UFE Reporting Guidelines

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Date:	TBC

Contents

Note: There is a version history at the end of this document.

1. Introduction

1.1. Purpose and scope

These are the *UFE reporting guidelines* (Guidelines) made under 3.15.5B of the National Electricity Rules (NER).

These Guidelines have effect only for the purposes set out in the NER. The NER and the National Electricity Law prevail over these Guidelines to the extent of any inconsistency.

The purpose of these Guidelines is to set out AEMO's approach to preparing and publishing the Unaccounted for Energy (UFE) Trends Report that provides information and analysis of UFE in each *local area* to facilitate efficient decreases in UFE over time.

The reporting period for the (year "x") UFE Trends Report is 1 May (year "x-1") to 30 April (year "x").

UFE Trend Reports are to be prepared in accordance with these Guidelines. The content of the UFE Trend Report includes:

1. Reporting on total UFE by *local area* over the reporting period.
2. Analysis of UFE in each *local area* against expectations and benchmarks.
3. Analysis of the sources of UFE in each *local area*,
4. Recommended actions to gain further visibility of UFE.
5. Recommended actions to reduce UFE.

1.2. Definitions and interpretation

1.2.1. Glossary

Terms defined in the National Electricity Law and the NER have the same meanings in these Procedures unless otherwise specified in this clause.

Terms defined in the NER are intended to be identified in these Guidelines by italicising them, but failure to italicise a defined term does not affect its meaning.

The Retail Electricity Market Procedures – Glossary and Framework:

(a) Is incorporated into and forms part of this document; and

(b) Should be read in conjunction with the document.

1.2.2. Interpretation

These Guidelines are subject to the principles of interpretation set out in Schedule 2 of the National Electricity Law.

1.3. Related documents

Title	Location
Metrology Procedure: Part B Metering Data Validation, Substitution and Estimation	https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/market-operations/retail-and-metering/metrology-procedures-and-unmetered-loads
Retail Electricity Market Procedures – Glossary and Framework	https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/market-operations/retail-and-metering

1.4. Key definitions – UFE components

For each *local area,* an amount representing UFE is determined by AEMO for each *trading interval* in accordance with 1.4.1.

Calculations detailed in 1.4.2 and 1.4.3 are also undertaken by AEMO to assist with the allocation of UFE for each *distribution network connection point*.

1.4.1. UFE calculation

In accordance with NER 3.15.5(a), for each *local area*, the UFE amount for each *trading interval* is determined by the following formula:

UFE = TME – DDME – ADME

Where:

UFE is total unaccounted for *energy* amount (in MWh) for a *local area*,

TME is total *energy* inflows, expressed in MWh, into a *local area* from *transmission network connection points*,

DDME is cross boundary *energy* flow, expressed in MWh, between adjacent *distribution networks* adjusted by the applicable d*istribution loss factor*. DDME is a positive value for the supplying distribution *local area* and a negative value for the receiving distribution *local area*, and

ADME is the aggregate of *energy* flows, expressed in MWh, for each *connection point* in a *local area* adjusted by the applicable d*istribution loss factor*.

UFE, TME, DDME and ADME information is available from the RM 46 Report for *financially responsible Market Participants* (FRMPs) and *Local Network Service Providers* (LNSPs).

1.4.2. UFE allocation

In accordance with NER 3.15.5(c), the allocation of UFE for each trading interval for every *distribution network connection point* in a *local area* is determined by the following formula:

UFEA = UFE x (DME/ADMELA)

Where:

UFEA is the allocation of *local area* UFE (in MWh) for a *connection point*,

DME is the amount represented by (ME- x DLF) at a *connection point* in the *local area*,

ME- is the amount of electrical *energy* flowing to the *connection point* as recorded in the *metering data* at a *connection point* in the *local area*,

DLF is the *distribution loss factor* applicable at a *connection point* in the *local area*, and

ADMELA is the aggregate of all DME amounts in a *local area* for which a *Market Customer* (other than a suspended *Market Customer*) is *financially responsible*.

