



Oakley Greenwood

Addressing the urgent need for network tariff reform

Jim Snow, Director

Electricity Price & Market Dynamics Review conference

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Sydney

National Retail Vision Work – 2007

“A national energy industry with increasing national economic and policy impact and stringent national watchdogs for its financial, economic and competitive performance.....providing fertile ground for innovation and change”

- National regulation and energy policy (and potentially social policy) will **seek to drive significant change** and accountability into the industry in terms of fostering competitive behaviour and market entry, reducing jurisdictional interference, and **mitigating energy price rises** and associated economy wide impacts through being diligent on the prudence of investments and the costs of inefficient industry processes and practices;

Alternative Paper Title?







*If you look like your are “broken” then you will
get help to be “fixed”...*

*.....been apparent since 2003 this is the major risk from increasing
network prices*

.....it is the main “monopoly” part of the supply chain

.....the rest can claim to be very competitive due to market forces

Been an emerging trend that has now come above the line – apparent back to 2003*

- Predicted major price increases in power prices due to network cost escalation driven by load factor decline, aging networks and (potentially) demand response 
- Energy prices would increase due to CPRS, RET and other renewables imposts  
- Gas would be limited for base load power generation and would face pricing issues going forward to be competitive 
- Funding Issues and Opportunities - predicted the Banks and Investors are the real rulers 
- Forecast that network pricing would have to evolve (price to retailers not customers) and become more dynamic to be cost reflective - unwind subsidies and increase options to avoid high bills 
- AMI as an enabling technology for pricing options for customers - watching brief

* Papers to IPART 2003, AIE Papers 2009, 2010, DM Papers 2007, 2009, AMI Reports, Retail Strategy

Recent Rumbblings (Garnaut)

Transforming the Electricity Sector, Update Paper 8, Garnaut (March 2011):

“The recent electricity price increases have mainly been driven by increases in the costs of transmission and distribution.

- *There is a prima facie case that weaknesses in the regulatory framework have led to over investment in networks and unnecessarily high prices for consumers.*
- *The upcoming review of regulatory arrangements by the Australian Energy Regulator presents an opportunity to correct distortions in current regulations.”*

“Garnaut....blames flaws in the framework regulating electricity producing monopolies, price-capping incentives for firms to over-invest, a generous appeals process, too-high reliability standards and continuing state ownership as all contributing to escalating prices, on top of the need to replace ageing infrastructure.” [Crikey.Com]

Recent Rumbblings (IPART)

Changes in regulated electricity (NSW) retail prices from 1 July 2011, IPART (Draft, April 2011)

- *In March 2010, we estimated average price changes of 10% to 13% on 1 July 2011 and 2% to 11% on 1 July 2012. Over 80% of these price increases were due to increasing costs of transporting electricity from the generators to customers (network costs). Our updated estimates largely confirm our estimates from last year, with the exception of additional costs arising from the Federal Government's changes to its RET scheme.*
- *Our draft decision indicates that average regulated electricity prices will increase by around 18.1% for Country Energy customers, 17.9% for EnergyAustralia customers and 16.4% for Integral Energy customers (Table 1.1). These increases come on top of rises of around 7% to 13% in 2010.*
- *These charges are regulated by the Australian Energy Regulator (AER) and we take these regulated costs and include them in the retail prices. These charges have increased significantly in recent years, and will increase*

We agree - the drivers of higher costs are now embedded - momentum issue.

Recent Rumbblings (IPART Continued)

More Detail in
Section 7

Specifically, we recommend that:

- *To address the rapidly increasing network costs arising from regulatory decisions, the Australian Energy Market Commission initiate a review of the National Electricity Rules to address concerns that these rules may bias the Australian Energy Regulator's decisions in favour of higher network prices and inefficient outcomes.*
- *To assess the network cost increases arising from the NSW Government's changes to service standards, the NSW Government satisfy itself that the network licence standards for network reliability and security align with customers willingness to pay and take steps to ensure that future changes to standards are subject to rigorous cost benefit analysis.*
- *To limit price increases to pay for high-cost solar schemes, the NSW Government to ensure that only the most cost-effective options are adopted in the future, and to consider:*
 - *closing the NSW Solar Bonus Scheme to new participants*
 - *requiring electricity retailers to contribute to the costs of the Solar Bonus Scheme for existing participants*
 - *advocating that the Federal Government eliminate the solar credits multiplier from its Renewable Energy Target scheme [and more about such schemes]*

Recent Rumbblings (Parry Inquiry)

NSW Electricity Network and Prices Inquiry (Parry, December 2010) - this is a really good expose of the issues that have been building for the last decade and how they are impacting - as this is most recent analysis, and quotes a lot of the IPART report, we have quoted it here extensively

“Customers are facing substantial known increases in electricity prices over the next few years and there are several additional potential factors which could further add to the upward pressures on electricity prices. It is hard to avoid the conclusion that all these factors create a “perfect storm”.”

