Asset values, rents, and the single buyer proposal for the New Zealand electricity sector

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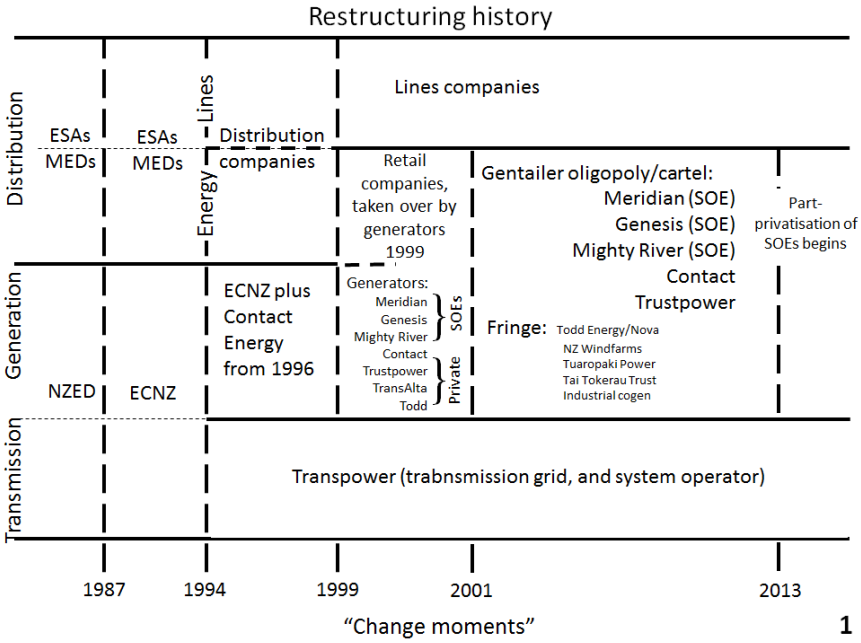
Abstract: The single buyer proposal advanced by the Labour and Green Parties directly addresses three of the most obvious problems that have arisen in the New Zealand electricity industry since 1990: vertical integration between generation and retailing which has foreclosed competitive entry to the retail market; appropriation by dominant gentailers of various categories of rent the property rights to which remain contested; and massive upward revaluations of fixed assets which have crystallised wealth transfers - mainly from residential consumers - to the gentailers' owners (including the state). (The single-buyer model does not address the separate problems of asset valuations and regulatory capture in the natural-monopoly lines segment of the industry.) Its implementation would force policymakers to confront hard choices over the allocation of risk, in relation both to short-run price fluctuations in the wholesale market and to long-run generation investment decisions and incentives. A more arms-length alternative to the single buyer would require far more vigorous and determined use of strong regulatory and tax instruments than recent New Zealand governments have been willing to undertake.

Introduction



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It is now two and a half decades since the restructuring of the electricity industry got under way with the establishment of the Electricity Corporation of New Zealand

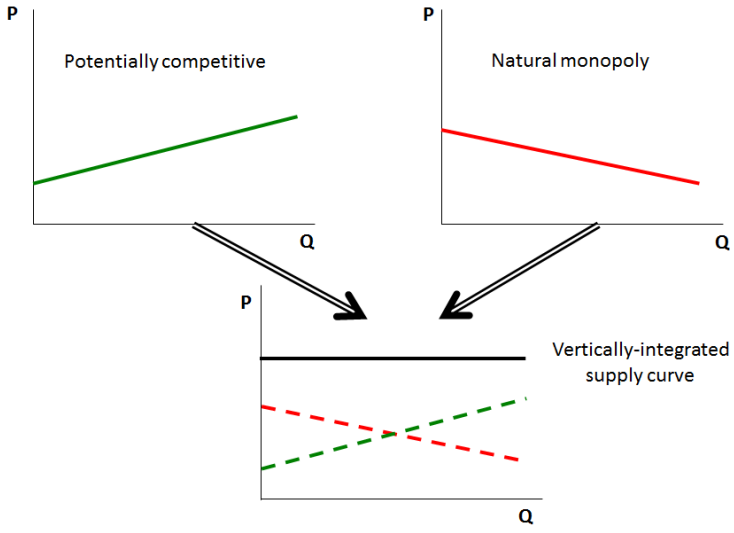
(ECNZ) in 1987. Central to the first stage of restructuring was the elimination of vertical integration in the wholesale and retail segments of the industry. The theory behind this was that electricity generation and final sale were "potentially competitive" and hence could be converted to commercially-driven operations and exempted from regulatory control (beyond the process of setting up rules to govern the market platforms on which competition would supposedly take place). In contrast, lines networks (the grid and the local distribution systems) were natural monopolies that would require some form of regulation to prevent the exercise of their market power to take of excess profits.

The old integration arrangements had been based on engineering and operational synergies

i. at local level amongst energy retailing, local lines networks and distributed (locally-connected) generation, and
ii. at national level between the construction and operation of large-scale generating plant and the nationwide transmission grid.

They also, however, embodied an important economic synergy as well, which is immediately apparent when one considers the long-run cost curves implied by that "monopoly versus competitive" theoretical split. Generation and retailing could be portrayed as potentially competitive because they have the familiar textbook cost curves with rising long-run marginal cost beyond some minimum efficient scale. The long-run supply curves for these segments of the industry are therefore either horizontal or upward-sloping.

Supply curves for monopolistic and "potentially competitive" activities



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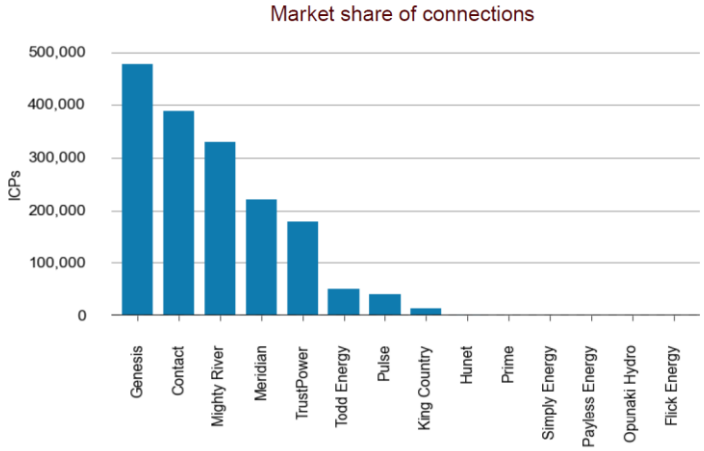
In the case of generation the upward slope is unequivocal: as the generation fleet expands the lower-cost sites and technologies are implemented ahead of the higher-cost ones. Lines networks, with their economies of scale, have downward-sloping supply curves. Vertical integration between lines and energy businesses at wholesale level within the old NZED and ECNZ thus produced a relatively flat long-run supply curve, compared to the situation when the two were separated. At retail level economies of scale probably dominated within the geographical limits of each ESA's franchise territory.

The new industry structure following the Electricity Companies Act 1992 and the Electricity Industry Reform Act 1998 left local lines networks and the transmission grid to operate as stand-alone activities, while generation and retailing of energy have been left unregulated and allowed to become vertically integrated in the hands of five large companies, in a market with only a tiny fringe of independents (the most important of which is Todd Energy):

New Zealand has 14 electricity retailers, 24 brands



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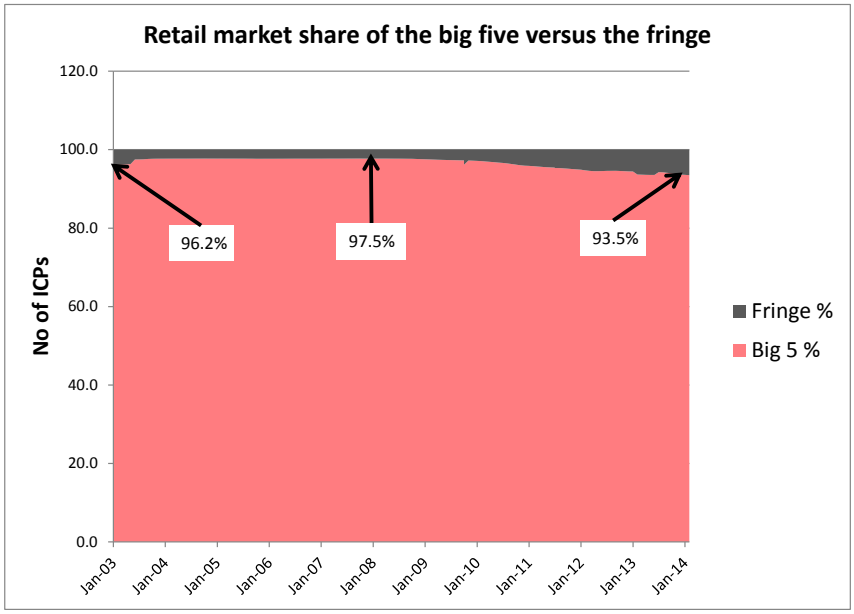
Carl Hansen, "Progress with improving electricity industry performance", Treasury guest lecture 1 April 2014 p.18.

Vertical integration of generation and retail clearly offered very large synergies from the point of view of the large generators, because for each company having a customer base matched to their generation capacity enabled them to transact most of their wholesale transactions in-house rather than having to secure wholesale supply on the open market. Large sums of money were spent on "customer acquisition" in the years 1999-2002 as the five dominant players locked up portfolios of retail customers matched to their generation assets, while would-be retailers lacking sufficient in-house generation to underpin their retail sales were squeezed out. The outstanding example of the hazards of operating a stand-alone retail business without the critical minimum amount of upstream generation was the failure of On Energy in the winter of 2001, which served as a long-lasting deterrent to new entry.

Fifteen years after the final breakup of ECNZ in 1999 the five large gentailers still hold 94% of the market, a stable dominant position that has been barely touched by continual government talk about workable competition backed by repeated "nudging" interventions to create the promised competitive behaviour – forced asset switches, the "what's my number" campaign, pressure for "more transparency".



