Project Marinus – Basslink 2 Submission

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Financial viability. Some things to consider.

I doubt that pumped hydro is ever likely to be viable in Tasmania due to the ?20% round trip losses on top of the basslink cable losses and the potential for rapid installation of batteries if prices decline further.

Even in South Australia with a small battery (30MW power being 2% of average demand) and a varied power output (maybe similar to a future NEM) the arbitrage seems to get a price differential of about 50% maybe average $80/$120 apart from a few rare events, in the last week it was $100/$150 with charging 0.8GWh and discharge 0.6GWh (opennem.org.au) operating less than 30% of capacity (1.4GWh out of possible 5GWh -30MWx168hours).
Existing Basslink operated in last week at about 40% of capacity, exports + imports 36.3GWh out of potential 84GWh (500MWx168hours). There was a 30% price difference between exports and imports which is probably higher than average. Basslink also has at times operated exporting from a higher price to a lower price.

It does not appear it will be easy to make money on arbitrage. In 2 years there will be a maybe a few hundred MW of grid connected batteries trying to do it. Snowy hydro could be used more as a balancing power source and the existing pumped hydro is only just starting to be used. The extra connections under the ISP should also reduce fluctuations in price. The 5 minute rule will hopefully reduce the wild fluctuations in price which may also reduce potential for arbitrage gains. In the more distant future electric vehicles will add significant demand management and maybe even a big virtual power plant.

Our existing battery
Tasmania's existing very large storages (Lake Gordon,Pedder and Great Lake.Arthurs Lake) and medium storages (Lake St Clair, Lake King William, Lake Echo) already have the potential to act as a battery though do not always appear to be have used as such (eg in July this year these dams' power stations were operating at times with power being exported to Victoria at low prices – often $50 Mwh). There are limitations on speed and capacity for future expansion. For example Hydro Tas mentions that due to the age of power stations future availability is likely to be lower than now. Gordon Dam is usually limited in the speed it can ramp up output due to the impact on the river. In winter there can be so much capacity (wind and run of the river power) in Tasmania that imports are not viable unless Victorian price is negative.

At some times of the year however, Tasmania could import most of its net demand (upto maybe 1MW ex Tasmanian solar, wind and hydro minimum river flows) to balance excess solar/wind from Victoria. In the NEM by the end of 2020 there should be an extra ?6GW (60% more than now) of solar and ?2GW of wind (40%) and after that maybe 2-3GW a year combined (assuming no Govt policies to stop it and ISP continues to be implemented). So future fluctuations could be large but there are already slower acting power stations that can come into play as well as the other players mentioned above.

If a 2nd 600MW cable was used 30% of capacity (importing 15%/exporting 15%) effectively making $30 MWh arbitrage (net of transmission losses) so equivalent to continuous 90MWx$30 per hour = $2700 per hour or $23.65million per year less $18million costs = net $5.65million per year. At 40% capacity and $40MWh arbitrage = 120MWx$40 = $4800 per hour or $42 million - $18 million costs per year = net $24 million per year.

Summary

Pumped hydro never likely to be viable here. This suggests a 1200MW link will not bring much benefit. Price arbitrage is not likely to be easy money so on financial measures alone it is difficult to justify. However, security considerations may well justify a 600MW cable but it depends on price. A larger cable would me more viable if existing Basslink's life is now expected to be much shorter than original projected 40 years; or if there is significant increase in Government's desire to meet the Paris agreement commitments (much less than 2 degrees, net zero emissions by 2050 etc).