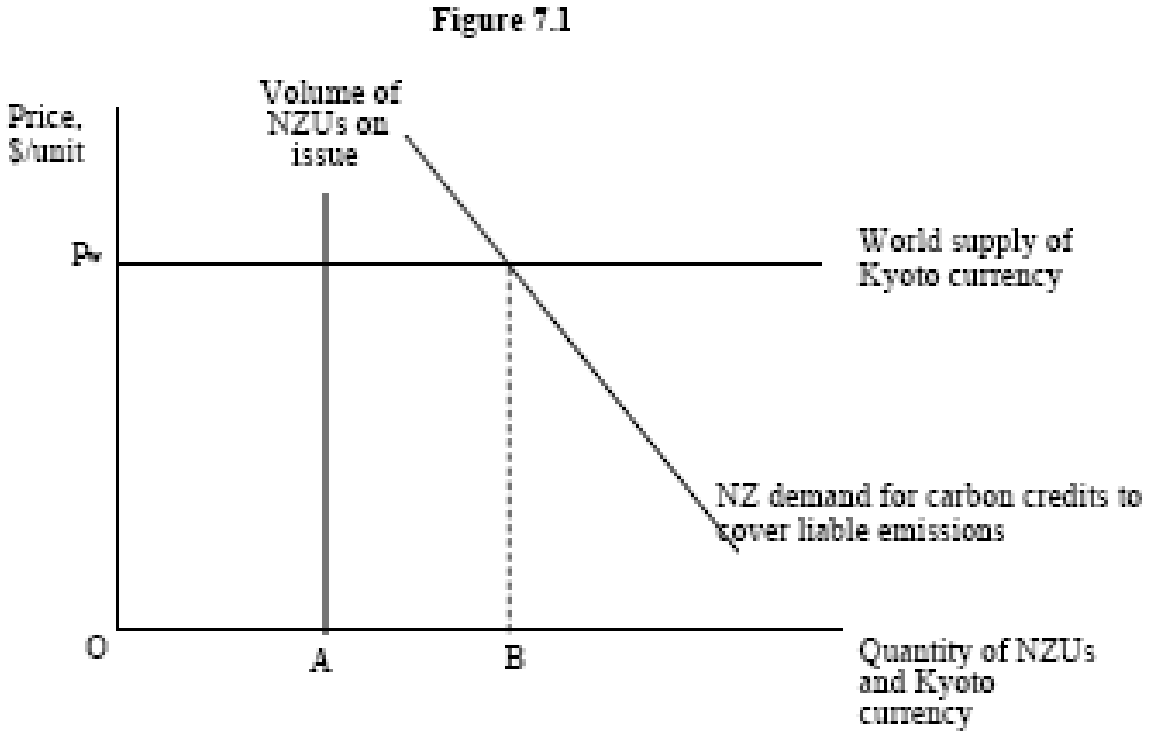
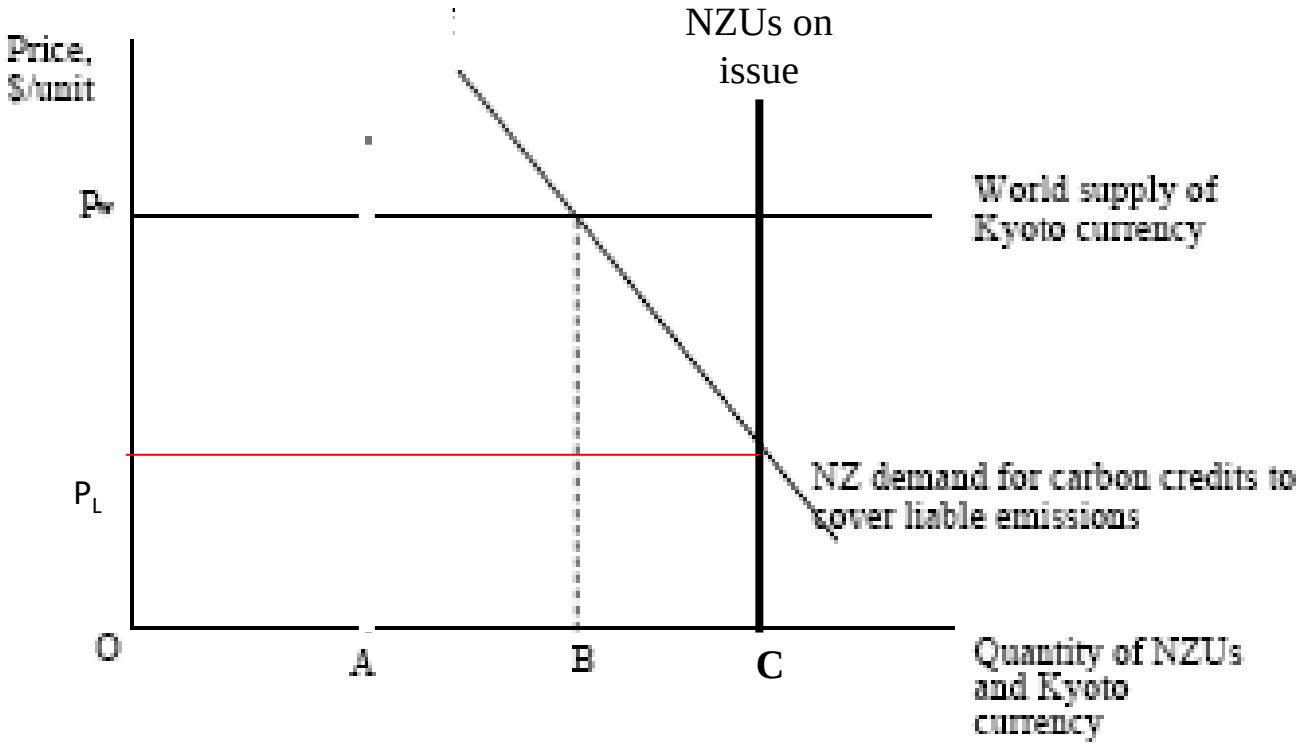


Diagram from Geoff Bertram and Simon Terry *The Carbon Challenge,* 2010, p.122.