1.4.3. UFE Factor (UFEF)

The UFE Factor (UFEF) is used to facilitate the allocation of UFE to individual *connection points*.

UFEF = UFE/ADMELA

Where:

UFE is total UFE amount (in MWh) for a *local area*, and

ADMELA is the aggregate of all DME amounts in a *local area* for which a *Market Customer* (other than a suspended *Market Customer*) is *financially responsible*

UFEA = UFE x (DME/ADMELA), or can be expressed as:

UFEA = DME x (UFE/ADMELA), therefore

UFEA = DME x UFEF

UFEF and ADMELA are available from the RM 46 Report. UFEF is also available from the RM 43 Report.

2. Summary and analysis of UFE

2.1. Trend interpretation

Charts in this section provide a summary of the UFE calculation variables, identified in Section 1.4, for each *local area* over the reporting period. The underlying data for each chart comes from values that are available in MSATS RM43 and RM46 Reports. Data values for the charts in this section are of the settlement type “Final”.

As this data is sourced from AEMO’s Metering Data Management system, load values are positive and generation values are negative.

Information presented in the charts is the total of each component for a *day* and are displayed as kWh values. The left vertical axis scale is related to TME and ADME values and the right vertical axis is related to UFE values and, where applicable, DDME values.

2.1.1. UFE components – [DNSP 1 Name]

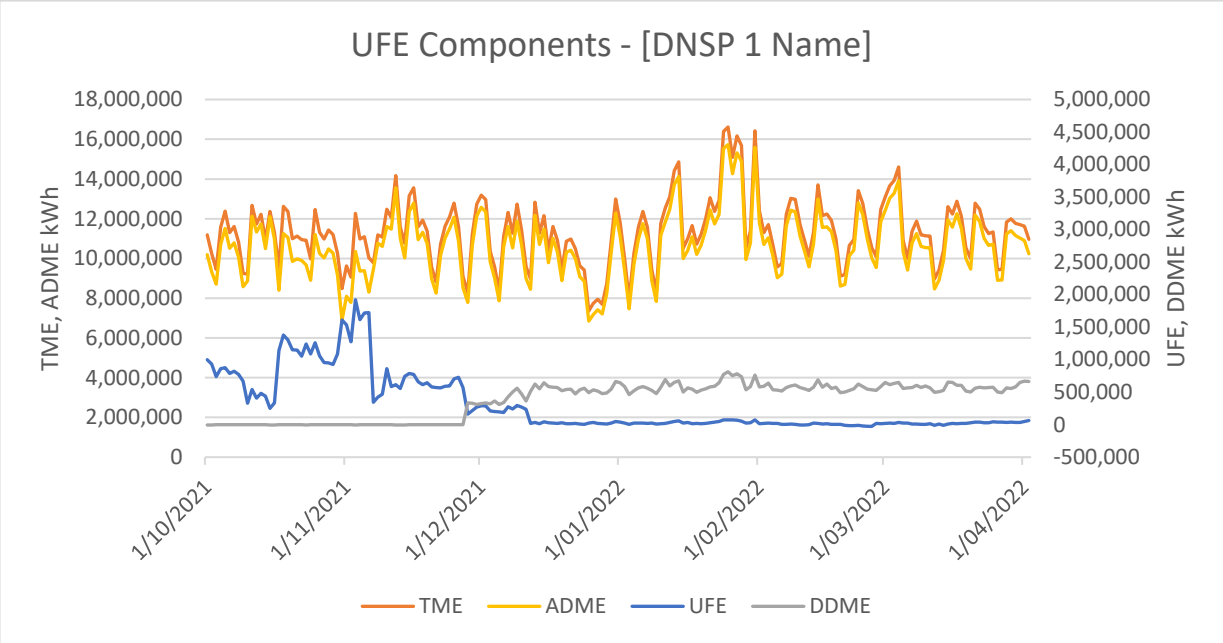


Figure 1 UFE components – [DNSP 1 Name]