Table 5.1: Contribution of cost components to average cumulative price increases from 2010/11 to 2012-13
(% nominal)

	EnergyAustralia	Integral Energy	Country Energy
Increase in network charges (as determined by the AER)	1	16	35
Increase in wholesale energy costs	1	1	3
Increase in retail costs and margin	3	2	3
Rounding	1	1	1
Total increases	36	20	42

Table 5.1 shows the contribution of different components of electricity costs to the cumulative percentage price increases to 2012/13 based on IPART’s 2010 determination. This does not account for the increased costs of the Solar Bonus Scheme and the modified RET which will both contribute a proportion of increased costs from 1 July 2011.

So what is driving this trend?

Declining Load Factors - major Issue for the industry in Australia

- Demand for electricity “energy” dropping/declining while peak demand is still growing - this is driving down the system load factor and driving network prices up (low use of peak assets)
 - Has been a clear trend since early 2000’s - temperature dependent peak demand
 - Initially caused by enormous growth in reverse cycle refrigerated air conditioning use in the networks - now well reported and subject of detailed forecasting in 2003 in NSW Network Price Determination process
 - **BUT now maybe more about price elasticity of demand**
- **“Demand response” has seen energy use actually now declining – volume response**
- This demand response cycle is often termed a “death spiral” – except where it is an essential service
- This will presumably “exhaust” at some stage but prices will continue to rise and cause other issues such as inequities and energy poverty, commercial rationalisations, State GDP impacts, etc.



So what is driving this trend?

Declining Load Factors - major Issue for the industry in Australia

- Now multiple other factors are starting to impact the load factor - many again as anticipated/forecast
 - Embedded generation - in NSW for example some 350 MW of rooftop solar will be installed thanks to State and Federal subsidy schemes impacting
 - This impacts directly on both prices (to recover the \$3b in subsidy) and a decline in electricity use in the grid
 - It also falls “inequitably” in that if your neighbour has a unit and you don’t.....
- Other green initiatives reducing energy use without much impact on peak demand
 - Off peak hot water load decline as Councils banned them and then a universal move to a new “green standards” for buildings (BASIX)
 - NSW Energy Savings Scheme (ESS) - another green subsidy scheme that is targeting 5% reduction in electricity use by 2014 using mandatory Retail targets and Energy Savings Certificates (GGAS remnants)
 - Energy efficiency drive (e.g. incandescent lamp removal)
 - The issue here is not the energy reduction itself but the fact it drives up prices as Load Factor declines

So what is driving this trend?

