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Nova Energy Limited
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25 July 2023

Submissions
Electricity Authority
PO Box 10041
Wellington 6143

By email: fsr@ea.govt.nz

Re: Ensuring an orderly thermal transition – discussion paper

Nova Energy (Nova) is pleased that this question is being addressed and has responded to the questions raised in the discussion paper.

Nova has not however attempted to answer the question of whether the existing thermal generators can provide adequate capacity to the electricity market through the transition to 100% renewables, or if additional peaking capacity will be required. So long as the Government proposes to put a cap on emissions from thermal generation at some point, or might fund development of Lake Onslow pumped hydro storage, then it is unlikely that any new thermal generation will be built.

Nova notes that open cycle gas turbines can operate on a range of gasses and liquids, which in future could potentially be made available from renewable sources. There is already much technical work being undertaken now to provide renewable fuels for air travel. It is possible that even with expensive renewable fuels, peakers may become more economic to run occasionally than operating the larger generation units at baseload in a market with high wind and solar capacity.

Nova's responses to the Authority's questions are appended to this letter.

Yours sincerely

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Nova submission: Wholesale market competition review

Q No.	Question	Response
Q1.	Do you agree with the desired outcome as described? If not, what do you think is the desired outcome in respect of thermal generation during the transition?	Strongly agree. There is significant change happening in the energy sector and disorderly closure of thermal plant will risk system reliability and that would be at a cost to consumers. A level-headed and predictable approach is needed to give thermal plant operators confidence to continue operations in the best interests of New Zealand. We note that there is a low tolerance for forced curtailments of consumers as evidenced by: • the reforms implemented after the 2009 Brownlee review in response to campaigns to conserve energy in the early 2000's; • the reaction to involuntary demand reductions on 9 August 2021; • weather related transmission failures in early 2023; and • the Government's Dry Year Battery Project where it is spending up to $100m (which approaches the cost to build 100MW of gas fired peaking capacity on a greenfields site) just investigating and developing business plans for dry year solutions let alone the prospective price tag of developing the Lake Onslow pumped hydro scheme; Expectations for security of supply can be expected to increase as New Zealand electrifies its transport and process heat. The reliability of the electricity system will take on increased importance and significance.. The experiences in Europe following the recent energy crisis and South Australia are examples of where forced outages resulted in hurried investment in thermal generation and supplies of thermal fuel, despite the desire to reduce emissions in the long run.
Q2.	Are there any other aspects of thermal transition risks that should be considered by the Authority?	Nova Energy holds consents to build 360 MW of open cycle gas turbine peakers (Peakers) near Otorohanga. Given the changes to legislation since consents were obtained in 2017, it is unlikely that further thermal plant consents will be granted. Without a significant increase in investment certainty, and quickly, this plant which is potentially critical to the transition will never be built.

Q No.	Question	Response
		Peakers may be built at Huntly, but we understand that may be subject to them replacing Rankine Units, so the incentive for doing so would be limited. Should it become necessary to shut down Unit 5 or a Rankine unit prematurely, deployment of replacement Peakers could not happen quickly. Peakers currently require 24-36 months to build, so even if investment signals were appropriate, there could arise a significant pressure point on the availability of dispatchable generation. Concept Consulting in Appendix B, quite reasonably, comments that it has not taken a view on the availability of flexible gas supplies, other than assume there will be gas available at a price premium to base-load quantities. The recent update of gas reserves suggests that the total gas market will necessarily be smaller than earlier projections. This may limit supply flexibility, and prices might start to move upwards towards an LNG import parity price, i.e. well above the prices assumed in the Concept analysis. Under such gas pricing, it may become uneconomic to keep Unit 5 running at baseload, even at low levels. While it could still support hydro-firming, startup times mean that it may not always be available to meet peak demand. Important considerations for investors in thermal capacity (as well as the fuels for them) include: a) appetite for such investment and the expected return on capital invested; b) ability to secure debt finance and insurance for such facilities which is declining relative to interests for the same entities to support renewable projects.
Q3.	Do you agree with the above expectation of the likely role of thermal generation throughout the transition? If not, what is your view and reasoning?	The prospect of the NZ Battery project (Lake Onslow or an alternative North Island pumped hydro storage project) overhangs the investment climate for thermal plant in New Zealand. If a decision is made to commence a large scale pumped hydro solution, that effectively puts a retirement date on all existing thermal plant. Plant owners need to make decisions in their own best interests, and it is unlikely they would invest heavily in plant maintenance or refurbishment if the impending commissioning of a pumped hydro storage project was going to limit the expected pay-back on such investment.

