THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Centre for Natural Gas
The University of Queensland
Brisbane QLD 4072

19 November 2024

AEMO
Email: ISP@AEMO.com.au

Dear Mr Westerman,

Re: ISP Methodology Consultation (Published 23/10/2024)

I am the Director of the Centre for Natural Gas (the **Centre**) at the University of Queensland (UQ). The Centre conducts multi-disciplinary research across a range of themes relevant to the gas, resources and energy industries and is co-funded by the University and industry partners. This letter represents my personal views, unless expressly stated otherwise, and does not necessarily represent the views of the University or the Centre partners. However, this letter benefits from input and insights from experts within the Centre and relevant research the Centre has completed or has underway.

The purpose of this letter is to comment on the ISP Methodology Issues Paper (**MIP**). The MIP is, in my view, well-conceived and AEMO have clearly made every effort to act quickly in response to the recent AEMC rule-change – I was fully supportive of the AEMC rule change, which aligned closely with the recommendations (and those of others of course) from my Draft ISP 2024 consultation submission (16 Feb 2024).

The key elements from my February submission, regarding "Flexible Gas", remain relevant as context for the MIP consultation questions:

1. The ISP explicitly states that the GPG is a "strategic reserve for…reliability and security, so is not forecast to run frequently…" at "…just 5% of its annual potential…". That GPG may be able fulfil such a role, in the right market, supply and infrastructure circumstances, is not disputed, however the economic viability of this scale of "strategic reserve" warrants closer attention. The magnitude of a 16.2 GW GPG[1] "strategic reserve" would require substantial infrastructure investment (not only in power plants), and the economics of existing GPG generators are (in many instances) marginal at utilisation rates much higher than 5%, especially where price control "caps" are part of the system.
2. Setting aside the economic challenges of low utilisation, there is also a fundamental risk that focussing on average annual utilisation disguises that as overall GPG usage declines, the system becomes more likely to be exposed to demand peaks that can't be met without substantial changes in pipeline infrastructure and/or gas storage and/or gas field/supply locations. The vulnerability of the NEM in the face of this uncertainty and volatility is an area of active research by the Centre and we seek to complement the work of AEMO.
3. Although a number of risks are identified and discussed throughout the ISP, the availability of gas supply, storage and pipeline networks, as well as GPG facilities, are not explicitly discussed as risks within this ISP.

In the following response I address the MIP consultation questions, however, I note that key economic and commercial risks in the points above are not included in the scope of the consultation questions. I recommend AEMO give further consideration to the questions of "who" would build out the infrastructure (gas supply, gas storage, gas transport, gas-powered-generation) and "why" they would do so in the face of the market predictions for utilisation and the likelihood of market intervention. The

[1] Note that this 16.2 GW reference is to the Draft 2024 ISP not the final 2024 ISP.

policies required for the “who” and “why” are as, or more, important than the “what” and “where” aspects of the MIP.

As with each of my submissions, I reiterate that we would welcome the opportunity to share and discuss the Centre’s research program with AEMO with the intent of ensuring that it is complementary and of use to AEMO and other stakeholders. We are available to meet in Brisbane or Canberra, or remotely, to promote effective collaboration.

Yours sincerely,

Professor David Close
Director, Centre for Natural Gas

Integrated System Plan (ISP) Methodology
Issues paper – Standard consultation for the National Electricity Market
23 October 2024

Consultation Questions

1. Do you consider that the proposal to develop a gas supply expansion model appropriately addresses the action in the Energy Ministers’ response to the Review of the ISP for additional gas analysis to be incorporated in the ISP? If yes, why? If not, why not, and how could this action otherwise be achieved?

   Response:
   Yes, the approach proposed may appropriately address the Energy Ministers’ response as it is the only way to quantitatively test scenarios for a complex system like the NEM. This is conditional on adequate assessment of supply and demand uncertainties (rather than specifically aiming for “best” or “reference” case assessments). The transition question might be better framed ... “given very wide demand uncertainties and long lead times, what policies are required to stimulate the required investment in ‘the overall gas system’ such that there is reliable gas / energy available in the worst-case?”