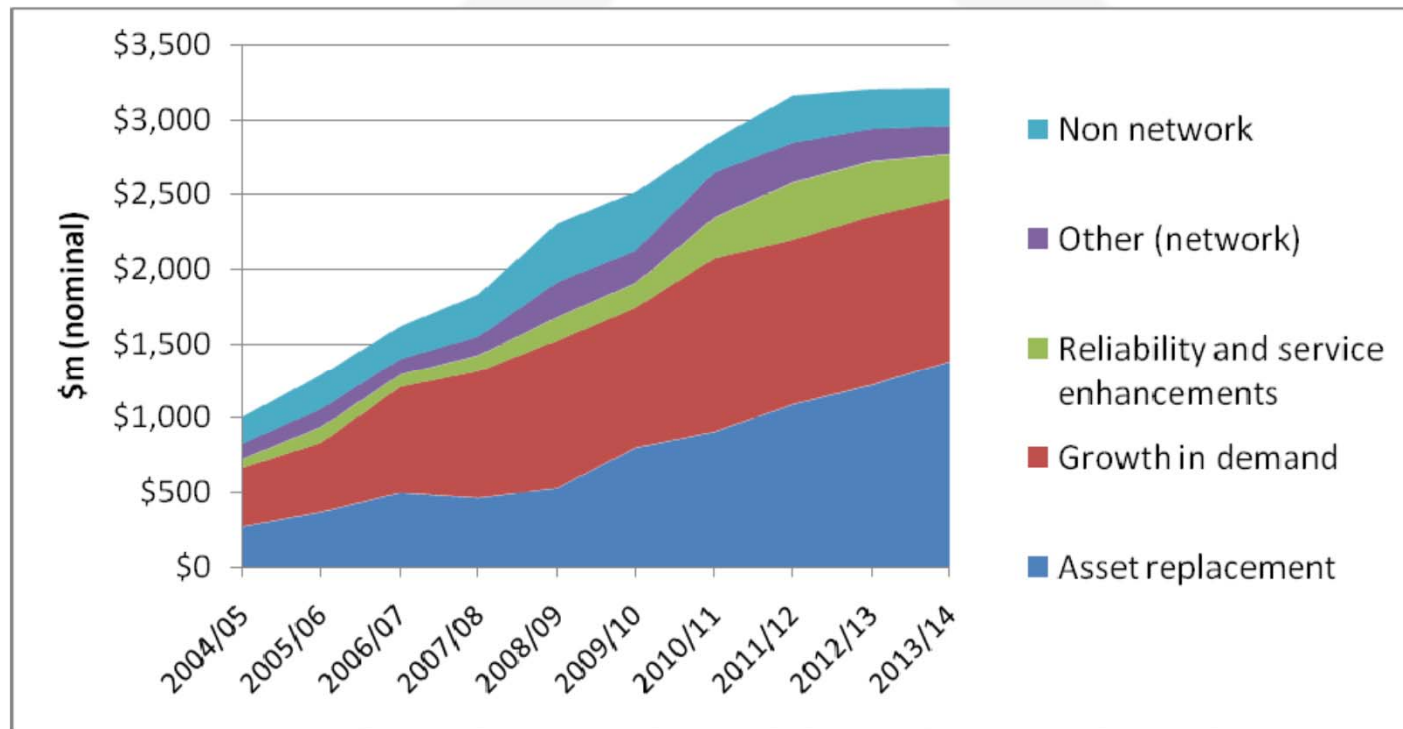
Changing Network Cost Drivers

- The main driver though 2000 was the increasing use of air-conditioning and its impacts on system load factor
- This is still a trend but the main drivers of network capital requirement in NSW are renewal of ageing assets and network reliability standards changes e.g. move to N-2 reliability standard in CBD
 - Reliability changes can increase the Long Run Average Incremental Costs (LRAIC) of network investments for both peak growth and network refurbishment - so results in a double acting driver which is not that obvious unless you examine LRAIC
 - *“Although standards usually involve a combination of deterministic and probabilistic approaches, in NSW the dominant approach is deterministic. This contrasts with Victoria where a predominantly probabilistic approach is adopted. The key difference is that absolute standards are set in NSW without necessarily applying the filter of a formal cost benefit analysis. Regulated standards in Victoria are generally subject to a economic cost benefit analysis prior to their adoption, however there is little if any actual assessment on what customers want or are willing to pay - lower reliability and lower costs, or higher reliability and higher costs.. (Parry Inquiry)”*

So what is driving this trend?

Changing Cost Drivers

Figure 5.2 NSW distributors' capital expenditure by purpose 2004/05 to 2013/14 (nominal)



Elements of LRAIC increase for reliability standard probably in growth and aged replacement capex as well

Note: Based on actual expenditure from 2004/05 to 2009/10 and forecast expenditure to 2012/14. EnergyAustralia's transmission business assets are included in this graph. (Parry Inquiry)

So what is driving this trend?

Regulatory Incentives

- There is a low risk when investing in capital for networks under regulation and this strongly aligns with technical perceptions that hardware is the lowest risk in terms of network reliability - I like to call this the “perfect incentive”
 - In “competitive” business the risk to capital is a prime driver and there is typically competition for capital returns in such business when investments are compared;
 - For NSW: *“Annual capital expenditure (excluding non-system capital expenditure) will grow by about three times from \$1b in 2004/05 to the over \$3b anticipated in 2013/14 in nominal terms (Parry Inquiry)”*;
 - NZ experience - capital competition drove 1993/4 project to introduce dynamic pricing at Southpower (now Orion Energy) - still in use and highly refined, worked on reducing capital - in absence of specific regulation?
 - *NSW Networks are Government owned - in 2011/12 network revenue will be \$3.85b and Government get \$942m - this rises to \$4.5b in 2013/14 and \$1.7b to Government (Parry Inquiry) - and Government sets the network reliability standards?*
 - The question is should the regulation regime change or should there be pricing reform?