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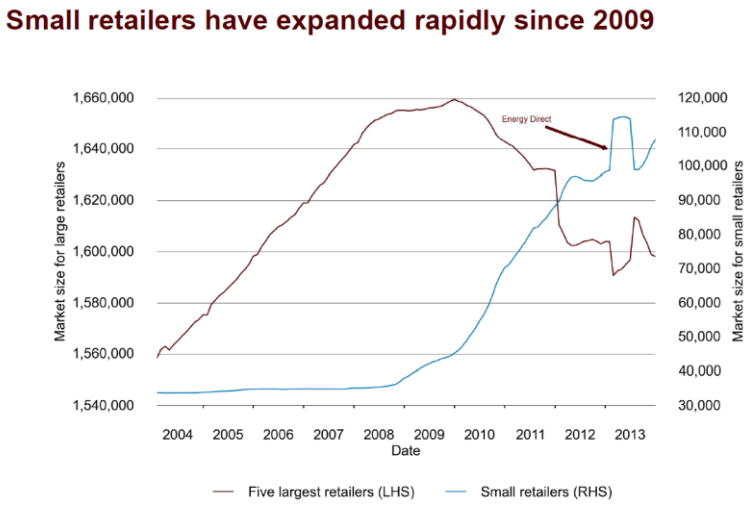
Constructed from EA data downloaded 7 April 2014 from http://www.reports.ea.govt.nz/OnlineReports.aspx .

A striking feature of the recent policy landscape has been the ongoing attempt by both the Government and the Electricity Authority to convey the impression that intense and growing competition has broken out in the retail market. The Authority, for example, claims that the expansion of small retailers has made dramatic inroads into the market share of the gentailers:



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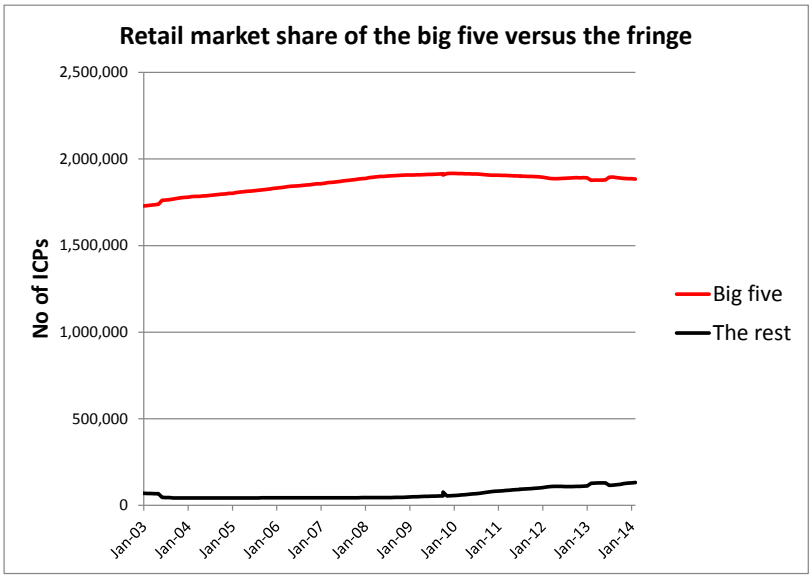
Carl Hansen, "Progress with improving electricity industry performance", Treasury guest lecture 1 April 2014 p.17.

But in fact, redrawing the chart on a common scale shows that there has been very little market penetration by independents:



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Constructed from EA data downloaded 7 April 2014 from http://www.reports.ea.govt.nz/OnlineReports.aspx .

Along similar lines, the Authority has strenuously denied that persistent rises in electricity prices have reflected the exercise of market power by gentailers.

Two extended periods of residential prices rising faster than C&I prices

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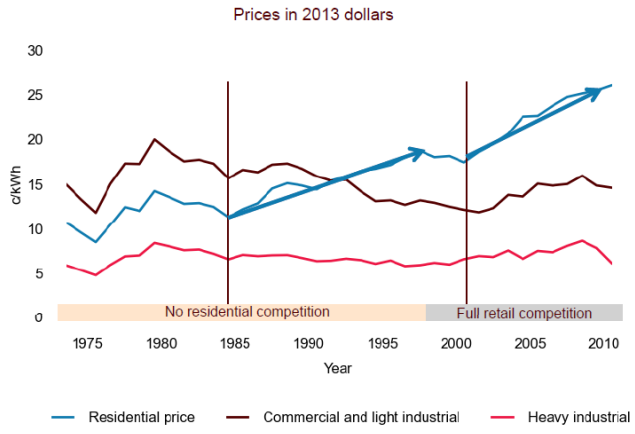

Carl Hansen, "Progress with improving electricity industry performance", Treasury guest lecture 1 April 2014 p.24

The steep rise in residential prices during the 1990s is attributed by the Authority to "elimination of a cross-subsidy" from commercial and light industrial consumers to residentials, though no actual evidence of the alleged cross-subsidy has been produced to date. (A cross-subsidy exists where one party pays below the marginal cost of supplying it and the revenue shortfall is picked up by the other party. However, a large part of the final price of electricity is simply recovery of common costs, the allocation of which is arbitrary from an economic point of view. It is clear that a substantial shifting of electricity industry

common costs off commercial and light industrial and onto residential consumers took place in the 1990s, reflecting both a shift in political sentiment against residentials and, probably, the more captive status of residential consumers.)

2001-08: all prices increased but residential prices rose fastest – why?

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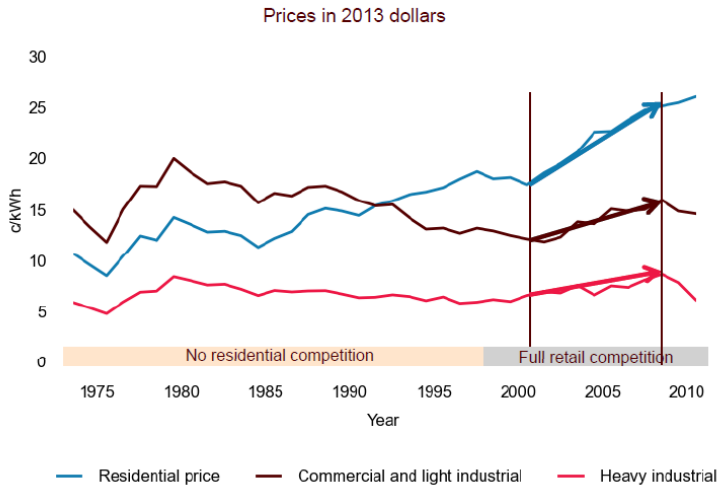


Carl Hansen, "Progress with improving electricity industry performance", Treasury guest lecture 1 April 2014 p.26.

The similarly steep rise in residential prices since 2000, accompanied this time by increasing prices for other consumers at least up to the Global Financial Crisis, is officially explained by reference to alleged rising costs of supply, or in some versions by the claim that "true cost" of supply has greatly exceeded the final price in the past and prices are only now catching up.[1] The simpler explanation, consistent with casual observation as well as with the data, is that the gentailers have been able to use their market power to price-gouge residentials and have faced no regulatory constraint on doing so.

The Single Buyer

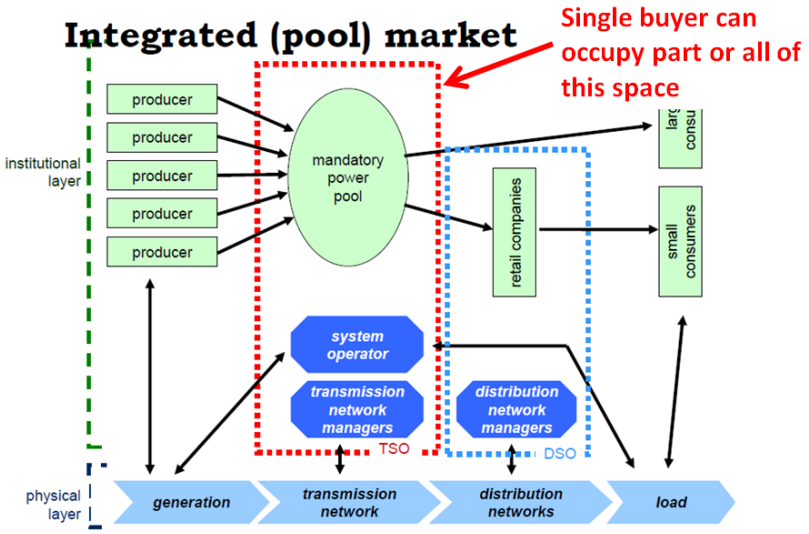
The lack of large-scale independent entry into retailing, and the ongoing ability of the incumbent five dominant players to price-gouge, is attributable to a large extent to the vertical integration of generation and retailing, which has no obvious engineering or operational synergies, but provides the incumbent large gentailers with a strong advantage against new competing retailers. Even within the retail fringe, the advantage to a retailer of owning its own generation is clearly illustrated by the leading position in the fringe of Todd Energy and King Country Energy, both of which own generation assets that provide physical hedging of their retail sales. The market for financial electricity hedges has certainly expanded in the past three years, but the main players in that market are still the incumbent

[1] Electricity Authority, *Analysis of historical electricity costs: final report*, 21 January 2014, http://www.ea.govt.nz/monitoring/enquiries-reviews-and-investigations/2013/historical-analysis-of-electricity-costs/ .

gentailers, and the terms on which independents are able to secure wholesale supply remain subject to gentailer control and potential manipulation. The fact that the gentailers have apparently been able to implement something akin to the textbook "double marginalisation" within their vertically-integrated market empires provides them with a strong incentive to defend their position.

Faced with this situation of entrenched market power being exercised at the expense of consumers' interests, a standard antitrust policy response would be forced ownership separation that obliged generators to divest their retail operations. Any such divestiture would obviously have to be accompanied by other regulatory or pro-competitive measures to avoid de facto ongoing partnerships between nominally independent retail and generation companies and the development of a genuinely level playing field on which competing retailers could secure wholesale supply. The 1998 Electricity Industry Reform Act provides ample precedent for such forced breakup of vertically-integrated operations, but there appears to be no political will to go that route.

Instead, the Labour and Green Parties have announced their intention, if elected, to interpose a "single buyer" between the wholesale and retail levels of the market, with all large grid-connected generation forced to sell its output to the single buyer, and all retailers offered the same terms of supply by the single buyer, creating thereby a level playing field for retail entry and breaking one of the channels through which the gentailers have exercised their market power. The effect of this proposal would be similar to a structural ownership separation of generation from retailing, with the added feature of introducing into the market an activist state-owned entity, with a mandate to prevent cornering of the retail market by generators' affiliates.



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Laurens De Vries, *Design Choices for Electricity Markets: a Systematic Analysis*, p.13
Figure 6, www.worldenergy.org/documents/p000905.doc

The single buyer proposal extends also to two other areas of concern with the electricity industry: the writing-up of the values of fixed assets, and the appropriation of various categories of rent. The focus of the remainder of this paper is on those two issues.

