2 December 2021

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Ms Anna Collyer
Chair
Australian Energy Market Commission
Sydney South NSW 1235

By online submission

Dear Ms. Collyer

Submission to Consultation Paper – DWGM distribution connected facilities

The Australian Energy Market Operator (AEMO) welcomes the opportunity to comment on the Australian Energy Market Commission (AEMC) Consultation Paper for Declared Wholesale Gas Market (DWGM) distribution connected facilities.

The accommodation of hydrogen production facilities and activities into the DWGM represents a significant step change, beyond what was contemplated by the establishment of the original regulatory framework. Many amendments required to accommodate natural gas equivalent (NGE) production will be addressed via the *Review into extending the regulatory frameworks to hydrogen and renewable gases* (Review) being conducted in parallel to this rule change process. However, there are a suite of changes specific to the DWGM, that are required to accommodate hydrogen and biogas production facilities as distribution connected facilities.

AEMO supports the principal objective of accommodating distribution connected facilities and hydrogen and biogas production into the DWGM. In terms of specific options posed by the Consultation Paper, AEMO has not identified critical issues for which it has a material preference at this preliminary stage and considers that industry is best placed to drive and position reform. Instead, AEMO's response broadly seeks to identify potential issues and options for resolution, and to set out high-level assessment of key issues. Nonetheless, AEMO supports options that efficiently balance implementation cost with benefit to industry and AEMO; and that have regard for the likely timing, scale and evolution of the future hydrogen industry.

Some observations are made within this submission regarding the applicability of certain elements of the Declared Transmission System (DTS) to the Declared Distribution System (DDS). In limited cases, gaps in the existing framework are identified and proposed for closure in the DTS to ensure these are not further exacerbated through application to the DDS. For example, some NGR gas quality and metering provisions relating to roles, responsibilities and procedures are outdated and do not recognise current best practise; and in some instances are silent on matters requiring clarity and prescription.

Attachment 1 addresses the questions raised by the AEMC in the Consultation Paper.

AEMC consultation may reveal an appetite from participants for AEMO to provide new services in respect of the DDS, which may not be permitted under AEMO's statutory functions, prescribed under s91A of the National Gas Law (NGL). On the basis of issues identified to date, AEMO does not have an early preference for where additional responsibilities should lie and will be guided by industry and government positions. It is noted that any expansion of AEMO's role into distribution systems must come within AEMO's statutory functions under the NGL, so this must be considered if any additions or changes to AEMO's role are proposed.

If amendments to the NGL are proposed through this rule change process, these should be consolidated with NGL changes proposed through the Review. Alternatively, if the need for future changes is foreseen but not yet required, amendments to the NGL could provision for specified changes to be made to the NGR by the AEMC to expedite any future amendment.

AEMO will continue to work with the AEMC on this rule change and the Review. Should you wish to discuss any of the matters raised in this submission, please contact Kevin Ly, Group Manager Regulation at kevin.ly@aemo.com.au.

Yours sincerely

Violette Mouchaileh
Executive General Manager - Reform Delivery

cc:

Attachments:

Attachment 1 – DWGM Distribution Connected Facilities AEMO Feedback

Attachment 1 – DWGM DISTRIBUTION CONNECTED FACILITIES
AEMO FEEDBACK

SUBMITTER DETAILS

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PROJECT DETAILS

NAME OF RULE CHANGE:	DWGM distribution connected facilities
PROJECT CODE:	GRC0062
PROPONENT:	Victorian Minister for Energy, Environment and Climate Change
SUBMISSION DUE DATE:	2 December 2021

CHAPTER 4 – ASSESSMENT FRAMEWORK

1. Is the proposed assessment framework appropriate for considering the proponents rule change request?	Industry is best placed to provide feedback on the assessment framework.

2. Are there any other relevant considerations that should be included in the assessment framework?	As above.

CHAPTER 6 – MARKET OPERATIONS

FACILITY REGISTRATION	
3. Should the existing definitions be expanded to include distribution connected facilities?	At this stage, AEMO does not have a preference as to whether existing categories should be expanded or new categories introduced. Specific new registration categories may be useful if distribution connected facilities (and their Registered participants) are subject to different Rule requirements to their transmission connected counterparts so that they can be readily differentiated. For example, if distribution connected producers are required to register but are only subject to a subset of the Rules for scheduling in the market then separate categories may be required so that it is clear which Rules (and Procedures) apply to each type of producer. If the Rule requirements are largely the same for a producer irrespective of a facility's connection location, then the existing registration categories would seem to be largely fit for purpose so long as they are extended to cover participants involved in the production of natural gas equivalents (NGEs), which is proposed by the Review into extending the regulatory frameworks to hydrogen and renewable gases (Review). However, a question to resolve is whether facilities that are producing hydrogen and directly injecting into the system (with blending occurring in the network or at another facility) should be captured as producers given that they are supplying energy into the market. This is currently unclear given the definition of natural gas and the proposed NGL changes in the Review to extend natural gas provisions to NGE. A further issue that should be considered is how blending facilities and their operators are registered. It is possible in the future that multiple Constituent Gas (CG) production facilities could sit behind a single common blending facility that injects NGE into the market. As the Consultation Paper notes, blending facilities would also withdraw natural gas to create a NGE and so differ from the current concept of a natural gas producer. There is potential that both the blending facility and the CG production facilities (and their associated participants) will need to be included in the registration framework if they are required to participate in the market. Further discussion regarding the application of NGR definitions to new production facility types and commercial arrangements is covered by AEMO's response the Review Consultation Paper.

