



1 March 2024

Electricity Authority
By email: OperationsConsult@ea.govt.nz

Potential solutions for peak electricity capacity issues

Meridian appreciates the opportunity to comment on the Electricity Authority's consultation paper on potential solutions for peak electricity capacity issues.

In Meridian's opinion the existing energy-only market provides the right incentives for ongoing investment in flexible, dispatchable capacity. Fundamentally, it is physical investment which ensures capacity. The current peak capacity challenges are in many respects a transitional issue as the sector invests into growing peak demand after an extended period of little or no demand growth. Thermal fuel supply issues and government policy impediments to investment in peaking and upstream gas supply may also have hampered this transition.

With the removal of these impediments, Meridian expects investment in flexible capacity to keep pace with system needs. However, there is broad acknowledgement across the sector that the next two winters may be challenging.

There is more than enough available generation capacity to manage increased peak demands so, the issue for peak demand management in the near-term becomes one of efficient coordination of the available resources at any given time including outage management and providing as much certainty as possible to inform the commitment decisions of thermal plant operators. Like the Authority, Meridian expects this coordination issue to abate over time as investments in batteries, demand response, and other flexible peaking resources are delivered by the market.

Meridian agrees with the Authority that any further initiatives must be carefully designed so as not to disincentivise innovation and investment in medium and long-term solutions to meet peak capacity needs.

This submission covers:

- Meridian’s actions to help address peak capacity challenges;
- the merits of reviewing the security of supply standards and other system operator tools;
- further actions that could be considered to improve the information available to participants and increased certainty for commitment decisions ahead of real time;
- Meridian’s view that the Authority is best to focus on improved market participation for batteries in the short-term;
- Meridian’s views on the design of a super peak financial product and concerns regarding whether those products would in fact bring more flexible capacity to market, as well as the cost to consumers of market making;
- our support for further consideration of an Integrated Standby Ancillary Service; and
- Meridian’s view that interim options to manage residual security of supply risks have high potential costs and risks of unintended consequences.

Responses to the Authority’s consultation questions are also appended.

Meridian’s actions to help address peak capacity issues

Meridian is carefully managing planned outages to ensure maximum generation availability over winter.

We have also been working to maximise the peaking capability of our existing hydro generation and have secured unit capacity increases at Manapōuri and Benmore power stations.¹ Further work is underway to access even greater unit capacity at Manapōuri.² These enhancements in aggregate add significant capacity to our generation portfolio at a

¹ See <https://www.meridianenergy.co.nz/news-and-events/capacity-at-manapouri-power-station-update> and <https://www.meridianenergy.co.nz/news-and-events/benmore-power-station-unit-capacity-update>

² <https://www.meridianenergy.co.nz/news-and-events/potential-increase-to-maximum-unit-capacity-at-manapouri-power-station>

fraction of the cost. Having this flexible capacity available could help with any tight supply and demand conditions that arise in the electricity system including winter peak periods.

Meridian is also developing grid scale battery storage at our Ruakākā Energy Park, near Whangārei.³ Construction of a 100MW Battery Energy Storage System (BESS) is well underway with commissioning expected in September. The BESS will support stable grid operations as a reserve provider and by storing off-peak energy for injection back into the grid over peak periods. Meridian has further grid scale battery options in its development pipeline.

In addition, Meridian is investing in demand response initiatives with both large and small customers. In October 2023, Meridian reached an agreement with Open Country Dairy to supply electricity to support commissioning of an electric boiler. As part of that agreement, Open Country Dairy will be compensated for reducing demand by up to 27MW when required to remove pressure from the electricity system, such as in winter peaks or periods of low hydro storage. This builds on a 50MW demand response agreement signed with New Zealand's Aluminium Smelter earlier in 2023 and both are early projects in a larger industrial demand response work programme. Meridian has recently announced a further 20 MW of demand response from the smelter over the coming winter 2024. Longer term we see considerable opportunity for flexible hydrogen production to help address both peak capacity and dry year risks. Work continues with our partners on the Southern Green Hydrogen project.

At the level of aggregated household demand response, Meridian is running trials to reward customers that enable Meridian to control and optimise their household electric vehicle charging, including to avoid peak demand periods.⁴ At scale we expect such offerings to be able to stack network benefits (by avoiding network peak demand times) and wholesale market benefits (by offering reserves as well as demand response during periods when wholesale market capacity issues arise).

