SEN's response to the WA Electricity Market Review Discussion Paper

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Front cover - turbine 2 of the Denmark Community Windfarm at dusk. As this project is so far from the nearest substation (Albany), the maximum output is restricted to 1.44MW. This means there is potential for 160kW of lost generation to be stored onsite if the economics were supported by recognition of the benefits such storage could offer – including secure supply during the peak times of Christmas and Easter at Denmark. Also, the 60km distance to the town of Denmark mean the line losses are 45% which also illustrates how much more value local generation can be in remote areas.

Executive Summary

SEN welcomes the opportunity to be part of the discussion on the review of the WA electricity industry.

There have been cost blowouts but there is also uncertainty about exactly where and how the $180/MWh figure is obtained. Synergy has numerous long term bilateral contracts but they are confidential. Some of these may be take or pay contracts and that with declining sales, costs per MWh may have blown out.

There is much discussion in the Review Paper about the Reserve Capacity Mechanism. SEN acknowledges that there is some excess capacity but this excess has only a minor impact on costs and will be even less in future once changes already made make it through the two year process.

Given that there is excess capacity, SEN suggests bringing forward retirement of the older coal fired power stations. This will also address the concerns about security of supply of coal.

SEN notes some major omissions in the paper, the role of renewable energy generation both current and future and pollution from the burning of coal and gas with its health and environmental impacts. Evidence of man made global warming has never been more apparent yet there is no mention of this except for the carbon tax, which now no longer exists.

SEN notes that there is a great potential for renewables to extend current gas and coal reserves. There is also much potential for renewables to contain prices and reduce expenditure on the network.

For renewables to achieve their full potential and provide the greatest value to the end consumers, changes to the access code and how networks charge for services will be required.

General Comments

Major cost drivers

The review fails to mention the dominant cost driver – residential air conditioning increasing peak loads. This has resulted in over expenditure on 'gold plating' of networks in the NEM to meet the rising peaks and has caused rising electricity prices due to excessive guaranteed returns on network assets. In the WEM, the major response to these rising peak loads has been the addition of excessive quantities of peaking capacity under the RCM. The continued use of peak load growth trends that occurred when the take up of residential air conditioning was at its' peak has resulted, along with planned block loads failing to be installed, in excessive peaking plant, which customers must ultimately pay for.

The next most significant cost drivers have been the increased and overdue expenditure on network maintenance and renewal and the augmentation of the network to accommodate the peak loads and peaking plant. By contrast, the cost impacts of the carbon tax and renewable energy have been much lower. So the statement in the introduction implying that renewable energy subsidies and carbon price are two of the major factors that have driven up costs is misleading.

Indeed, numerous recent studies show that the subsidies now paid to renewable energy plant (renewables) are more than compensated for by the cost savings that renewables provide in pushing down wholesale electricity prices[1]. Further, the argument that the carbon price is contributing is no longer relevant.

It also fails to acknowledge the subsidies which are paid for fossil fuel generation. They include;

- $495m in 2013/14 of taxpayer funds in electricity tariff support (Tariff Adjustment Payment), a significant proportion being attributable to gas and coal generation (see Breslin, p20 for details);
- Government funds for projects such as refurbishing Muja A&B ($300m);
- Government subsidies to the mining industry including port and road infrastructure (Australia Institute report gives $6.2 bn for 6 years to 2013/14 for WA, including gas processing expenditure ($743m), gas consumption assistance (($625m), assistance to minerals processing industries, largely through infrastructure provision ($100m)

[1] Reports regarding the RET from ROAM Consulting, Bloomberg New Energy Finance and Schneider Electric.

$180/MWh average wholesale electricity price?

The $180/MWh wholesale electricity prices are substantially higher than the rest of the country. It is unclear where this figure comes from and further details are required to back this claim up.

Does it include the $320 million refurbishing old coal power stations? (This would add roughly $25/MWh to the wholesale price of electricity for Synergy.[2]) Or is this part of the $600 million subsidy from the WA taxpayer?