4. Alternatively, should a new participant category be introduced to account for distribution connected facilities?	See previous response.
REQUIREMENT TO SUBMIT BIDS AND GAS SCHEDULING	
5. Should all bidding rules be updated to allow distribution connected facilities to bid into the market? If not, why?	If DWGM coverage is expanded to include distribution connected facilities, energy that is injected or withdrawn from the market will need to be accounted for in some way for settlement purposes. AEMO considers that at a high-level, there are at least two options. As the options are yet to be fully defined, AEMO is unable to undertake a full impact assessment at this point, however preliminary views are provided below. Response to questions 7 and 12 also relate to scheduling. **Option one: distribution connected facilities are included for bidding** Under this option, a distribution connected injection facility would be scheduled in the same manner as a transmission connected facility. Participants would be required to submit bids to the market for any volume of gas that they intend to flow through the DWGM and the facilities would be scheduled accordingly. It is assumed that the same set of scheduling and bidding Rules would apply to these facilities and therefore existing Procedures and systems could be largely extended to cover the new facilities without significant change. AEMO has not identified the need for any bespoke bidding requirements at this stage however this will require further consultation with participants. **Pros** • Relatively simple to implement on the assumption that existing functionality can be extended to distribution connected facilities. • Participants will be able to leverage the DWGM for portfolio/risk management. • Injection bids at these facilities will be published and provide market transparency. **Cons** • Mandatory market participation for facilities and participants may lead to potential operational/administrative burden. • May not be proportionate in terms of overhead for very small facilities to submit bids. **Option two: distribution connected facilities are excluded from bidding** Under this option, distribution connected facilities and the participants injecting gas from these facilities would not directly participate in the market. The facilities would not be scheduled in the DWGM and participants would not need to submit bids. DWGM wholesale market settlement would continue to only be for amounts that are withdrawn from a DTS custody transfer meter (CTM) with injections from distribution connected facilities and their associated withdrawals excluded from wholesale market settlement.

	To facilitate this option, adjustments to DWGM wholesale and retail settlement would be required to account for any quantities of gas injected by a distribution connected facility. A change is likely to be required as the current allocation process only contemplates withdrawals from the DTS into a declared distribution system (DDS) and assumes that this withdrawal is the only supply source for demand. AEMO expects that retail allocations would need to be updated to determine the share of withdrawals from the DTS versus injections into a DDS from directly connected facilities with these quantities allocated to the appropriate participants and settled accordingly. Other market processes may also need to be modified to account for quantities in a DDS not injected from the DTS e.g. the distribution UAFG process. An alternative approach could be to include amounts injected by a distribution connected facility in the wholesale market and settle any quantities at relevant market price without requiring the facilities to bid. For example, by treating any injections of gas as a deviation with participants being price takers at the next schedule's price. This approach would still require data exchanges between distribution connected facilities and AEMO systems and may not be appropriate if these facilities make up a significant share of supply. **Pros** • Possibly minimises participation "burden" for distribution connected facilities. • No need to submit bids for quantities of distribution injections. • May be more practical while distribution connected facilities remain a small share of supply. • Participants injecting at these facilities are not exposed to DWGM risk under an option where injected amounts are removed from market settlement (potentially also a con). **Cons** • Retail and wholesale allocations will need to be adjusted to reflect distribution-level injections and the systems do not currently cater for this. Therefore, system implementation is likely to be more complex than the bidding option. Further assessment is required for AEMO to understand the impacts of this option on its systems. • If there is a long-term view that these facilities should participate in the market then it may be undesirable to invest in developing this option in the short-term. • Participants operating at these facilities are not able to directly participate in the DWGM e.g. to sell gas into the market / manage their portfolios. • Limited market transparency for distributed connected facilities. • Not a scalable option if distribution connected facilities produce a significant share of supply.
6. Should all scheduling rules be updated to allow injections into the declared distribution system to be scheduled? If not, why?	See previous answer.

DEMAND FORECAST	
7. Should the demand forecast definition be amended to include all gas consumed from distribution and transmission systems within a declared system?	This will depend on whether distribution connected facilities are scheduled in the DWGM or not. • If distribution connected facilities are scheduled, then the definition of demand should be changed to include consumption supplied from these facilities so that injections balance withdrawals. • If the facilities are excluded from scheduling and allocations are managed outside of the market, then the definition of demand would remain as the gas withdrawn from the DTS. In this case while the definition would not change, the retailers would then need to change their demand forecasting methodology to be all demand minus the demand supplied from these distribution connected facilities. If the number of these facilities increases, the lack of transparency could create system security risks without being accurately forecast and AEMO would likely require site specific demand forecasts from the retailers from each of these locations per NGR208(2). The other consideration for demand forecasting is how this will impact on blending constraints. Hydrogen facilities will have blending limits therefore the amount of hydrogen which can be physically injected will depend on the consumption within that given network. Who and how this locational demand forecast is generated also needs to be considered to ensure an accurate scheduling constraint can be generated.
8. If not, is there an alternative solution that would maintain the existing NGR gas demand forecast definition?	See response to question 5.
DETERMINATION OF MARKET PRICE	
9. Should distribution connected facilities' constraints be treated consistently with transmission injection facilities and excluded from the pricing schedule? If not, why?	**Managing constraints** This question is only relevant if distribution connected facilities are included in the wholesale market. The constraint scenarios that would be likely to apply to a distribution connected facility include: 1. A facility-level constraint affecting the ability of the facility to inject into the market. 2. A distribution constraint related to the capacity of the distribution network. 3. A blending constraint required to ensure that gas in the distribution network remains within gas quality specification limits. The first scenario is analogous to a supply demand point constraint in the current market. In the existing market, these constraints are applied to facilities that are external to the transmission system e.g. Longford Gas Plant and the constraints are therefore applied to both the pricing schedule and operating schedule. The same approach could be adopted for distribution connected facilities. For example, if a distribution connected facility has an operational issue that affects its injection capacity, the facility operator could communicate the constraint to AEMO. AEMO would apply the constraint to that facility's injection meter in both schedules. The second and third scenarios refer to constraints that occur on a distribution system. As distribution system flows will not be scheduled by the market and participants have limited ability to respond to distribution constraints through the DWGM, it may be simplest to apply this type of constraint to both schedules - similar to how an 'external' constraint is currently managed in the DWGM including how facility flows are limited by their accreditation and their operating agreement with AEMO.

