RC_2017_06 – REDUCTION OF THE PRUDENTIAL EXPOSURE IN THE RESERVE CAPACITY MECHANISM

OUTSTANDING AMOUNT CALCULATION

26 October 2017

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AUSTRALIAN ENERGY MARKET OPERATOR

AGENDA

1. Summary & Objectives
2. Background
   - Prudentials
   - Rule Change Proposal RC_2017_06
   - Outstanding Amount
3. Outstanding Amount
   - Current Methodology
   - Proposed Methodology
   - Meter Data Estimation
4. Prudential Monitoring Process
5. Next Steps

SUMMARY & OBJECTIVES

- Market Participants' capacity liabilities are underestimated by the current Outstanding Amount calculation.

- Rule Change Proposal RC_2017_06:
  - proposes to reduce capacity liabilities by changing the capacity cost recovery framework (i.e. IRCR, CC Allocations); and
  - requires the Outstanding Amount to use real-time Capacity Credit Allocations to correctly reflect market risk.

- AEMO is proposing a holistic approach to improve the accuracy of the Outstanding Amount estimate across all market segments. This session will provide an overview of this proposal for Market Participant and an opportunity to provide feedback.

The WEM Prudential Requirements outlined in Chapter 2 of the WEM Rules are an essential risk management mechanism, intended to protect all Market Participants operating in the WEM from levies arising from a default event.

Prudential Monitoring

Legend: Outstanding Amount — Credit Limit — Credit Support — Trading Limit
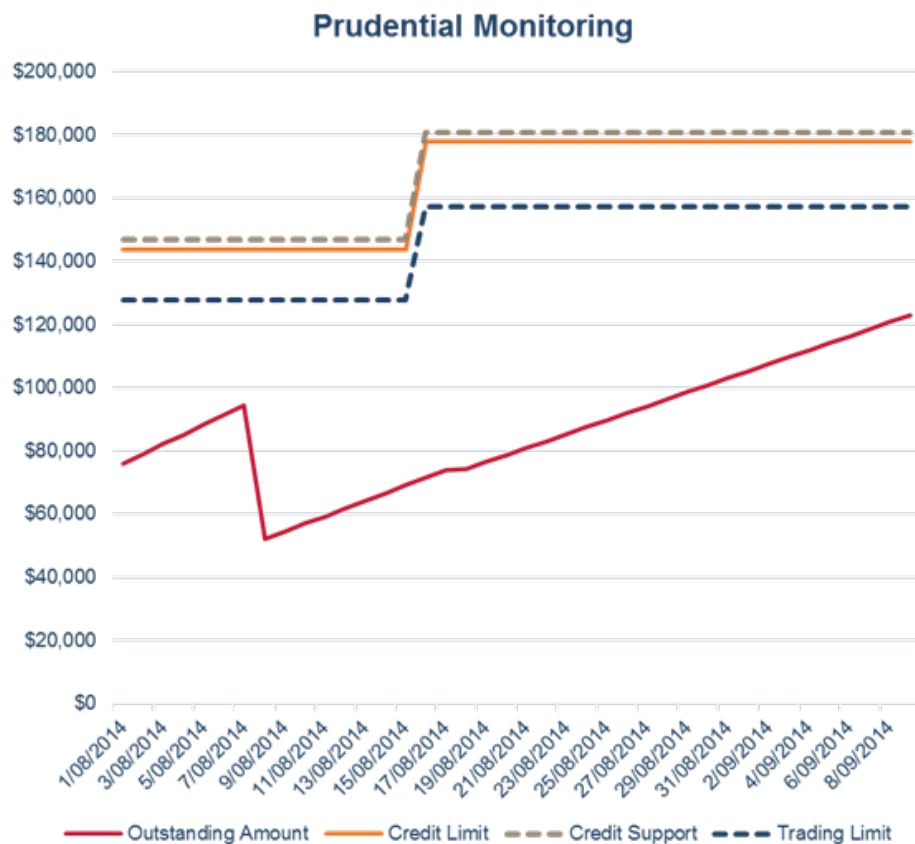
Credit Support [WEM Rule 2.38]
A Bank Guarantee or cash Security Deposit, in the form specified by AEMO, to the level of the most recently determined Credit Limit.

Credit Limit [WEM Rule 2.37]
AEMO's calculation of the maximum net amount owed by a Market Participant over a 24 month period determined by:
- 70 day maximum NSTEM exposure; plus
- 15 day maximum STEM exposure