But the carbon price could go lower if enough NZUs are issued: like any paper currency, the NZU is subject to inflation/devaluation if over-issued

Figure 7.1 with over-issue



Under the NZETS

- NZUs are issued free to corporate insiders (a) "to prevent carbon leakage" and (b) to compensate for any effect the ETS may have on the electricity price
- NZUs can be earned by forestry operations if the forest owner opts in, and these units can be sold into the market if the owner chooses not to bank them
- Banked NZUs can be used to cover current emissions (there is currently a substantial stockpile - about 120-150 million units* - of banked units from past over-issuing and dirty-air imports)
- Offshore carbon credits can be imported and used to cover local emissions whenever the Minister authorises this (by getting an Order in Council)
- The quantity of NZUs released for auction by Government remains at the whim of politicians subject to corporate capture (lots of ministerial discretion in the Zero Carbon Act). (The Government's emissions budgets are just "aspirational" Minister Shaw says)

* Figure from Ernst Young, *NZ ETS prices: Don't bank on the bull run continuing* February 2022 https://www.ey.com/en_nz/sustainability/nz-ets-prices-dont-bank-on-the-bull-run-continuing p.1, and Mark Daalder, ***Climate targets at risk if carbon market isn't fixed***, *Newsroom* 28 July 2022

Some history

Ernst Young, *NZ ETS prices: Don't bank on the bull run continuing* February 2022
https://www.ey.com/en_nz/sustainability/nz-ets-prices-dont-bank-on-the-bull-run-continuing p.2:

We have broken the NZU pricing history into three periods in which different drivers were in play:

- **International carbon pricing influence (2008-2015)**
  Over this period, the prices for international units within the Kyoto marketplace were the most influential drivers of the NZU price. This is because NZ ETS participants could use these international units for all/any of their compliance needs. This period only ended when the NZ Government decided to de-link the NZ ETS from these overseas markets.
- **Fixed price option influence (2015-2020)**
  Once the NZ ETS was de-linked from international markets, demand arising from NZ ETS compliance requirements could only be met by the purchase of NZUs. This change, along with a package of other domestic changes (such as the removal of the one-for-two provision) increased the demand and consequently the price of NZUs. Once prices hit the $25 fixed price option (FPO), more supply was available, and prices stabilised around this level. The FPO was increased to $35 for 2020, which was the last year that it was available.
- **Post NZ ETS reform pricing (2020-present)**
  The passing of the Emissions Trading Reform Amendment Bill in the middle of 2020 signalled the beginning of the most recent phase of NZU pricing. These reforms introduced a cap on emissions within the NZ ETS, planned reductions of this cap to ensure alignment with the government's emission budgets, and an auction platform to align the supply of NZUs with the target. Together, these new features of the NZ ETS are designed to align the supply of NZUs with our emission reduction targets over time.

The crucial missing ingredient is certainty

- Section 30GB of the Climate Change Response Act covers the making of regulations about the quantity of NZUs on issue and the price at which they can trade
- Until you know the regulations you won't know how many NZUs and offshore units will be circulating, so the market price will be uncertain
- Until regulations about imported units are known, the total allowed emissions quantity is unknown
- The regulations set a price ceiling ("trigger price") at which a "cost control reserve" amount of NZUs will be dumped into the market – but the ceiling lacks credibility. The 2020 trigger price was $50; the 2022 one is $70; the 2023 one is $78.40.
- There is no enforcement mechanism for the trigger price apart from flooding the market with extra units, which means the NZU issue volume is uncertain
- The price yesterday was $85.70

From my submission to the Select Committee on the Climate Change Amendment Bill back in 2020:

"The amended ETS legislation "leaves uncertain the extent to which domestic emission targets can be overridden at any stage by allowing the importing of emission credits. It fails to clarify whether the carbon price in the local market is to be (i) the marginal cost of domestic abatement [at the emission budget], or (ii) determined by some external carbon price in a process of arbitrage via cross-border trading, or (iii) just some politically determined "trigger" price. …

"The mere existence of the "cost containment reserve" provisions in the Bill destroys at one stroke the credibility of both notional emission targets and expectations of linkage between local and overseas carbon prices. The only "certainty" that is conferred by clause 30GB of the Bill is the certainty for large and powerful vested interests that the NZETS will continue to be subject to political manipulation, and hence to capture by those same rent-seeking large corporate interests, which have hitherto held the scheme captive to their interests."

And some more from 2020's submission:

"The NZU is basically a voucher that entitles its holder to cover, by surrender to the Government, whatever the implicit per-unit emission tax turns out to be in each period. By issuing large numbers of these vouchers free of charge to politically-influential insiders, the New Zealand Government in effect pays them to pollute. By allowing the vouchers to be carried over to future periods in an environment of price uncertainty, the Government makes them objects of financial speculation and market manipulation for capital gain. Having allowed NZU vouchers to be accumulated while emissions were covered by imported junk units, the Government is now faced with a large stock of 'banked' NZUs overhanging the market for the next few years."

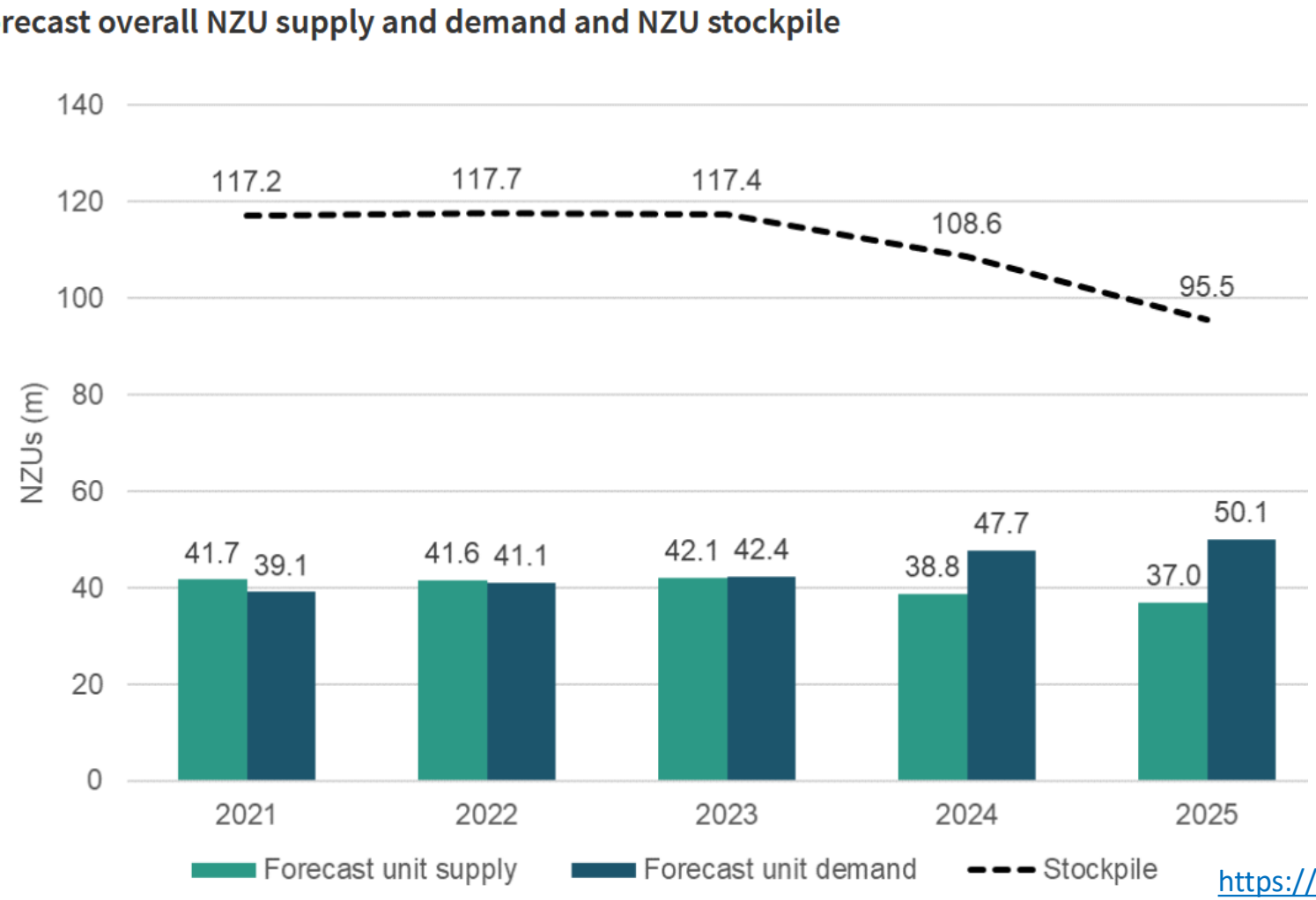
Low credibility of the NZETS “cap”