Local area observations

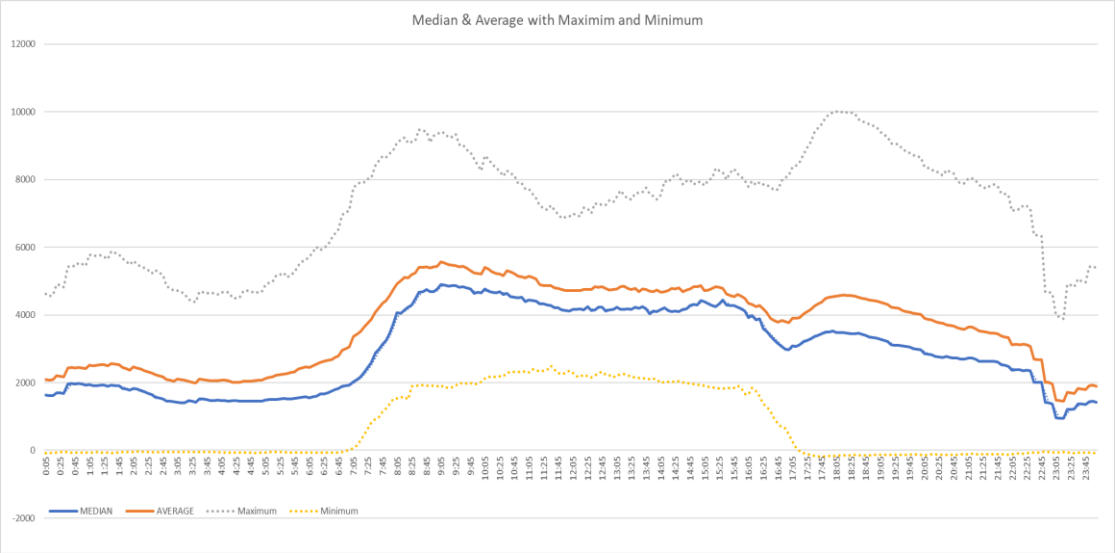
Observations and summary of trends in UFE component values and their relativities over the reporting period for each *local area*.

2.1.2. 2.1.2 UFE Components – [DNSP 2 Name]

3. UFE benchmark analysis

Analysis of the unaccounted for *energy* amounts in each *local area* in the reporting period is to be performed against benchmarks that have been determined by AEMO.

This section will provide details of the UFE benchmark values for each *local area* determined for the beginning of the reporting period and compared with UFE values during the reporting period. UFE value comparison against benchmarks will be an input into recommendations to reduce UFE.



4. UFE source analysis

AEMO is required to undertake an analysis of the sources of UFE in each *local area* in order to recommend actions to reduce UFE. The sources of UFE and the respective solutions to reduce UFE are diverse, therefore identifying the likely sources of UFE will be crucial to identifying actions to reduce UFE.

The areas of UFE source analysis would include the following variables that modify metering data:

- DLF value changes – historical analysis of DLFs
- Accumulation (BASIC) meter replacement with 5-minute interval *meters*
- 15 and 30-minute *metering data* transition to 5-minute *metering data*
- Type 7 loads transitioned to Minor Energy Flow *metering*
- Non-contestable unmetered loads (NCONUML) transitioned to metered arrangements
- NCONUML *loads* transitioned to alternative calculation methodologies
- Review of profiling methodologies
- Review changes to UFE values for manually read meters related to metering data changes from forward estimates to actual meter readings (refer to Appendix A.1)
- Review impact of unmetered temporary emergency cross boundary energy volumes

4.1. DLF Values

This section will provide, for each *local area*, a table of DLF codes and values for a five year period.

