



AEMO TUOS Pricing Methodology Decision Paper

March 2021

TUOS pricing for a changing transmission network
Decision Paper to advise of AEMO's decision on the final form of revised Pricing
Methodology for July 2022 to June 2027

Important notice

PURPOSE

AEMO publishes this document to inform AEMO in the development of AEMO's revised *pricing methodology*.

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1. Need for Consultation

AEMO as the TNSP for the Victorian transmission system recovers the cost of the *prescribed transmission services* (except *prescribed exit services* and *prescribed entry services* which are recovered by AusNet Services) from *Transmission Network Users* in accordance with its *pricing methodology* which is approved by the AER in accordance with Chapter 6A of the *National Electricity Rules* (NER). The current AEMO *pricing methodology* is available on the AEMO website¹ and entitled “Approved amended Pricing Methodology for Prescribed Shared Transmission Services for 1 July 2014 to 30 June 2019”. The validity of the methodology has been extended under an enforceable undertaking by AEMO initially to 30 June 2022.

An issues paper was published on 16 September 2020 (Issues Paper) and a Consultation Paper was published on 25 November 2020. Both considered significant questions that AEMO is facing in terms of setting Transmission Use of System (TUOS) prices in a changing power system. No submissions were received to the Issues Paper and two submissions were received to the Consultation Paper. Submissions are detailed on the [Transmission use of system – pricing methodology \(Victoria\)](#) webpage.²

2. General

The papers considered three main matters and asked several questions in relation to those and some other related matters. In summary, those three matters related to:

- The growing occurrence of measured negative energy and demand from connected systems caused by increasing penetration of distributed generation (primarily rooftop solar).
- TUOS treatment of batteries and other energy storage devices that are becoming an increasingly important part of the overall electricity delivery chain.
- Consideration of alternative methodologies to determine the locational price component of TUOS in response to more mixed set of transmission investment drivers than has historically been the case.

¹ <https://www.aemo.com.au/-/media/files/pdf/approved-amended-pricing-methodology--1-july-2014-to-30-june-2019.pdf>

² <https://aemo.com.au/consultations/current-and-closed-consultations/transmission-use-of-system-pricing-methodology-vic>

In addition to these issues, the Consultation Paper also stated that there were amendments to the Pricing Methodology required to update it considering changes to the regulatory framework, processes and other minor administrative matters since the current version.

3. Reverse Flows at Transmission Connection Points

3.1 Recap

The transmission system was originally conceived to deliver energy from large generators to the major load centres. This meant that Transmission Connection Points (TCP) were substantially load points and generally no energy flowed in the opposite direction.

The current power system now has TCPs that do not always behave as loads and so in the absence TUOS being levied against generators, the question remains as to what happens when TCPs or loads turn into generators (i.e. there is reverse flow at the TCP) as they do now with distributed energy generation, with storage devices and in some cases, directly connected loads with co-located excess generation or storage.

3.2 Overview

The three options identified were:

- Option 1 – Allow the negative energy to be subtracted from the load
- Option 2 – Treat the net negative value as zero at a TCP
- Option 3 – Only consider half-hourly consumption and treat all negative values as zero

3.3 Proposed Treatment at Customer TCP

AEMO considers that the best option is Option 3 and the consultation did not raise any alternatives or variations on that option.

We have been made aware of a TCP that under certain network configurations had a combination of positive and negative meter flows and it was unclear whether the customer would be disadvantaged. On investigation it was confirmed that the metering arrangements would only measure the customer's load as the summation of the meters was done each 30-minute period and would always accurately represent the load.

4. Energy Storage Systems (ESS) and Payment for Transmission Usage

4.1 Recap

AEMO proposes to continue its current practise of not charging directly connected ESSs. To recap, AEMO's proposal for a rule change "Integrating Energy Storage Systems into the NEM"³ has recommended that ESSs should not pay TUoS charges. The AEMO rule change proposal does point out that a hybrid load which consists of an ESS and a load should not use the ESS to avoid payments by the load and this may require additional metering behind the TCP.

AEMO's enforceable undertaking provided to the AER on the AEMO pricing methodology has a clause 6.2 which explicitly states that "...transmission use of system charges will not be determined or charged in respect of existing or new connection points at which large scale batteries are connected, either in respect of supply (discharging), or consumption (charging)...".

Despite the above, not all ESS should be exempted, and this has been clarified in the proposed draft Pricing Methodology.

4.2 Proposed Treatment

The draft Pricing Methodology will confirm that AEMO does not intend to charge TUOS to stand alone ESS that are directly connected to the transmission network. As stated in the Consultation Paper, this is subject to the following exceptions:

- Where electrically powered pumps are used to recharge pumped hydro storage systems, the pumps will only be exempted from TUOS where the pumps are used exclusively for the pumped storage system and the proponent agrees to maintain that exclusivity in its Use of System Agreement with AEMO for the duration of the agreement.
- ESS used as part of a transmission connected load drawing facility (e.g. manufacturing factory, metal processing facility, wood and paper processing facilities etc) and located behind the load drawing facility's meter will be treated as part of the load drawing facility for TUOS purposes. The measurement of the combined operation of the load facility and ESS will be conducted by the energy meter located at the TCP and prices and charges determined in the same way as any other TCP for TUOS purposes. This includes treatment of negative 30-minute energy and demand readings (see section 3 above).
- For embedded ESS, it is up to the DNSP to determine how they will treat these for DUOS purposes but they will not attract discrete TUOS charges as they are not

³ <https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem> on page 2 of rule change proposal

themselves connected to the transmission network. The charges (to the DNSP) will therefore rely on flows at the TCP with the treatment of flows into the transmission network treated as per section 3 above. Like distribution connected generators, ESS that are distribution connected might qualify for payments under the avoided TUOS regime under clause 5.3AA(h) of the NER.

