Thursday, 5 October 2023

Dear Ms. Collyer,

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia, representing over 1,000 of the leading businesses operating in renewable energy, energy storage, and renewable hydrogen. The CEC is committed to accelerating the decarbonisation of Australia's energy system as rapidly as possible while maintaining a secure and reliable supply of electricity for customers.

The CEC thanks the AEMC for the opportunity to make a submission in response to the consultation paper on our *Enhancing Investment Certainty in the R1 Process* rule change request.

This rule change comes at a critical point in the NEM transition. The rapid and unplanned exit of thermal coal generation, combined with a national target to achieve 82% renewables by 2030, means it is critical that we accelerate new investment in renewable generation and storage.

Australia is already far behind where it needs to be in terms of attracting and retaining investment. A historically uncertain federal energy policy environment, material curtailment risk and a fracturing of the national regulatory frameworks has already made Australia a complex place to invest.

This is worsened by requiring investors to navigate a complex and uncertain connection process. Connecting a generator or storage asset to the NEM is onerous and time consuming, with a high bar set in terms of technical capabilities, exacerbated by complex modelling requirements. All of this occurs through a 'negotiation' with powerful monopolies with incentives to load uncertainties and associated costs onto connecting parties.

These material uncertainties are a major headwind to attracting international capital to invest in the NEM. We are already seeing this manifest as a slowing in investment in renewable generation. CEC members continue to identify the connections process as one of the key impediments to investing in the NEM.

The CEC's rule change request is designed to address this problem, primarily by trying to transform uncertainty into definable risk, and allocating that risk to the parties that are best placed to manage it. This is reflective of standard principles of economic efficiency.

It is worth reiterating that the rule change request was the product of an intensive work program with NEM stakeholders, including AEMO and NSPs, through the Connection Reform Initiative (CRI). We hope that the spirit of collaboration adopted by generators, developers, OEMs, NSPs and AEMO can be continued through the AEMC's processes.

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High level comments

Before addressing the specific questions raised by the AEMC, we first wanted to counter some of the principle-based arguments being made in opposition to our proposed rule. These counterarguments inform our specific responses to the questions below.

We consider many of these arguments are rooted in a misunderstanding of the actual incentives faced by investors and developers of renewable generation and storage assets.

One of these misunderstandings is the assertion that developers of projects will look to rush through the GPS negotiation process, and will target GPS levels that are far below what is reasonably required, in an effort to save on costs. We understand this has been proposed as a reason to reject the concept of materiality ranges and thresholds – as per the Type 1 process.

This suggestion ignores the reality of the GPS negotiation process. NPS are monopoly businesses that wield a disproportionate degree of power relative to connecting generators. AEMO, as a market body with clear regulatory powers under the NER, is also in a very different position to developers during a connection process. Further to this, the NER squarely place the 'onus of proof' on connecting generators during the GPS negotiations.

Assertions that connecting generators will somehow be able to use the presence of materiality thresholds to target lower levels of performance is therefore unrealistic – the sheer power imbalance in the GPS negotiation process, explicitly allowed for in the NER, means that AEMO and NSPs are entirely able to prevent such an outcome from arising in the first place.

Secondly, it's also illogical to suggest that connecting parties will be strongly incentivised to minimise their obligations, in either the GPS negotiation process or during R1, in order to minimise capital costs. The reality is that generators face far stronger incentives to progress a project as quickly as possible through GPS and registration, in order to finalise commissioning and begin earning revenue.

Most mature developers, who are fully cognisant of their negotiating position due to the power imbalances inherent in the NEM connection process, are therefore incentivised to meet whatever demands are placed on them in order to accelerate their connection to the greatest extent possible.

Anecdotally, many connecting generator and storage providers will in fact tend towards meeting the automatic access standard (AAS), and in fact providing levels of capability above the AAS, in order to accelerate their connection. This may include voluntarily moving to grid forming capability, or providing levels of reactive support capability that are far in excess of what is needed at the point of connection.

