

Submission to the Electricity Market Review
Energy & Communications Branch
Ministry of Economic Development
Wellington.

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Submitter: Energy Solution Providers, level 2, 60-64 Upper Queen Street, Auckland, New Zealand

Thank you for the opportunity to make a submission on this review.

Energy Solution Providers Limited (ESP) is an Energy Management Company with over eleven years experience in the electricity industry. ESP provides its clients with a range of services from tariff negotiation through to monitoring and targeting. We cater to a wide range of companies and other organisations assisting them to be more energy efficient in monitoring and targeting electricity usage to achieve best practice energy management. Electricity is a significant cost and in the past year it has been difficult to find truly competitive rates in the market. In fact in recent tariff RFPs some retailers have refused to provide quotes and one has exited the TOU market altogether.

ESP believes the New Zealand electricity market, as it is presently structured, is fatally flawed. The ETAG Review even states that "The Government's approach should be either to have a competitive market and make it work, or abandon it and put in place some sort of central planning option."

While the market delivers significant benefits in terms of profits it fails utterly to deliver on what was promised at its inception – lower prices for electricity, security of supply and a competitive market. We believe the path taken by successive New Zealand governments has been in error and that it is time to resile from the practice of re-examining and then re-legislating for improved performance. Why? Because after sixteen Bills, Acts and Amendments; ten reports, reviews and a task force; twenty five sets of rules, regulations, strategies and processes; the setting up of a regulator and regulatory structures within government departments; a number of government policies and the dismantling of the industry it is not delivering on the promised security of supply at fair and reasonable prices to consumers. It is time to stop.

Electricity prices began rising above the CPI in 1996. In 2002 the gap began to widen significantly. As a result New Zealand has more expensive electricity prices than Canada, the US, a number of European countries and more importantly Australia whom we compete with for commercial and industrial business investment. The extraordinarily high prices charged for residential electricity leads to significant hardship for low and fixed income families.

The regulatory framework has not been sufficient to guarantee investment in infrastructure which has led to failures such as the cable failure in Auckland in 2006, the transformer failure in Auckland in January 2009, the degradation of the HVDC link and in April the failure of that link.

The reason the market fails is that the focus is on profit rather than security of service and there are too many entities in the sector all trying to leverage a profit margin and no effective overall governance of the industry as a whole.

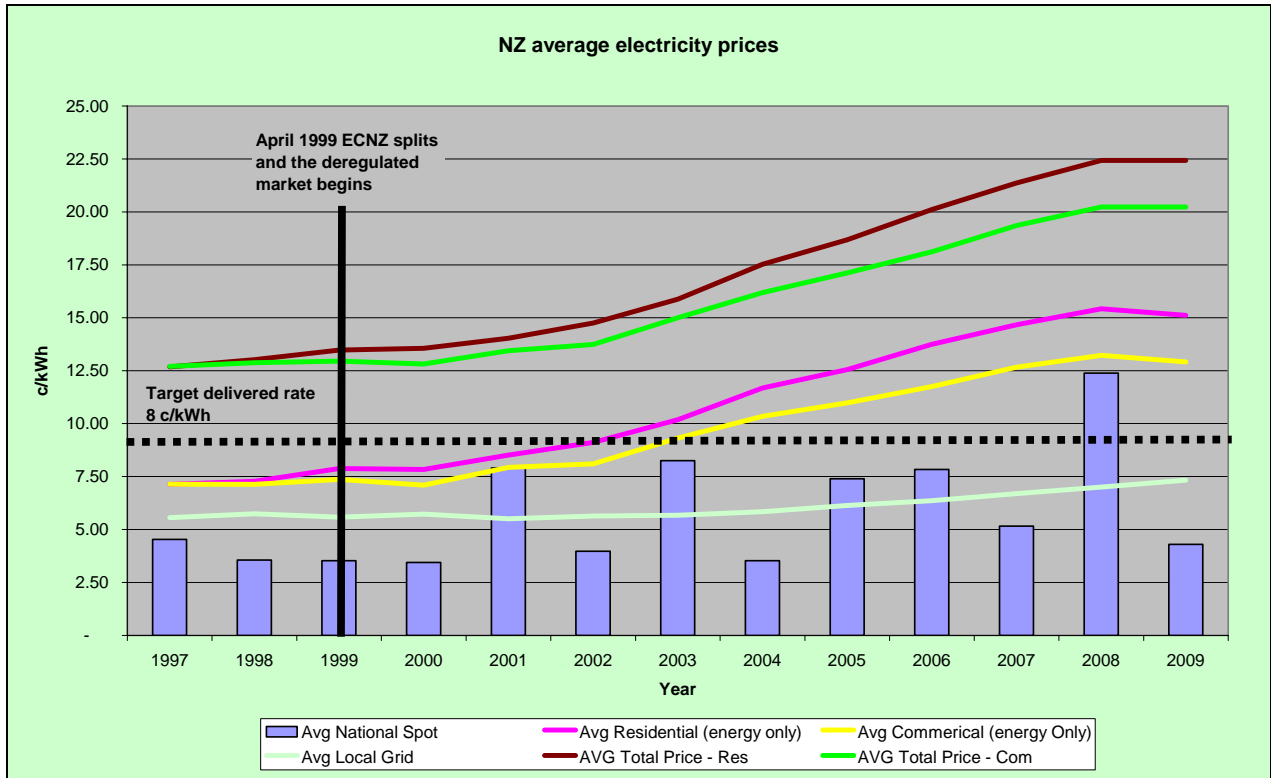
The market provides significant benefit in dividends to shareholders. The Wolak Study in its criticism of generators using market power to raise spot market prices quotes The State-Owned Enterprises Act 1986, which requires an SOE to be "as profitable and efficient as comparable businesses that are not owned by the Crown". That is, the directors of the State owned firms also have a legal obligation to ensure that they are exercising all available unilateral market power."