Rent appropriation

From the outset of industry restructuring in the 1980s it was apparent that the cost structure of generation in New Zealand differed from the situation in the large overseas markets where most of the new thinking about electricity was being developed. The New Zealand system had a predominance of hydro and geothermal plant whose construction costs were sunk and whose operating costs were very low. At the margin of the generation 'fleet' were thermal plants with lower capital costs, but high operating costs. As the industry has expanded over the past couple of decades, new generation investments have pushed into projects with successively higher long-run marginal cost (LRMC):

Electricity Authority generation LRMC chart

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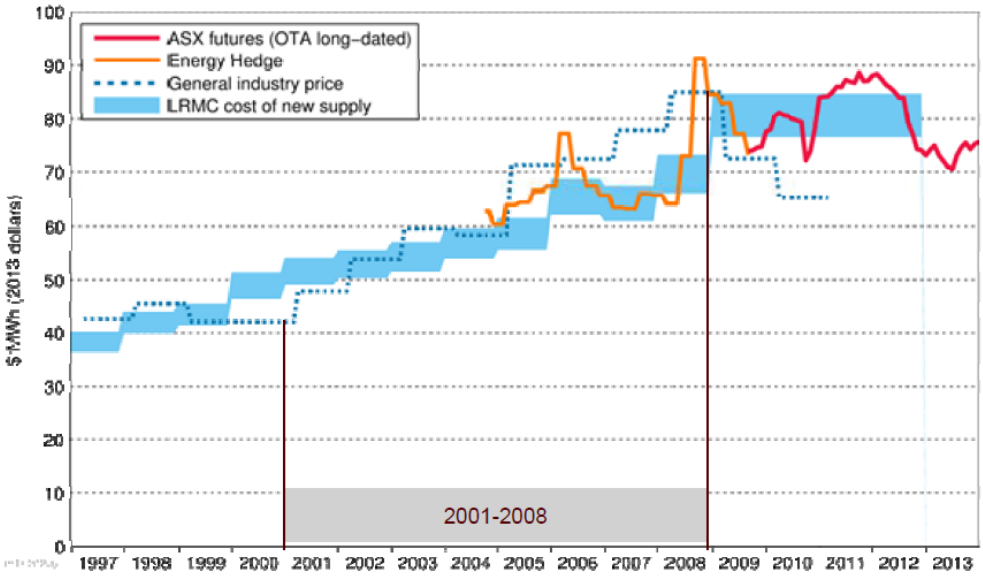

Carl Hansen, "Progress with improving electricity industry performance", Treasury guest lecture 1 April 2014 p.14

The long-run supply curve plots LRMC against quantity, showing the supply price at which each successive unit of supply can profitably be placed on the market after allowing not only for variable operating costs but also for overhead costs including the cost of funds required to purchase and install capital equipment.

An upward-sloping long-run supply curve (an "increasing-cost industry")

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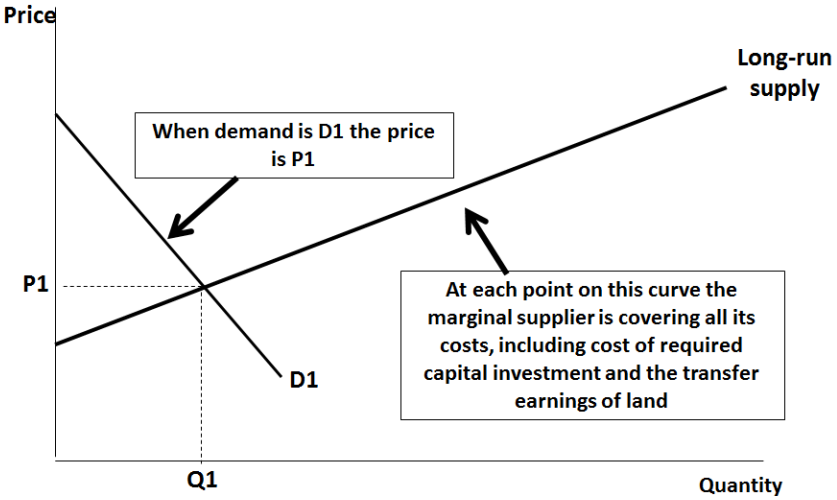

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Typically the textbooks draw the long-run supply curve for a competitive industry as a horizontal straight line to reflect the assumption that with free entry and exit all firms, whether existing or new, face the same costs, so that supply adjusts to demand over the long term at a constant price that reflects average cost, which is equal to long-run marginal cost. In theory, thus, the expansion of a perfectly competitive industry facing growing demand looks like this as more and more firms enter to serve demand:

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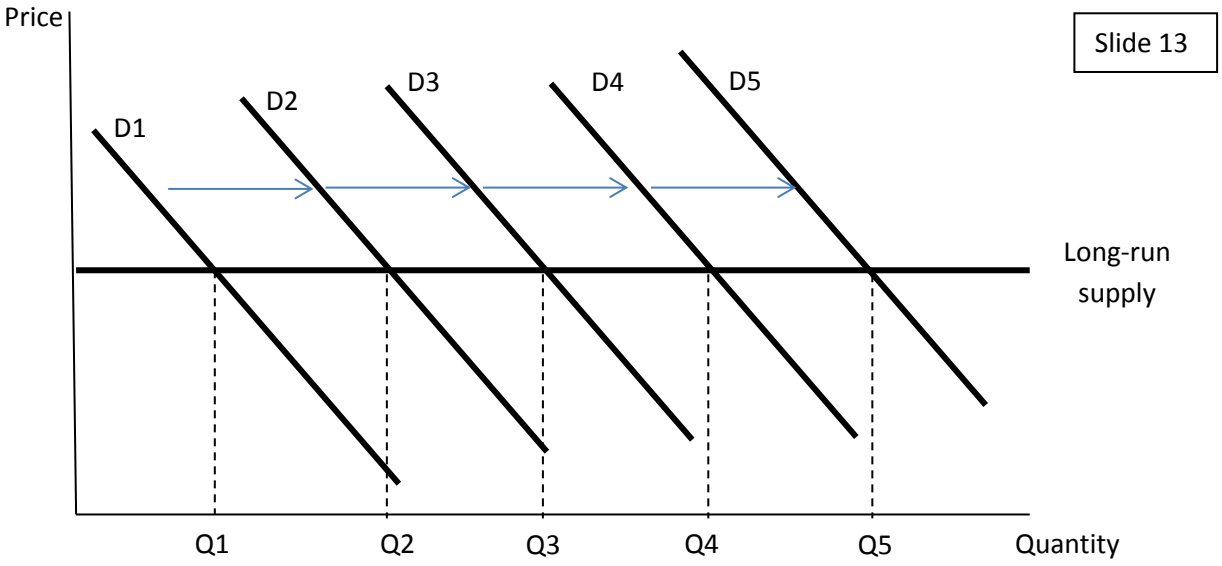
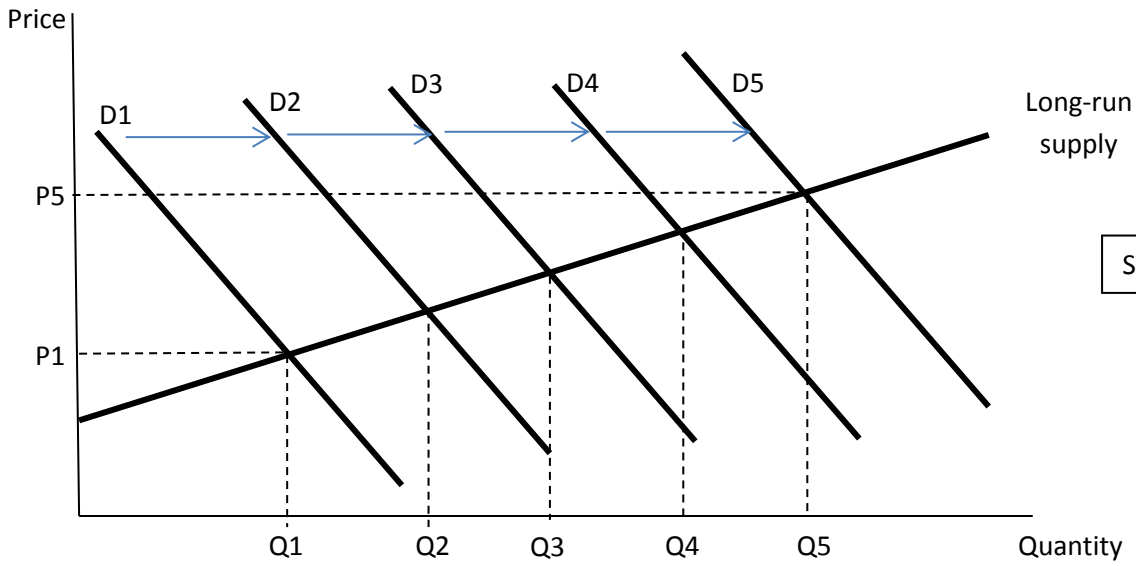


Where there is a scarce factor of production, however, even under perfect competition the long-run supply curve slopes up, so that as demand grows from D1 to D5 the competitive price is driven up from P1 to P5:



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The explanation for the upward slope is that some factor of production (such as "land") is in limited supply and as demand for the product increases, the margin of production is pushed into less and less productive or well-located resources. What this means is that those firms which control the most productive or well-located resources – consider for example firms which in the early stages of market expansion were profitable when supplying Q1 at price P1 – are able to collect rent equal to P5 minus P1, not because they have earned the extra income by doing anything new or innovative as the market expands, but simply because they are squatting on the best resources.

"Ricardian rent" is secured by the owners of infra-marginal production as the price is driven up at the margin:

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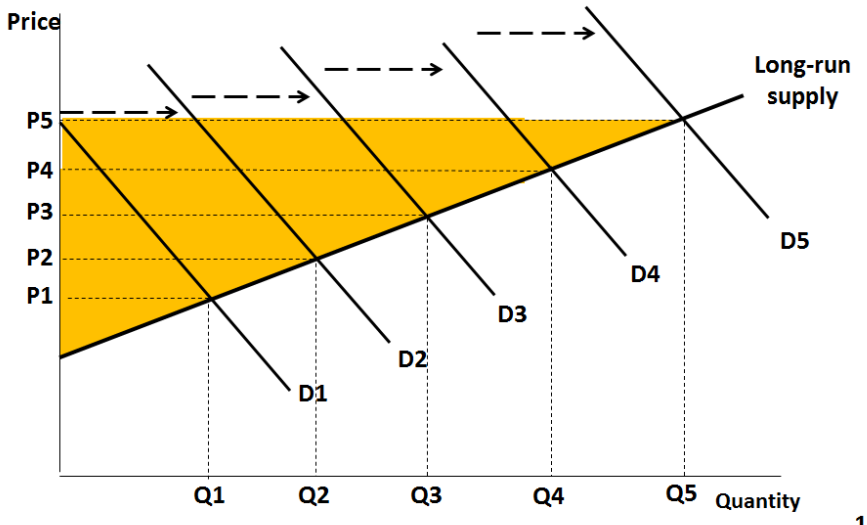

When demand is D5, market quantity is Q5, and "competitive price" is P5, total Ricardian rent is the yellow triangle.

