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Utilities Commission of the Northern Territory
Level 8, TIO Building
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Generator Performance Standards (GPS) Feedback

Assure Energy Asset Pty Ltd (as trustee for the Assure Energy Asset Trust) (**Assure Energy**) is pleased to submit the following feedback in relation to the Commission's draft decision on the proposed amendments to the Generator Performance Standards.

Assure Energy is the parent entity of its two wholly owned special purpose vehicles: Assure Energy NT Robertson Pty Ltd (as Trustee for the Assure Energy NT Robertson Trust) and Assure Energy NT Darwin Pty Ltd (as Trustee for the Assure Energy NT Darwin Trust) (**Assure Energy SPVs**).

The Assure Energy SPVs entered into power purchase agreements with the Commonwealth of Australia, represented by the Department of Defence, on 2 April 2019 in respect of a project involving the design, construction, operation and finance of two on-base solar photovoltaic power stations and associated batteries at Robertson Barracks and RAAF Darwin (**Project**).

The power stations are under construction and scheduled to commence commissioning in the next couple of months and will be indirectly connected to the Darwin – Katherine interconnected transmission system via Defence substations located at Robertson Barracks and RAAF Darwin. Electricity generated from these facilities will primarily be used by Defence with any excess generation above the Defence load to be exported to the grid.

We appreciate the ongoing engagement and involvement of stakeholders in the development of the new standards and provide below our key feedback.

Summary of feedback

We believe that there are other solutions to potential problems that might occur due to the increase in solar generation forecast in the Northern Territory which may not have been fully investigated. We note that the proposed GPS results in a number of inefficiencies and believe that alternative solutions may provide a more efficient outcome. We query if such other potential solutions have been adequately investigated.

Notwithstanding the above statement, we have spent considerable resources analysing the proposed GPS with a view to trying to comply. We believe that we will be able to comply with all of the elements except in relation to the capacity forecasting accuracy requirements. For clarity, we confirm that we are able to provide the capacity forecasts contemplated and it is only the accuracy requirements that present an issue. We note that complying with the proposed GPS (excluding the capacity forecasting accuracy requirements) will come at a cost to the Project and we hope that this demonstrates our commitment to working proactively with the relevant authorities to achieve a reasonable position for all parties.

Underpinning the above conclusion is a report we have commissioned which incorporates actual data from solar forecasters in the market along with historical weather data from the Bureau of Meteorology and our detailed plant design.

We submit that the costs of complying with the capacity forecasting accuracy requirements are too much to bear for a project like ours (fully committed, power purchase agreement executed and construction underway). We estimate the costs to be in excess of \$10m. The financial imposition of the proposed GPS as it currently stands is not acceptable to us and would impact our ability to make future investment in the Northern Territory due to the uncertainty of such an investment. We therefore believe that the GPS should incorporate a grandfathering regime in respect of the accuracy requirements of the capacity forecasts to projects that have already executed

power purchase agreements. We would then we aim to comply with the intent of the GPS within the capabilities of the committed plant.

Is the proposed GPS the most efficient solution?

We believe that generators are not best placed to solve the system security concerns and it would be more efficient to deal with the system issues at an aggregate level.

The proposed GPS regime appears to have a number of inefficiencies, some of which are:

- Each generator is focussed only on its own firm offer. This will result in times where one plant has a BESS charging and another plant has a BESS discharging. Individual batteries responding differently on the same network is clearly inefficient
- The regime is trying to make individual generators incredibly accurate. This is not realistic as there will be times when a plant does not meet its forecast (eg through plant failures or forecasting failures) so a problem would still exist in the proposed GPS. Such an occurrence would require a system response but each generator is tasked with meeting its own forecast rather than helping with a system response. A separate system response is therefore likely to be required under the proposed GPS. We question if a single integrated system response alone would be more efficient than trying to make generators individually achieve very high levels of forecast accuracy.

We query if the Commission is satisfied that all potential responses to system security have been sufficiently investigated to determine an efficient solution. Some potential solutions that could be investigated include:

- Improving the number of trips that conventional plant experience. We believe that the existing fleet of conventional plant experience above average outages and it appears that solar projects are being tasked with trying to solve the problem. Is there room for improvement in the conventional plant which could potentially lessen the forecast accuracy requirements imposed on solar providers?
- On an aggregate basis across multiple power stations geographically separated, a single forecast system would benefit from the portfolio effect which would even out individual errors to provide more accurate forecasts. This could be incorporated with forecasting rooftop solar generation and a centralised BESS that could provide capacity firming and voltage support.

If the proposed GPS is implemented, we have concerns about the ability for the Northern Territory Government to deliver on its commitment to 50% renewable energy by 2030 as outlined in the Roadmap to Renewables. The proposed GPS will substantially increase the cost of future solar projects and this cost will ultimately be paid for by Northern Territory consumers.

An element of grandfathering for projects with executed power purchase agreements

If the Commission continues with the proposed GPS, we believe that an additional element of grandfathering is appropriate.

Under the proposed GPS there are grandfathering arrangements for projects with an existing connection agreement. We believe that a grandfathering regime should apply in respect of the capacity forecasting accuracy requirements to projects that have an executed power purchase agreement. These are projects that have committed to investment in the Northern Territory (and are currently delivering that investment). The projects were struck before the rules came to light and so the economics do not take into account the proposed GPS. The accuracy requirements of the capacity forecasts in the proposed GPS will have a major impact on the financial viability of the Project and future investment decisions.