Reviewing the security of supply standards and system operator tools

The security of supply standards set out in clause 7.3(2) of the Code have not been reviewed since 2017 despite the Authority finding at that time that “some changes to the security of supply standards may be warranted” and that, while it decided not to make that changes at that time, a further review should be undertaken “sooner than the regular five-yearly period”. To our knowledge there has been no such review subsequent to 2017. It may be timely to undertake this work to:

³ <https://www.meridianenergy.co.nz/power-stations/ruakaka-energy-park>

⁴ <https://www.meridianenergy.co.nz/ev/smart-charging-trial>

- test whether the costs and benefits implied by the current standards are still reasonable; and
- test whether additional standards might be useful if the current North Island Winter Capacity Margin has not been a reliable indicator of the recent peak resource adequacy risks.

There may be an opportunity to simultaneously review (and codify if appropriate) the system operator's New Zealand Generation Balance application and the concept of the 200MW residual that the system operator uses to meet its principal performance obligations (we note here that the application currently lacks a way of accounting for the fact that an outage is outside the peak periods on a given day – we would support the addition of that functionality).

Meridian would support an open review of all these standards and tools to increase clarity and the confidence of the industry as a whole that prudent processes are in place that are not overly risk averse and strike the right balance between consumer costs and increased security of supply.

Actions to improve the information available to participants and improve commitment decisions and market efficiency in general

In addition to the options considered in the consultation paper, the Authority could also consider the merits of further improvements to thermal fuel information disclosure to facilitate commitment decisions and more efficient generation offers generally. A lack of fuel or lack of fuel storage flexibility can have a significant impact on market outcomes and efficiency, in much the same way as plant capacity reductions. In fact, not procuring or not disclosing fuel availability or flexibility could result in greater uncertainty, inefficient price discovery, and reduced security as other participants do not know whether the capacity is available. Better informed participants will be able to make more efficient decisions in the long-term interests of consumers.

Currently there is limited information available about contracted thermal fuel supply for electricity generation or the flexibility of upstream gas storage to serve electricity generation needs and asymmetry relative to information disclosed about hydro storage. The market often has to make thermal fuel assumptions based on observed offer behaviour in real time. When the Authority previously consulted on improved information disclosure in respect of thermal fuels, it did not take action to require more thermal fuel information disclosure to the market (which would likely have required changes to the exceptions to the disclosure obligation in the Code). Instead, the Authority put in place a quarterly reporting regime that required all “major

participants” to disclose to the Authority (rather than the market) when they relied on exceptions to the disclosure obligation. Meridian remains hopeful that the quarterly reporting regime is a stepping-stone for the Authority to move towards requiring that information about contracted thermal fuel and fuel storage be disclosed to the market. This would be beneficial not only for security of supply over the next two years but also for market efficiency and the long-term benefit of consumers in general.

The Authority is best to focus on improved market participation for batteries in the short-term

In the near term, we agree that the Authority’s efforts are best focused on checking for and removing any regulatory roadblocks to investment and innovation in battery storage and demand-side flexibility. This includes ensuring that these resources can easily participate in existing ancillary service markets. While such improvements should be a priority, we do not expect this to have a significant impact within the next two winters.

We agree with the Authority that there appear to be issues with the way the Code limits the participation of BESS, including:

- The inability of the market system to model a resource that can transition from load to generation. Further consideration of a 'bi-directional' offer form for BESS has merits as this could enable the full range of BESS capability to be signalled to market, including instantaneous reserve offers that reflected the total change in state the BESS can achieve by ceasing to charge *and* commencing generation. We agree that without careful management by participants and the system operator, it is also possible that a BESS could be dispatched for interruptible load provision while being dispatched to generate at the same time. Changes to enable bi-directional offers may also be able to remove the risk of inconsistent combinations of energy and instantaneous reserve being dispatched.
- BESS only being able to participate in frequency keeping when discharging as a generator, despite technical potential for a BESS to frequency keep while charging. We agree this could limit the potential revenue available to the BESS operator and could weaken the business case for investment in BESS depending on the use case and portfolio of the investor.
- Regulatory uncertainty, for example, the automatic under-frequency load shedding (**AUFLS**) code requirements are restrictive of BESS in ways which potentially limit its ability to best support the market (and deliver better system security overall) and

create uncertainty for investment. It would be helpful to have a clear and streamlined approach to AUFLS for BESS. Similarly, having more clarity on reserve availability costs allocation processes by the System Operator for BESS and other new technologies would provide greater certainty for project economics.

