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Submitted via email: regulatory.consultation@transgrid.com.au.

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Dear Ms Kulbacka

Project Assessment Draft Report Broken Hill reliability project

Hydrostor welcomes the opportunity to respond to TransGrid's RIT-T – Revised Project Assessment Draft Report (PADR) for Maintaining Reliable Supply to Broken Hill (published October 6, 2021).

Hydrostor is the world's leading developer of Advanced Compressed Air Energy long duration Storage (**A-CAES**) projects, enabling the transition to a cleaner, more affordable, and more flexible electricity grid. Hydrostor has a variety of projects in operation or under development, as well as a pipeline of large-scale A-CAES projects representing over 6 GW and 65+ GWh of deployment potential in the USA, Canada, Chile and Australia, with significant global project potential across many other markets.

Hydrostor Long Duration Storage solution

Hydrostor's A-CAES is a more flexible application of well-proven compressed air long duration storage technology. Long duration storage a critical missing piece of Australia's National Electricity Market's (**NEM**) transition to net zero emissions. A-CAES in particular provides reliable long duration storage capacity, for a 30-50 year+ period, as well as providing other grid benefits such as high levels of system inertia needed for ongoing voltage support in the NEM. Hydrostor's solution for maintaining a reliable supply to Broken Hill involves the repurposing of an economically end of life mine located in Broken Hill, providing additional benefits to the region in terms of jobs and economic growth. While not specifically in the scope of the RIT-T, but in line with consumer preferences the Hydrostor A-CAES solution for Broken Hill will result in an investment in the order of $500m in the Broken Hill region creating at least 750 direct and indirect jobs during construction and ongoing contribution of more than $10m to the local economy for 40+ years operational lifetime[1].

This long duration storage solution would, in effect, create a mini grid at Broken Hill that will operate connected to the grid and can meet TransGrid's identified need of reliability at Broken Hill over the long term. This is in addition to the A-CAES solution providing important services to the NEM in parallel, which are not achievable by the diesel gas turbines. The synchronous AC generation

[1] Economic Impacts of the Broken Hill A-CAES ACIL Allen June 2021

system of A-CAES can provide all primary ancillary network services and black start, enhancing system strength and improving network operation. It is noted that the existing diesel generation cannot help to stabilise the local grid as it cannot run while the TransGrid system is connected at Broken Hill. The Hydrostor solution will be available to run any time and will reduce curtailment of renewable resources already operating in Broken Hill. Ancillary services available from Hydrostor will benefit all renewable generation in the southwest of NSW and it will enable more investment in renewables at Broken Hill and surrounding areas.

Hydrostor's proposal to TransGrid is to provide a staged long duration energy storage solution that incorporates 50MW and 250MWh dedicated in reserve at all times for reliability support services at Broken Hill. When not called upon to provide the reliability, the A-CAES asset, as well as additional stages of A-CAES capacity that would be paid for and used by Hydrostor's equity holders, will participate in and add liquidity to the NEM wholesale market.

ARENA has confirmed interest in funding support for the project and funding arrangements are being progressed via its Advancing Renewables Program (ARR).

Updated RIT-T guidelines

TransGrid issued its initial PADR in early August 2020 and concluded that Hydrostor's solution was expected to deliver the greatest net benefits of all options, across all three scenarios considered.

However, in late August 2020, as part of developing the guidelines to make the ISP actionable, the AER provided addition guidance regarding the treatment of non-network options in the RIT-T cost benefit assessment. TransGrid revisited the RIT-T assessment having regard to the new RIT-T guidelines and concluded that purchasing and refurbishing the existing old diesel turbines from Essential Energy **(Option 2)** is the option with the highest net benefit to meet Broken Hill's reliability corrective action. Hydrostor's solution (**Option 1A/5A (2))** has the second highest benefits under this new approach.

The RIT-T guidelines are clear that a proponent should rely on the guidelines that were in effect when a RIT-T proponent initiated the RIT-T (i.e., the Project Specification Consultation Report or **PSCR**):

Each version of these RIT–T application guidelines will be effective from its effective date of issue, and RIT–T proponents should apply it as soon as practical. However, for compliance purposes concerning a RIT–T application, we will only have regard to the guidance that was in effect when a RIT–T proponent initiated the RIT–T in question. In this context, initiated means from the publication of a [redacted] *report.* [Page 8 Application guidelines | Regulatory investment test

TransGrid released its PSCR in November 2019. The guidelines that were in effect at that time were the December 2018 Application Guidelines for the Regulatory Investment Test for Transmission. It is unclear then, why the Australian Energy Regulator **(AER)** required TransGrid to adopt the 2020 [redacted] as it has resulted in a different preferred option. An option that further reasons set out below.

