



EDITORIAL

Partial Privatisation Postponed

The recent decision by the Government to postpone until next year the launch of the asset sales programme, due to start with the sale of shares in Mighty River Power, may be a harbinger of change in the outlook for the New Zealand Energy Sector.

Whilst the need to give due consideration to Maori sensitivities concerning the use and ownership of water is the official reason for the delay in the programme, the fact that the call for a public referendum on the asset sales issue is looking like reaching its required 10% of the population could also be a contributory factor in the decision. Furthermore, the possibility of changes in the arrangements for converting water into solid electricity (i.e. aluminium) at Bluff creates uncertainty in the electricity market, which would not bode well for a share sales launch.

In this issue of EnergyWatch, founding SEF member Norm Stannard looks back over the history of the NZ electricity industry, in the context of the electricity market reforms overseas, to track how New Zealand has come to the point of considering selling down strategic assets when market conditions allow.

Another recent indication that the asset sales programme might be at risk of being derailed is the difficulty that Solid Energy is having in turning a profit from digging up high quality West Coast coal and selling to Asian steel-makers. Could that hard commercial reality clip the wings of the SOE coal miner and constrain proposed adventures into underground gasification and lignite conversion?

Another big industry suffering from the global slowdown is aluminium smelting, resulting in Rio Tinto suggesting that it might pull out of New Zealand unless its principal operating cost, electricity, can be made more attractive. In response to this ploy, which might just be bluff from Bluff, Jeanette Fitzsimons



A car-less day in 2008 prior to the opening of the Johnstone Hill tunnels on the toll road section of Heatley's Holiday Highway to Northland.

Might this be a more frequent sight in 2028?

See Page 3 for Kerry Wood's rethink of Peaky Oil, Pricey Oil, RoNS and other transport issues.

suggests an innovative solution. She envisions integration of a scaled down aluminium smelting operation with the electricity system as a load leveler and dry year back up. Her proposal, published in The NZ Herald, is reproduced here.

Feed back to her article in the NZ Energy and Environment Business Week suggested that a loss making SOE might result and that the dedicated Manapouri power station has to be base load. These criticisms are founded on the current disaggregated economic model, requiring every component of any system to consider only its own narrow economic interests. She is presenting an alternative vision of the practical benefits to be derived from coordinated planning of the deployment of all facilities in New Zealand, with commercial arrangements being a consequence rather than the defining purpose.

That same theme of restructuring electricity management in New Zealand came out of the seminar held in Wellington following the SEF AGM in July. Speakers Molly Melhuish and Geoff Bertram were challenged to explore whether increased private ownership of generation assets could co-exist with a sustainable energy future.

The conclusion drawn from the seminar was private ownership of assets and long term energy sustainability were not necessarily mutually exclusive, **provided** a coordinated function-focused network management regime was well-defined before the assets were sold.

Another outcome of the SEF AGM day was that I have been entrusted with the role of convener with an enlarged management committee. We all look forward to interesting times serving the needs of the SEF membership for another year.

The Parliamentary Commissioner for the Environment recently produced a report on Solar Water Heating suggesting that because SWH output is low at the times of peak winter early evening power demand, when fossil generation is at a maximum, that the merits of SWH for Greenhouse Gas emission reduction are

questionable. In this issue Professor Arthur Williamson counters that view, pointing out that water heating with the sun leaves water in the lakes, making that energy store available to tackle the peak power problem.

This issue finishes with more on the lignite story with a new report on alternatives and a report from Germany on restoration of lignite fields.

I am most grateful to all the contributors to this issue of EnergyWatch and I encourage all SEF members to respond and to make contributions to the next issue.

Steve Goldthorpe, Editor

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Reality check

If we are prepared to munt the planet enough (and there is little evidence we are not), oil at \$100/bbl will be around long enough to make purely economic arguments, for renewable energy and replacement of oil as a transport fuel, unviable. Promotion of electric transport, renewable energy etc. just based on climate change mitigation won't wash with the majority of politicians and businessmen who are de facto climate change deniers.

Brent Efford

Peak Oil, Pricey Oil, Ports, RoNS, Rail and a Rethink

By Kerry Wood

A recent study by Leonardo Maugeri¹ says we can stop worrying: 'Peak Oil Theory' is a myth. Uncritical reviews have appeared in all sorts of prominent places but Maugeri fails basic checks.



- Brent crude was US\$ 117/bbl when this was written, with record pump prices and flat demand.
- The paper relies on a private database with no access for independent checking.
- Wikipedia have tagged his page: *This article appears to be written like an advertisement.*

One of many responses to Maugeri is by Sadad al-Husseini,² a retired executive vice president of Saudi Aramco for exploration and production. al-Husseini's brief article points out that Maugeri mixes up crude oil and natural gas liquids; reserves and production capacity; reported capacity and actual production; proven reserves and speculative resources. He sets aside the IEA's 2008 estimate of 6.7% annual oil production capacity decline and substitutes his own 2%. This eliminates two thirds of the problem, with no checks possible. al-Husseini concludes

Much as all the stakeholders in the energy industry would like to be optimistic, it isn't an oil glut by 2020 that is keeping oil prices as high as they are. It is the reality that the oil sector has been pushed to the limit of its capabilities and that this difficult challenge will dominate energy markets for the rest of the decade.