	Alternatively, if these constraints are only applied to the operating schedule, then they would potentially create uplift charges and ancillary payments if higher priced injections are scheduled in the OS to offset a reduction in injections caused by a distribution level constraint. However, as uplift is not locational it is not clear that this would provide a meaningful signal that participants could respond to in an efficient manner. In general, AEMO considers that the Rules could provide the high-level framework for constraints including Rules around information flow with Gas Scheduling Procedures used to specify the constraint scenarios and how the constraints are applied to the schedules.
OPERATING SCHEDULES	
10. Should the existing design be maintained with distribution networks managing the constraint issues outside of the DWGM?	As it is not proposed that flows in individual distribution systems will be scheduled by the market, distributors would need to manage constraints on a distribution connected supply source within their own networks. Where appropriate, distributors would need to provide constraint information to AEMO if distribution connected facilities are scheduled in the market.
11. Should the operating schedules be expanded to allow distribution constraints within the operating schedule? a. In this case, what compliance liability considerations need to be made for distribution connected facilities?	See response to question 9.
12. Should a new constraint type be added for distribution connected facilities that is managed by the gas scheduling process?	An important issue to resolve is the party that is responsible for communicating the constraint to AEMO. The constraint would not need to be applied to the distribution network itself but rather AEMO would need to understand the impact on net injections by the distribution connected facility into the network so that this can be reflected in the schedules. The Rules could create a head of power for a new constraint type, including coverage for information with the Procedures providing detail on how the constraint is managed and applied.
CAPACITY CERTIFICATES	
13. Should distribution connected facilities be allocated capacity certificates for tie-breaking rights? Why?	AEMO considers that industry is best placed to comment on whether capacity certificates are required at these facilities to manage market risk.
14. What would be the implications of modelling the capacity of potentially a high number of distribution connected injection points?	Significant modelling is yet to be completed; however, preliminary modelling indicates that distribution networks could be incorporated into the zonal model relatively easily in most regions. For example, the Hyp Murry Valley project in Albury Wodonga could be incorporated into the proposed Northern zone as this distribution supply effectively impacts the transmission network as a reduced locational demand. Therefore, a DTS injection at Culcairn, or an Albury Wodonga distribution network injection, are comparable supplies within the Northern Zone, and injections into the Albury Wodonga network would reduce the injection capacity into the DTS at Culcairn.

CHAPTER 7 – MARKET OUTCOMES

TITLE, CUSTODY AND RISK	
15. Do the rules need to be changed to manage the title of injections within the distribution system?	The gas ownership and title provisions in the NGR and NGL do not appear to be adequate as they only cater for title transfer at the interconnection of the DTS and a distribution system, where title is transferred to the market participant withdrawing gas at a system withdrawal point. Under the current definitions, the arrangements would not cover distribution connected facilities without amendment. AEMO understands that the Review is also considering this matter. Changes in the NGR and NGL will have impacts for the Wholesale Gas Market Ownership Rules (an AEMO Procedure). AEMO therefore requests to provide feedback into this work as the rule change progresses. The interactions between establishing and transferring title and retail and wholesale market mechanisms (e.g. allocations) needs further investigation as the options are developed.
16. Do the rules need to contemplate the co-mingling of gas within a distribution system? If not, why?	The current Rules allow AEMO to comingle gas in the DTS. Distributors are best placed to comment on whether equivalent Rules are required for distribution systems or whether existing arrangements are adequate.
PARTICIPANT COMPENSATION FUND	
17. Should the participant compensation fund cost recovery mechanism be expanded to include distribution connected facilities? If not, why?	If distribution connected facilities are included in the market (i.e. scheduled) then the participant compensation fund should be expanded to include distribution connected facilities to ensure participants injecting at these facilities are eligible.
ALLOCATIONS AND DETERMINATION OF FEES PAYABLE	
18. Should the definition of what gas can be allocated be expanded to include gas supplied by distribution connected facilities?	If distribution connected facilities are included in the market, then the definition of what gas can be allocated should be expanded so that market fees apply equally. If distribution connected facilities are outside of the market a fee framework may still need to be considered. Although these facilities would not directly participate in the market, costs associated with settlement and retail systems changes will need to be recovered from participants on an equitable and cost-reflective basis.
19. Are there other alternative solutions that would be more effective?	No comment.
DEFAULT NOTICES AND MARKET SUSPENSION	
20. Should the rules be expanded to include distribution connected facilities for default notices? If not, why?	If the facilities are scheduled then these rules should be expanded, if not then they could be excluded as they will not have market exposure.

21. Should the rules be expanded to include distribution connected facilities for market suspension? If not, why?	See previous response.

CHAPTER 8 – SYSTEM OPERATIONS

APPLICATION OF THE CONNECTIONS FRAMEWORK	
22. Should the connections' framework be expanded to cover distribution injections? If not, why?	The existing connection framework involves AEMO and APA approving connections to the DTS. AEMO performs multiple functions for a new DTS connection such as gas quality monitoring requirements, metering requirements, system operation impact assessments, SCADA data connectivity and communications configurations, and potentially facility registration and market registration setup for the facility. For a distribution connected facility AEMO would still play a role however it is anticipated to be less significant. The facility registration, market registration, SCADA and metering data requirements are likely to remain. A key issue for distribution connected facilities is that appropriate processes and controls are in place to ensure that the blended gas stream remains within the gas quality specification limits. Therefore, to ensure a consistent process for all connections regardless of which network a facility is connecting to, a consistent framework would be beneficial. The process would need to recognise that the parties will have different responsibilities depending on which network the facility is connecting to. The general approach to this should be to maintain flexibility for future change by limiting prescription in the Rules and establishing detail in the Connection Approval Procedure. Any amendments would be subject to industry consultation by AEMO to ensure a fair and balanced approach.
23. If so, what considerations should be accounted for in the transitional wording?	Distribution businesses are best placed to determine how transitional arrangements might apply to projects at various stages of the connections processes.
24. Who should the party responsible for assessing and approving connections into the distribution system?	Distribution businesses would predominately provide this assessment as the asset owner and operator.
25. Is the separation of connection agreements before 15 March 1999 with those made after still relevant within the NGR?	It is AEMO's understanding that there are no longer any facilities connected to the DTS which pre-date 15 March 1999 that have not had a connection modification but notes that this can be validated via the AEMC consultation process. If AEMO's understanding is correct, the clause is redundant and could be removed from the rules.
OBLIGATIONS OF THE DECLARED SYSTEM SERVICE PROVIDERS	
26. How should the rules be amended to include obligations for DDS service providers? Where should these obligations sit in the rules?	A framework for connection and registration would be beneficial as it would provide a single consistent and transparent approach for new connections regardless of which network a party is connecting to. The framework however would need to acknowledge that different parties would have different responsibilities depending on whether a distribution or transmission network is being connected to. If the rules provide the guidance for this high-level framework, the details could then sit within the Wholesale Market Connection Approval Procedures (Victoria).