In recognition that this is a fast-developing technology which can be packaged up with technologies in any number of ways, AEMO will determine whether the ESS is eligible for an exemption at the time that the connection application is made by the proponent.

5. Peak Day (MD10) versus 365 Day Method for Locational Prices

5.1 Recap

The current locational pricing methodology uses the average of the 10 weekday maximum demand half-hours on the system wide maximum demand days to allocate usage of the transmission system assets to TCPs and therefore set the annual revenue to be allocated to each TCP. AEMO considers that choosing a subset of conditions that occur at peak demand times during a year is now problematic because the period “of greatest utilisation of the transmission network” is not simply the maximum demand of the power system.

Transmission investment is now being justified based on unlocking renewable energy generation rather than being biased towards the reduction in unserved energy at peak demands.

Accordingly, maximum demand days no longer appear to be the only driver for new augmentations and as argued in the Consultation Papers, the methodology used in other regions (the “365 days methodology”) would be better suited.

5.2 Comments

AEMO was asked whether modelling could be prepared that demonstrated the benefits of a move towards the 365 day methodology from the MD10 methodology. Any modelling would be too inaccurate to act as a worthwhile decision tool. The reasons are:

- In order to be sufficiently accurate, the modelling would need to try to emulate load flows in a state of the network that does not yet exist. At best this would be inaccurate and could potentially be misleading.
- Changes to how pricing is calculated necessarily changes behaviours by customers to try to achieve a lower locational price than would otherwise be the case. A forward-looking model is unable to accurately reflect these behaviours across the network over a period of time without relying on a set of untested assumptions.

AEMO contends that the methodology is more aligned with the requirement that pricing be reflective of demand at times of greatest utilisation of the network and for which network investment is most likely to be contemplated⁴ than the existing methodology. It also aligns with locational pricing methodologies adopted by TNSPs in other jurisdictions.

Lastly, AEMO was asked to consider whether charges for locational pricing could be calculated on t-1 data rather than t-2. This would make charging more reflective of more recent customer usage data. AEMO considers this an appropriate suitable charging methodology in that charges are reflective of more recent activity. However, it does come with some disadvantages:

- Where t-2 data is used, a full year's set of data points are available for each customer and hence, the data on which the locational charge is based can be confirmed by all customers and therefore, the charge can be fixed and communicated to each customer prior to commencement of the year. This is useful for customers in terms of budgeting.
- A consequence of having more variable locational charges is that it makes the distribution price setting process carried out by the AER and the DNSPs more complicated as the transmission charges payable by the DNSP have scope to fluctuate after the distribution prices have been set.
- There is a greater likelihood of under and over recovery in a year which will mean adjustments to the non-locational component in the following year to even out the impact. Allowing AEMO to over-recover would mean that the affected customers would not have the benefit of the over-recovered amount until the following year and if AEMO were to under-recover, the carrying costs of funding the shortfall would need to be added to the non-locational allocation in the following year increasing charges above what they could have been.

The above uncertainties would, in AEMO's view mitigate against the benefits of having more recent data to set locational charges.

6. Other Amendments

6.1 Equalisation Adjustment Scheme Derogation

No submissions were received on this issue. While the scheme has ended, the provisions have been retained in the (albeit unlikely) event that the derogation is reinstated in future years during the term of the Pricing Methodology.

⁴ Clause 6A.23.4(b), National Electricity Rules (version 158) and clause 2.2(a) of the AER's Electricity transmission network service providers - Pricing methodology guidelines.

6.2 Change in timing of publication of transmission pricing

No submissions were received on this issue. Accordingly, the pricing calculations will be conducted so that prices can be published by 1 March each year.

6.3 National Transmission Planner Costs

No submissions were received on this issue. National Transmission Planner costs will be recoverable in accordance with the relevant Rules.

6.4 Cost under Ministerial Order under section 16Y of the National Electricity (Victoria) Act (NEVA)

No submissions were received on this issue. The right to recovery of costs allowed by section 16Y of the NEVA is mirrored in the draft Pricing Methodology and 'AEMO contacting costs' will be allocated to *prescribed common transmission services* as required by the Second VNI SIPS Ministerial Order.

6.5 Miscellaneous

On review of the draft Pricing Methodology an error was found under section 3.5.1 for situations where whole datasets at a Transmission Connection Point for locational charge setting purposes is incomplete or unavailable. The current clause references the incomplete dataset as "year t" whereas it should be "year t-2". The whole paragraph should be as follows (amendment highlighted):

"If historical average monthly *maximum demand* data for Financial **year t-2** is unavailable or only partially available for a Connection Point, AEMO will charge Transmission Customers for the *adjusted locational component of prescribed TUOS services* by multiplying the Locational Price by the actual average monthly *maximum demand* for the Financial year t for their respective Connection Points. This will be done in two steps."

It would not make sense to leave it as "year t" since that information is not available at the time of TUOS price publication.