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RE: Amendments to the Reliability Standard Implementation Guidelines, MT PASA Process Description and Energy Adequacy Assessment Projection Guidelines Consultation

ERM Power Limited (ERM Power) welcomes the opportunity to respond to the Australian Energy Market Operator's (AEMO) consultation on amendments to AEMO's Reliability Standard Implementation Guidelines (RSIG), Medium Term Projected Assessment of System Adequacy (MT PASA) Process Description and Energy Adequacy Assessment Projection (EAAP) Guidelines.

About ERM Power

ERM Power (ERM) is a subsidiary of Shell Energy Australia Pty Ltd (Shell Energy). ERM is one of Australia's leading commercial and industrial electricity retailers, providing large businesses with end to end energy management, from electricity retailing to integrated solutions that improve energy productivity. Market-leading customer satisfaction has fuelled ERM Power's growth, and today the Company is the second largest electricity provider to commercial businesses and industrials in Australia by load[1]. ERM also operates 662 megawatts of low emission, gas-fired peaking power stations in Western Australia and Queensland, supporting the industry's transition to renewables.

http://www.ermpower.com.au
https://www.shell.com.au/business-customers/shell-energy-australia.html

Reliability Standards Implementation Guideline

We offer comments to AEMO's proposed amendments to the RSIG as follows;

Interaction with the Interim Reliability Measure

ERM notes the proposed amendments as set out in the Guideline to support the introduction of the proposed Interim Reliability Measure. Whilst not indicated in the Issues Paper, we would be of the understanding that if the proposed rules to implement the Interim Reliability Measure is not made, or altered from the draft rules, the proposed amendments to the Guideline associated with the Interim Reliability Measure would be modified or withdrawn.

We also note that the proposed Interim Reliability Measure has an expiry date of 31 March 2025 and that the last date AEMO can enter into a 3-year contract for Interim Reliability Reserve will be 2022 for the 2024/25 summer. For clarity, we believe these details should also be included in section 1.5 of the Guideline.

[1] Based on ERM Power analysis of latest published information.

Reliability standard implementation process

We note that AEMO has indicated that the Electricity Statement of Opportunity (ESOO) will be used to determine a forecast exceedance of the Interim Reliability Measure and note that in the amended Guideline, Table 3 under the area of Second Action, the words Interim Reliability Reserve have been replaced with the words 4.8.9 Instruction, RERT or Direction. It is unclear to ERM Power where the deleted words Interim Reliability Reserve have been derived from as the current version of the Guidelines indicates a blank space in this area.

The proposed amendments indicate that AEMO is seeking to change the purpose of the ESOO in the Guideline. The current purpose of the ESOO is to inform the National Electricity Market of potential reliability issues in the future and request a retailer reliability obligation (RRO) reliability instrument if required. If the proposed Interim Reliability Measure rule changes are implemented, AEMO may procure interim reliability reserves.

The proposed amendments to the RSIG seek to activate market interventions not defined within the RRO or proposed interim reliability measure within the ESOO reliability forecast period which could be potentially based on out of date information. We do not support this proposed change and believe that decisions to procure or activate RERT, as opposed to interim reliability reserves, and issue a Clause 4.8.9 instruction or direction should remain subject to a breach of the Reliability Standard as identified in the MT PASA, EAAP or Short Term PASA. We would support the inclusion of the currently deleted words in the amended Guideline, that being "Interim Reliability Reserves" as the appropriate Second Action.

ESOO generation capacity

We note AEMO proposed amendment;

"The historical information may not be considered suitable in instances where a deteriorating trend in reliability is evident in the historical data and there are concerns that this trend may continue."

We are concerned that this inserts a modelling bias where improvements in generator reliability is not treated in the same way. We suggest alternative wording for the proposed amendment as follows;

The historical information may not be considered suitable in instances where a deteriorating or improving trend in reliability is evident in the historical data and there are reasonable grounds to indicate that this trend may continue.

We are also concerned by what we perceive as a willingness to further insert modelling bias in the form of the following additional provision;

"AEMO may further validate these assumptions through consultant peer review."

In ERM Power's view this tends to imply an intent that in cases where the registered participant provides information as requested by AEMO which AEMO does not agree with, then AEMO will engage additional consultants to amend the information provided by the registered participant. We recommend that this proposed amendment not be included in the Guideline. If AEMO determines that in their view inclusion of these words is appropriate, then we consider that an additional amendment is appropriate to ensure the modelling inputs satisfy best practice;

Where AEMO determines that the registered participants advice be substituted by advice from any consultant engaged by AEMO, AEMO will fully document the reasons for this and undertake stakeholder consultation prior to implementing this substitution.

ESOO intermittent generation

We support AEMO amendment to indicate;

"For intermittent generation, AEMO prepares intermittent generation profiles from a model that includes historical performance and/or meteorological variables proven to be effective for this purpose."

However, we believe the use of intermittent generation profiles based on meteorological variables should be subject to documentation of reasoning behind AEMO's decision to depart from historical profiles when these are available. We offer the following additional amendment to the Guideline.