27. If so, are there any additional considerations that are needed for the declared distribution systems?	See previous response.
AEMO'S OBLIGATIONS IN ASSESSING AND APPROVING CONNECTIONS	
28. Are the declared distribution system service providers the most appropriate party to facilitate connections into the declared distribution system? Why?	Yes, the DDS SP is the most appropriate party to facilitate these connections as they are the asset owner, and they know the capacity and typical flows in their networks.
29. Should AEMO have an active role in assessing and approving connections for distribution connected facilities? Why?	AEMO would only need to be involved as described in Question 22. That is receipting data, market registration and setting up the data connectivity.
CONNECTED PARTIES' OBLIGATIONS	
30. Should the rules be expanded to enforce compliance from distribution connected facilities regarding their connection agreements?	DDS Service Providers are best placed to identify any enhanced compliance requirements. The nature and extent of the framework is up to the AEMC as informed by industry feedback. Consideration needs to be given to having appropriate compliance mechanisms established for maintain gas quality within specification limits.
31. Are there any alternative solutions that would be more effective?	See previous response.
GAS QUALITY	
32. Who should be responsible for the management of the gas specification within the distribution system?	**Gas Quality Responsibilities** Broadly, responsibilities for gas quality should be considered in terms of three activities. That is, responsibility for: setting the gas quality standard; providing gas quality monitoring systems and plans; and actively monitoring the gas quality. This is covered in further detail in the following sections, however in summary, AEMO's preliminary view is as follows: • Setting the standard: There should be a single transparent standard dealing with gas quality in distribution and transmission networks (not necessarily uniform standards) and that AEMO may be best placed to develop this, in consultation with network owners and other stakeholders. • Providing gas quality monitoring systems and plans: Systems should be provided by a Connected Party where they elect to do so, or by a network service provider if the Connected Party does not provide the system. The submission of gas quality monitoring plans for approval should be required by the party providing the system. • Monitoring gas quality: There are two options for monitoring gas quality for a DDS connection – either the DDS Service Provider or by AEMO. Both options would require the sharing of data between the DDS Service Provider and AEMO. The first option may be

	more aligned to the operational responsibilities, whilst the second option may be more efficient and provide for greater consistency between DDS Service Providers. **Standard gas quality specifications responsibility** The most efficient outcome would be to have a single Victorian gas quality standard covering all distribution networks and transmission networks. This would provide a single transparent standard for anyone wanting to connect to either the transmission or distribution network. AEMO would appear to be best placed to set the single standard for Victoria as it has already established guidance and transparency for the DTS participants through its *Gas Quality Standard and Monitoring Guidelines*. This document provides an overview of the standard of gas quality required at all system injection points connected to the DTS and could become a Procedure under part 15B of the NGR. Assuming the establishment of a *Gas Quality Standard and Monitoring* Procedures, which could also cover biomethane and hydrogen connections, under the NGR, changes to the document will be subject to consultation. It will therefore be open to collaboration with participants, including asset owners, providing the opportunity to input into its modification.
33. What is the most appropriate instrument for the gas quality monitoring requirements: b. The rules? c. AEMO guidelines or procedures? d. Another instrument?	**Standard gas quality specifications instrument** Per the above response, the most appropriate instrument for setting out gas quality monitoring requirements would be a Standard/Procedure based on AEMO's current *Gas Quality Standard and Monitoring Guidelines*, which incorporates AS 4564, Victorian legislated requirements, and the physical asset requirements. While AEMO initiated the development of the *Gas Quality Standard and Monitoring Guidelines* based on operational requirements, this document is not recognised by the NGR. This is an issue because the additional requirements[1] for gas quality, required for the safe operation of the DTS, covered in the guideline are not NGR compliance obligations, despite being required under other legislative instruments or being deemed necessary by the DTS Service Provider or AEMO. Recognising the *Gas Quality Standard and Monitoring Procedures* as a Wholesale Market Procedure under 135EA(2)(s) of the NGR will mean that requirements identified as being necessary for the safe operation of the system that do not currently sit in other instruments will be mandatory. Under NGL 91BN(1), AEMO and each person to whom the Wholesale Market Procedures are applicable must comply with those Procedures. Other benefits of including requirements as a Wholesale Market Procedure are that it would provide both DTS and DDS participants clarity about exactly what is required and the mandatory nature of the requirements. Also, as a Procedure under part 15B of the NGR, changes to this document will be subject to consultation and therefore participants will get the opportunity to input into its development, meaning that there will be a collaborative approach to its establishment. Should the existing framework for DTS gas quality be similarly applied to a DDS without formal NGR recognition, the same risks and lack of clarity are likely to arise. The above could be achieved by redefining "standard gas quality specifications" to mean specifications contained in the AEMO *Gas Quality Standard and Monitoring Procedures*; and amending NGR 287 to require AEMO to make the *Gas Quality Standard and Monitoring Procedures* setting out the standard gas quality specifications.

