Submission to the AEMC: Minimum System Load Framework and Floor Price Proposal

About Good Heat

Good Heat is a developer of industrial-scale electric thermal energy storage (eTES) projects. We deliver heat as a service to industrial customers, enabling the replacement of fossil fuel-fired process heat with renewable electricity without requiring our customers to invest capital or operate in dynamic electricity markets.

Our projects are designed to operate as large, flexible resistive loads. By storing energy as heat, we can shift electricity consumption in response to market conditions while providing reliable, continuous heat to industrial processes. This flexibility allows our assets to support power system operation while reducing emissions from Australia's industrial sector.

Good Heat is developing projects in Australia and Europe, and our first Australian project is currently progressing through development in Victoria.

What is eTES?

Electric thermal energy storage converts electricity into stored heat using resistive heating elements. Heat is stored in a thermal storage medium and discharged as required to supply industrial processes.

Unlike conventional industrial loads, eTES decouples electricity consumption from heat demand. This enables electricity to be consumed when it is cheapest and avoids adding to peak demand.

From a power system perspective, eTES behaves as a highly flexible demand-side resource capable of rapidly increasing or decreasing consumption within operational limits. As renewable generation continues to increase, this flexibility can assist in managing periods of excess generation, reducing renewable curtailment and supporting secure system operation.

A notable characteristic of resistive loads like eTES is the insensitivity to voltage or frequency disturbances.

Another key characteristic unique to thermal storage is its high storage capacity, and ability to discharge heat simultaneously with charging, which both allow for a much longer response than electrical storage facilities (batteries).

Our First Project

Good Heat's first Australian project is located in Victoria and is designed to supply renewable industrial heat to a large manufacturing customer.

The project has been deliberately designed to operate flexibly in response to electricity market conditions. The commercial success of the project depends on our ability to identify periods when consuming electricity provides value both to the customer and to the broader power system. Therefore, the project is necessarily exposed to spot prices.
The system could contribute approximately 250 MWh of load to a MSL event.

As one of the first projects of its kind in Australia, our experience highlights both the opportunities and the practical barriers facing flexible demand participation.

Signalling

We are not scheduled and do not have adequate access to market signals
Good Heat strongly supports the objective of encouraging additional flexible demand during periods of minimum system load (MSL). However, effective demand response depends on participants having timely and reliable information about when these conditions exist or are likely to occur.

Our facilities are expected to operate as market loads rather than scheduled loads. As a result, we do not have access to many of the operational signals and forecasting tools routinely used by scheduled participants.

If flexible demand is expected to play an increasingly important role in maintaining power system security, the associated operational signals should be readily accessible to all participants, irrespective of their registration category.

We have requested access to AEMO data several times and been rebuffed. NEMWEB is not an adequate substitute for a database; it is delayed and requires clumsy handling of zip files.

Mandating that we become scheduled is also impractical – the additional cost and responsibility are not reasonable for Good Heat to bear.

Defining minimum system load is necessary

We agree that it is important that the concept of minimum system load be clearly defined within the market framework.

Today, market participants can observe demand levels but cannot reliably determine when AEMO considers the system to have entered, or exited, minimum system load conditions, nor how AEMO intends to respond operationally.

A clearly codified framework would provide participants with greater confidence that they understand the circumstances in which particular interventions or market settings may apply. This certainty is particularly important for new forms of flexible demand whose operating strategies will increasingly depend on responding to these conditions.

We agree that the LOR conditions declarations is a good starting point for MSL. Good Heat will require a day ahead notice at a minimum to be able to prepare to maximise consumption during the MSL event. Longer notice periods would be helpful, similar to LOR, e.g. “potential MSL3 on Wednesday, AEMO requests market response”.

We are not sure this needs to be attached to ST PASA, rather than just refer to it. What’s important is that AEMO declares their intention to intervene, and to what degree.
Clear and transparent signalling will allow flexible demand to operate with confidence and will improve the effectiveness of any accompanying reforms.

Pricing

Good Heat tentatively supports the proposal to use market prices to encourage additional demand during periods of minimum system load. While it would directly benefit us, there are potential unintended consequences from intervening in price formation.

It is not clear to us what state of price formation is expected during MSL events.
Presumably having all thermal units at mingen, and all large renewables off will naturally lead to very low if not strongly negative prices.

We encourage the Commission to consider the interaction between any new pricing arrangements and existing ancillary service markets.

