

Northern Territory Electricity Market Consultation Draft Functional Specification

UGL Submission and Comments

1.0 Introduction

UGL have a long history of participation in the development of the NT generation and transmission systems and look forward to continuing to do so in both generation and transmission.

This submission is in response to the recently released Consultation Notes on the NT Electricity Market development.

UGL have prepared these comments in light of a range of available public domain documents including:

1. Utilities Commission – Power System Review 2016-17
2. PWC – System Control Technical Code – May 2015
3. PWC – Network Management Plan 2013-14 to 2018-19
4. NT – Roadmap to Renewables – September 2017

2.0 Capacity Mechanism - Reliability Manager

The consultation paper indicates that:

A pragmatic transitional arrangement is proposed to create a basis for entry of new renewable resources in 2019 before more complete implementation of the Capacity Mechanism can be put in place.

And that following this the Reliability Manager will determine annually:

- *calculates Capacity Obligation*
- *calculates and publishes reference Capacity Price*
- *allocates proportional responsibility for Capacity Obligation to Retailers*
- *confirms Retailers' contracted Capacity arrangements*
- *Reliability Manager contracts for balance of Capacity if necessary*

2.1 Security needed to invest in new Renewable Generation

At the commencement of the NTEM the existing generators have a monopoly position with the capacity to meet the total system requirements.

A capacity mechanism which is annually assessed may not provide the long term certainty and hence security required to allow new renewable generation to commit. How is this to be addressed within the proposed NTEM structure.

2.2 Transitional Arrangements for Renewable Energy

It is noted from the Utilities Commission Power System Review that the load forecast indicates a reduction in system demand and energy from current levels.

Please provide an indication of expected transition arrangements proposed for renewable energy over the coming 5 years. Are there annual targets expected for Renewable Energy.

2.3 Renewable Generation vs Scheduled Generation

Given the nature of renewable generation and its dependence on renewable energy sources, what mechanism is proposed to assess the capacity requirements for Scheduled and Renewable generation.

There will be times, rain and heavy cloud, where Solar PV will not be able to supply – during such periods scheduled generation will need to be available to meet system demand requirements.

How is this factored into the Capacity Determination.

Will Renewable Generation be given priority for dispatch when available.

3.0 Renewable Generation Mix

Table 2.3 of the Utilities Commission Power System Review report indicates to meet the 50% renewable target by 2026-27 that the following Solar PV is required for DKIS:

- a) 222MW Large Scale Solar PV
- b) 113MW Rooftop Solar PV
- c) 44MW Commercial Solar PV

A total of 379MW Solar PV is indicated.

Given the nature of Solar PV this means that during the day there will be a significant excess of Solar PV where the day time demand level varies from 60MW to 270MW.

Have studies been completed to confirm what measures will be required to meet Code Performance Requirements for System Strength, stability, steady state and dynamic frequency and voltage control.

Please confirm what ancillary services and energy storage capabilities are assumed to be required to support this development.

4.0 Connection of Large Scale Solar PV

It is likely that large Scale Solar PV installations will be installed inland to avoid potential damaging cyclonic winds experienced from time to time in the coastal areas. Various reports indicate that the Channel Island to Katherine 132kV system would be the most likely connection point for such developments.

If 222MW of Solar PV is to be installed on to this system who will be responsible for the ongoing development of the 132kV system to meet future Renewable Generation addressing:

1. Spinning Reserve requirements allowing for the loss of a 132kV line – noting that the existing line has a high lightning outage rate.
2. Thermal limitations on the 132kV existing system
3. System Strength requirements
4. Voltage & frequency control to mitigate cloud effects – similar to that experienced in the Alice Springs system
5. Other system requirements – protection speed, voltage and frequency control

What timeframes are proposed for the development of the 132kV system to accommodate the proposed new renewable generation.

5.0 Energy Storage Capabilities

If only Solar PV renewables are installed who will be responsible for cost and operation of the energy storage requirements for the overall system.

Assuming Solar PV for supply of renewable energy it appears that the energy storage capability would need to be up to 320MW for 6 to 8 hours per day. This is approximately 20 times the South Australian Tesla battery installation capacity.

What technology is envisaged for this energy storage and how will it be delivered.

6.0 Solar Thermal Option

Has Solar Thermal technology been considered for the DKIS System.

What dispatch mechanism is proposed – to allow Solar PV priority – when available and Solar Thermal sufficient access to the market to be economic and to meet the renewable energy targets.