Q No.	Question	Response
		While Concept Consulting's modelling supports the conclusions reached in the paper there are still uncertainties that are not necessarily reflected in the modelling which will affect the role of thermal plant in the future; • demand growth is difficult to predict, particularly with the Government support being given to decarbonising through the ETS and GIDI fund; and • the extent to which demand response will play a meaningful role is also difficult to predict, particularly if growth comes from the digital economy rather than industrial processes. There is an underlying assumption that spot prices will incentivise continuing performance irrespective of a limited appetite from stakeholders for high prices, for example the UTS claim following the scarcity event of 9 August 2021. Nova understands the appetite for forced demand curtailments is very low, as noted above. In Nova's view, in the absence of continuing investment signals, the current fleet of thermal assets may fail to adequately support system reliability and security.
Q4.	What (if any) improvements could be made to information to aid decision-makers in relation to thermal transition risk?	As thermal plant exits the market, remaining flexible generation (hydro with storage) will be concentrated to a small number of parties. To address thermal exit is also to consider the market effects and pricing strategies of the remaining flexible generators in a post thermal market. Initiatives that support competition in that environment are also likely to be of value to thermal generators.
Q5.	Are there any aspects in current spot market arrangements that are likely to undermine incentives to make efficient decisions in relation to back-up resources? If so, what are they?	The modelling and analysis conducted by Concept Consulting captures the importance of high prices during periods of very tight supply to the financial returns available to thermal generators. Thermal generators need to be confident that they will benefit from high prices and not have them subjected to unreasonable delay or reduction due to lobbying. Nova continues to be frustrated that it has not been paid for its generation for the trading periods affected by the 9 August 2021 UTS process, and the incentive this places on parties to lobby regulators. In the real world thermal generators can also only benefit from high prices if they can anticipate them and ensure they are offered in to generate at the time. This has two important implications:

Q No.	Question	Response
		a) The offers (forecasts) of intermittent generators must be more accurate if both slow-start and fast start generators are to fulfil their role in covering for intermittent generation. Otherwise there will be need for additional demand response, prices will be higher than otherwise, and the return realised on investment for the thermal generators is lower, and b) The value of scarcity prices must be updated. If scarcity prices are below the true cost of lost load, then over the longer term thermal plants can be expected to retire prematurely given lower realised returns. The MDAG recognised the need for both these requirements in its recent Options Paper. Advancing Option 5 in the MDAG Options paper 'Offer price reductions after gate closure' would also enable the Peaker units that rely on unit commitment when offering into the market to compete more effectively with the price setting generators.
Q6.	Do current arrangements provide balanced incentives to conclude forward contracts to manage thermal risks of transition appropriately? If not, what are the reasons for your view?	The necessary arrangements are now largely in place, with real time pricing addressing the lack of pricing accuracy in situations when reserves fell below the minimum level required in SPD. The review of 'scarcity prices' still need to be addressed, as does settlement of prices for 9 August 2021. This will give retailers greater appreciation of the potential price movements in tight supply situations and should lead them to better cover their exposure to high spot prices.
Q7.	Do current arrangements ensure reasonable availability of forward contracts related to back-up services – such as dry year cover? Please explain your reasoning.	Nova believes there are adequate incentives in place. However, because ASX futures have separate prudential requirements to the Clearing Manager for the wholesale spot market, Nova does not believe that ASX Futures are sustainable as a core hedging product for dry year cover. That means that OTC hedges are generally required. This has the disadvantage for participants in that OTC hedges are illiquid and therefore it is more difficult for retailers to adjust exposure as retail volumes or market conditions change.
Q8.	To what extent do current arrangements create potential for	Consumers are not all the same and have differing needs. Residential consumers, commercial consumers and industrial consumers place different weightings on the