In short, the argument that connecting parties will always seek to target low levels of GPS capability in order to minimise costs of connection, does not correspond to the strong incentives faced by mature developers to do whatever is necessary to get their projects connected as quickly as possible.

Finally, we would also like to address the argument that it is somehow efficient to allocate the cost of material connection uncertainties to connecting generators. A basic concept of economic efficiency is that uncertainty / risk should be borne by the party best able to manage it. Another way of expressing this is to ask – who has access to the widest range of lowest cost mitigation solutions. This is the concept underpinning modern system security reforms, particularly the system strength frameworks - its universal application is key to driving lowest cost solutions for consumers.

Generators are not best placed to manage these risks and uncertainties, primarily on the basis that they do not have access to the full range of mitigation solutions. For example, some of the interaction problems that might be identified under a Type 2 connection may be resolved at lowest cost by making adjustments to network equipment for management of power quality, harmonics and voltage. Equally, a network is the only party who would be able to meaningfully coordinate the re-tuning of multiple inverter responses of IBR assets, in order to manage oscillatory interactions identified in a Type 2 process.

Generators would have access to none of these solutions, likely resulting in duplicative, wasteful and high cost solutions being adopted to resolve an issue – the cost of which will ultimately be recovered through higher wholesale prices.

Why make this rule?

The main benefits of making the proposed rule will be improvements to the overall connection process, by enhancing transparency, translating uncertainty to risk, and more effectively allocating that risk to the parties who can mitigate it at lowest cost.

This will reduce both implicit and explicit costs for all parties leading to more efficient investment, ultimately reducing costs for customers while supporting enhanced reliability of supply.

We acknowledge that outside this formal rule change, AEMO and some NSPs have been working to improve their internal processes. The CEC welcomes these ongoing developments and consider that these will drive improved outcomes for all parties.

However, the overall concern remains that these measures, while a positive development and well received by industry, will simply not be enough to address the material uncertainties that have arisen in regards to the NEM connection processes. This can only addressed through the provision of statutory certainty, by making well structured and definitive changes to the NER.

The many reforms being implemented by AEMO and some NSPs are best complemented by changes to the NER. This is necessary to ensure they are repeatable for all connecting parties. Even more importantly, this ensures they become standardised, certain and well understood by as many investors as possible.

In the below attachment we have responded to the specific questions raised by the AEMC in the consultation paper.

As always, the CEC welcomes further engagement with the AEMC on this reform. Further queries can be directed to Christiaan Zuur at the CEC on czuur@cleanenergycouncil.org.au.

Kind regards

Christiaan Zuur
Director, Market, Investment, and Grid

Attachment – Answers to specific questions in the AEMC consultation paper

Questions 1, 2 and 6: Absence of NER obligations on process engagement and timeliness

- **DO YOU AGREE THAT THE ABSENCE OF NER OBLIGATIONS ON PARTIES TO THE R1 PROCESS IS CONTRIBUTING TO POOR ENGAGEMENT AND PROCESS DELAYS?**
- **HOW DO CONNECTING PARTIES CURRENTLY MANAGE UNCERTAINTY REGARDING TIMEFRAMES FOR THE R1 MODELLING PACKAGE ASSESSMENT AND TO WHAT EXTENT DOES PUBLIC DATA (E.G. AEMO CONNECTION SCORECARDS) ASSIST?**
- **WOULD THE PROPOSED TIMELINES PROVIDE SUFFICIENT CERTAINTY ABOUT THE DURATION OF THE R1 MODEL ASSESSMENT PHASE?**

The rule change request sets out several issues with the status quo assessment of R1 models. Together these lead to inefficient allocation of uncertainty to investors. These include:

- Uncertainty of timeline and information – New entrant generators are not able to plan for how long it will take for a registration application to be approved. The current NER frameworks for the R1 process do not specify a timeline or time limit for NSPs or AEMO to review the R1 model package, to provide reasons for approving or rejecting an application, or to specify a pathway with specific requirements for a rejected applicant to meet requirements for registration. The current arrangements have therefore created material uncertainty for applicants, related to indeterminate project delays and considerable cost increases.
- Unbounded costs – This uncertainty results in increased and potentially unbounded costs. For example, needing to conduct unforeseen rounds of revisions to the R1 models requires allocating scarce engineering and technical resources. That incurs direct costs, plus opportunity costs as those resources become unavailable for an indeterminant time for other connection projects. This is in addition to the costs associated with foregone revenue due to delays in energisation of the generating system.