Where AEMO determines that historical intermittent generator profiles are to be substituted by profiles based on meteorological variables, AEMO will fully document the reasons for this and the level of expected improvement.

ESOO energy constraints

Whilst not directly indicated in section 2.1.3, Table 4 – Implementation summary indicates that energy constraints for hydro pant will be based on "Monthly inflow of water assumed for hydro plants based on historical observations." We question this input assumption to the ESOO as historical data for hydro plant storages indicates that storage levels will fluctuate between months and years with storages not aligning around a reference starting point on either a monthly or yearly basis. Please refer to Attachment 1. Requiring hydro storage levels to return to a designated reference starting point on a monthly or yearly basis for the ESOO modelling could result in outcomes where USE is forecast which would not occur in practice, as registered participants would allow storage levels to fluctuate based on prevailing energy market prices and the calculated opportunity cost of water.

It is also unclear from the RSIG and the ESOO Methodology Document how the ESOO reliability forecast calculation includes the use of pumped storage hydro to supplement natural water inflows. It is also unclear that the calculation methodology allows for all hydro plant to be at rated capacity whenever USE is forecast. We believe these points should be made clearer in both the RSIG and the ESOO Methodology Document.

ESOO forecast demand

We support AEMO's proposal that modelling be undertaken on the basis of the operational sent-out demand definition. However, it should be noted that significant confusion has occurred when stakeholders have sought to compare published ESOO demand forecasts with other historical data published by AEMO. In the interests of improved transparency ERM Power recommends that the forecast demand data published in the ESOO be based on the operational as generated definition to align with other AEMO data, including the MT PASA demand forecasts and real time operational demand. This will remove the level of confusion which occurs when ESOO published demand does not align with readily observable demand data.

Network constraints

For completeness, we recommend the following amendment to the Guideline.

Detailed information on network constraints can be found in the network constraints documents listed in section 1.3

We also recommend that the section be amended to indicate that the ESOO modelling uses system normal constraints only on the basis that planned network outages are not modelled, as it is assumed they can be scheduled at times of surplus supply.

Whilst we note that unplanned network outages may be included in the ESOO modelling we recommend that the Guideline be amended to state that;

Unplanned network outages of designated *inter-regional transmission elements* may be modelled as set out in the ESOO Methodology Document.

As set out in National Electricity Rules (NER) subclause 3.9.3.(c)(a), unserved energy (USE) is calculated based on events associated with generation and inter-regional transmission elements. We believe that forecast of potential USE should be based on the same NER definition.

Whilst section 1.3 indicates Guidelines associated with constraint implementation and formulation, the section should also provide a link to the actual constraint's workbook used in the modelling.

Updates to the ESOO

Whilst the Guideline sets out a new section as to when an ESOO update will be provided when information becomes available, that in AEMO's opinion materially changes the statement of opportunities based on historical events, it is unclear to ERM Power that this would occur when the material change would potentially result in an improvement to the prevailing reliability forecast. We consider that the section should be amended to provide confidence to stakeholders that the ESOO will be updated for material changes with the potential to both positively and negatively impact the reliability forecast.

Factors for additional EAAP reporting

We recommend that the following factors in section 2.2.5 be amended to

- A significant increase or decrease in Hydro storage levels
- A major positive or negative change in operational consumption.
- Any other events or emerging events that may materially impact the reliability forecast by way of energy limitations

We also recommend that AEMO consider deleting the following factor as it is unclear as to the purpose of inclusion of this factor. We are also unaware as to when an update to the EAAP report has been released due to this factor.

- The requirement for AEMO to exercise the RERT under rule 3.20.

Projected Assessment of System Adequacy

For completeness we recommend the following additional amendment to that proposed by AEMO;

Separate reserve assessments are applied for MT PASA and ST PASA processes. MT PASA identifies LRC (as does the ESOO and EAAP) while ST PASA identifies LOR conditions based on determined capacity reserve levels.

Medium Term PASA (MT PASA)

For completeness we recommend the following additional amendment to that proposed by AEMO;

AEMO's response to projected LRC identified in MT PASA may be to take direct action in the form of directions – for example, directing a Generator to reschedule an outage – or contracting for RERT under rule 3.20. AEMO is able to dispatch these contracted reserves to manage power system reliability and, where practicable, security noting that AEMO may not specifically contract reserves for the purpose of maintaining power system security.

MT PASA demand

For completeness we recommend the following additional amendment to that proposed by AEMO;

At a minimum, a combination of the most probable daily peak load (50% POE) and 10% POE demand profiles are sampled probabilistically in the Monte-Carlo simulations to develop the expected USE. At AEMO's discretion and following consultation with stakeholders, more POE demand profiles (such as 90% POE) may be included, if USE outcomes are expected to be materially different from 50% POE outcomes.

Table 4 – Implementation Summary

For clarity in the USE calculation methodology we recommend the following amendment to the ESOO, MT PASA and EAAP to that proposed by AEMO;

The 90% POE demand profiles are not normally modelled, as USE values are assumed to be zero.