Bills not kWhs or MJs

Customers pay bills and there is no mention of the potential for customers to reduce their bills by:

- installing PV on the roof, unless the customer already has PV, is in the CBD or an apartment, is shaded during the middle of the day or is renting. Most installers now have finance if there is an issue with funding;

- using less energy and using it more efficiently. The potential of LED lighting to replace hugely inefficient incandescent and halogen lights is substantial. Similarly, ceiling insulation, awnings, curtains, pelmets, cavity wall insulation etc can all assist.

As retail prices continue to go up, they serve as an increasing incentive for people to reduce their electricity usage and install PV.

Gas and Coal supply

While the paper goes into much detail about gas and coal supply, there is no mention of renewable energy generation (wind and solar PV).

There is no acknowledgment, discussion or consideration of:

- existing wind and solar plant driving down wholesale electricity prices, as is now occurring in the NEM, because the energy output of high bid price peak generators is not required and so the price paid to all bidders is lower[3]

- the potential for rooftop solar with storage to enable edge-of-grid customers to go offline (with the improved reliability of a stand alone system) with considerable savings to networks as well as improving voltage quality for all those further up the line and reducing line losses paid for by the retailers

[2] $25/MWh ~ 65% of market share x 18,000GWh of electricity consumed last year / $320m
[3] University of Queensland study showing how wind reduces NEM prices and volatility, http://reneweconomy.com.au/2014/wind-power-shown-to-slash-nem-prices-cut-network-volatility-90191

- the potential for solar farms and rooftop PV to predominantly reduce the daytime consumption of natural gas by mid-merit and peaking plant and wind farms to reduce consumption of both coal and gas. Given the anticipated significant rise in gas prices in the next few years, this will further contain generation price rises.

Future of RET

The likely outcome on the existing RET scheme is that the Senate will not allow it to be scaled back or scrapped. In this case, virtually all new installed generation out to 2020 will need to be renewable or renewable enabling technology (e.g. energy storage – rooftop solar PV with batteries and pumped hydro generation and molten salt heat energy storage on solar thermal power stations) in order for WA to meet its obligations. Much of this can be done by the private sector thus reducing WA Government risk exposure.

Nevertheless, the RET may be considered too tenuous for investors to put their money into new renewable energy plant. If the WA Government was to prepare backup legislation on a state basis with the same targets, proportionally, as the Federal scheme, this could provide investors with sufficient confidence.

Numerous studies about the RET have shown that the benefit from lower wholesale prices due to the renewable energy being installed, is greater than the cost of the RET scheme to consumers (see previous page). In terms of exposure to the risk of future high gas prices and carbon repricing, there are even greater benefits to increased renewables in our electricity supply mix[4].

Energy Storage

SEN contests the statement in section 3 that “electricity cannot be stored economically”. This depends on the situation. Consider, for example, fringe-of-grid areas where the costs of infrastructure and line losses are high as mentioned previously.

In the metropolitan areas, embedded storage (batteries) could assist with demand side management to reduce peak load. This has the added benefit of providing ancillary services by improving voltage and frequency stability, while allowing the penetration of further embedded solar PV generation. This value to the grid needs to be recognised as part of the economics of onsite storage. While the cost of battery storage is currently high, as was the case with PV, the costs are expected to drop dramatically with increased volume of production.

[4] http://reneweconomy.com.au/2014/why-the-renewable-target-should-be-ramped-up-not-cut-80398

Health and environmental considerations

There is also no mention, whatsoever, of the very real health and environmental issues (including water consumption) with the burning of fossil fuels.

A major omission of the Review Discussion Paper is that it fails to consider the impact of coal and gas burning on the climate, in spite of this issue being arguably the greatest challenge to global civilisation, and the burning of fossil fuels being the main driver. This is in spite of the IPCC III report, subsequent research findings into the rate of Antarctica's ice shelf melting, and WMOs' September 2014 report.

Questions

Why is the cost of supplying electricity to retail customers so high that it requires a significant taxpayer subsidy to keep tariffs at levels comparable to other Australian states?

