



## EDITORIAL

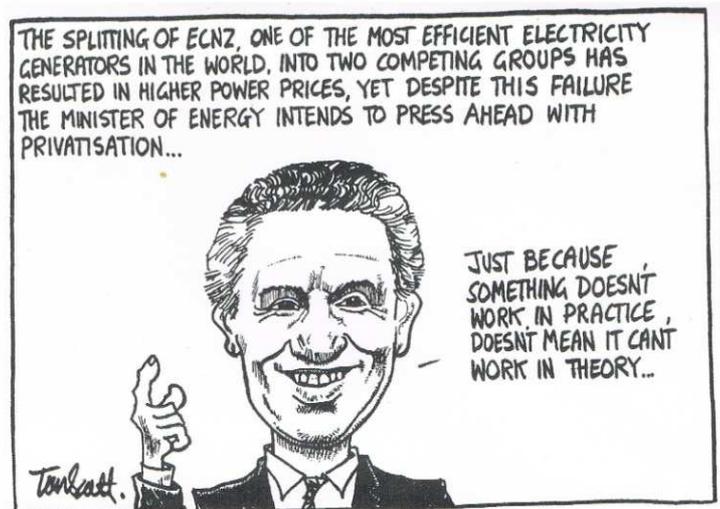
### COULD "NZ POWER" WORK?

During the flotation process for the Mighty River Power asset sale the Labour Party and the Green Party issued a joint warning to the market place that in the event of a change of government there could be a major change in the governance arrangements for electricity wholesale purchasing. The outline proposal was described as a single wholesale electricity purchaser dubbed "NZ Power". In this issue of Energy Watch several contributors give their interpretations of what such a change from the existing complexities might mean and how such a new arrangement might work, or not, in practice.

This classic Tom Scott cartoon dates from 1997; the time of the Max Bradford electricity reforms. It highlights the disparity between neo-liberal economic theory and its practical manifestation in the New Zealand context. After nearly two decades of the electricity reform experiment, and in the midst of further abrogating of Government responsibility for meeting the electrical needs of our country, it is timely to reassess the key mechanisms that have lead to the current disconnect between what it costs to make and deliver electricity in New Zealand and what the consumers have to pay for it.

The knee-jerk reaction of the free-market ideologues to the NZ Power proposal has been to declare that it can't possibly work, with very little explanation as to why not that I, as a humble layman, can understand. I need more convincing than the simple assertion "Central planning? – Been there. - Done that. – Doesn't work." Therefore I invited a number of luminaries to try to explain in simple terms the pros and cons of the NZ Power proposal. I reproduce their replies to that invitation in this issue of EnergyWatch.

To re-phrase the sentiment attributed to the character in Tom Scott's cartoon I am suggesting "Just because something doesn't work in theory doesn't mean that it can't work in practice." In my work as an energy systems analyst I lay great store by theoretical principles. If I determine that a proposed scheme contravenes the laws of thermodynamics then I use that insight as a basis to explain its practical flaws. However, the laws of economic theory are derived from observations of human behaviour and are not as immutable as the laws of physical science. There are many examples of human behaviour that deviate from economically rational behaviour and therefore provide examples of the fallibility of economic theory. Perhaps things can work in practice contrary to fashionable theory. The bumble bee can fly.



Also in this issue is an emotive article written by Kristin Gillies from an activist's conference that he recently attended in Australia. In contrast to the usual analysis and commentary in EnergyWatch, this piece reminds us all that we are real humans with feelings, needs, and concerns that override considerations of efficiency and cost. Although those concerns may be irrational and emotive at times, they are nonetheless very real. Perhaps this perspective provides a signal to the energy supply industries that failure to take full account of the wider needs of the communities within which they operate can ultimately compromise their prime function of providing those same communities with energy services. As the PCE says; our energy industries need a social licence to operate.

Jeanette Fitzsimons has long been a critic of the Business-As-Usual, There-Is-No-Alternative You-can't-make-an-omelette-without-breaking-eggs mindset underpinning much of our existing energy and commodity infrastructure. In this issue she challenges the frequently made assertion that steel cannot be made without using coal.

As usual we finish with an update on oil prices.

Thanks to the wonders of the internet I am actually compiling this issue of EnergyWatch from my hotel room in Beijing. The Great FireWall of China presents a few interesting challenges, but they are not insurmountable. I am here for a month working on a very interesting project to consider an application of carbon capture and storage in the Chinese context and to try to explain the consequences to the Chinese.

Contrary to the commonly held view that China presents an impenetrable obstacle to global progress with CO<sub>2</sub> emission reduction there are significant signs that the issue is being taken seriously at a very high level in China. A centrally planned economy with the power to

dictate actions on a massive scale provides possibilities that cannot eventuate under the free market carbon trading regimes that have fallen into disarray in the First World.

China is an interesting place with every day presenting new challenges and turning preconceived notions up-side down. I look forward to sharing some of these experiences when I get back home to the blue skies and the clean water of Aotearoa.

I am most grateful to the luminaries who have taken the time to share their thoughts on potential restructuring of the New Zealand electricity industry. I hope this compilation of views makes a useful contribution to the ongoing debate.

Any feedback or further commentary would, as always, be very welcome.

*Steve Goldthorpe, Editor*

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# OPINION COMPILATION ON THE “NZ POWER” IDEA

All potential contributors were given a guideline list of issues for discussion in the form of “How?” questions. I suggested that they might like to focus on one or two questions. Brian Leyland chose to give a short comment on each question, so I present Bryan’s responses first as a scene-setting summary, followed by the other perspectives in alphabetical order. *Editor*

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## BRYAN LEYLAND

*EW How “locked-in” is NZ to the competitive wholesale electricity market?*

**B.L.** Fairly effectively - but not impossible to change.

*EW How would legislative changes work to enact a single buyer regime?*

**B.L.** By renegotiating all the contracts on the basis that the new contract will not change the share value. I believe that any attempt to expropriate share value is wrong and would destroy New Zealand's international credibility.

*EW How would generators be dispatched and paid under a single buyer regime?*

**B.L.** The single buyer would decide when they will run and how much they would generate.

*EW How would high-cost generators be rewarded for providing back up security of supply under a single buyer regime?*

**B.L.** The primary payment to the generators from which they derive their profit margin would be a payment based on the value of assets that are involved. As far as possible, the profits made by the generator would not be very much affected by how much they generate. This means that dry year reserve is properly rewarded and will be available.

*EW How might low-cost generators respond to a reduction in the ability to make the windfall profits that the current market arrangement allows?*



**B.L.** In exchange for the possibility of making windfall profits, they would have a long-term contract which gave them stability and security. The shareholders would welcome this. As a result, they might be happy with the smaller dividend.

*EW How might wholesale electricity prices evolve over the next decade under single buyer model compared with under the competitive wholesale market model?*

**B.L.** It would stop the rise in prices caused by everybody getting a reward based on the cost of the newest generator and, to a greater extent, the ability to manipulate the market.