Links to referenced AEMO documents in the RSIG

We note that a large number of links to referenced AEMO documents in the RSIG do not function as intended. We recommend that AEMO implement a process to review and amend document links as and when required as to ensure the location and retrieval of documents via the AEMO website is accurate and up to date.

Medium Term Projected Assessment of System Adequacy Process

We offer comments to AEMO's proposed amendments to the MT PASA process as follows;

Semi-scheduled wind and solar generation forecasts

Similar to the proposed amendment in the RSIG with regards to semi-scheduled wind and solar generation forecasts, we recommend that an additional amendment be included to indicate;

Where AEMO determines that historical intermittent generator profiles are to be substituted by profiles based on meteorological variables, AEMO will fully document the reasons for this determination, and the level of expected improvement.

Demand Side Participation (DSP)

AEMO has proposed the following amendment;

MT PASA uses the committed amounts of DSP published in the latest NEM ESOO.

We query the use of the word 'committed' as this could imply that only scheduled wholesale demand response is included in the future which in our view has the potential to underestimate the level of DSP and suggest the following change

MT PASA uses the same amounts of DSP published in the latest NEM ESOO

AEMO inputs – demand forecasting

AEMO indicates that;

"To capture the impact of weather variations on demand, at least ten different annual demand profiles (corresponding to model cases discussed in Section 4.3) are developed for each region, based on different historic weather patterns and POE annual peak demand forecasts."

The indication of "at least ten different annual demand profiles" seems to be in conflict with other areas of the document and the RSIG which indicate eight different historical load profiles are used. In the case of the MT PASA process our understanding is that this would translate through to eight 50% POE and eight 10% POE profiles or sixteen different annual demand profiles.

Based on our understanding we recommend the following amendment;

"To capture the impact of weather variations on demand, at least sixteen different annual demand profiles

We also suggest that Table 1 in section 4.3 be amended to indicate "At least 8 reference years"

MT PASA Reliability Run

With regards to output from hydro generators, we note that the process indicates that;

"Energy limits are implemented through the requirement that the storage at the end of the year must be equal to or greater than the storage at the start of the year."

Storage levels are also subject to "a series of optimal storage targets for each weekly period are set" by AEMO, and if these AEMO determined "optimal storage targets" are not met then "penalties are applied according to a series of penalty bands that are low for small variations and high for large variations from target levels". It is unclear from the Process document if the setting of these weekly "optimal storage targets" are subject to consultation with the registered participant. Lastly, "In addition to the storage targets, hydro generation is also constrained according to any MT PASA weekly bids submitted." It is unclear if this applies only to capacity availability or includes energy constraint bids.

When considering the modelling dispatch process for hydro generation as set out in the Process document, it is unclear if available hydro generation would be fully dispatched during a half hour modelling period when the model recorded USE, and therefore record forecast USE in periods, where in actual dispatch no USE would be recorded. ERM Power is of the view that the modelling process should not prevent the full dispatch of available hydro plant at times where forecast USE could be recorded.

Given the normal year on year fluctuations observed in hydro power schemes storage levels. Please refer to Attachment 1. We question the requirement in the modelling that "the storage at the end of the year must be equal to or greater than the storage at the start of the year." We see no valid reasoning for this to be the case and recommend that this be amended to;

Energy limits are implemented through the requirement that the storage at the end of each modelled year must be above the lower storage limit and levels must also remain within upper and lower limits supplied by the registered participant as part of the ESOO data collection request. Monthly inflows to the modelling are to be based on historical average monthly inflows across the modelling period.

In addition, we question the need to apply an AEMO determined weekly "optimal storage targets" on the basis that the registered participant already supplies weekly energy consumption targets as part of their MT PASA submission. The current process would use the lower of the registered participant supplied weekly energy constraint or the AEMO determined energy constraint based on meeting the weekly "optimal storage targets". We believe the current process is overly conservative and could result in forecast USE being higher that is warranted. We recommend that the process be simplified to;

In addition to the application of a yearly lower storage limit, hydro generation is also constrained according to any MT PASA weekly available capacity and energy constraint bids submitted by the registered participant.

MT PASA Loss of Load Probability (LOLP) Run

The methodology as set out with regards to the LOLP run remains somewhat unclear. The stated purpose of the LOLP run is to;

"To determine days most at risk of load shedding, AEMO conducts a LOLP assessment for each day in the two-year horizon, assuming that weather conditions associated with high demand and/or low VRE generation availability were to occur on that day."

However, the Process document contains no definition for VRE generation availability. The term could be defined as AEMO's semi-scheduled uninterrupted intermittent generation forecast (UIGF) appropriately extended for large non-scheduled VRE generation output which are also included in the current operational demand definition.

This would account for the input energy available for VRE generation excluding the impact of local or network constraints. We believe there would be value defining this term in the Glossary.