Given that most electricity generated is purchased under confidential long term bilateral agreements it is difficult to know. How is the $180/MWh average wholesale price derived? What, exactly does it include? History suggests that such contracts may include take or pay agreements with generators who may themselves also have take or pay agreements with gas and coal suppliers. Over estimated forecasts when committing to these contracts may then mean that actual volumes required are substantially less than contracted commitments. Without further details, this is only speculation.

Could the current industry structure result in a competitive market under any market mechanism?

Synergy is currently regulated, has TEC obligations and has a monopoly on customers smaller than 50MWh/year. If all retailers had uniform restrictions, obligations and opportunities, the market might become more competitive. Current long term bilateral agreements may also be financially difficult for Synergy. Again, without information about this, this is speculation.

Why can high volumes of generation capacity be added each year, with the costs passed through to customers, where there is often no requirement for it?

This question is not quite right. It is the nature of the 10% 'Probability of Exceedance that considerable excess capacity is available most years. This has been compounded by historical trend based load forecasting that has not sufficiently taken into account the paradigm shifts and a summer of cooler than average peak periods.

Are network costs reasonable and does the network code enable long term efficient entry and exit of plant?

Overall network costs would be lower if the network was replaced at the fringes by stand alone systems. This will require changes to the access code.

The code should also be based on constrained connection for all parties connected, similar to the NEM.

What does the current primary fuel situation indicate for the availability and price of fuel for future generation?

Even ignoring the serious and significant health and environmental problems of burning fossil fuels, as the Discussion Paper has done, the situation regarding our current dependency on the burning of coal indicates that we should switch significantly to renewable energy plant as soon as practical. Supply constraints and the associated price increases of both coal and gas will have decreasing impacts with increasing takeup of renewables.

Is the current trajectory of electricity costs and government subsidies sustainable?

No. A $600 million bailout of the WA electricity industry is particularly inequitable for the smaller consumer.

It is difficult to comment without knowing exactly where the blowout in costs occurred. It is worth noting that the RCM excess, amounting to $125 million for the year just passed will be considerably less for the following years. This is because the very high costs put forward by Western Power for working out the Reserve Capacity Price payments for the year 2012/13 added $340 million to the cost of market capacity over a 2 year period.

What $2.4 billion could buy outright:

- 600MW of rooftop solar at $2/watt installed (no STCs) which would provide 180MW of capacity at peak loads and 960GWh/year of electricity assuming 1600 Full Solar Hours/year;

and

- 400MW of windfarms at $3/watt installed which would provide 140MW of output at peak load (assuming average output of 35% during this time) and generate 1400GWh/year of electricity assuming 40% Capacity Factor.

(These figures could increase substantially if the funds were used an incentive to encourage private investment.)

In developing competitive electricity markets how important is the structural separation of Synergy into several generators and retailers?

There is much emphasis on increasing competition to drive efficiencies and put downward pressure on costs. The review does not put forward any argument or mechanism as to how competition is going to drive down costs. If this is to occur, then the current lack of competition must be allowing current market participants to make excessive profits which can be curtailed by competition. However, there is no evidence of excessive profits.

Nor is there any mention of the potential for the new gentailer, Synergy to become involved with the solar PV market, previously not possible for Synergy as a pure retailer.

If Synergy is broken down into smaller gentailers, they need to have similar capabilities - and cover similar geographical areas, ie not city versus country.

All retailers ought to have access to all customers.

Should the retail electricity market be opened to FRC and should all retailers also be able to retail gas?

Yes, the retail electricity market should be opened to FRC with a WA Government subsidy going to Western Power so that its consequential lower network charges mean that Synergy and hopefully other retailers can profitably offer electricity to retail customers at similar prices paid to Synergy before FRC. If competition drives down retail prices, the subsidy going to Western Power can be progressively reduced.

In any case, customers pay bills, not unit prices so they have the option of offsetting higher prices by installing more efficient appliances and lighting, employing other conservation measures and or installing solar panels and or solar hot water.

Yes, all electricity retailers should be allowed to retail gas.

In fact, it never made sense that the breakup of SECWA all those years ago would pit gas versus electricity for space and water heating and cooking.

