



# Reduction of Prudential Exposure Working Group

20 September 2018

# Agenda

1. Project Overview
2. Phase 1 Stakeholder Engagement
3. Phase 1 Market Procedure timeline
4. Phase 1 Project Status
5. Phase 1 Functionality for Review
  - Application Showcase - Release 1
  - Discussion item & Application Showcase: Capacity Credit Allocations
  - Discussion item: Outstanding Amount
  - Discussion item: API Documentation

# Project Overview

- The Reduction of Prudential Exposure (RoPE) project is to be implemented in 2 sequential phases:
- Phase 1: July 2018 – May 2019
  - Implementation of rule change RC\_2017\_06 which amends the Individual Reserve Capacity Requirement (IRCR) calculation, Capacity Credit Allocation and associated settlement & prudential processes.
- Phase 2: May 2019 – December 2019
  - Implementation of a change to Market Procedure: Prudential Requirements which aims to improve the responsiveness of the Outstanding Amount calculation and the efficiency and effectiveness of the prudential framework in the WEM.

# Project Overview

## Evolution of Prudential Requirements

### RoPE Phase 1

#### RC\_2017\_06

Delivery of **rule change** RC\_2017\_06 to correct significant prudential issue in relation to exposure in the RCM

### RoPE Phase 2

#### Outstanding Amount Improvements

Deliver **market procedure changes** to implement more accurate Outstanding Amount calculation that will estimate settlement positions on a daily basis using market data. Provides a robust basis to make changes to Credit Limit.

#### Credit Limit Improvements

Deliver a **market procedure change** to amend Credit Limit. Considerations **may** include: (1) Increase clarity on prepayments.  
(2) Reduce 24 month period to 12 months.  
(3) Align STEM and NSTEM periods.

### Future / Reform

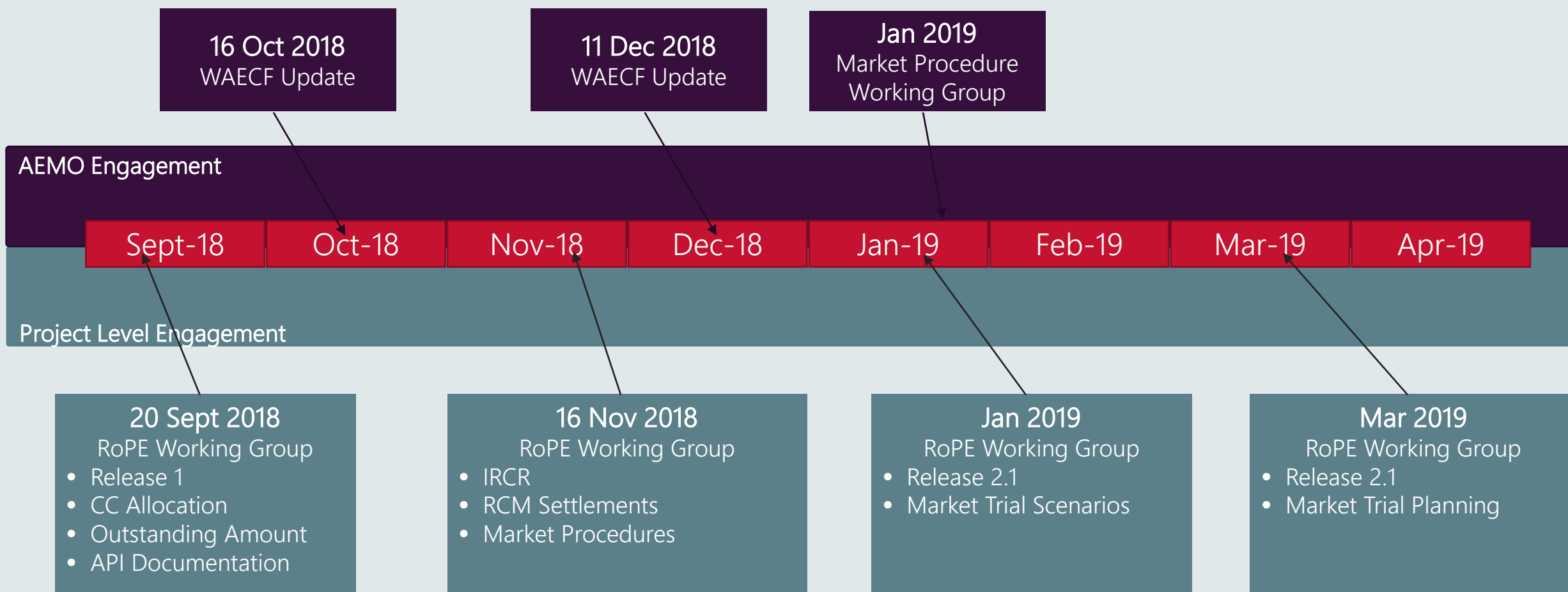
#### Review and Redesign of Prudential Requirements

Improved prudential and settlement outcomes.