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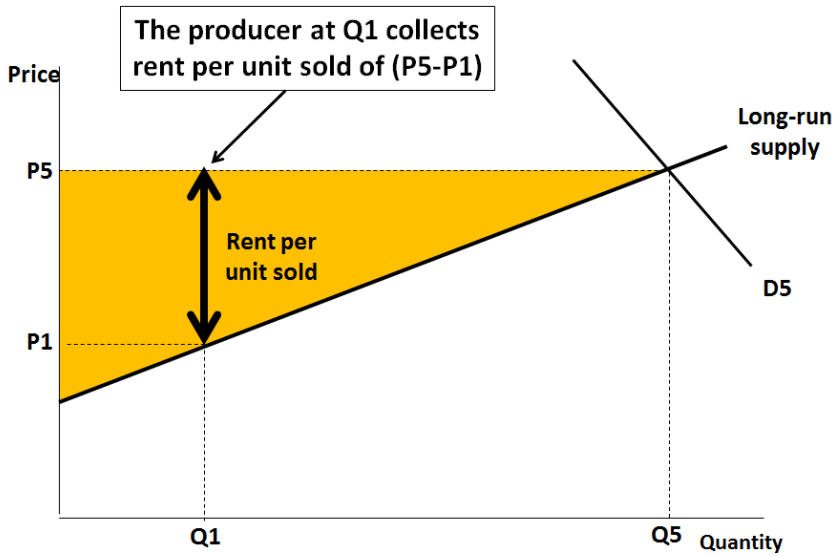

This process by which the competitive market delivers rents – what used to be called "unearned increment" – into the laps of the fortunate owners of high-quality resources was brought into clear focus in 1814 by the classical economist David Ricardo, and attracted later writers such as Henry George to the proposition that these rents performed no socially-useful function and so could be taxed away without any impact on the productive efficiency of the industry – so long as the marginal firms (those producing the last few units of output Q5) continued to recover a profitable return on the costs they incurred, which would be basically capital costs of producing on marginal land commanding zero rent.

Some part of rent can perform an allocatively-useful function in the perfectly-competitive setup when the scarce factor of production has alternative uses. Consider for example the production of a fully-divisible commodity produced under standard technology and sold in a fully competitive market with no externalities. Potatoes are a good example. (I choose potatoes because some defenders of the current New Zealand electricity market have tried to pretend that electricity is just like potatoes; one point of the present analysis is to show why this is wrong.)

Imagine that the market for potatoes is in a large city – call it "Auckland" – and that potatoes can be produced anywhere simply by plowing land and planting seed potatoes. Suppose that close to Auckland there is an area of soils that are especially well suited to potato cultivation – call this hypothetical area "Pukekohe" – and that the owners of land in this zone can profitably supply potatoes to Auckland at low cost because of their high land productivity and low transport costs to reach the market. These growers represent Q1 on the long-run supply curve. Other suppliers to the market are on less productive land, or located further away, or both. To make

it profitable for these more marginal growers to produce potatoes, the market price has to be P5 to call forth total supply of Q5. Then in a comoetitive market that prices at the margin, the owners of the good close-in land at Pukekohe will secure not just a return on their capital but a rent (P5-P1) on the land they use.

The value of Pukekohe potato-growing land will then rise to the present value of the expected rents. Suppose now that the rents from potato production are taxed away; then the value of the land when used for potatoes will fall and competing uses might become more attractive. Call these competing uses "housing development". The rent tax then may set up incentives for the resource to be reallocated to alternative uses, with the consequence that the supply of potatoes is reduced (the long-run supply curve is shifted left) and the price to final consumers is driven up.

So far so good, and to this point I sound like the National Government, Business New Zealand and the Electricity Authority in the more coherent arguments they have managed to muster against the Labour/Greens electricity policy. So it would be fair to draw the conclusion that if I thought the electricity market was just the same as the market for potatoes, I would have to stop arguing for a progressive-price arrangement – or other form of social electricity tariff - that would in effect transfer a large slab of wholesale rents from the infra-marginal producers to final consumers, in the form of a low-priced (or free) tranche of electricity.

The case for progressive pricing, and for restraining the ability of the electricity industry to receive the maximum possible rents at the expense of its customers, rests critically on three propositions that I hold to be true:

- The market is not competitive, with the result that the final price of electricity lies substantially above the cost of marginal supply – that is, the current price to consumers is well above P5, and a large slab of rent accrues even at the margin. The market price of electricity therefore has no moral authority as the starting point for economic analysis.
- Electricity production and supply is different from that of potato production in fundamental ways: in particular, the key fixed assets are highly specific and not footloose.
- The property right to appropriate rents arising from the use of water and steam for electricity generation is contested and does not obviously lie with the gentailers.

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The first proposition – that excess profits accrue even at the margin to the existing gentailers – rests on the barriers to entry that shelter the gentailer cartel from genuine competition, and on the (flawed) design

The second proposition - that rents to low-cost hydro plant whose costs were sunk long ago perform no socially-useful function – rests on the economic theory of specific, lumpy, sunk-cost fixed assets which do not have alternative uses and which therefore will not be reallocated away from electricity generation if denied the right to capture rent.

The third proposition – that the gentailers do not have the property right to the rents on heritage generation assets – arises from the fundamental claim that nobody in New Zealand owns water. The water that gives productive value to dams and the steam that drives geothermal turbines are common property, and their use free of charge for electricity generation shifts the appropriation of their value – the rent – from the community at large to the gentailers' shareholders. Prior to corporatisation and privatisation, the value of water rents was passed through to electricity consumers via low prices that did not contain a rent component. Since the generation assets were transferred to the five gentailers in the late 1990s, their right to appropriate water rents has been unilaterally asserted but never legally tested. The single buyer proposal includes a *de facto* reassertion of the community's property rights over water and steam.

I look now at the three propositions in more detail.

Multiple layers of rents

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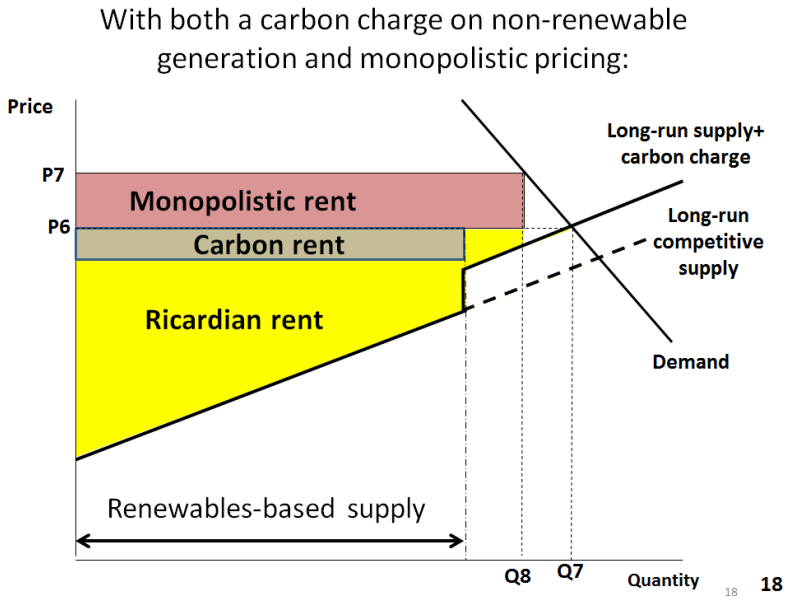

The diagram schematically shows three categories of rent accruing to the gentailers. Ricardian rent is the bottom layer; onto this is added carbon rent which renewables-based generation receives as a result of the interaction of marginal-cost pricing with the Emissions Trading Scheme. On top of that are monopoly rents arising from uncompetitive profit-taking by the vertically-integrated in the retail market by the

vertically-integrated gentailers; included in these are rents that are dissipated through inflated "operating costs" in that market, which in turn include wasteful use of resources in the customer-churn exercise that provides the industry with window dressing without delivering sustainable general gains for consumers.[2]

Just how much of this rent could be transferred from gentailers to consumers is an open question, but the mechanism for achieving such transfers under a single-buyer model is straightforward: long-term wholesale supply contracts with the owners of generation assets on the same model as the longstanding Rio Tinto (NZAS) contract with Meridian. The single buyer proposal includes the intention that the new agency (New Zealand Power) would enter into such contracts to secure long-term delivery of a tranche or tranches of electricity at prices well below the marginal market-clearing price. Provided that these contracts have their impact on the revenue only from infra-marginal plant, they would leave the allocative role of the price mechanism intact at the margin of the market. The institutional design of the contracts is a matter of detail; the principle is straightforward and well established.[3]

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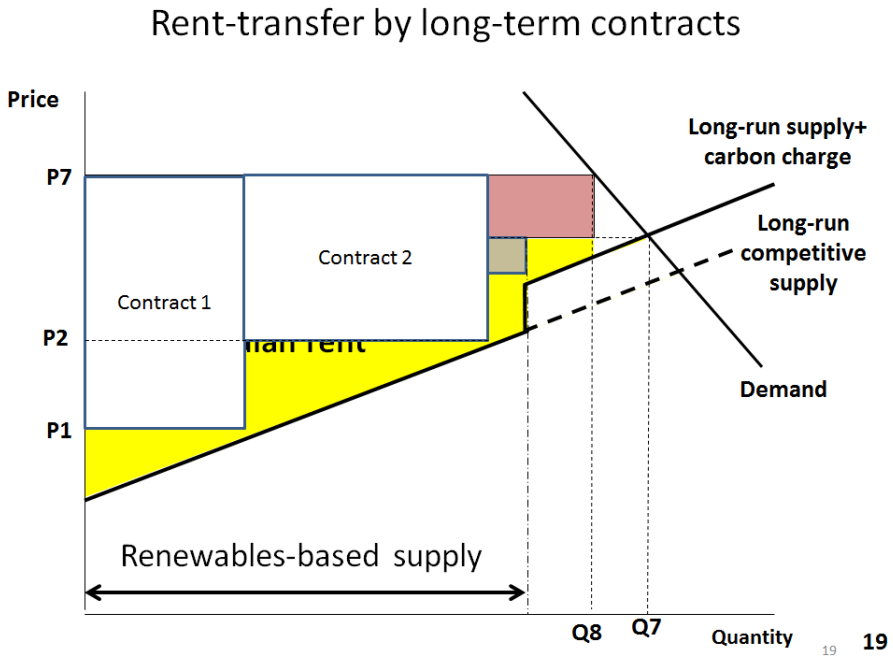
2 COVEC, *Evaluation of the Consumer Switching Fund*, report for Ministry of Business, Innovation and Employment November 2013, http://www.med.govt.nz/sectors-industries/energy/pdf-docs-library/electricity-market/implementing-the-electricity-market-review-recommendations/progress-on-review-measures/evaluation-of-consumer-switching-fund-1.2-mb-pdf , P.58: "We found no statistically significant effect of the CSF projects on real residential retail electricity prices."