The profits in themselves are a direct indicator of higher costs for consumers. The government as the largest shareholder in the market receives tens of millions of dollars each year as a result. However, it appears this profit is not going back into securing the industry but into the general fund for re-distribution.

In short it is the wrong model for New Zealand and we believe radical change is required to set it on the right path.

In Max Bradford's 2002 analysis of the market since deregulation he says when the labour government came into power in 2000 it had the opportunity to reverse the legislation and take control of the electricity industry back into state ownership. It didn't. He sites this as a signal the market was working and that the "benefit of choice and lower prices has been achieved." ESP believes it was more that the market was providing significant revenue to the government which it was loath to part with.

Max Bradford went on to say in his review that "widespread consumer perception in the New Zealand public is that the introduction of a competitive electricity market has been disruptive and, some might say, has not worked. That is a perception that will be gradually replaced by the facts, hopefully." Clearly the facts prove he was wrong.



Yours sincerely

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Energy Solution Providers Submission

1. Introduction

Electricity is a vitally important utility essential to the ongoing viability of civilised society. Society needs security of supply and fair prices to encourage business growth and to foster the well-being of the general public. The rapid increase of commercial and domestic pricing coupled with degraded infrastructure indicates the market in its current form is not working.

The Electricity Technical Advisory Group (ETAG) stated that “The rate at which retail prices have risen, especially for residential consumers appears excessive when compared to the increase in the cost of new supply.”

The group also noted that “The reliability and capacity of the transmission system can be improved.” This is in spite of record profits over the past few years.

The Wolak Study for the Commerce Commission identified there was “Insufficient competition to discipline suppliers against using market power.”

In our view the New Zealand consumer is being overcharged by this industry to the tune of \$4 billion dollars every year. We also believe with the right model the industry could deliver what is required for business growth and social wellbeing.

History of deregulation

It is claimed that the New Zealand Electricity market was the first fully deregulated electricity market in the world although the introduction of privatisation of the electricity sector occurred in Chile in the early 1980s and was accelerated when Margaret Thatcher privatised the UK electricity industry.

In the 1980s electricity generation and transmission including policy advice and regulatory functions were the responsibilities of the Ministry of Energy. The industry was factionalised and disjointed, there was too much political interference and this led to a lack of overall responsibility for investment in infrastructure and new generation and widespread inefficiencies. As a result there were electricity shortages.

This led the government to begin the process of separating the functional part of the industry from direct government control. In 1987 the ECNZ was set up as an SOE to own and operate the generation and transmission assets of the Ministry of Energy.

The aim was to increase commercialisation of the industry – in other words run it as a business. However the Ministry of Energy retained policy and regulatory activities.

A number of reforms followed including separating the transmission arm of the ECNZ and setting up Transpower to maintain transmission to local networks. In the late 1990s there was a scramble for ownership of lines companies and prices far in excess of the lines company values were paid. The corporate cowboys had a field day. The market didn't deliver on its promise and so more reports, reviews and regulations were undertaken to try and make it work. It didn't.

What followed has been a constant tinkering as the government has tried to regulate the market so that it delivers what Max Bradford, the minister who supervised the wholesale dismantling of the electricity sector in the 1990s, promised, that the reforms would “deliver choice (of electricity company) and lower electricity prices (both wholesale and retail) to consumers.”

2. Purpose of the Electricity Market Review

The purpose of the Electricity Market Review was to determine ways to improve the performance of the electricity market and its institutions and governance arrangements in order to better achieve the government's objectives for the electricity sector.

These objectives are:

- a. To ensure that electricity is produced and delivered to all classes of consumers in an efficient, fair, reliable and environmentally sustainable manner; and
- b. To promote and facilitate the efficient use of electricity.

- c. Within these two objectives, to ensure that the electricity sector contributes to economic growth by providing for security of supply and efficient prices.

In undertaking the review the Electricity Technical Advisory Group ETGA was to look at performance to date, identify problem areas, assess the costs and benefits of reform options, and develop recommendations.

In making assessment for the review the ETGA was to consider a number of reports, papers, findings and analyses including relevant market design and regulatory developments and examples in other countries. These appear to have been Australia and the UK. ESP questions why the ETGA did not look at BC Hydro which has arguably one of the most efficient electricity systems in the world providing the cheapest electricity in North America.

By excluding the ownership and governance of the SOEs and the regulation of electricity lines, the review effectively meant its authors were being asked only to rearrange the deckchairs on the Titanic rather than provide a way forward where New Zealanders would benefit from a reliable and fairly priced electricity system.