“As it stands, the Government was planning to auction 68.1 million units between 2023 and 2026. Now, the commission says, it should reduce that to 58.1 million units. An extra reserve of units in the cost containment reserve, which opens up if auction prices rise too high, will also become less accessible. The cost containment reserve will trigger next year if the auction price rises above $78.40, releasing up to seven million extra units into the market.

Over the course of the last National government, the ETS was gutted to allow unlimited numbers of bunk international units and cheap domestic units into polluters' vaults. Now the private stockpile consists of around 150 million units or four years of emissions from ETS sectors.

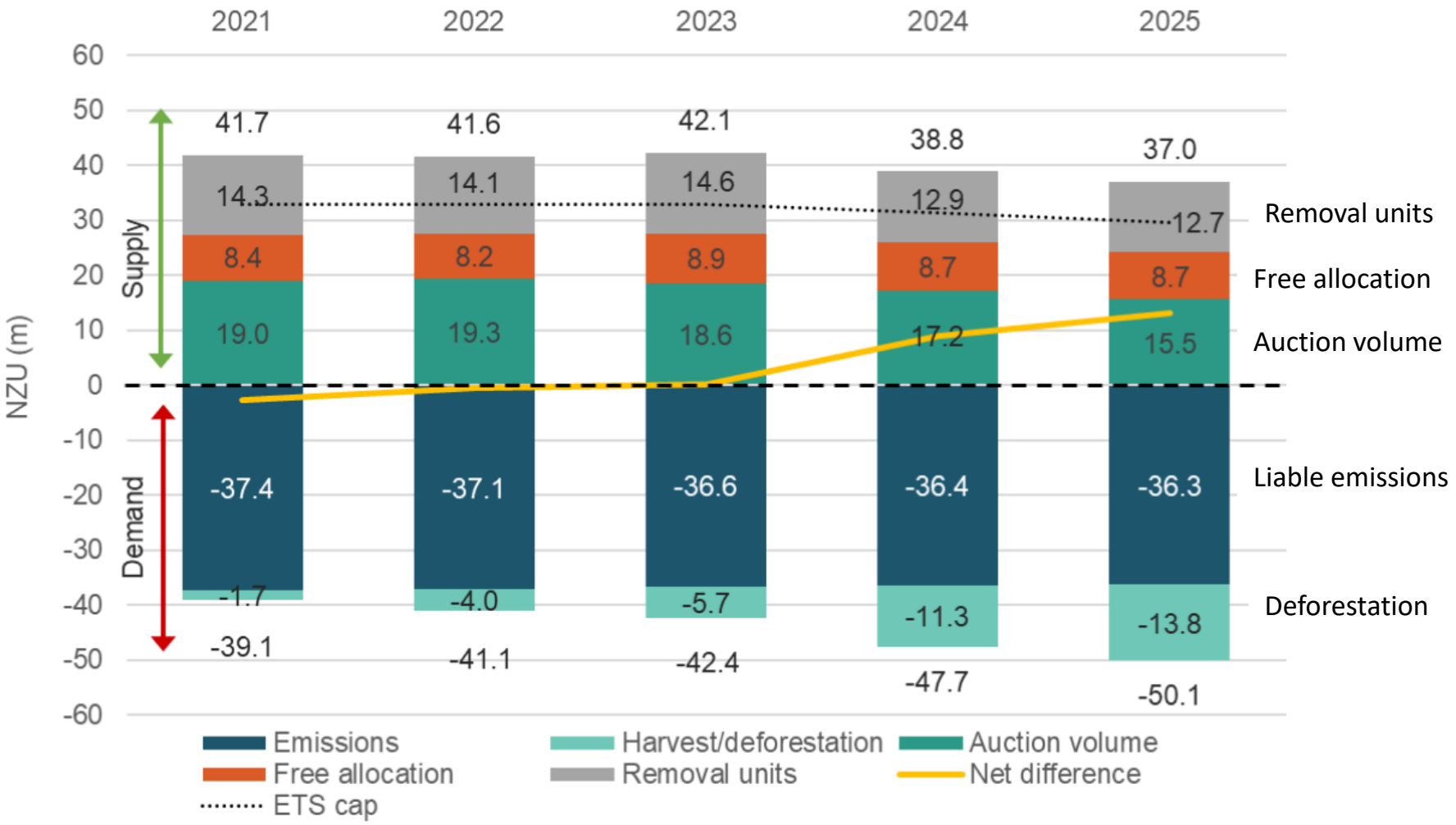
(Mark Daalder, **Climate targets at risk if carbon market isn’t fixed,** *Newsroom* 28 July 2022)