[1] For example, this includes parameters without quantitative limits in AS 4564 or the Regulations, but which require an appropriate limit determined based on the characteristics of the DTS.

Gas Quality Standards - Offline gas quality measurements

AEMO proposes that the *Gas Quality Standard and Monitoring Procedures* would cover the requirements for measurement of offline parameters and therefore these requirements should form part of the gas quality monitoring system[2]. This will be important for biogas and biomethane which have different impurities to natural gas and are likely to require different offline measurement regimes.

This will be important because while offline measurements are covered by the *Gas Quality Standard and Monitoring Guidelines*, they do not form part of the gas quality monitoring system per the existing rules. This leaves important offline measurements such as compressor oil, mercury and radon as ambiguous requirements which can be covered by other standards but without a clear requirement for them to be monitored by the NGR.

Defining the gas quality monitoring system as the requirements documented within the *Gas Quality Standard and Monitoring Procedures* (per the above proposal) would provide clarity to address the existing offline gas quality monitoring gaps within the NGR, and allow for future flexibility as new offline monitoring requirements are expected to be required for biomethane/biogas.

The above could be achieved by removing reference to specific monitoring equipment in NGR 288(4); and instead requiring monitoring equipment as specified in the *Gas Quality Standard and Monitoring Procedures*, which would include measurement of offline parameters.

Off-specification Gas

Depending on who is monitoring gas quality at the distribution level, there may be value in a consistent approach to managing off-specification gas at both the transmission and distribution level. Currently, NGR 289 establishes, for the DTS, AEMO's ability to accept off-specification gas and AEMO's *Gas Quality Guidelines* provides a transparent and consistent approach for accepting or rejecting low levels of off-specification gas. This arrangement is permitted under NGR 289(5)(b) where AEMO determines, in its reasonable opinion, that *"acceptance* (of off-specification gas) *is necessary to ensure the safety of the public or the safety, security or reliability of the declared transmission system."* Furthermore, NGR 343(1)(d) enables AEMO to require (therefore allow) the supply of off-specification gas into the DTS when intervening to overcome a threat to system security.

There is however no provision in the NGR that would allow the distributor to accept off-specification gas into its network (except where this is supplied by AEMO from the DTS). It may therefore be prudent to have an arrangement similar to the DTS framework for managing off-specification. This would remove the requirement to shut-off supply from a hydrogen or biogas facility every time there is a short duration off-specification gas excursion, or the requirement to conduct a risk assessment in response to every off-specification gas event to determine whether the gas is safe to accept.

If this was extended to distribution networks, it could provide similar transparency and consistency benefits both within and across networks. Similar to the DTS, it would need to be demonstrated that acceptance of off-specification gas is necessary for safety, security or reliability of either the DTS or the DDS, or both.

Consideration should be given to whether AEMO's *Gas Quality Guidelines* should be specifically referenced in the NGR, and whether this document should be extended to cover DDSs, or whether DDS Service Providers should develop their own arrangements. A mechanism for recognising the *Gas Quality Guidelines* in the NGR could be through adding a new definition to Part 19, with this definition meaning the

[2] Continuous monitoring for some gas quality parameters is not always feasible, and offline testing can be conducted instead e.g. for measuring contaminants such as compressor oil, mercury, radioactivity, elemental sulphur and mercaptan sulphur. Offline testing frequency requirements vary from days to months and involve taking a gas sample from the relevant facility, injection point of gas field and sending this to a laboratory for testing and reporting results.

	guidelines made by AEMO pursuant to NGR 289. AEMO and distribution businesses would still retain the ability to deviate from the Gas Quality Guidelines as required, based on assessment of risk and requirements.
34. Should the declared distribution service providers and Energy Safe Victoria be the parties responsible for continued monitoring of the network and compliance respectively? If not, Why?	**Provision of the gas quality monitoring system** Current DWGM rules require the DTS SP to be the only provider of gas quality monitoring equipment for an injection facility connected to the DTS. This however does not reflect current practice as for five out of ten injection points, the gas quality monitoring system is provided by the Connected Party. For distribution connected facilities it would make little sense for the DTS SP to be the provider of the equipment. For online measurements, a Connected Party to the DTS or a DDS should be explicitly permitted to provide a gas quality monitoring system for the system injection point if equipment complies with the standards and the Connected Party elects to do so. If the Connected Party does not provide their own equipment, then the relevant service provider (either the DDS SP or DTS SP) they connect to would be required to provide the system. The benefit of this approach is that it may lead to more competitive pricing and other arrangements. This is also consistent with the approach to the provision of DTS metering installations which may be provided by the DTS SP or a Connected Party. Currently offline measurements are not part of the gas quality monitoring system and therefore not required to be covered by the monitoring plan. The Connected Party is best placed to meet this obligation as this typically involves testing within the production or storage facility. The rules should be adjusted not to specify the contents of a monitoring system but allow the online and offline requirements to be covered within the proposed *Gas Quality Standard and Monitoring Procedures* and recognise that the provider of each of these components could be provided by different parties. This issue will also exist for new distribution connected facilities which will need to develop measurement regimes and to monitor the impurities associated with biogas and biomethane. **Submission of gas quality monitoring plans** Consistent with existing provisions, a gas quality monitoring plan for a distribution connected facility should be submitted for approval. Responsibility for approving this plan should sit with the party responsible for monitoring gas quality and compliance, whether that be AEMO or the DDS SP (per discussion below). There are a number of gaps regarding the existing framework for gas quality monitoring plans, which will need to be addressed in developing new DDS arrangements, should the existing arrangements be applied. These are discussed below. <u>Responsibility for online versus offline measurements</u> Under DTS arrangements the gas quality monitoring plan must be submitted by the provider of the gas quality monitoring system (i.e. the Connected Party or the service provider). This is appropriate for online quality measurements where the provider is responsible for the gas quality monitoring system. For offline measurements, it is proposed that the Connected Party be responsible for the submission of a gas quality monitoring plan. Currently for DTS Connected Parties there is an inferred responsibility for the gas quality monitoring system provider to submit a plan in respect of the offline requirements, however these would be more appropriately provided by the Connected Party. This would address a gap under Victorian legislation whereby a Connected Party is required to supply gas that meets the gas quality standard but there is no requirement to demonstrate compliance with offline measurement requirements. This gap should therefore be addressed in the DTS and carried through to DDS arrangements. <u>Captured facilities</u> The framework should be reviewed to ensure that all production facilities are required to submit a gas quality monitoring plan, whether directly or indirectly connected to the DTS or DDS. Under DTS arrangements, due to the operation of the producer definition, a producer