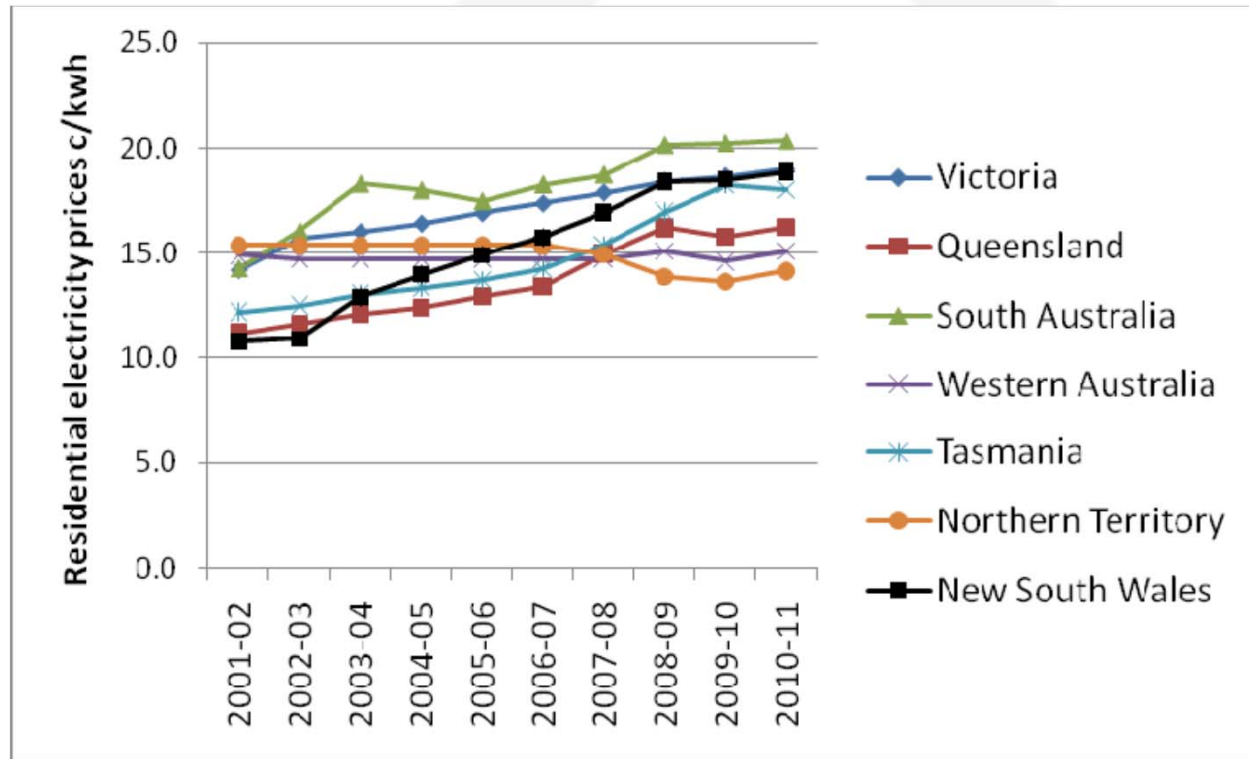
So what is driving this trend?

Regulatory Incentives

- The Weighted Average Price Cap (WAPC) form of regulation used by AER in NSW (Vic and SA) rewards growing energy use (and punishes declining use), and
 - It provides strong incentives for Ramsey pricing - pricing to those most able to pay (including VoLV?)
 - It also has a “momentum” effect on prices into the next reset periods
- This is all supported by good economic theory related to monopoly pricing BUT the underlying premises are losing validity
 - Energy use is declining so it becomes a case of sharing the pricing pain not gain, and
 - The capital driven price rises are so rapid currently (e.g. 20 years of rises in 5) you quickly get cost allocation distortions that give rise to equity issues and economic growth impacts
- The pricing and hence revenue recovery under the WAPC is not related to the costs drivers nor the cost allocations for customer classes - magnified by high price rises
 - Customer and economic impacts perceived to fall “inequitably” and “inefficiently”
- This is a prime driver for reform - the “perfect storm” as Parry Inquiry puts it!

Pricing Reform

Figure 2.2 shows the movement of prices in each State and the Northern Territory since 2001/02. It shows that in 2000/01, NSW had the lowest electricity prices of any state. NSW prices are becoming relatively more expensive and while not the highest are now above the national average. (Parry Inquiry).



This comparison is far more telling on a customer class basis – business is the bigger loser typically - and inequities also become clear on this basis

Interesting to see differences between states and ownership?