Could include:

- (1) Shorter settlement cycle.
- (2) Review of Credit Support vs prepayment quantities.
- (3) More sophisticated CL process (e.g. PoE).

# Phase 1 - Stakeholder Engagement



# Phase 1 - Market Procedure Timeline

- The Market Procedures or Guidelines impacted by RC\_2017\_06 are:

Market Procedure	Proposed Effective Date
Capacity Credit Allocation	01 May 2019
IRCR	01 May 2019
Prudential Requirements	27 June 2019
(Settlement Cycle Timeline)	01 April 2019

- Consultation:
  - Draft Market Procedures will be shared at the November 2018 RoPE working group.
  - Market Procedures will be presented at a Market Procedure Change Working Group in January 2019.

# Phase 1 – Project Status

## Overall status



**Schedule** – slightly ahead

**Cost** – slightly ahead

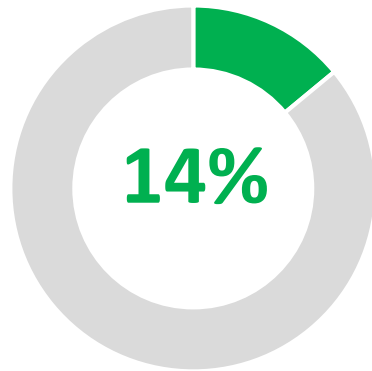
**Scope** – on track

**Resourcing** – minor impact by AEMO architecture resources

**Issues** – unchanged

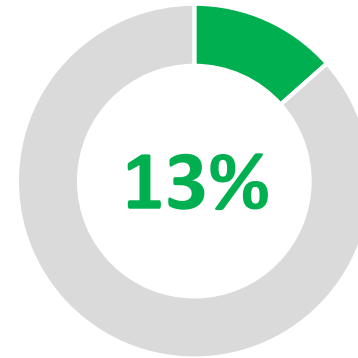
**Risk** – unchanged

## Progress



- Identified solution design and development work has commenced.
- Changes required for Transitional Rules complete.
- Development is progressing on Peak Interval, CC Allocation and Notifications.
- Drafting of the Market Procedures is underway.

## Cost



### Notes:

- Progress is ahead of budget

## Count Down

### Release 1

83

days to go-live

### Release 2

223

days to go-live



### Milestones:

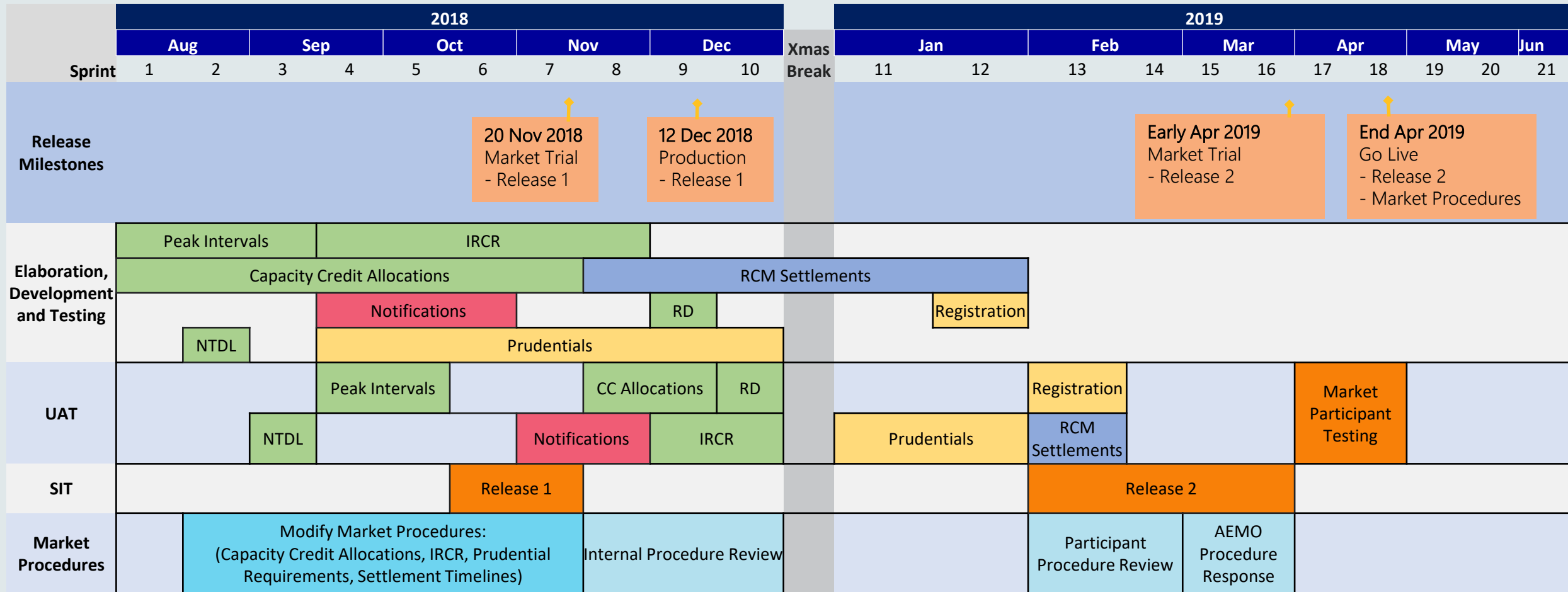
#### Release 1

- UAT Testing: 3 Sep
- SIT Testing: 15 Oct
- Market Trial: 20 Nov
- Go-Live: 12 Dec