Meridian sees dispatchable demand enhancements as less of a priority given low uptake of direct demand side participation in the wholesale market. The Authority rightly identifies that physical limitations exist for demand side participants and enabling signalling of ramp rates and return times may further enable participation. However, in Meridian's experience demand side participation can generally be better accommodated through bilateral contracting, for example with a retailer, to manage any number of bespoke physical requirements and reward the demand response through a combination of availability premiums and/or call fees. This approach enables far more tailored arrangements to suit the counterparties compared to a large consumer simply bidding directly into the wholesale market.

The consultation paper also considers making it mandatory for participants with contracts for demand side flexibility to signal their resources to the market. In Meridian's opinion the existing wholesale market information disclosure obligations in the Code already go some way towards addressing this concern. Going further to require demand side resources to bid into the wholesale market (presumably above a set *de minimis* threshold) would be a reasonably significant change akin to making any node with a flexible demand resource attached a non-conforming load and increasing the burden on wholesale purchasers at those nodes. While in principle we can see potential benefits if all demand side resources are visible through bids, the costs would be reasonably high and careful cost benefit analysis would be required.

To prioritise all these options the Authority will need to consider the likely costs, risks, and timeframes involved alongside the expected consumer benefits. In Meridian's opinion, work to consider bi-directional offering and improved frequency keeping participation for BESS should be prioritised. However, we note that these improvements are unlikely to make much of a difference for winter 2024, so winter 2025 may be an appropriate target.

Financial incentives

Meridian first notes that the half-page section in the consultation paper on financial incentives is extremely light on details regarding what the Authority has in mind for a standardised super peak product. The link between the financial incentives discussed and how they would help with the near-term peak capacity and coordination challenge is not clear. The Authority also appears to have jumped to one specific option – an exchange-listed and market-made solution

– without any consideration of alternatives. Designing a standardised financial product (and any market making associated) would be a highly complex undertaking with significant implications for electricity markets and consumers, therefore separate and thorough consideration of this in its own right is required before the Authority commits to further work.

That said, Meridian supports development of a standardised super peak hedge contract as a helpful starting point for new participants wanting to transact such products in the over the counter market. A standardised structure could facilitate transactions and may save new participants starting from scratch with drafting of complex ISDA documents for a super peak contract.

Any standardised product could be adapted by participants to suit their diverse commercial needs. In Meridian's experience, super peak hedge products are already transacted frequently in over the counter hedge markets. A key benefit of over the counter transactions for flexibility hedges is that they are customisable. Different purchasers of super peak products have different load profiles that they want to hedge, and suppliers of flexibility will have different ideas about the structure of financial contracts that will best reflect their physical capacity to cover those contracts whether through batteries, thermal generation, hydro storage, or other resources.

A standardised product to facilitate over the counter transactions should be distinguished from an option where the Authority seeks to design a standardised product and list it on an exchange. Under that option, there would be a strong possibility that the Authority could invest in the design of a standardised product that was not highly traded. It is also not clear at this time whether the ASX would want to list such a product, so development of a new platform for listing of a standardised product would add further costs.

Meridian also queries whether the creation and listing of standardised super peak hedges would incentivise investment in flexible supply side capacity and demand flexibility. The price discovery time horizon for any standardised super peak hedge would not be sufficient to support long-term, capital-intensive investments in new supply side capacity. For example, peak quarterly futures prices are available on ASX for three years ahead. However, any investor will be looking for a return on investment over the life of the relevant asset (say 20 years) and will have to make a range of longer-term assumptions. The existence of near-term standardised products is likely of limited value in this exercise. Investors in supply side flexibility will also be looking at potential revenue stacks from a range of sources across spot, ancillary service, and financial markets. In any event, a standardised product would not be

able to incentivise investments in flexible capacity to be available in time to support the next two winters.

If the objective is discovery of forward prices for shaped products like peak and super peak hedges, there are alternative ways to discover prices at far lower cost to consumers. For example, the Authority is considering implementing improvements to the hedge disclosure obligations in the Code, which (if implemented well) would enable participants to analyse contract prices that broadly conform to different shapes like peak or super peak. This would enable transparent price discovery without the potential for wasted cost and effort if standardised products are listed.

Market making would involve significant costs to levy paying consumers and there are no clear benefits

The Authority seems to have presupposed that the only option for a standardised product is an exchange listing or similar. Furthermore, assuming that option is implemented, the Authority is testing views on whether to force trading through market making, rather than first monitoring whether trading emerged voluntarily because it is in the commercial interests of counterparties.

