



Settlement Managers Working Group

14th December 2021

Agenda

1. Welcome
 - Staff Introduction
2. Project Updates
3. 5MS Post implementation
4. Global settlement update
5. CLP effectiveness report highlights
6. WDR update
7. Estimations and initials
8. Christmas Contacts
9. Open Forum
10. Lygon Digital Bank Guarantee update (external presenters)

Project Updates

Presented by: Stephen Harrison

Complete/Upcoming Projects

NEM

GAS

July 2021

New Fee Structure
Commencement
1 July 2021

Sept 2021

Zero Demand
1 September 2021

Oct 2021

5-Minute Settlements
1 Oct 2021

Market Customer flooring
10 Oct 2021

Wholesale Demand
Response
17 Oct 2021

May 2022

Global Settlements

Jan 2023

Commencement of 2020
DWGM Enhancement Rule
Changes
1 Jan 2023

5MS Post implementation

Presented by: Stephen Harrison

Key Outcomes

WHAT HAS STARTED OR BEEN ENABLED?

WHAT HAS BEEN DISABLED, STOPPED OR REJECTED?

DISPATCH & BIDDING



- ✓ **5-minute profiles bids** via FTP (JSON), Web bidding (5MS) and API will be accepted.

- ✗ 30-minute bids will be rejected
- ✗ Bids via FTP txt (legacy) and Web Bidding (30 Minute legacy) will not be accepted
- ✗ AEMO stops populating 30-minute bidding tables.

RETAIL



- ✓ All Interval metering data must be delivered to AEMO in **MTRD format**
- ✓ All tranche 1 metering to be delivered to AEMO for settlement in **5-minute granularity**
- ✓ All tranche 1 meters to provide **register level metering data**
- ✓ **RM UFE Reports** generated for settlement runs at 5-minute (includes 2 days of transition week)
- ✓ Participants **must subscribe** or **request** RM UFE reports (i.e. no automatic push of reports)

- ✗ MDMT files for interval meters will be rejected

SETTLEMENTS



- ✓ AEMO produces **preliminary settlement** statements for settlement week 40 (as per settlement calendar)
- ✓ All Periods post 1 October to be **settled at 5-minute**
- ✓ **UFE Volumes** reported for 5-minute settlement periods

- ✗ Participants will be unsubscribed from legacy tables



Post go-live update

Meter data quality

- Metering data quality issues are still being observed relating to some MDPs
 - ie inappropriate zero substitute reads impacting all Settlement calculations
- AEMO continuing to work with MDPs to resolve data discrepancy issues

Profiling

- 5 Minute Load Profiles (5MLP) are currently creating unexpected and unusual energy spikes (both positive and negative)
- These spikes are impacting the calculation of both trading interval energy and UFE values
- AEMO is currently in discussions with the AER regarding a potential solution to this issue

MDP Interconnector Transition

- As of 1 Nov 2021 AEMO appointed a new MDP for interconnectors
- Transition issues observed in prelims will/have been be fixed for finals