Official optimism about reducing the stockpile: last year



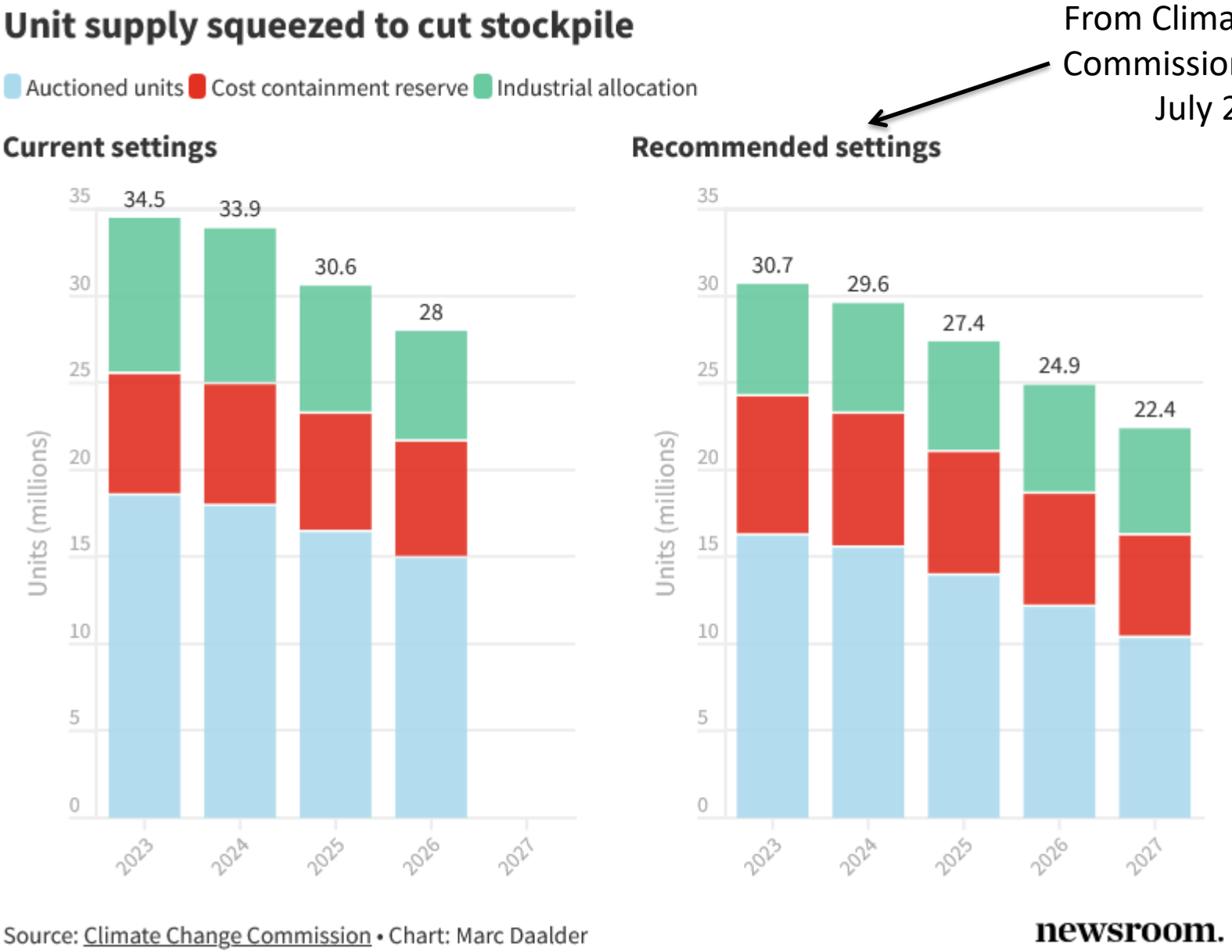
https://www.mfe.govt.nz/ets/market-info-portal