If the proposed GPS is implemented for future projects then they can factor in the design, economics and broader implications into the negotiations and investment decision. Such future projects will likely require a substantially larger BESS to attempt to meet the proposed standards and this increased cost would be passed on to the energy purchaser and ultimately consumers.

We note that the Commission's draft determination argued that the accuracy requirements around the t30 forecasts encouraged generators to under bid their capacity. The draft determination went on to say that economic dispatch principles would mean that solar should be dispatched in preference to other generators. After discussing with PWC, we understand that this may not be the case. Within six months (the expected timeframe for PWC's systems in relation to this section of the GPS to come online) we understand that PWC will use the minimum of t30 and firm offers to dispatch plant. This means that there is no encouragement to underbid t30 forecasts as it would result in not being dispatched fully if the firm offer was subsequently higher. The potential benefits that the Commission identified appear not to exist.

We suspect that the 30 minute timeframe contemplated relates to the time required to bring thermal generation online. This is a very long time compared to other thermal generators, so we question:

- is 30 minutes required for all thermal generation on the system or only some plants to come online?
- is there contingency built in to this timeframe (eg additional time for a failed start)?
- is an additional burden being placed on to solar generators from unreliable thermal generators?
- is there a type of thermal generation in the market with a faster start time?
- can the 30 minute timeframe for capacity forecasts and planned dispatch be reduced?

Under clause 3.3.5.17(g) a process for detecting non-compliance with capacity forecasts and the action that will be taken in response to any non-compliance is to be developed and published by PWC by 30 March 2020. This is a key piece of information and it is difficult to make a fulsome submission with that piece of information missing. In the Commission's draft determination it noted that the, "compliance process needs further clarification to enable generator developers to assess how best to invest to meet these requirements." Given our Project is underway we do not have this benefit, further supporting our request for a grandfathering regime to apply.

PWC have submitted that, "Early mover renewable generators should not get an unfair advantage of lower access standards that result in higher entry barriers to subsequent generator developments and higher costs to consumers." We would argue that early mover renewable generators have an unfair disadvantage since the costs of complying with the proposed GPS cannot be factored in to their power purchase agreements. Any new solar development would include the substantial increased costs in its negotiations which would ultimately be passed on to consumers.

PWC also notes a minimum daily demand of ~100MW. We suspect this is a minimum over an entire year and not a regular daily minimum. The average daily minimum appears to be ~130MW and occurs during the very early hours of the morning when solar is generating very little (if any) energy. We therefore think that some of the downside scenarios presented by PWC might be extreme. Has the Commission considered the demand during daylight hours when solar will be generating?

Our Project is relatively small at only 14MW across two geographically separate sites (RAAF Darwin and Robertson Barracks). We believe that this small size is relevant to our grandfathering request especially when viewed in conjunction with the daytime system demand (ie when solar is actually producing power) which we believe is substantially higher than the minimum daily demand which may have been the basis for analysis conducted by PWC.

Changing rules post investment decisions hamper industry confidence. There are other Australian and international markets for generators to invest in and retrospective rule change risk is a fundamental element when making investment decisions.

Technical analysis supporting our position

Aurecon was engaged to analyse the implications of the proposed GPS on the Project. While a number of issues were identified across the proposed GPS, our focus for this submission is on the capacity forecasts. Aurecon developed a performance model which incorporated high resolution irradiance data from the Bureau of Meteorology, achievable forecasting accuracies based on data received from solar forecasters and the BESS firming capacity of the Project.

As part of the report's research it became evident that for the t30 forecasts, sky cams are not relevant because clouds are generally beyond the horizon (and therefore out of the view of sky cams) meaning that the t30 forecasts need to use satellite images. These images' resolution is inferior to sky cams and only update every 10 minutes. This means that the t30 forecast might be using data to predict up to 45 minutes into the future (t30 + 5 minute dispatch period + 10 minute old satellite image). The forecasts from such a system is clearly not going to have the very high levels of accuracy required by the proposed GPS.

Similarly, the firm offer requirements were also analysed. For this shorter-term forecast, sky cams generally take over from the satellites. Under the proposed GPS we are required to hold our dispatch to within 0.5% of the firm offer for the 5 minute dispatch period. Again, the detailed modelling shows that this is not achievable since there will always be outliers meaning there are some dispatch periods where the firm offer is not able to be held.

For clarity, the analysis did not just look at the forecasting reliability. It incorporated the BESS procured by the Project to reduce the forecasting errors. However, we are still unable to economically meet the level required by the proposed GPS. To achieve those levels a far greater BESS would be required which we estimate to exceed \$10m. We submit that this is an unacceptable imposition to impose on the Project (which is only around 14MW) where the investment decision has been made and construction is underway.

Drafting comments on specific items

Clause 3.3.5.1 Reactive Power Capability:

- We suggest clarification is added to the end of 3.3.5.1(a): “The reactive power requirement of 0.395 x rated active power capacity of the generating system is based on its active power capacity under normal operating conditions. The generating system is not required to be capable of supplying or absorbing additional reactive power if it provides additional active power to support power system frequency control.”

Clause 3.3.5.15 Inertia and Contingency FCAS:

- We note the proposed language from PWC’s submission on 10 January 2020, “Subject to energy source availability as determined in capacity forecasts under clause 3.3.5.17...” It is not clear to us which forecasts from 3.3.5.17 are being referenced. We suggest it should be made clear that this refers to the firm offers under clause 3.3.5.17(b)(4). We note that this language exists elsewhere and a similar comment applies in each instance.

Thank you for the opportunity to provide input to these standards. Please do not hesitate to contact me should you have any questions in relation to this submission.

Yours sincerely,



Edward Hart

Power Producer Representative, Assure Energy