3. Section 2 – Security of Supply

Para 13.	Failures such as the cable failure in Auckland in 2006, the transformer failure in Auckland in January 2009, the degradation of the HVDC link and in April the failure of that link add to the perception of vulnerability.
Para 18.	Low inflows and lake levels indicate a scarcity of supply but this has not been borne out in a shortage of generation. High spot prices have as much to do with fear mongering as with real time issues. The vulnerability then is not a lack of supply but engendered public opinion fuelled by market players seeking higher profits. These need to be regulated.
Para 20. & Para 21.	Conservation campaigns should be part of a mainstream government conservation strategy. There should also be step up rates for usage to encourage residential consumers to use less electricity. We strongly believe that residential and commercial users can save between 5% and 15% of their usage through simple measures such as switching off lighting, computers and other equipment left on standby and through better lighting use in offices and using energy star rated equipment. Also through monitoring and targeting excessive after hours and office hours use.
Para 28.	Reserve Energy Generators should be government owned quick start thermal plants capable of supplying sufficient capacity to cover average shortfalls in dry years.
Para 30.	Generators should be required to provide annual generation capacity estimates broken down into monthly/weekly periods and if they fail to meet those estimates, requiring reserve generation, they should be penalised by being charged with the cost of the extra generation. Hydro generators should be required to ensure minimum lake levels are sustained when making estimates. There is enough data and modelling available to them to make accurate estimates.
Para 31 – 33.	We believe the public should be educated and encouraged to conserve electricity on a daily basis. We do not believe there should be financial incentives other than lower costs through lower usage. Generators falling short of agreed projected supply should be penalised with the cost of providing reserve generation. These penalties would then remove the incentive to talk up supply shortages as the spikes in the spot market would be removed by reserve generation with the cost accruing to the defaulting generator(s).
Para 34.	It is not the retailer who causes the spot price to spike therefore the penalty should reside with the generators. Consumers should not be rewarded except through lower usage.

Para 35 – 36.	We do not support Recommendation 2. We believe the disincentive through penalising generators for shortfalls would work better.
Para 41.	We believe there should be one Independent System Operator (ISO) and that should be the Electricity Commission which should be strengthened so that it has full control over the industry including generation, transmission and distribution and retail. We believe the Commission should have representatives of consumer bodies on it. We think the British Columbia model is an effective model for New Zealand to follow. The regulator, the BC Utilities Commission (BCUC) requires the generator, BC Hydro, to submit a proposal every two years for its future activities and for forward pricing. It is a comprehensive review and the BCUC has judicial powers. BC Hydro is required to take more aspects into consideration than profit. The result is a well- planned, well-regulated system that delivers the cheapest electricity in North America. A table showing the comparison between New Zealand and BC is appended in Appendix 1.
Para 42 – 44	We do not support the phasing out of Reserve Energy as proposed in Recommendation 4 and do not support the sale or reassignment to an SOE of Whirinaki as in Recommendation 5.1 but do support the concept of penalties as outlined above. Whirinaki should continue to be government owned.
Para 45	We support Recommendation 6.

4. Section 4 – Transmission and Distribution

Para 89.	We do not support Recommendation 16 and believe the Electricity Commission should retain these powers (see Para 41.)
Para 95.	<p>According to figure 40 in appendix 12, prices for local distribution to residential customers have increased by 17% and have decreased 10% for industrial and 5% for commercial consumers. This appears to be at odds with the figures in Para. 95. We believe the margins between cost and selling price are still too large and need to be reduced further, especially for residential consumers. Currently for residential consumers the rate for generation is 8c/kWh and for transmission 1.9c/kwh. Added to that is the line company rate of 6.3c/kWh. The total cost of generation transmission and distribution is 16.2c/kWh which is excessive compared to other countries. Even for this total alone NZ has higher electricity prices than most of Europe and certainly all of the Canada, Australia and the US except for Alaska (which is comparable) and Hawaii.</p> <p>The comparison between New Zealand and other countries (Figure 48 in the Appendices to the Review) shows New Zealand in a favourable light compared to other countries. However the figure is flawed as it converts c/euro into c/NZ. We believe this figure should have left the figures in their original currency as the rates are relative to domestic incomes not converted rates. When this is done NZ comes out as the most expensive.</p> <p>We also believe that lines companies have been lax in improving distribution networks and profits have not gone back into making improvements for several years. There is also the difficulty of small rural ELBs having large areas to cover with higher costs and a smaller revenue base than say Vector with a small geographic area and a higher number of customers. We believe there needs to be some weighted redistribution of cost to assist small ELBs with line maintenance.</p>