Long term operation of fossil fuel generation inconsistent with Transgrid Vision and policies of all levels of Australian Government

While Option 2 (where TransGrid would purchase the existing turbines and undertake required refurbishment activities) exhibits the highest net benefit (between 9% and 12% higher Option 1A/5A (2)) TransGrid notes its concerns in the revised PADR that "prolonging the use of fossil fuel technologies is inconsistent with Broken Hill's City Council's Sustainability Strategy and the general transition of the electricity sector to low emission technologies." [page 7 PADR]

TransGrid's concern is an understatement. Simply put, option 2 should not even be considered as part of the RIT-T. The prolonged use of diesel generators is also inconsistent with:

1. TransGrid's corporate vision of "A clean energy future for Australia" and a backward step in TransGrid's 5-star rating by the Global Real Estate Sustainability Benchmark (GRESB) 2020 ESG benchmarking report (and presumably TransGrid's upcoming corporate ESG Strategy to be released before the end of 2021)
2. NSW Government's Electricity Infrastructure Roadmap seeking to transform its electricity system into one that is "cheap, clean and reliable" and includes a target of 2GW long duration storage.
3. NSW Government's target of 50% reduction in emissions by 2030 and net zero by 2050
4. Commonwealth Government's net zero policy by 2050 and a 35% reduction in emissions by 2030.
5. AER's commitment to the newly launched international Regulatory Energy Transition Accelerator.
6. Prudent cost planning for long-term operations, given significant uncertainties with the long-term operational cost of these assets, which does not appear to be accounted for in the RIT-T.

In addition, the AER requires Network Service Providers to take into account feedback from the community and stakeholders. The feedback from the Broken Hill community and stakeholders is clear that TransGrid should not progress with the acquisition of the diesel generators and select the highest-ranking clean energy option in the PADR

It is incongruous with all the above for the AER to force TransGrid to purchase and operate diesel [redacted]able and necessary to have these diesel generators continuing to [redacted]port solution (until the long-term solution will be constructed and [redacted]-CAES by 2025), it seems wholly unreasonable and imprudent to consider these near-end-of-life diesel generators as a long-term network support solution that will both ensure reliability, meet policy objectives, and enable clear support from consumers and local stakeholders.

[redacted]

Including unregulated costs and derivative benefits into the RIT-T calculation

The cost benefit analysis in the revised PADR includes costs incurred by consumers through regulated revenues as well as the costs incurred by the equity participants in Hydrostor. We submit this is a misapplication of the RIT-T guidelines.

The purpose of the RIT-T is to mitigate the risk that consumers will pay for inefficient investments. As articulated by the COAG EC in its 2017 review into the RIT-T:

"*The RIT-T is designed to identify the most efficient regulated investment in transmission infrastructure, whether intra- or inter-regional in scale, and ultimately protect consumers from paying more than necessary for their supply of electricity.*

The role of the RIT-T is to avoid inefficient regulated investment in new transmission assets, including interconnectors, in the NEM. It recognises that network projects which are included in a transmission network business' regulated asset base must be paid for by energy consumers over the life of the asset—generally from 30 to 50 years; and that in some cases, a network investment is not the best option.

Simply put, the RIT-T plays the role of gate-keeper—ensuring that consumers only pay for investments that are economically efficient and optimal overall for the NEM. It aims to ensure that all credible options for addressing an identified need are considered, and that the relative merits of network and non-network options are considered on an equal footing

Importantly, the RIT-T only applies to investments that will benefit from regulated revenues; that is, regulated revenues recovered from electricity consumers. It does not apply to investments that are funded from other sources, for example augmentations paid for by generators, merchant interconnectors, or investments funded by governments." (COAG EC Review of the Regulatory Investment Test for Transmission RIT-T Review 6 February 2017)

Hydrostor's proposal is to provide a staged long duration energy storage solution that incorporates 50MW and 250MWh dedicated in reserve at all times for reliability support services at Broken Hill. When not called upon to provide the reliability, the A-CAES asset, as well as additional stages of A-CAES capacity that would be paid for and used by Hydrostor's equity holders, will participate in and add liquidity to the NEM wholesale market. It is the wholesale market participant's success (or failure) in the wholesale market that determines the extent of the market facing benefits. This is a risk to be borne the wholesale market participant, not consumers.

[redacted]efits in the RIT-T calculation, for the unregulated capacity in the A-[redacted] on the expected revenue streams from its operation in the market. [redacted]lly provide greater consideration to near-term implementation of a larger-scale A-CAES solution (as contemplated in the PADR), and indeed would result in the truly lowest costs to consumers.