ERM Power understand the process of using the eight historical operational sent out demand traces following scaling to the respective 10% POE demand forecast and the corresponding eight historical VRE generation availability traces matched on a yearly basis, including large non-scheduled VRE generation to create the regional abstract operational sent out demand ex VRE generation availability trace. We also understand the process to then derive the abstract LOLP daily maximum demand values for each day-type on a monthly, or alternatively defined period basis. We understand this to be the residual operational sent out demand shown on a daily basis for the 24-month term of the MT PASA that would be supplied by scheduled and non VRE large non-scheduled generators, plus flows across interconnectors.

However, the document is less clear as to the application of support from an interconnected region and contribution from large non VRE non-scheduled generation. Whilst the documents note that system normal and planned outage network constraints are used in the modelling, which could indicate that interconnector support is allowed, the example LOLP graph supplied in Appendix E – Figure 14 and graphs available from AEMO's Market Portal do not include data with regards to flow limits from interconnected regions or large non VRE non-scheduled generators for the LOLP calculation. It does however include the output contribution from Intermittent (VRE) generation which seems at odds with the definition of the LOLP daily maximum operational sent out demand values as discussed above. By way of example, in our view the LOLP graph for Victoria should at least include the capability of interconnector support from Tasmania noting that interconnector flow limits are an output from the MT PASA modelling process.

We believe the current explanation for deriving the LOLP daily maximum demand values as set out in Appendix B and the explanation of the LOLP run as set out in Section 4.4 to be confusing in some areas.

Rather than attempting to set out proposed amendments in this submission, we would be happy to provide direct assistance to AEMO to improve this area of the Process document.

MT PASA daily peak maximum and minimum demand values

With regards to demand traces prepared to meet the requirements of clause 3.7.2(f)(1A) in Appendix B page 31 of the Process document, AEMO indicates that;

b) "The published values are net of all non-scheduled generation based on the assumed profiles of large non-scheduled generation within each region in each reference year, whereas in the reliability run large non-scheduled generation (and associated demand) is modelled explicitly"

Would it be reasonable to assume that the published values are scheduled demand on an as-generated basis to be met by scheduled and semi-scheduled generation? If that is the case, we request that this be clearly indicated in the process document by the addition of the following;

The published values represent scheduled demand on an as generated basis.

Additional reporting data

Clause 3.7.2(f)(5B) requires AEMO to report daily values for adjusted maximum and minimum aggregate scheduled generating unit PASA availability for each region following adjustment for the inclusion of Scheduled Generator probabilistic forced outage information.

We note that the amended Process document indicates that in addition to meeting the rules requirement, AEMO has proposed to supply three additional adjusted aggregate scheduled generating unit PASA availability values for each region. It is unclear to ERM Power why the additional values have been included or the reasoning for their inclusion.

Energy Adequacy Assessment Projection Guideline

We offer comments to AEMO's proposed amendments to the EAAP Guideline as follows;

EAAP principles

With regards to principle (6)(B), we are not aware that AEMO continues to publish an Annual National Transmission Statement. We understand the requirements of NER clause 5.6.5 were deleted in NER Version 30 commencing 1 July 2009.

Scenarios that must be studied in preparing the EAAP

For consistency with proposed amendments as set out in the Issues Paper, we suggest the following amendment to the EAAP Guideline.

The following scenarios must ~~will~~ be included in the ~~first~~ EAAP ~~to be published by 31 March 2010~~:

Simulation cases

In accordance with the forecasting best practice guidelines we recommend that additional simulation scenarios be developed in consultation with stakeholders and offer the following suggested amendment for AEMO's consideration;

If the need arises, AEMO following consultation with stakeholders with regards to additional scenario development will conduct simulations of additional scenarios as appropriate in future using the GELF information provided by Scheduled Generators in accordance with these EAAP guidelines.

Modelling assumptions for the EAAP

We recommend that demand side participation (DSP) also be included in the EAAP modelling assumptions – Section 4 on the same basis as DSP in the ESOO and MT PASA with the methodology for its inclusion set out in the EAAP Guidelines.

With regards to the capacity of generating units, we are concerned that use of the MT PASA submission values may understate capacity to meet forecast demand for average summer days and potentially unnecessarily consume energy from hydro power schemes that could otherwise be used to reduce forecast USE. We recommend consideration be given to incorporating higher capacity values for average summer days based on the process to be utilised for the 2020 ESOO.

Power transfer capability and network constraints

For clarity, we suggest the following amendment

- use/enabling of control schemes, NSCAS and Network Support Agreements to achieve maximum power transfer capability levels;

This would be consistent with the Term as set out in Appendix A – Glossary, to the Issues Paper.

ESOO Methodology Document

Whilst not forming part of this consultation process, we recommend that AEMO also consider a review of the ESOO Methodology Document to provide consistency with the RSIG, the MT PASA process and the EAAP Guidelines.

Please contact me if you would like to discuss this submission further.