5. Section 5 – Wholesale and retail prices

Para 101.	We believe the criticisms of the Wolak Study are unjust. While it was done in hindsight foresight is now more accurate than ever before and statistics and modelling exists to make reasonably accurate predictions of lake levels and demand. Our recommendation is that Generators be required to produce a two year forward plan for approval by the Electricity Commission and that any deviation from that plan should carry penalties.
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	<p>The demand response to high spot prices is largely carried by residential customers who consume 32 percent of the supply and do not have the benefit of time of use rates. Retailers hedge potential exposure to high spot prices by striking high kWh residential rates. These are some of the highest rates in the developed world. (See above in Para 95 and Appendix 2)</p> <p>We believe that the generation costs are excessive. At 8c/kWh for residential rates we believe the market structure is failing to deliver lower prices and generator profits are significantly above the cost of generation. Currently there is no incentive for more competition to enter the generation market as there is almost perfect supply and demand. A new entrant would not achieve the return on investment required to set up in competition to the current six large generators. There is some potential for smaller generation to supply the grid and this will continue. However it will not significantly affect the current market prices. Also generators have little incentive to provide more generation as that would presumably lower prices. We believe our proposal for a negotiated price and two year forward projected plans should be considered.</p>
Para 102.	<p>We believe the predicted new capacity estimates should be revised down. Through modest savings in usage we believe the need for new generation can be slowed.</p> <p>For example if commercial users throughout NZ saved between 5% and 15% of their usage through better energy management practices they could save between 462GWh – 1387GWh per year. The savings from commercial users alone could avoid that. Add industrial and there are a further 859GWh – 2579GWh. Residential would add a further 620GWh – 1862GWh. Totals range from 1941GWh to 5828GWh per annum.</p>
Para 104	<p>If there is no evidence of long term exercise of market power, and we seriously question that, then we believe the case for having fixed prices for generation arrived at through a two year negotiated forward plan regulated by the Electricity Commission is strengthened.</p>
Para 105	<p>As above. We do not believe the spot market is the right mechanism for determining electricity pricing. Generators have an incentive to hold back generation to amp prices. We believe an agreed price and predicted capacity outlined in the two year forward plan with penalties for shortfalls in generation would give more security to the market. It would avoid the current situation where low rainfall is talked up resulting in high spot prices. These prices are inevitably passed on to consumers through higher fixed prices.</p>
Para 106-107	<p>We agree that the market is not working as it should and believe it is the wrong model for a utility such as electricity. The potential for false scarcity to push up both hedge and spot prices through fear mongering and withholding generation has been seen to happen and so the market can never function as the regulator nor engender competition. However, we believe the time of use (TOU) pricing structure should remain in place as this encourages users to manage use during higher priced periods.</p>
Para 109. - 110	<p>The retail price for residential and commercial users is only 14% of the cost. The larger percentages are in generation at 36% and distribution at 29%. These are the costs we believe are the ones which need addressing not the retail margin. The main reason there is very little retail competition is that there is a small margin to work within. If the costs of generation and distribution were regulated then the retail price would be more flexible and real competition has the potential to exist.</p> <p>If retailers are making significant profits from 3c/kWh for residential (estimated total income \$373m per annum), then generators are making \$993m; lines companies \$782m; transmission \$236m and the government in GST \$310m all from residential customers. So in effect the government gets a cut two ways. Once from dividends and secondly from GST.</p>

<p>Para 111.</p>	<p>The objectives of the last stage of the reforms were to “deliver choice (of electricity company) and lower electricity prices (both wholesale and retail) to consumers.”</p> <p>While this happened to begin with as newly minted electricity retailers touted for business over time the competition has settled into a steady increase in prices with very little difference between retailers’ offerings.</p> <p>The consumer has shown a remarkable indifference to the opportunity to switch retailers so competing for customers is a rare occurrence.</p> <p>Recently competition in the market for domestic customers rose not because of competitive prices but with dissatisfaction over the arrogance of Contact Energy’s directors. Contact lost 40,000 customers as a result. The main beneficiary of this was Mercury Energy and now Contact is trying to woo them back, not with lower retail prices but with below the line cash incentives and other inducements. By using these methods the retailers keep prices high and only spend a fraction of the potential loss of income as a sweetener. Once they have recouped lost customers they will be able to carry on with the same pricing having written off the inducements as advertising costs.</p> <p>Despite the exodus of customers Contact still managed a net profit of \$117 million.</p> <p>Overall competition does not exist. Consumers are aware they can change retailers and don’t because by and large the rewards are not there. I recently ran our domestic electricity account through Power Switch. The result: over a year there was a marginal cost saving from one other retailer of \$57, hardly worth the effort to switch, while the other retailers’ prices were more expensive one up to \$1200 more expensive. This surely was a signal that the retailer did not want any more customers.</p>
<p>Para 118.</p>	<p>In regards to the three options proposed by the Review we believe none of them are workable. We believe taking generation capacity from one generator and giving it to another is like rearranging the deckchairs on the Titanic. For example, if the generation was swapped – that is the generators then had enough capacity to meet the needs of their retail customers – the spot market would cease to exist and so would retail competition. This would lead to more of the same where the vertically integrated generators gouge the market and pass the costs on to the end consumer through their retail arm.</p> <p>As mentioned in previous paras., we believe the generation of electricity should not be competitive. The electricity market cannot deliver competition in generation. The Wolak Study proves this. The best option is to regulate the generators as we have suggested previously by requiring them to provide forward generation plans at fixed prices and to penalise them if they fall short requiring generation from the government owned reserve generator. This means the generators have to be focused on what they should be focused on and that is reliability of supply, not profits.</p> <p>There are many studies now that show the deregulation of the electricity sector has not produced the intended results. While there are as many ways suggested for fixing the problem most seem to think that putting the Genie in the bottle – going back to government ownership - is too costly.</p> <p>One study done by The American Public Power Association (August 2009) found that “consumers simply have not benefited from the restructuring of wholesale markets.” Some of this disparity has been attributed to high fuel prices for gas fired generation, however, if that was the case, the study said, “then one would not expect to see the high margins on electricity sales in 2008 because the higher prices would be cancelled out by higher fuel expenses.”</p> <p>The study’s analysis of generation in the PJM Interconnection found that “revenue earned by these companies greatly exceeded the costs of producing the electricity that was sold into the market.”</p> <p>The study concluded that “these profits are simply not what one would expect under a truly competitive market. In such a market, high profits would not be sustained because new entry would encourage competition in the form of lower prices. The absence of such price competition, and the continued presence of a handful of incumbent companies as the largest beneficiaries, points to a market that is not competitive.</p> <p>The losers in the PJM Interconnection are the same as in New Zealand – the end consumer.</p>

