Record No: TGD2017/107930
Container No: TGF2017/1293

Dr Patrick Walsh
Utilities Commissioner
Utilities Commission
GPO Box 915
Darwin NT 0801
By email: utilities.commission@nt.gov.au

Dear Dr Walsh,

Submission of Katherine Solar Pty Ltd Application for Standard Generation Licence in the Northern Territory (NT)

Territory Generation (**T-Gen**) thanks you for the opportunity to provide a submission in relation to Katherine Solar Pty Ltd (**Katherine Solar**) application for standard Generation Licence, operating in the NT electricity market.

In principle, T-Gen is generally supportive of Katherine Solar's generation licence application and the 25MW solar photovoltaic facility (**Solar Farm**). Since its establishment in July 2014, T-Gen has been supportive of strategies to improve business efficiency and competitiveness as the NT Electricity Market evolves. This is consistent with the NT Government's electricity reform program to drive efficiency, encourage competition and renewables, consequently providing for the long term interests of the NT electricity consumers.

However, T-Gen believes there are a number of key issues which need to be considered prior to granting a generation licence to Katherine Solar, including:

(1) Katherine Solar Farm protection settings

T-Gen owns and operates the Katherine Power Station, which includes four dual open-cycle gas turbines with emergency black start diesel, with a maximum capacity of 36MW. The Katherine electricity network is connected to the Darwin network by a 132Kv transmission line stretching approximately 300km from T-Gen's Channel Island Power Station. Accordingly, introducing 25MW into the Katherine electricity network must be carefully managed with appropriate control mechanisms put in place.

It is imperative that the Solar Farm has adequate protection and safeguards should the Darwin-Katherine 132Kv line open and island the Katherine network. Katherine Power Stations' black start diesel engine would start and supply essential services to allow other engines to be started and synchronised to the islanded grid. T-Gen would expect that procedures are put in place to require the Solar Farm's main CB to remain open until grid stability and system security is reinstated along with the 132Kv line closed and back in service.

(2) The location and risk of the Solar Farm

Proximity to the grid is one of the most important criteria for selecting a site. T-Gen would strongly recommend Katherine Solar engaging early with T-Gen to ensure capacity and access is available, and to minimize any increase in risk or down rating of the 132Kv line. Consideration of network and generation support is another important element for discussions that must take place with T-Gen and Power and Water Corporation. Opportunities should be investigated at an early stage (such as battery storage), as such projects can shape the details of plant design and protections to avoid inevitable system constraints. T-Gen expects that any future network stability constraints are placed with Katherine Solar.

(3) Accounting for line losses

Due to the distance of the 132Kv Darwin-Katherine transmission line, substantial line loss occurs which produces a financial burden on electricity entities. Katherine Solar ought to be held accountable for line losses and a transparent mechanism on the allocation of the cost of line losses on a 'user pays' basis ought to be implemented.

(4) Ancillary Services

From the information available to us, it does not appear that Katherine Solar has made provision for battery storage to cover loss of supply when cloud cover or other contingency events occur that affects the network. If this is the case, there must be a mechanism implemented to cover the 25MW output of the Solar Farm in regards to spinning reserve and other ancillary services which T-Gen provides. Without such a mechanism, it is unacceptable that T-Gen will be expected to bear the costs of spinning reserve and ancillary services.

(5) Requirements for generation outside of daylight hours

The intermittency and requirements for power generation outside of daylight hours (10:00 AM – 5:00PM) will require power is generated by others (T-Gen). The publicly available version of Katherine Solar's license application does not state if any stand-by arrangements with other generators are being sought.

(6) Dynamic modelling

T-Gen would have expected that dynamic modelling was carried out to cover contingencies that will inevitably occur, such as reactive power capability, fault levels, generating response to frequency or voltage disturbances, and the impact on network stability and the 132Kv line. If modelling was carried out, T-Gen requests access to same, to enable an evaluation of risk and impacts the Solar Farm will have on T-Gen's operations and business.

We appreciate the opportunity to provide this submission. If you have any queries or require further information please do not hesitate to contact Hieu Nguyen, General Counsel and Company Secretary at hieu.nguyen@territorygeneration.com.au.

Yours sincerely

Tim Duignan
Chief Executive Officer

15 December 2017