	that is not directly connected to the DTS (for example where connected via an interconnected pipeline) is not a Registered participant and not required to submit a plan, yet ultimately supplies gas to the DTS. The impact is that AEMO has limited information by which to monitor gas quality for the facility supplying the DTS. Plan requirements To ensure clarity and consistency across DDS SPs regarding content and procedural matters, gas quality monitoring plan requirements might be most appropriately established under AEMO's *Gas Quality Standard and Monitoring Procedures* (currently guidelines), particularly if the gas quality monitoring standard is also established under this instrument. This approach would also allow flexibility for AEMO, in consultation with stakeholders, to refine requirements as the industry evolves and needs shift. Existing DTS requirements for a gas quality monitoring plan are not fit for purpose as they apply only to the system (which includes only installed equipment) but not to broader requirements. That is, NGR 288(6) requires the provider of a gas quality monitoring system to submit a plan to ensure the accuracy and reliability of a gas quality monitoring system; and provisions for periodic testing and calibration, mitigation of any interference, and the storage of calibration data. In practice, a range of additional requirements exist which are covered by AEMO's *Gas Quality Standard and Monitoring Guidelines* and are adhered to by Connected Parties. AEMO considers that it would be appropriate to amend the existing DTS provisions for consistency with the DDS provisions proposed above i.e. the establishment of requirements in Procedures rather than the Rules. Approval of a plan Lastly, under DTS arrangements, where a facility operator submits a plan that does not meet AEMO's requirements there is no mechanism for AEMO to take action, aside from curtailment. This matter should also be considered in this Rule change, both from a DTS and DDS perspective. **Monitoring of gas quality** In monitoring distribution connected NGE production facilities, the key concern will be monitoring how injections from the facility impact the composition of the blended gas stream in the network, rather that monitoring the gas being injected by the NGE facility. For example, a key concern when managing hydrogen blending into a natural gas stream will monitoring compliance with the Wobbe index specification. Determination of the Wobbe index for a gas blend requires both the original natural gas composition and the composition of the injected gas to be known, along with the relative flow rates. An alternative is to measure the composition of the blended gas stream however this is more costly. AEMO has a real time system that determines the gas composition throughout the DTS, including at each DTS withdrawal meter. There are two options for responsibility to monitor distribution connected facilities and the resultant blend: • DDS SP: The DDS SP will manage the production facility. However, to avoid having to install equipment to measure the original natural gas and the resultant blend, AEMO would have to provide composition data to the network operator in real-time such that the distributor can calculate the composition of the resultant blend. There may be value in this approach in the short-term while there are a limited number of operational facilities. A transition to AEMO responsibilities could occur through a later rule change, or on the basis of a specified trigger, for example on reaching a given number of facilities or service providers or a specified gas quality issue or scenario. It is important however to note that if participants want AEMO to manage this function, NGL changes may be required to recognise this additional AEMO function that is outside of its existing DTS operator role.

	• AEMO: As AEMO has the DTS gas composition at each DTS withdrawal meter and AEMO will also be provided with the metering data for each of the distribution connected facilities, AEMO would therefore have access to data required to monitor the composition of the blend. There may be efficiency benefits gained under this approach by having a single entity responsible for this monitoring activity. **Compliance with gas quality monitoring plans** To ensure best practise in both the DTS and DDS, there should be an explicit obligation for the provider of a gas quality monitoring system and a facility operator to comply with the approved gas quality monitoring plan. This is not explicitly required in the NGR, but it is important, for both providers of gas quality monitoring plans in the DTS and DDS alike to have an obligation to comply so that there is recourse by the appropriate entity (i.e. AEMO or the DDS SP) for any breaches. The impact of a failure to comply with the approved plan is a lack of access to critical information by the monitoring entity. This could lead to challenges in initially identifying a gas quality issue, or in determining the cause of an issue - which can exacerbate incidents and lead to higher restoration costs.
35. Should the rules consider alternative gasses, such as hydrogen, within the gas quality monitoring rules?	**Gas Quality Standards** The gas delivered to end use customers will need to meet the gas quality specifications for the DDS, regardless of the type of NGE that comprises the blend. Therefore, rather than dealing with gas quality relating to hydrogen or biogas specifically within the rules, the AEMO *Gas Quality Standard and Monitoring Procedures* should establish how hydrogen and biomethane blending would be managed and any requirements specific to each type of gas. The benefit of this approach is that it is more flexible, with AEMO being able to refine requirements as the needs of different gases evolves, in formal consultation with the appropriate stakeholders.
METERING	
36. Should the rules be amended to cover metering accuracy requirements for distribution connected facilities?	**Metering calibrations for installations used for DWGM billing and settlement** Metering accuracy requirements should apply to all metering installations used for DWGM billing and settlement whether the metering is installed at DTS or DDS points. This approach mitigates the risk of settlement and billing inaccuracies, as well as expensive and time-consuming manual corrections by AEMO for metering inaccuracies, where defects in the metering installations are not identified and actioned. It is noted that existing provisions relating to the calibration of metering installations apply only to metering installations at system points. However, it is important that all metering installations that are involved in billing and settlement of the DWGM are accurate and maintained and calibrated in accordance with the rules. For example, NGR 299 does not capture delivery points or receipt points that are not system points, which includes custody transfer points between distribution networks. A metered demarcation valve between two distribution networks that is used to settle the DWGM is a receipt point and not covered by existing calibration requirements. These points should also be subject to calibration requirements. To achieve the above, NGR 299(1) could be amended to apply metering installation calibration and maintenance requirements to connection points (not just system points) used for DWGM billing and settlement. **Metering calibrations for hydrogen - accurate DWGM billing**