Global settlement update

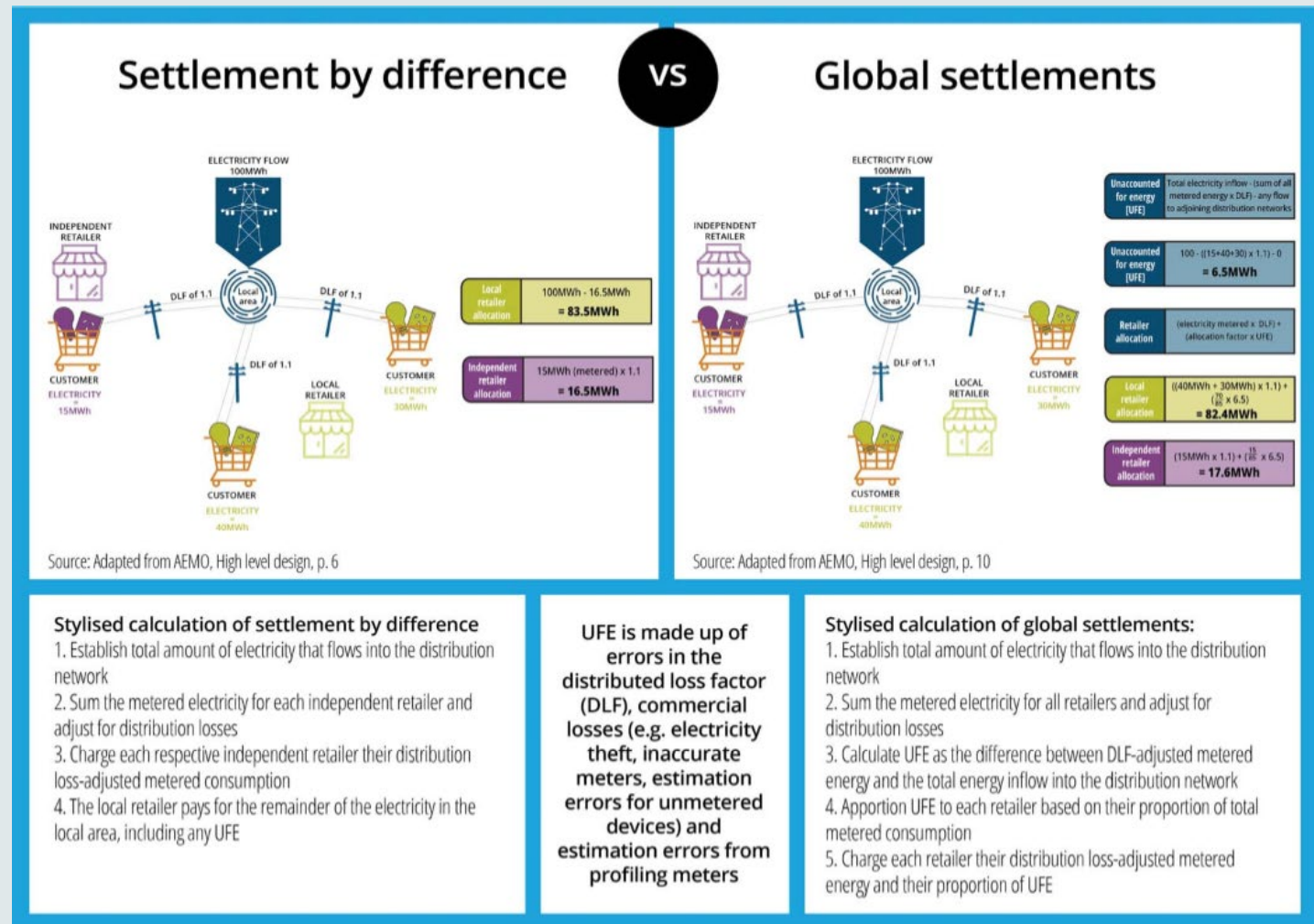
Presented by: Darren Gatty

Settlements by Difference vs Global Settlements

Under Global Settlements, UFE is calculated at the local area level (i.e. distribution network) and allocated across all market customers.

In broad terms, UFE is made up of errors in distribution loss factors and commercial losses:

- Electricity theft
- Inaccurate/faulty meters
- Estimation errors associated to unmetered devices and profiling



For more information please refer to the AEMC's website:
<https://www.aemc.gov.au/rule-changes/global-settlement-and-market-reconciliation>