Yours sincerely

[signed]

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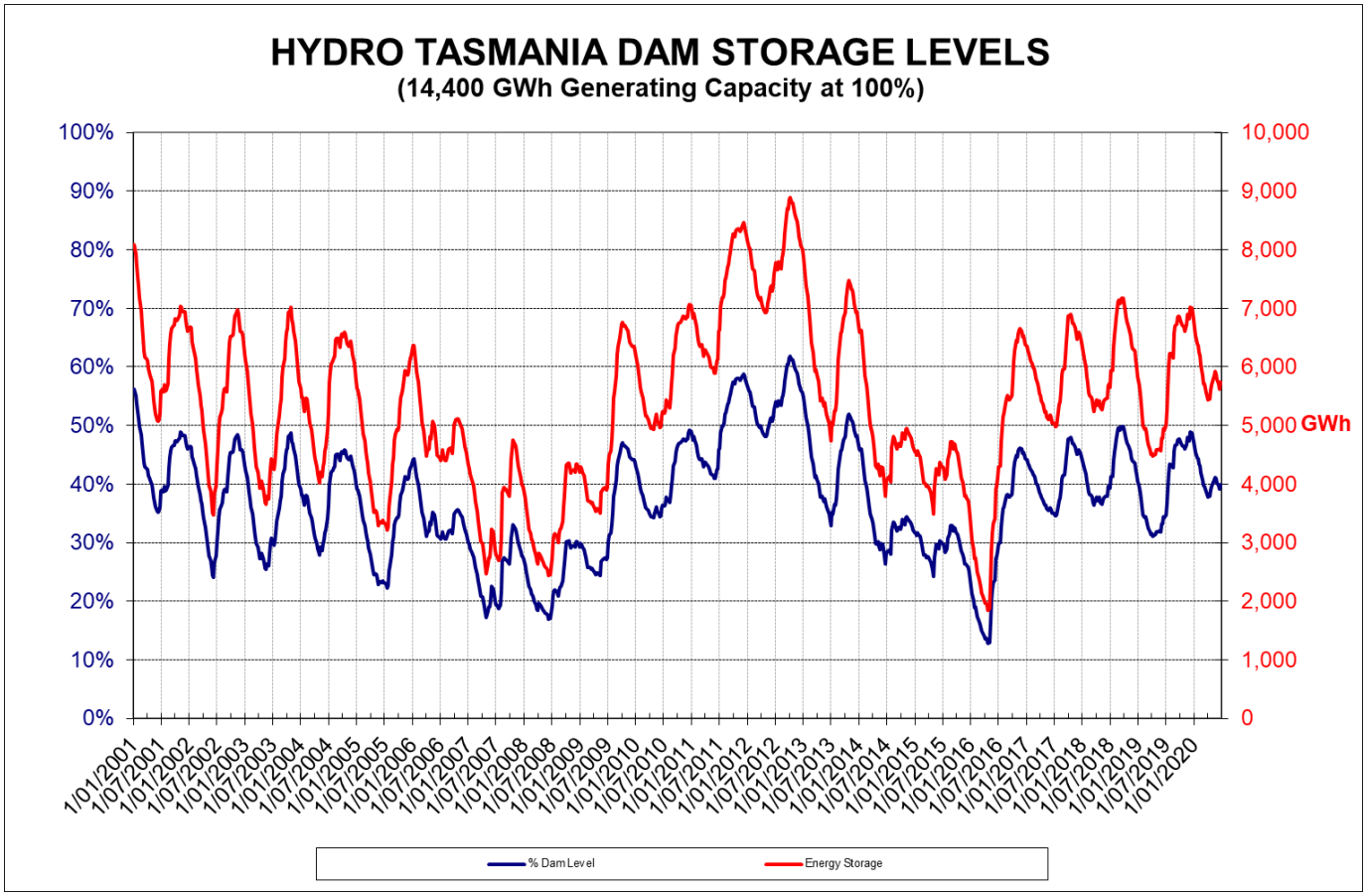
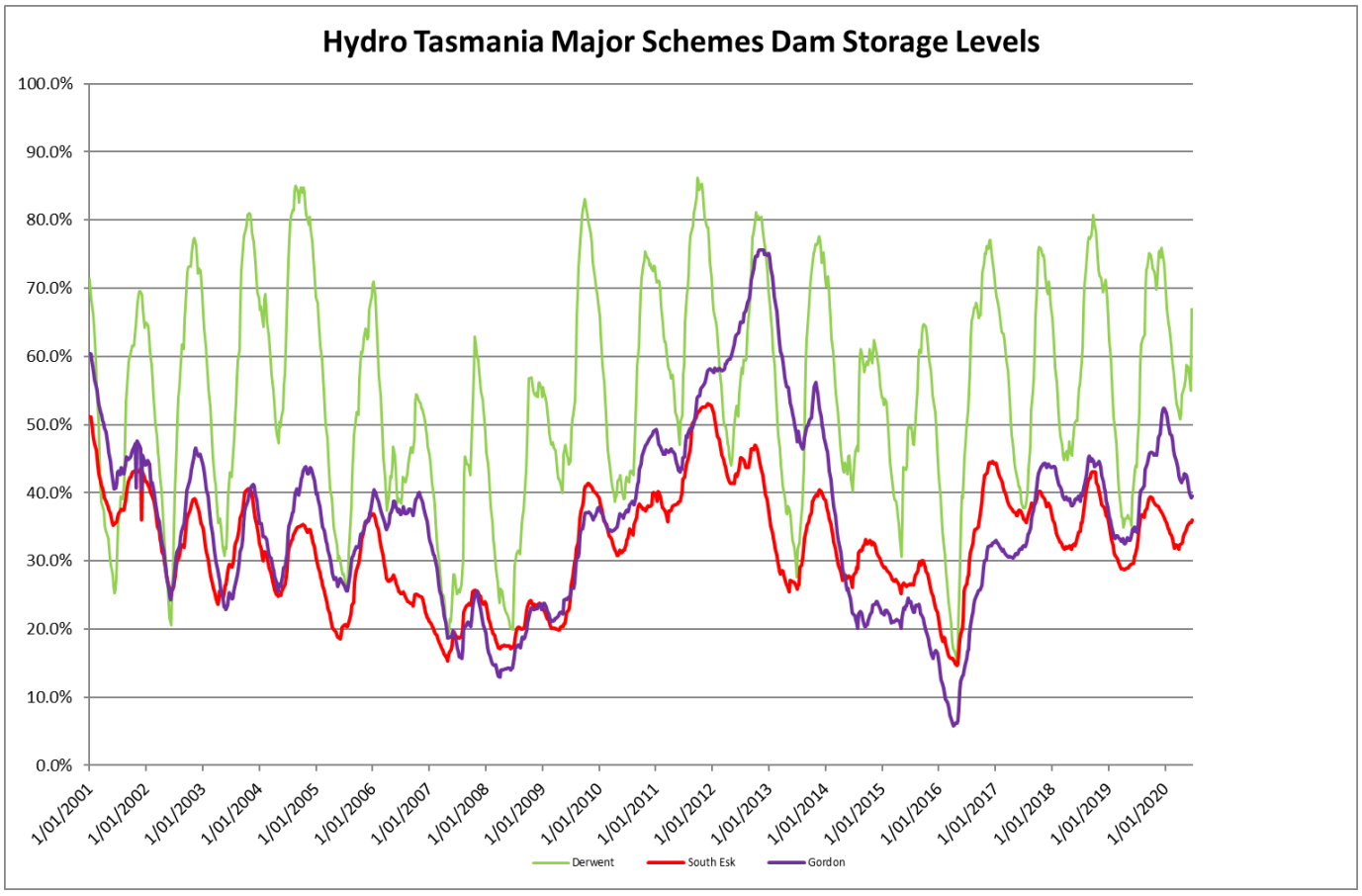
Attachment 1