While increases in NSW have been steep over the last two years, the trend of increasing prices is common across all jurisdictions. (Parry Inquiry).

Pricing Reform

I will not directly address today the issue of regulatory reform but as outlined look at network pricing reform - with reference to NSW and the WAPC as such - however what I will present is and was valid even without any regulation and hopefully assists such reviews.

There are few truths to confront:

- Rapid network price rises based on volume (energy) in a declining energy environment gives rise to major risks and distortions
 - There are major revenue risks for networks themselves - places a lot of emphasis on the energy forecasting - and at the tariff component level to boot
 - The cost allocation assumptions become more and more meaningless for pricing as Ramsey pricing creates larger and larger distortions and perceived inequities
- Network “customers” are really the Retailers
 - All networks are now separated from Retailers - there is no direct ability to “price to a customer” as such - Retailers will repackage the prices how they see fit
 - Hence pricing must be designed to be “indifferent” to retailer repackaging - if their customers use on peak they pay LRAIC so network is remunerated for this investment - if not then “savings” are made

Pricing Reform

- Interval metering is meant to enable pricing to small users that reflects the value of electricity delivery over time - or costs if you like
 - This is very hard to do when the network pricing is doing neither
 - AMI has the bulk of its benefits therefore in network opex savings rather than capex (and in energy served savings) - IM is marginal cost anyway to Networks...
- Networks in theory should be totally agnostic to the “saving of energy” - if this is done for policy purposes - but this is not the case
 - Greenhouse reduction programs that rely on subsidy magnify if you like the customer inequities from charging on a volume basis for what is a capacity based system
 - The costs need to get smeared over ever decreasing energy use and you hear the call now “that I reduced my consumption but my bill still went up”?
 - The bulk of users are residential and they respond to “bill size” by reducing demand - but keep using peak as it relates to air conditioning use on extreme days - now we are talking **“imperfect incentives”**
 - There is a major issue here brewing about equitable cost recovery.....

Pricing Reform

- Detailed analysis and experience over the last 25 years gives rise to the view that network pricing reform should be toward prices being “cost reflective”
- Prices need to become more reflective of the underlying cost “drivers” so that
 - Networks can be indifferent to customer responses (and green policies), and
 - Have less risk to revenue collection and hence funding of their business
 - Customer can respond to real cost drivers if they do see the prices passed through (or not and just pay if they wish), and
 - Customers can readily see if they are paying an “equitable” share of their use of systems
- Prices need to therefore reflect
 - The dynamic nature of peak demand on the system - more dynamically set peak demand charges - can use metering and/or NSLP - Interval Metering not a prerequisite
 - The use of system assets - voltage level pricing in effect - low voltage end use is charged low voltage rates regardless of customer type (although they will be differentiated by demand profile)
 - The high fixed and low variable costs typically associated with networks