UFE Key Acronyms and Calculations

Term	Description
UFE	The total unaccounted for <i>energy</i> for each <i>trading interval</i> i.e. residual energy associated to a local area after all metered energy has been allocated $\text{UFE} = \text{TME} - \text{DDME} - \text{ADME}$
TME	The amount of electrical energy flowing at each of the transmission network connection points in the local area i.e. sum of all TNI energy into and out of a local area
DDME	The amount of electrical energy flowing at each of the distribution network connection points in the local area which are connected to an adjacent local area i.e. sum of all Cross Boundary metered energy into and out of a local area
ADME	The aggregate of the amounts represented by (Metered Energy (ME) x DLF) for that trading interval for each connection point assigned to the transmission network connection point or virtual transmission node i.e. sum of all NMI energy flows within a local area adjusted by DLF
UFEA	The unaccounted for energy allocation to each participant in the settlements system $\text{UFEA} = \text{UFE} \times (\text{DME}/\text{ADMELA})$
DME	DME is the amount represented by (ME- x DLF) for the relevant connection point and trading interval. The ME- quantity is the Net Energy quantity for a distribution network connection point for a TI but only when it is negative (i.e. has load). So, ME- is subject to the 'Floored Load' and is zero for: (a) GENERATR or NREG NMI classification codes and (b) NMIs where local generation (e.g. from solar panels) exceeds the load.
ADMELA	The aggregate of the DME amounts represented by $-\text{ME} \times \text{DLF}$ for that trading interval for each market connection point in that local area i.e. sum of all net NMI energy loads within a local area, net generation is set to 0 for the trading interval
UFEF	A factor to determine the allocation of UFE to each (or group of) <i>energy</i> loads at each <i>market connection point</i> (adjusted by DLF) for each <i>trading interval</i> i.e. factor that can be applied to applicable loads to determine the allocation of UFE $\text{UFEF} = \text{UFE} / \text{ADMELA}$

UFE Issues

- During the soft start period the Settlements system does not receive the Tier 1 Retailer reads now being delivered to the Retail Solution
 - Settlements instead uses a settlement by difference approach to calculate the Tier 1 DME values required for the allocation of the UFE
 - This means the DME values calculated by Settlements for Tier 1 retailers will already include a portion of UFE
 - This is visible as the ADMELA published in the RM46 report is different than the ADMELA published in the MMS Data Model table SETLOCALAREAENERGY
 - the UFEF published in the RM43 report will not be able to be used to reconcile to the UFE allocation from Settlements
- The 5 Minute Load Profile (5MLP) and the meter data quality issues are flowing through to the UFE calculated values leading to incorrect variation in the numbers reported
- The residual Participant led transitional activities e.g. creation and maintenance of XBOUNDARY, NCONUML and DWHOLESALE NMI are still required to be completed to ensure all the appropriate data is being received with the correct configuration
- UFE is being calculated in the NSWGRID and QLDGRID Local Areas and allocated to transmission connected loads, a resolution is currently being tested for the 14 NMIs involved
- Unusual trends and spikes in the UFE data are being investigated, in one case what appears to be incorrect meter data has been received for a single 15min period, resulting in a -70MWh spike in the TXU Local Area

GS Outputs

- The data from the Retail Solution is available in new MSATS Reports which can now be subscribed to:
 - **RM43** which provides the UFE Factor for each TI for each Local Area
 - **RM46** which provides the Total energy values used to calculate the UFE and the UFE Factor
- The MMS Data Model now includes the below changes to publish the GS data from the Settlements System
 - **SETLOCALAREATNI** (new table)
 - Contains the TNIs being included in each Local Area for each settlement date and run number
 - **SETLOCALAREAENERGY** (new table)
 - Contains the Local Area level data for each trading interval and each settlement run
 - Includes fields for the UFE, TME, DDME and ADME calculated by the Retail Solution
 - A defect is present in the population of the ADME field meaning it currently only shows NULL values, which is planned for resolution in a future AEMO system release
 - The ADMELA included is the value calculated by the Settlements System
 - **SETCPDATA** (altered table)
 - New fields UFEA and DME are being populated with the Settlements System calculated values
 - New field AFE is the Accounted For Energy so excludes the UFEA and so will remain the same after full GS go-live on 1 May 2022, as during the soft start period
 - New field AGE is the Adjusted Gross Energy and will only include the calculated UFEA after full GS go-live, during the soft start period $AGE = AFE$

More Information

- A UFE Focus Group has been set up under the May 2022 Readiness Working Group to provide a forum to support participants with the key UFE settlement, reporting and management concepts
- The Focus Group meetings held to date have the presentations and recordings available via the AEMO website at <https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/may-2022-readiness-working-group-rwg>
- Any questions around GS or suggestions for the Focus Group can also be directed to gsmsdr@aemo.com.au