3 See e.g. Bertram, g., I Dempster and S. Terry, *Hydro New Zealand*, 1992.

4 Geoff Bertram, *Is there a 'regulatory compact' regarding gentailer asset values and revenues? If so, what does it say?*, IGPS symposium presentation, Wellington 4 July 2013, http://igps.victoria.ac.nz/events/completed-activities/Seminars/0407_Bertram%20presentation.pdf .



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The idea is easily shown on the diagram. The two contract tranches shown pay respectively P1 and P2; the amount of rent that could be passed through the consumers depends entirely on how stringent these prices are and how large the contracted tranches are. I have guessed that up to $1.5 billion per year would be roughly the maximum achievable; the Labour Party proposal suggests a target of about half of this, around $700 million p.a.

Asset specificity and sunk cost

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Potato-growing land at Pukekohe has plenty of other socially-valuable uses which means that the market's bidding mechanism, operating through the signalling function of rents, forces potato-growing to compete for its land. The Karapiro hydro dam on the Waikato River, in contrast, has no high-valued alternative use from which it has to be bid away by payment of rent. The dam provides "spillover benefits" to activities such as competitive rowing and water management in the Waikato catchment, but there is nothing else it could be used for that would yield anything like the income it secures from generating electricity. Imagine that this dam were put onto the market with the constraint that it must be used for some purpose other than electricity generation; then its sale price (what economists call its transfer earnings, or value in next-best use) would be far below what an electricity generator would be willing to offer. Indeed, the price could very well be zero, given that a buyer aiming to use the dam for, say, competitive rowing, would be looking down the barrel of ongoing maintenance costs that would surely eat up any positive monetary value the rowing federation could anticipate from continued access to the lake. A scrap dealer might pay some small amount for the right to take away the turbines and other generating equipment for scrap, but would be deterred if it were

made clear that the dam's purchaser would be liable for any later damage to third parties resulting from allowing the dam and spillways to decay *in situ*. Clearly nobody would want to buy the dam just to demolish it.

The point here is that Karapiro has commercial value as part of the Mighty River portfolio of fixed assets simply and solely because it can generate electricity. It was built for that sole purpose, and it could perform no comparably-valued social function if withdrawn from that purpose. When from time to time, Mighty River Power Ltd has asked PricewaterhouseCoopers to revalue the dam, along with its other generation assets, the procedure used has been one of "fair value" calculation that assigns a monetary value based simply on the rents that the current electricity market institutions allow to accrue from the company's final sales revenue, after subtracting all the other costs it incurs (labour costs, administrative overheads, costs of motor vehicles, software, lines charges and so on). Because Karapiro is only a part of a highly-integrated interdependent system of dams on the Waikato, its rent-yielding capability, and hence its "fair value", cannot be unambigiously derived in isolation from the total, so in practice the PwC valuation is an overall assessment of the value of the total generation portfolio when used for its specific, dedicated purpose.

But no socially-meaningful allocative function is sustained by allowing Mighty River Power to collect rent on Karapiro and the other Waikato dams; the dam would still be used for generating electricity even if its owners were denied the right to collect rent on it. The argument for leaving the rent untouched is simply one of equity and property rights, not efficiency: the company claims, and exercises, the right to receive rents from the market simply because it happens to be the owner of the dams which enable the value of falling water to be realised as electricity production. But ownership of the dams confers the right to collect those rents only so long as the market structure and institutions allow water to be utilised without charge, effectively passing to the dam owners a property right over water.

Here, therefore, we come to the crux: under what socially-ratified and legitimate property right have the five gentailers transferred billions of dollars of wealth from electricity consumers to themselves? Putting this another way, when the generation assets of the former ECNZ were sold off to the five large new gentailers (plus a few to fringe operator Todd Energy), did the purchase of those assets confer upon the new owners the unrestrained right to collect water rents and thereby drive the value of the assets up far above the purchase price? This question goes to the heart of the social contract under which the electricity sector has been deregulated and fragmented.

For neoliberals, the answer is plain: property rights are effectively absolute once secured, and the generation assets were sold off by ECNZ without any explicit

separation of rights to water. Any buyer (including the successor SOEs) that is able to persuade the New Zealand Government to sell its assets for a price that is far below what they will turn out to be "worth" in an unregulated market is entitled to reap the full benefits from this smart dealing. The successors to ECNZ paid a price for the fixed assets based on the old pricing model which allowed water rents to dissipate downstream to consumers, and then eagerly collected the rising rent revenues as the market margin moved up the long-run supply curve, allowing them to revalue the assets as their associated water rents increased.

For people more attuned than neoliberals to the history of the sector, to the broad landscape of moral philosophy, and to the economics of regulation, the answer looks rather different. There were clear policy guidelines in place at the time of the breakup of ECNZ which embodied a clear expectation that prices would not run massively ahead of inflation, and industry spokespersons paid explicit lip service to those guidelines. Respect for the guidelines was the condition upon which light-handed regulation – effectively non-regulation of prices – was premised, at least so far as the Government's public statements went[4]. The New Zealand public were given what amounted to political undertakings that the industry would behave in a socially responsible fashion, and the industry was put on notice that it would incur regulatory risks if its failed to deliver on the Government policy objective stated in 2000 of "costs and prices to consumers which are as low as possible, while ensuring that prices reflect the full costs of supply including environmental costs", and "fairness in pricing so that the least advantaged in the community have access to energy services at reasonable prices"[5].

Slide 21

Functionless rents are not part of the "full cost of supply" for an industry whose fixed assets are specific to a single purpose and have zero transfer earnings. The lowest price consistent with recovering the full cost of supply under these circumstances is the average-cost price. Setting price at the margin under an arrangement that allows rents to accrue without restraint was simply, flatly, inconsistent with the 1998 and 2000 Government energy policy.

The single buyer proposal involves rolling back the rent appropriation without necessarily changing anything in relation to merit-order scheduling or price discovery at the margin. If the single buyer takes over the system operator (or the system operator becomes the single buyer) there will be several difficult issues to resolve. The Labour policy statement of April 2013 seemed to envisage possible changes to the way generation capacity is dispatched, and also was not clear about whether the

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4 Geoff Bertram, *Is there a 'regulatory compact' regarding gentailer asset values and revenues? If so, what does it say?*, IGPS symposium presentation, Wellington 4 July 2013, http://igps.victoria.ac.nz/events/completed-activities/Seminars/0407_Bertram%20presentation.pdf .

5 Labour Government *Energy Policy Framework* October 2000

intent is to limit low-price contracts to apply only inside the market margin or whether an average-pricing regime would be applied across all generation. These are important details that will have to be seriously analysed and discussed in the event that the government changes at the next election.

There are two clear alternatives to the single-buyer-long-term-contracts model as an approach to capturing functionless rents.

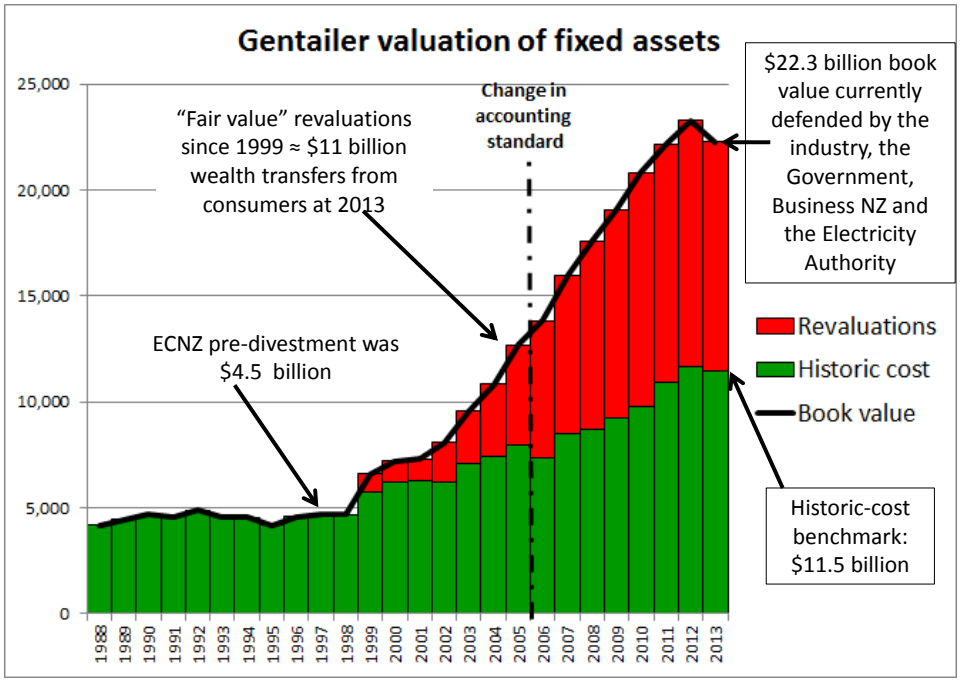
- One would be to impose a price on water to enable the community to recover the value created by water as a resource when it flows through turbines. This would require explicit assertion of a common-property right over water.
- The other would be a regulatory regime that placed a cap on allowed revenue for the gentailers while retaining a marginal-priced spot market; there would then have to be some explicit mechanism for rebating excess revenues through to downstream purchasers.

Either of these would be feasible, but both would require stern application of the relevant policy instrument, whether tax or 'heavy-handed' regulation. The single-buyer architecture may well be more politically 'saleable' than either of those.