Breakdown of forecast NZU supply and demand

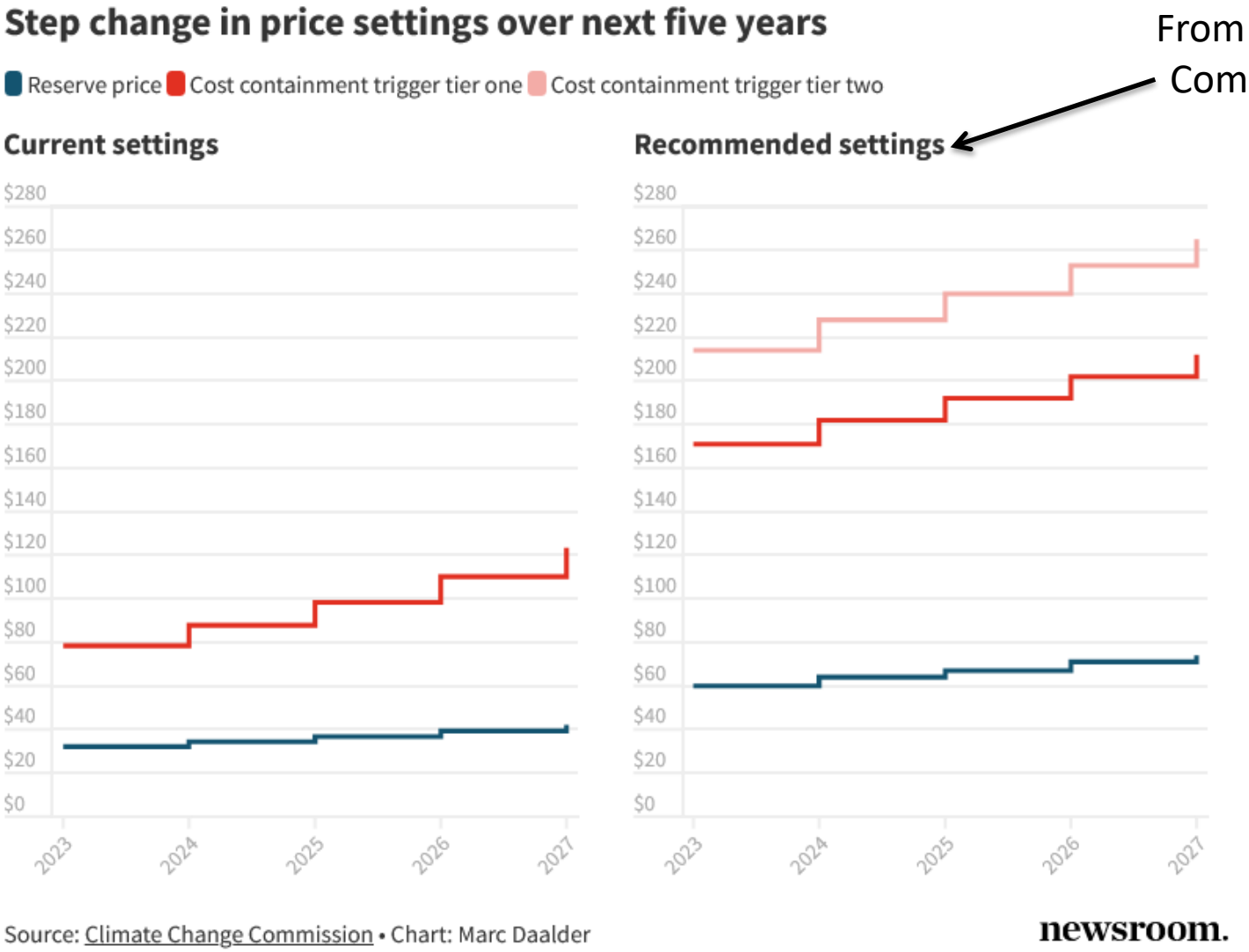


https://www.mfe.govt.nz/ets/market-info-portal

From Climate Change Commission report in July 2022



From a Climate Change Commission report in July 2022



(Mark Daalder, **Climate targets at risk if carbon market isn't fixed,** *Newsroom* 28 July 2022)

Ernst Young, *NZ ETS prices: Don't bank on the bull run continuing* February 2022
https://www.ey.com/en_nz/sustainability/nz-ets-prices-dont-bank-on-the-bull-run-continuing p.11:

The NZU stockpile and auction volume choices

While the Government is reducing auction volumes to try to bring the stockpile volume down, the Cost Containment Reserve (CCR) sales have so far disrupted these plans.

The auction volumes that were originally set by the Government over the 2021 to 2025 period were reduced by 5.4 million NZUs each year. This auction volume reduction had the objective of reducing the NZU stockpile volume in a stable, long-term manner. However, in 2021, all 7 million NZUs in the CCR were sold due to auction prices rising above $50, which was the CCR trigger price level. The overall impact of these two counteracting drivers was that 1.6 million additional NZUs were sold than would have been if aligned with the underlying emission budget target.

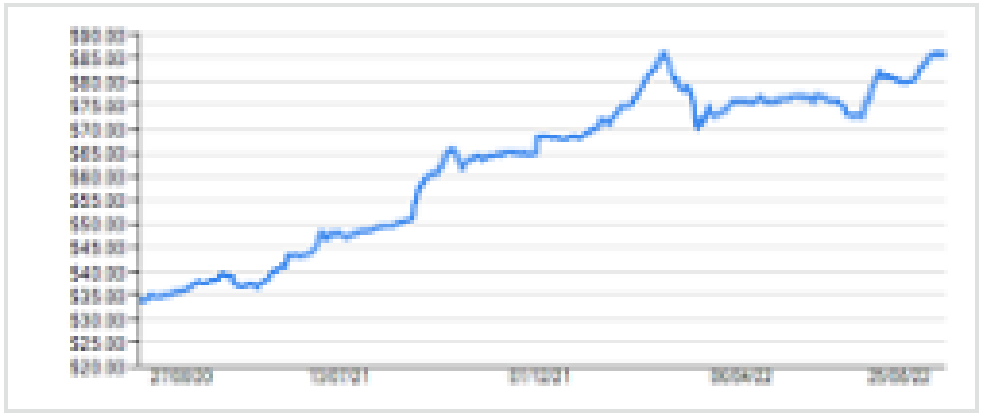
There is uncertainty about how the interplay between actions to reduce the auction volume and the CCR will impact the NZU stockpile volume going forward. Our analysis does not attempt to build scenarios for different outcomes in this area, but if NZU prices remain above the trigger price for 2022 ($70), then a similar volume-outcome to what was experienced in 2021 may be expected.

https://www.carbonnews.co.nz/tag.asp?tag=Carbon+prices at 26 August 2022

Carbon prices

MARKET LATEST: NZUs $85.70

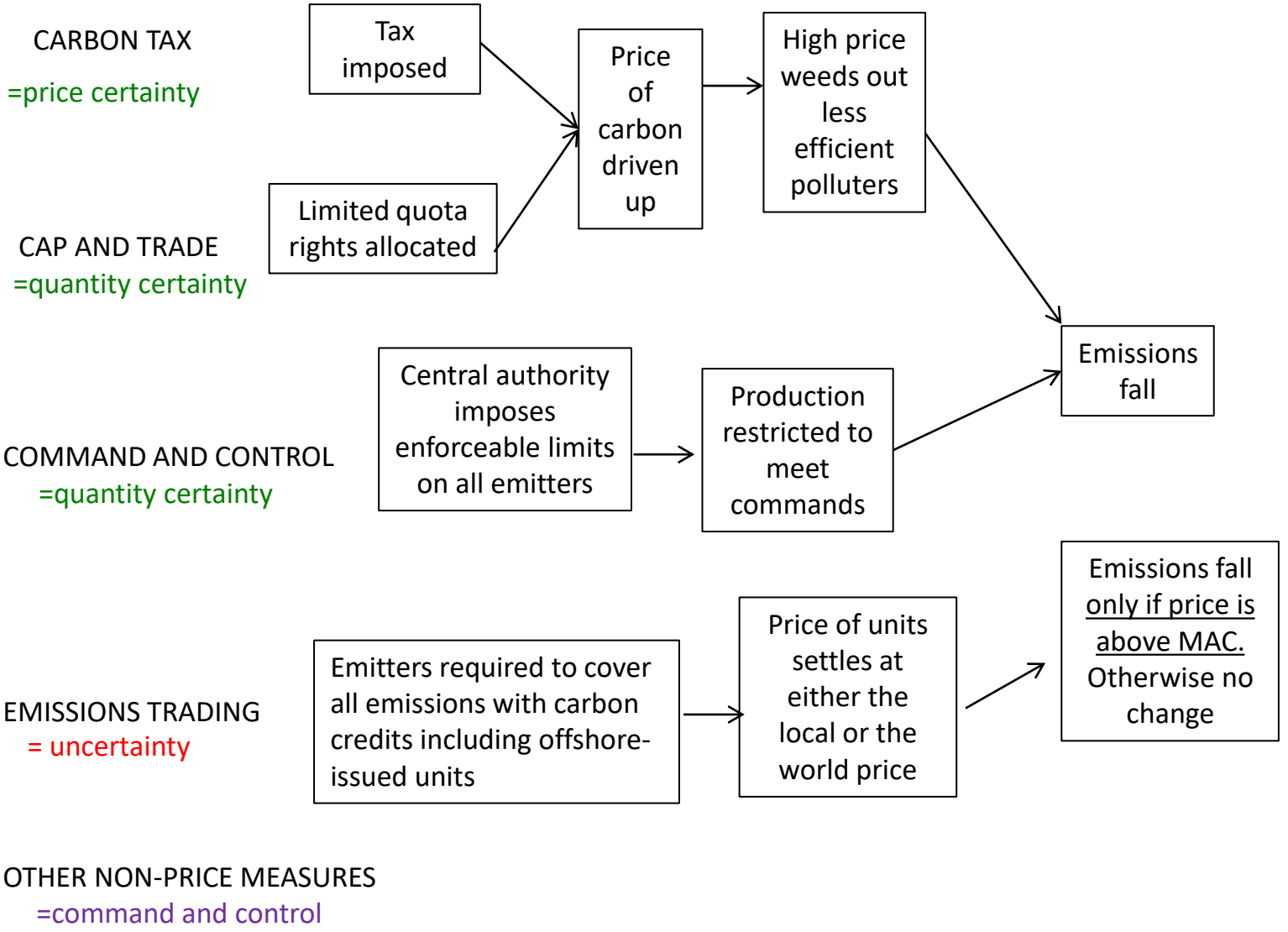
Today 11:00am – SPOT NZUs opened at $85.70 bid and $86.00 offered on CommTrade this morning, after last fixing at $85.70.



