NTESMO

IES Deemed Load Profile

Contents

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1 Overview

The proposal sets out how the Market Operator will estimate and profile IES electricity consumption into 30-minute trading intervals for market settlement purposes where interval metering data is not available.

1.1 Purpose

This paper brings to the attention of Market Participants, particularly Jacana Energy and IES, the Market Operator's intention to use a deemed load profile, as described herein, as one element in determining Jacana Energy's non-interval meter consumption, and for determining the total IES load at the Transaction Reference Point (TRP). The quantities for these Market Participants will be determined on a trading interval basis. The Market Operator is required by clause A6.4(d) of the System Control Technical Code (the Code), to develop an algorithm for the purpose of profiling the IES load (as measure by consumption meters) into trading intervals, and to consult on that algorithm with electricity market stakeholders. This paper satisfies that requirement.

1.2 Background

The deemed load profile is necessary there is insufficient interval metering data available for the Indigenous Essential Services (IES) load to accommodate the design of the Interim Northern Territory Electricity Market (I-NTEM).

The deemed load profile is based on information received from the Network Provider with regards to the configuration of IES bulk metering in the Darwin-Katherine power system. This is in accordance with A6.4(a) of the Code.

1.3 Current IES Metering Configuration

The metering data for IES customers available to the Market Operator can be a mix of statistical interval meters and individual customer consumption meters that service the IES customers.

The statistical meters can be located at the entrance of some IES communities. For any one of these communities, the statistical interval meter measures the total electricity consumed within that community, as well as unmetered loads such as Telstra services, streetlights, and electrical losses. At the time of approval of this paper, four communities had statistical interval meters at the entry points. In addition to these statistical interval meters, these communities have meters installed at each premise. The premise meters use accumulation technology whose measurement is obtained from a meter reading cycle, nominally once every three months ('consumption meters'). The premise meters are used for retail billing.

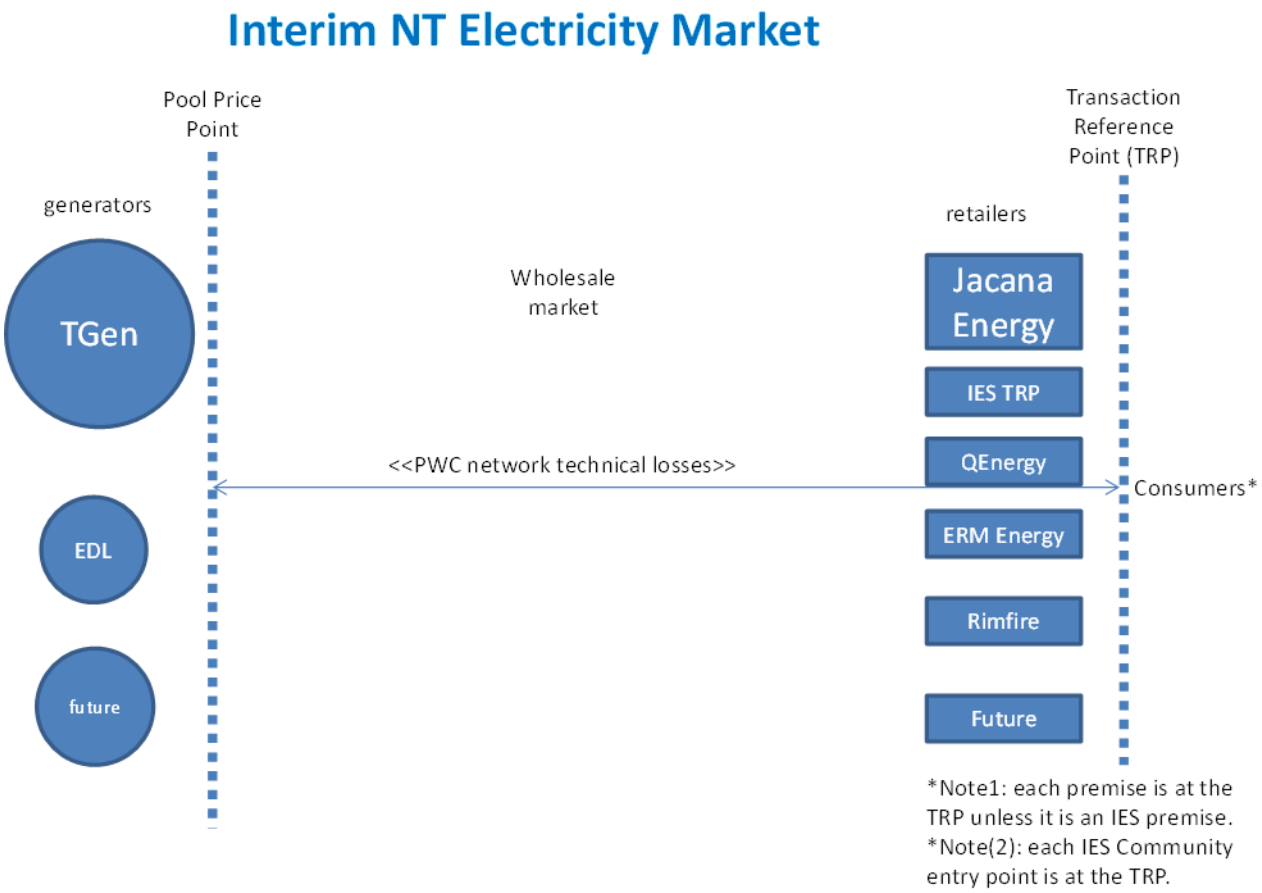
The remainder of the communities may not have meters at their entry point and only have premise accumulation meters.

