

PROF NEGNEVITSKY AND GOANNA ENERGY SUBMISSION TO PARLIAMENTARY STANDING COMMITTEE

Following Professor Michael Negnevitsky's verbal statements to the Senate hearing into Tasmania's energy crisis last month, the Parliamentary Standing Committee of Public Accounts have invited Professor Negnevitsky to make a written submission. He has invited Goanna Energy Consulting Pty Ltd (Goanna) to make a joint submission; Goanna has agreed to.

The Standing Committee have identified 6 areas of interest in the attached letter dated 19th April 2016 and the deadline is Mon 16th May.

TASMANIA'S EXISTING ENERGY SYSTEM:

Diversity of energy supply:

[supply is quite diverse in terms of different fuel types but is subject to constraints]

- Hydro
 - Great bulk of capacity (??%) and energy generated (??%)
 - Marginal cost very low because of near zero fuel cost
 - Energy constrained due to drought. Well known risk factor with predominantly Hydro system and needs to be managed as such but could query how well this has been done in lead up to current crisis & aftermath of carbon tax. Though some extenuating circumstances e.g. lowest spring catchment inflows.
 - Tasmanian is different from other parts of NEM where the systems are more prone to capacity constraints
 - This difference has implications for how Tas system should be managed. How much is NEM operations influenced by capacity not energy constraints?
 - Emission free generation. Was useful/valuable with carbon price but less so no. How well was this value and removal of carbon tax managed? Was the water resource run down too quickly and without enough regard to energy security?
- Basslink
 - Costly to build due to undersea DC nature and length (~\$1b).
 - Tasmania is paying for this. At time it was built there were questions re the economics and whether more economic to build natural gas fired generation using the TGP.
 - Still valuable to Tasmania though as the prolonged drought last decade showed. Also valuable for spot price arbitrage which can benefit Hydro Tasmania. But is there a lower cost option?
 - Single link so zero redundancy if something goes wrong.
 - Hard to repair due to undersea DC link. Track record here and elsewhere (Moyle Inter Connector) points to this.
 - This becomes a critical issue when dams are low and the time to repair is lengthy as at present. But what is the chance of this happening again as BL has worked well for a decade? Should still ask the questions

- How well has the current situation been managed? Are the risks known and well assessed? How well do the emergency procedures cope?
- Wind
 - Significant growth in capacity due to Tasmania wind resource and influence of the RET.
 - High cost but tempered by influence of RET which subsidises the cost and brings down despatch price (note that electricity customers pay the cost of the subsidy in their retail electricity prices). Cost declining but wind is a mature technology so scope to decline more limited.
 - This allows wind to displace other forms of generation not covered by the RET e.g. in Tasmania this has mainly been gas.
 - Constrained as an energy security option due to relatively low availability (Tassie wind resource partly offsets this) & need for thermal backup at least until battery technology takes off.
- Gas
 - Significant gas gen in Tas (400+ MW ??) but until Basslink crisis this was mothballed and intended for closure/sale.
 - Higher in the merit order than Hydro, VIC coal (via Basslink) or wind (net of RET) so was being displaced in Tas and elsewhere in NEM. HT was 'handed' TVPS from Aurora. Considered it to be a drain so wanted to off-load it asap.
 - Now likely to continue in role of backup to Hydro in event of drought or Basslink failure and wind in event of its non-availability.
 - Gas gen has been one of the biggest users of gas in Tasmania but highly variable use. Has operated on 'take or pay' gas contracts which end in Dec '17 & will now need to be renegotiated
 - Presence of gas gen has been helpful to the small Tas gas market by spreading the fixed costs of gas network across more capacity. Without it gas transport prices predicted to rise
 - Gas commodity prices also rising due to LNG exports from Qld. Tasmania is not immune due to interconnected gas markets in SE Australia.
 - Economics of gas generation sensitive to increases in price of gas. Rule of thumb - \$1/GJ in price of gas = \$5-7/MWh increase in price of gas fired generation.
- Solar – summer/day time
 - What are potential for solar in Tasmania?
 - Solar plus battery storage as a potential solution for a household?
 - Threats for distribution networks – potentially underutilised assets?

