2 December 2021

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

By online submission Reference: EMO0042

Dear Ms Collyer

Re: AEMC Review into extending regulatory frameworks to hydrogen and renewable gases

Thank you for the opportunity to respond to this gas market review into extending the regulatory frameworks to hydrogen and renewable gases (Review). AEMO has prepared this submission in response to issues raised regarding market transparency mechanisms and their application to Natural Gas Equivalent (NGE)[1] as well as any further need for extension to Constituent Gas (CG)[2]. AEMO manages the Gas Statement of Opportunities (GSOO), the Victorian Gas Planning Report (VGPR) and the Gas Bulletin Board (BB) therefore these mechanisms are the focus of its response.

AEMO continues to work closely with the Australian Energy Market Commission (AEMC) on other aspects of the Review. As part of this work AEMO has committed to working with the AEMC to identify any potential National Gas Rules (NGR) changes identified through its assessment of the AEMO-made Procedures relating to the STTM, DWGM and regulated retail markets under the NGR.

Further, in parallel with this submission, AEMO will respond to the DWGM distribution connected facilities rule change (Rule Change) Consultation Paper. This deals with issues specific to the DWGM and the accommodation of production facilities, notably hydrogen and biogas facilities, into a Declared Distribution System (DDS).

1. Assumptions and scenarios

This submission assumes that provisions in the NGR that apply to natural gas and related facilities and activities will apply to NGE as proposed by the Officials' consultation

[1] Terminology is consistent with AEMC terminology i.e. a gas (such as biogas) or blend of gases (such as a low level natural gas-hydrogen blend) supplied to consumers by pipeline and that is suitable for use as natural gas.
[2] Gases (other than natural gas) that are not themselves authorised for supply to end users but are used to create an NGE or other blend subject to the NGL.

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paper[3]. That is, elements of the national gas regulatory framework should apply to NGE and related facilities and activities in the same way that they do to natural gas.

It is also assumed that the Market Transparency reforms package, awaiting progression through the South Australia Parliament, will proceed as anticipated. This reforms package proposes to enhance BB and GSOO reporting requirements.

In considering the future application of market transparency mechanisms, AEMO has identified broad categories of facilities that may be involved in the supply of NGE. While this is not an exhaustive list, it is useful to consider the various types of facility and potential regulatory treatment.

Broad categories considered in developing this submission include:

- NGE production facilities which are likely to be involved in production only, such as biogas plant, which produce NGE from organic waste;
- NGE production facilities which may withdraw NG to produce NGE, such as blending facilities;
- CG production facilities which may produce hydrogen for blending into NGE, such as hydrogen electrolysers and steam methane reforming (SMR);
- CG production facilities which may produce hydrogen for injection directly into natural gas pipelines;
- Large customer facilities, which may also produce NGE or OG product[4] using one or more of the above technologies for use in processes at those facilities.

2. Summary of issues

Physical differences between natural gas and NGE may necessitate modified reporting measures to ensure that participants and AEMO have the transparency required for planning and risk management in the short- to medium-term. For example, greater transparency would enable participants to understand and predict the impact of NGE production facilities on the relevant distribution systems. AEMO has therefore proposed an option for basic data on NGE production facilities to be provided by relevant distribution businesses on a periodic basis.

Also, CG for the production of NGE, may be produced by unrelated parties or facilities, for example a hydrogen electrolyser and blending facility may be separately operated or located. While NGE producers may have obligations to provide key information (either under the existing framework or via amendments as suggested in this submission) these producers may not have direct access to the CG data on which this relies. While there is no immediate need to capture CG in BB reporting requirements, CG production information will be required to inform AEMO's forward-looking GSOO and VGPR forecasts where NGE may play an increasing role in later years. AEMO therefore

[3] Refer to Officials' Consultation Paper: Extending the national gas regulatory framework to hydrogen blends & renewable gases Changes to the NGL, NERL and Regulations.
[4] Other Gas (OGO Product – means gas or gas blends supplied to consumers by pipeline other than NG or NGE – these are not within the current review scope but are relevant for context.

proposes that its ability to obtain information from CG producers if required be formally established by the Rules. It further suggests that development information regarding CG projects be collected and provided to AEMO by distribution businesses for forecasting purposes.