In this instance, the premise accumulation meter data is subject to calculated line (technical) losses between generators and the entry point (also known as the TRP), and unmetered load (non-technical) losses between the entry points and the premise meters.

1.4 Transaction Reference Point

The TRP is the connection point on the Darwin-Katherine power system where customers are connected to the Power and Water ('PWC') electricity network, as shown in Figures 1 and 2. It is the point of sale to customers of electricity that is produced by Generators. For the IES load it is a virtual point of sale because the actual point of sale is within the IES network.

Figure 1 - Transaction Reference Point in relation to Generators

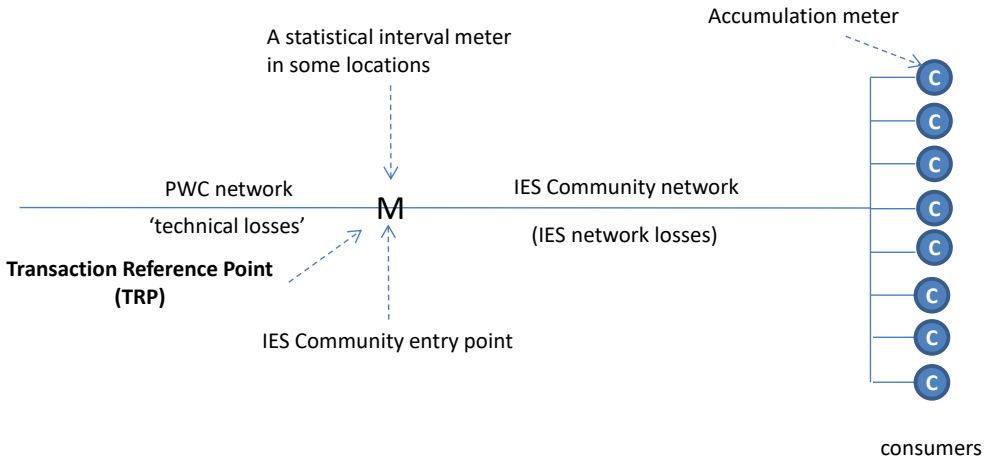


In general, the TRP is significant because it plays an important role (from a wholesale line loss perspective) in the I-NTEM settlements process.

For IES communities it has a further significance - the entrance point to the community is the TRP, irrespective of whether a meter is installed at that point or not. The consumers within that community require their consumption meter readings to be adjusted by the unmetered loads so

that their meter measurements better represent the value at the community entry point. This arrangement is shown in Figure 2.

Figure 2 **-** IES communities and their meter arrangements



1.5 Pool Price Point

The Pool Price Point (PPP) is the location assigned to all generating units from a loss's perspective, as shown in Figure 1. It is the point where the I-NTEM settlements is balanced (total generation = total consumption). The PPP has an assigned loss factor of 1.0 per unit.

The TRP is electrically separated from the PPP by the PWC line losses ('technical losses'). These losses are determined and published by the Network Provider after approval by the Utilities Commission.

The line losses used at the commencement of the I-NTEM are those recorded in the Interim Electricity Market Functional Specification (April 2015).

For the purpose of determining Jacana Energy's total assigned load, the total IES load of all IES communities on the Darwin-Katherine power system ('the IES total load') at the PPP (in trading intervals) is added to all other interval meter consumer loads in the Darwin-Katherine power system, as measured at their TRP and adjusted by PWC losses to the PPP.