At its core, the issue with the current frameworks is that they place the material and unmanageable uncertainties related to R1 delays, solely on the generator, where connecting generators have no ability to predict or to manage these uncertainties. In a small market like Australia, investors are well aware of these unmanageable uncertainties, and will inevitably factor them into their investment decision making.

Inevitably, some generation connections will face issues during the R1 stage that must be resolved. At present, there is very little that generator proponents can do during the connection enquiry and GPS negotiation stages, to determine what issues will be identified in the R1 process. This is particularly the case where issues are identified in relation to the plant's performance against the grid – and where those issues are created by changes in the grid itself, external to the connecting generator's plant.

New entrants potentially face unbounded responsibilities to resolve these issues before they can be registered. They are also often not the party best equipped to manage those issues.

If there are complex issues identified through the R1 modelling, the new entrant may need to request an amendment to the connection agreement. The process for this renegotiation of a connection agreement is set out in clause 5.3.9 of the NER – this is the real basis of the significant uncertainty associated with the connection process. The 5.3.9 process can allow for the entirety of the previously agreed GPS to be reopened and subject to additional modelling. This can have disastrous effects on a project, resulting in material costs accruing for every day that a project is kept in this 'modelling loop'.

We note that a sperate workstream of the CRI led by AEMO is examining the clause 5.3.9 process to find improvements. However, at this stage it is unclear whether these issues will be addressed through the AEMO review.

The AEMC correctly identifies that AEMO and some NSPs are actively attempting to resolve the issues relating to unclear specifications of the requirements for new entrants and speeding up assessment. We welcome this ongoing continuous improvement on the connection process such as the AEMO connection scorecard based on the experience over the last few years.

We consider this rule change as a complement to these efforts. The cultural and process changes within some NSPs and AEMO - along with more experience from generator proponents and engineering consultants

engaged in connections – are of course critical to delivering an improved connections process. However, this is only part of the story.

These improvements in culture, process and relationships are naturally complemented by formalisation and standardisation of R1 processes in the NER. This allows all connecting parties to benefit, including those parties considering entering the NEM for the first time, which is critical to restoring overall confidence in the NEM connection process.

In this instance, formalisation through changes to the NER means converting material uncertainties with the current frameworks, into quantifiable risk. It then allows for these quantifiable risks to be allocated and borne by those parties best enabled to manage them. By doing so, these costs become manageable, and materially less than at present.

The CEC notes the question raised by the AEMC regarding whether publicly available data, such as the recently developed Connection Scorecard, helps to address uncertainty. The CEC acknowledges the value of measures like the Connection Scorecard in terms of helping to inform the general market and policy makers as to progress in the reforms to the connection process. However, as per the commentary above, this information is far too general to provide anything particularly meaningful to investors.

The most meaningful way to address the uncertainties of the R1 process is to standardise through the statutory requirements of the NER – as is their purpose.

Question 3 and 7: Existing process for renegotiating technical performance standards and the introduction of a materiality guideline

- **DOES THE EXISTING PROCESS FOR RENEGOTIATING TECHNICAL PERFORMANCE STANDARDS CREATE BARRIERS FOR ENABLING CONNECTING PARTIES TO NEGOTIATE EFFICIENT SYSTEM SECURITY AND RELIABILITY OUTCOMES?**
- **DO YOU AGREE WITH THE CEC'S PROPOSAL FOR MATERIALITY GUIDELINES, INCLUDING WHETHER THEY COULD APPROPRIATELY DEFINE MATERIALITY THRESHOLDS FOR THE CATEGORISATION OF CONNECTION TYPES?**

The rule change request identified that, historically, 'reasonable engineering judgment' has not always been applied when assessing non-compliance at the R1 stage with the performance of the GPS connected to the negotiated connection agreement.