*EW How could new renewable generation build be encouraged under conditions of surplus generation capacity?*

**B.L.** I don't see any particular reason to build new renewable capacity unless it is the most economical way of meeting the increased load. Hydro and geothermal certainly come into this category. Wind does not.

*EW How would the advent of additional electricity demand from electric vehicles be managed?*

**B.L.** I have little hope that we will see anything substantial and electric vehicles this side of 20 or 30 years. What people forget is that ordinary motorcars are getting more and more efficient and, anyway, electric vehicles often take power from gas and coal fired stations. But if electric vehicles did arise, it could be handled quite easily by a single buyer

*EW How practical would it be for electricity released by the potential closure of the Tiwai Point aluminium smelter to be distributed around New Zealand?*

**B.L.** If the smelter is shut down a single buyer market would handle that much better than the present market. It would put a lot of low-cost electricity on the market and this could be shared. But the single buyer would still need to make sure that there was sufficient dry year reserve which, under the present system, there probably would not be because Huntly would shut down. The coal stockpiled at Huntly is the critical dry year reserve.

**EW** How would a single buyer model affect New Zealand's transmission constraints?

**B.L.** The single buyer would pay to build the transmission reinforcements needed. But it would have a strong inducement to manage demand by restoring the old ripple control system, or a modern equivalent, and by making sure that generation was managed to minimise constraints and maximise overall efficiency. Under the present regime, the generators can manipulate constraints.

**EW** How would a single buyer model address the peculiar load following issues in New Zealand?

**B.L.** I am not sure that we have any peculiar load following issues apart from those generated by wind farms. Provided we do not build too many more, they are manageable.

**EW** How would a single wholesale buyer model affect the retail electricity market?

**B.L.** Not only would it make all the traders employed by generators redundant, (hooray!) but it might be the best idea to put distribution back into the hands of the lines companies.

**EW** How can lessons to be learned for New Zealand from similar arrangements overseas?

**B.L.** By studying the various overseas markets that have worked or have not worked - something that the Electricity Authority steadfastly refuses to even contemplate.

**EW** How could a single buyer model be kept independent of political pressure?

**B.L.** With extreme difficulty. The Labour/Green proposal to subsidise renewable energy is an example of what needs to be avoided. It would need to be set up similar to the Commerce Commission. The government tendency to manipulate the electricity market to win votes is always a risk. The proposal for a block of cheap energy is a perfect example. In reality, it will benefit the prosperous far more than the poor for the simple reason that the prosperous would harvest most of the benefits. I am amazed that the Green party cannot understand this.

*Bryan Leland*

## ALASTAIR BARNETT

The recent Labour / Green announcement of a possible return to a single buyer of wholesale electricity is based on the assumption that this market restructuring would somehow produce the holy grail of lower prices plus



reduced greenhouse gas emissions. This is comparable to asserting that changing to a single buyer of passenger tickets on the RMS Titanic would somehow have ensured the great ship continued to carry passengers as long as its contemporary, TSS Earnslaw.

Certainly a single buyer has the market power to negotiate a sharper deal with the producer of the services, but this negotiation will only centre around *production costs* – the running costs involved with generating the power or making the voyage, using plant which is already commissioned. The *development costs* sunk in commissioning that plant are far more significant in power production, or transatlantic crossings, and how would a single buyer affect these?

A single buyer might have been successful in demanding that the deckchairs be rearranged in a more satisfactory layout, but would a government agency have been just as keen as private buyers and company shareholders to add to national prestige by taking the Blue Riband at the first attempt? Would market forces have been any more able to demand improvements in the crucial rudder design through the agency of a single buyer rather than multiple buyers?

The designers of our power stations face choices of a similarly critical nature, particularly in the civil engineering field, where nothing can be treated as standard. They will all be well aware of notorious failures with consequences similar to the sinking of the Titanic, but also of celebrated successes where elegant design has produced abundant power at a vastly reduced cost. What has the structure of the wholesale

market got to do with these fundamental technical outcomes?

Under the present wholesale market model, we see obvious solutions being neglected, simply because the sole focus of the purchasers is on minimising the price of meeting their short term power needs. The options of expanding or consolidating power production are of no interest, because the delay before such power is available is measured in years. We have elegant and cheap options for supplying Auckland peaks through Waikato pumped storage, and further south through pumped storage between Lakes Pukaki and Tekapo, and between Lakes Wanaka and Hawea. Even in the Chatham Islands the South Coast hydro development could eliminate the import of costly diesel, but because these schemes cannot contribute power this week they are not a market purchase consideration.

As long as we continue to agonise over the optimum electricity market structure, I see little hope of progress towards lower prices or reduced greenhouse gas emissions. Isn't it time we focussed on the real issues?

*Alastair Barnett*

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Murray Ellis' response is focussed on the following (perhaps naïve) comment in my covering letter *"In simple terms, the current competitive wholesale market model works on the basis of all electricity producers at each time and place being given the same price regardless of their production and capital costs, with that price being the cost of the most expensive electricity generation that has to be dispatched to maintain instantaneous electricity supply at all times. This means that low cost hydro operators receive payments greatly in excess of their costs."*

*Editor*

## **MURRAY ELLIS**

The appearance that "low cost operators" are overpaid because they receive the market clearing price is wrong.

The market process is designed to incentivise each generator to price at their marginal cost of production, and most of the time this seems to work. This means that the difference between price and each generator's marginal cost of production is their opportunity to recover their fixed and capital costs. The marginal cost of generating a few extra units of electricity is usually very different from the total cost of generation.

A consequence is that proposals to pay each generator only what they bid would not produce the anticipated reduction in prices. Generators would have no option but to bid substantially higher prices and the system would operate much less efficiently. The end result would be a lot of waste and higher prices. No-one operates on that arrangement.

What would constitute a "fair and reasonable price" is being deliberately kept totally vague. This may be an effective political tactic, but means that the proposal cannot be evaluated.

The promise of \$300 reduction per household approaches the mendacious. Nothing close to this can result without severe upheaval. It implies a sequester of the share value of Contact Energy and Trustpower and a large transfer from taxpayers to electricity purchasers. I don't believe that even a left wing Labour/Green government would actually do this, although it does remind me of the £100 tax rebate that Labour promised in 1957. It assured them of success in that election, and failure at the next, after voters discovered what the consequences were like.

The single buyer model has been advocated by Bryan Leyland for nearly 20 years. It was considered, but dismissed, as an alternative to introducing the competitive wholesale market system we have now. It could easily have been introduced then. Changing to it now would not be anywhere near so easy, but possible. Small reductions in prices might be achieved, and future price increases ameliorated, but no more. The transition would be lengthy and disruptive. Right now, when demand is not growing anyway, it would not matter too much if no new

generation capacity was built for a few years, so there would be an opportunity.

Unfortunately, it would then need only a single serious plant failure to create an emergency, and this is entirely possible.

The short answer about closure of the smelter is simple. It involves constructing a transmission line from Invercargill to Benmore with the required capacity. It might also bring forward the laying of additional cable(s) across Cook Strait and upgrading from Haywards to Bunnythorpe.

