Tranche two regulations issues paper: Consultation submission form

This form is to be used to provide feedback on a series of questions included in the Tranche two regulations to support the Electricity Infrastructure Roadmap Issues Paper (PDF 800KB) to help inform the development of the regulations.

Please see the Electricity Infrastructure Roadmap webpage for more information.

Consultation questions

You do not need to answer every question. Please answer the questions of interest to you.

Chapter numbers indicate the location of questions in the Issues Paper.

Please make your submission by **5pm on Friday 21 May**.

Confidentiality and submissions

Providing submissions is entirely voluntary, is not assessable, and does not in any way include, exclude, advance or diminish any entity from any future procurement or competitive process regarding the Electricity Infrastructure Roadmap, or any other NSW programs.

The NSW Government is committed to an open and transparent process, and all submissions will be made publicly available unless the stakeholder advises the Department not to publish all or part of its submission. Authors may elect for some or all of their submission to be kept confidential. If you wish for your submission to remain confidential please clearly state this in your submission.

Your details

Submission type	☐ Individual ☒ Organisation ☐ Other Click or tap here to enter text.
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Stakeholder group	☒ Generation or storage infrastructure provider ☐ Electricity consumer or representative body ☐ Network infrastructure provider

	☐ Energy retailer ☐ Government or market institution ☐ Individual ☐ Other (please specify) Click or tap here to enter text.

Questions

Chapter 4 – Energy Security Target	
Question 1: Should the Energy Security Target Monitor define the method to determine the derating factor or should the method be defined in the regulations? If not by the derating factor, how else should the regulations address the probabilistic nature of semi-scheduled generators in the context of the deterministic Energy Security Target?	The regulations should define the derating factor for each generator by technology type, as described in Chapter 3 of the Issues Paper. This method would provide certainty and consistency to the calculation of firm capacity and, combined with the 10 financial year outlook of the Energy Security Target (EST), would provide a clear signal to energy market participants of the NSW Government's expectation for investment in new infrastructure to maintain a reliable supply of electricity over the medium to long term. Importantly, Hydrostor feels it is important to recognise the capacity / energy security contribution of longer-duration energy storage – for example: 8 hour storage, which is already identified in the enabling legislation, should receive full qualification, but shorter durations should be derated as appropriate. Hydrostor would value further discussions on this matter. Equally important, as the EST is the sum of the maximum demand and reserve margin, it will be important to expedite regulations that will define how the Energy Security Target Monitor (ESTM) is to treat capacity from large renewable generation units and utility-scale energy storage such as Hydrostor's Advanced Compressed Air Energy Storage (A-CAES). A-CAES, in particular, is a unique energy storage pathway for Australia that should be explicitly considered as an important option to meet the EST. It has similar operating characteristics to pumped hydro but can lower cost to consumers by being flexibly sited, with lower water usage and permitting requirements, and be developed and constructed in much shorter timeframes.
Question 2: Should the regulations prescribe any other matters for inclusion in the Energy	To provide locational context to situations where the Energy Security Target Monitor (ESTM) considers the firm capacity will not meet the Energy Security Target