Capacity Mechanism

Could alternative capacity mechanisms work within the current industry structure?

The current system has evolved over half a decade with industry input by encouraging rule changes and debates about these changes. It needs to be remembered that a decrease in peak load has never happened before. Also, the past summer whilst warmer than average on average, had cooler peaks than normal.

While there is discussion on financial burdens being imposed on customers, there is no acknowledgment that this was to remove the risk of blackouts from insufficient capacity. The Varanus Island disaster is not mentioned.

The load forecasting leading to capacity requirements has over-predicted load growth and peak load growth. There are certain periods of time when traditional growth trends no longer apply (e.g. Oil crises in the 1970s reducing the growth in energy use) and we witnessing one of those periods now. Forecasting probably failed to take into account the price elasticity of electricity use, where near 100% increases in electricity prices would be expected to reduce demand by near 10%. Also the penetration of much more energy efficient white goods, especially refrigerators, entertainment systems, LED TVs, and home computers, especially laptops and tablets replacing desktop computers with tube screens. The 'pink batts' scheme and upgrades to more efficient air-conditioning and its increased use for winter space heating are also having an effect. Lastly, energy efficient lighting is having an impact with compact fluoros replacing incandescent light bulbs and LEDs replacing halogen downlights. Lastly residential roof-top solar PV is reducing both electricity consumption and peak loads, with commercial solar PV now taking off and offsetting daytime commercial loads. It's no wonder that the forecasting has been inaccurate but with a better appreciation of these fundamental changes/impacts, the load forecasting could have been better.

A particular problem with peaking plant installed purely to address the small number of peak load hours is that it can tie up network access. If this access was allowed to be used by other generators during the rest of the year, this would free up some 20% of total capacity of the network for new incumbents. This would require a modest change in the network access code.

Could the capacity mechanism be carried out one year ahead rather than two years to minimise forecasting error?

Maybe. Not only can rooftop solar be installed gradually rather than in large blocks being, small systems, they are also installed without the risk of planning approvals being delayed or cancelled, network studies required (residential) and, as installers can provide finance, there is also little risk to loans being secured. Such small systems provide around 28% of ratings as solid capacity during peak periods, however they do not qualify for capacity credits. Perhaps they should and if they did, consumers would have a price signal to increase that 28%.

Other comments

There seems to be little understanding that this is not about baseload. Talk of capacity factors means little when SWIS load only exceeds 80% of the peak load for 2.3% of the time. This compares with 10.4% of the time for the east coast NEM. Equally, terms like 'low utilisation' will always apply to plant that is only required a few hours a year. Figure 11 shows the load duration curve correctly but the different types of generation are incorrectly applied across the graph - doing this only makes sense if all the generation is baseload, it is not. Figure 2: Wholesale electricity cost comparison for 2013-2014 uses the term excess “energy” to describe the cost of excess capacity. While the cost is real, the word energy is wrong. The units are in MW not MWh.

WA should be looking at advancing the early retirement of 390MW of Kwinana Stage C, saving about $46million in reserve capacity payments for one year. Retiring Muja A and B, will reduce excess capacity by another 400MW and cancelling their capacity credits will save around $50million/year. These coal fired power stations are more than 40 years old and have high maintenance and low efficiency. Retiring Synergy’s old inefficient coal plant will also reduce its dominance and lessen the need to split it up to achieve the same end

Network planning and connection

Would it be more efficient, and cheaper for new entrants, to move to an access code based on constrained connection for all parties connected, similar to that applying in the NEM?

There should be an access code based on constrained connection for all parties connected similar to the WEM. Unconstrained access has been a barrier for new projects whereby peaking plant has been allocated network capacity and so precluding access of other generation. Peaking plant is able to provide a flexible balancing/spinning reserve plant to *support* variable renewable generation, however, with unconstrained access, it effectively *prevents* connection of renewables. The existing unconstrained access arrangement has resulted in a number of runback schemes, especially to allow access for renewable energy plant. This stop gap measure demonstrates the shortcomings of the unconstrained access model which does not take into account the inherent characteristics of a generator. For example, solar farms cannot be offered network access if network studies indicate that there is sufficient network capacity to take their output during the day but not at night.