1 Leonardo Maugeri (2012), Oil: the Next Revolution. The unprecedented upsurge of oil production capacity and what it means for the world. Petroleum Intelligence Weekly, 2 July 2012

2 <http://www.energybulletin.net/stories/2012-08-22/don%E2%80%99t-count-revolution-oil-supply>

The IMF also shows concern in a working paper (papers are never IMF policy).³ The authors study recent oil price and supply changes, concluding:

Our model performs far better than competing models in predicting either oil production or oil prices out of sample, in a field where predictability has historically been low...

...our prediction of small further increases in world oil production comes at the expense of a near doubling, permanently, of real oil prices over the coming decade. This is uncharted territory for the world economy, which has never experienced such prices for more than a few months...

...a lack of availability of oil may have aspects of a negative technology shock.

Pricey Oil

Record pump prices are heralded by a diagram from the AA showing how far you can drive with \$50 of petrol. But note the small-print: *...in a typical medium-sized car (2.0 litres +) which consumes 10 litres per 100 km.* That is SUV territory. How does our Prime Minister think we can become 'rapid followers' with a fleet in this state?

New Zealand is in particularly bad shape to face a doubling of oil prices. Our exports go a long way to get anywhere and our tourists are a long way from home. We have high oil-use and moderate income. The BRICS⁴ economies are in better shape; we use nearly 14 barrels of oil per person per year for all purposes, while India uses less than one barrel. So which economy will gain more value from a marginal barrel? Which can afford the higher bid?

RoNS

Roads are essential to the economy. They provide access to virtually every property, in stark contrast to other transport infrastructure.

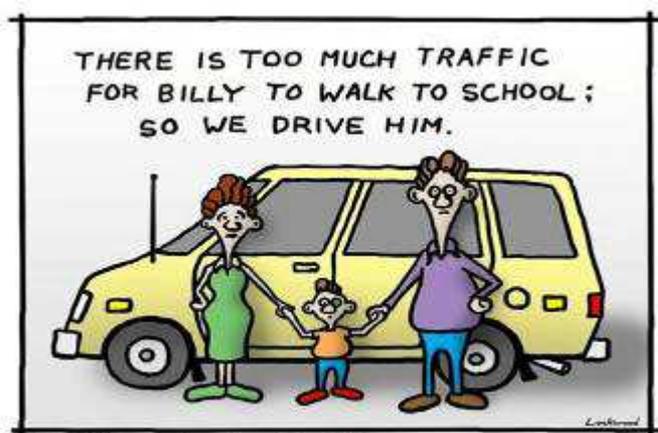
3 The Future of Oil: Geology versus Technology (WP 12/109)

4 *Brazil, Russia, India, China and South Africa*

Roads are used for walking, cycling, public transport, freight and private motor vehicles; plus oddballs such as skateboarding. Urban roads also have essential and much wider uses, such as letting light and air into buildings, providing a setting for architecture, a corridor for other infrastructure and somewhere to meet or chat. We have allowed the least-efficient transport modes to dominate both energy use and road space, with no plans for change.

Roads of National Significance (RoNS) are another matter: for cars and trucks only. But what are they for? No city has solved traffic problems for any length of time by building motorways, and Auckland and Wellington are running out of places to put motorways.

Several cities have cancelled urban highway projects, or even closed and demolished motorways, all with little or no effect on either traffic or the economy. One study identifies 17 such projects, mostly in the United States.⁵ The capacity of a traffic lane is two or three thousand car passengers per hour in theory, but often far fewer at peak hours and fewer still on ordinary city roads. Light rail can reliably carry 10,000 passengers per hour on-street and heavy rail 30,000 on a separate easement. Yet we assume that costly roads are the only alternative to gridlock.



Traffic Inducing Traffic

5 ITDP and EMBARQ (2012). The Life and Death of Urban Highways, http://www.itdp.org/documents/LifeandDeathofUrbanHighways_031312.pdf

RoNS is based on a series of myths.

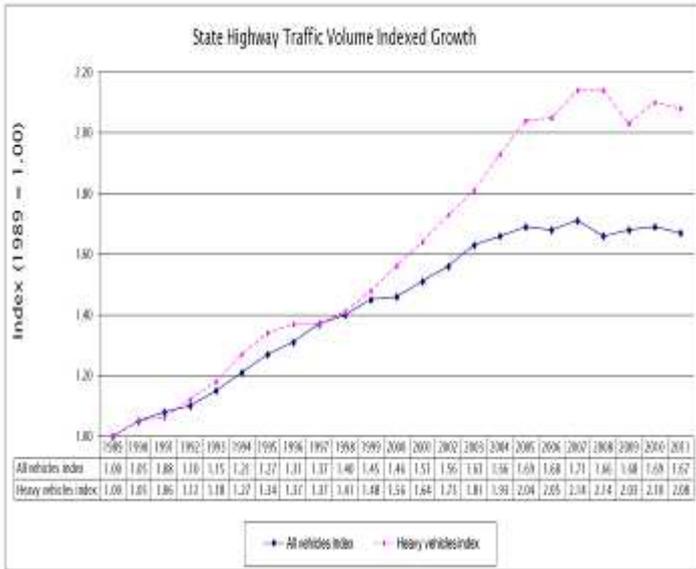
- Gridlock is inevitable without building new roads and no other mode has significant potential (the my-job-is-essential, trend-is-destiny and sunk-costs fallacies).
- Traffic grows over time, sometimes boosted by special factors but generally independent of oil price, economic growth or competing modes (the Daddy-knows-best fallacy).
- There are no diminishing returns in road-building, despite massive external costs and cross-subsidies (this-time-is-different fallacy).
- There is no prospect of climate change, oil scarcity or doubled oil prices (the over-the-rainbow fallacy).
- RoNS is an economic get-out-of-jail mega-project (the Think-Big fallacy).