Q No.	Question	Response
	misaligned incentives between retailers and consumers in relation forward contracting with adverse impacts on thermal transition risk? Please explain your reasoning.	price / reliability / sustainability trade-offs. Of course the nature of the market is that all retailers, so long as they meet their prudential requirements and the Code, have the same right to supply their consumers from the grid. Under these conditions, consumers are not expected to make an assessment if their retailer will be able to supply them in the event of a supply shortage. This is not particularly unusual in the commercial world, but the binary nature of the financial viability of electricity retailers is perhaps less common. If a company's brand value was at risk if it hadn't fully hedged its exposure to spot prices they might take a more cautious approach. Large scale consumers can reach terms with their electricity retailer that they will reduce their demand under prescribed circumstances, as has NZAS with Meridian Energy.
Q9.	To what extent do current arrangements relating to use of ripple control in periods of tight supply affect thermal transition risk? Please explain your reasoning.	It is appropriate to use all available means to best manage the balance between supply and demand in tight supply situations. At the same time, it is also important that the true costs of the alternatives are recognised and factored into pricing. Ripple control of hot water is a valuable asset, and consumers are already paying for the ripple control relays in their power meters through metering charges. If ripple control is used to supress peak period pricing, then it also has the effect of reducing the marginal economics of thermal generation plants. As stated above, the Concept Consulting work highlights the importance of such pricing to maintain the economics of thermal generation in the transition. It is appropriate therefore that such demand response should be bid at an appropriate scarcity price. Ideally the revenue from that demand response should also be credited back to the affected consumers, but that would likely be difficult to implement.
Q10.	Do you agree with the Authority's view above that lumpiness does not (at present) threaten to disrupt an orderly thermal transition? If so, or if not, please explain your reasoning.	Yes, but tempered with the possibility that an abrupt exit by NZAS of the Tiwai aluminium smelter or termination of gas supply from a gas field for any reason could precipitate simultaneous closure of a number of thermal generators.

Q No.	Question	Response
Q11.	To what extent are there any selective support mechanisms paid outside the wholesale market which could pose a challenge to achieving an efficient thermal transition? Please explain your reasoning.	
Q12.	To what extent is thermal generation providing a service that is needed but not explicitly priced and rewarded? Please explain your reasoning.	The large thermal power stations by their design provide system inertia to the grid, thereby creating net free reserve. Nova understands that currently there is no need to incentivise the provision of system inertia, but as the balance of generation changes, rewarding system inertia will help retain existing resources at the margin. Peakers can also provide system inertia, but only at the cost of not operating at full capacity and as such would need compensation in order to provide that.
Q13.	To what extent will thermal retirement/investment decisions be driven by non-financial factors? Please explain your reasoning.	Periphery issues such as maintaining fuel supplies and staffing still come down to the financial benefits of maintaining thermal plant versus the opportunity cost of retirement. It is possible that these issues become more challenging and expensive as more plants are retired and the overall scale of thermal generation reduced.
Q14.	What (if any) other factors could undermine an efficient thermal transition? Please explain your reasoning.	In order of probability / impact: a) Unplanned plant failures that prove uneconomic to reinstate. b) The integral connection to the gas market and how that is transitioned. Maintaining supply flexibility is expected to become increasingly difficult as volumes fall and potential sources of flexible demand decline. c) There is a risk of staff seeing no future in thermal plants within New Zealand, and therefore leaving the industry for other opportunities. We are seeing this already. d) Emerging thermal technology, increasingly efficient and with low emissions options, e.g. carbon capture, utilisation and storage may disrupt existing operations. e) Continued access to capital as financial institutions respond to ESG pressures. f) Grid capacity if new renewable generation projects cause grid constraints.

Q No.	Question	Response
Q15.A	What (if any) other evaluation criteria should be considered? Please explain your reasoning.	The value of preserving optionality should also be considered. Peakers have the capacity run on renewable liquids or gasses, both of which may be stored in volume, or alternatively be linked to carbon capture and storage. Peakers can also be upgraded to run efficiently at baseload by retrofitting HRSG units and steam turbines. While these options are not currently economic, as an example, it is feasible that in future breakthrough developments in solar PV could lead to massive growth in solar rather than wind, and for that to be supported by renewable Peakers and batteries.
Q15.B	Do you have any views on the options discussed above, and how useful they might be if thermal transition risks increase in future?	**Option G – Introduce minimum notice period for reductions to plant capacity** may have adverse consequences. For instance, it may become a self-fulfilling prophecy with reduced odds of reversal as key staff and suppliers make their own decisions based on any announcement. The specific timing of closure may also hinge on market conditions, such as hydro storage levels, availability of gas supply contracts, or major demand shifts, e.g. Tiwai closure; none of which are fully predictable by either the Authority or the plant owner. The time elapsed in which a thermal generator can remain viable may also be uncertain, as is the case with TCC currently.
Q16.	What other options (if any) could be explored to mitigate thermal transition risks, should these risks increase in future? Please explain your reasoning.	Because the circumstances that may lead to thermal plant closure are many and varied it is difficult to apply a single formula to minimise the risk. The best option lies in the Code enabling the operators of thermal plant to: • operate efficiently, • compete effectively with both hydro generation and intermittent generation, and • manage their available resource to best effect.