Furthermore, as observed by the AEMC, the NER prevents NSPs and AEMO from accepting minor reductions between the GPS and R1, even where this would be consistent with the exercise of good engineering judgement. AEMO and NSPs are in effect prevented from accepting a slightly reduced setting in R1 than what was originally determined in the GPS, even if this would have no material consequence for the system, or where it may in fact be beneficial for the system – such as through better coordination of post-fault reactive response.

We also understand that the lack of a sensible, risk-based approach to assessing materiality has led to significant waste of limited human and capital resources. NER-level restriction on AEMO's and NSPs' ability to accept non-material changes from the GPS also places costs on generators both through project delays and potential capital costs of altered designs. Proponents have spent considerable effort, time, and resources to resolve minor issues which have limited to zero impact on the security of the power system. From an overall system cost perspective, this is an inefficient outcome.

In line with the NEO's efficiency objective, minimising this inefficient expenditure is the key purpose of the introduction of the concept of the Type 1 connection in the rule change request. Under this proposal, the NSP and AEMO become empowered to accept non-material changes, rather than requiring an inefficient expenditure to resolve this non-material issue. Providing rules clarity will allow for AEMO, NSPs and connecting parties to actually use their engineering judgement in these instances.

We understand that determining what can be considered a material impact likely will be a learning process for all parties. Consequently, AEMO and NSPs are likely to be conservative in this appraisal when the rule comes into force. However, having this framework in place allows for progressive development of requirements where it is appropriate.

There are various ways that a materiality guidelines / assessment framework might be developed. We acknowledge concerns from various stakeholders that materiality is difficult to standardise, however a sensible

risk based approach, which considers impact and probability on a case by case basis, should be possible and practical to determine. Defining what is material, and what is not, has been identified by members as a crucial element of the proposed reform, and central to reducing uncertainty around the connection process.

We also note advice from some our members that offers a valuable insight into why performance may reasonably change between GPS negotiation stage and the final R1 package. Developers advise that due to the NER requirement to target the Automatic Access Standard (AAS) in all standards, there is no capacity to add margins during the connection application stage, with all equipment being tuned to its limit. This means that when minor changes inevitably arise between the abstract modelling exercises of the GPS negotiation, and the R1 stage where the final design is firmed up, there is no room to account for marginal and immaterial reductions in performance.

The above interpretation also counters the argument that developers may seek to exploit the materiality thresholds framework, in an attempt to target lower initial GPS settings. In some cases, it may actually make more sense to adopt a more conservative approach to estimations of eventual plant performance and therefore GPS settings, rather than requiring all assets to meet the AAS under all conditions. A materiality threshold could be structured in a manner that reflects these likely changes, to deliver a practical and more flexible approach to connections – effectively to leave headroom for improved performance, rather than being viewed as an attempt to lowball the initial performance.

We also note the AEMC's request regarding the specific circumstances where downward negotiation of the GPS between 534A letter and R1 was appropriate but not feasible. The CEC encourages the AEMC to engage with developers on this specific issue, however we understand that particular responses under S5.2.5.5, related to post fault reactive current injection, have historically formed the basis of this situation.

Question 4 and 8: The R1 process and external system security issues

- **DO YOU AGREE THAT THERE ARE PROBLEMS WITH THE WAY THE R1 PROCESS SEEKS TO RESOLVE EXTERNAL SYSTEM SECURITY ISSUES?**
- **WHAT ARE YOUR VIEWS ABOUT THE PROPOSED PATHWAY FOR EACH CONNECTION TYPE, INCLUDING THE ASSIGNMENT OF OBLIGATIONS AND THE ALLOCATION OF COSTS AND RISKS?**

Please see the above sections for comments on the Type 1 pathways.