DLF Code	2017	2018	2019	2020	2021
Code 1	1.0350	1.0328	1.0320	1.0301	1.0309
Code 2	1.0181	1.0195	1.0191	1.0185	1.0182
Code 3	1.0795	1.0745	1.0691	1.0664	1.0637
Code 4	1.0564	1.0556	1.0554	1.0544	1.0506
Code 5	0.9468	0.9671	0.9381	0.9375	0.9296
Code 6	1.0021	1.0174	0.9991	0.9963	0.9970
Code 7	1.0101	1.0108	1.0099	1.0110	1.0119
Code 8	1.0983	1.1080	1.1057	1.0989	1.0859
Code 9	1.0891	1.0851	1.0634	1.0563	1.0481
Code 10	1.0163	1.0133	1.0121	1.0135	1.0141
Code 11	1.0164	1.0164	1.0192	1.0085	1.0102
Code 12	1.0186	1.0210	1.0444	1.0339	1.0253
Code 13	1.0926	1.0827	1.0610	1.0555	1.0495
Code 14	1.1229	1.1264	1.1039	1.0848	1.0651
Code 15	1.0052	1.0193	0.9882	0.9949	0.9953
Code 16	1.0014	0.9964	0.9942	0.9969	0.9956
Code 17	1.0502	1.0450	1.0514	1.0443	1.0335
Code 18	1.0458	1.0492	1.0578	1.0256	1.0391
Code 19	0.9876	0.9853	0.9905	0.9852	0.9750
Code 20	0.9758	0.9764	0.9788	0.9831	0.9720
Code 21	1.0107	1.0084	1.0100	1.0046	1.0063

4.2. Accumulation Metering Migration to 5-minute Metering

This section will provide, for each *local area*, a chart of the number of accumulation *metering installations* and the volume of *accumulated metering data* transitioned to 5-minute metering over the reporting period.

4.3. 15 and 30-minute Metering Migration to 5-minute Metering

This section will provide, for each *local area*, a chart of the number of 15 and 30-minute *metering installations* and the volume of 15 and 30-minute *interval metering data* transitioned to 5-minute metering over the reporting period.

4.4. Unmetered Loads Migration to Metered Arrangements

This section will provide, for each *local area*, a chart of the number of unmetered (type 7 and NCONUML) *metering installations* and the volume of unmetered *metering data* transitioned to 5-minute metering over the reporting period.

4.5. NCONUML Alternative Calculation Methodologies

This section will provide, for each *local area*, a chart of the number of NCONUML *metering installations* and the volume of NCONUML *metering data* transitioned to alternative calculation methodologies over the reporting period.

4.6. Review of Profiling Methodologies

This section will provide, for each *local area*, a chart of the number of profiled *metering installations* and the volume of profiled *metering data* over the reporting period. The profiling methods to be analysed are:

- Net System Load Profile (NSLP),
- Controlled Load Profile (CLP), and
- 15 and 30-minute *metering data* profiled using the methodology described in Metrology Procedure: Part B, Section 12.4

4.7. Review Unmetered Cross Boundary Energy Volumes

This section will identify *energy* volumes that that were related to unmetered temporary emergency cross boundary *energy* flows over the reporting period.

5. Recommendations – UFE visibility improvements

AEMO is required to make recommendations to improve visibility of unaccounted for *energy* in each *local area.*

With UFE being aggregated to the *local area* level, a key function of the reporting framework will be to identify when and how more granular information should be gathered to identify UFE.

Analysis of *local areas* to determine whether more granular geographic UFE information is likely to be valuable will be an on-going undertaking by AEMO to provide additional UFE visibility.

Time factors (e.g. season, and day) that produce patterns of UFE that are occurring are likely to be important in identifying causes and solutions to reduce UFE. This section will provide, for each *local area*, a chart comparing UFE values for each quarter of the reporting period to identify seasonal variance.

6. Recommendations – UFE reduction actions

AEMO is required to recommend actions to reduce the amounts of unaccounted for *energy* in each *local area*, including without limitation any actions AEMO recommends ought to be taken by *Market Participants*, *Network Service Providers*, the *AER* and AEMO.

While global settlements will improve the information provided regarding UFE and the incentives on retailers to minimise UFE, there are a number of possible actions that are the responsibilities of either DNSPs (e.g. accuracy of DLF calculations) or AEMO (e.g. unmetered

load profiling procedures) to resolve and the reporting framework will make recommendations for these to occur. Furthermore, there may be cases over time where the global settlements arrangements can be improved and AEMO will recommend such actions.