Trading Limit [WEM Rule 2.39]
The amount of Credit support held by AEMO multiplied by 0.87.
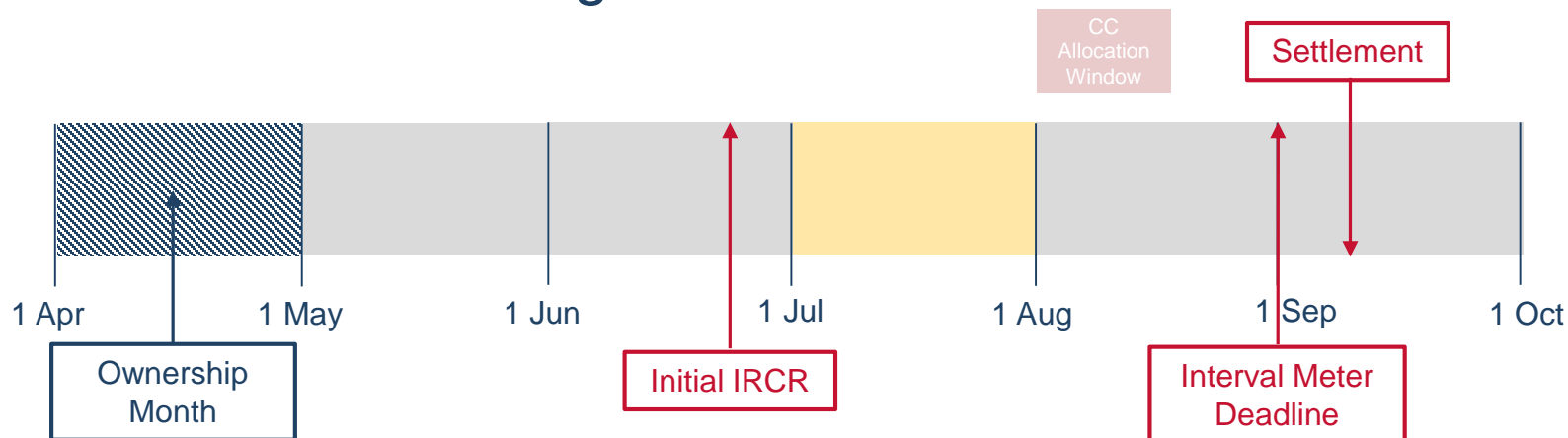
Outstanding Amount [WEM Rule 2.40]
AEMO's estimate of the amount owed by a Market Participant at any time.

- The Outstanding Amount calculation can underestimate Market Participant capacity liability in a number of scenarios. As a result, all Market Participants have a heightened exposure to default levies in the event of a Market Participant default.

- AEMO has developed a Rule Change Proposal in consultation with Stakeholders that reduces the risk of default levies by:
  - mitigating the capacity cost prudential risk in a timely manner;
  - **minimising increase to prudentials;**
  - minimising change to existing rules, systems and processes; and
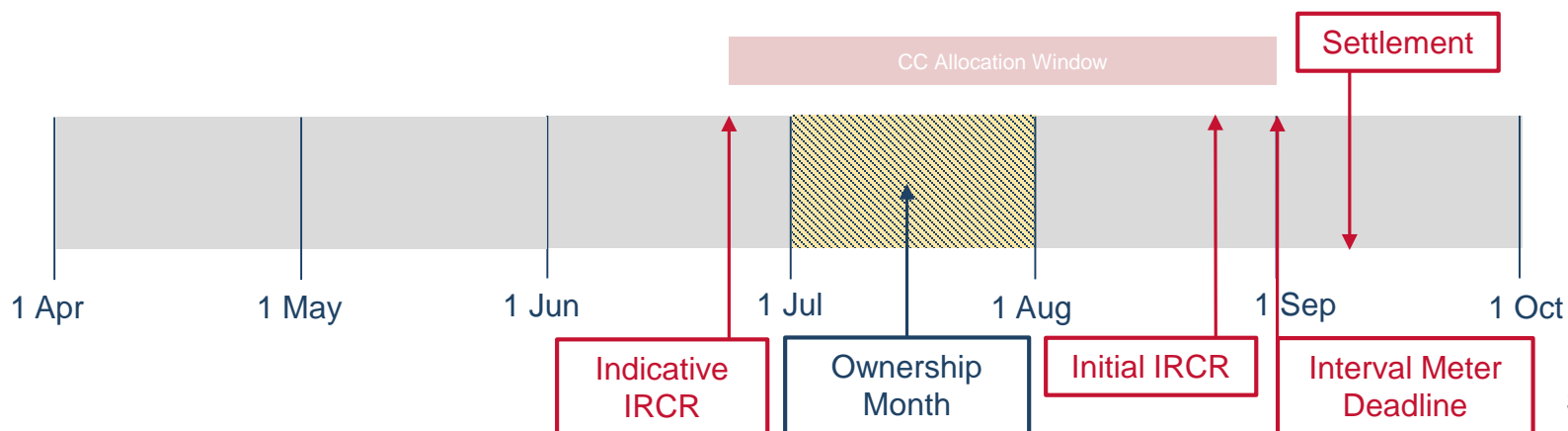 - is consistent with the market objectives and market reform.