Hydro Power Schemes Historical Storage Level Graphs

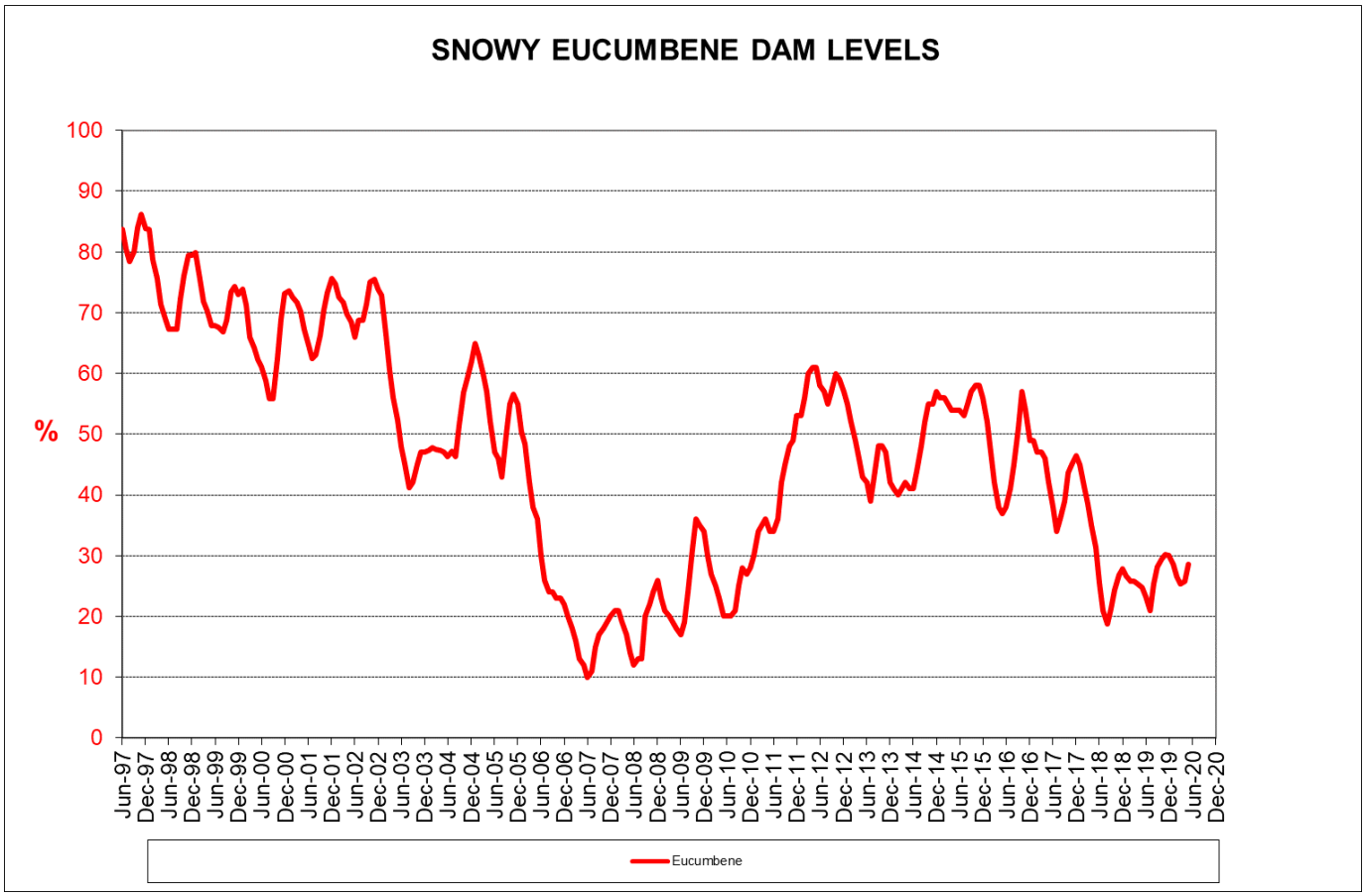
Hydro Tasmania – All Storages