Appendix A. UFE analysis supporting information

A.1 UFE chart interpretation

The charts provided in this Appendix provide additional information to support UFE analysis in each *local area*. These charts are:

- UFE for the *local area*
- UFE for the *local area* as a percentage of *local area* ADME
- UFE components for the *local area* by settlement data version, i.e. Prelim, Final, Rev 1 and Rev 2.

UFE for a local area charts the aggregate of UFE values for each *day* over the reporting period. The UFE values are determined by the UFE calculation that is detailed in section 1.4.1.

UFE as a percentage of ADME charts the aggregate of UFE values as a percentage of the aggregate of ADME values for each *day* over the reporting period. This shows the variability of UFE with respect to the aggregate of *energy* flows for each *connection point* in a *local area*.

UFE components by settlement data version (Pelim, Final, Rev1, Rev2) charts the aggregate of each UFE component value (UFE, TME, DDME, ADME) for each *day* over the reporting period.

A.1.1 UFE analysis supporting information – [DNSP 1 Name]

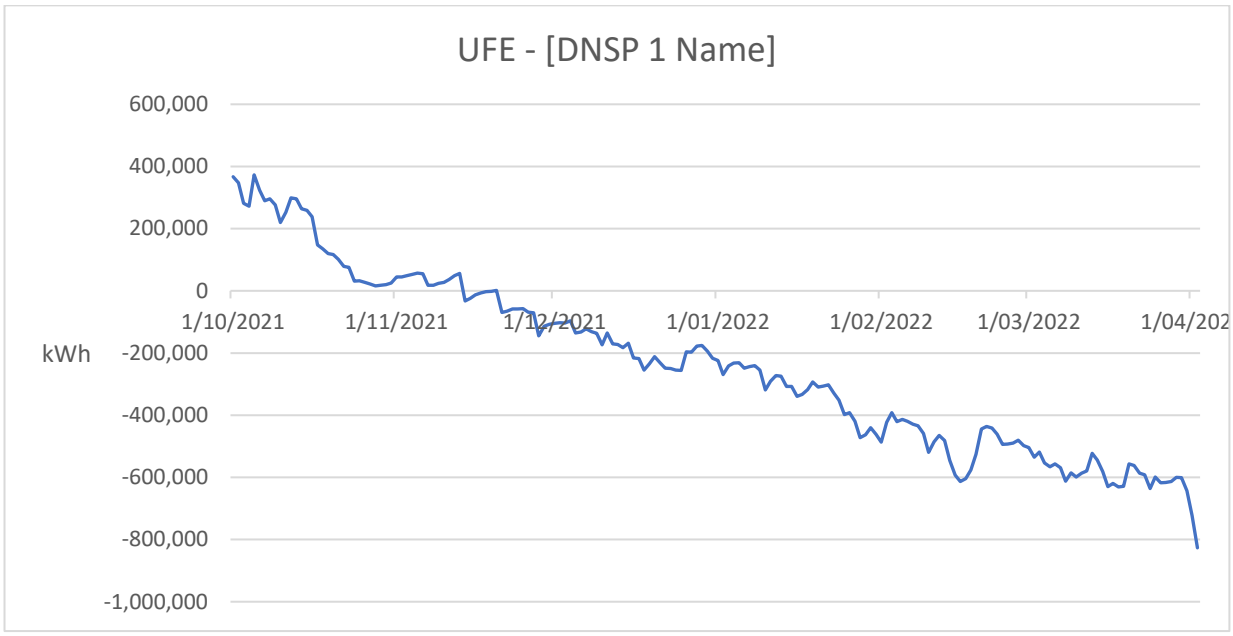


Figure 2 UFE – DNSP 1 Neme]