- ## Prior to Rule Change

- ## After Rule Change

- Clause 2.40.1 of the Market Rules defines **Outstanding Amount (OA)** as:

  1. Invoices not paid
  2. Plus AEMO's reasonable estimate of amounts payable to AEMO for all past periods for which no Settlement Statement has yet been issued
  3. Less AEMO's reasonable estimate of amounts payable to the participant for all past periods for which no Settlement Statement has yet been issued
  4. Less any prepayments made by the participant to AEMO

- AEMO's calculation is outlined in the Prudentials Market Procedure and defines amounts payable to/by as:

  1. The number of STEM days exposed multiplied by their average daily STEM exposure (using latest invoice)
  2. Plus the number of NSTEM days exposed multiplied by their average daily NSTEM exposure (using latest invoice)

OUTSTANDING AMOUNT
CURRENT METHODOLOGY

- Outstanding Amount =
  Invoices not Paid + Estimated Exposure (not invoiced) - Prepayments
- Exposure (not invoiced) is estimated using a daily average from the last invoice

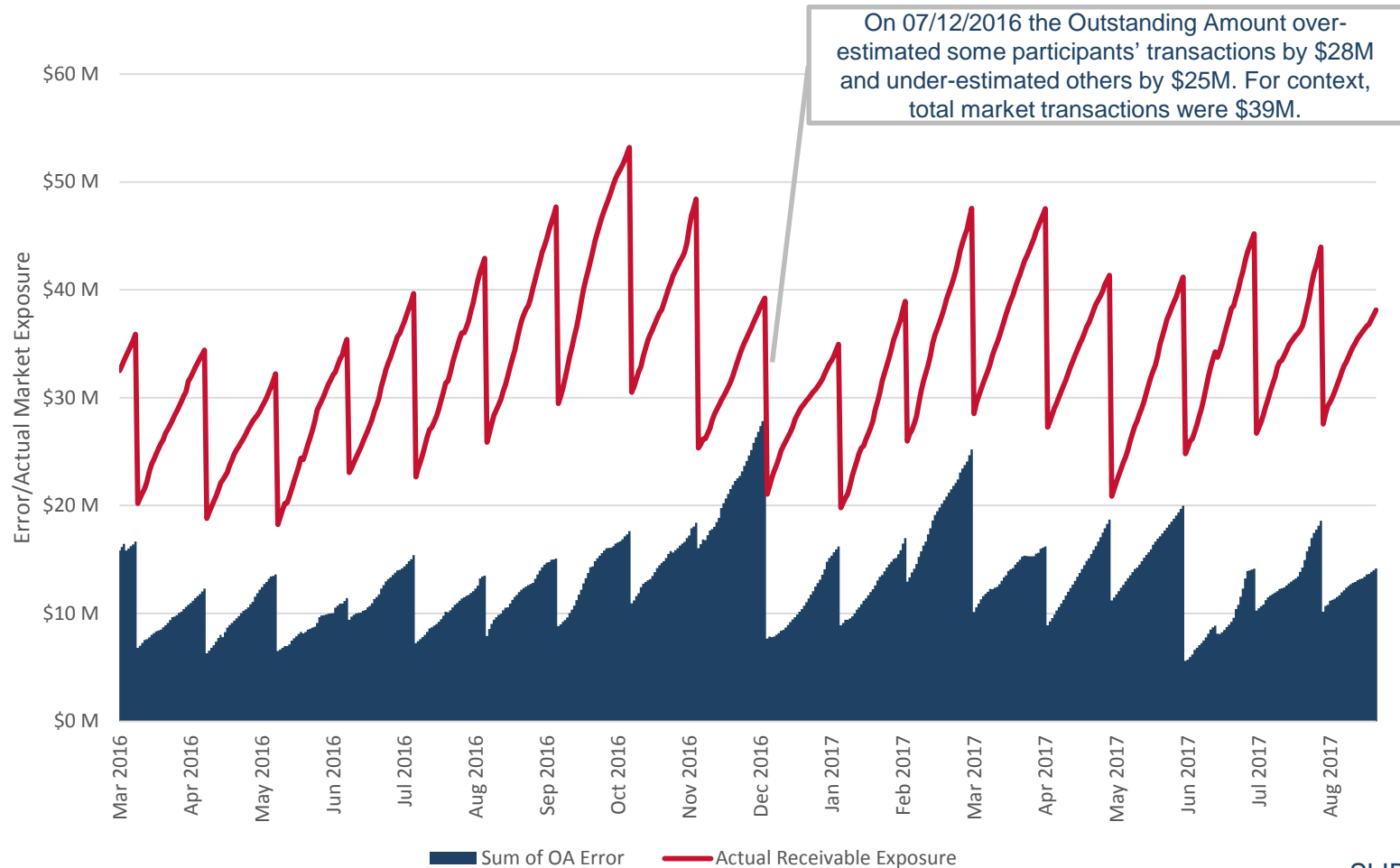| Segment	Last Invoice	Daily Average	Days Exposed	Exposure
STEM	-$7k	-$1k	4	-$4k
Ancillary Services	$60k	$2k	50	$100k
Balancing	-$300k	-$10k	50	-$500k
Market Fees	$30k	$1k	50	$50k
Reconciliation	$3k	$0.1k	50	$5k
Reserve Capacity	$600k	$20k	50	$1000k
Estimated Exposure				**$651k**