	The injection of NGE has the potential to impact transmission and distribution metering accuracy, meaning that the calibration requirements contained in the Metering Uncertainty Limits and Calibration Requirements Procedures (Victoria) will need to be reviewed. However, an appropriate subset of calibration data will be necessary before adjusting calibration requirements. Under existing requirements, NGR 299(3) requires AEMO to review the calibration requirements contained in the *Metering Uncertainty Limits and Calibration Requirements Procedures (Victoria)* at intervals not exceeding one year. The procedures establish the limits of uncertainty that each metering installation must meet and are set so as to be achievable by commercially available meters. Under NGR 299(2), each metering installation in the DTS must be calibrated by the responsible person in accordance with the *Metering Uncertainty Limits and Calibration Requirements Procedures (Victoria)*. Calibration of meters is performed to detect material meter error and provide confidence that the metering uncertainty is within an appropriate tolerance. The requirement for AEMO to review calibration requirements will be relevant to metering installations for NGE production facilities injecting into a DDS and therefore existing arrangements should be extended. However, it is proposed that the arrangements be modified as follows, for both the DTS and DDS, to enable needs-based and meaningful reviews based on identified issues and/or sufficient data points. Firstly, the frequency of AEMO's obligation to review calibration requirements should be reduced from an annual basis to, "as required with an interval that must not exceed five years". This will reflect that AEMO may instigate a review of calibration requirements based on specific metering accuracy issues encountered, which is particularly relevant when considering the infancy of arrangements for DDS NGE injections. The five-year limit will ensure an ongoing requirement for periodic reviews, noting that under current annual review arrangements (in place since the establishment of the DWGM), AEMO has not made any material changes to the calibration requirements, indicating that the review period is more frequent than necessary. Secondly, AEMO's obligation to review calibration requirements include a provision to extend this timeframe to the extent it is unable to conduct the review due to the lack of data provided by a Responsible Person. This is because AEMO is reliant on the responsible person making available an adequate set of metering installation testing results. Without the results of the calibration tests, AEMO is unable to determine whether the uncertainty limits are being met, and therefore unable to complete a meaningful review of the calibration requirements and uncertainty limits. This has presented compliance risk for AEMO under current arrangements, which could be exacerbated when extended to the review of calibration requirements for NGE metering installations for a DDS connection.
37. Should the rules be amended to allow distribution connected facilities to provide their own compliant metering?	A Connected Party should be explicitly permitted to provide the metering installation for their system injection point if the equipment complies with relevant standards, including maintenance and calibration requirements, and they elect to do so. If the Connected Party does not elect to provide its own metering installation the relevant network services provider (either the DDS SP or DTS SP) would be required to provide it. This approach is consistent with metering installation requirements for the DTS; as well as AEMO's proposed approach for gas quality monitoring rules (see above response to Question 34).
38. Are there any other distribution connected facilities metering related issues that should be included in the rules?	Under NGR 299(1) calibration requirements for metering installations only apply to those at system points. These clauses should be expanded to cover meters which directly impact DWGM billing accuracy, for example at injection points from a production facility into a DDS. Further, there are some gaps in these clauses which should be addressed prior to application to the DDS to ensure ongoing best practice. **Metering calibration for suspected non-compliance**

	AEMO proposes that NGR 299(15) is amended in order to ensure that action is required to be taken by the responsible person, when AEMO or the responsible person reasonably suspects that the accuracy of a metering installation does not comply with the DWGM metering requirements or of any matter which could affect the integrity of the metering data. The work to restore accuracy should be performed within a reasonable specified timeframe. The objective of this proposal is to address an existing gap in the NGR affecting the integrity of the metering data which has previously resulted in inaccurate billing outcomes for market participants in the DTS and could potentially do so in a DDS if not rectified. To illustrate, while NGR 299(15) requires a Responsible person to notify parties and resolve an issue on becoming aware of breaching metering installation accuracy requirements, it does not specify any action where AEMO suspects any issue or defect with the metering installation. For example, there is no obligation on the Responsible person to resolve the issue or even investigate it based on AEMO advice. **Temporary modification approval** AEMO proposes that any temporary modifications made to metering installations must be treated as maintenance per the maintenance planning procedures and therefore be approved by AEMO before work is undertaken. Similar to the above, this proposal seeks to address an existing gap in the NGR so that it is not carried through to DDS arrangements. The proposed approach would ensure that AEMO has visibility over works impacting the integrity of metering data; reduce the extent of any metering inaccuracy required due to temporary modifications; and reduce impacts to DWGM settlement and billing. At times, a responsible person must make temporary modifications to metering installations in order to complete maintenance activities, however the Metering subdivision does not recognise this work and therefore does not provide for how this should be performed. This means that there is no obligation on a responsible person to notify or seek approval from AEMO for any temporary modifications to metering installations, or to ensure that the metering installation is restored to its initial state as soon as practicable on completion of any maintenance activities. The accuracy of a metering installation is crucial in ensuring appropriate billing and settlement outcomes, so it is important for AEMO to have information relating to any activities that will impact this to ensure appropriate market outcomes, and for any metering installations that are impacted to be restored as quickly as possible. **Energy Content Calculations and accurate DWGM billing** NGR 303(5) should be amended so as not to reference specific standards for calculating the energy content of gas flowing through a metering point at each metering installation, and refer instead to the relevant standard as prescribed in AEMO's Energy Calculation Procedures (noting that these procedures have been consolidated, with other metering procedures, into the AEMO Wholesale Market Metering Procedures). This will allow alternate standards to be documented which can allow for blended gases. This is necessary because NGR 303(5) requires that the energy content of gas flowing through a metering point at each metering installation is calculated in accordance with American Gas Association Report (AGA) 7, AGA 8, and ISO6976 unless the Responsible Person, the affected Participants, and AEMO agree otherwise. While AGA Standards were once considered to be the relevant standards for calculating the energy content of gas, these have since been updated and replaced with other, internationally recognised, standards. The proposed approach would give AEMO the flexibility to prescribe the most appropriate method to calculate energy content of gas flowing through a metering point based on current and best practise. This will be important to ensure that AEMO and affected participants continue to calculate the energy content of natural gas and NGE, for DTS and DDS-connected metering points, in accordance with the relevant standards and therefore best practise. Importantly, any update to the standards prescribed by the Wholesale Market Metering