This is inconsistent with recommendation 24 of the Market Development Advisory Group, which suggested that market making should be considered as a backup or contingency option for implementation only if industry co-design of a standardised contract fails or it becomes clear in future that trading activity for flexibility contracts is inadequate to generate reasonable forward price discovery. Recommendation 24 is part of the tranche 2 lower priority recommendations for consideration in 2025 and beyond. In Meridian's opinion there is no case for bringing forward consideration of market making without first attempting industry co-design of a standardised flexibility product and then allowing time to monitor trading activity and price discovery (which as noted above, Meridian considers would most efficiently occur with prices discovered through the improved hedge disclosure system and analytical tools built on the back of that data).

Any market making of listed standardised flexibility products would entail considerable costs to consumers and the benefits are far from clear. The Authority increased its levy funding by \$14.4 million to cover the costs of a fifth commercial market maker for the existing suite of monthly and quarterly baseload futures. The fifth market maker provides only 20 percent of the total market making service and we understand the \$14.4 million levy cost covered only nine months from 1 September 2025 to the end of the financial year, meaning the notional

total annual cost of market making the current baseload contracts could be at least five times that sum (i.e. \$72 million per annum) and likely more (i.e. \$90 million per annum if the nine months of costs are extrapolated to a year). That cost could be expected to increase with any extension of market making into new products. If anything, we would expect the costs of market making for flexibility products to be higher than baseload products given the relative complexity in pricing such products and likely volatility. Any expected benefits to consumers from market making listed flexibility products would need to exceed those costs.

Meridian considers this unlikely because the benefits of price discovery can be realised at far lower cost through improved disclosure of over the counter hedges and improved analytical tools built on the back of the hedge disclosure system with the improvements proposed by the Authority to identify different shaped contracts and the associated prices at which they are transacted.

Before considering market making any further the Authority should first consider the design of a standardised flexibility product and monitor trading of that or similar products. Given the costs of market making, it should be a last resort option to be considered only if trading in flexibility products proves inadequate and price discovery for such products is not possible via an improved hedge disclosure system.

Meridian supports consideration of an Integrated Standby Ancillary Service

Meridian supports consideration of an Integrated Standby Ancillary Service. Work on this option should be a priority.

We agree with the Authority that this new ancillary service for standby reserve should be:

- fully integrated into the spot market (like other ancillary services, such as frequency keeping and instantaneous reserves) to ensure additionality; and
- technology agnostic and neutral between demand and supply flexibility to favour market competition.

We also agree that the costs and benefits to consumers would need to be carefully considered as part of this project. Given the timeframes involved and the likely evolution of capacity issues over time, the estimated costs and benefits to consumers should also be refreshed closer to the go live date.

Meridian understands that the design and implementation of this option may take several years and that peak capacity issues may be resolved by investment before this option goes

live. The situation should be monitored by the Authority on an ongoing basis while policy development and implantation activity occur. While we agree the winter peak capacity coordination issue is unlikely to persist long-term due to investments in generation, storage, and load management, the future is uncertain. It would be prudent to have this option ready for implementation if still required.

In Meridian's opinion, a new integrated ancillary service could support power system resilience and incentivise investment in flexible resources on both the supply and demand side, particularly by rewarding resources that offer critical backup but may be infrequently required.

Interim options to manage residual security of supply risks have high potential costs and risk unintended consequences

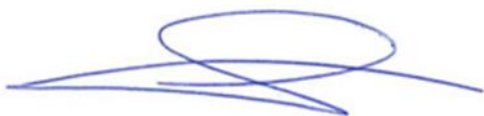
The consultation paper investigated interim options for rapid implementation ahead of winter 2024, including:

- contracts for out-of-market resource;
- out-of-market tender for emergency demand response; and
- payments to participants to commit their resources to the market.

Like the Authority, overall, we consider the interim options considered in the consultation paper likely to: be distortionary, be inefficient, add costs to consumers, and risk significant unintended consequences by undermining the current market design. We also have doubts about whether these options could in fact be implemented successfully ahead of winter 2024. While it is tempting to reach for immediate solutions for winter 2024 we agree that the costs likely outweigh the benefits and therefore these interim options should not be the priority for the Authority at this time.

Nothing in this submission is confidential and we would be happy to discuss our views with the Authority.