The example above assumes:
- the last NSTEM Invoice was for a 30 day month;
- there are 4 days for which STEM liabilities have accrued but not invoiced; and
- there are 50 days for which NSTEM liabilities have accrued, but not invoiced.
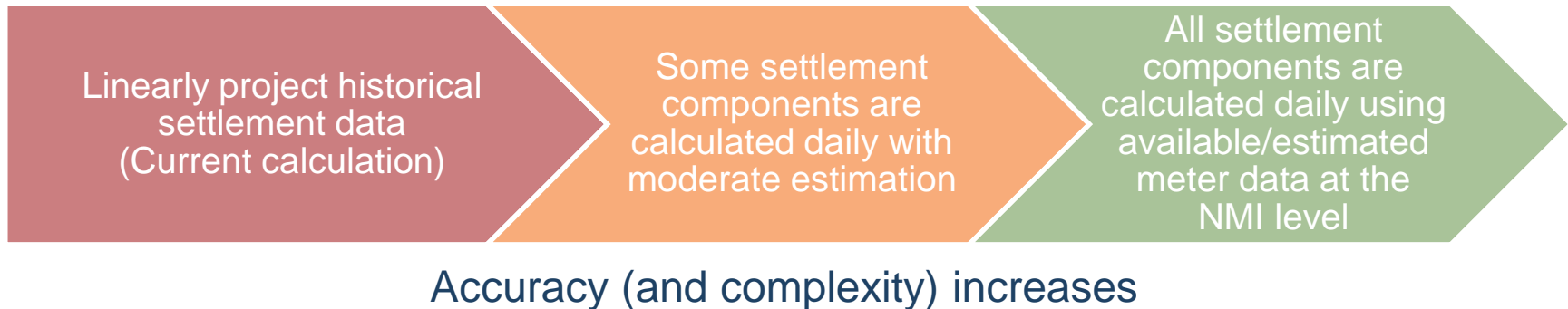
Not accounting for the RC_2017_06 issue, the Outstanding Amount calculation over-estimates some participants' transactions, and under-estimates for others.

On 07/12/2016 the Outstanding Amount over-estimated some participants' transactions by $28M and under-estimated others by $25M. For context, total market transactions were $39M.

OUTSTANDING AMOUNT
DRIVERS

- Greater accuracy in the Outstanding Amount estimate reduces the risk of Market Participants incurring Default Levies and better protects the market.

Linearly project historical settlement data (Current calculation)	Some settlement components are calculated daily with moderate estimation	All settlement components are calculated daily using available/estimated meter data at the NMI level

Accuracy (and complexity) increases

- RC_2017_06 requires AEMO to account for Capacity Credit Allocations in Outstanding Amount in real time.
- Due to the magnitude of inaccuracy in the Outstanding Amount calculation and the inefficiency this presents, a more complete approach is proposed.
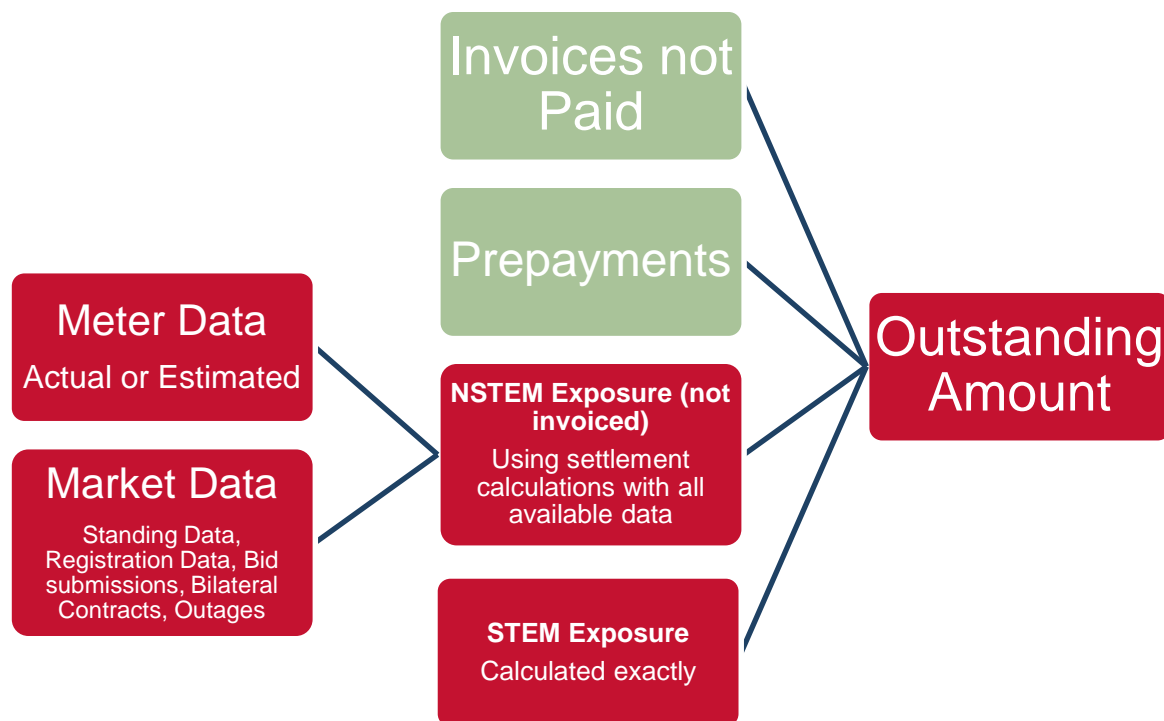
OUTSTANDING AMOUNT
OPTIONS CONSIDERED

Option 1	Option 2
Estimation of NSTEM Exposure using settlement calculations with all available data except: • Meter data estimated at a Market Participant level. • Assume no constraints, no refunds as meter data wont be available at a facility level. • Some estimation of parameters based on previous invoice values. Exact calculation of STEM exposure using settlement calculations with available data.	Estimation of NSTEM Exposure using settlement calculations with all available data and comprehensive meter data estimation at a NMI level. Exact calculation of STEM exposure using settlement calculations with available data.