#### Release 2

- SIT: 28 Jan 2019
- Market Trial: 8 Apr 2019
- Go-Live: 24 Apr 2019

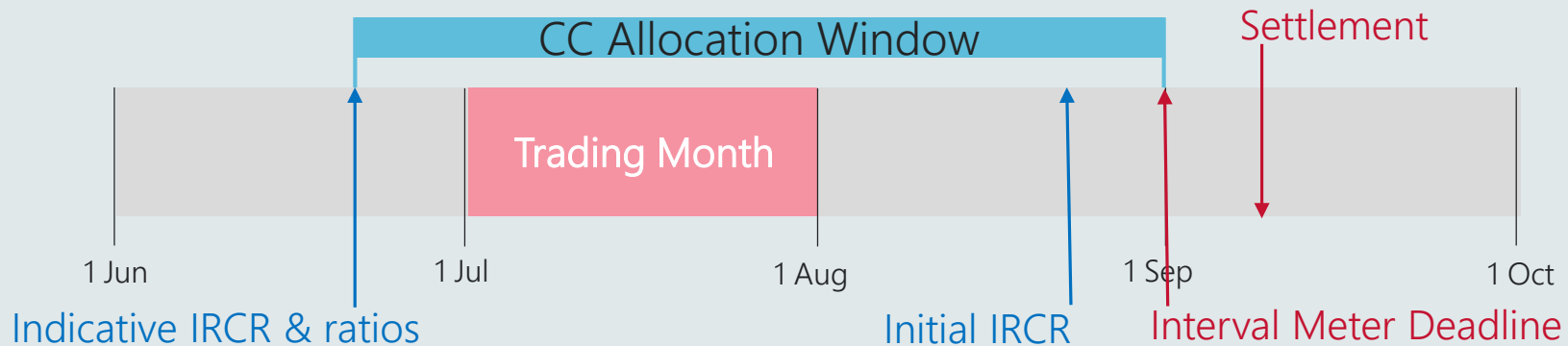
# Phase 1 - Project Schedule





# Rule Change Overview

#	Item	Current Rules	Proposed Change	Rules
1	Publication of Peak Intervals	Publish with IRCR	Determine and Publish the Peak Intervals on a specified timeline.	4.1, 4.28 (Transitional Rules)
2	Meter Ownership Month for IRCR	n-3	n	App 5 – Step 6
3	Capacity Credit Allocations	Start of n+1	Open window at least 10 Business Days prior to month. Close window on the Interval Meter Deadline. Require binding handshake.	9.4 & Procedure
4	Modified Timelines for IRCR Determination	n-1	Indicative IRCR 10 Business Days before month n. Initial 5 Business Days before CC Allocations close.	4.1.24, 4.1.28
5	Recalculation of IRCR	IRCR is not adjusted.	IRCR recalculated according to normal adjustment cycle.	9.16.3
6	Capacity Credit Over-Allocations	Allocations reduced to zero.	Allow Market Generators 2 Business Days to resolve over-allocations, then proportionally reduce. Settle Market Customer over-allocations at RCP.	9.4.12, 9.7 & Procedure
7	Outstanding Amount Calculation	Linear projection based on historic invoice amounts.	Outstanding Amount is better estimate of individual settlement components. (including IRCR, CC allocations & energy charges).	Subsequent Procedure Change