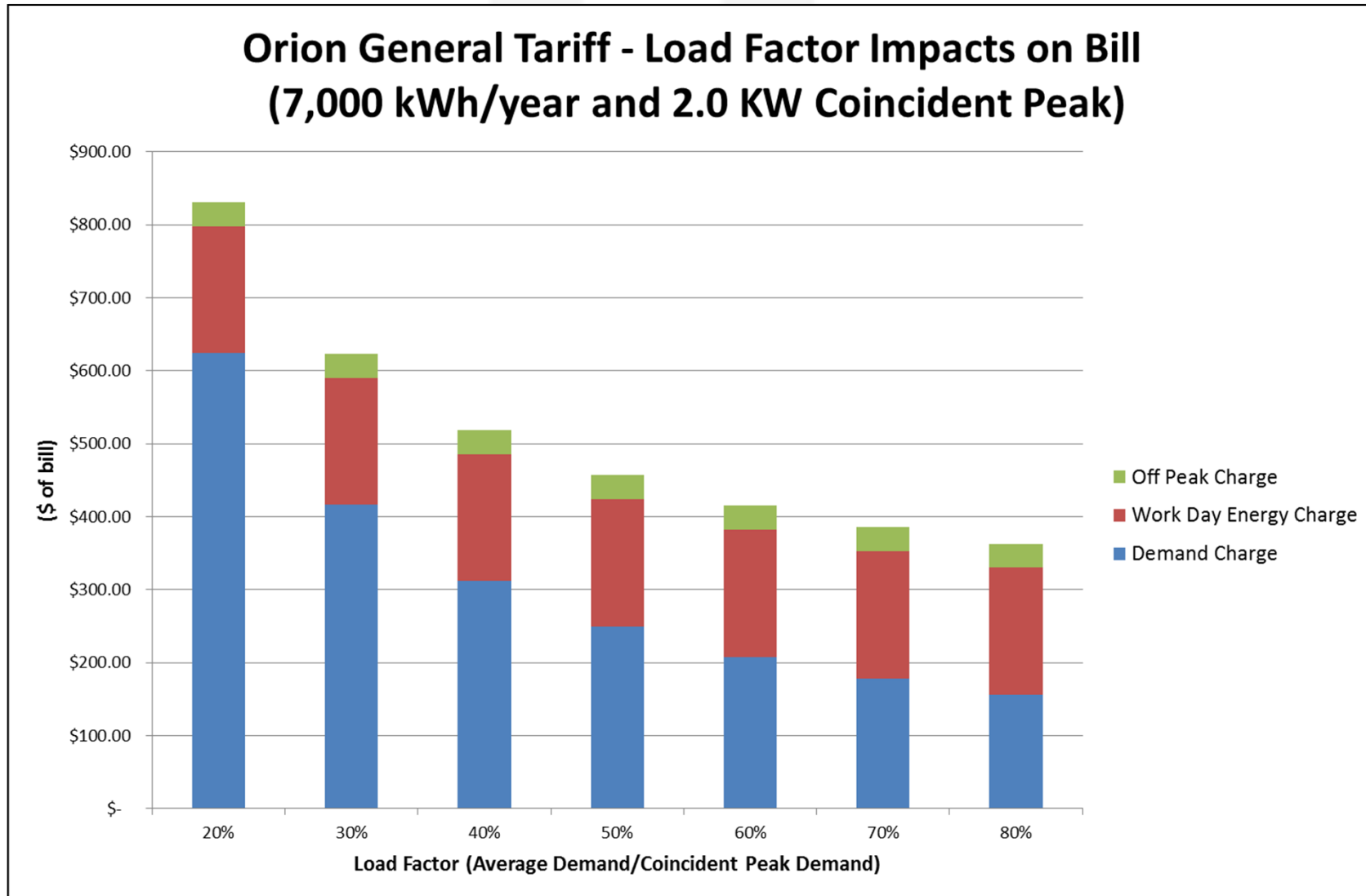
Pricing Reform

- A very similar approach has been used successfully for about 18 years in NZ by Orion Energy – based on Long Run Average Incremental Cost (LRAIC) - a process we developed in 1993 – now applies even to low voltage customers

Tariff Component		
Peak Charge	42.80 cents/kW/day	Charged based on usage recorded on dynamic peak days
Energy Charge Working Week Days	6.215 cents/kWh	7 am to 9 pm
Energy Charge - Other	0.785 cents/kWh	Rest is all Off peak

- Retailers charged in aggregate for their customer load on the Orion Network
- They also deploy peak reduction rebates and embedded generation credits using the LRAIC – settled at Grid Exit Points (using NEM type data)
- All major Retailers voluntarily installed Interval meters in response

Impact of load factor on low voltage tariff charged to Retailers



In Conclusion

- Network pricing reform will require time to undertake and some leeway from regulators (e.g. On side constraints, constraints on tariff changing, etc.)
- The form of regulation if it is revised (and I am sure this will be the case) should support the use of cost reflective pricing and reduce the “perfect and imperfect incentives” - these are key barriers
 - Provide incentives to reduce capital spend (or increase risks to capital spend)
 - Retailers should pay for their customers share of the use of systems
- Do not get diverted by the Interval Metering requirement argument - this form of pricing can and is being done at grid exit points (which also provides other flexibilities) - but it is true IM materially aids implementation, and the marginal cost for this benefit is low based on cost benefit analysis
- Recognise the impacts of subsidies and rebates and do not apply them directly to network pricing - they must be applied separately, similarly
- Address the energy poverty issue through government policy not prices
- Reform is not only achievable but desirable - but I suspect it may need a (political) champion?

Thank you

Jim Snow, Director
Oakley Greenwood Pty Ltd

+61 4 1777 5893

jsnow@oakleygreenwood.com.au



www.oakleygreenwood.com.au

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Greg Thorpe

Market policy, market design and regulation
Market analysis and market modelling
Climate change impact analysis
Transmission / Generation interactions
Gas/electricity interactions

Jim Snow

Phone: 07 32637612, Mob: 0417775893

jsnow@oakleygreenwood.com.au

www.oakleygreenwood.com.au



Oakley Greenwood

www.oakleygreenwood.com.au