As a general comment, we understand that other stakeholders have argued the kinds of arrangements proposed in our rule change request must be balanced against 'additional administrative complexity', and associated time delays. This can be addressed by AEMO and NSPs investing in development of better processes to identify issues earlier in the process, as proposed by our rule change. As the CEC understands it, significant delays in connection processes to date can be often attributed to slow AEMO and NSP processes. Its therefore illogical to argue that our proposed arrangements, which would require both parties to actively invest in more effective connection assessment processes, could somehow make things worse.

Type 0 pathway

We note that generators will likely have a strong incentive to try and minimise any difference between the 534A modelling and the R1, in an effort to be able to follow the streamlined Type 0 pathway. We consider this strong incentive should be accounted for by the AEMC, when assessing claims made by other stakeholders that connecting parties might try and game the other pathways, in an effort to minimise their costs. As discussed in further detail below, the strongest incentive faced by connecting generators is to finalise their connection and begin earning revenue.

Type 2 pathway

The power system is complex and ever changing. The connection agreement sets out the performance of the incoming generator against the power system as it exists during the negotiation stage. Once the connection has progressed to the R1 stage, changes in external circumstance can affect the performance of the generator against the wider system. Under the status quo, the generator is responsible for modelling any changes, and potentially determining a solution.

This places a material uncertainty related to timing and cost on the existing generator, which it is unable to predict or manage.

The AEMC requested stakeholder examples of historical costs and time delays, along with feedback on AEMO's ongoing better regulation reform. The CEC will continue to work with members to provide the AEMC with this information, noting that it is commercially sensitive and also that developers may be unwilling to have published any information that might impact on their future relationship and negotiations with AEMO and TNSPs. The AEMC must therefore recognise that an absence of publicly available evidence of specific instances does not mean an absence of such problematic examples.

However, we can point to an (anonymised) example where the Type 2 provisions could have applied. In this instance a large project was held for an extended period in R1, where numerous PSCAD studies determined that a reduction in system damping was related to a power flow issue. As the project was the first one to push network flows past the MW threshold, it led to many investigations to better understand this phenomenon, even though it became evident that the generator didn't have enough capability to cause such a large swing in MW.[1]

In terms of management of broader power system issues, this should be viewed through the lens of appropriate allocation of risk. New entrants cannot manage the wider power system to control their R1 model outcomes to relate to the system. This means that generators continue to face material and unmanageable uncertainties associated with new, unforeseen complexities as the deployment of new inverter-based generation continues. No new entrant knows where it may face redesigns and indeterminate delays due to the changes in the modelled interaction with the power system identified through the R1 assessment.

This is why our rule change request introduced the concept of a Type 2 connection. Where the R1 modelling has identified issues that are due to the wider system, these are often better managed by the TNSP who has access to better information and modelling functionality. In addition, AEMO and TNPs have the global visibility, frequent modelling runs and wide area modelling capabilities, to better be able to identify and mitigate wider security issues.

Type 3 pathway

The CEC acknowledges concerns raised by AEMO regarding processes for ensuring compliance with the proposed conditional approval remediation plan.

The CEC does not consider that conditional approval should become a default approach for all parties. We have also consistently supported the development of strong compliance frameworks, to ensure that generators that progress under a Type 3 process follow through on their commitment to meet the conditions of R1 approval.

We note AEMO has raised questions regarding whether a 'physical curtailment' model would be workable to ensure compliance with these conditions, on the basis that this may come at the cost of meeting system reliability. While we acknowledge issues regarding reliability, it also follows that if AEMO had material concerns regarding the system security implications of the generator energising, it would be looking to physically curtail the asset anyway, whether through application of constraint equations or through a direction.

That aside, we consider that if there are concerns regarding the strength of incentives to meet remediation plans, then the threat of physical curtailment is probably the strongest possible incentive available.