# Application Showcase

Release 1

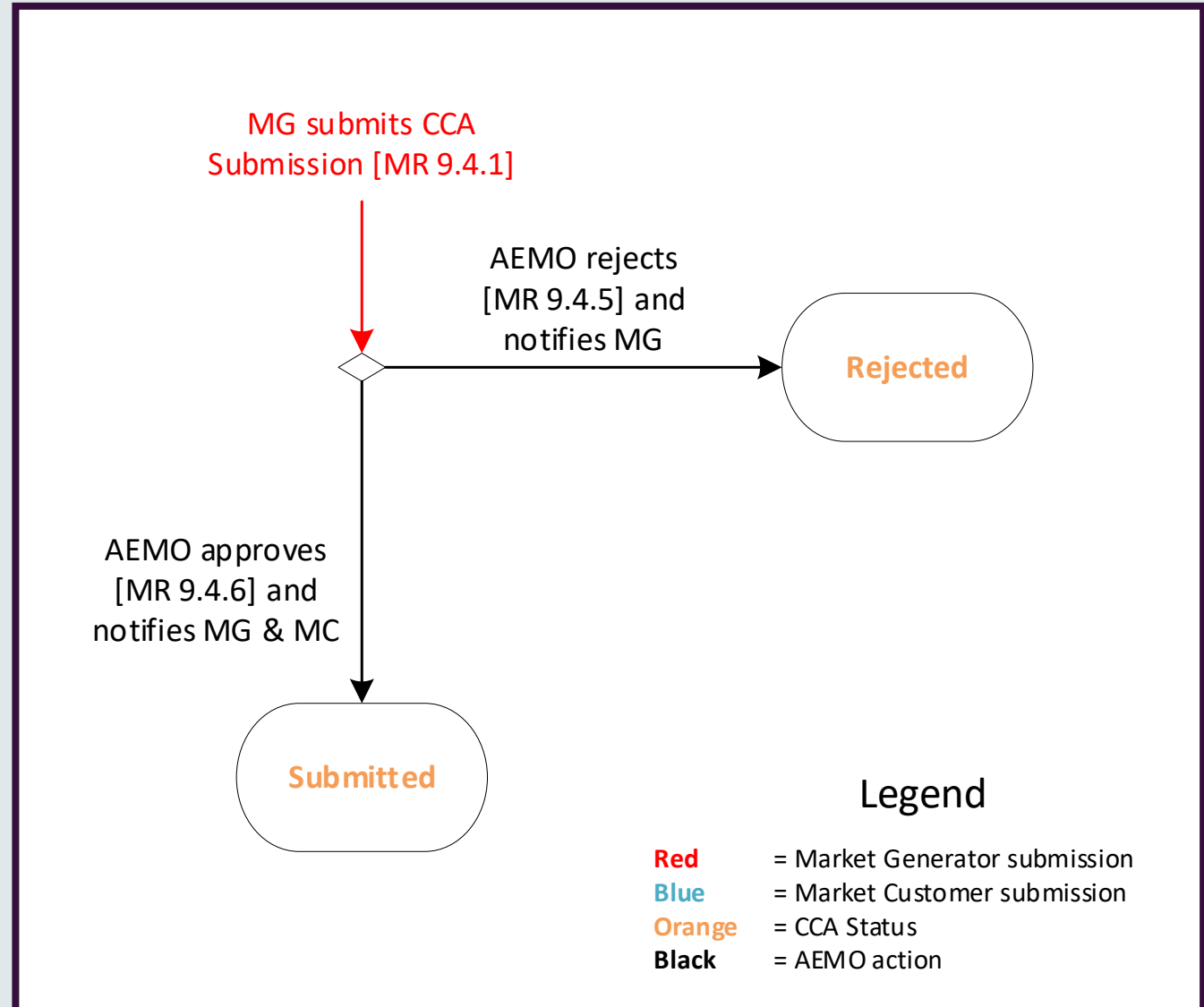
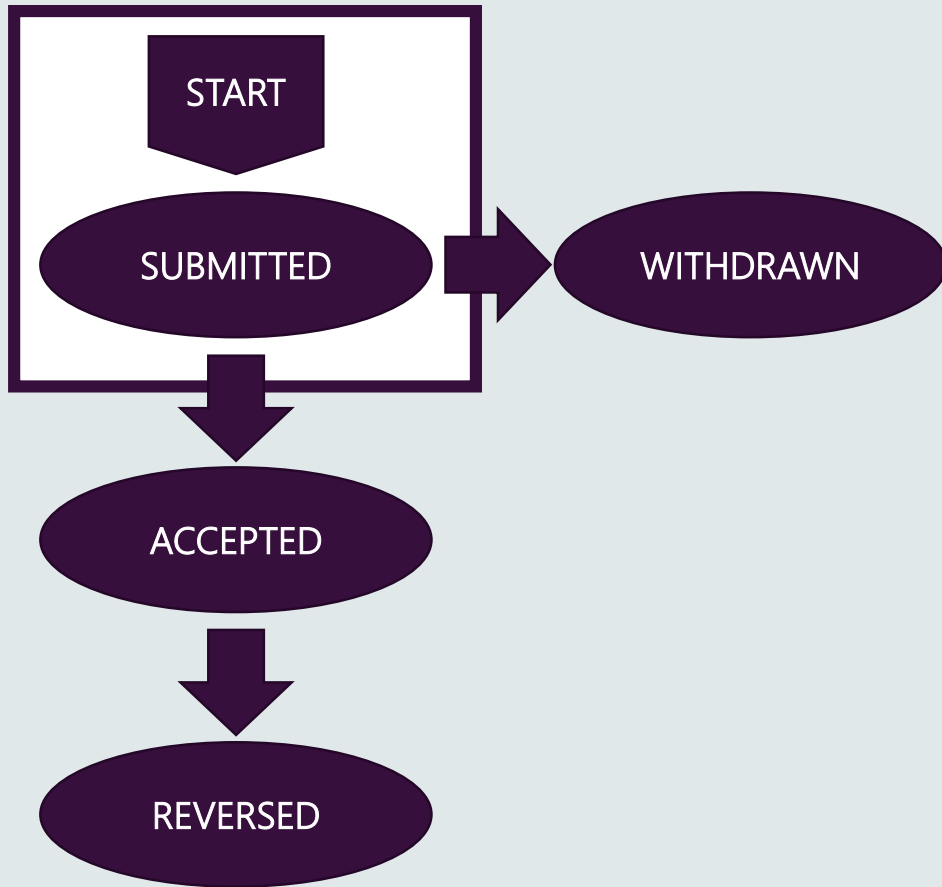
# Capacity Credit Allocation Process