PURPOSE OF BASSLINK (I):

- Trading
- Constraints
- Cliental
- Security Policy
 - Has proved useful from time-to-time as dam levels dropped

- Is it the most cost effective option though? Maybe gas is cheaper? Need to look more closely
- Current problems show it is not a perfect solution and need to consider contingencies that deal with its potential failure/non availability
- Contagion Risk from current events have been brought to the fore, as highlighted by Bell Bay comments to Senate hearing.
- Frequency Control

THE FUTURE OF ENERGY SECURITY AND GENERATION DIVERSITY

Diversity of energy supply:

- Hydro
- Wind
- Solar – summer/day time
- Gas – Price
- Basslink & Basslink II
 - What's the purpose of BL2? Unlock increased Tas renewable capacity to mainland? Or add more security?
 - If the former, then beneficiary pays principal suggests that those who benefit should pay for it.
 - If the latter, then are there better/other options to consider that may be more economic? Eg make better use of the TGP to have gas generation as backup &/or increase gas substitution as an additional fuel choice (would seem to cost a lot less, say \$1b+ for BL2 v zero extra infrastructure for gas and Tas gets to make better use of existing gas infrastructure)
- Battery as technology matures
- Pump storage /Wind overnight
- Hydro suited for high wind penetration 40-50% but frequency control required

DEMAND SIDE ROLE IN ENERGY SECURITY PAST, PRESENT AND FUTURE:

Load management. Economic signals.

Customer acceptance and Role of Government Policy and incentives.

Education and technology, so customers can subscribe to DR (Demand Response) like they do to solar. So DR Value proposition needs to be understood.

[DR may also make sense as a cost effective energy security option via voluntary load shedding agreements to help deal with shortfalls in supply (e.g. loss of BL or low storages) or help meet peaks in demand. This already done to some extent with MIs but amenable to extension to other customers. If it was a natural part of the Tasmania electricity market it would provide additional stand by options on top of gas generation.]

PRIVATISATION RISKS AND REWARDS

*Privatisation of Government entities, several views

- A) Technical Aspect
 - Establish split regs
 - System security (S.T)
 - Reliability (long term)

More economical

Long run if appropriate S?

- B) Social
 - Immediate job impacts. ???

Well managed and explained e.g. >50's job losses.

- C) Younger generation encourages insulation and relocation, establish own business start-ups?

Privatisation could be inevitable due to small market share and lack of competition, leading to inefficiencies.

However, there are significant risks in a small state like Tasmania

Transitional period must be well managed.

Market behaviours must be considered.

[Privatisation can quickly become a highly emotive issue. But needs to be seen more as a matter of do the benefits outweigh the costs.]

There is no inherent reason why Government should own power assets. Issues about electricity being an essential service, generators/retailers having market power and networks being monopolies can be handled via state or national regulation. And are so handled successfully in other states or overseas.

There are also good reasons why Government should exit risky electricity generation and retail businesses. By being involved they put taxpayer's money at risk. Remember the state bank fiasco's of the 80s when Government owned banks in deregulated financial markets. The electricity market can be even riskier.

Vic and SA sold their power assets a long time ago and neither would want to reverse it. NSW has more recently sold them and the result (and way process was handled) is seen as a success. WA appears to be following suite with budget announcements to sell some generation assets and the "non-core" parts of its main network.

AER benchmarking work is consistently showing that the privately owned networks are the top performers in terms of lowest costs, efficiency and productivity. This has pay offs for electricity consumers in terms of sustainably lower prices as network charges are around half of the electricity bills for households and small businesses.

One challenge for Tas would be its predominately Hydro system and how to handle the 'ownership' of catchments which display some elements of a common resource. This would need to be examined but options could include Government ownership of catchments, a separate catchments corporation or separation of catchments according to power station requirements, much like the coal fields in Vic were assigned to individual power stations at sale, perhaps with the addition of a national third party access regime where the catchment has an essential infrastructure element.

Tasmania should be examining such reforms to see if they are suited to the state and would bring economic benefits.

In the end benefits to electricity consumers should be the objective more so than maximising state revenue. Competition and the chances of it taking hold in Tasmania is fundamental. Interstate energy retailers have shown interest in Tasmania. To date the small market combined with the Hydro dominance making risk management for them more difficult have been show stoppers. The market's size is what it is but the dominance issue can be dealt with through structural separation if it's feasible and worth it. The current approach of regulating HT's contracts hasn't worked as there's no new entrants. There won't be any competition until the Wholesale market issue is effectively addressed. Without it smaller Tasmania consumers don't get access to price discounts such as those in the competitive mainland electricity markets and must pay higher prices for electricity.

As an aside, the emergence of retail competition in electricity would probably also bring some more competition to Tasmania's gas market as retailers generally sell both.