If it turns out this is not practical, then a NER civil penalty provision may need to be considered. However, we understand from AEMO there are concerns regarding the force of these financial penalties, and whether they will be sufficiently strong to ensure compliance. The CEC suggests the AEMC engage with AEMO and the AER on this front, to explore how the civil penalty frameworks may be applied to deliver sufficiently strong compliance incentives.

[1] For reasons of confidentiality and commercial sensitivity, we will not name the project where this situation arose. We are happy to explore the possibility of facilitated conversations with the specific party, if this would be helpful for the AEMC.

Questions 5 and Question 9: Requirement for dispute resolution and its design in revised process

- **HOW MATERIAL IS THE ABSENCE OF AN INDEPENDENT, EXTERNAL DISPUTE RESOLUTION PROCESS FOR THE EFFICIENT NEGOTIATION OF TECHNICAL PERFORMANCE PARAMETERS BEFORE REGISTRATION APPROVAL?**
- **WHAT ARE YOUR VIEWS ABOUT THE CEC'S PROPOSAL FOR DISPUTE RESOLUTION?**

In the rule change request, we noted that the existing dispute resolution options such as the ability to request an independent engineer or commercial arbiter do not apply to the decision to approve the R1 model. The gap in the dispute resolution framework means there is no cost-effective and timely mechanism for generators to escalate concerns with the decision of the NSP and AEMO.

The AEMC notes that there are ongoing processes underway to improve the internal escalation and assessment process within AEMO. Our rule change request aims to acknowledge and integrate these changes into the new framework. By formally reflecting the ability to escalate internally (through the implementation of facilitated reviews) the revised NER will reflect the improved risk profile for generators. In the absence of our recommended changes, applicants would continue to need to consider any long term consequences of raising disputes and the likelihood of resulting changes.

We note that the decision to approve the R1 model for a new entrant generator is one that is made by a monopoly and market body and has considerable economic impact on a market-based business. Principles of good economic regulation require a clearly defined mechanism for issues to be raised to provide certainty for generators and investors.

Question 10: Alternative models

- **DO YOU SUPPORT THE CEC'S PROPOSED MODEL OR DO YOU PREFER AN ALTERNATIVE APPROACH? ARE THERE ANY MODIFICATIONS TO THE CEC PROPOSALS THAT YOU BELIEVE MAY IMPROVE IT?**

In its consultation paper the AEMC proposed two high level models which are suggested as an alternative to the CEC's proposal. The key benefit outlined by the AEMC for either of these models is that these would require minimal or no changes to the NER.

We consider neither of these models meets the policy goal of providing certainty and reduced risks to generation proponents through the improved process and behaviour.

Model 1 described by the AEMC is to focus on mechanisms outside of the NER such as AEMO's work to deliver continual work with applicants, while implementing more clarity on timelines. We acknowledge the work AEMO is doing in this space and look forward to it continuing. However, this does not address the fact that the current NER frameworks provide little guidance of the process followed or the expectations on part of different categories in the R1 process.

AEMO processes are developed, utilised and adapted at the sole discretion of AEMO. They are therefore less effective than NER defined processes, which have force of law and provide investors with certainty as to the risks faced by their projects. Rule change codification will bring increased certainty to participants that is more clearly defined than the status quo, even with improved process improvements in AEMO.

Model 2 described by the AEMC is to prescribe changes that would enable NSPs to undertake a lighter touch review of the R1 package. We note that in practice this might look like the Type 1 assessment where there is not much material impact determined by the R1 model.

However, this alternative does not fully engage with how NSPs will respond in more complex or difficult situations identified in R1. We consider that NSPs will tend to load the costs of managing these more complex issues on to generators, which is the precisely the issue we are trying to address in this rule change.

Further the effectiveness of this alternative model will depend on how individual NSPs respond and alter their behaviour under such changes. By contrast, placing a more predictable and clearer process with clearly defined tasks for responding to these situations will de-risk the process for the connection applicant, as well as providing the NSP and AEMO with tools needed to allow for rapid connection while maintaining system security.