*Murray Ellis*

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## STEPHAN HEUBECK

### A GREAT CHANCE FOR ELECTRICITY STORAGE AND UPGRADING



The Labour and Green parties have announced substantial changes for the NZ electricity sector should they form the next government. The plans envisage the formation of a new government entity which would act as a single buyer of electricity in combination (more importantly) with acting as system operator. Many details of the plan remain unclear. For example, how exactly it will be ensured that savings realized by the single buyer won't get lost throughout retailing, or how may the progressive pricing structure for households proposed by the Green Party be implemented in practice, etc.

However, the proposed plan could (at least partially) rectify many wrongs of the current system, and risk of failure is low – sadly for no other reason than there being not much that could be done worse than the current system. How many other purchasing systems apart from the current electricity spot market are we using where the most expensive item in one's shopping basket is the price for all items in the basket? In particular when this price can be subject to wild

swings as the result of gaming amongst a handful of dominant players?

It is not a given that a new government entity would run the NZ electricity sector with more buffer, or minimise the use of fossil fuels for electricity generation soon. Such objectives may be trumped by the wish to lower electricity prices. However, a single buyer purchasing electricity at prices related to actual generation cost that are stable long-term would at least remove the perverse incentives to drain hydro (and wind) surpluses as fast as possible to minimise the depressing effect on prices, or to delay necessary capacity expansions for as long as possible so as not to depress the spot market price pre-maturely. Despite many press releases with a different tune, the raw numbers indicate that over the last decade periods with electricity shortages have been most profitable for the established generators - and the current spot market pricing regime is the root cause behind this.

Long-term stable pricing reflective of the cost of generation under the new government entity's regime may also help with the establishment of new smaller generators on the supply side and new purchasing/consumption models, such as co-operative buying, on the demand side. Currently, supply gluts resulting from unusually wet weather, which occur every few years and reduce the spot price to near zero or negative for weeks, are a very effective barrier for preventing the establishment of new generation capacity by all but the largest and financially most liquid generators, while supply shortages, generally caused by droughts and leading to highly inflated electricity prices under the current spot market pricing regime are equally detrimental for all but the largest and financially most liquid retailers.

Again, there is no guarantee that the establishment of the new government entity would bring about such benefits, if for example details like first priority for "must run" generation, like wind, are not handled correctly. But at least the new model would offer a chance for improvements and new developments which the current system so effectively suffocates. Furthermore the new government entity may be

in a position to steer the development of new generation based on maximum system benefit, which would take into account transmission constraints and losses, source and spatial diversification for risk minimisation, etc., thereby mitigating some disadvantages of the current disaggregation where new generation is built on a lowest generation cost basis, with no regard for the potential problems such investment decisions may present for Transpower, lines companies, system efficiency and ultimately the end user.

But the most exciting benefits that the proposed changes could enable medium to long term, are related to new options for electricity storage and electricity up-grading. Despite electricity representing only a bit more than a ¼ of NZ end use energy consumption (transport being ~ ½ plus another ¼ heating mostly natural gas), the electricity sector has options to dramatically expand the provision of non-fossil fuel energy at reasonable costs (traditional economics) without having to wait for any further technology breakthroughs. In addition to demand reduction, efficiency increases, and fuel alternatives, a substantial excess supply of electricity from renewable resources (in the form of fuel for electric vehicles, electro-chemical fuels or “electrified” industrial processes) would be most valuable and important for substituting fossil fuels in the transport and industrial sector which will sooner rather than later become increasingly hard to come by and expensive. The current electricity market can’t handle a 10% oversupply, whereas a strategically managed “regular oversupply” that is used to substitute fossil fuel use in other sectors would not only help to reduce New Zealand’s overall fossil consumption but would also address the “problem” of renewables (i.e. wind) intermittency, since the future applications for “oversupply” already have their own back-up (on-call demand). At a lower and more traditional level, similar opportunities could be realized for electricity storage – either as better hydro lake management or as pumped storage. The current system provides no incentives, but disincentives, to invest into storage systems, whereas a single buyer could more than credibly

commission, manage and benefit from strategic electricity storage as part of the overall NZ electricity system.

In short, the proposed plans hold lots of positive potential, but nothing is guaranteed and the key will be to manage the details correctly. Let’s be wary of wasting another opportunity.

*Stephan Heubeck*

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## Hon GARETH HUGHES MP

### Empowering NZ

The Greens believe it is more important for families and businesses to have affordable power than for government and investors to make big profits.



That is why we have launched the Empowering NZ discussion document.

New Zealand has had the fifth-largest increase in power prices in real terms among the 34 OECD countries in the past 20 years whereas in inflation-adjusted terms, power became 6 percent cheaper for the average household across the OECD.

For 20 years Kiwis have heard excuse after excuse why power prices need to keep going up. Despite more than 100 reviews, reforms, legislative amendments, asset swaps and switching ad campaigns over that period, as listed on the MoBIE website, in New Zealand electricity became 70 percent more expensive.

The current market is geared towards increasing prices and excessive profits. The current wholesale marginal cost approach sees low cost electricity priced at the cost of the most expensive plant needed to meet demand and averages around 8c/kWh, well above the average cost of producing electricity. The current asset valuation sees generators ‘capitalise’ the high price they can charge for electricity into their asset values leading to increased prices in a feedback loop. The Commerce Commission’s

Wolak report estimated around \$700m taken out of the pockets of consumers in excessive profits – this is a stealth tax on the economy.

Greens have released a positive plan for cheaper greener power and are keen for your feedback. We are proposing a Pharmacist-style single buyer, progressive pricing and energy efficiency.

NZ Power will be a ‘single buyer’ – all generation will be sold to it and it will onsell to electricity retailers and major users. NZ Power will make long-term contracts with generators and use its market power drive the overall cost of electricity down to the average cost, rather than the higher marginal cost. NZ Power will add greater long term planning and national thinking in the electricity market and will be able to encourage demand side responses as well as new renewable generation. The single buyer model will weaken the ability of the generator/retailers to share risk across their wholesale and retail operations, allowing more competition. This, in turn, should encourage new entrants currently struggling to feed new generation into the grid, be it household solar PV or wind, and foster greater competition and innovation in the retail end of the market.

Business as usual isn’t working for New Zealand and we would like to hear your thought on empowering New Zealand and cheaper, greener electricity.

*Gareth Hughes*

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## **Dr SUSAN KRUMDIECK**

The reason power prices have risen is because demand has grown. Every new generation resource is more expensive than the existing ones.



Any upgrade to the grid to handle higher demand has to be paid for. Peak demand is the highest price of all. I would support the Labour/Green buyer’s group proposition, but for a different reason: it would provide opportunities for

profitable investment in demand side management (DSM).