- AEMO proposes to implement Option 2:
  o There were minimal time and cost savings.
  o A more accurate result will be obtained.
  o A more robust Outstanding Amount provides a stronger platform for changes to Credit Limit methodology.
  o System implementation may provide platform for future system improvements.

- High level Outstanding Amount framework remains the same.
- The requirement is to improve the estimated exposure (not invoiced) for STEM and NSTEM.
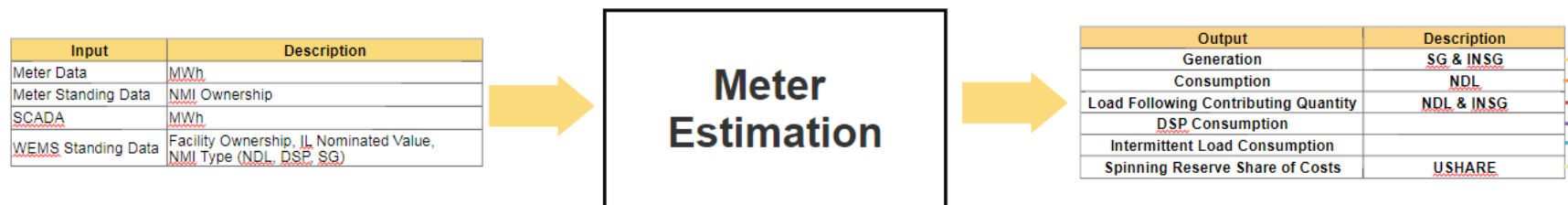- Exposure (not invoiced is estimated using all available market data and estimate of meter data where unavailable.

- To explain the proposed change to the Exposure (not invoiced) component of Outstanding Amount, we will explain the:
  o proposed approach for meter data estimation; and
  o proposed approach for calculating each settlement segment using the meter data estimate and available market data. These segments are:
    ➢ STEM
    ➢ Market Fees
    ➢ Balancing
    ➢ Reconciliation
    ➢ Ancillary Services
    ➢ Reserve Capacity

Input	Description
Meter Data	MWh
Meter Standing Data	NMI Ownership
SCADA	MWh
WEMS Standing Data	Facility Ownership, IL Nominated Value, NMI Type (NDL, DSP, SG)

Meter Estimation

Output	Description
Generation	SG & INSG
Consumption	NDL
Load Following Contributing Quantity	NDL & INSG
DSP Consumption	
Intermittent Load Consumption	
Spinning Reserve Share of Costs	USHARE

- Meter Data is estimated on a NMI level as follows:
    - If meter data is available to AEMO use it
    - Else if SCADA data is available, use it
    - Else, estimate the meter data using like day like period (LDLP) methodology

- LDLP uses the last known meter data for a NMI based on a similar interval on a similar day and scales it by the system Relevant Demand Quantity (RDQ).

- This aligns with the approach adopted in the NEM.

PROPOSED CALCULATION
LIKE DAY LIKE PERIOD EXAMPLE

Trading Interval	NMI 8001000000	System RDQ
Mon, 9 Oct 17 8:30am	1 MWh	1500 MWh
Mon, 9 Oct 17 9:00am	1.1 MWh	1550 MWh
Mon, 9 Oct 17 9:30am	1 MWh	1450 MWh
⋮	⋮	⋮
Mon, 16 Oct 17 8:30am	x	1600 MWh
Mon, 16 Oct 17 9:00am	y	1550 MWh
Mon, 16 Oct 17 9:30am	z	1400 MWh