The Think-Big fallacy justifies ‘short-term’ maintenance cuts, exposed by a ministerial briefing by the NZ Transport Agency (NZTA 2012/02/27). Four new routes are now deemed nationally significant: Hamilton–Tauranga, Cambridge–Taupo, Napier–Hastings and SH1 near Christchurch. A timetable shows RoNS-building beyond 2023, with four new projects still to be worked in, and presumably more to come.

A classic strategic error in infrastructure is to neglect maintenance, but budgets for all roads are being trimmed to ‘raise’ money for RoNS. A common feature of economic collapse is runaway investment in infrastructure that cannot be maintained.⁶ In Sumeria four thousand years ago it was irrigation canals, in the Soviet Union it was the military and now California is far behind with road maintenance. In Milwaukee a large interstate highway bridge collapsed in 2008; it had been declared structurally deficient in 1990 but nothing was done.

The NZTA’s state highway traffic index shows traffic stable or falling, a well established trend (see figure).

6 Ronald Wright (2004). *A Short History of Progress*. Melbourne: The Text Publishing Company, ISBN 1 920885 79 X



Population is rising at about 1%/year, so motor traffic is falling in per-capita terms.

Newman and Kenworthy⁷ report that vehicle kilometres in the United States leveled off in about 2005, and by 2009 was down about 5%. They found similar trends in all of Australia's five principal cities.

Newman and Kenworthy suggest six interdependent reasons for falling urban traffic (in New Zealand about two thirds of total vehicle-kilometres).

- People demonstrate an average travel-time budget of around one hour a day. This sets a practical limit on commuting distances
- The growth of public transport.
- The reversal of urban sprawl.
- The aging of cities.
- The growth of a culture of urbanism.
- The rise in fuel prices.

RoNS justification

The NZTA website refers to a study by Australian consultants SAHA (2010).⁸ There are also about 250 words of text, including these gems:-

7 Peter Newman and Jeff Kenworthy (2011). 'Peak Car Use': Understanding the demise of automobile dependence. *World Transport Policy and Practice*, Vol 17.1, June 2011

8 Available at <http://www.nzta.govt.nz/network/rons/index.html>

A key departure from road planning in the past is that the RoNS projects represent a 'lead infrastructure' approach.

Build it and they will come.

Around 92 per cent (by weight) of all freight within New Zealand is moved by road.

In fact rail and coastal shipping each handle around 15% of freight tonne-kilometres. It would be equally honest to claim that walking is the dominant non-freight transport mode, at around 100%.

The SAHA Report is suitably opaque but an earlier version (marked 'final') is more forthcoming; it was released accidentally. Rod Oram commented in the Sunday Star Times, 12 May 2010 that the conventional benefit-cost ratio (BCR) for Heatley's Holiday Highway was 0.4 (40c of benefits for every \$1 spent), the Waikato Expressway 0.5 and Transmission Gully 0.9. These projects look a little better if 'wider economic benefits' (WEBs) are added. However, Oram cites an Australian source suggesting that the SAHA figures for WEBs are too high, and in any case should not be added to BCR estimates: that risks double-counting.

Oram again

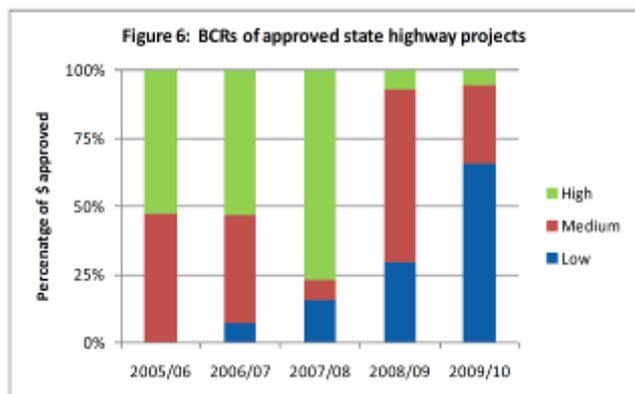
Auckland, Wellington and Christchurch are trying to cope with growth. They have just elected mayors and councils who believe some of the solutions are more public transport and more compact urban forms.

In contrast the government has said bluntly that it believes the opposite is true.

WEBs were originally derived from studies of London's Jubilee Line: land values around stations rose substantially. Now WEBs are being applied to rural roads, somehow, but not to Auckland's inner city rail loop.

The Ministry of Transport's *Briefing to Incoming Minister* (BIM, December 2011) reports a steady decline in benefit-cost ratios for state highway projects (Figure 6), with 'low' benefits growing

from zero to over 60% of projects in 5 years. Diminishing returns are setting in. The July 2011 Government Policy Statement shed all references to benefit-cost ratio, and now promotes ‘lead infrastructure.’



Rail

KiwiRail is struggling, with layoffs and deferred catch-ups of long-overdue maintenance. A much-hyped \$4bn upgrade turns out to be mostly from revenue. Twenty new Chinese locomotives have been in the news but the backbone of the fleet, the 116 DCs and DXs are all over 37 years old and some are rebuilds from the 1960s.

Despite old technology, KiwiRail energy efficiency is way ahead of road. Line-haul trucks in 2008 emitted over four times more carbon emissions per net ton-kilometre than KiwiRail freight trains. This rail advantage can be improved to 6 times with full modernisation using diesels, or 15 times with electrification. Passenger train emissions show similar gains over buses.