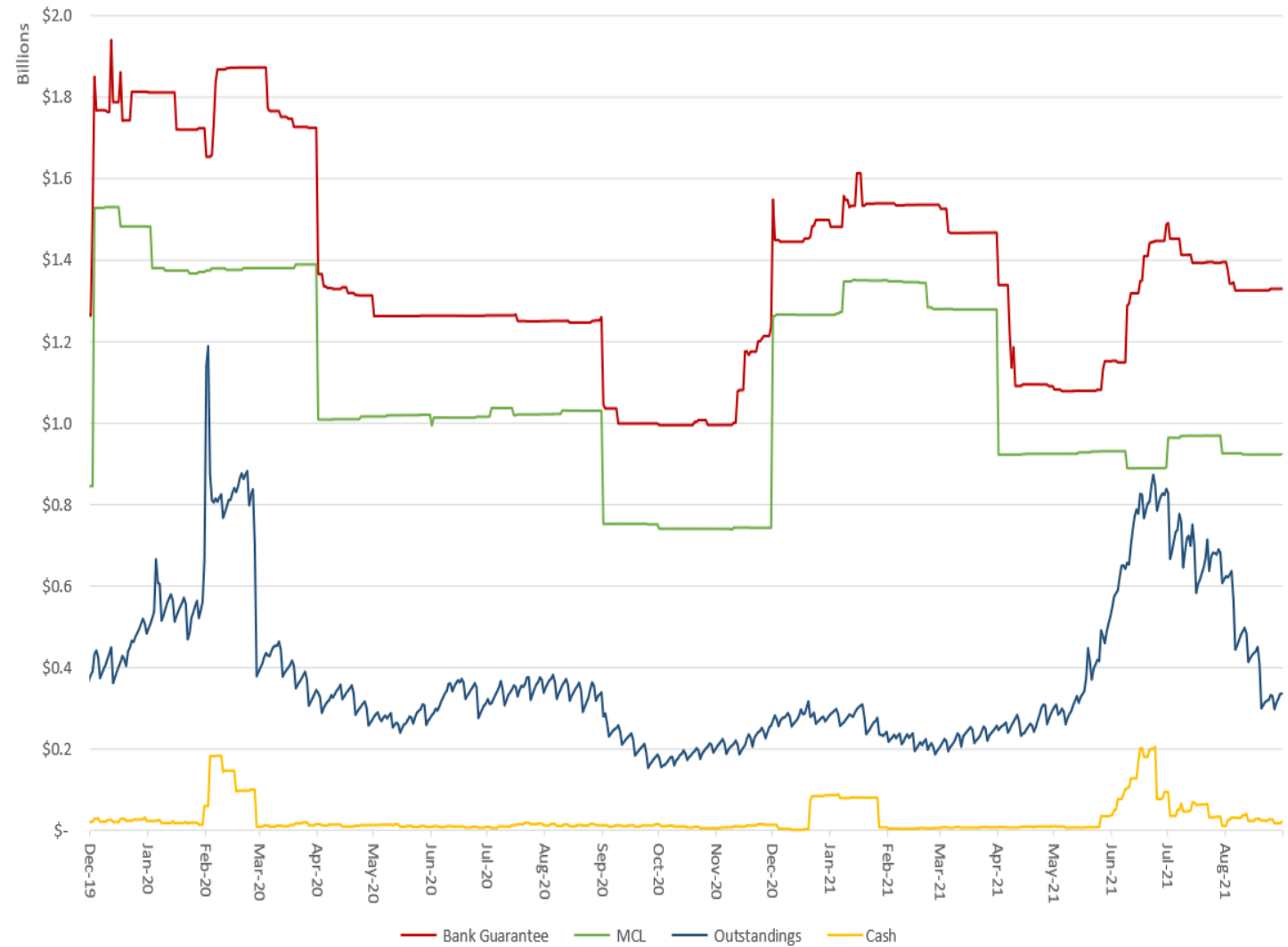
CLP effectiveness report highlights

Presented by: Cheryl Huang

CLP effectiveness report highlights 2020 ~2021

- ❖ Outstandings level (OS)
 - Low OS in summer (due to mild summer conditions in 2020/2021)
 - High OS in winter (due to QLD power outage May in 2021)
- ❖ Bank guarantee level (BG)
 - BG levels remained higher than MCLs
 - No change in BG levels according to lower OS in summer 2021
- ❖ Cash level (SDA)
 - High SDA levels from Christmas week 2020 to Australia Day 2021
 - High SDA levels from May to July 2021
- ❖ Changes relating to prudentials
 - Second year after Shoulder 1 removal
 - No obvious resulting change to prudential levels
 - Reduction in administrative efforts
 - Effects from 5MS settlement and wholesale demand response mechanism are yet to be observed.
- ❖ Meeting the Prudential Standard (2%)
 - Down trending POEs since 2018 in all regions (except higher POEs in NSW and QLD after QLD power outage)
 - QLD and SA met 2%
 - NSW, VIC and TAS exceeded 2%
 - No shortfall

CLP effectiveness report highlights 2020 ~2021



CLP effectiveness report highlights – long term trends

- ❖ Meeting 2% in the future
 - Expecting all regions, with perhaps the exclusion of Tasmania, will be in line with the 2% prudential standard

- ❖ Impacts of low demand and negative prices
 - Possible long-term trend of price and/or volatility reduction.
 - The cumulative effect of this trend could result in decreasing MCL levels in the future.
 - If reducing MCL levels, market may require an increasing amount of cash provision in high price events if:
 - MCL requirements continue to decrease and
 - Participants reduce additional credit support.
 - Under such a scenario:
 - Participants may face greater challenges to cashflow;
 - Risk of shortfall may increase.
 - AEMO will review its prudentials processes to identify any additional risks due to this trend.



Wholesale Demand Response

Presented by: Callum Carpenter

WDR is Live

- Wholesale Demand Response went live on 24th October.
- This means registered wholesale demand response units (WDRUs) can now be dispatched.
- Demand response events have since occurred.

Overview

- A demand response service provider (DRSP) is a new type of market participant who offers and provides load as wholesale demand response.
- A DRSP registers and classifies NMI(s) for WDR.
- Once a NMI passes baseline eligibility assessment, it can operate in the market.
- NMIs are bid in and dispatched like a generator.
- Subject to non-conforming protocols.

Statement Changes

- New line item on statement for WDR transactions.
- New section in the SR with WDR related information.

Summary of NEM Transactions
for Week 41: 03 Oct 2021 - 09 Oct 2021

Description	\$
Energy	0.00
Ancillary Services	0.00
Settlement Residue Auction	0.00
Wholesale Demand Response	21,303.17
Market Fees	0.00
TNSP Residue	0.00
Security Deposits	0.00
Reallocation	0.00
Revision Adjustment	0.00
Revision Interest	0.00
Early Payment Interest	0.00
Other	0.00
GST	2,130.32
Reassignment	0.00
Total	23,433.49

Wholesale Demand Response (WDR) by Region and Quarter

Region	Quarter	DRSP	FRMP	WDR Reimbursement Rate (\$/Mwh)	WDR Settlement Quantity (Mwh)	WDR Trading Amount (\$)
NSW1	2021Q4	AEMODRSP		\$4.86	22.25	\$652.34
QLD1	2021Q4	AEMODRSP		\$4.66	366.42	\$12,724.88
QLD1	2021Q4	AEMODRSP		\$4.66	201.95	\$7,173.21
SA1	2021Q4	AEMODRSP		\$4.20	7.99	\$239.63
VIC1	2021Q4	AEMODRSP		\$4.96	21.33	\$513.11