$$x = \frac{1\ MWh}{1500\ MWh} \times 1600\ MWh = 1.067\ MWh$$
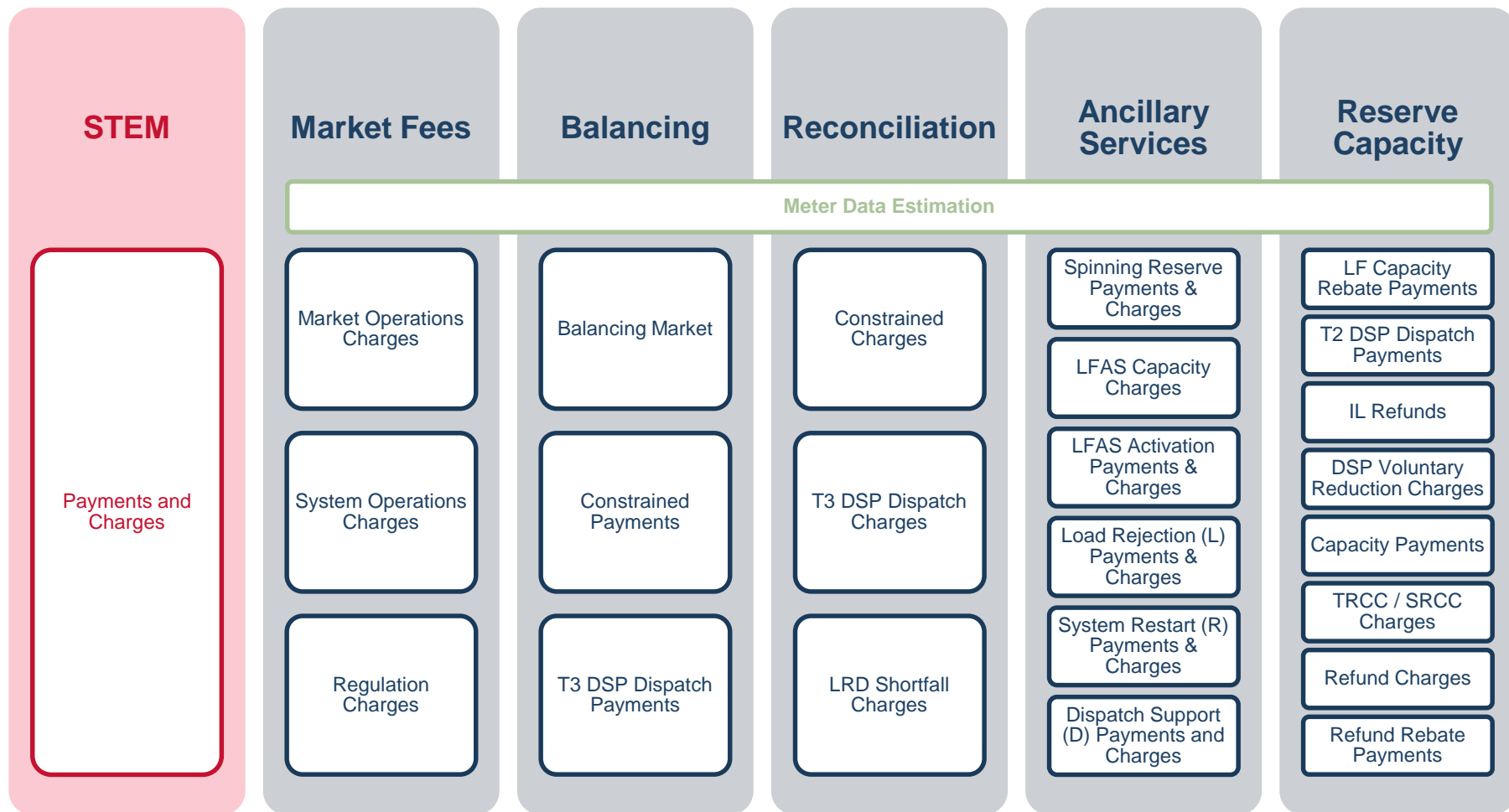
$$y = \frac{1.1\ MWh}{1550\ MWh} \times 1550\ MWh = 1.100\ MWh$$

$$z = \frac{1\ MWh}{1450\ MWh} \times 1400\ MWh = 0.966\ MWh$$

Public Holidays are considered a 'Sunday' when determining the 'Like Day'
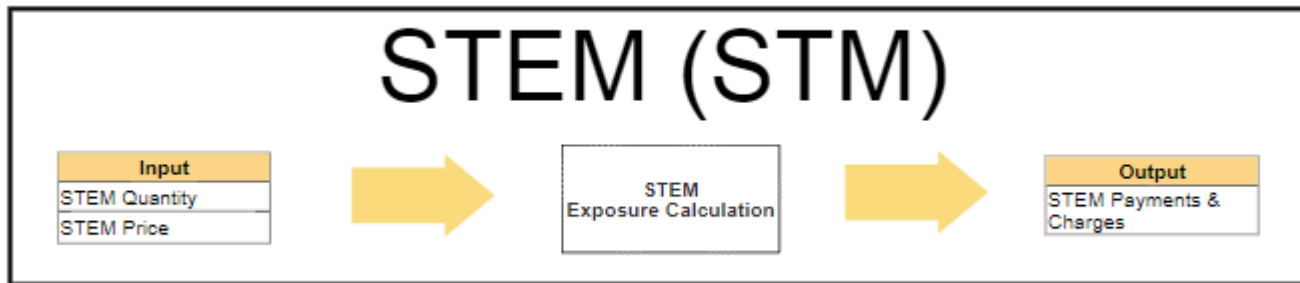
PROPOSED CALCULATION
COMPONENTS