Large loads can face significant and highly uncertain exposure to Lower Contingency FCAS costs. During certain system conditions these prices can rise to the market price cap, creating substantial liabilities that are difficult to predict in real time. At the same time, small customers with rooftop solar are not liable for FCAS recovery, exacerbating the impact on remaining customers. Due to the difference in price cap to floor, and multiple Lower Contingency markets it's theoretically possible for the liability to be two orders of magnitude larger than the benefit from consuming at market floor price.
This creates an unintended incentive for flexible loads to *reduce* consumption precisely when the market may be attempting to encourage additional demand.

We encourage the Commission to carefully consider whether these FCAS cost exposures could undermine the intended effectiveness of minimum system load pricing reforms. If flexible demand cannot confidently estimate its total cost of consumption, participants may adopt conservative operating strategies that reduce rather than increase demand during these periods.

Another important interaction could be the impact on electricity contracts. There could be unintended consequences of skewing price outcomes beyond what might normally be dispatched.

In general, we agree with the concerns that price intervention may not influence the generators causing the MSL, and any response from rooftop solar is difficult to predict in the lead up to a MSL event. We do not share the optimism of the governing bodies that DER will soon be exposed to wholesale signals given the protectiveness of state and federal governments for this class of generator.

Procurement of Load Reserves/Response
Good Heat supports the concept of procuring demand-side providers to assist in managing minimum system load events.

This is our preferred pathway to providing AEMO with tools to manage MSL.

We consider there is value in establishing a mechanism that enables AEMO to contract flexible demand capable of increasing consumption when required for system security.

However, we recommend that such a mechanism operate outside the energy market, in a manner similar to the Reliability and Emergency Reserve Trader (RERT).

An out-of-market mechanism activated at AEMO's discretion would provide operational flexibility while avoiding unnecessary market registration and compliance obligations for participants whose role is to provide flexible demand only occasionally.

Reducing participation barriers will encourage a broader range of industrial loads to participate and should increase the available pool of demand-side resources.

We are sympathetic to the reasoning from the CEC, that dispatch interventions are problematic for operating short duration electricity storage. This is true for automatically setting price to the market floor as well.

We do not believe that short duration electricity storage is the ideal tool for this situation, although it intrinsically helps through normal operation and response to cleared market prices. An overreliance by AEMO on short duration electricity storage would be a poor outcome for all – here we agree with the CEC, the use of short duration electricity storage as the primary MSL tool subtracts from the capabilities to deliver other services.
Instead we believe electric loads in the traditional sense offer the best alignment with needs. Electric vehicle charging, and electric heat are the largest potential sources, and the MW scale facilities (e.g. electric freight and industrial heat) can offer the most schedulable flexibility.

As an aside, we note that the CEC's proposal to recover MSLAS costs from consumers again primarily impacts large loads, perversely incentivising them to switch off. The *beneficiary* is actually non-scheduled generators in this case.

We agree with the Commission's note that MSL requires a degree of 'aheadness'. This necessarily impacts the actions of a service provider in the day ahead of triggering, complicating the status of the service provider's bids when co-optimised as an ancillary service.

Overall, we prefer the forward procurement of reserves/response because it gives greater confidence that they will be available. Good Heat will not give substantial weight to intervention pricing or a potential ancillary service market in our eTES business cases due to the level of uncertainty on price, volume and duration. However, we can recognise a

contract with AEMO for a particular service. Note that the primary incentive for our investment is the low spot prices prevalent in the NEM.

We doubt that lithium batteries will give any weight to intervention pricing or an MSL ancillary service either, at least until revenues are demonstrated in reality. Furthermore, we expect that the implementation of another ancillary service will have a multi-year lead time during which AEMO does not have their tool, and the NPV to service providers is further discounted.

Conclusion

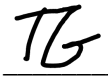
Good Heat supports the Commission's objective of creating a robust framework for managing increasing occurrences of minimum system load.

Flexible industrial demand, including electric thermal energy storage, has significant potential to contribute to secure and efficient power system operation while accelerating industrial decarbonisation.

To maximise this opportunity, we encourage the Commission to prioritise transparent operational signalling alongside any incentive mechanism. Participants must have confidence that they understand when minimum system load conditions exist and how AEMO will operate the system before price incentives can be expected to produce efficient outcomes.

We also encourage careful consideration of unintended interactions and support further development of an out-of-market load reserve mechanism that lowers barriers to participation while providing AEMO with an additional operational tool.

Thank you for the opportunity to respond to this consultation. Please contact us if you have any questions.



Tom Geiser
Chief Energy Markets Officer