Security Target Monitor's report? If so, what are they?	(EST) (i.e. a target breach), it will be important to detail any constraints and conditions that prevent capacity from generators not being included in the calculation of firm capacity. As an example, there could be a situation where a non-network and / or long duration storage solution could be implemented to improve the firm capacity contribution of existing generators thereby enabling it to contribute to the EST but the details of the constraint would need to be visible to enable the market to propose a solution. As is evidenced by Hydrostor's participation in the Broken Hill A-CAES project (as documented in the Transgrid Project Assessment Report for the Maintaining reliable supply to Broken Hill) the non-network option of long duration energy storage using A-CAES delivers the lowest cost to consumers, compared to traditional technologies and solutions. However, the reliability component is only one aspect of the overall project, and the Energy Security Target Monitor's report should account for local reliability needs as part of its overall evaluation mechanism. To facilitate the development of non-network solutions using long-duration storage, the location and nature of constraints and conditions that limit generation capacity contributing to firm capacity needs to be known. In addition, Hydrostor believes that the ESTM's report should investigate reliability requirements beyond 10 years – with 20 year outlooks being a common timeframe for planning purposes in other jurisdictions (e.g. North American Reliability Council members and state jurisdictions). This is important as long-lifespan infrastructure (such as long duration energy storage with project lifespans exceeding 10 to 20 years) should be part of the overall solution set to ensure maximum reliability at the lowest cost. Therefore, reliability planning should reflect the nature of infrastructure both coming offline and least cost for future development.
Chapter 5 – Electricity Infrastructure Investment Safeguard	
Question 3: To what extent are the requirements for carrying out competitive tenders of Long Term Energy Service agreements appropriate? Are there any other requirements that should be considered?	Hydrostor is supportive of the stated requirements and principles set out for the Consumer Trustee for the carrying out of competitive tenders for Long Term Energy Service agreements (LTESA. In particular, Hydrostor supports the requirement to consider the long-term financial value of the tender participant's offer to consumers based on the proposed terms of an

	LTESA and the relevant infrastructure's expected impact, including but not limited to wholesale electricity prices, network investment and need for essential system services. Hydrostor would like to highlight that, from its involvement in the Transgrid Regulatory Investment Test – Transmission (RIT-T) for the Maintaining reliable supply to Broken Hill, it will be imperative that the definition of this requirement clearly establishes eligibility criteria and merit criteria to assess the combined value of long-duration storage that can meet the objectives of both reliability driven projects (i.e. non-network solutions) and projects motivated by the delivery of market benefits from a single asset. It is also imperative that the implementation of LTESAs for long duration storage projects are not limited by unnecessary eligibility restrictions, such as geographic or technology restrictions, nor are they restricted to specific considerations that do not take into the full remit of objectives in S44 of the EII Act. For example, implementation of these contracts should not be solely restricted to Renewable Energy Zones, as there are important reliability and clean energy objectives to achieve in other parts of the NSW grid. Ensuring broad eligibility for long duration energy storage technologies, including A-CAES, will ensure the most diverse set of reliability and economic benefits, at least cost to NSW electricity consumers. As an example of these economic benefits alone, development of long duration storage, particularly A-CAES, delivers significant and long-lived economic benefit to the region in which it is developed. A recent assessment by ACIL Allen for Hydrostor's Broken Hill 200MW A-CAES project identified that it would deliver significant economic benefits to both the local community of Broken Hill and the greater region and state of New South Wales. It is estimated that the project expenditures in Australia will total $562m for construction, resulting in 780 full time equivalent (FTE) jobs over the three years. It is also identified that $556m (99 per cent) of the construction expenditures will take place directly in New South Wales, with $239m in the local Broken Hill community. 53% of all operations expenditures over the life of the project will be purchased from the local Broken Hill community, equivalent to a total of $457 million over 40 years or $11.4m a year. The inherent nature of A-CAES results in long-lived economic benefits which, by default,

	minimises risks and regrets to NSW consumers of investment in this type of storage infrastructure.
Question 4: Do you agree with the matters the Consumer Trustee must take into account when preparing the Infrastructure Investment Objectives Report? Are there any other matters that should be taken into account?	Hydrostor agrees with the matters the Consumer Trustee must take into account when preparing the Infrastructure Investment Objectives Report (IIOR) however, as with the response to Question 3 in relation to LTESA, the relative merits of meeting the reliability standard with long-duration storage should be combined with the relative merits of projects motivated by the delivery of market benefits from a single asset. Hydrostor also believes that it is critical that the IIOR enable sufficient lead-time for longer development cycle resources (such as construction-based resources like pumped hydro and A-CAES) to ensure that appropriate investments can be made to ensure resource availability in the timeframes required. For example, if the IIOR identifies mid - to late - 2020s infrastructure needs, it is important to act on these needs early through commercial processes like the LTESA so that developers can respond. Doing this will avoid unnecessarily limiting options, that would only serve to increase costs to NSW customers. As noted in Hydrostor's response to Question 5, Hydrostor recommends that preference be given to more flexibly-developed resources that can achieve commercial operations in earlier timeframes, but early action is important in any circumstance to ensure least-cost outcomes.
Question 5: In what circumstances should the Consumer Trustee prefer long duration storage over firming infrastructure to meet the reliability standard?	To ensure the minimum objective of 2GW of long duration storage in construction by 2030 is achieved, in combination with the NSW Government target to achieve net zero emissions by 2050, the Customer Trustee should give preference to long-duration storage over firming infrastructure to meet the reliability standard. In particular, the Customer Trustee should give preference to long-duration storage where a reliability and market benefit can be combined to deliver the lowest cost solution to consumers. Moreover, long-duration storage has the advantage of enhancing the investment certainty of variable renewable energy (VRE) assets through a reduction in the risk of curtailment and improving utilisation of network infrastructure, that is typically a fixed cost. Creating investment certainty for VRE projects will ensure the lowest levelized cost technologies available are deployed to minimise the cost to consumers with zero emissions. This is true in a general sense, and not