Demand has flattened off over the last few years, which the industry did not foresee, even though it was foreseeable. The top priority for a prosperous society should be to manage electricity price exposure to ensure wellbeing of all citizens and to ensure that business, industry and services can carry out their activities without electricity price drag on the economy. The optimal way to ensure the rather feeble market works in a reasonable way is to have ample spare capacity at all times at all locations on the system. The historical approach is to grow the supply, transmission and distribution systems ahead of demand. I will propose that demand side management is a much more cost-effective and equitable way to manage costs, supply security, and market rationality.

DSM has three objectives: -

- Improve or insure grid security;
- Maintain lowest average retail price;
- Ensure profitability of most efficient generation and conservation investments.

The DSM project is a cooperative effort between consumers and the utility. DSM projects overseas have typically had market competitive rates of return. These projects have to be carefully engineered and tailored to the specific circumstances of each local population. There are some examples of DSM projects in New Zealand, like night rate water heating, ripple control, energy saver light bulbs and home insulation incentives. However, there is much more that can be done. The problem is that there are limited market entry points for businesses that could provide DSM projects.

The group purchasing approach won’t really be very effective unless the group can manage its demands and leverage this management, particularly by limiting demand growth and peak demand level. The current “market” is set up so that ALL stakeholders, customers, lines companies, retailers and generators are positioned in adversarial relationships. A perfect market is theoretically supposed to manage this kind of “competition” through price signals.

However, the way New Zealand society, the economy, and the power supply system works would be much more fruitfully managed through cooperation, education and incentives to manage demand to match supply.

I realise that this perspective is counter to the current market thinking. But the current market thinking is so last century. Last century we were happily believing the free market theory and keeping busy growing. The reality of the resource and distribution system for this century is that we cannot afford growth. We now need to believe that we have enough, that we can manage prosperously within the limits of our renewable resources, and that if we work together and help each other out, we will all be better off and more secure.

*Susan Krumdieck*

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## MOLLY MELHUIISH

How might wholesale electricity prices evolve over the next decade under a single buyer model compared with under the present electricity market?



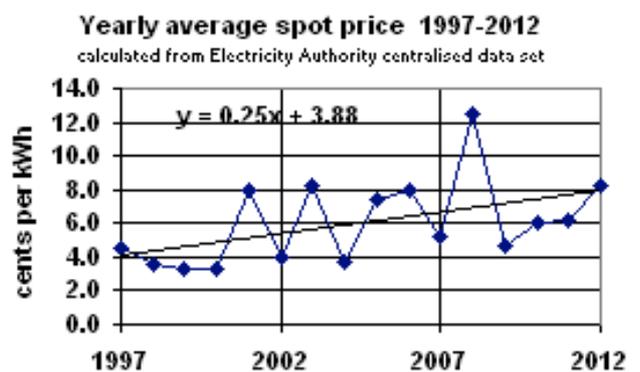
The present competitive market shows an extremely large variation in average wholesale prices, year upon year. In the first decade of the market, prices were around 4c per kWh in wet hydro years, but rose to 8-12c/kWh in the driest years. Companies could only survive by relying on their retail businesses to make up the revenue shortfalls.

The very high average prices arose always from brief periods when prices “spiked” to several dollars per kilowatt-hour for a few half hours – far more than the 20-35 cents per kWh needed to run the most expensive power station. Companies argued they needed those extreme but rare prices to make it possible to build new power stations, or even cover the cost of keeping old thermal stations on standby. In years when excess hydro energy drove spot prices down, high retail margins were needed to maintain

acceptable dividends to shareholders. Only vertically integrated companies – with both generation and retail, were able to maintain their businesses.

Under a single buyer regime, revenues would be far more predictable. Contracts would be written so that generators would fully cover their cost plus acceptable profit. The 2006 Ministerial Review that studied three alternative wholesale market structures concluded that Single Buyer would give the highest reliability of supply – but at the highest overall cost. The decision-maker, being accountable to voters, would put a big premium on keeping the lights on, and contract generously with the owners of “reserve” power stations such as Whirinaki, to ensure it was ready in case of a dry year or a sudden outage.

Regulators in New Zealand and overseas speak of the difficulty of negotiating such contracts. Companies know every detail of their cost structures and can afford the best lawyers and consultants. Perhaps one example was in 2003, when the new Electricity Commission was faced with a hydro shortage, and purchased a new “reserve” power station at Whirinaki for \$150 million, a year after the old Whirinaki was removed. Contact bought this back for just \$33 million.



This graph shows that spot price rises averaged ¼ cent per year - about 4% per year (nominal, not real terms) - since the market began. Retail prices rose by about 5% per year; the margin is attributed by the industry to the cost of risk management (hedging) of the wholesale prices.

The Labour Greens promise is to initially cut retail prices by around 10%, and control further price rises through the Single Buyer taking on risks; mainly of dry years. At present a large

surplus of generation in the North Island is driving prices down, with some 270 MW of geothermal capacity commissioned in the last two years. This will give the Buyer good bargaining power for a while.

The longer-term outlook for wholesale prices will depend mainly on how fast alternatives to electricity can enter the retail market - photovoltaic, efficient wood burning, and as always - insulation of houses. (Gas heating is less of an alternative - residential gas prices have risen even faster than electricity).

Labour and Greens policies to protect consumers instead of investors in the large companies could break through the barriers to electricity alternatives and effectively cap price rises - but only if part-privatisation does not entrench the barriers created by today's regulatory system.

*Molly Melhuish*

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## **ROBBIE MORRISON**

From Germany

The 'NZ Power' proposal centres on (based on my cursory examination) a single buyer of wholesale electricity

(a monopsony) offering producers their real-time long-run marginal cost.

Paid-as-you-bid auctions should match uniform price auctions (what New Zealand has now), given that participants can anticipate the likely marginal price (in the absence of competition deficits).

The debate in central Europe certainly does not traverse the establishment of a regulated monopsony purchaser (the European Commission would indeed have a fit). The key issues here are: -

- capacity markets -- the need to provoke timely investments / are such provisions required or are they anti-market (note though that in New Zealand, aggregate demand is falling)
- coupling across nation systems - technical and economic / compounded by the

physics of AC load flow and generation fleet differences between neighbours

- dealing with intermittency - via flexibility, transmission reinforcement, storage, and curtailment / likely to get more difficult as renewable capacities grow
- carbon pricing -- the over-allocation in the EU  
ETS trading scheme and the collapse of the carbon price (the cap still applies)
- alternatives -- nodal pricing is being discussed, but mostly at an academic level / the current German market relies on the "strong transmission" assumption and uses "re-dispatch" (aka "out-of-merit dispatch") to fix commitment discrepancies
- what next technologies and architectures - a ton of work on engineering solutions (those who think that technologies are a secondary issue are mistaken) and some research on system architectures (such as electric vehicle growth and integration, smart demand)
- pathway models to 2050 -- based variously on general equilibrium, optimal growth, or engineering/cost frameworks.