Rail freight can only be door-to door if both origin and destination have sidings. There is no money for either sidings or transfer facilities but access for road trucks is ‘free’, hidden in land-development costs. Some large transport-users, including road haulage firms, are already paying for rail sidings into their depots.

Is KiwiRail being set up to fail?

- Rail freight is too slow between Wellington and Auckland, because of decisions taken over a century ago. Money was tight. The

problem is fixable with a low-cost curve-easing programme, planned but not funded.

- The capacity of the Hamilton–Tauranga line was recently doubled for \$25 million (more passing loops) but rail expansion is ‘uneconomic’.
- There is no mechanism for comparing road and rail projects, even in outline. The practical effect is that roads are improved (which always makes them worse for someone) and rail is ignored.

KiwiRail is now essential for two tasks which the roads cannot perform but is the government aware of either?

- Commuters in Auckland and Wellington, with some potential in Christchurch and Hamilton.
- New Zealand’s main export ports.

Export Ports

Container ship sizes are increasing rapidly, the change accelerated by fuel costs and low rates. The NZ Shipper’s Council⁹ hopes to see the tonnage of most vessels visiting New Zealand doubling by 2020. If this happens, most container ships will make only a single port-call in each island, most likely at Tauranga and Lyttelton. Port upgrading will be costly (say \$M50–100 each), or even more costly if port companies try competitive investment in sunk costs, with a near-certain loser. The alternative is older ships on new routes, mostly to hubbing ports in Australia. The Shipper’s Council estimates that this would cost New Zealand \$400 million each year. If we want those savings, two ports will need the capability to load large vessels within about 20 hours. The port companies are doing their best but the government is apparently waiting for ‘invisible hand’ decisions in foreign boardrooms.

No New Zealand port (with the likely exception of Marsden Point) can be developed to store enough containers on site; some of them will have to be at remote depots: ‘inland ports’. We

⁹ The New Zealand Shipper’s Council (2010). The Question of Bigger Ships: securing New Zealand’s international supply chain

already have inland ports, including Wiri (South Auckland, for Ports of Auckland), Southdown (South Auckland, for Tauranga) and Woolston (Christchurch, for Lyttelton). Freight shipments between a port and its inland satellite have to be within the 20 hour loading time, and export containers must arrive in the right order. This cannot be done by road transport on congested roads and congestion-free roads are a fantasy. It has to be rail, or possibly coastal shipping.

Rethink

A rethink on the scale needed here is a huge task but government action is all in the wrong direction. The best I have seen is an IPENZ paper (2008)¹⁰, but it is now too narrow and too incremental. We are in denial.

It is utterly implausible that New Zealand can go on ignoring these inconsistencies until RoNS are completed, let alone paid off. RoNS demonstrate the difficulty of changing transport quickly. Turning around the effects of today's 1950s-based policy vacuum will take twenty years or so. Filling the vacuum needs urgent, radical measures. The price of failure will make RoNS look cheap—but still wrong.

Kerry Wood

10 IPENZ (2008). Transport: engineering the way forward. http://www.ipenz.org.nz/ipenz/media_comm/documents/Transport_Policy.pdf

11 Parliamentary Library Research Paper (2010) *The Next Oil Shock?*



ETS? - Its curious how 'Scheme' said in a Kiwi accent sounds like 'Scam' *Editor*

The smelter – risk?, opportunity? or just bluff?

By Jeanette Fitzsimons



Does anyone really believe that Rio Tinto is serious when it threatens to close its smelter if it doesn't get cheaper power?

Having seen them operate at the select committee considering the ETS, when their Asia-Pacific boss swanned in and put on an amazing piece of theatre threatening closure if there was a price on carbon, I don't think so. They are very good at threats to get their way and see us as a small country with few options.

The Bluff smelter is one of the more efficient plants in the world and produces exceptionally pure aluminium; paying around 5c/ kWh.

However, just in case anyone thinks there is a risk, it would be good to consider our options.

The smelter was built in tandem with Manapouri. It is valued by the electricity industry because it takes base load (continuous) electricity on long term contract.

The 1993 revised contract gave it an additional 60 MW (about 10% of its use) at spot price to ensure that it reduced its consumption by that much when the lakes were low and supply was tight. They have preened themselves ever since on their good citizenship whenever this clause is invoked and they save us from power cuts. Most New Zealanders don't realise it was designed that way in return for getting more cheap electricity when it was available and is to the smelters advantage.

Many have argued that if it were shut down we would benefit from the hydro electricity released. But it isn't quite that simple. First, the smelter uses 15% of our total electricity – a continuous 572MW, sometimes up to 610MW.

That is large enough to destabilise a lot of things. New transmission would have to be built to get an additional 15% to the north where it is needed. Second, we have a glut of electricity at the moment; demand is not rising and new renewable wind and geothermal stations have been consented but are not being built. This is what is worrying those who want to sell 49% of the generators; if the smelter isn't drawing power the price will crash. There is also the social disruption of some 800 jobs in Invercargill.

Surely there is a better opportunity here. There are three potlines and a fourth small one. If you turn off the power suddenly the pots freeze and they can't be reopened. However, they are capable of a planned shutdown with a few weeks' notice. Let's close the oldest two over two years and release that power to the grid. Let's offer them a price for the more modern lines (I guess a fire sale price would be appropriate as they can't easily take it away) and run it as a small SOE as part of the electricity system. When there is ample power it runs flat out making and storing aluminium. Every winter if the lakes are low when demand is high, it does a planned shut down and releases the power to the rest of us. It could flatten the winter peak (though not the daily peak as it can't shut down that fast) and use the stored aluminium ingots to continue to meet demand.