Ineffectual attempts to create certainty

- The ‘trigger price’ reflects Government’s terror of a high carbon price – but may not be sustainable in the face of market developments (cf the housing market 2000-2021)
- Promises to not allow too much importing of units can be broken at any time – e.g. after a change of government
- Leaving agriculture out is of uncertain credibility
- Forestry decisions and hence claims to earn NZUs are inherently hard to predict – and policy on forests keeps changing, partly because of the risk that so much will be planted that the NZETS will have no effect on actual emissions
- The future world price and availability of offshore credits is unknowable

Which brings me back to the choice of policy instrument



Why a carbon tax with border adjustments would have been the smart move (and still could be)

- The tax can be imposed across the entire economy with no exemptions and can be adjusted regularly as conditions change (cf the RBNZ's use of the OCR)

- Border adjustments mean that the carbon tax is automatically rebated on all export goods – just like GST - so no need to rush around arranging special deals for farmers, Tiwai Point, Carter Holt Harvey and all. That kills the "competitiveness at risk" argument for special favours

- The revenue can be recycled as a dividend to all households (a sort of Universal Basic Income) or can be hypothecated to funding green investments

- Certainty can be locked in if there's bipartisan support

- Harmonisation with other countries' carbon-tax regimes is straightforward and international commitments can be made (=> "carbon clubs")

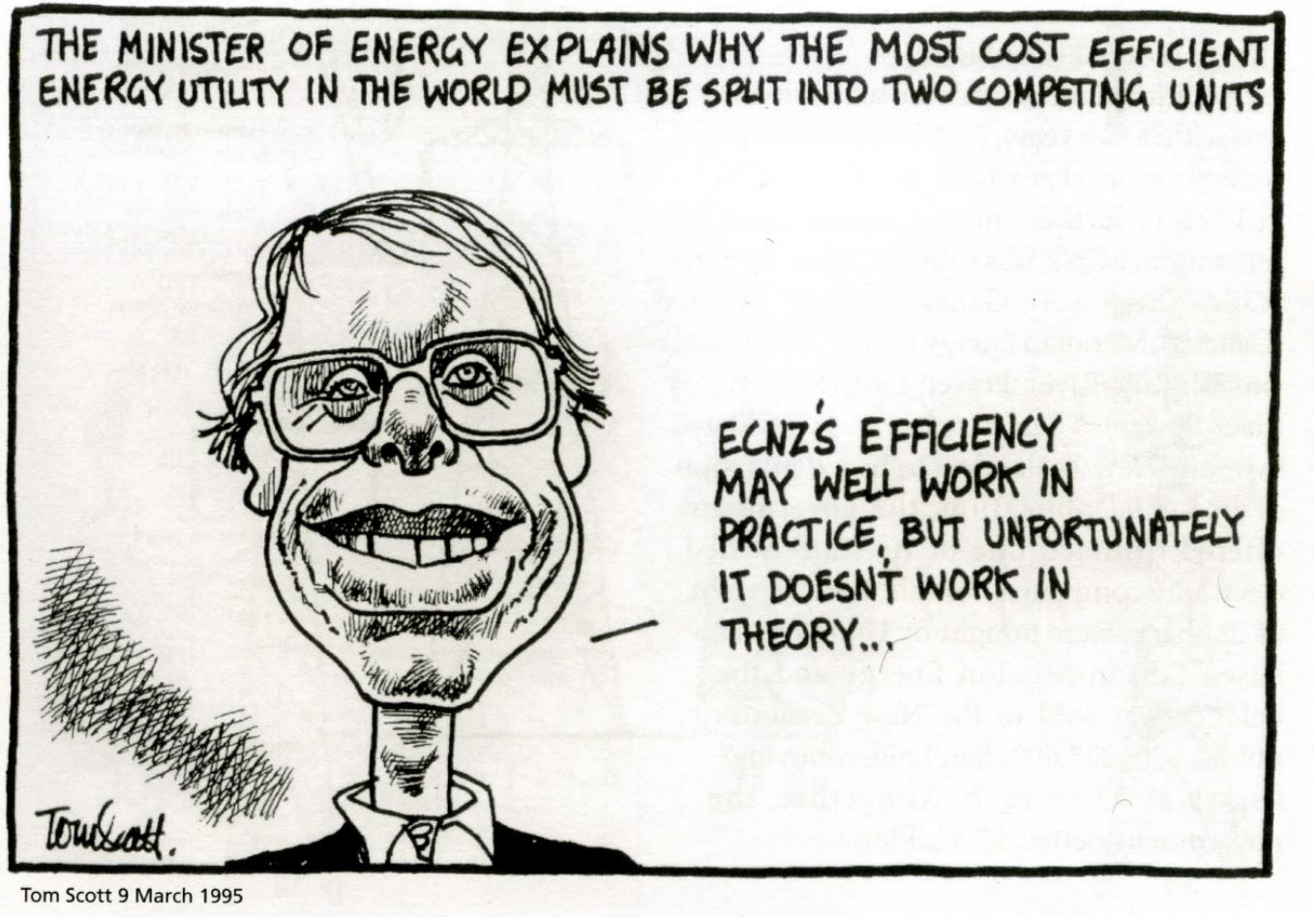
Given that the time when price instruments might have done the job is now past, the world is now heading for either >2^{o} climate change or direct regulation along the lines of