My reactions to the 'NZ Power' proposal are: -

- electricity market design is extraordinarily complex, both technically and politically
- whatever happens (bidding abuse is fixed, company valuations revert to book value, and rents are redistributed to consumers OR alternatively 'NZ Power' comes to pass), the role of customer domain (that part of the system where the customer has jurisdiction) must be included
- the analysis should be sophisticated, should not rely on orthodox first principles, and should include a mix of simulation, game theory analysis, and experimental economics

I wish everyone luck with their engagement in this issue.

*Robbie Morrison*

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## Hon DAVID PARKER MP

New Zealanders are paying too much for power. That's a given that even the Government struggles to deny.

For 15 years power bills have increased at



twice the rate of inflation. In the last year they rose at five times the rate of inflation. Consequently the number of disconnections rose by 10,000 to 40,000 in 2012. In addition a Canstar Blue survey found that over a third of New Zealanders can't afford to adequately heat their homes in winter. Higher power bills mean a higher price we will all have to pay for healthcare. The evidence of a lack of competition in New Zealand's electricity market is substantial.

Average residential power bills have risen by \$770 since 1997. The 2009 report of Stanford Professor Wolak for the Commerce Commission found overcharging by the four largest generators was 18% or \$4.3 billion. Prices have increased further since. Residential tariffs have risen more than many other countries and are now three times industrial tariffs. While industrial should be lower because of scale and avoided line costs, the difference is now the second highest in the world and cannot be properly explained.

Consumers close to physical supply sometimes pay more than those more distant. The million dollar salaries for executives and hikes in directors' fees show a market not constrained by competition. The list goes on and on.

The so-called Bradford reforms were fundamentally flawed in many ways. They left lines – always a natural monopoly – unregulated. Prices increased and there was underinvestment until lines were regulated.

The promised competition has not resulted. The main 5 generators account for 95% of generation and dominate a similar percentage of retailing.

The problems go deeper than a lack of competition. The pricing model used means all electricity dispatched is paid the amount of the

highest bid accepted. This means our abundant cheap hydro (almost 60% of our generation) is priced at many multiples of the cost of its production. Morningstar has said cost of hydro generation for Mighty River Power was less than \$5/MWh, whereas the market was paying about \$70/MWh. Even after a fair return on capital, that's excessive.

In effect we allow the owners of old hydro to capitalise into their balance sheet the value of the free public water resource. This is the main driver of the multi-billion dollar revaluations of hydro assets, which electricity consumers pay for through higher power bills.

Labour proposes that generators be paid for their production costs plus a fair return on their capital. Generators will be structurally separated from retailers. A Crown agency, NZ Power, will sit in the middle. NZ Power will tender for new capacity under long term contract, the cost of which will be averaged into the market (rather than driving the price of existing low-cost hydro ever higher). The future price track for electricity will be more predictable, helping investors in energy intensive businesses commit to investing in New Zealand.

Competition for new generation will ensue. Cost effective energy efficiency alternatives to extra capacity will be able to be considered (the current system does not allow this). The retail market will also be more competitive than it is now.

New entrants in both generation and retailing will increase the range of investment opportunities for those wishing to invest in the electricity system.

Many overseas jurisdictions, including a number of States in the USA, run similar systems.

The net result of this policy is a \$230 - \$330 reduction in the power bills of Kiwi households. It will also be a five to seven per cent drop in bills to businesses. Independent economists Berl have said those savings created a \$450 million boost to the economy and around 5,000 jobs. That's a huge benefit.

Despite this, critics of our proposals have made exaggerated claims comparing Labour to

Stalinist states asserting that capital flight will ensue. This will not happen. As our policies clearly show Labour favours a market economy and a competitive market.

As a country we can't afford excessive power bills. The costs to all of us are too high in the short term and in the long term.

*David Parker*

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## KEN PIDDINGTON

Looking back to the early years of SEF, I realise that we had no idea how firmly the political culture would resist the shift in energy policy which we all considered to be relatively minor.



Amory Lovins and other inspiring leaders of technical change had convinced us that the soft energy path was the shape of the future, that it had many economic advantages for our skinny little realm, and that the transition would appeal to some basic Kiwi instincts.

At the personal level, since I was using an off-grid PV system in the Central North Island, it also struck me that the rural community had a lot to gain from a steady uptake of the new technologies. Even if the bureaucracy was keen on staying with traditional sources of energy, surely the body politic would, given the number of rural seats, welcome policies which improved security of supply and offered a degree of independence from the distant generators.

My work in the developing world had also convinced me that in the Pacific we had a ready-made opportunity to contribute expertise and funding in order to assist a wider transition in the region. The World Bank had already analysed the net economic and environmental benefits of phasing out fossil fuels and reducing the carbon footprint of the Pacific Island states. *In the case of the atoll communities, it concluded that PV supply was the best economic option.* Now, two decades on, the introduction of renewable

technologies has gathered a lot of momentum, but since we are short of the necessary skills, New Zealand is not getting full benefit from being part of the solution.

On the domestic scene, the history of the last two decades tells us that our line of argument was very wide of the mark. The great future of the restructured power industry, as promoted by Bradford, Deane et al, created a smoke and mirrors illusion of lower prices within a rational market structure; this would rule out any dirty work, so that competition would always triumph over collusion. And some key players in the political process still believe that to be the dawn of the future, believe it or not!

It is also obvious that there was a missing link. The new technologies offered the opportunity for individuals and communities to invest in small-scale power generation. In the northern Wairarapa, Ralph Sims had a demonstration project under way with a community at the end of a valley, which had hitherto been vulnerable to sudden power cuts with trees falling on the lines, floods and suchlike. Their enthusiasm when the power went on in the woolshed was marvellous to see.

But the 'market' did not recognise that these individual decisions could be an element in the proper operation of a competitive regime. Neither did it understand that resilience could be part of future grids, national and local. In the urban setting, the new technologies could increase future property values. Already, this has happened in Queensland, with policies designed to facilitate the uptake of PV and solar hot water.

So SEF needs to think about the lessons to be learned from the recent past, and define a role for our network to contribute in the future formulation of policy options for the country at large, and for country people in particular.

*Ken Piddington*

*In my invitation for perspectives on the NZ Power concept I asked contributors to try to consider the practicalities in an apolitical way, but as Ken points out, the key issue is the conflict between underlying political ideologies. Editor.*

## DAVID REID

### What is right with our current wholesale electricity market?

Our wholesale electricity market is based on sound economic principles that are used for setting the price of many commodities where competition is possible. Its extraordinary complexity arises because of need to maintain an instantaneous and uninterrupted balance between supply and demand over a long stringy geography and with much of our generation relying on the weather.

10 years ago the wholesale electricity market was relatively young and it wasn't working nearly as well as it is now. Major changes have been implemented in recent years and our market now seems to be working well. The background to these recent changes and their intent is outlined below.