Para 155.	Smart Meters and smart tariffs. We support the idea of smart metering. Smart meters have the potential to provide significant source of information to the industry and to allow consumers to more responsibly manage their usage. At present the meters being installed appear to be one-way meters which will allow retailers to have differential rates for TOU usage. We think that recommendation 23 does not go far enough in requiring retailers to provide acceptable rates for TOU. We believe step up rates for residential usage are acceptable but that they are agreed rates as would be the level of each step.
Para 156.	Price monitoring is all very well but it is rather like shutting the door after the horse has bolted. We believe that fixed prices are a more reasonable solution. These would be as mentioned before. part of a regulated process requiring two-year forward planning.
Para 161.	The reasons customers don't often switch is because there is no competition or so little that it is hardly worth it. This goes for both commercial and residential consumers.
Para 166.	We do not believe Contact has made any significant cut in retail prices to woo lost clients back, only in below the line incentives.
Rec. 25.1	Promoting the benefits of consumer switching when there is no real competition is a waste of money. We believe this could be far better spent on educating consumers on how to save electricity.

6. Section 6 - Governance

Rec. 26	<p>We disagree with the recommendation that the Electricity Commission (EC) be disbanded and replaced by an Electricity Market Authority.</p> <p>We believe that it would be better to strengthen the EC and model it on the British Columbia Utilities Commission (BCUC) and provide it with a robust regulatory regime to operate within.</p> <p>The EC would be responsible for ensuring that customers receive safe, reliable and non-discriminatory electricity at fair rates from the market it regulates. that shareholders of these utilities are afforded a reasonable opportunity to earn a fair return on their invested capital, and that the competitive interests of NZ businesses are not frustrated.</p> <p>The EC would continue to approve the construction of new facilities planned by generators and lines companies.</p> <p>The EC's function would be quasi-judicial and have the power to make legally binding rulings. The EC would continue to be self funding from the levy.</p> <p>The EC would also review energy-related matters referred to it by Cabinet. These inquiries would usually involve public hearings, followed by a report and recommendations to Cabinet.</p> <p>Main responsibilities would be approving:</p> <ul style="list-style-type: none"> • Construction of facilities • Operation of facilities • Capital and acquisition plans • Revenue and rates • Service levels and public safety <p>This would ensure the public interest concerns are reflected in decision-making processes.</p> <p>We believe the make up of the EC should be independent and no members should be representatives of the generation, transmission, distribution, and retail arms of the sector. We agree that members of consumer groups and business should be members and that the remainder should be independent.</p>
	All of the powers outlined in recommendations 26.5 through 29 should be the responsibility of the EC. We do not favour split regulation. One body is in a better position to retain the overview and regulation of the entire sector.

7. Conclusion

The chair of ETAG stated in his covering letter to the Minister of Energy that "It is important that we continue to make improvements to the electricity market.....this can and should be done through well-considered improvements to the existing model." We disagree.

Unlike other markets, the nature of the electricity market is not one of supply and demand but rather one of demand and supply. Demand is inelastic and without demand no electricity is generated. Using a Spot Market structure to regulate supply leads to manipulation of pricing by withholding generation or talking up shortages to amp prices, and ultimately, to winners and losers. The ultimate loser is the end consumer who wears the cost of this manipulation or any mistakes made through poor planning, bad management and in the case of Contact's board corporate greed.

There are too many players each trying to leverage a profit margin from a small market. Having multiple players from generation through to retailing means it is hard to control lines of responsibility and as a result New Zealand has an infrastructure which is falling apart at the seams. We simply do not believe the claim that the Spot Market is effective at regulating supply and conserving lake levels. There is enough generation capacity in New Zealand with more being added all the time. The need for renewable energy and more innovative thinking in the industry has led to some interesting new directions.

We believe the best solution for New Zealand's electricity sector is to have a State-owned utility. We are not suggesting going back to the old model which was fraught with bureaucratic mismanagement but it is clear the current model is not working. In fact deregulated electricity markets everywhere are beginning to fail because the privatised model is the wrong one. We are aware that many believe a return to state ownership is now impossible because of the huge cost of buying back the privatised parts of the industry. Competition is never going to work as a regulator. There simply is no incentive.

As a first step we believe the government should buy back the distribution networks. While this is likely to be expensive we believe single control of transmission and distribution will ensure the infrastructure to deliver electricity from the generators to the end consumer regulated. We believe the concept of running these enterprises as SOE's and therefore quasi-commercial businesses is flawed. Business is driven by profit rather than by delivery of an essential utility and therefore unless there is sufficient regulation we will continue to have the current situation where transmission costs 1.9c/kWh local distribution costs 7.01 c/kWh, generation 6.42 c/kWh metering, retail and other fees 5.67 c/kWh

However, if the government is unwilling to take this step we believe electricity prices should be fixed at 8 c/kWh delivered and regulated by an overseeing body which splits this delivered cost across the multitude of players in the market.

The next step is to fix prices paid to Generators. We believe the BC model is one worth following, even if just for the governance structure alone. The BC Hydro experience is the New Zealand situation in reverse. The government of British Columbia had the foresight to realise having multiple players in a small market was never going to work and over time bought them out and set up a single entity BC Hydro governed by a regulator, the BCUC.

High electricity prices and New Zealand has some of the highest in the world, make it difficult for business to be competitive and causes hardship for low income families. The situation must be fixed and we believe our submission provides some sound ideas for a way forward. Trying to regulate competition into the market and shuffling generation from one generator to another will not provide the competitive market sought by the review.

Some comments I took off the CRA (U of Calgary Centre for Regulatory Affairs) and the Wolak report.