- Ban on internal combustion vehicles
- Phase-out and eventual ban on all fossil-fuelled air travel
- Ban on coal-fired heating
- Ban on coal mining
- Ban on all new oil and gas developments
- Big reduction in livestock numbers
- Massive carbon sequestration efforts by forestry planting and mechanical means
- Massive subsidised roll-out of renewable energy production on an integrated global scale
- Shut-down of production (hence consumption) of non-essential consumer goods in order to divert scarce resources to the strategically crucial industries
- New Zealand last saw this sort of stuff in WW2 – it's a war footing

That level of regulatory intervention may be “politically unfeasible”

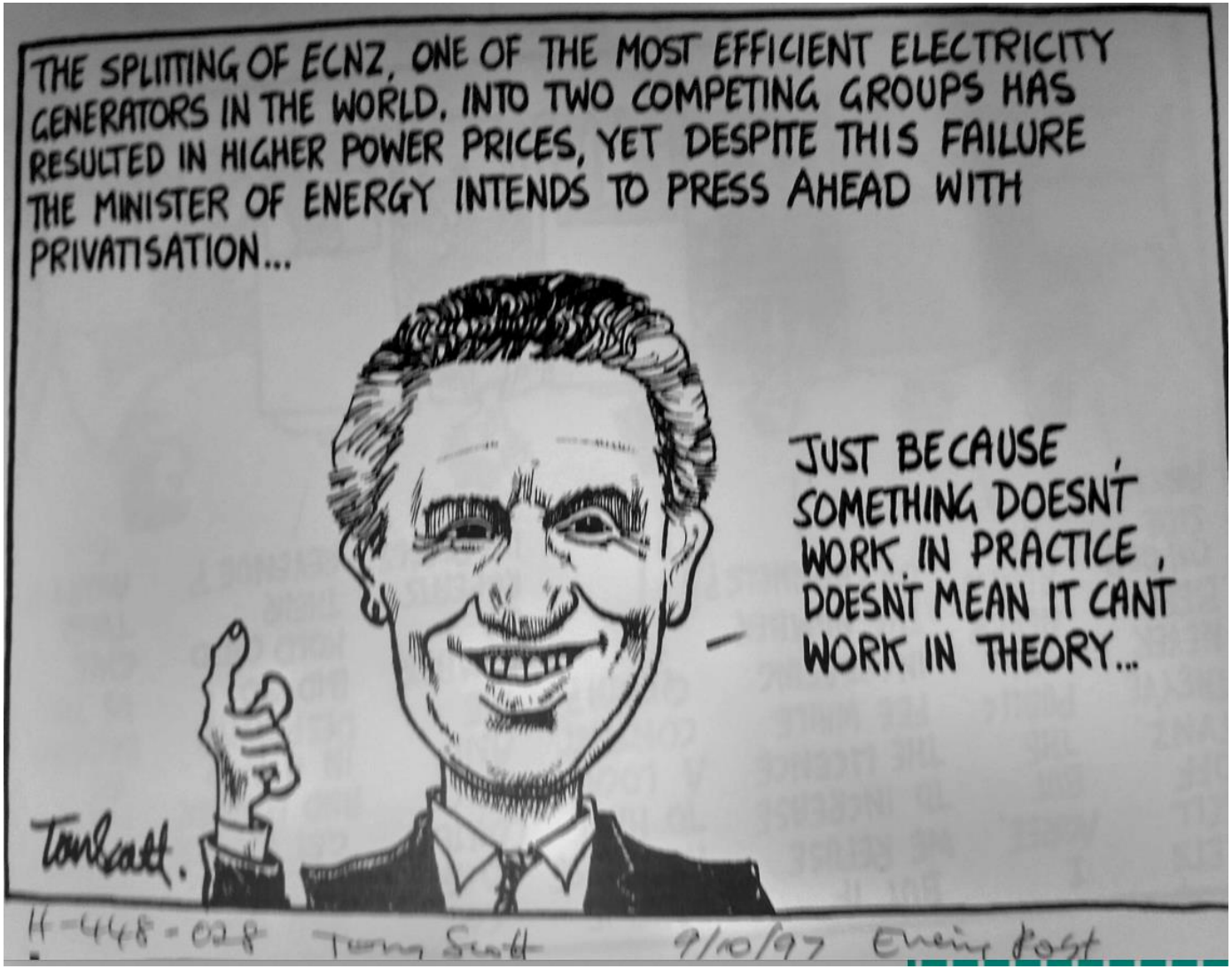
But the bottom line is that Nature does not negotiate