3. Out-of-scope matters

While OG products, which are out of scope of the Consultation Paper, currently have limited relevance to end use customers, these may eventually become more prevalent. In developing 10- and 5-year forecasts of supply adequacy for GSOO and VGPR respectively, AEMO may soon need to consider the potential for OG products to substitute natural gas and NGE. Further, as the GSOO provides forecasts of 10 – 20 years or longer, the value of the GSOO for stakeholders may be augmented in later years by the inclusion of OG product as a source of supply in its own right (rather than as a factor impacting demand for natural gas and NGE). AEMO agrees that these issues should not be included in this review, however flags these issues for consideration through the next review process.

If you have any queries Kevin Ly, Group Manager Regulation, can be reached at kevin.ly@aemo.com.au .

Yours sincerely

Violette Mouchaileh
Executive General Manager - Reform Delivery

cc:

Attachments: Attachment 1 – AEMO positions on market transparency mechanisms

ATTACHMENT 1 – AEMO RESPONSE TO CHAPTER 4

QUESTION 8 – CHAPTER 4 – EXTENSION OF THE TRANSPARENCY MECHANISMS TO NATURAL GAS EQUIVALENTS

1. Except for blending facilities are there any other facilities or activities involved in the supply or use of natural gas equivalents that are not already captured by: a) the BB facilities listed in rule 141 of Part 18 of the NGR? b) the DWGM registration categories in rule 135A of Part 15A of the NGR?	**Facilities considered** As set out in the covering letter, various facility types have been considered in assessing application of market transparency mechanisms, including, for example blending facilities; biogas plant, SMR facilities, hydrogen electrolysers and large user facilities. This is not intended to be an exhaustive list of future facilities, but has been used as a basis for understanding high-level potential regulatory scenarios and treatments. **Application of BB facilities listed in NGR 141** Under existing BB arrangements BB facilities must register to the extent they meet a 10 TJ reporting threshold. Distribution connected production facilities are currently registered on the BB, although it is noted that clarity in the NGR regarding the application of BB reporting requirements to distribution connected production facilities could be enhanced for the avoidance of doubt. Therefore, under proposed future arrangements NGE production facilities would need to meet a 10 TJ nameplate rating reporting threshold to be captured. In the foreseeable future a 10 TJ CG production facility may not eventuate, meaning that NGE production facilities would not be required to register for the BB. However, it is noted that when mixed with natural gas to create NGE using, for example, a 10% blend, such facilities have potential to approach the reporting threshold by producing approximately just 1 TJ of hydrogen – and would need to be registered for the BB. For blending facilities, changes proposed to NGR Part 18 under the Market Transparency reforms package will better establish the application of 'production facility' to a blending facility i.e. a facility for blending CG and natural gas to form NGE. The definition for production facility will be amended to mean "…a gas processing plant at which natural gas is produced …"[5]. Some production facilities, such as blending or SME facilities, may involve both withdrawal or consumption of natural gas and injection of NGE. Therefore, to the extent these activities exceed the reporting threshold AEMO would require information relevant to more than one facility category. Under the NGR a facility can be registered in the BB as more than one facility type and there is precedent for this arrangement[6]. However, definitional issues should be considered to remove ambiguity and ensure the capture of the facilities: • the new definition of BB large user facility[7] does not capture the use of a facility for production as by definition such facility does not principally comprise the operation of a production facility.

[5] NGR 141 definition under Gas Transparency Measures package.
[6] E.g. Iona is registered as a BB storage facility and BB compression facility
[7] BB large user facility is a new facility type to be introduced by the Gas Transparency Measures package.