Nāku noa, nā



Sam Fleming
Manager, Regulatory and Government Relations

Appendix A: Responses to consultation questions

1.	Do you agree with the principle that the winter capacity margin should be based on the trade-off between the cost of the hours of reserve or energy shortfall and the cost of the peaking generation needed to mitigate it? Do you have any other suggestions on factors the Authority should consider and why?	Yes, in principle.
2.	Do you agree with our assessment of the incentives for demand response? If not, what is your view? Are there other criteria that the Authority should consider?	Yes, Meridian broadly agrees.
3.	Other than financial incentives, what are the other barriers to entry for demand response participation in the wholesale market that you have identified?	No comment.
4.	Do you agree that the Authority should focus its resources on identifying and lowering barriers for BESS and demand side flexibility to participate in the wholesale and ancillary services markets? If so, where do you think the Authority should focus first?	In the near term, we agree that the Authority's efforts are best focused on identifying and lowering barriers for BESS and (to a lesser extent) demand side flexibility to participate in the wholesale and ancillary services markets. See further comments in the body of this submission.
5.	Do you agree that any solutions should satisfy these principles? If not, what is your view and why? Are there other principles that the Authority should consider?	Yes, although consideration of the Authority's statutory objective should be paramount.
6.	Do you agree that a standard product for financial 'super peak' hedges is required?	No, it is not "required". The Authority should be asking whether a standardised product would result in long term benefits to consumers. As discussed in detail the body of this submission, Meridian considers a standardised 'super peak' hedge could be a useful starting point for some parties looking to agree bilateral contracts in over the counter markets. Listing and market making of any such product may entail high costs that exceed any consumer benefits.
7.	What factors do you think we should consider in the design of such a product?	Given the diversity of commercial needs amongst participants, a standardised product may be of limited value as anything more than a starting point for parties to adapt. In

		<p>Meridian’s experience, counterparties tend to request super peak contracts for difference in the form of an ISDA Master Agreement and Schedule. Requests commonly vary in terms of:</p> <ul style="list-style-type: none"> • volume; • reference price nodes; • duration of the period of cover, i.e. specific months, quarters, or years in future; • the trading periods considered to be included in a super peak; • whether the contract covers super peaks on business days only or seven days a week. <p>If the Authority intends to progress this option further, an industry co-design process should be attempted to carry out the initial design work.</p>
8.	Do you agree with our assessment of the risk for the medium to long term?	Broadly, yes.
9.	Do you think it would be beneficial to create a new integrated standby ancillary service? What is your view and why?	Yes, for the reasons given in the body of this submission. Although costs and benefits would need to be carefully assessed and reassessed closer to implementation.
10.	How should the costs for a standby ancillary service be allocated?	To wholesale purchasers as beneficiaries of the service.
11.	How should the residual requirement be set? Should it be an operational setting or dynamically calculated? If it is dynamically calculated, what factors should be considered in the calculation?	It would be simplest to use an operational setting of 200MW (at least initially), reflecting the system operator’s current trigger for a low residual situation notice. However, in the longer-term a more dynamic calculation could have merits.
12.	How should deficit (scarcity) standby residual be priced in relation to scarcity energy and scarcity reserve prices?	As noted by the Authority, this should be priced below the lowest price tranche of sustained instantaneous reserve contingent risk violation at \$3000/MWh.
13.	Do you agree with our assessment of the issues associated with procuring additional resource out of market? If not, what is your view and why?	Broadly, yes.

14.	Do you think it would be beneficial to create an out-of-market tender for emergency demand response? If not, what is your view and why?	No, for the reasons given in the body of this submission.
15.	Do you think it would be beneficial to provide payments to resource providers for any uncleared generation and/or dispatchable demand? If not, what is your view and why?	No, for the reasons given in the body of this submission.
16.	What do you consider to be an appropriate scaling factor to determine the price for residual and why?	Determining an efficient price will be challenging and any factor applied is likely to be somewhat arbitrary.
17.	What is your view on the factors the Authority should consider when valuing the costs associated with a standby ancillary service?	Costs of an integrated standby ancillary service would need to be considered in light of: <ul style="list-style-type: none"> • security standards that have not been reviewed since 2017; • public and political appetite for shortages that appear to be well below efficient levels; and • the potential costs and unintended consequences of ex-post interventions in the market if shortages were to occur.
18.	What other options should be considered to better manage residual supply risk for winter 2024?	Meridian has not identified any other options at this time.
19.	Do you have information on any other international standby ancillary services and their positive impacts? If yes, please share your information.	No.