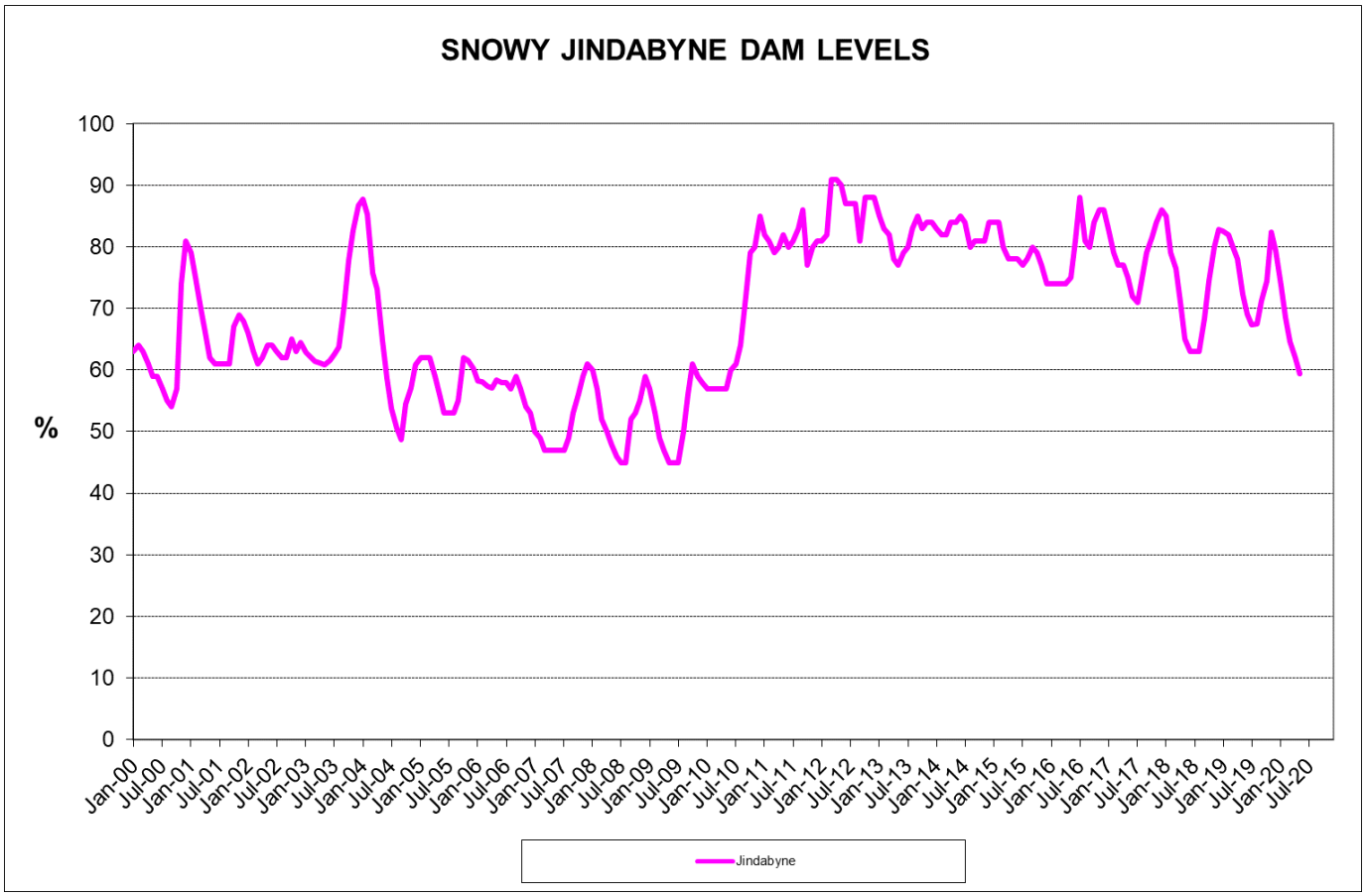
Hydro Tasmania – Individual Primary Storage Schemes