2. Do you agree with the proposal for AEMO to develop at least one gas development projection per ISP scenario, and apply the projection as an input to the capacity outlook model? If yes, why? If not, what method would you recommend for the inclusion of gas development projections in the ISP?

   Response:
   There is insufficient information to provide a categorical response to this question. In principle it is highly unlikely that a single scenario will adequately inform risk and uncertainty management.

   If there is substantial scenario analysis completed, and different scenarios ranked across relevant criteria (e.g. funding risk, approval risk, supply risk, etc.), then selecting an individual gas development projection to test the interaction with the OPD or individual ISP scenario may be justified. However, if a single gas development projection is selected for each ISP scenario without full transparency regarding the assumptions and economic modelling that underpins the decision, then ultimately the objectives of the rule change will not have been met in my view.

The gas analysis, in my view, should build on the Gas Statement of Opportunities (GSOO) and look at all aspects of what will be required to meet the ISP ODP, i.e. to deliver the ~15 GW of "Flexible Gas" there are risks in the following, non-exhaustive listing, areas for domestically supplied natural gas:

i. *Gas supply adequacy (in particular that available supply does not decline faster than demand)*

ii. *Gas transport capacity (in particular that very high demand rate volatility can be accommodated)*

iii. *Gas storage capacity (as above)*

iv. *Gas-powered-generation capacity and location in relation to (i) and (ii)*

v. *The investment case for each of (i) through (iv).*

For alternative gases there are even greater levels of uncertainty regarding:

i. *Volume or capacity of supply for biofuels (incl biomethane), hydrogen or other renewable gases*

ii. *Transport and storage options said products*

iii. *The investment case for, in the case of hydrogen (i.e. not a 'drop-in' gas), building massive hydrogen gas generation, transport and storage infrastructure to provide a long-duration-energy-storage (LDES) option that is anticipated to run less than 5% of the time. Moreover, in the case of green hydrogen by definition it will not be available during a renewable drought unless it is stored or transferred over a sufficiently large distance to move away from where renewable capacity factors are correlated (or by definition they are also in a renewable drought).*

Consideration of LNG imports is also important and the degree to which LNG imports play a role is dependent on many factors, many of which relate to the above, non-exhaustive list of risks – with one notable additional risk being whether any gas user/buyer is prepared to enter into committed off-take agreements or if some other scheme, backed by government, will be necessary. The global LNG market is an even greater consideration for any potential LNG import-supported scenarios.

The Centre has spent considerable time and resources considering appropriate context and scenarios, and provide an independent view on these factors that "gas industry stakeholders" will find difficult if they are involved in some aspect of the non-exhaustive list above. AEMO will need to find truly independent consultants as independent experts, academics, or ensure sufficient in-house expertise to assess the likelihood of major investment decisions in upstream projects, midstream/pipeline projects, and power-generation projects. The Centre would welcome the opportunity to engage on these matters, but I cannot articulate the full-range of challenges and potential scenario analyses in this submission.

3. What alternative approaches should AEMO consider for enhancing the incorporation of gas in the ISP to address the action in the Energy Ministers' response?

Response: As per above, I would recommend that a holistic approach is taken that looks at aspects of "doability" and "likelihood" of occurring and take a broad 'risk assessment' approach to incorporating gas in the ISP. Given the uncertainty regarding gas supply even in the coming 1-5 years in the southern states, forecasts about what will occur on longer time frames are fraught. I would recommend against taking an approach where the parameters are

driven by "what is needed", in a 'worse' or 'slow deployment' case, rather than "what is possible" or "what is likely".

4. What improvements could be made to AEMO's proposed approach to increase consideration of gas availability, considering gas transportation and storage capacity?

   Response: It is entirely appropriate to increase consideration of gas availability – however, even a 'transportation and storage capacity' lens is arguably too narrow and on the time-frame of the ISP upstream supply risk needs to be considered also.

5. What improvements could be made to AEMO's proposed approach in its capacity outlook models to improve the representation of fuel usage for gas generation, particularly for mid-merit capacity?

   Response: No specific comments. I'm not sure I fully understand what is meant by "fuel usage for gas generation" – is that intended to be specific to organic material for biogas/biomethane generation?