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	• It could be interpreted that while natural gas for SMR can be considered to have been 'consumed', for a blending facility would be 'withdrawn' (similarly storage it does not 'consume' natural gas). • the new definition of BB large user facility may not capture the 'withdrawal' of natural gas by a blending facility as in its proposed form it involves the "consumption of natural gas from the operation of the facility". Broad options for the above are to either review the definition of BB large user facility to contemplate this dual registration; create additional reporting requirements for a BB production facility which also withdraws or consumes natural gas; or to create new facility types account for multiple activities. This latter two may be simpler and avoid the need for multiple registrations. Large user facilities may also produce NGE using one or more of the above technologies for use in processes at those facilities. To the extent the NGE is consumed at that facility, that facility would be simply registered as a BB large user facility. This would mean an obligation to provide information required by a large user facility, but not production information. SMR and hydrogen electrolysers facilities may produce CG which is then used to produce NGE by blending facilities; and direct injection facilities may inject CG directly into the system. These will not be automatically captured by proposed changes and therefore the facilities will not be registered on the BB. **Application of DWGM registration categories under NGR 135A** Biogas facilities would be captured by the NGR Part 15A definitions for Producer[8] and Market Participant – Producer[9] (which reference NGR Part 19 and NGL producer definitions), assuming the accommodation of distribution connected production facilities into DWGM definitions via the DWGM DCF Rule change[10]. For blending facilities, which blend CG and natural gas to create NGE, there may be potential ambiguity regarding whether this blending can be interpreted as 'producing' NGE per the NGL definition of producer[11], noting that NGL changes proposed through the gas transparency measures will need to be taken into account[12]. For blending facilities and SMR facilities which may involve both withdrawal of NG and injection of NGE, DWGM registration would be required in respect of both activities. The existing Market Participant – Distribution Customer[13] would largely cover withdrawal or consumption activities, although similar to the BB issues raised above, the definition references withdrawal from a DDS but not consumption. To ensure clear application of this registration category, further ambiguity may need to be addressed regarding whether a NGE producer that withdraws NG for the purpose of producing NGE is an 'end-user' and therefore a 'Distribution Customer' as established by NGR 200.

[8] Producer: A producer that injects natural gas into the declared transmission system (NGR 135A).
[9] Market Participant – Producer: A producer that buys or sells natural gas in the declared wholesale gas market (NGR 135A).
[10] The objective of the DWGM DCF Rule change is to enable the participation of distribution connected production and storage facilities in the DWGM, to facilitate hydrogen blends. It is proposed that the definition of Producer will apply to an NGE production facility injecting into a DDS, either by expanding existing definitions or by creating new facility types.
[11] Producer means a person who carries on a business of producing natural gas (NGL); and Producer means a person that injects natural gas into the declared transmission system (NGR).
[12] Definitions for natural gas industry and natural gas industry facility have been developed under the proposed Gas Transparency package
[13] Market Participant – Distribution Customer: An end user that: (i) buys natural gas in the declared wholesale gas market; and (ii) withdraws natural gas from a declared distribution system (NGR 135A).

	The NGL requires a person who participates in the DWGM in two or more registrable capacities to be registered in both or all of those capacities[14]. Although there is an option to create a new, bespoke, registrable capacity for the operator of a facility that both withdraws and injects NG and NGE, AEMO cannot see the value in an additional category to cater for these activities at this preliminary stage. To the extent that reporting requirements require a consolidated set of bespoke reporting requirements there may be value, but this need has not yet been identified. Similar to BB arrangements, a large user facility producing NGE for consumption onsite would be registered as a customer, but not a producer. SMR and hydrogen electrolysers used to produce CG for NGE, or to directly inject into the system, will not be automatically captured by DWGM registration categories.
2. If the information to be reported by facilities involved in the production, transportation, storage, compression and or use of natural gas equivalents is to be based on the information reported by their natural gas counterparts, are any amendments required to reflect differences in the physical characteristics of these facilities compared to natural gas facilities for: a) the Bulletin Board reporting obligations in Part 18 of the NGR? b) the GSOO content in rule 135KB of Part 15D of the NGR? c) rules 323-324 in Part 19 of the NGR? d) the compression and storage reporting obligations in Part 18A of the NGR? e) the price information to be published by the AER in proposed rule 140B in Part 17 of the NGR?	<u>High-level differences</u> The following differences in the physical characteristics of these facilities compared to natural gas facilities. 1) NGE reserves will need to be estimated on the basis of alternative sources such as various types of biogas feedstock. 2) NGE production processes will involve new and varied technology, with a key difference for some facilities being the need to withdraw NG in order to produce and inject NGE. 3) NGE production volumes will be considerably lower for a given facility in the foreseeable future. 4) NGE production, particularly biogas production, may be subject to considerably greater volatility. 5) NGE production will, for the foreseeable future, be via distribution connected facilities. Impacts of these differences are discussed below. <u>Definition of nameplate rating</u> The calculation of nameplate rating should be reviewed as these are defined by normal operating conditions and may not be applicable for calculating the nameplate rating of NGE facilities. That is, for different gases operating conditions may vary, resulting in ambiguity for NGE calculations when determining capacity and therefore application of the BB reporting threshold. A standard approach could be via Rules clarification that the nameplate rating is to be calculated as the maximum that can be achieved regardless of fuel composition at normal operating conditions. <u>Reporting on reserves</u> The classification system and standards established by the Petroleum Resources Management System (PRMS) is used by AEMO to forecast natural gas reserves under the GSOO and will be used by relevant BB reporting entities to report information relating to reserves and resources[15]. The PRMS is specific to natural gas estimates and is not appropriate for the estimation of NGE reserves, such as agricultural or