The total of all interval metered consumer load and the IES total load is subtracted from the total sent-out electricity produced by Generators in the Darwin-Katherine power system. The balance represents the total electricity measured by accumulation meters in that power system that are not associated with IES communities. This calculated value is assigned to Jacana Energy in the settlements process, along with any interval meters also assigned to Jacana Energy.

The paper explains how the loads measured by premise meters in each IES community are to be assembled into half hour measurements (trading interval) at that community's TRP. Each community's total TRP load is adjusted by its relevant loss factor to represent a load at the PPP. The total load of all adjusted IES Community loads represents the total IES load. This total IES load is then profiled by the trading interval values of the bulk statistical meters.

1.6 Deemed Load Profile Principle

The deemed load profile principle is as follows:

A single electricity measurement made over a long period can be broken down into 30 minute intervals by applying an agreed proportion of that measurement to each interval. The agreed proportion may vary from one 30 minute interval to the next in accordance with the pattern of consumption behaviour, as determined using an interval meter.

A statistical interval meter provides an acceptable means for determining the pattern of consumer behaviour for the IES communities ('the deemed load profile'). The statistical interval meters would be used in the following ways:

- For the community in which a statistical interval meter has been deployed, as trading interval data to represent that community's total consumption meter readings, including energy losses.
- For the communities where no statistical interval meter has been deployed, as a deemed load profile, applied to the total of the consumption meter readings for those communities.
- For the purpose of determining the energy losses that can be then applied to the loads of the customers in communities where a statistical interval meter is not installed.

The deemed load profile principle is applied below to form the proposal presented by this paper.

1.7 Deemed Load Profile Principle

The data from the IES statistical interval meters will be used to estimate the total IES load on a trading interval basis at the PPP for the nominated month. This will be performed in the following way:

- Where that community has a statistical interval meter at the entry point ('statistical meter community'):
    - The statistical interval data for this community will be added directly to the IES total as representing trading interval quantities at the TRP.
    - No adjustment for IES network losses or non-metered losses is required (the statistical meter incorporates these quantities).
    - No adjustment need be made for wet season and dry season since the statistical interval meter quantities will accurately represent these differences.

- Energy losses between the TRP and the PPP are to be applied in accordance with the HV / LV rating for each community and the location in the power system.
- Energy losses between premise consumption and the bulk statistical meters are to be determined for use in the non-statistical meter communities below. This will be achieved by determining a scaling factor ('the non-statistical meter communities scaling factor') from the annual accumulation meter readings and the monthly statistical interval meter readings for the statistical meter communities taken as a total.

- Where that community does not have a statistical interval meter at the entry point ('non-statistical meter communities'):
  - The total consumption (premise meters) for each of the non-statistical metered communities on a rolling 12 month basis (commencing with the 2014 calendar year) is to be reduced to a monthly value and increased by the average IES community losses to represent a quantity at the TRP for the nominated month for that community. This is to be achieved by using the non-statistical meter communities scaling factor.
    - The scaling factor will vary each month according to the variation in bulk statistical interval meter quantities.
    - That scaling factor is to be applied to the total annual accumulated meter quantity for that community each month to produce an estimated quantity at the TRP for that Community.
    - The estimated TRP value is further adjusted by the PWC technical losses for the HV/LV location of that Community to produce an estimated quantity at the PPP for that community.
    - The total of all estimated Community quantities at the PPP are totalled and profiled using the trading intervals from the total of the statistical meter communities' bulk interval meters.
  - The resultant profile represents the total IES load on a trading interval basis. These trading interval quantities can then be combined with the trading interval quantities produced from interval meters for the purpose of determining the energy supplied by Generators to accumulation meters assigned to Jacana Energy.
  - The total IES load (being the PPP scaled up quantity in total), when proportioned on a trading interval basis using the combined bulk statistical meter values, becomes the 'deemed load profile' for that month for the IES Communities.
  - No adjustments need to be made for wet season and dry season since the aggregated statistical interval meter quantities will accurately represent these differences.
- The total accumulation meter quantity for these communities will be updated in accordance with the rolling 12 month dataset and performed in accordance with the settlements revision timing (13 weeks after the end of the settlements period).

- The profiling methodology is to accommodate a progressive reduction in the number of non-statistical meter communities as more bulk statistical interval meters are installed across the IEC Communities.

1.7.1 Peak and off-peak periods

Monthly peak and off-peak period quantities will be produced by aggregating the relevant trading intervals in that month (refer to the Code for definitions of peak period and off-peak period).

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