## Key Changes

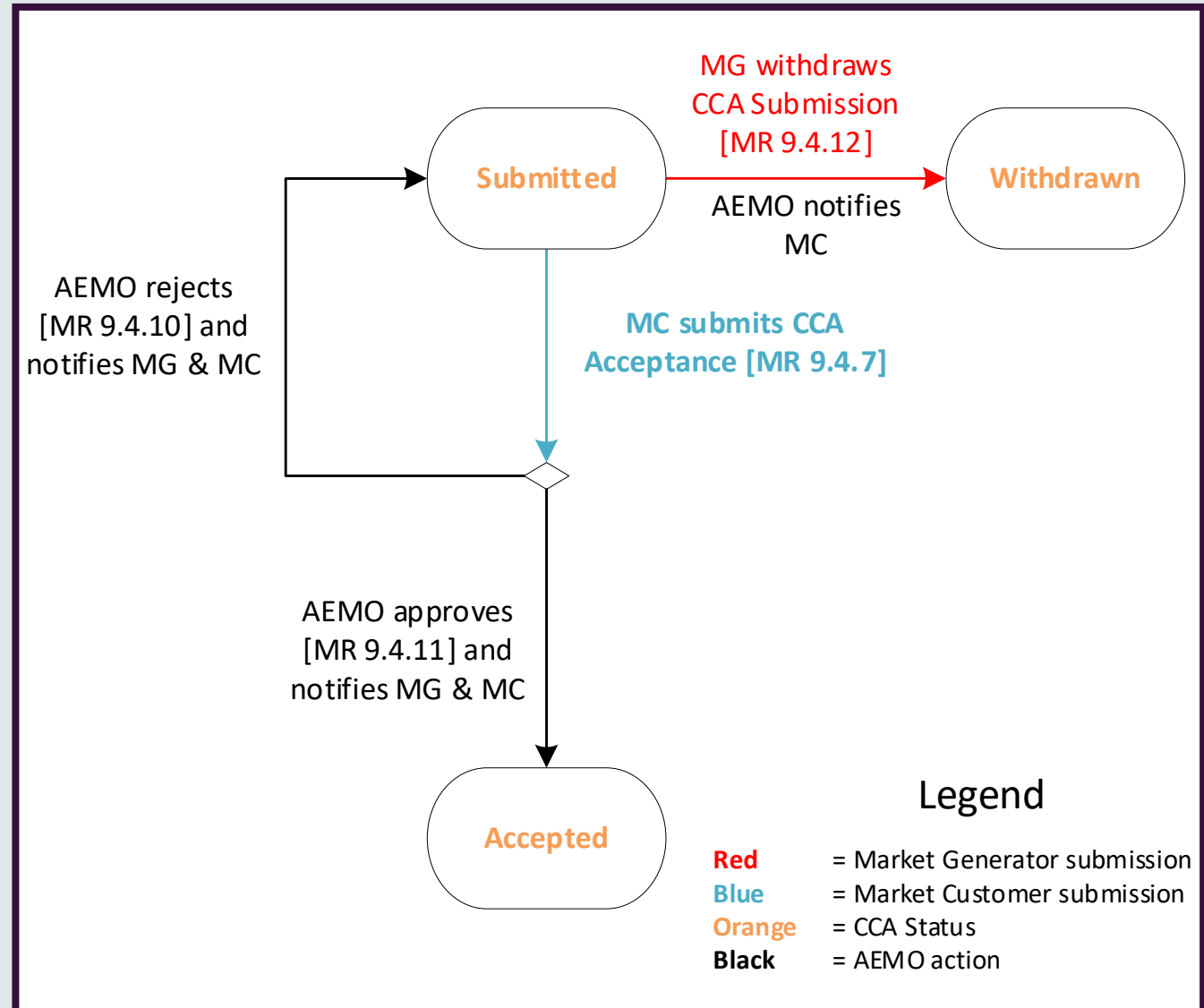
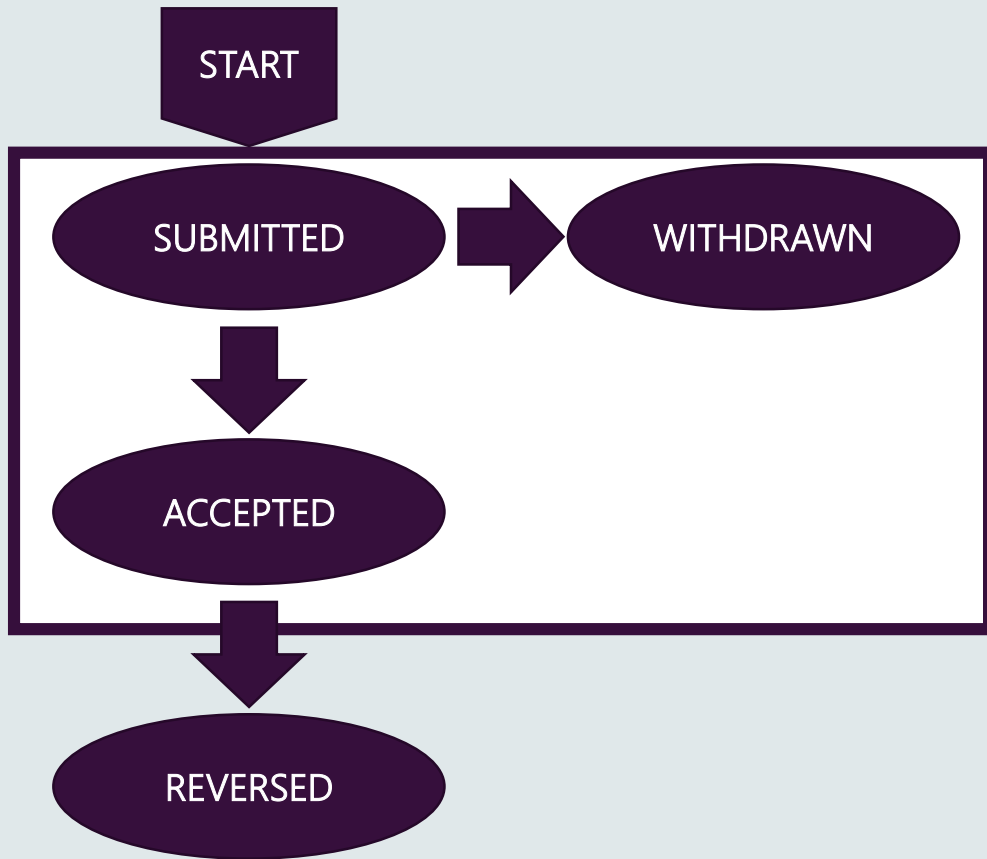
- The Capacity Credit Allocation process is redesigned in RC\_2017\_06 as summarised below:
- AEMO is required to notify Market Participants throughout the process (which will be made by email)
- AEMO is required to approve/reject submissions within 1 Business Day (in accordance with section 9.4 of WEM Rules)