Additional Reports

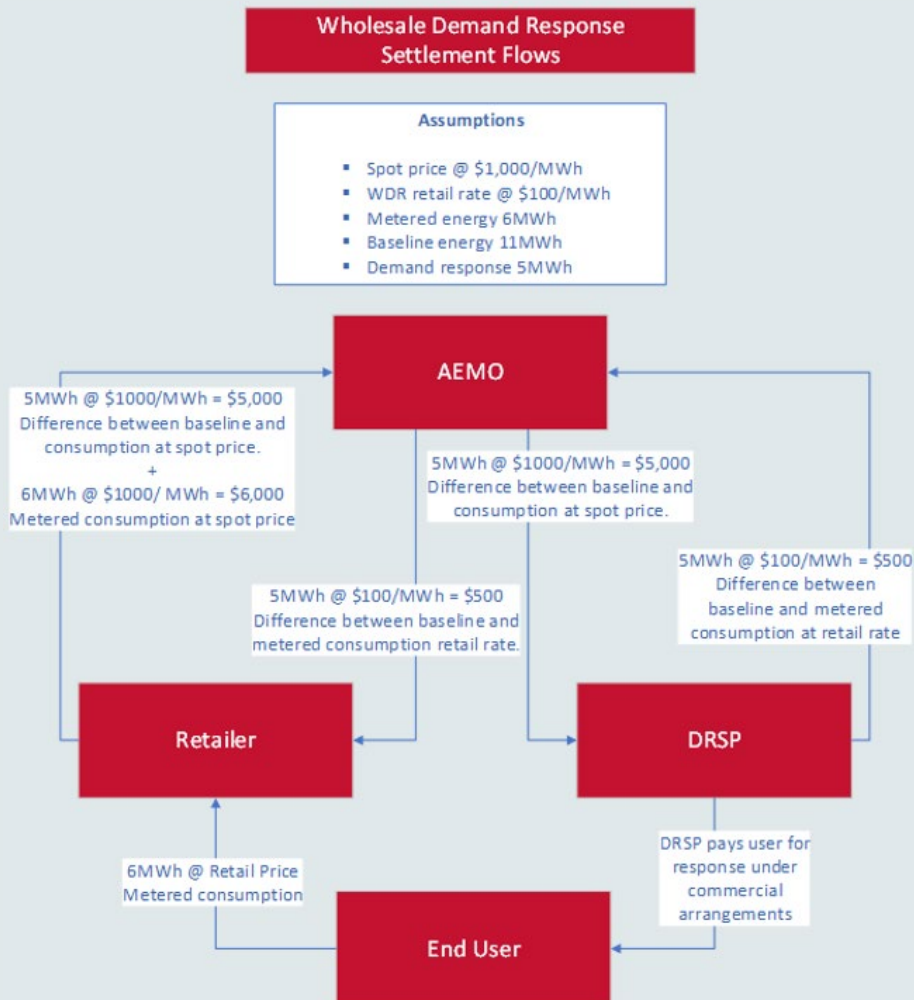
- Confidential Settlements Report
 - Published to Data Interchange
- DUID: NMI Mapping
 - FRMPs and DNSPs
 - Published to Data Interchange
 - Provides FRMP with the details of their WDR NMIs
- Further Updates
 - Market Summary Report
 - Regional Summary Report

What is the WDRRR?

- Wholesale Demand Response Reimbursement Rate.
- It's the \$/MWh rate that the retailer will receive for any WDR that occurred for a NMI they are the FRMP for.
- The rate is set for each region and each quarter.
- Published to the Data Interchange.

Financial Flows

- FRMPs pay for ME and DR, but also receive DR x WDRRR.
- DRSPs pays the WDRRR but receives DR x RRP.



Settlement Scenarios

Following slides show examples of:

1. WDR settlement where demand response is fully settled
2. Capped settlement due to over delivery against NMI maximum responsive component
3. Negative settlement where DRSP pays due to metered energy being below the baseline level

TABLE: Standard parameters used in each scenario

Parameter	Value	Scenario comments
NMI	1234567	In jurisdiction of VIC1
DLF	1.00	For ease of calculation
TNI	ABCDE	In NEM region VIC1
RRP TLF	1.00	For ease of calculation
Region	VIC1	Unlikely to differ from NMI jurisdictional region
RRP	1000 \$ / MWh	Assume constant price for each 5 minutes in dispatch hour in VIC1
Dispatch Bid	5 MW @ \$500 / MWh	Assume dispatched for 1 hour ie 12, 5 min intervals with dispatch target 5 MW
MRC	6 MW	
WDRRR	100 \$ / MWh	In NEM region VIC1
MRC SQ	6 MWh	