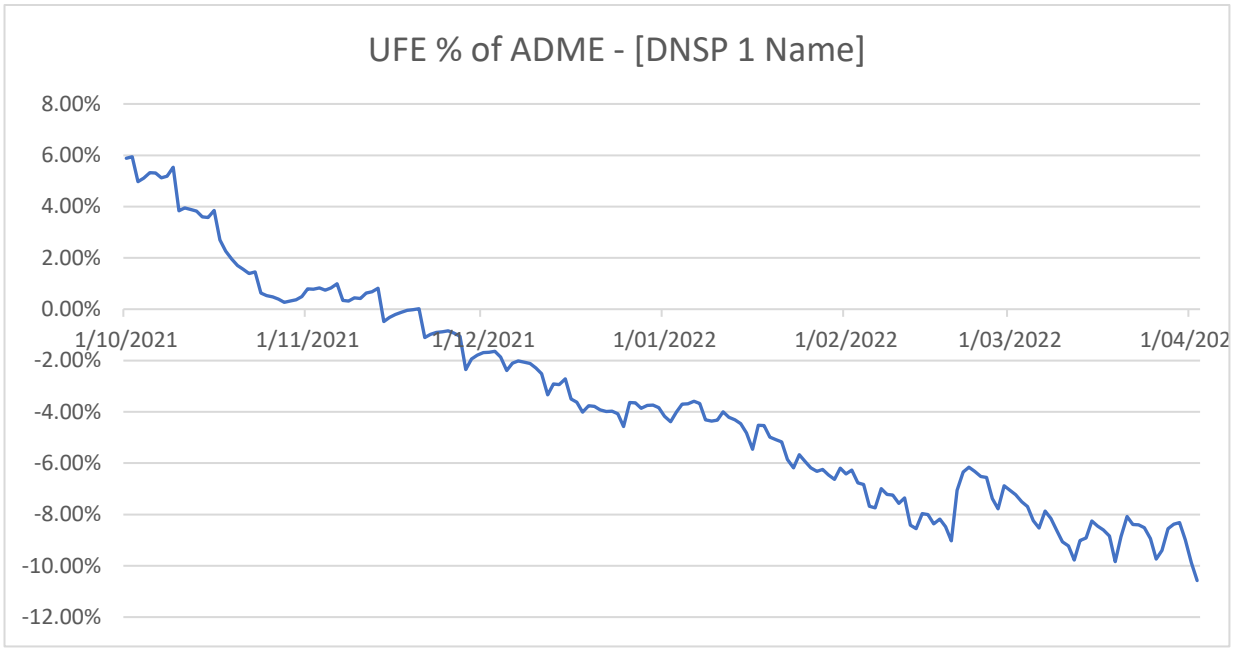


Figure 3 UFE% of ADME – [DNSP 1 Name]

A.1.2 UFE analysis supporting information – [DNSP 2 Name]

A.2 UFE component analysis

The charts provided in this Appendix provide additional information to support UFE analysis in each *local area*. These charts are:

- UFE components for the *local area* by settlement data version, i.e. Prelim, Final, Rev 1 and Rev 2.

UFE **components by settlement data version** (Pelim, Final, Rev1, Rev2) charts the aggregate of each UFE component value (UFE, TME, DDME, ADME) for each *day* over the reporting period.

A.2.1 UFE components by settlement data type [DNSP 1 Name]