	just in regard to the implementation of Renewable Energy Zones. Hydrostor reiterates the importance of achieving the overall long duration energy storage target in the EII Act, and not limiting the implementation of these resources to Renewable Energy Zones. Furthermore, the cost of transmission to access these long duration storage resources should be implicitly accounted for in the evaluation of LTESAs and / or as appropriate by the Consumer Trustee. For greater clarity, long duration energy storage is an important reliability resource in its own right. Because it has more flexibility than firming infrastructure its implementation should be prioritised in a general sense and not restricted to primarily renewable-enabling applications. Recognition of the multiplicity of benefits that long duration energy storage can offer is critical to the ultimate success of the program and achieving reliability objectives. For example, the Texas implementation of Competitive Renewable Energy Zones (CREZ) and the socialization of transmission costs for this purpose has done little to advance actual reliability objectives in Texas (e.g. the recent state-wide blackouts are an indirect result of not having reliability as the foremost objective for CREZ and power infrastructure build-out, compared to market objectives). It is therefore important that any socialised transmission costs are accounted for in the evaluation of long duration energy storage asset costs in a competitive tender. This will help to ensure that dollars spent are truly maximising reliability contributions rather than creating a distant REZ that is built around a large, but expensive, long duration storage resource alone. It should also be acknowledged that different classes of long duration storage technology are accompanied by varied duration for development and construction. Pumped Hydro storage traditionally has long development and construction timeframes, plus is burdened by a high degree of site characterisation risk in the front-end engineering and design phase. By contrast, A-CAES has development and construction durations more akin to traditional firming technologies such as gas generation but the significant benefit of zero emissions, reducing curtailment of VRE and, by being flexibly sited, improving network infrastructure utilisation.
Chapter 6 – Classification of REZ network infrastructure	

Question 6: Are there any other considerations that should be taken into account in classifying REZ network infrastructure in regulations, including the need for, and scope of, sub-classifications?	Hydrostor's primary focus is long duration storage, which falls outside of the definition of network infrastructure, as defined in Electricity Network Assets (Authorised Transactions) Act 2015, however, it is important to acknowledge that long duration storage will increase the utilisation of Network infrastructure, REZ network infrastructure – Regulated and REZ network infrastructure – Unregulated (infrastructure components). For long duration storage to add value to the network infrastructure components associated with a REZ it will be important to optimise the siting of this storage to maximise the benefit thereby placing downward pressure on the price to consumers. Hydrostor notes that the Renewable Energy Zone Access Scheme in the Issues Paper on Central–West Orana (CWO) refers to "LTESAs also be available to 'outstanding' projects outside the REZs". In classifying REZ network infrastructure, the ability of long duration storage that can be sited to optimise the utilisation of REZ infrastructure components should be considered. Importantly however, Hydrostor also reiterates that any socialised transmission costs associated with REZs are accounted for in the evaluation of long duration energy storage asset costs in a competitive tender. This will help to ensure that dollars spent are truly maximising reliability contributions rather than creating a distant REZ that is built around a large, but expensive, long duration storage resource alone. Such a situation could be very suboptimal for consumers, especially if you consider the potential of competing alternatives that can be flexibly sited, like A-CAES and other technologies.
Question 7: What types of network infrastructure could be subject to economic regulation under Part 5 of the EII Act?	Hydrostor is concerned at the potential exclusion of non-REZ "Network Infrastructure" from consideration as part of both the IIOR and the LTESA processes, particularly in the case of long duration energy storage. Hydrostor believes this would inadvertently create suboptimal outcomes for consumers, and efforts should be made to ensure that long duration energy storage projects that could contribute to the reliability outcomes defined in the EII Act are not precluded from consideration in the IIOR or LTESA. Alternatively, the IIOR or LTESA processes should be structured to ensure that valuable long duration energy storage is appropriately classified to enable such consideration and eligibility. Hydrostor believes this issue should be specifically addressed going forward.