Some jobs would be preserved. Some aluminium would continue to be made and sold to supply NZ metal rolling and extrusion and fabrication plants. The closed bits could be cannibalised for parts for many years.

The benefits would be:

- About 350-400 MW released to the grid would lower prices but not crash the market if every domestic consumer were given a "smelter dividend" – a basic block of cheap power, to compensate them for extreme price rises over recent years. This would be a real help to families struggling with poverty and cold homes. Additional consumption would

cost more to discourage waste. This has been discussed for years as a "stepped tariff" or "progressive pricing". It would also make electric cars more feasible, powered by renewable electricity.

- The winter peak would be met by the third and fourth potlines. Fossil generation could be substantially reduced. Huntly (sometimes producing 10% of our greenhouse gas emissions) could close with one unit going on stand-by for short term peaks or outages, probably running on gas. Our system would become much more renewable.
- Some additional water could be returned to the Waiau river which is suffering from losing so much. Manapouri sends its water to Deep Cove, starving the river of water it needs for fish breeding.
- The remaining potline could be the nucleus of new industries at Bluff focussing on using the aluminium and generating more jobs

The challenges would be:

- Building new transmission lines north. This would cost, but Transpower has said it is quite feasible. They should publish plans to do this now. It would be the best bargaining chip we could have in the wrangle over the power price with Meridian.
- The old contract sold the power to RTZ Power NZ, separate from the smelter. We have to ensure they don't still own that power if the smelter closes, or there will be no benefits for us.
- Managing the seasonal effect on employment in Southland. But better than no jobs.

You can't store electricity. You can store some water from hydro stations but there are limits to how much. You can easily store aluminium.

Oh, but I forgot – we are not allowed to plan the electricity system any more.

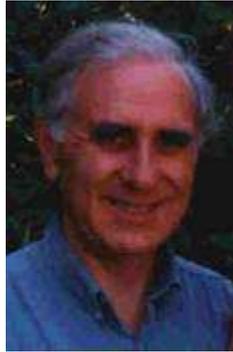
Jeanette Fitzsimons

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6th September 2012 (amended 16th Sept)*

Observations of a Founding Member of SEF

By Norm Stannard

As true New Zealanders please each day remember those that have passed; think if those that are here today and work for those that are to come.



The SEF founding mission remains pertinent.

These thoughts are from the last NZ Electricity Department, Management Services Team Leader working in the field at plant and District level. With my boss, the head of the department Bill Moxon, I carried out what was the last audit of NZED management systems against existing and the latest best practice. We did not know then that, within a short time we would be working together again, to combat the start of a selling off of these efficient community owned assets.

Through Bill's and others' energies we felt compelled ethically to seek means to counter the worst outcomes of a government inflicted mantra that all aspects of good governance come back to the "market rules". No public services, even parts of a long proven, efficient, complex engineering machine supplying electricity to its owners, were exempt.

Thus, together with many eminent people the Sustainable Energy Forum came into being and consistently made its mark. Today that generation with 'institutional memory' is, by perforce of age, handing on stewardship of the Forum. But the task remains. The lessons have not been learned.

As I personally hand over my minor yoke, there are four stories of many I would like to share.

Firstly, under central government direction in 1988 the Waikato region's local government owned electricity systems were amalgamated. In 1992 the Electricity Companies Act required all community-owned electricity suppliers to become companies. The new "company" (WEL)

sold shares to an American company who in the eyes of the community commenced to asset strip and overcharge the city's people. The community decided it had to buy its own asset back to regain control. It remains a community trust asset returning all profit to the citizens and keeping in advance of developing population needs. It has also reduced the city's environmental footprint through the creation of its own wind farm and landfill gas fueled power station.

As an aside, this meets the NZ Government's Rio Earth Summit commitment to the Habitat Agenda, which they consistently reinforced in international and Commonwealth forums until very recent times. For example the theme of CHOGM Edinburgh 1997 was "*Sustainable Communities Through Partnership; The Commonwealth Implements the Habitat Agenda*" each of the Prime Ministers signed up to this commitment for us all "*To act locally and think globally*", which includes each local community minimizing its own environmental footprint.

Today the capital beneficiaries of WEL are Hamilton City Council (63%), Waikato District Council (35%) & Waipa District Council (2%). If, or when, the WEL Energy Trust is wound up these three councils will receive the capital in those percentages. Income beneficiaries are those electricity customers connected to the WEL Networks power lines network in the Trust's traditional area. The electors and beneficiaries of the Trust reside within this area. *The region's people own their electricity supply system.* To meet its Rio and UN Habitat Agenda commitments to sustainability objectives including minimizing its resource use footprint, in terms of electricity the community now only needs to maintain its own generators. If central government sells the national generation system it will reinforce the need for local generation to ensure security of supply, at actual production and supply costs, for ordinary citizens because control will have totally passed out of their hands.

Today the WEL developed wind farm has an operations expert partner, namely the state owned energy company Meridian, which the current Government intends to put up for sale – and the circle starts again....

My second story is as a deeply involved witness.

I was brought up in Britain, and from 1957 trained and worked in rebuilding and operating power stations and associated transmission systems. Providing an essential service to the population at all times was engrained into the minds of all involved. With each loss of generation or a transmission line the risks of loss or life are ever present.