	Procedures is collaboratively developed between AEMO and the responsible persons and is subject to the process for making Procedures under the NGR.
THREATS AND INTERVENTIONS	
39. Is it necessary to expand AEMO's powers to be consistent with DTS connected facilities given the broad powers currently in the rules?	AEMO's current powers of direction under NGL 91BC allows AEMO to give a written direction to a Registered participant respect to the DTS or a DDS. The rules should reflect this existing law.
40. Should distribution connected facilities be able to claim compensation for losses incurred for injections required during an intervention?	These facilities should be eligible to claim compensation and the compensation Rules and Procedures should be expanded as it is expected that these facilities will be subject to directions that AEMO may make under the NGL.

CHAPTER 9 – OTHER ISSUES

ALTERNATIVE SOLUTION 1 – SUPPLY FROM DISTRIBUTON CONNECTED FACILITIES MANAGED CONTRACTUALLY	
41. Is there merit in further exploring this proposed solution?	AEMO believes industry is best place to provide a view on this option. AEMO's suggested option 2 in response to question 5 is similar to this option.
42. Are there any aspects of this solution that should be incorporated into the proposed solution?	See above.
ALTERNATIVE SOLUTION 2 – SUPPLY FROM DISTRIBUTON CONNECTED FACILITIES MANAGED AS NEGATIVE DEMAND	
43. Is there merit in further exploring this proposed solution?	There would be complexity to implementing this option particularly if AEMO's market systems are unable to process negative values for demand. AEMO considers that it would be preferable to pursue the options posed in the response to question 5 over this option.
44. Are there any aspects of this solution that should be incorporated into the proposed solution?	See above.
MATERIALITY THRESHOLD	
45. Should this rule change consider including a materiality threshold in the rules?	A fundamental issue to address is the policy basis for a materiality threshold and an exemption regime. If a determination is made to include distribution connected facilities in the wholesale market, it should be established why the costs of market participation outweigh the benefits for certain facilities and not others especially as these facilities are expected to be relatively small initially. If a materiality threshold is included for bidding, then consideration would need to be given to what the alternate arrangements are for an exempt facility. The energy injected by exempt facilities would presumably still need to be catered for

	in settlement (either automatically settled at a market price or removed from the market) and so systems and information exchange would likely still be required for exempt facilities. It may also be challenging to determine an appropriate materiality threshold. Individually, a facility below the threshold may not have a material impact on the market and system but in aggregate a large number of exempt facilities may affect both market outcomes and system security, potentially undermining the basis for their exemption. A further concern is whether an exemption regime could create a regulatory loophole where facility nameplates are set to be are below the regulated threshold to avoid market participation.
46. Should a reduced set of bidding requirements be applied to distribution connected facilities that do not meet the current bid size of 1 GJ?	AEMO is interested in industry's views on whether facilities that have a nameplate of have less than 1 GJ/hour are likely to eventuate in the near-term. Given the very small size of such a facility, it may be practical that such a facility does not bid and another mechanism is used to settle or account for any injected quantities.
47. Do the rules provide a barrier to bidding quantities of gas smaller than 1 GJ?	See response to question 48.
48. What are the impacts and costs associated with updating the bidding system to accommodate decimal GJ bids?	At present AEMO's bidding systems to not facilitate bids below 1 GJ and AEMO has not assessed the impact of a change to facilitate bids below 1 GJ or fractional bids. As part of this rule change process, it would be useful to understand from industry how likely it is that this type of functionality would be required in the near term or whether facilities of this size should bid at all.
SCHEDULING INTERVALS	
49. Should this rule change consider changing the current scheduling intervals or is this an issue that should be addressed in a separate rule change process?	In AEMO's view this is an issue that could be considered in the future (potentially as a part of the next phase of the hydrogen framework review) as it is probably more appropriate to consider this option as a part of holistic review of the DWGM's market design.
EXPECTED COSTS, BENEFITS, AND IMPACTS OF THE PROPOSAL	
50. What are the expected costs associated with the proposed changes for: a. existing market participants? b. new market participants that would fit into the distribution connected facility category? c. AEMO?	It is difficult for AEMO to provide an assessment of cost until the options are further defined and preferred options have been identified. Areas that are likely to drive cost include: • Any bespoke changes required to wholesale and retail settlement systems. • Additional data exchanges between AEMO, participants and facility operators. • Changes to scheduling and demand forecast systems.
51. How would these costs be recovered under the existing regulatory framework?	Under the current framework, any additional costs for AEMO from implementing this rule change would need to be recovered through market fees.

	AEMO notes that if changes to the gas market fees are required as a consequence of this rule change, a transitional rule may be needed to facilitate consultation and change to the AEMO's Gas Markets Participant Fee Structure. AEMO will seek to further discuss this matter with the AEMC as the rule change progresses.
52. What are the impacts of the proposed solution and the "do nothing" scenario?	Proponents of distribution connected facilities and market participants are best placed to respond to this question.
53. Is the proponent's assertion that the long term costs of inaction are greater than the costs associated with the proposed solution correct?	Proponents of distribution connected facilities and market participants are best placed to respond to this question.
IMPACT ON CONTRACTS MARKET	
54. What considerations need to be given to the contracts market when integrating distribution connected facilities into the DWGM?	Proponents of distribution connected facilities and market participants are best placed to comment on this question.