In 2005 the Commerce Commission (CC) instigated an investigation into alleged anti-competitive behaviour in the NZ wholesale electricity market. The CC engaged an American electricity markets expert, Professor Frank Wolak to review the market's competitiveness. The Wolak's review covered the period from 2001 and 2006. He concluded that, at times, the major generators had sufficient unilateral market power to set wholesale spot prices above expected competitive levels. He considered that this "uncompetitive" situation arose during the dry winters of 2001, 2003 and 2006. During these periods, he argued that there was a concentration of market power due to water scarcity, transmission constraints between islands and lack of competition in the thermal generation market. This gave one or more of the large generators the ability to extract excess rents. The CC estimated that, if Wolak was right, the excess rentals collected over this six year period was of order \$4.3 billion. While the appropriateness of Wolak's methodology and hence his conclusions are still hotly debated, the CC investigation was the catalyst for a substantial market reforms programme that commenced in 2009.

The key reforms included:

### Decreasing wholesale market concentration:

- Transfer ownership of the Tekapo hydro power scheme from Meridian to Genesis – implemented in June 2011.
- Virtual asset swap between the NI and SI SOEs – i.e. imposing 15 years term hedge swaps between Meridian/Genesis (1 TWh/y) and Meridian/MRP (0.45TWh/y) – implemented at the start of 2011.
- Relaxed the rules on Lines companies owning generation and allowed them to retail the output - implemented in 2009.
- Encourage gas exploration and development. With the end of the Maui Contract: gas prices increased significantly and short supply flexibility had diminished. This trend appears to have reversed in the last few years.

### Creating a liquid and transparent hedge (futures and options) market

- Establishing a hedge market with standard hedge products – originally via EnergyHedge and now on the ASX with hedges out for 3 years in advance
- Mandating participation by the larger generators and increasing information disclosure

### Decreasing locational price risks and barriers to the development of lowest cost new generation

- Building the HVDC Pole 3 committed in 2008, and the Central and Upper North Island grid upgrades committed in 2009. These will improve security of supply, reduce transmission constraints and energy losses. The upgrades are now nearly complete and their costs and benefits are just now coming into play.
- Introducing Financial Transmission Rights to allow retailers to hedge their location risks. The EA has now completed the implementation of the first FTR product and inter-island hedge, and the first FTR auction is in June 2013

There are other significant improvements in the pipeline, but the state of play today is far better than it was in 2006 and the market appears to be working well.

*David Reid*

## EMOTIONS RUN HIGH IN OZ

**Kristin Gillies from Coal Action Network Aotearoa\* attended Australia's largest-ever gathering of coal and gas activists**



[www.beyondcoalandgas.org](http://www.beyondcoalandgas.org)

Three days amongst 250 of Australia's most inspiring coal and gas campaigners has been a surprisingly emotional experience. As I reflect on the journey of the past few days I am left with a deep sense of respect for these people and those around the world so heavily impacted by the fossil fuel industry.

In my daily life and work it has been easy to overlook the widespread harm the industry is causing right now to ordinary people every day. This conference has brought this home for me and I would like to share that with you.

### **Opening night:**

A bloke of about 50 stands up, takes the mic, and introduces himself as an ex-coal miner who now spends his time fighting the expansion of the coal port, and therefore the coal industry in McKay, Queensland.

He has felt the damage first hand. The numbers he uses are staggering, the millions of tonnes of coal, the amount of seabed that needs to be dredged, the number of coal trains, the amount of coal dust spread across the city.

And he tells the story of hurt, of struggle, and of grim determination that is similar to many other stories that night and those of the hundreds of people here, and the tens of thousands of people across the country so heavily impacted by the mining industry.

The first evening feels incredibly cathartic. People just need to tell their stories, talk about the hurt that is being felt in their communities, the price that is being paid by the land, the water and the people for the promised riches of this mining boom. And they are feeling it very hard.

The announcement next morning of the suicide of a farmer whom many there had been supporting brings it into sobering relief. The pressure of being the only farmer in his area not to sell out to a giant coal seam gas company proved too great. There are plenty of tears.

### **Similarities with NZ**

I hope we never feel it this hard in New Zealand but I am immediately struck by the similarities.

I think of the stories from around our country and how much they resonate with the stories I am hearing here in Australia.

I think of the people around Puhī Puhī, unsure and afraid of what the new gold mining permits issued there mean.

I think of the people of Waihi, who will now have to live with mining under their homes.

I think of the folks in Taranaki, who find their rural landscape suddenly industrialised by the burgeoning oil and gas companies; and the people of the Tararua, valiantly trying to stop Tag Oil doing the same to theirs.

And I think of Greymouth, the loss of jobs, the loss of life, and how much hurt they must be feeling.

### **Day two: Optimism**

But by day two there are less signs of pain and more smiling faces and it obvious why such a large and diverse crowd have gathered here. Workshops on the latest climate science, community organising, media skills, health monitoring, direct action, social media, lobbying, and groundwater impacts fill the place with an amazing sense of optimism.

When you look at the diversity in the crowd it is obvious that this is a movement that has momentum and knows it is going to win. Doctors, farmers, students, church leaders, grandmothers, taxi drivers and others talk about the positive change that is happening around the country.

1 million homes on solar power, coal power stations shutting down, communities blockading

gas companies, nanas knitting to stop coal seam gas, everyday folks changing their super funds because they invest in fossil fuels.

And they say this is just the beginning.

### **Lessons for NZ: finance is crucial**

Coming home, I am inspired to put some of the lessons from here into action. The key points discussed here are stopping investment and encouraging divestment from fossil fuel projects. Knowing our government Superfund, our major banks, and other institutions responsible for investing our money are putting it in such a destructive industry demands attention.

Understanding finance seems crucial in exposing and ultimately stopping investment in climate change. There is also a lot of work being put into building community resilience, simple and effective when the industry comes knocking.

I also feel inspired to help make an event like this happen in New Zealand. The sharing, the support and the strategising are invaluable and can only strengthen our movement. I'm taking expressions of interest.

It has been an experience and a privilege to have spent these past days in the midst of such a determined movement. The words shared at the closing are less about hurt and more about the inevitability of success.

I have a moment of jealousy, wishing for the resources and breadth of experience in our movement in New Zealand, but quickly acknowledge it is borne out of necessity, something I hope we never feel like here to the same extent. These fractured communities see not only contaminated water and land, but understand that the floods and the droughts are also impacts of the fossil fuel industry and climate change.

In New Zealand we have had some great victories against the fossil fuel industry. The fight which stopped Marsden B going ahead has

ensured we will never build another coal fired power station again. Petrobras abandoning plans for deep sea oil exploration off the East Cape and Solid Energy dropping plans for lignite conversion in Southland are some of our recent wins.

In New Zealand we have achieved a great deal but still find ourselves on the cusp of a massive expansion of the fossil fuel industry. This expansion is already being passionately opposed across the country - from the fight to stop coal mining at Denniston, the growing Lock The Gate movement against oil and gas, and the national opposition to the threat of Anadarko drilling in our coastal waters this summer.

We have defeated these threats before and must continue to learn, to share, and to work together to ensure we defeat them again and minimise the harm like I have witnessed here.

### **We still have a choice:**

We can let the government continue to roll out the red carpet to these companies and face the same fate as these people who have gathered here this weekend.