Settlement Scenarios

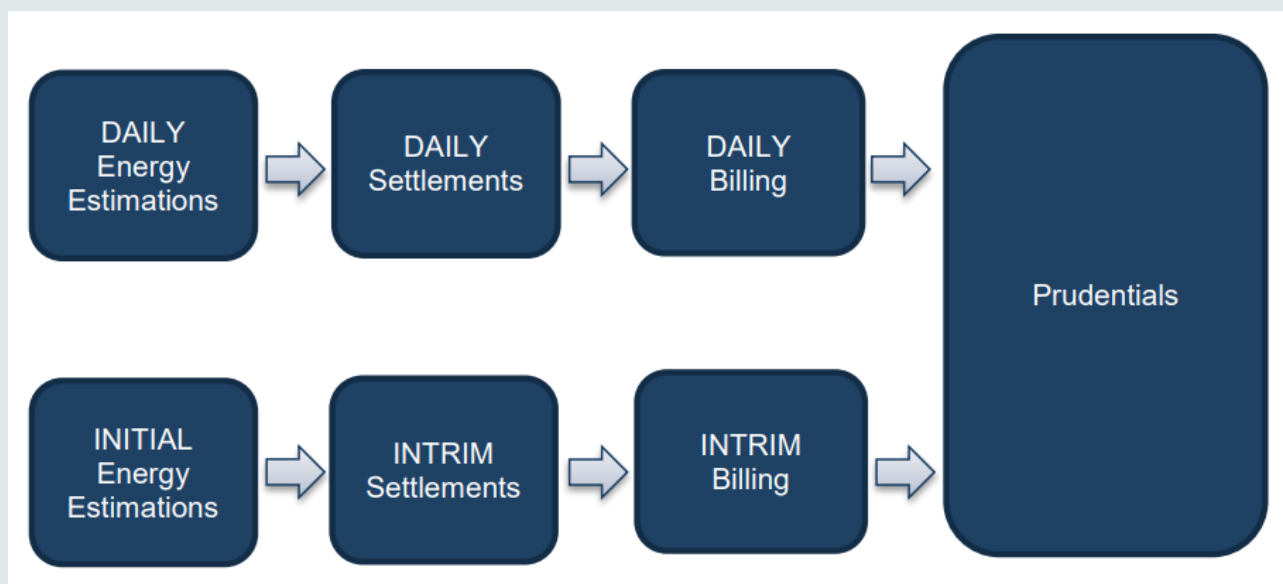
PARAMETER	1. GOOD	2. BAD (CAPPED)	3. UGLY (NEGATIVE)	COMMENT
ME	11.3 MWh	9.3 MWh	18.3 MWh	
ME * DLF	11.3 MWh	9.3 MWh	18.3 MWh	DLF = 1
BSQ	16.3 MWh	16.3 MWh	16.3 MWh	
BSQ * DLF	16.3 MWh	16.3 MWh	16.3 MWh	DLF = 1
UWDRSQ "Demand Response"	5 MWh	7 MWh	-2 MWh	BSQ* DLF - ME * DLF
WDRSQ	5 MWh	6 MWh	-2 MWh	CWDRSQ: Min(MRCSQ, UWDR SQ)
WDR TA to DRSP (red means DRSP Pays)	5 MWh * 900 \$/MWh = \$4,500	6 MWh * 900 \$/MWh = \$5,400	-2 MWh * 900 \$/MWh = - \$1,800	WDRSQ * TLF * (RRP - WDRRR)
WDR TA from FRMP (red means FRMP paid)	5 MWh * 900 \$/MWh = \$4,500	6 MWh * 900 \$/MWh = \$5,400	-2 MWh * 900 \$/MWh = - \$1,800	WDRSQ * TLF * (RRP - WDRRR)
Energy TA from FRMP	11.3 MWh * 1000 \$/MWh = \$11,300	9.3 MWh * 1000 \$/MWh = \$9,300	18.3 MWh * \$1000/MWh = \$18,300	ME * DLF * TLF * RRP
Total Amount from FRMP	\$15,800	\$14,700	\$16,500	WDR TA + Energy TA