[14] NGL 91BJ (3)
[15] NGR 141 and 171B under proposed Gas Transparency package.

	commercial waste. For example, limitations on NGE reserves are different as NGE feedstock is subject to volatility due to weather or economic factors. To ensure a consistent and transparent approach to NGE reserve forecasts, a new standard for various forms of NGE will need to be developed. There is likely to be considerable work to develop an NGE reserve standard, due to limited international precedent on which to inform the standard and the need for considerable industry consultation. The development of this standard may exceed implementation timeframes contemplated under Phase 1 and may require extended transitional arrangements. This standard may also need to incorporate systems and standards for CG, and further detail is provided below in the next table. <u>Multiple registrations for single facilities</u> As described above, an NGE production facility may also consume or withdraw natural gas. This dual use of a facility means that transparency into all relevant activities will be required, to the extent reporting requirements are triggered for that activity. As discussed above there are three broad options for addressing dual activities: either the facility or facility operator will need to be registered in both categories; a new category could be introduced which establishes bespoke reporting requirements; or the reporting requirements of an existing category could be expanded where relevant to dual activities. Further detail about scenarios considered are set out in response to the preceding question. <u>Biogas production volatility</u> Biogas production could be subject to greater production volatility than natural gas (or other NGEs) given its reliance on feedstock volumes that is subject to external factors such as agricultural output and weather conditions. Annual and seasonal swings could become significant with an increased number of facilities. There may be value for participants and AEMO in having transparency into production and forecast changes in production to ensure appropriate planning and risk management. <u>Small production facilities</u> While in the foreseeable future NGE facilities are not anticipated to reach significant scale individually, they have potential for a significant impact on distribution systems in aggregate. Early indications are that there could be a significant number of small facilities which could produce approximately 5-8 PJ per annum. While individually this is not significant, over time this could become significant in aggregate. Under existing BB arrangements, AEMO and participants would not have transparency of small facility NGE production. However, there would be value in some transparency into these facilities to understand the capacity and volume of NGE injected into a distribution system. This would position AEMO and participants to better monitor and manage risks associated with NGE production, seasonal volatility as discussed above, production impacts and market evolution. Reporting requirements could be light-handed, for example requiring some basic standing data and some periodic (quarterly or annual) production data. A straightforward way to obtain this information may be via distribution businesses, rather than the facilities directly. There will be value in consulting with industry to develop an approach that would not place unnecessary administrative burden or require costly system changes.

	It will be similarly important in the longer term to incorporate the aggregate impact of NGE production to undertake supply adequacy assessments under the GSOO and the VGPR. Under the new GSOO Procedures[16] AEMO would be able to specify the NGE production facilities that are GSOO reporting facilities and therefore capture the information via the GSOO survey. For VGPR reporting, two NGR changes would be required to ensure that NGE production can be incorporated into forecasts. Firstly, a NGE producer will need to be a Registered participant under the NGR, which is anticipated to be facilitated through the AEMC DWGM DCF Rule Change. Secondly, the requirement that Registered participants are bound to report only where relevant to the operation or security of the DTS would need to be expanded to the operation and security of a DDS. With these amendments, NGE production facilities of any size could be required to provide forecasts in respect of supply and capacity matters[17]. It is noted that the DWGM DCF Consultation Paper does not explicitly address the expansion of VGPR reporting requirements to ensure reporting by distribution connected facilities, yet this issue may also need to be addressed in the context of the Rule Change.
3. Should blending facilities be treated as production facilities for the purposes of the Bulletin Board, GSOO and VGPR, or should specific reporting obligations be developed for these facilities? Why? If you think specific reporting obligations are required, what should these be?	For the purposes of the BB, blending facilities (and other NGE production facilities) should be treated as production facilities. There may be value in amending reporting requirements, as set out in response to the previous question, to reflect the dual use of facilities and to provide AEMO and participants with transparency into smaller facilities. From a GSOO and VGPR perspective these facilities should also be treated as production facilities. Although AEMO has not yet identified any specific reporting obligations for these facilities, for GSOO purposes these requirements could be established via the GSOO Procedures and should not require a rule change. From a VGPR perspective, information requirements are sufficiently broad to obtain appropriate forecasting information for these facilities, assuming they are Registered participants.
4. Are there any other gaps in the NGR that have not been identified that would need to be addressed if the five transparency mechanisms were to be extended to natural gas equivalents? Why? If you think there are other issues, what are they and what amendments are needed?	Nothing further identified.