Or we can take a cue from the growing number of communities I have met here this weekend and take action to keep them out.

I know which I am inspired to do. *Kristin*

**\*Coal Action Network Aotearoa (CANA) is a group of climate justice campaigners committed to fighting the continuation of coal mining in NZ**

*“CANA recognises coal as the primary threat to Earth’s climate system. CANA promotes climate justice by advocating and acting for a just transition to an Aotearoa free of coal mining and use.*

*“We do this work in order to open up a space for a sustainable ways of living and organising our societies, so that our future generations will have a thriving planet to sustain them”*

**“Once you have witnessed an injustice you cannot claim ignorance as a defence for inaction. You make an ethical choice to act or not”. *Ben Metcalfe, Greenpeace.***

## CAN WE MAKE STEEL WITHOUT COAL?

**By Jeanette Fitzsimons**

Coal is the most concentrated source of carbon dioxide and the biggest threat to the climate through accelerated global warming.



Leading climate scientist James Hansen of NASA and Columbia University says that if we are to stabilise climate at a safe level the world needs to phase out coal burning to zero by 2030.

This is supported by analysis by Carbontracker and others that 80% of the known reserves of coal must be left in the ground forever if we are to limit warming to two degrees.

Coal Action Network Aotearoa (CANA) is committed to opposing all new coal mines in order to meet that target. However, 60% of Solid Energy's coal production is for steel making and the company says that "there is no way of making new steel without coal". This was repeated recently by Minister Nick Smith in the House.

If this is true, principled climate campaigners must either stop opposing new coking coal mines on climate change grounds (Happy Valley, Denniston Escarpment, Mt William, Pike River) or propose a world with no new steel.

Fortunately Solid Energy's claim is not true.

### **Why is coal used to make iron and steel?**

Coal, preferably high quality coking coal, is first converted to coke. This reduces the raw iron by combining with the oxygen, provides the carbon to alloy with the iron to make steel, and provides the very high temperatures to drive these processes.

Alternative processes need to meet all three functions. This is why you have to do more than just substitute a different energy source.

New Zealand's Glenbrook Steel plant uses a different process. It is a unique design, developed to use NZ iron sands and sub-bituminous coal from Huntly.

### **What quantities are we talking about, globally and in NZ?**

World steel production in 2011 was 1518 Mt and used 761 Mt of coal – 12% of all hard coal mined. (1)

The Glenbrook plant (now owned by Bluescope) makes 600-650,000 tpy steel and uses 750,000 tpy Huntly coal plus 1,000 GWh electricity and some Natural Gas, supplying 90% of NZ's needs. It also recycles steel.

### **What other options are there?**

Steel can theoretically be recycled indefinitely, with the remelting and alloying process ensuring its quality. That requires energy, but much less than to make new steel, and it needs no new source of carbon. The current global rate of steel recycling is 30%. It should be possible to raise that to 80% if there were a sufficient price on carbon. Failure to price environmental damage leads to massive waste because collecting material for reuse is "just not worth it".

The steel industry worldwide is putting serious effort into finding ways of reducing carbon emissions from steel making – within the current economic framework. Car tyres have been used to substitute for some of the coal; the Hisarna process reduces coal input by 20% by using it directly rather than converting it to coke; and electrolysis is capable of coal-free production, but requires another 20 years of commercial development.(2) But we are looking for something that could replace coal altogether.

Charcoal made from wood or other biomass can provide the reducing function, a source of energy and the minor carbon component in steel, with further heat obtained from electricity or natural

gas (or biogas). However, even the small quantities of iron and steel made a couple of centuries ago, along with the heavy demands of ship building, had a serious impact on Europe's forests. The scale of steel demand is now many times greater, so the real question is about scale and sustainability. Climate change cannot be considered in isolation from land use, food production, and forestry policy.

### **Is there enough wood or other biomass, and where would it come from?**

Growing wood purposely for steel making comes into immediate conflict with food production and the protection of wild nature. Land is a limited resource. However, all existing forestry operations have residues of woody material of low commercial value. Prunings, thinnings, branches, bark, average at least half the tree. Then there are damaged logs. Woody waste from crops – coconut shells and husks, corn stover, grain stalks – add to this.

Figures from the Food and Agriculture Organization of the UN (3) estimate annual waste from commonly cultivated crops is in the region 25-176 exajoules (1 EJ =  $10^{18}$  Joules). A Finnish study estimates annual waste biomass from all sources including forestry is around 64 EJ and compares this with total global energy use from all sources for all purposes of 440 EJ. For comparison, global coal use for steel making is around 22 EJ (1)

Carbonscape, a NZ firm which has developed new very efficient microwave technologies to process wood waste into charcoal, calculate that with their process it would take 1.6 billion tonnes biomass globally to replace all the coal currently used in iron and steel making, even at our current high rates of growth and low rates of recycling. Carbonscape is not yet in commercial production but has produced test batches of charcoal to secure an order for 9,000 tonnes from NZ Steel.

### **Are the forestry operations that produce the residues themselves sustainable?**

An important question is whether the forestry and other biomass operations on which steel making might piggy-back, should all continue.

Brazil produces some 23-36 million m<sup>3</sup> of biological charcoal each year to make iron and steel. Some of it is from planted woodlots on a 7 year rotation but most is from old growth forests. There is a major international campaign to stop this logging of old growth forests to supply the steel industry.

Much logging in tropical countries is actually illegal as well as unsustainable and the world's old forests are diminishing fast, along with the wildlife and indigenous communities they sustain. We cannot both campaign against cutting forests unsustainably, and rely on residues from this practice to fuel our steel mills.

If a plantation forest is managed well, using its residues for energy and carbon is a big environmental plus. But how is the steel maker to tell the difference between charcoal from sustainably managed forests, and from illegal and unsustainable cuts?

While it seems impossible, there is already a worldwide system in place to do just that for timber, paper and packaging.

The Forest Stewardship Council (FSC) certifies 165 million ha of forest in 80 countries (including 1.4m in NZ) are legally harvested and well managed with regard to environmental protection, wildlife conservation, and safe and fair working conditions, with chain of custody certificates in 105 countries. Forests may be planted or well managed natural forests where high wildlife densities and populations of animals like great apes and tigers are retained. There is a move to apply this system to residues.

### **Is the wood residue in the right place?**

Of course, not all waste can be easily recovered; some will be remote or inaccessible; some of it already has alternative uses; and the 2% green

leaf and twig waste should remain on site to return nutrients to the soil.

Handling, drying and transport are major costs. However, if it is planned right the forestry industry already has much of the equipment needed on the site, and removing waste can be a bonus for an industry which otherwise has to work around it or burn it.

Practices such as taking the whole logs to a skid site, cutting and stacking at the time of logging, and the use of mobile chippers can reduce costs. Carbonscape says their micro-wave charcoal technology lends itself to small scale units for decentralised processing in the forest. A NZ wood fuel supplier says the energy required to haul a truckload of dry chip regionally is equal to only about 4% of the payload.