Deregulation – view in 2001 shortly after deregulation in Alberta complete.

Advantages include:

- increased competition, more customer choice, possible service improvements;
- potentially lower costs, if competition results in improved efficiency;
- marginal cost pricing better reflects market conditions and gives better price signals to market participants; and
- trade will tend to promote price convergence between regions: high-price regions could experience lower prices.

Disadvantages include:

- price uncertainty due to changing market conditions;
- possible upward pressures on prices due to increased costs for some market participants (e.g., higher costs of capital because of higher risks);
- higher risks mean uncertainty for new investment compared with cost-of-service regulation;
- marginal cost pricing means more volatility, potential for price spikes;
- trade will tend to promote price convergence between regions: low-price regions could experience higher prices.

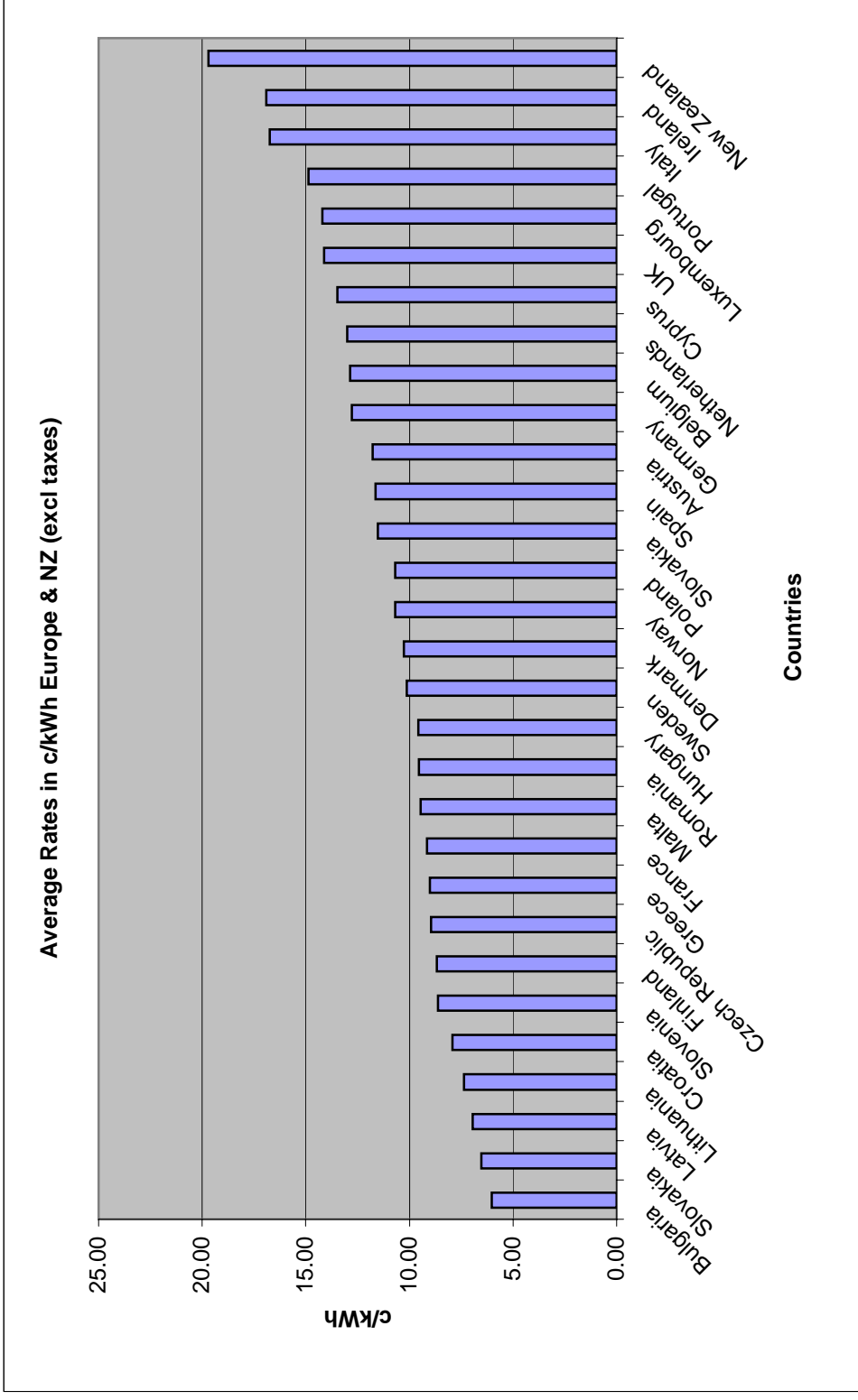
Wolak Executive Summary

“A firm’s management has a fiduciary responsibility to its shareholders to take all legal actions to maximize the profits it earns from participating in the wholesale market.”

“Electricity possesses virtually all of the product characteristics that enhance the ability of a supplier to exercise unilateral market power. Supply must equal demand at every instant in time and at each location in the transmission network. It is very costly to store electricity and its production is subject to extreme capacity constraints in the sense that it is impossible to produce more than a pre-specified amount of energy from a generation unit in an hour. Delivery of the electricity must take place through a transmission network with a finite capacity. The pricing of wholesale electricity to final consumers makes the half-hourly wholesale demand extremely inelastic, if not perfectly inelastic with respect to changes in half-hourly wholesale prices. Finally, in most wholesale markets the vast majority of generation facilities are owned by a relatively small number of firms.”