QUESTION 9 - CHAPTER 4 – EXTENSION OF THE TRANSPARENCY MECHANISMS TO CONSTITUENT GASES

5. Do you think the following transparency mechanisms should be extended to the facilities and activities involved in the supply of	As described by the Officials and the AEMC, CG is used to create an NGE. NGE production is likely to use CG in a blending facility where natural gas is withdrawn from the system, blended with CG, and injected back into the system as NGE. The

[16] NGR 135EA(6) under proposed Gas Transparency Measures package
[17] NGR 324(2)

constituent gases as part of the initial rules package or should the application of one or more be deferred until a later process? Why? A) The Bulletin Board B) The GSOO C) The VGPR D) The compression and storage terms and prices E) The AER's gas reporting functions.	CG could be produced onsite by the NGE production facility or transported (via pipeline or otherwise) to the NGE production facility by one or more CG producers, which may or may not be related entities. **Need for CG reporting given NGE reporting obligations** From a transparency perspective, NGE production facilities will be subject to any reporting obligations that apply under the BB, GSOO or VGPR (either via automatic application of NGL changes or additional requirements established through this Review process). This would mean that NGE production facilities would ultimately be required to provide and update certain types of operational and forecast information based on arrangements with, and information provided by, CG producers. Where CG producers are not directly captured by NGR reporting obligations, NGE producers would be reliant on commercial arrangements with CG producers to meet their reporting obligations. There may be value in placing reporting obligations on CG producers to mandate the provision of information under the NGR, rather than relying on commercial arrangements. For a shorter-term transparency mechanism such as the BB, the above issues are not anticipated to be material. That is, the number of facilities and participants is not anticipated to warrant CG BB reporting requirements. For longer-term, forward-looking, transparency mechanisms such as the GSOO and VGPR, direct access to CG production and facility development data may become important with the increase in CG producers and potentially evolving commercial arrangements. Further, CG production may also be an input to electricity demand forecasts under the Electricity Statement of Opportunity (ESOO) so may have heightened importance in preparing those forecasts (acknowledging that National Electricity Market objectives are out of scope for this Review). AEMO therefore considers that it may be appropriate for the Rules to formalise the ability of AEMO to capture CG production information for the GSOO and VGPR. **Application of mechanisms to CG** Under current VGPR reporting requirements only Registered participants are subject to reporting requirements, therefore changes to the NGR would be required to cover CG production facility operators. Further, similar to previous discussion regarding NGE production, VGPR reporting would need to be expanded to include information required for operation and security of a DDS. Under the GSOO survey AEMO may be able to require information in relation to the natural gas industry (which will automatically extend to the NGE industry) that is necessary for the preparation of the GSOO. Given the importance of CG forecasts to inform NGE forecasts this should be already covered by provisions in the new Market Transparency reforms package. However a rule change to specify this may remove any ambiguity and mandate provision of information by CG producers where required by AEMO. Further, AEMO suggests that maintenance of a register of future CG facility development projects by each distribution business, with key information to be provided to AEMO, would assist with forecasts. Such arrangements would be akin to the requirement for Transmission Network Service Providers to provide to AEMO key connection information under the NER.

6. If you think the transparency mechanisms should be extended as part of the initial rules package: a) What facilities do you think need to be captured? b) Do you think the facilities and activities involved in the supply of constituent gases should be subject to equivalent reporting obligations as their natural gas counterparts, or are some modifications required to reflect differences in the physical characteristics of these facilities?	Any production facility producing a CG for the purpose of producing NGE would need to be captured in GSOO and VGPR reporting requirements, likely to include hydrogen electrolyser and SMR facilities. While the option to extend VGPR and GSOO reporting requirements to CG production seeks to address potential difficulties in information flows between NGE and CG facilities, the equitable approach may be to apply obligations to all CG production facilities, regardless of commercial arrangements. Existing VGPR requirements under NGR 324 appear sufficient for extension to CG production facilities and may not require amendment.
7. Are there any other gaps in the NGR that have not been identified that would need to be addressed if the transparency mechanisms were to be extended to constituent gases? Why? If you think there are other issues, what are they and what amendments are needed?	Nothing further identified.