It is the equity participants in Hydrostor who will take the risk in this investment (not consumers), [redacted]the benefits (revenue streams) that should be considered. Afterall, the AER doesn't tell a solar or wind farm, battery or a gas-fired peaker whether they think it is going to be profitable or not.

Market Benefit Report out of date

TransGrid engaged EY to undertake market modelling to assess the wholesale market benefits, allowed under the RIT-T guidelines, expected to arise under each of the credible options. However, EY's market benefit report was not updated under the revised PADR. The report produced in August 2020 was based on the 2020 AEMO Integrated System Plan (ISP) central scenario.

Since the completion of the EY report the NSW Government has released its Energy Roadmap (November 2020) and AEMO will release the draft 2022 ISP in December 2021. Hydrostor submits that the combined impact of these changes will substantially change the market benefits and the report should be updated.

Inadequacy of diesel solution

The existing diesel fuelled gas turbines are approximately 40 years old and have been used by Essential Energy to support the transmission network at Broken Hill since the 1980's.

The diesel turbines, given the age and operating history, have not been adequately demonstrated to be reliable as a long-term solution. Moreover, with the aging nature of the transmission line between Buronga and Broken Hill it would seem logical that the reliability solution in Broken Hill will be called upon more frequently as more preventive and reactive maintenance on the line is performed. The PADR does not articulate what changes will be made to the existing diesel fuelled gas turbines to mitigate this situation and provide for potential increased operation in the future.

In the event of a transmission line outage mine operators in the region are currently instructed by Essential Energy to significantly curtail their demand as the existing diesel plant cannot reliably sustain the total demand on the Broken Hill distribution system. Apart from the significant financial impost this has on mining operations it also poses safety risks to their underground mining operations and has resulted in the need for manual evacuations in the past. As a major sources of demand on the Broken Hill distribution network mine operators should be offered the same level of reliability as all other customers so it can operate its operations in a safe and sustainable manner. The existing diesel fuelled gas turbine plant has not been able to achieve this in the past and the PADR does not detail how this will be resolved in the future.

Without clear independent verification of actual turbine condition, for example through an independent physical inspection report on the diesel turbines, it can only be assumed that the condition of the diesel turbines is commensurate with their age and that they would not be suited for an application requiring prolonged or regular operation. The PADR does not describe what [redacted] existing diesel turbines to mitigate their deteriorated condition to [redacted] in the future.

New Mining Loads in Broken Hill

TransGrid states in the PADR that, "Option 2 would not require any associated network investment (relating to switchbays or fault level upgrades)" and that" Acquiring the existing turbines does not [redacted] benefits, as they are currently configured to operate only in islanded mode." When the Broken Hill network is islanded from the NEM the existing diesel turbines cannot support the total demand therefore, major mining loads are curtailed.

Hydrostor is aware of new mining loads being progressed in the region and these developments will be hindered by not having access of a long-term, cost effective, predictable, and reliable supply of electricity. The Cobalt Blue and Hawsons Iron mines together will have an estimated load of between 180mw to 190mw. Both mines will produce metals that are in demand for the transaction to clean energy and lower emission industry. As neither of these loads are currently committed TransGrid has not taken them onto account in the PADR conclusions. They are however, mentioned in the PADR sensitivity analysis.

For greater clarity, the Hydrostor A-CAES solution has significant flexibility to readily supply this important load growth, a fact that is specifically recognized in the PADR, but unfortunately is not factored into the basic economic assessment of the diesel generators compared to the A-CAES alternative.

Hydrostor considers that these investments show more than just an intent to develop resources in this region and this needs to be taken into account the PADR load forecasts. The selection of an option in this PADR that is unable to meet reasonable Broken Hill future load requirements is not in the best interests of consumers in Broken Hill.

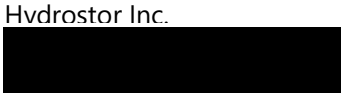
Investment in Broken Hill Region

As previously highlighted, it is incongruous for the AER to force TransGrid to purchase and operate diesel generators and even more so when this is in direct contradiction to the Broken Hill City Council's Sustainability Strategy. Moreover, the PADR states that Option 2, "inconsistent with the Sustainability Strategy of Broken Hill City Council and the general transition of the electricity sector to low emission technologies".

Based on an independent report by ACIL Allen[2] Hydrostor's PADR solution will provided significant economic benefits to NSW and the local community of Broken Hill. These benefits include: investment in the order of $560m, with the majority of construction expenditures occurring in New South Wales and the community of Broken Hill; the creation of 260 full time equivalent construction jobs over three years, with a peak in the second year of 350 workers, many whom will be from the local Broken Hill region; and during to 40+ years of operation, roughly $12m per annum of local expenditure.

Sincerely,

Jon Norman
President
Hydrostor Inc.



[2] *ibid*