Appendix 1 - rate comparison europe and NZ

Bulgaria	6.03
Slovakia	6.52
Latvia	6.94
Lithuania	7.37
Croatia	7.93
Slovenia	8.61
Finland	8.68
Czech Republic	8.95
Greece	9.00
France	9.14
Malta	9.45
Romania	9.54
Hungary	9.57
Sweden	10.13
Denmark	10.27
Norway	10.69
Poland	10.69
Slovakia	11.52
Spain	11.64
Austria	11.78
Germany	12.79
Belgium	12.86
Netherlands	13.00
Cyprus	13.48
UK	14.11
Luxembourg	14.21
Portugal	14.86
Italy	16.74
Ireland	16.90
New Zealand	19.70
Average	11.10



Appendix 2 - Comparison BC Hydro & NZ

Description	BC Hydro	NZ
Population	4.43 million	4.32 million
Land Mass	944,73 sq/km	268,676 sq/km
Customers	1,801,038	1,961,755
Generation (GWh/year)	52,512 GWh	41,655 GWh
Generation Capacity (MW)	12,755 MW	9,380 MW
Generation purchased from IPP	8.2 GWh	N/A
Usage – residential	17108 GWh	12,417 GWh
Usage – Commercial	18872 GWh	9,253 GWh
Usage – Industrial	15981 GWh	17,192 GWh
Usage – Other	1957 GWh	798GWh (co-generation)
Sources of electricity	Hydro 90%, 10 % (thermal, geothermal, wind, biomass, co-generation)	Hydro 60%, 24% thermal, 16% (geothermal, wind, biomass, co-generation)
Average Residential rate	8c/kWh*	22c/kWh (Range 21c/Kwh – 24c/kWh)
Average Commercial rate	8c/kWh**	18c/kWh (Range 15c/kWh – 21c/kWh)
Average Industrial rate	7c/kWh	15c/kWh
Average usage per residential connection	11,000 kWh	9000 kWh
Legislation and Rules governing electricity market	Hydro & Power Authority Act, Utilities Commission Act	Electricity Amendment Act 1987, Electric Power Boards Act 1990, Energy Companies Act 1992, Electricity Act 1992, Electricity Industry Reform Act 1998, Electricity Industry Bill 2001, Electricity Hazards from Trees Regulations 2003, Electricity Governance Rules and Regulations 2003, Regulatory Framework for Transmission Investment and Pricing 2004, Electricity and Gas Industries Bill 2004, Electricity Low Fixed Charge Tariff Option for Domestic Consumers Regulations 2004, Resource Management and Electricity Amendment Act 2005, Electricity Governance Connection and Distributed Generation Regulations 2007, Electricity Disconnection and Low Fixed Charges Amendment Act 2008, Electricity Industry Reform Amendment Act 2008, Commerce Amendment Act 2008, Electricity Continuance of Supply Amendment Bill 2008, Electricity Renewable Preference Repeal Act 2008.
Governance	British Columbia government, Ministry of Energy Mines & Resources, Ministry of Attorney General, British Columbia Utilities Commission (BCUC),	NZ Government, MED, MCom, MFE, Minister for SOEs, Electricity Commission, Electricity Complaints Commission, Commerce Commission, EECA,
Utility company	BC Hydro & Power Authority	Contact, Trustpower, SOE boards, Transpower, Board, Lines Co Boards, Retailer Boards.
Generators	1 plus 42 Independent Power Projects (IPP)	5 major plus 6 small
Transmission Companies	1	1
Lines companies	1	28
Retailers	1	20

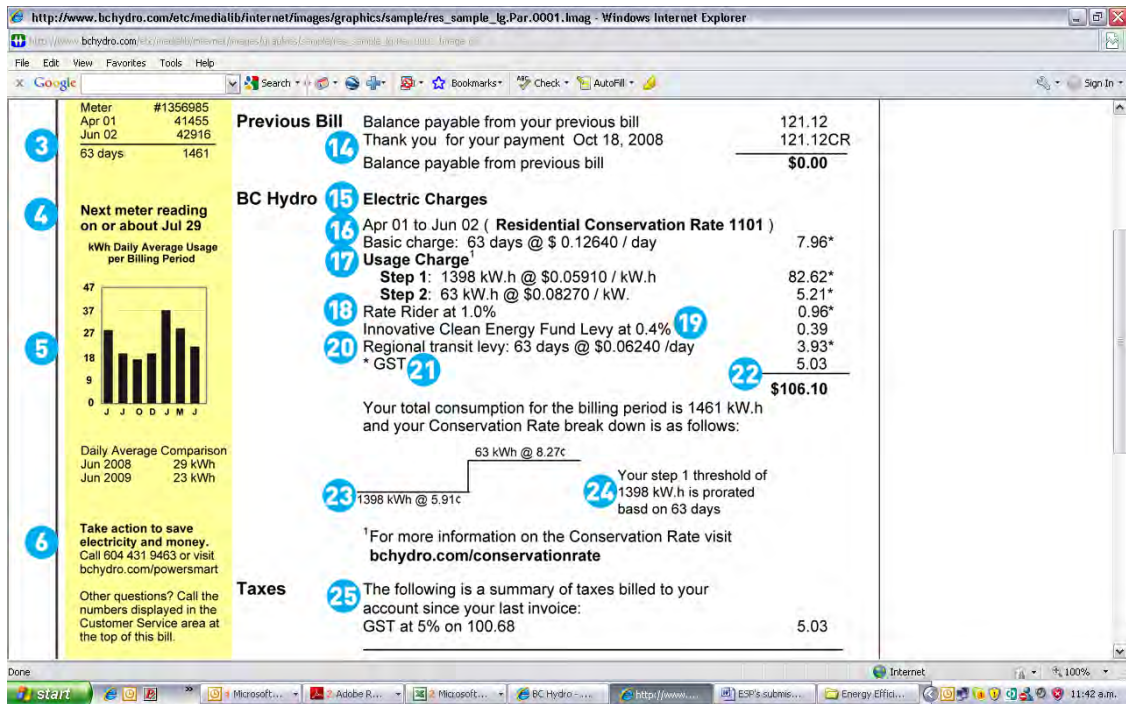
* Has two step kWh rate (rises from 5.9c/kWh to 8.2c/kWh) which encourages residential users to use less power.