- This slide provides an overview of the settlement components.
- Subsequent slides show the inputs, outputs and calculation proposed for the Outstanding Amount.
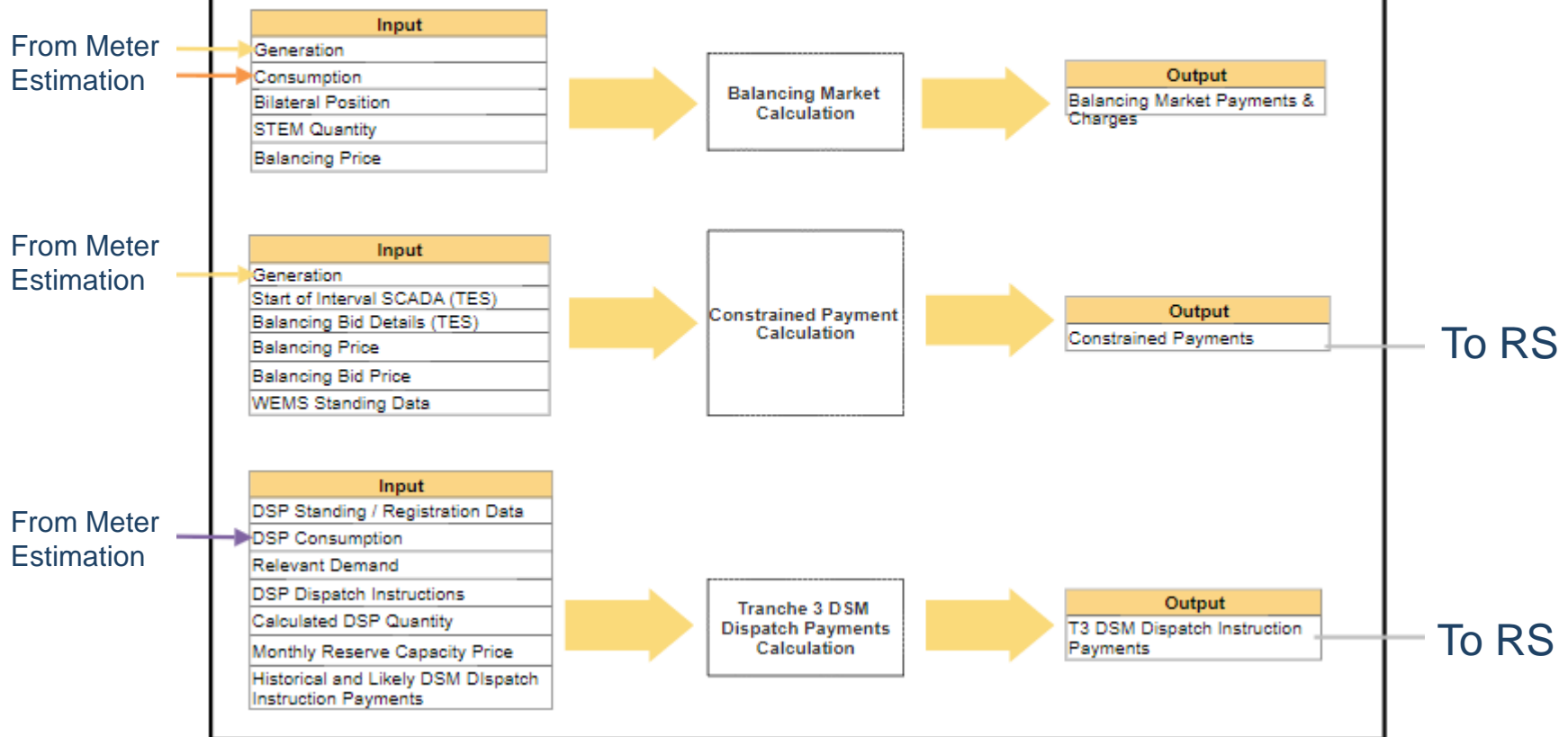
STEM	Market Fees	Balancing	Reconciliation	Ancillary Services	Reserve Capacity
	Meter Data Estimation				
Payments and Charges	Market Operations Charges	Balancing Market	Constrained Charges	Spinning Reserve Payments & Charges	LF Capacity Rebate Payments
					T2 DSP Dispatch Payments
				LFAS Capacity Charges	IL Refunds
	System Operations Charges	Constrained Payments	T3 DSP Dispatch Charges	LFAS Activation Payments & Charges	DSP Voluntary Reduction Charges
				Load Rejection (L) Payments & Charges	Capacity Payments
	Regulation Charges	T3 DSP Dispatch Payments	LRD Shortfall Charges	System Restart (R) Payments & Charges	TRCC / SRCC Charges
					Refund Charges
				Dispatch Support (D) Payments and Charges	Refund Rebate Payments

Balancing (BS)

From Meter Estimation

Input
Generation
Consumption
Bilateral Position
STEM Quantity
Balancing Price

Balancing Market Calculation

Output
Balancing Market Payments & Charges

From Meter Estimation

Input
Generation
Start of Interval SCADA (TES)
Balancing Bid Details (TES)
Balancing Price
Balancing Bid Price
WEMS Standing Data

Constrained Payment Calculation

Output
Constrained Payments

To RS

From Meter Estimation

Input
DSP Standing / Registration Data
DSP Consumption
Relevant Demand
DSP Dispatch Instructions
Calculated DSP Quantity
Monthly Reserve Capacity Price
Historical and Likely DSM Dispatch Instruction Payments