Asset revaluation

The ability of the gentailers to exercise market power to ramp up their sales revenues without attracting any regulatory sanctions inevitably meant that their profitability turned out greater than would have been allowed under cost-of-service regulation. This excess profitability mean that the value of a typical gentailer to an investor quickly came to exceed the initial outlay that had been required to purchase the assets and the customer base. The resulting gap between the historic cost of the fixed assets and their value if sold as a going concern provides a measure, admittedly a crude one, of the scale of wealth transfers from consumers to the gentailers since 1999.

The financial statements of all five gentailers enable us to construct time series of two measures of asset value: the backward-looking historic cost value that provides a benchmark of actual expenditures incurred to fund the acquisition, expansion and maintenance of the generation assets; and the forward-looking "fair value" of the assets representing their anticipated capacity to earn revenue in excess of operating costs. The aggregated data across the five large gentailers is in the chart below.



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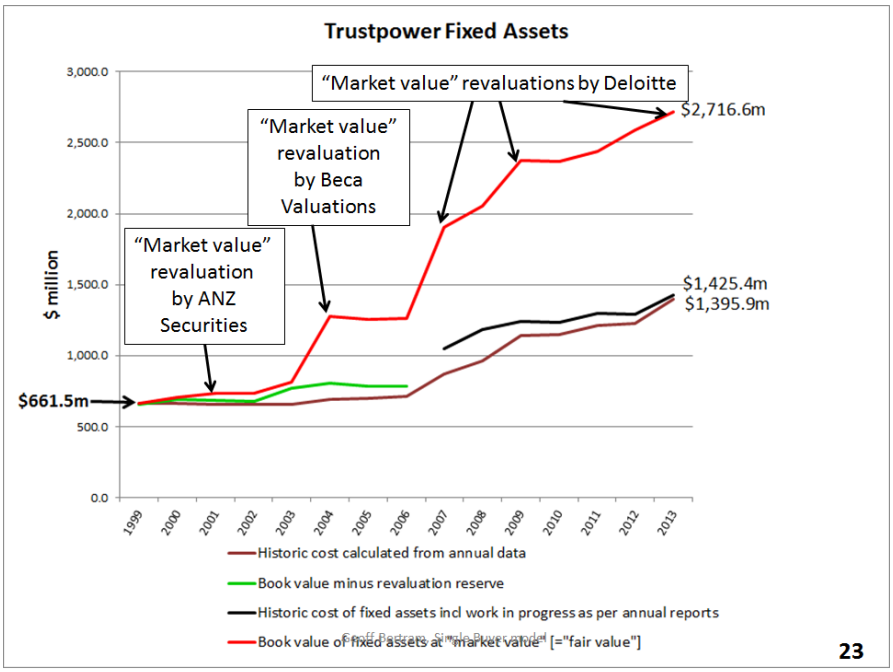
The pattern of asset revaluation is consistent across all the gentailers until 2010, when Contact Energy reverted to historic cost on the basis that it was more informative than the "fair value" estimates produced by consultants – while taking the opportunity to assert that its 2004 valuation ought to be the historic-cost base on the very weak grounds that Origin became the main shareholder that year. (In my chart Contact's historic cost starts from the 1999 base corresponding to privatisation). Company by company detail is shown below.



Slides 23-34

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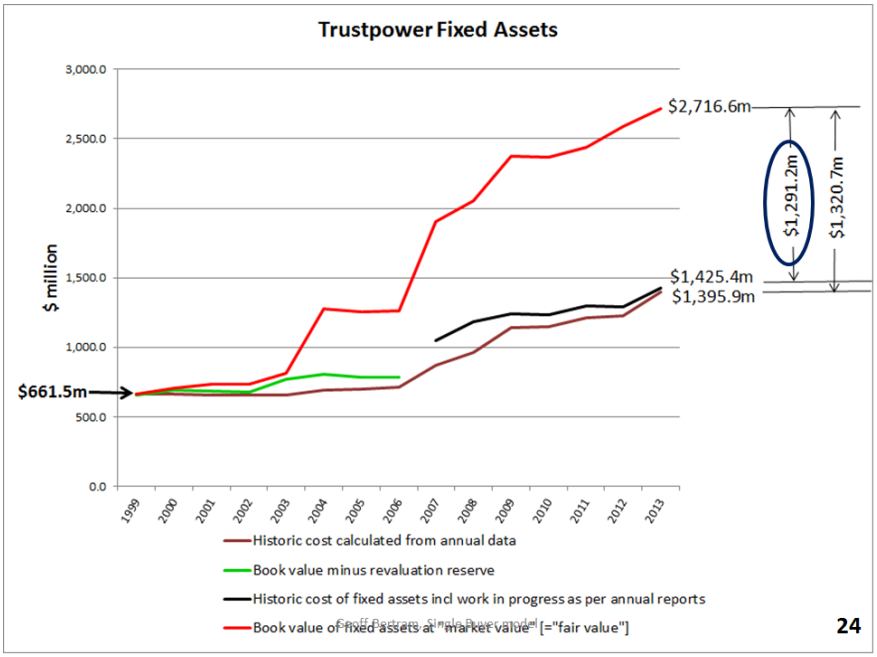
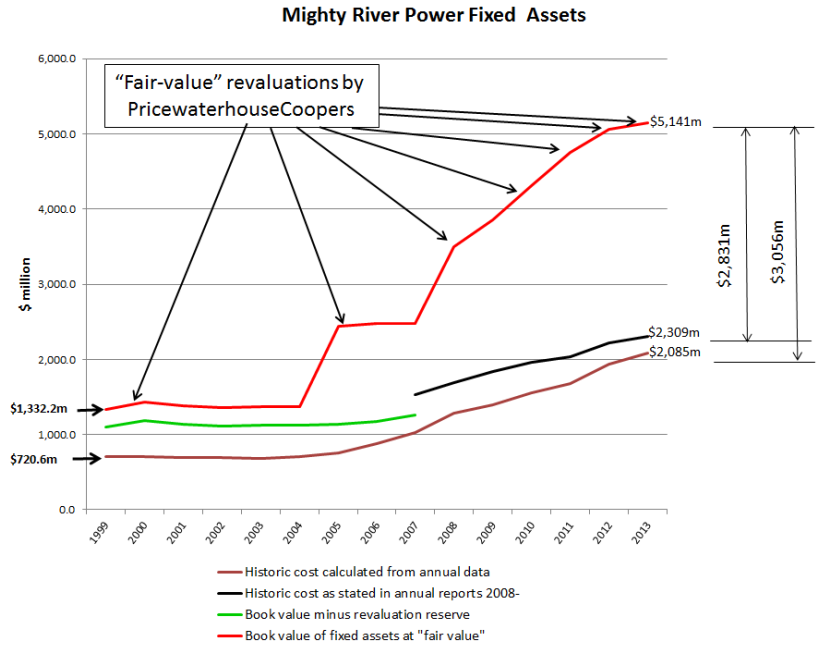
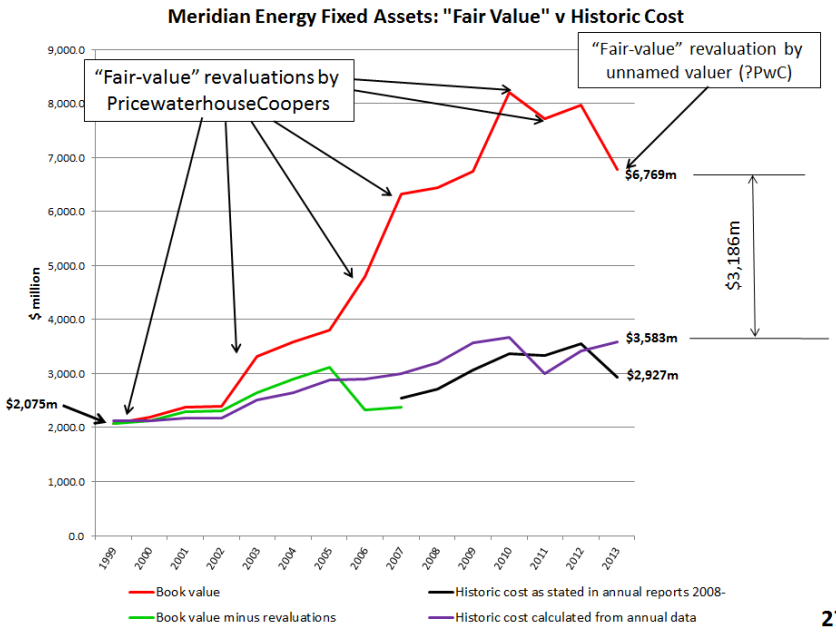

Trustpower Fixed Assets
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
0.0
$ million
$2,716.6m
$1,425.4m
$1,395.9m
$1,291.2m
$1,320.7m
$661.5m
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Historic cost calculated from annual data
Book value minus revaluation reserve
Historic cost of fixed assets incl work in progress as per annual reports
Book value of fixed assets at "market value" ["fair value"]

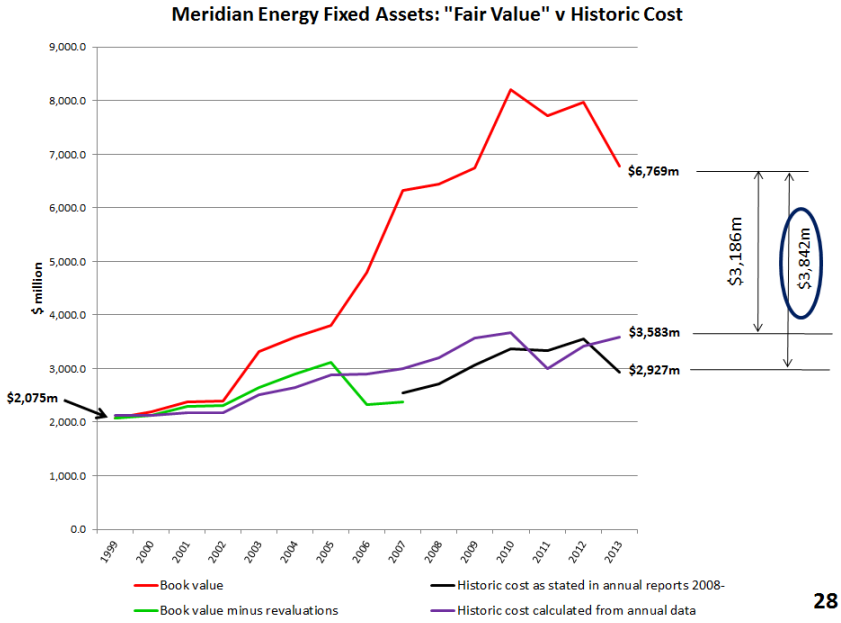
24


Mighty River Power Fixed Assets
6,000.0
5,000.0
4,000.0
3,000.0
2,000.0
1,000.0
0.0
$ million
"Fair-value" revaluations by PricewaterhouseCoopers
$5,141m
$2,309m
$2,085m
$2,831m
$3,056m
$1,332.2m
$720.6m
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Historic cost calculated from annual data
Historic cost as stated in annual reports 2008-
Book value minus revaluation reserve
Book value of fixed assets at "fair value"