Networks cost 37% of retail and are on par with the other states. Given WA has the lowest customers/km of powerline, this is unexpected. It would be informative to see the cost breakdown into transmission, distribution and ancillary services.

A higher WACC would encourage network investment but could lead to an increase in network tariffs. Is this a necessary trade-off to achieve a reliable network?

Deregulation and competition are seen as mechanisms that drive down costs, so it is interesting that recent cost increases in the WEM have been more driven by those sectors where competition and deregulation have had the most impact. The WA Government monopoly business, Western Power, has not added to cost increases as much as the over construction of baseload and peaking plant by competitors in the deregulated generation sector. Efficiencies gained from competition can be quickly wiped away by over investment in capital plant. This is because labour costs make up a relatively small cost of electricity production, which is dominated by the capital cost of plant, and parts for its repair and maintenance and most importantly the cost of fuel delivery to an excessive number of generating facilities.

The network has had billions of dollars spent on it recently. There has been no real effort to look at how solar PV with storage can be used to replace edge-of-grid customers, ie single phase feeder customers in remote rural areas. This results in a huge waste of resources. Note that PV with storage would improve reliability for not only the customers who have it, but also reduce voltage fluctuations for all those who remain connected. There also would be large reductions in line energy losses.

Price of Gas

The value of solar PV as a gas saver needs to be acknowledged when considering whether there is sufficient gas reserves allocated to the domestic market and the rapidly escalating cost of gas. For example, Synergy will see its cost of gas almost treble in 2015 as its new gas contracts take effect. This means solar PV will start to achieve significant cost savings in 2015 as it is a daytime electricity source that can reduce the load on mid-merit and peaking gas plant.

Will there be sufficient gas reserves for future electricity generation needs?

This need not be an issue if sufficient renewables are installed.

Both new wind plant and behind the meter rooftop solar are already competing with new gas plant and will be even more competitive as the price of gas increases on world markets while renewables costs continue to decrease. In any case, as the percentage of renewable energy increases, it will offset the amount of gas required for electricity.

How can new domestic gas supplies best be encouraged by downstream markets?

We do *not* need any new domestic gas supplies if we install sufficient new renewable generation and energy efficiency measures. For this reason, the WA Government should not be involved in take or pay contracts for domestic gas supplies. Indeed, current take or pay contracts need to be renegotiated.

Coal supply

The review should not be asking whether we have sufficient coal reserves in WA. Regardless of what current state and federal governments believe, the science on climate change accepted by nearly all foreign governments and all credible scientific institutions suggest we leave as much WA coal in the ground as possible.

Renewables will allow us to do this, and do it cheaper in the medium to long term.

As can be seen below, there are no supply side constraints with renewables.

The energy used on the SWIS grid could be met by any one of these energy sources within the land areas shown her, to scale with the rest of the map of south west WA.

Industry Structure

Do you see the structural separation of Synergy as important for achieving a competitive market?

The structural separation of Synergy is not a priority, as increasing the competition in the electricity sector does not inevitably reduce costs. Achieving the right overall level of investment in generation and networks is the prime consideration followed by achieving the best mix of generation (base load, mid-merit and peak load generators) with renewables playing an increasing role and with base load fossil generation being replaced with more flexible complementary dispatchable generation. Competition can lead to suboptimal development of the grid and the installed generation mix if not managed carefully.

SECWA used to supply gas and electricity to the entire state from generation to the customer. It was then split into gas versus electricity, then electricity into generation, network and retail. All of this intended to bring down electricity prices. It did not and ignored the fact that customers pay bills, unit prices x quantity. If reducing costs to the consumer is the goal, then the focus should be on the supply of energy services, cooling, heating, lighting etc rather than kWhs of electricity and MJs of gas.

Vertically integrated energy suppliers would find this straightforward, as reduced sales of energy (electricity or gas) would be offset by income from the sales of efficiency and embedded generation.

Do you see regulating Synergy to mitigate its market power as a superior or inferior option to structural separation into two or three sets of assets?