1995: Contact Energy split off from ECNZ

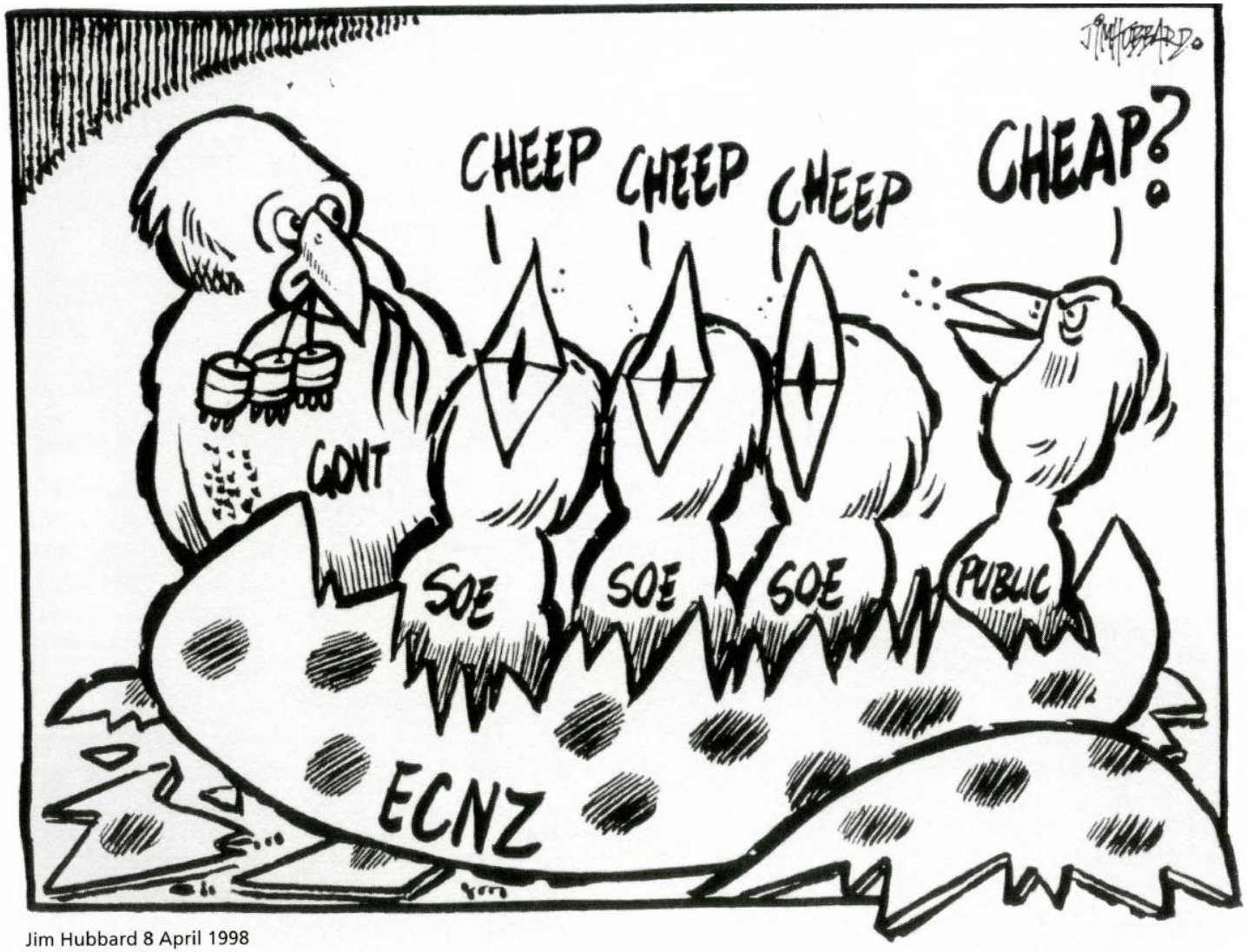


Tom Scott 9 March 1995

1997-99 ECNZ broken up as a prelude to privatisation



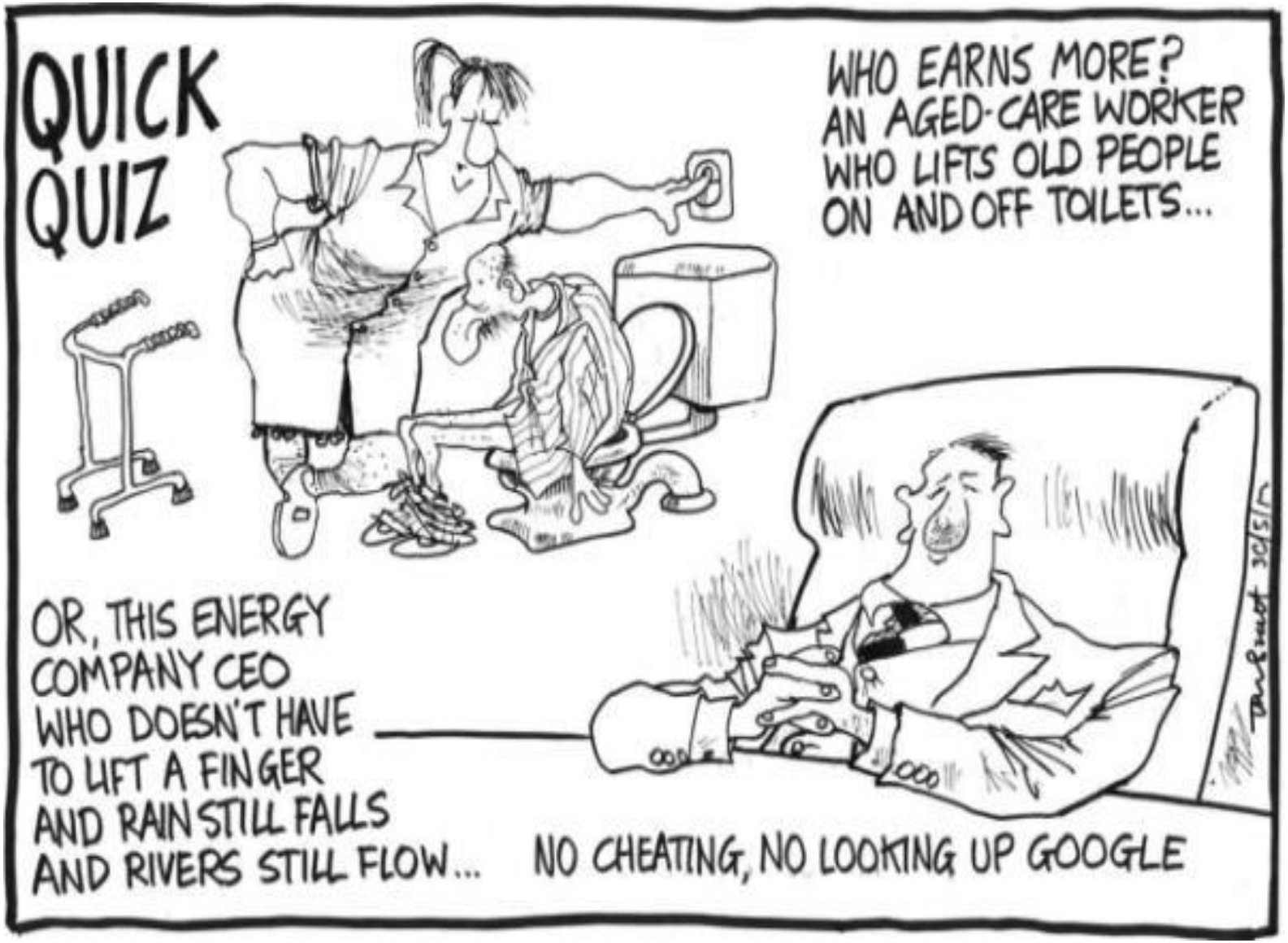
Tom Scott 9 October 1997



Jim Hubbard 8 April 1998

2012: the cartel securely entrenched

Tom Scott March 30 2012



Tom Scott 30 May 2012

2012-2014 Part-privatization of generation