Post war, the ordinary people of UK fought to rebuild their electricity system. Early on it was revealed that the electricity market could not cope or exist. The owners of private systems supplying their own areas and some local council's systems did not come to the party for the rebuild. So the whole sector was "nationalised". The UK engineering industry developed, produced and erected "cutting edge" generators and transmission systems, working as UK Inc. It took until the late 1970s before it can be said that the UK had a system with minimal risk of loss of power, and therefore improved quality of life for its citizens – the owners.

In the 1990s all that changed with the implementation of World Bank and or IMF utilities privatisation policy directives to debtor nations. The electricity system was put up for sale to the "share market". It has taken 20 years for the ordinary people of UK to lose the ownership of their hard won electricity supply system. A limited number of predominantly overseas people/or companies can be seen as the on-going beneficiaries. Profit is the prime focus of life in a commercialized utility's management. Therefore staff plus their diverse range of operational services contracting companies, and ordinary citizens cannot be as confident of the ethics and dedication required to provide the service.

The following is an example from when the 1990's UK government put on the market their electricity generation and distribution industry:

In 2005 the German Company EON bought power stations and the Midlands Region distribution systems servicing a population well in excess of New Zealand's. In 2011 the distribution network and retail arm that they had bought for £2.7 billion, they put on the market. The £4.5 billion they made just for the Midlands distribution system did not stay within the UK. The distribution network shares are now totally owned by Americans, the same that own other UK distribution networks. See

<http://www.ft.com/cms/s/0/d8e90ca6-4464-11e0-931d-00144feab49a.html#axzz212i8A2Qq>

for the range of well known customers of Wall Street that are the owners of UK, Midlands Electricity.

Electricity supply systems being a public serving 'utility' is a purely cost plus set of entities. Whatever profit its board sets to match its own expectations plus management staff's, shareholders' expectations, plus the commercially produced "marketing" costs, along with actual plant and operational costs is what is charged to the public.

In the public eyes there is an inordinate proportion of profit taken by the shareholders, plus the board members and senior staff as salaries and bonuses. Far in excess of these costs are those from the range of additional post-nationalisation entities that clip the ticket.

The buying and selling of these assets, has been portrayed as 'paying off debt'. The question then arises *whose debt* are they talking about given that EON is a German company.

Another story on this topic concerns the Commonwealth. Traditionally, every two years at the Commonwealth Heads of Government meeting (CHOGM), the prime ministers of the 54 member countries have presented snapshots of their situation including those related to the governance of utilities. Their peoples' concerns are given in their CHOGM Communiqués. A set of concerns related to utilities is shown in their

direction to the Commonwealth Foundation to advise them. An outcome is the 2004 Commonwealth Foundation Publication *“Making it Flow – Learning from Commonwealth Experience in Water and Electricity Provision”*. This provides a grim set of warnings about the results of communities selling their assets. One conclusion to be taken is that the twenty year old World Bank and/or IMF policies have failed to work to the benefit of the public.

Another message that could be taken from this is that politicians have a short career in Parliament and therefore political parties have limited corporate history. It is easy for the new members and their advisers to take previous, sometimes proven faulty, policies and give them new names for the media to promote the “new broom as providing progress”. Attention grabbing column inches is what matters for both entities.

Finally, by a chapter of accidents I attended the first follow on conference to the UN Earth Summit in Rio as the representative of the World Federation of Engineering Organisations. It was a shock having previously believed governments had the prime aim of protecting and sustaining their own people. I do not believe that now.

The conference I was at was the follow on to the Rio Earth Summit, the 1994 UN Global Forum – in other words the World’s Cities Summit held in the Manchester Trades Hall. A cross section of people from each city overfilled this massive hall. As the conference progressed it became patently obvious that as experts on the many topics spoke, they mentioned the World Bank’s identified, imposed, funded and managed projects all of which subsequently have to be paid for by ordinary citizens in those countries. The audience continually stood and clapped the speakers as they listed the inappropriate needs, locations and technologies used by the developed world’s contractors and the size of the debt imposed upon the community, causing outcomes of extreme hardship.

Clear messages were given at that Summit that *change was essential*. But today little has changed and indeed the situation seems to have got worse.

My unforgettable memory of that Summit was the large number of young people holding their city’s flags surrounding the opening speaker for the Summit, a representative of the younger generation. The speaker was a 10 year old boy;. He stated *“We say to this generation of managers, do not hand over a non-sustainable planet as the result of your stewardship”*.

For our generation a haunting legacy of our stewardship is failure to meet that boy’s needs.

*Norm Stannard
CEng. MIMechE, DMS, FIPENZ*

Meridian Metering Muddle

Last month I received a power bill for 1760 units for 2 months for our church tennis pavilion which usually uses about 3 units/month. It was a shocking \$500+ bill for the 2 month period.

The story I was given was that the meter reader had been reporting 5 digits and that a new meter reader had reported six digits - with a leading zero. The System had then missed a monthly account and created an error condition because the number of digits reported was different. The System then assumed that a new meter had been installed and wiped all the old records. Since The System now had no basis on which to make an estimate it made the assumption that we were a normal domestic consumer and estimated the average of the domestic consumers in the local area for two months in the winter billing period.