Synergy's market power can be lessened without structural separation or direct regulation of Synergy. Opening up the retail market to full retail contestability (FRC) by providing any WA Government subsidy only to Western Power, so that the subsidy flows through to all retailers, would help to create a level playing field. Under the current situation where Synergy gets the subsidy, FRC is a distant goal. Ultimately regulations across all retailers and gentailers should be uniform. The market dominance of Synergy can be lessened by acknowledging that it owns and operates the oldest and most inefficient fossil fuel plant, which should be retired to remove excess generation capacity.

Is the level of market concentration a matter of concern for existing and potential investors? Is it a factor in choosing to invest or not invest in the WEM?

No comment.

TAP

In moving to a market that can accommodate FRC, how should the TAP and the TEC be handled?

No comment.

What factors need to be considered in the repeal of the Gas Market Moratorium?

Same as those for removing the 50MWh limit on contestable customers for electricity.

Should the TEC continue to be funded from the SWIS distribution tariffs, or instead be funded from consolidated revenue?

The TEC should be funded out of consolidated revenue. All WA taxpayers should carry the cost burden and not just electricity customers connected to the SWIS. Why should those who benefit from this subsidy not equitably share the burden.

Should the network operator be subject to competition in the provision of metering and other services?

The network operator should be subject to competition for the provision of metering. Retailers would have more flexibility to provide different 'time of use' tariffs if they could offer new Smart meters to new customers. The choice of metering should be limited to those on an approved list to ensure compatibility and to eventually enable remote reading of meters and smart control of circuits and appliances. This would reduce the burden on Western Power of upgrading all of the electricity meters with subsidies from the WA Government.

'Time of use' metering would solve many problems on electricity pricing and the cost of supplying peak loads. . Ultimately all meters must provide for 'time of use' electricity selling and buyback rates. The current situation where customers pay the same for a unit of electricity during peak load times as during the middle of the night is fundamentally deficient. Any changes to the market and electricity pricing that does not include time of use tariffs will be insufficient. The cost of retrofitting these meters is considerable. Customers with solar PV, however, are bearing the cost and so reducing the overall cost of the inevitable changeover. The cost can be offset to a large extent by the user having the ability to monitor and change energy use to provide cost savings. All new rooftop solar PV customers could be offered only 'time of use' selling and buyback rates that encourage moderation of peak loads and reward those with solar PV production biased towards the afternoon and with low electricity usage during peak load times. This would also provide additional rewards to customers who can load shift by incorporating battery storage with their rooftop solar PV systems.

Networks also need to be able to charge according to peak load (and export for rooftop solar) rather than volume.

What benefits could be realised by requiring Synergy to bid on a facility-by-facility or unit-by-unit basis?

Special market rules that apply to Synergy need to be eventually phased out if there is to be fair competition in the market. To move in this direction, it seems reasonable to require that Synergy bid on a facility-by facility or unit-by-unit basis. This would make the relative merits of its different power stations more transparent and increase competition between them. It would also help determine which should be retired based on low utilisation.

What do you consider the most important matters to be managed in a transition to the NEM?

The NEM has been developed and optimised to cater for a very different market on the east coast. Adopting it for WA sounds simple but it would not fit the WA situation. The flatter load of the WEM compared to the NEM illustrates the difference having such a vast geographical spread of load and generation in the east. In addition, there is substantial hydro electricity, too.

Any redesign of the electricity market must not cause zero marginal cost renewables to be limited in output except on technical grounds e.g. to maintain system stability. If the market design is right this should also minimise the overall cost of generation, as the marginal cost of electricity from non-renewable energy sources is always positive apart from thermal plant, where there can be high costs associated with shut down and restart. Base load thermal power stations and variable renewable energy sources are not a good mix, as base load plant cannot or does not operate well at low loads and does not control system frequency very well with variable loads. It is inevitable that renewable energy will take over from fossil fuel generation, so the level of base load thermal generation needs to be curtailed over time and replaced with flexible dispatchable generation as variable renewables and base load do not work efficiently together.