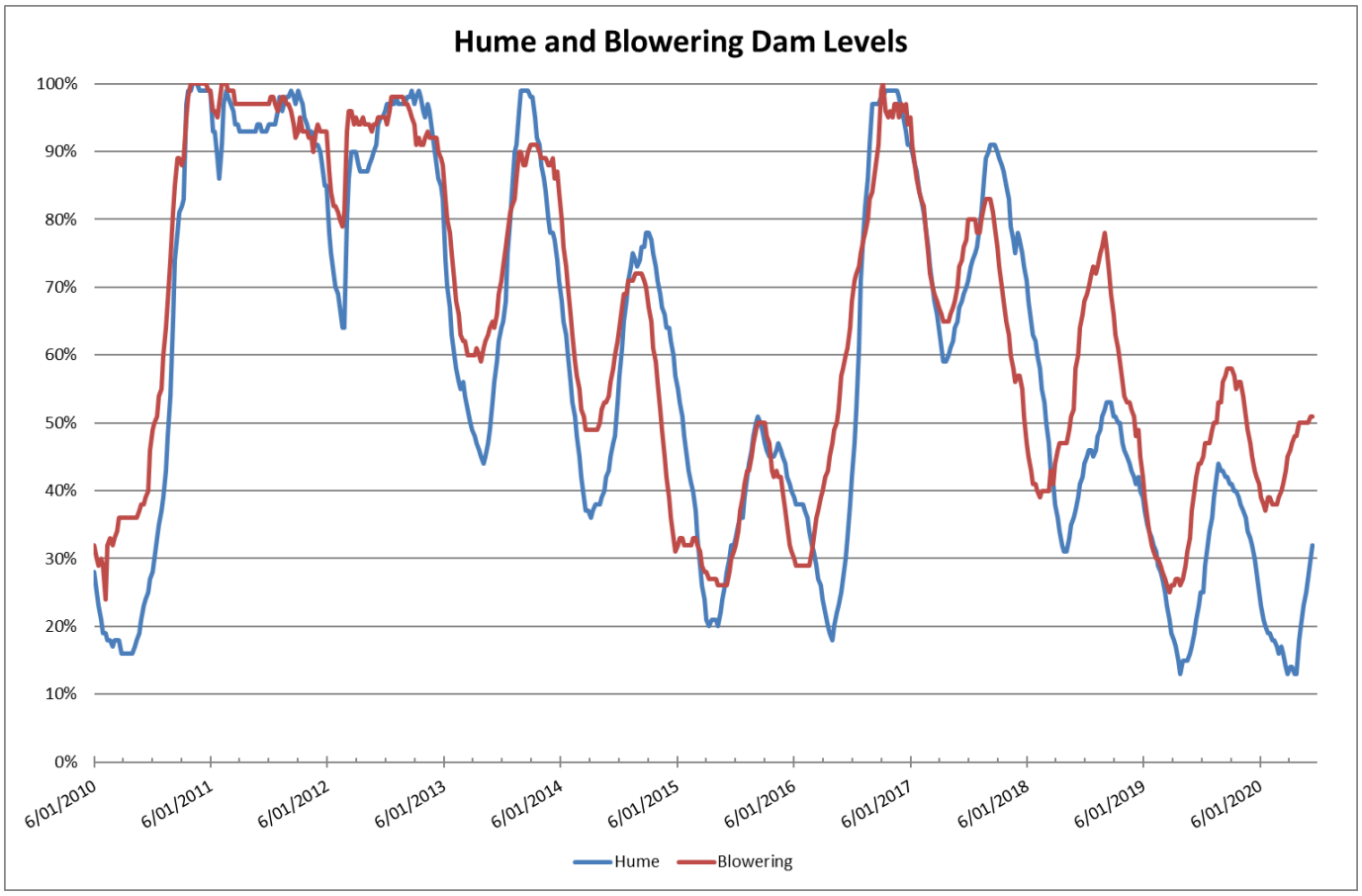
Snowy Primary Storage - Lake Eucumbene



Snowy Secondary Storage – Lake Jindabyne



NSW Minor Storages – Blowering and Hume



AGL Southern Hydro – Dartmouth and Eildon Storage Schemes