The Meridian representative in charge at the customer complaints call centre couldn't see anything wrong with The System, nor with planning to direct debit that large huge amount of money from our account. She refused to give me any form of apology. She said The System would have given us a zero bill next time. Had I not intervened then we would have had zero electricity bills for the next 14 months! *Editor*

Solar Water Heating in Relation to Power and Energy

By Professor Arthur Williamson

The Parliamentary Commissioner for the environment has published a review of Solar Water Heating (SWH) in which she pursues the following line of thinking: -



- the purpose in managing electricity use is chiefly to reduce carbon dioxide emissions from burning fossil fuels for electricity generation;
- the use of fossil fuels in New Zealand is largely (but not entirely) related to meeting peak **power** demand that usually occurs in cold weather;
- that measures such as solar water heating contribute to the reduction in electricity **energy** demand;
- but that solar water heating makes an insignificant contribution to the reduction of peak **power** demand at the time the peaks occur.

She then goes on to question the usefulness of direct thermal solar water heating in terms of her analysis of its lack of contribution to the reduction of peak power demand in winter.

The PCE rightly notes that there are two significant aspects to electricity supply–energy and peak power demand. What I think she under-rates is the contribution of storage to solving the peak power problem. Storage is a necessary component in matching sources and loads when they have different time behaviour. (For example, energy storage is a necessary part of the UK power system where large nuclear and fossil fuel fired generating stations that operate at constant output are coupled to the variable load. In that case pumped storage is used to take up the output at low load and to deliver extra

power at times of high load). Storage plays an even greater role in systems that include the variability of so called “renewable” energy sources. In this respect it is perhaps relevant to note that much of the value of hydro electricity generation lies in the energy storage in our “hydro-lakes” which have long served to buffer the high variability of the renewable sources of rain and snow. These lakes, along with the shorter-term storage provided by hot water cylinders and perhaps a number of as yet unrecognised buffers that exist in cold stores distributed around the country, provide about the only capacity that can be used right now to reduce the effects of peak power demand.

While our storage lakes are not overflowing (and these days they very rarely do) and recognising that the installed generating capacity of the hydro stations represents about twice their average output, the hydro-system makes a significant contribution to reducing the amount of fossil fuel generation that is required to cope with peak demand.

Because of this spare storage we are able to make good use of other intermittent and variable energy sources such as wind and solar.

While each of these is producing energy it reduces the need to draw from storage and allows water storage to build up for use at peak times. In this regard the fact that the “renewable” source is not necessarily available at the precise time of the peak does not mean that it makes no useful contribution to managing peak demand.

I think that the PCE view of SWH in winter is a “Glass half empty” one. The “Glass half full” view is that, as shown by fig 6.1 of her report even in mid winter SWH produces half of the hot water energy. One might also note the significant role of distributed energy sources in reducing transmission and distribution loads.

The PCE also rightly notes that the matter of real concern is the production of greenhouse gases from the combustion of fossil fuel, which are generally burned at peak times.

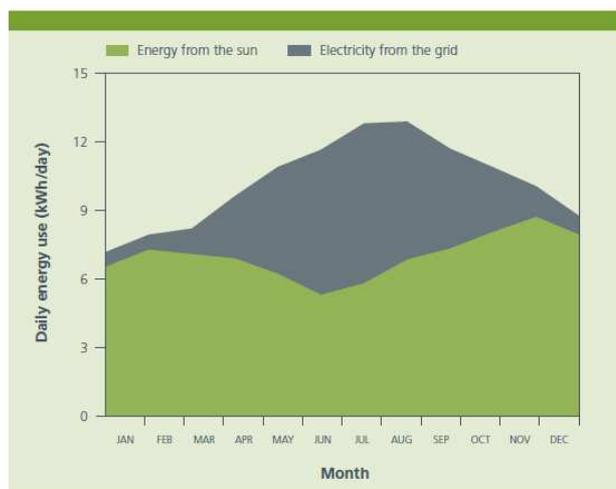


Figure 6.1 The performance of a solar water heater varies throughout the year. The green area is the amount of energy provided by the sun. The grey area is backup electricity provided by the electricity grid.⁸⁰

From *Evaluating Solar Water Heating*, PCE July 2012

About 25% of the electricity generated in NZ is from fossil fuel combustion and much of that occurs when there is peak demand in winter when the storage lakes are getting low. Our own studies (Mason, Page and Williamson *Energy Policy* 38, 2010 3973-3984) indicate that with proper use of the hydro storage the country's present electricity requirements could be met 99% in energy and 90% in power with renewable (wind) and geothermal inputs. The highest unmatched peak demand would be approximately 1000 MW and the unmatched energy demand would be about 100GWh/yr requiring an additional peaking supply to run at various levels for short periods at up to 1000 MW totalling a few hundred hours per year.

Again the PCE is right in pointing out that demand side management, such as could be achieved with ripple control of water heating, would reduce these peak requirements considerably. Our studies indicate that ripple control of water heating could probably reduce peaks by about 400-500MW. However such measures would require nationwide co-ordinated

action by the industry—something that has not happened willingly since the disaggregation of the industry in 1998.

The PCE comments that heating water with night-rate electricity is an economic choice. However, like many other measures, this is not a cure-all. As The PCE says, 12% of generation currently goes to water heating if this were all done over say 10 night time hours this would represent a load of 1.3GW which would almost certainly replace daytime peaks with night-time peaks.

In addition to conventional direct thermal solar water heating there are other means of heating water from the sun. Each can reduce electrical energy use by about 50-70% and each has its own characteristics.