Supporting information

If you have additional information you would like to provide to support your views, please provide it here. If you have additional documents to provide to support your views, please email it with your submission.	Long duration storage has the benefit of contributing significant economic benefits to the region in which it is located therefore, as highlight in Hydrostor's response to Question 3, this criterion should be a principle when assessing LTESA tenders. Hydrostor can provide a copy of the ACIL Allen Economic Benefits report for its Broken Hill A-CAES project as support if required. Hydrostor is happy to share its significant power project and energy storage development experience in North America to display the important decisions facing the NSW Government, including its experiences in California, Texas and Ontario. California has struck an important balance between achieving renewable build-out and reliability objectives by directing technology-neutral and location-neutral procurements for energy storage, and long duration energy storage. This is a useful model for NSW to consider, even if REZ areas are pursued separately. The following link to the California Public Utilities Commission (CPUC) decision identifying the need for 1 to 1.6GW 8hr+ storage provides an interesting comparison of how other international markets are determining the optimum resource portfolio to inform integrated resource and transmission planning. Hydrostor also reiterates the cautionary account of the Texas CREZ process: long duration energy storage is an important reliability resource in its own right. Because it has more flexibility than firming infrastructure its implementation should be prioritised in a general sense and not restricted to primarily renewable-enabling applications. Recognition of the multiplicity of benefits that long duration energy storage can offer is critical to the ultimate success of the program and achieving reliability objectives. For example, the Texas implementation of CREZs and the socialization of transmission costs for this purpose has done little to advance actual reliability objectives in Texas (e.g. the recent state-wide blackouts are an indirect result of not having reliability as the foremost objective for CREZ and power infrastructure build-out, compared to market objectives). It is therefore important that any socialised transmission costs are accounted for in the evaluation of long duration energy storage asset costs in a competitive tender. This will help to ensure that dollars spent are maximising reliability contributions rather than

	creating a distant REZ that is built around a large, but expensive, long duration storage resource alone. Investigation and analysis of the recent (i.e. February 2021) failure of the Texas power system operated by the Electric Reliability Council of Texas (ERCOT) is a good source of reference on the impacts of poor identification of resource adequacy and reliability planning. The report as this link is just one example of the investigation and analysis that has been undertaken in relation to failure of the grid in Texas.

Confidentiality and submission publication preferences

Please indicate your publication preferences.

Would you like all or part of your submission to be confidential? If so, please identify the part(s) in your submission	☐ Yes ☒ No
For confidential submissions: Some confidential submissions may be shared with the Australian Energy Market Operator, Australian Energy Market Commission, Australian Energy Regulator, the Energy Security Board, TransGrid, the Clean Energy Finance Corporation, Australian Renewable Energy Agency, Essential Energy, Endeavour Energy and/or Ausgrid to better understand and respond to issues raised. Would you like your submission to be kept confidential from these parties?	☐ Yes ☒ No
If your submission is published, only your name and organisation would be published. Would you like your submission to be anonymous and these personal details redacted?	☐ Yes ☒ No

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- Directly relevant departmental staff, consultants and advisors
- The Australian Energy Market Operator, Energy Security Board, Australian Energy Market Commission, Australian Energy Regulator, or the Australian Competition & Consumer Commission
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