Tranche 3 DSM Dispatch Payments Calculation

Output
T3 DSM Dispatch Instruction Payments

To RS
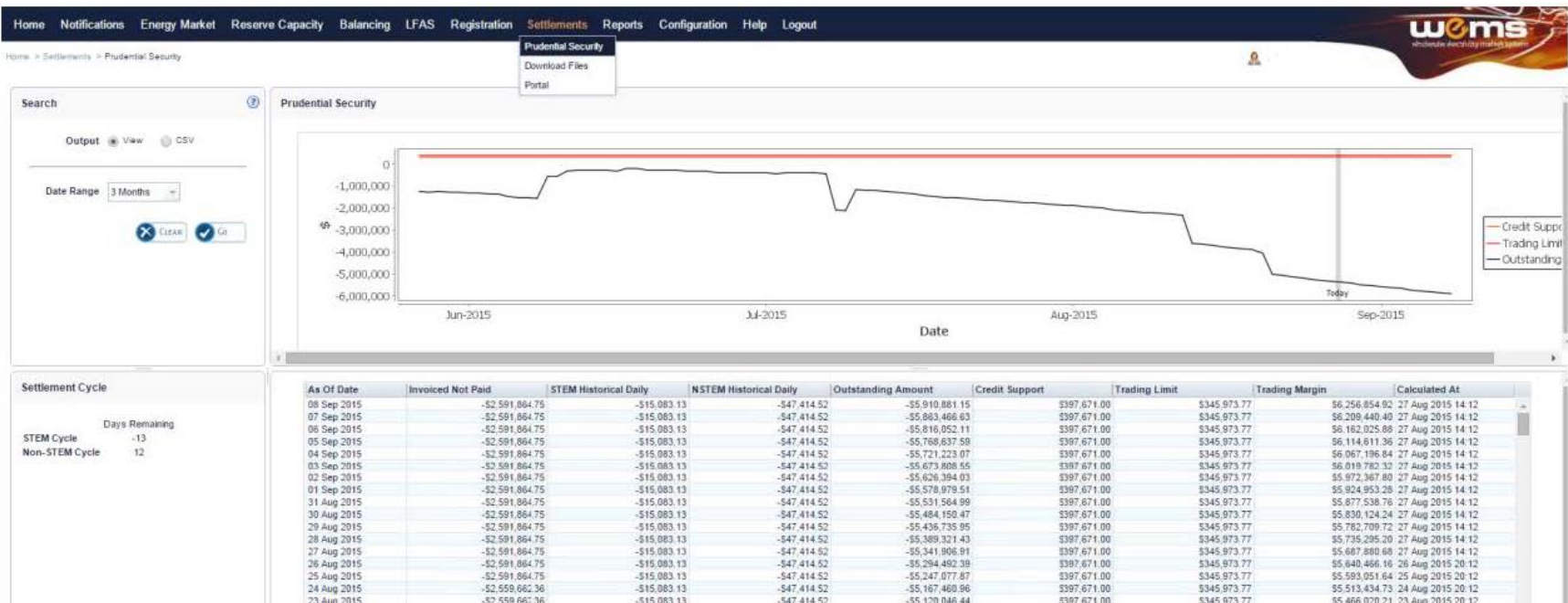
PRUDENTIAL MONITORING PROCESS

- Currently, AEMO provides Market Participants with a forecast of their Outstanding Amount up until the next NSTEM Invoice in the WEMS MPI.

- This is possible due to the current methodology of Outstanding Amount, which increases at the same rate each day.

PRUDENTIAL MONITORING PROCESS

- Forecasts will no longer be provided under the new approach for Outstanding Amount which takes into account live trading behaviour.

- The Outstanding Amount will be a daily value, representing exposure up to the end of the last complete Trading Day. Market Participants will need to resolve their position on a daily basis.

- AEMO will provide Market Participants with a calculation specification documentation and output files (similar to current Participant Information Reports) that will allow Market Participants to verify the Outstanding Amount calculations.

- Market Participants remain responsible for monitoring their Outstanding Amount in relation to their Trading Limit at all times.

Event	Date
Notification Published	26/07/2017
First Submission Period	26/07/2017– 13/09/2017
Draft Rule Change Report Published	30/11/2017
Second Submission Period	30/11/2017 – 02/01/2018
Final Rule Change Report Published	31/01/2018
Ministerial Approval	28/02/2018
Commencement	TBA

- AEMO will progress the RC_2017_06 and Outstanding Amount changes as a single project.

- Expected AEMO project:
  o Board Approval in March 2018.
  o Commence work in March 2018.
  o Anticipate a 6 month project with a small team of developers and testers.
  o Funding available within existing ERA approved capital expenditure.

- Tentatively recommend a 1 October 2018 commencement.

NEXT STEPS

- AEMO welcomes participant feedback prior to commencing Market Procedure development. There will be opporunity for further consultation including on the detail of AEMO's procedure before commencing the formal process.

- Proposed commencement of any Market Procedure change is in line with implementation of RC_2017_06.

- Direct any queries to Stuart MacDougall (08) 9469 9943.

- AEMO welcomes written feedback to wa.operations@aemo.com.au by COB Tuesday, 21 November 2017.