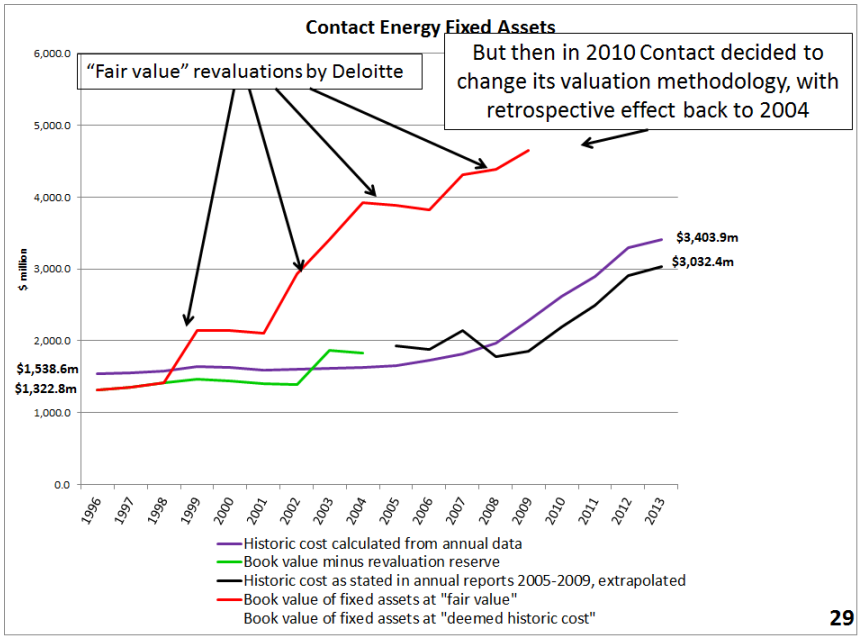
25


Meridian Energy Fixed Assets: "Fair Value" v Historic Cost
"Fair-value" revaluations by PricewaterhouseCoopers
"Fair-value" revaluation by unnamed valuer (?PwC)
$6,769m
$3,186m
$3,583m
$2,927m
$2,075m
$ million
9,000.0
8,000.0
7,000.0
6,000.0
5,000.0
4,000.0
3,000.0
2,000.0
1,000.0
0.0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Book value
Historic cost as stated in annual reports 2008-
Book value minus revaluations
Historic cost calculated from annual data

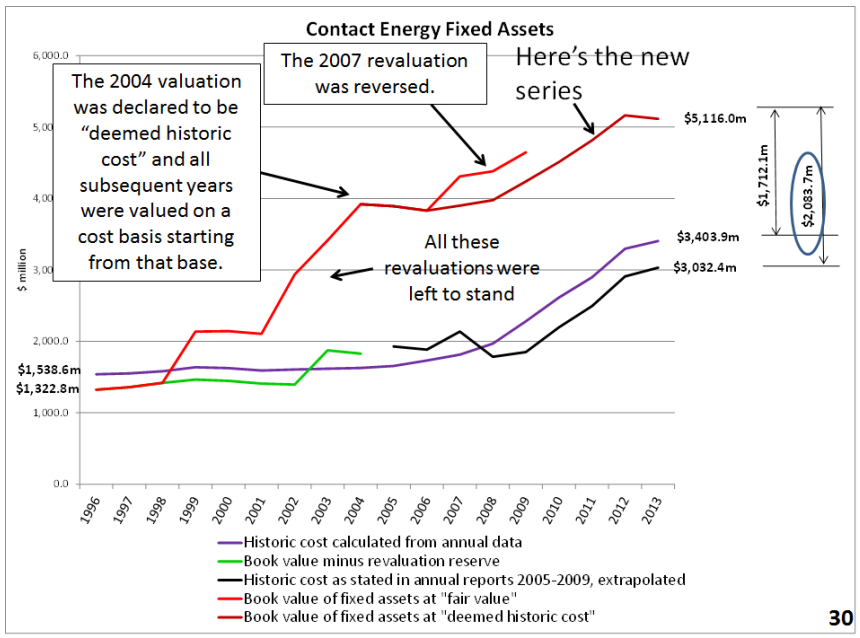
27


Meridian Energy Fixed Assets: "Fair Value" v Historic Cost
$6,769m
$3,186m
$3,842m
$3,583m
$2,927m
$2,075m
$ million
9,000.0
8,000.0
7,000.0
6,000.0
5,000.0
4,000.0
3,000.0
2,000.0
1,000.0
0.0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Book value
Historic cost as stated in annual reports 2008-
Book value minus revaluations
Historic cost calculated from annual data

28

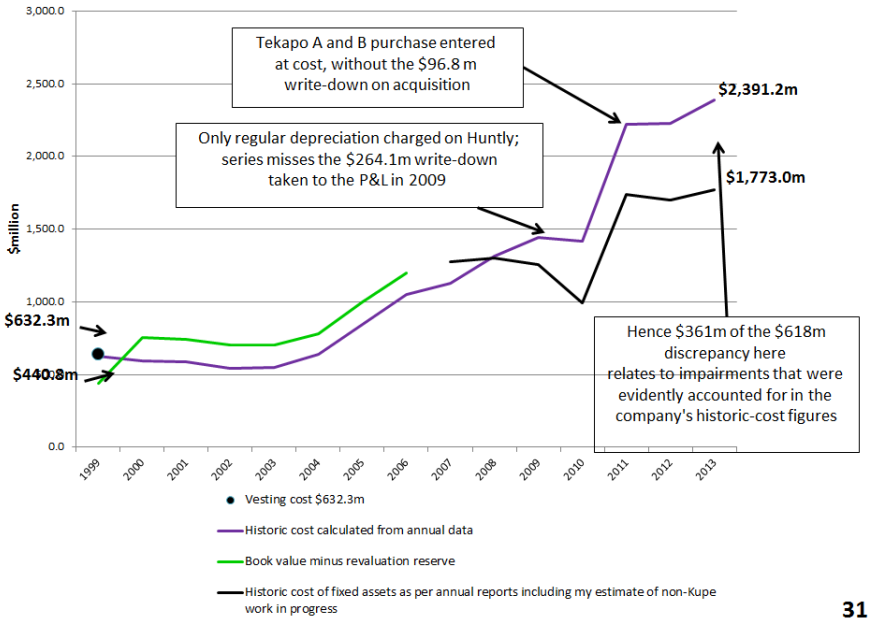

Contact Energy Fixed Assets
"Fair value" revaluations by Deloitte
But then in 2010 Contact decided to change its valuation methodology, with retrospective effect back to 2004
$ million
$3,403.9m
$3,032.4m
$1,538.6m
$1,322.8m
Historic cost calculated from annual data
Book value minus revaluation reserve
Historic cost as stated in annual reports 2005-2009, extrapolated
Book value of fixed assets at "fair value"
Book value of fixed assets at "deemed historic cost"

29


Contact Energy Fixed Assets
The 2004 valuation was declared to be "deemed historic cost" and all subsequent years were valued on a cost basis starting from that base.
The 2007 revaluation was reversed.
Here's the new series
All these revaluations were left to stand
$5,116.0m
$1,712.1m
$2,083.7m
$3,403.9m
$3,032.4m
$1,538.6m
$1,322.8m
Historic cost calculated from annual data
Book value minus revaluation reserve
Historic cost as stated in annual reports 2005-2009, extrapolated
Book value of fixed assets at "fair value"
Book value of fixed assets at "deemed historic cost"

30

Reconstructing Genesis Energy's historic cost of fixed assets



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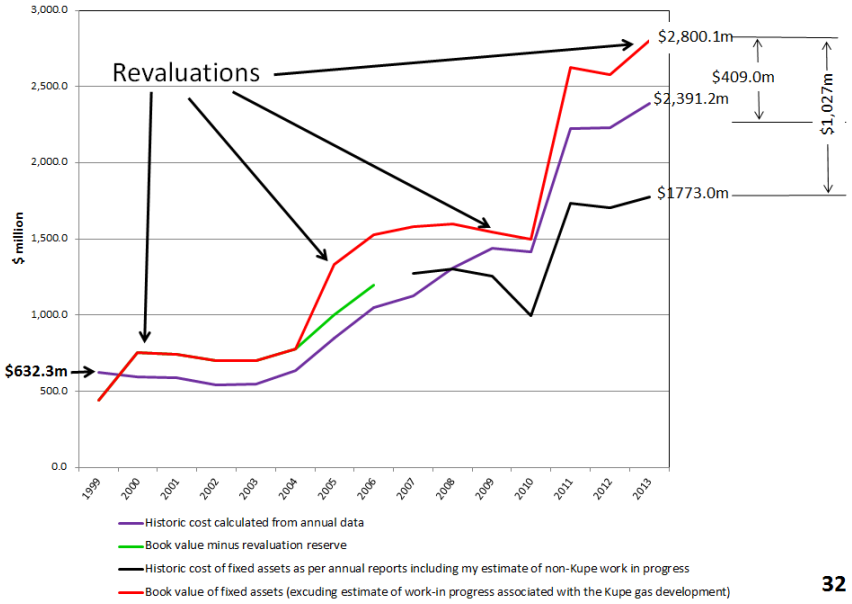
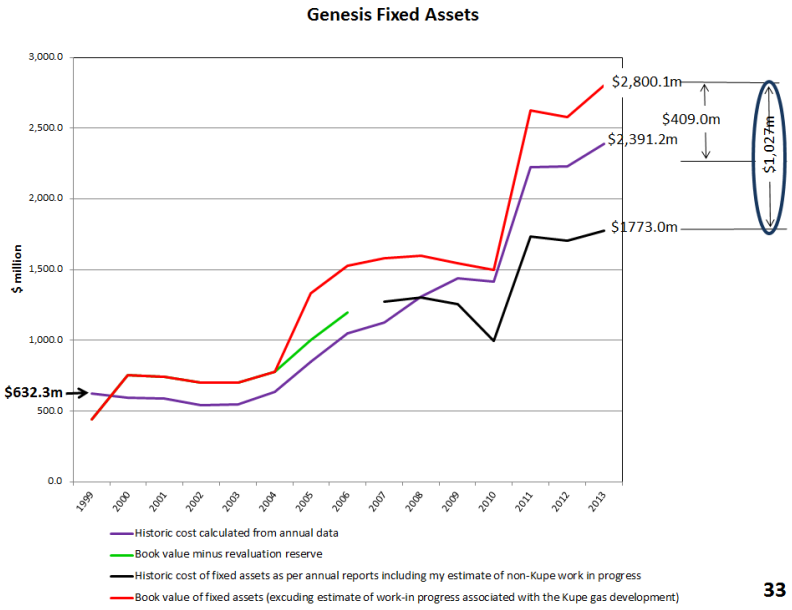
Genesis Fixed Assets