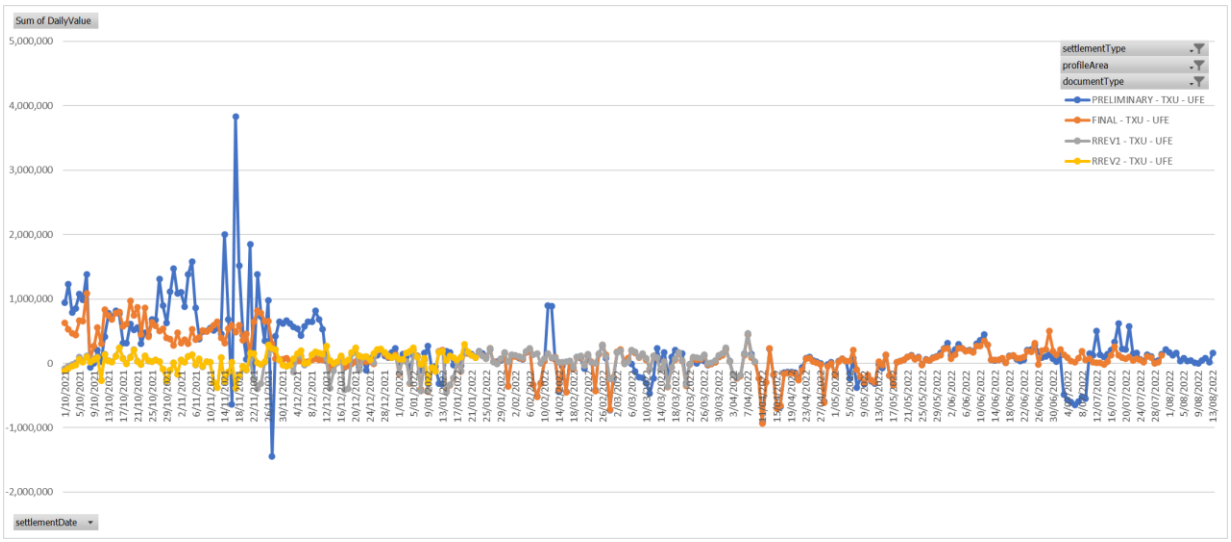


Figure 4 UFE by settlement data type – [DNSP 1 Name]

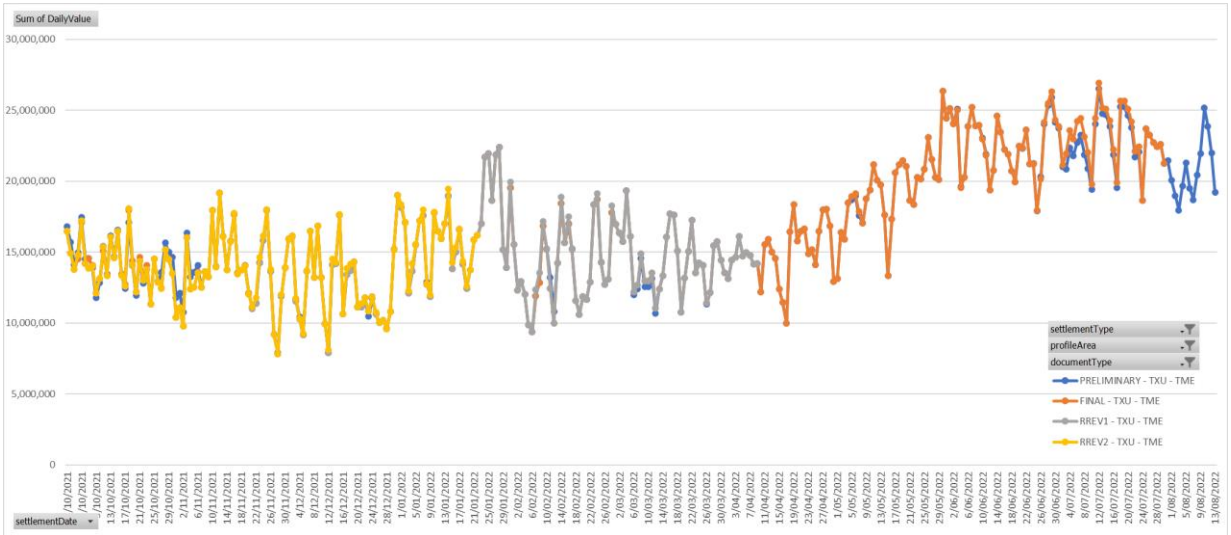


Figure 5 TME by settlement data type – [DNSP 1 Name]