Current Rules	RC_2017_06
Only MGs made submissions.	MGs and MCs make submissions
A submission is from 1 MG to many MCs	A submission is from 1 MG to 1 MC
CCAs were processed as a set	CCAs are processed sequentially
CCA sets could be copied from previous month	CCAs cannot be copied from previous month
CCAs could be modified	CCAs cannot be modified (only withdrawn/reversed)
CCAs are made after the Trading Month	CCAs can be made prior to the Trading Month
Impossible for MG CCA > CC	Possible for MG CCA > CC (requires amendment)
Impossible for MC CCA > IRCR	Possible for MC's CCAs > IRCR (settled at RCP)

# Capacity Credit Allocation Process Submission

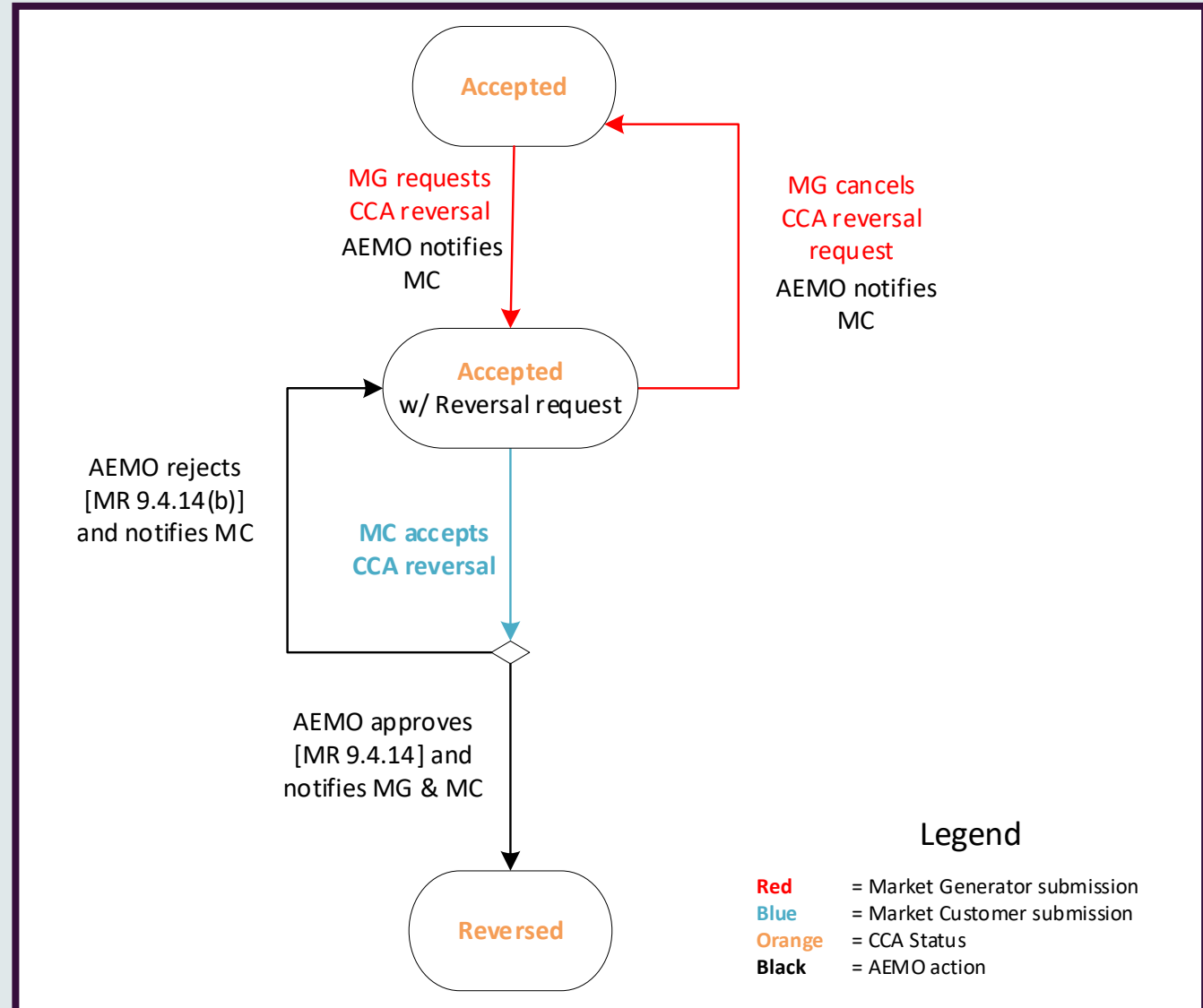
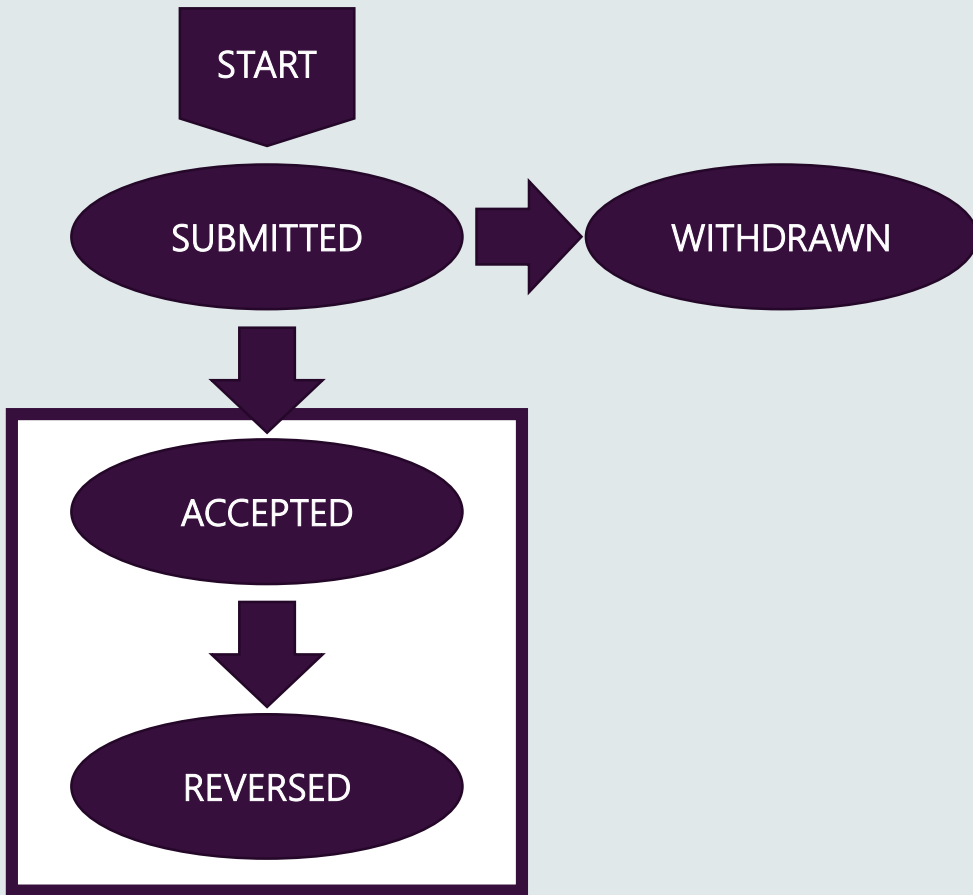