32



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In summary, at 2013

	Book Value ($mill)	Historic Cost ($mill)	Difference ($mill)	Difference %
Mighty River	5,141	2,309	2,832	55
Genesis	2,800	1,773	1,027	37
Meridian	6,769	2,927	3,842	57
Contact	5,116	3,033	2,083	41
Trustpower	2,717	1,425	1,292	48
Total	22,543	11,467	11,076	49

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Taken at face value, the gap between historic cost and book value provides a preliminary indication of the extent to which gentailer profitability has run ahead of the actual cost of service. Because of the vertically integrated nature of the companies, with generated electricity transferred to retail affiliates at in-house transfer prices, the "fair value" of generation assets is based on the total profits secured across both generation and retail activities; hence an unknown (but probably substantial) part of the revaluations is capturing inflated retail margins as well as ricardian rents to sunk-cost generation plant.

In 2013 I used the $12 billion of revaluations shown in the financial statements at that time to estimate that total gentailer revenues exceeded the warranted revenues that a US-type regulator would have allowed by $1.5 billion annually. (This calculation allowed for depreciation at just over 3% and a post-tax return on capital

of 9%). The basis for this estimate was that writing down the industry's fixed assets to historic cost would enable revenues to fall by this amount while leaving profits adequate to yield a market return on and of the residual asset base.

However, it must be borne in mind that the adoption of new IFRS accounting rules around 2006 changed the way in which asset revaluations affect the book value of a company. Under the old accounting rules every dollar of revaluation was entered into the revaluation reserve which translated directly to shareholder equity. Under the new rules, adjustments are made for deferred tax at 28%, which means that only 72% of the revaluation is credited to equity. Thus a write-down of $11.5 billion on fixed assets translates to only an $8.3 billion reduction in equity. If this is taken as the relevant capital base, it would imply excess annual revenue more in the $1 billion range. The Labour single-buyer proposal foreshadowed revenue reductions of the order of $700 million, which still allows a reasonable margin of error.

One obvious weakness in this line of analysis is the fact that "fair value" estimates are forward-looking and hence are only as good as the analysts' foresight. It is clear from the decade of steady upward revaluations after 2000 that PwC, Deloitte, First NZ Capital and the other valuers brought in by company boards of directors were riding a wave of optimism regarding the ongoing ability of the gentailers to keep raising their retail prices ahead of inflation, partly on the basis of rising LRMC and partly on the basis of the exercise of market power. Until the last year or so that optimism was reinforced by actual performance. But the fair-value estimates represent actual transfers of wealth only to the extent that their high earnings projections are sustainable, and it seems likely that the revaluation boom is now tailing off in the face of weaker market conditions as well as the regulatory risk inherent in the Labour-Greens proposals.

The asset sales of 2013-2014

Company	Shareholder equity 2013 $ billion	Proceeds from 49% sale $ billion	Implied valuation $ billion
Mighty River	3.182	1.7	3.4
Meridian	4.688	1.9	3.8
Genesis	1.95	0.74	1.5

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Mighty River Power reported its shareholder equity in June 2013 as $3.2 billion. The sale of a 49% stake in May 2013 raised $1.7 billion, implicitly valuing the firm at $3.4 billion; and even with the share price having dropped about 15% since the float the market valuation of the company remains roughly $3 billion, not impossibly far from the 2013 book value.

Meridian's reported shareholder equity in June 2013 was $4.7 billion, after a large write-down reportedly reflecting changes to the NZAS contract. The sale of 49% of the shares in October 2013 raised $1.26 billion plus another $0.6 billion deferred payment, a total of $1.9 billion, implicitly valuing the company at only $3.8 billion, far below the book value. Thus only about two-thirds of the estimated wealth transfers embodied in the revaluation reserve were realised by the sale.

Genesis reported shareholders' equity in June 2013 at $1.95 billion. The sale of 49% of the shares at $1.55 will bring in $736 million[6], implying a valuation of $1.5 billion, again well below the 2013 book value, but the share price seems likely to rise after the sale process concludes.

[One puzzle that has emerged in recent months is the apparent disconnect between the story told by asset revaluations and the story emerging from analysis of profitability by industry sources, which claim to find rates of return on historic costs that do not exceed their cost of capital. This remains the subject of future research.]

The single-buyer proposal embodies a regulatory write-down of fixed assets to historic cost, with the revised company book values providing the benchmark against which profitability is measured.

Some caveats

So far so good. But there are two elements in the single-buyer proposal that raise potentially serious difficulties.

[6] NZ Herald 28 March 2014.

Two sets of risks

Slide 36

- Short-run: who absorbs spot-market fluctuations?
  - If single buyer takes 100% then it bears all the spot-market risk
  - If single buyer handles only contracted volumes and leaves a spot market to operate at the margin, this may translate volatility into the single buyer's volumes sold to retailers
- Long-run: who bears investment risks if the single buyer tenders out new investment opportunities? Who underwrites assets that may end up stranded?

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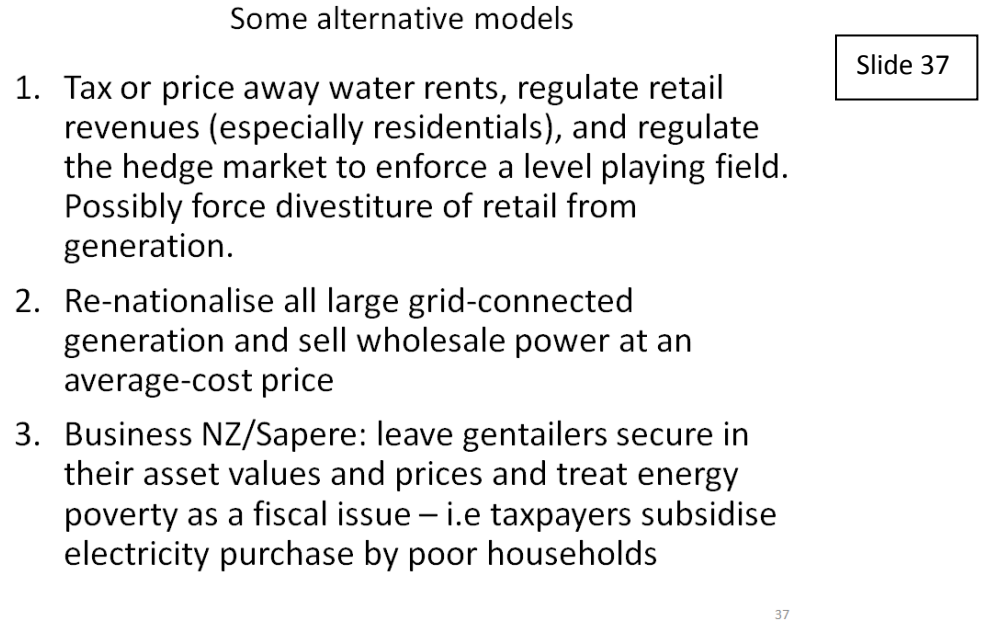
The first is that by introducing what is in effect a new version of the old Bulk Supply Tariff, the single buyer will be selling to retailers at a fixed price but still facing some volatility of its wholesale purchase costs, assuming that marginal supply is drawn from a functioning spot market (that is, the single buyer's low-price contracts with generators are assumed not to cover 100% of purchased electricity). This short-run market risk will have to be absorbed by the single buyer unless it restricts its scope to the contracted part of generation output and allows active spot trading amongst generators and retailers at the margin – in which case the model would be no long strictly a single-buyer one, but simply a dominant-buyer one, and some means would have to be found to prevent the marginal tail from disrupting the entire market.

The second issue is the planning and contracting of investment in new capacity. The Labour proposal envisages an auctioning process in which the single buyer would determine a required investment programme and seek bids from private-sector players to undertake each project. Bidders would require long-term contracts to underwrite their investment, and these contracts could become liabilities for the single buyer if for any reason the planned investment path proves misconceived, or the contract terms are skewed in favour of the private parties in ways that are becoming familiar from the record of public-private partnerships elsewhere in thr world. There are good arguments for introducing a more centrally-coordinated approach to investment planning in the electricity industry, but there are risks inherent in having a state-owned agency standing in the centre of a market populated with private-sector entrepreneurs pursing private profit. The auctioning mechanism and contract terms will determine where long-run investment risk comes to rest, and it may be that the government is better able to bear such risk than the private sector. Ultimately it will make a big difference whether new generation capacity is owned by the single buyer/the Government, or by the private parties that bid to build the plant. If the latter, then risks should go with ownership – but the risk

of assets being stranded would obviously affect the bids offered by those private investor parties.

Conclusion

The single buyer proposal is one way to tackle some of the most egregious anti-consumer conduct of the electricity gentailers, but it is of course not the only approach. At the structural level one can envisage three obvious alternatives: serious regulation, re-nationalisation, and the industry's own proposal[7] for taxpayers to pick up the costs of price rises and asset revaluations by subsidising the electricity bills of low-income households while leaving the gentailers and lines companies secure in their profits and asset values.



I confess that I would be attracted strongly to the first of these if it were possible to convert the New Zealand Parliament and Government from their weak and lacklustre regulatory stance of the past two decades into something that more closely resembled the textbook expectation of a regulator. The single buyer idea, after all, is really just a backdoor way to try to achieve decent regulatory outcomes that protect consumers from predation, without actually bringing in the real thing - serious regulation backed by a statutory requirement that consumers be protected from monopolistic practices. My concern is that given the lack of political stomach for a

[7] Toby Stevenson, Kieran Murray, and Joanna Smith, *Achieving policy goals for the electricity Industry*, report prepared for Business New Zealand by Sapere Research Group, 10 February 2014.

robust regulatory approach, it is difficult to see how the single buyer model can be implemented without suffering the same industry capture, rent seeking and opportunism that have bedevilled electricity sector “reform” to date.