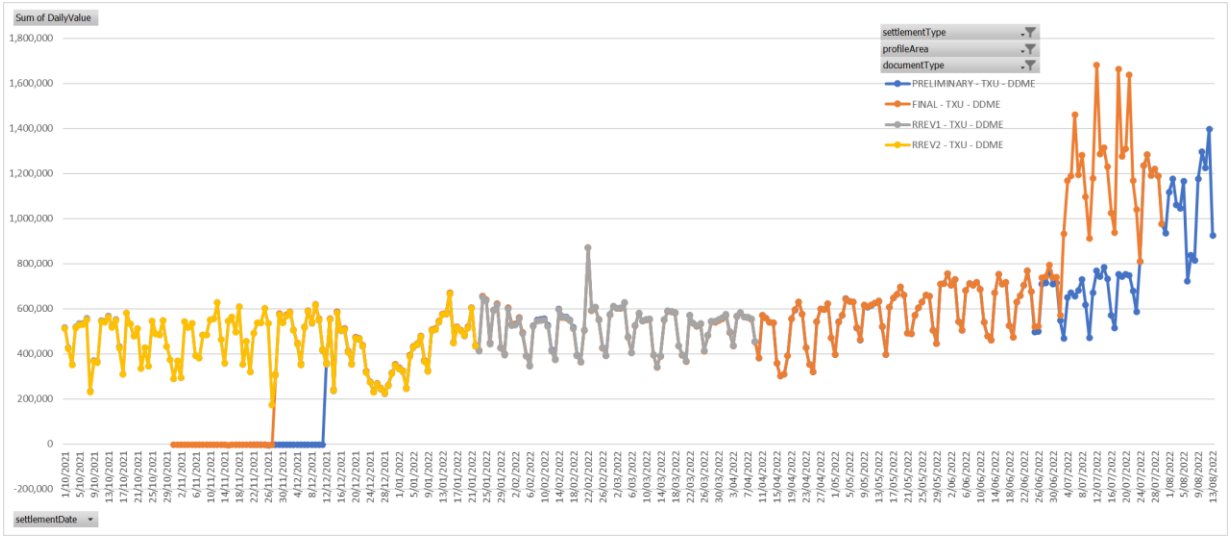


Figure 6 DDME by settlement data type – [DNSP 1 Name]

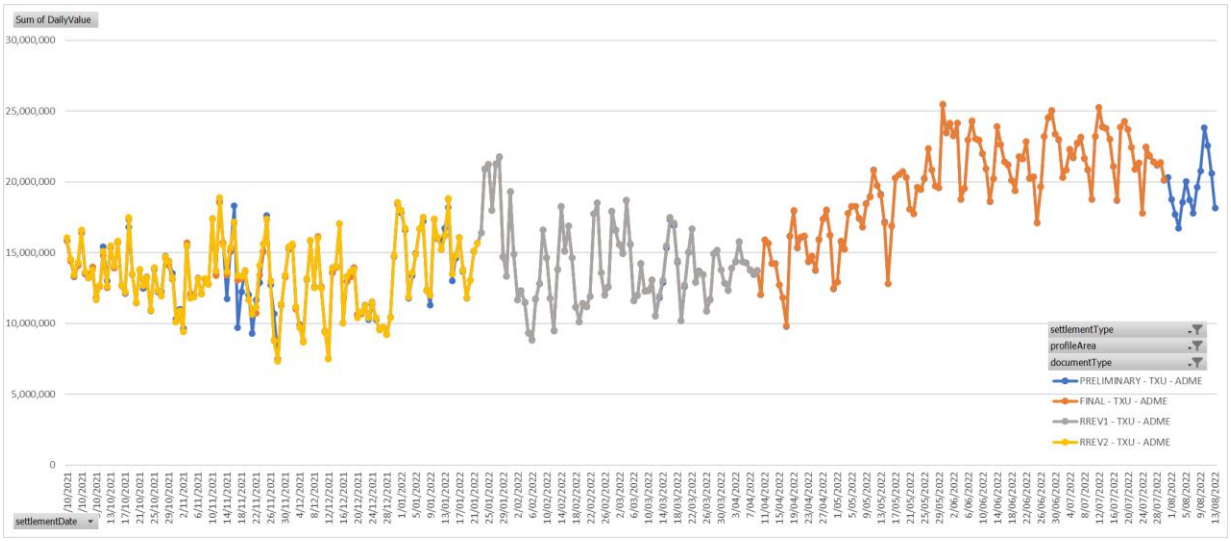


Figure 7 ADME by settlement data type – DNSP 1 Name]

A.2.2 UFE components by settlement data type [DNSP 2 Name]

Version Release History

Version	Effective Date	Summary of Changes
1.0	1 March 2023	First Issue