Prudential estimation

Data flows to assess participants position for the days before Prelim. (overview)

Metering Estimation Process

- Formerly known as Settlement Estimation.
- Applies for any whole day in the outstanding period where neither Final or Prelim is available.
- 2 different scenarios run every* day:
 - Daily
 - Interim



Metering Estimation Process

Outstandings composition at a given point in the week

Prudential Day	Week 1							Week 2							Week 3							Week 4							Week 5							Week 6																							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat																	
Mon Wk 5	Final							Preliminary							Preliminary							Interim							D	D	PD																												
Tue Wk 5	Final							Preliminary							Preliminary							Interim							Daily		PD																												
Wed Wk 5	Final							Preliminary							Preliminary							Interim							I	Daily		PD																											
Thu Wk 5	Final							Preliminary							Preliminary							Preliminary							Intrim		Daily		PD																										
Fri Wk 5								Preliminary							Preliminary							Preliminary							Interim		Daily		PD																										
Mon Wk 6								Final							Preliminary							Preliminary							Interim							D	D	PD																					

P
D - represents Prudential Day

Daily and Interim in the context of a run on a given day:

2014Wk25							2014Wk26						
							INITIAL data						
				D-7	D-6	D-5	D-4	D-3	D-2	D-1	PD		
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
INTRIM							INTRIM			DAILY	PD		
Relative to the prudential date (D). D-1 is the prudential day minus one day.													

Metering Estimation Process

Data Sources*

Generation:

Mostly* SCADA

Load:

Mostly* Scaled Like day energy

Mostly Meter data
(INITIAL)

DAILY
Energy
Estimations



DAILY
Settlements



DAILY
Billing



Prudentials

INITIAL
Energy
Estimations



INTRIM
Settlements



INTRIM
Billing



Has the interest in Interim runs changed?

Table 7: Published data summarised by run type

Run Type	NEM Confidential Meter Data	NEM Confidential Settlements Data	NEM Confidential Billing Data	NEM Confidential Prudential Data
Daily	Not published	Published	Published	Published daily. Prudentials is an aggregate of all of this information.
Interim	Not published	Not published	Not published	
Preliminary	Published	Published	Published	
Final	Published	Published	Published	
Revision 1	Published	Published	Published	
Revision 2	Published	Published	Published	

Some information relating to Settlement Estimations is not available to Participants; daily and interim metering; interim settlements and interim billing data is not published. At the June 2014 Settlement Managers Working Group (SMWG) a project to make available the interim information was proposed. Participants were asked to provide feedback on the usefulness of this data if it was made available, there was not sufficient interest from industry for this project to proceed.

- More Info:
 - [Estimation Guide](#)
 - [Estimate Policy](#)



Christmas Contacts

Holiday Period Prudentials and Clearing

- Provide mobile numbers and email addresses of **at least two staff members** who will be monitoring Prudentials and Clearing
- For all participants that will be **closed** over Christmas, please contact the Prudentials team prudentials@aemo.com.au to discuss alternate arrangements
- Early payment is strongly recommended and is easy to arrange as an ad-hoc or permanent request
- Settlement Calendar for Christmas:

MARKET	FINAL STATEMENT	FINAL STATEMENT DATE	EARLY PAYMENT DATE	PAYMENT DATE
GSH	Nov-21	21-Dec-21	22-Dec-21	23-Dec-21
NEM	2021 Week 48	22-Dec-21	23-Dec-21	24-Dec-21
DWGM	Nov-21	24-Dec-21	29-Dec-21	30-Dec-21
STTM	Nov-21	24-Dec-21	29-Dec-21	30-Dec-21
NEM	2021 Week 49	31-Dec-21	04-Jan-22	05-Jan-22