### **Other Advantages of Wood over Coal**

A wood-based process has no sulphur or mercury emissions, low oxides of nitrogen, no toxic coal mine tailings, less ash (and non-toxic) less slag, and needs less lime. It is claimed there are fewer industrial accidents than with underground coal mining.

Because of these benefits, the Norwegian ferro-silicon industry is willing to pay twice as much for wood charcoal as for coal (per unit fixed carbon) for smelting.

### **What are the big obstacles?**

Leaving aside the biggest issue, which is total lack of political will or interest in climate change as a problem, there are two issues which need to be addressed.

The first is scale, as it is for all sustainability questions. Constantly growing steel production within an infinitely expanding economy will very soon run up against limits of land and water. Steel making can continue in a sustainable society without coal, but on a limited scale.

The second is price. Under NZ's ETS, coal exported to China, India or Japan pays nothing

for its carbon emissions, and locally burned coal pays a derisory amount.

A serious price on carbon without loopholes, preferably internationally co-ordinated, is necessary and urgent if steel making is to move away from coal. Necessary – but not sufficient. Without controls on forestry the world's forests will be raped to supply the steel industry. A requirement that all steel fuel come from FSC certified forests or sustainable agriculture would do it.

### **How much steel do we really need?**

In a sustainable society when we are not constantly building more bridges and high rise short-lived buildings, demand for steel will drop. Design for durability and repair will play a part. There are also materials that can substitute.

Steel framework in up to 6 storied buildings can be replaced with pre-stressed laminated timber, a process developed at Canterbury University. It then becomes a store of carbon rather than a source of emissions.

### **What do we need to create a sustainable steel future?**

First, a substantial price on carbon. That will help drive the wood based technologies and recycling. A recent Otago University thesis estimates that even \$50/tonne would be enough to drive all technically feasible boiler fuel substitutions of wood for coal. (4)

Second, we need good resource studies and mapping of the wood residue resource, along with improved harvesting techniques and equipment. Scion is doing some of the former.

Third, we need to expand the FSC and make certified residues mandatory in this country. There are moves towards that overseas.

Once these are done we need a national strategy on the priority use of wood residues. Transport fuels, boiler fuel and smelting fuel will all compete for the available wood and allowing the market to sort out how it is used risks very perverse outcomes. It is inexcusable that no

government has embarked on this work, or even plans to.

Most of all though, we need a change of mindset, where climate change is recognised as serious enough to change our way of doing things, and to learn to prosper within the limits of the biosphere.

What is clear is that there is no case for soft-peddalling our demand that no new coal mines be opened.

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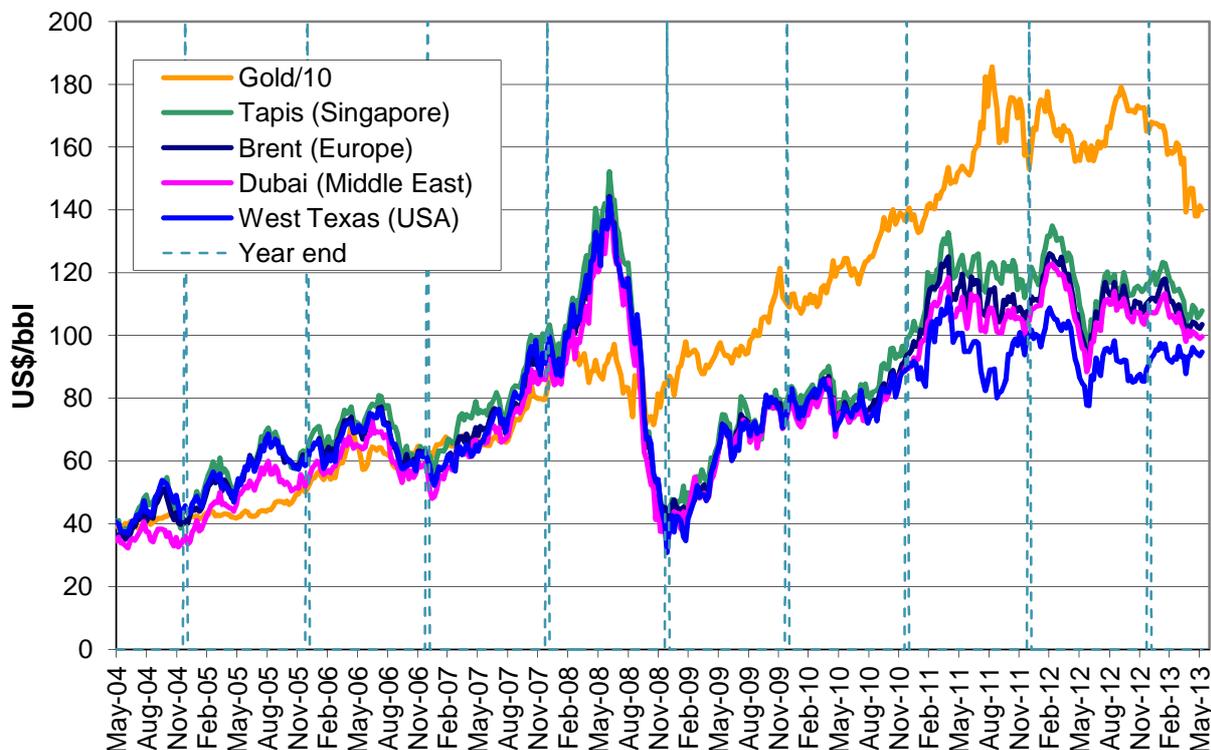
The full paper from which this is taken is at <http://coalactionnetworkaotearoa.wordpress.com>

### Next Issue of Energy Watch

After the domestic perspective of this issue, a more international one is planned for the next issue. As always, letters to the editor will be welcome, in particular feedback on the electricity industry. Editor

## Neil's Oil Price Chart

This chart, based on data compiled by Neil Mander from the New Zealand Herald over that last 9 years, tracks a basket of oil spot prices in comparison with the gold price. The last two years data show that a pseudo-stable non-US oil spot price of \$100-\$110/bbl has become the new normal, with the US internal oil spot price remaining below the symbolic US\$100/bbl benchmark.



## Join our sustainable energy news & discussion group

SEF Membership provides a copy of our quarterly EnergyWatch magazine. In addition, many members find the SEFnews email news and discussion facility an easy way to keep up to date with news and views as it happens. The discussion by the group of sustainable energy “experts” who have joined the service offers an interesting perspective.

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Some busy people using a work address prefer to use the Rules function in their email software to automatically save SEFnews emails to a separate folder for later reading. If you do not want a Yahoo ID, the administrator <admin@sef.org.nz> can select the ‘daily-digest’ option for you.

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### Contributions Welcomed

Readers are invited to submit material for consideration for publication.

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

Material can be sent to the SEF Office, PO Box 11-152, Wellington 6142, or by email to [editor@sef.org.nz](mailto:editor@sef.org.nz), or by directly contacting the Editor, Steve Goldthorpe at PO Box 96, Waipu 0545.

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