** Has poor power factor penalty which encourages commercial users to improve power factor. From our experience we've seen power factor as low as 40/100 and many average around 75/100. Poor power factor is caused by poor load balancing.

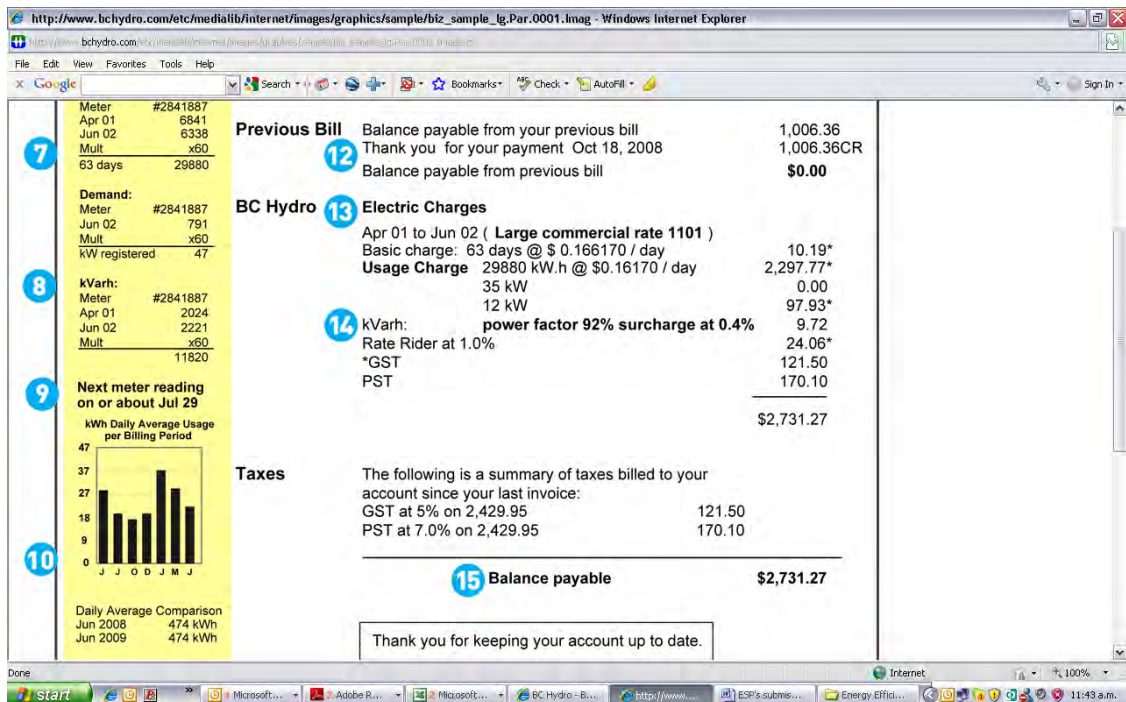
APPENDIX 3

Electricity bill structure BC Hydro

Residential Bill



Commercial Bill



Appendix 4 comparison NZ and BC Hydro rates

NZ	*Sector MWh	** Average Rate (\$/kWh)	Total Energy Charges NZD	*Number of Customers	Average Consumption MWh	Cost Per Customer
Industrial	16,190,078	\$ 0.15	\$ 2,428,511,700	104,191	155.39	\$ 23,308.27
Commercial	7,974,883	\$ 0.18	\$ 1,435,478,940	137,373	58.05	\$ 10,449.50
residential	12,732,879	\$ 0.23	\$ 2,990,787,750	1,562,064	8.15	\$ 1,914.64
Totals	36,897,840	\$ 0.1858	\$ 6,854,778,390	1,803,628	20.46	\$ 3,800.55

BC Hydro Rates applied to NZ	Sector MWh	** Average Rate (\$/kWh)	Total Energy Charges NZD	Number of Customers	Average Consumption MWh	Cost Per Customer	Savings Per customer per annum
Industrial	16,190,078	\$ 0.08165	\$ 1,321,902,060	104,191	155.39	\$ 12,687.30	\$ 10,620.97
Commercial	7,974,883	\$ 0.08165	\$ 651,140,425	137,373	58.05	\$ 4,739.94	\$ 5,709.55
residential	12,732,879	\$ 0.06920	\$ 881,097,401	1,562,064	8.15	\$ 564.06	\$ 1,350.58
Totals	36,897,840	\$ 0.07735	\$ 2,854,139,885	1,803,628	20.46	\$ 1,582.44	\$ 2,218.11

Total annual amount that NZ power users over charged by \$ 4,000,638,505

* Source Ministry of economic development 2006

** Source Energy Solution Providers research and tariff negotiation results 2009