- Conventional SWH is illustrated in the opposite figure from the PCE's report.
- Photovoltaic panels directly linked to water heating would be simple and is approaching cost effectiveness.
- Hot water heat pumps draw energy from the surrounding air that been heated by the sun.
- Even wet backs on wood burners heat water using solar energy captured by trees.

Different technologies have their various contributions to make to reducing the production of greenhouse gases and SWH is but one of many measures we can adopt and each can be evaluated on a number of bases. None of them alone can save us. To judge SWH solely in terms of its potential instantaneous contribution to reducing peak electricity demand is, I believe, misleading. Energy "saved" with SWH can be banked in the hydro lakes and drawn down when needed to contribute to solving the peak power problem, hence easing the peaking load met by fossil fuel generation. Thus SWH helps meet the PCE's initial objective of managing electricity use chiefly to reduce CO₂ emissions from burning fossil fuels for electricity generation.

Professor Arthur Williamson

New economic report set to ignite debate about lignite alternatives

By WWF

Hundreds of new jobs and tens of millions of dollars could be generated for the people of Southland without developing the polluting coal industry, a new economic report by BERL has found.

The WWF-New Zealand has commissioned the report *“A View to the South: Potential Low Carbon Growth Opportunities for the Southern Region Economy”*

Proposals to mine and process lignite coal in the Southern region could add up to 10 per cent a year to New Zealand’s greenhouse gas emissions. Concerned these proposals could set back national efforts to reduce our emissions, the global conservation organisation asked BERL to investigate the potential for lower carbon forms of economic development in the region.

WWF-New Zealand’s Climate Change campaigner, Peter Hardstaff, said:

“In Southland, like in all regions of New Zealand - and all over the world - people are facing challenging choices about ensuring social, economic and environmental wellbeing. How can we improve our quality of life while responding to the global imperative to keep global warming below dangerous levels?”

“BERL’s report shows that forgoing the exploitation of fossil fuels does not mean forgoing all jobs and having no livelihoods – it just means doing things differently. There are a range of options to pursue in the Southern region which could create more jobs and more money for people in the region, in potentially low carbon industries.

“WWF hopes this research will inform debate and aid decision-making on the future economic development choices available to the Southern region. We strongly encourage central and local government to promote policies that favour a clean and healthy economic future for the people of the region, and the whole of New Zealand.”

<http://wwf.org.nz/?9301/New-economic-report-set-to-ignite-debate-around-lignite-alternatives>



Recultivation and flooding of a former lignite mine north of Klinge, near Cottbus - Photo:Martin Roll

Lignite mining in Lausitz

By Alan Thatcher (from Germany)

I went with some friends to check out lignite mining in Lausitz, an hour or so drive south of Berlin. Large scale strip mining of the relatively shallow deposits has been going on since the early 50s and the area's become something of a demonstration model for restoration with an ongoing attempt to attract tourists.

To this end many of the old mines have been filled with water to create "Lakeland Lausitz"

and a disused F60 overburden conveyor bridge has been opened to the public. Next to the F60 there was about half an acre of PV panels and behind the briquette factory a dozen or so wind turbines in the middle distance nicely silhouetted against the huge steam plume rising from the distant power station. But, for sheer devastation there's nothing quite like an open cast strip mine.

To keep the mine dry, bores are drilled around the perimeter and ground water is continually pumped into the Spree River, which flows into an area of narrow waterways, wetlands and water meadows which acts like a giant sponge. This

keeps the downstream level of the river, which subsequently flows through Berlin, remarkably stable. However, decades of lowered ground water in the Lausitz means that when they eventually stop pumping, as one day they must, the Spree will likely flow backwards from time to time until ground water levels return to normal. This may also take decades. The effect on the Berlin's water supply is unknown. Filling the old mines with water seems like a good idea - except some of the lakes are so acidic nothing can live in them. Thousands of tons of lime have been chucked in these lakes but we saw no birdlife - not even a duck. The land itself is rather unstable - it's glacial moraine, so sand with fine gravel mixed in. With no significant vegetation apart from a few weeds, erosion around the lake edges is marked. Not long ago a number of houses complete with occupants, slipped into one of the lakes.

The reason the lignite is there is because this is the southern limit of ice age glaciers. The ice sheets scraped the landscape clean of organic material and dumped it along with the moraine material in distinct layers. The plant origins are clearly visible in the lignite. Soils are not particularly fertile to start off with, but after

being turned upside down they sure don't grow much - except pine trees. Until recently there was no attempt to preserve topsoil. Now "restoration" includes plans to reinstate small areas of agriculture amongst the forests. At least in Lausitz drainage is not an issue. A soil scientist involved in mining restoration near Bonn reported that the soil structure there is now so poor that it's like concrete, wet or dry.

The propensity for mining companies to simply bulldoze villages and towns to make way for mines is slowly leading to a local protest movement. What seems to be particularly annoying them is the predominance of the Swedish SOE Vattenfall in mining and electricity generation using the lignite. Vattenfall, of course, would never consider such activities in Sweden.

Maybe one day (and yet more hundreds of millions of taxpayer's Euros) Lausitz will turn out to be a tourist mecca, but there's a very long way to go and I doubt it will happen within the lifetime of most of the current population.

Alan Thatcher

Neil's Oil Price Chart

This chart compiled by Neil Mander, tracks a basket of oil prices in comparison with the gold price. The last few months have shown a marked increase, but that is within the range of \$100/bbl +/-25%, which has been the norm for the last 2 years. The disconnect of the US (Texas) price is now firmly established.



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