# Capacity Credit Allocation Process Acceptance



# Capacity Credit Allocation Process

## Reversal



### Legend

- Red** = Market Generator submission
- Blue** = Market Customer submission
- Orange** = CCA Status
- Black** = AEMO action

# Application Showcase

Capacity Credit Allocations (Release 2)

# Capacity Credit Allocation Process Amendments

- For Trading Month June 2019 onwards, Capacity Credit Allocations can occur prior to the Trading Month.
- Therefore, the termination of a Capacity Credit may result in a Market Generator's Capacity Credit Allocations exceeding its Capacity Credits ( $CCA > CC$ ).
- If this occurs, a Market Generator has 2 Business Days in which it may amend its CCAs to ensure that  $CCA = CC$ .
- If the Market Generator elects not to amend its CCAs, AEMO must amend them in accordance with a methodology outlined in the Capacity Credit Allocation Market Procedure.



# Capacity Credit Allocation Process

## AEMO amendments

- AEMO proposes to use the following methodology when it is required to amend a Market Generator's Capacity Credit Allocations for a Trading Month [Market Rule 9.4.17]:

$$CCA_{i,amended} = \left( \frac{CCA_{i,current}}{\sum_i CCA_{i,current}} \right) \times CC$$

Variable	Units	Definition
$CCA_{i,amended}$	Capacity Credits	The Capacity Credit Allocation, i, after AEMO amends it.
$CCA_{i,current}$	Capacity Credits	The Capacity Credit Allocation, i, prior to AEMO amending it.
$CC$	MW	The number of Capacity Credits held for that Trading Month by the Market Generator that are allowed to be traded bilaterally under the Market Rules.

- AEMO proposes to notify any Market Generator and the corresponding Market Customers that have their Capacity Credit Allocation amended by AEMO under Market Rule 9.4.17, within one Business Day from the amendment. [Market Rule 9.4.17(b)]

# Capacity Credit Allocation Process

## AEMO amendments - Example



$$CCA_{i,amended} = \left( \frac{CCA_{i,current}}{\sum_i CCA_{i,current}} \right) \times CC$$

$$CCA_{1,amended} = \left( \frac{30}{120} \right) \times 100 = 25$$

$$CCA_{2,amended} = \left( \frac{90}{120} \right) \times 100 = 75$$

# Application Showcase

Capacity Credit Allocations - Amendments (Release 2)

# Capacity Credit Allocation Process

## Assessing Trading Margins

- AEMO is required to considering whether a Market Participant's (MP) Trading Margin is likely to be negative after a Capacity Credit Allocation is established or reversed.
- AEMO proposes to calculate the change in the Market Participant's Outstanding Amount ( $\Delta OA$ ) using the following formula:

$$\Delta OA = CCA \times 1.1 \times \frac{Days_{exp}}{Days_{TM}} \times MRCP_{TM}$$

Variable	Units	Definition
$Days_{exp}$	days	The number of complete Trading Days in the past from the Trading Month associated with the CCA.
$Days_{TM}$	days	The number of Trading Days in the Trading Month associated with the CCA.
$MRCP_{TM}$	\$ per Capacity Credit (ex GST)	The Monthly Reserve Capacity Price which applies to the Trading Month associated with the CCA.
$CCA$	Capacity Credits	The number of CCs associated with the CCA.

# Capacity Credit Allocation Process

## Assessing Trading Margins - Example

- MG submits 100 Capacity Credits to MC for Trading Month June 2019 on 16 June 2019.
- The Monthly Reserve Capacity Price (MRCP) is \$10k per Capacity Credit (ex GST).
- The change in Outstanding Amount,  $\Delta OA$ , is calculated as \$550k (inc GST).

$$\Delta OA = CCA \times 1.1 \times \frac{Days_{exp}}{Days_{TM}} \times MRCP_{TM}$$

$$\begin{aligned}\Delta OA &= 100 \times 1.1 \times \frac{15}{30} \times \$10k \\ &= \$550k \text{ (inc GST)}\end{aligned}$$

# Phase 1 – Outstanding Amount

- In accordance with clause 2.40.1 of the Market Rules, AEMO must calculate the Outstanding Amount (OA) for a Market Participant.
- AEMO currently calculates OA as

$$OA = INP + EE - PP$$

Variable	Units	Definition
<i>INP</i>	\$ (inc GST)	Invoices not paid as defined in Market Rules clause 2.40.1(a).
<i>EE</i>	\$ (inc GST)	Estimated exposure as defined in Market Rules clause 2.40.1(b). AEMO proposes to change the calculation for EE as per the following slide.
<i>PP</i>	\$ (inc GST)	Prepayments as defined in Market Rules clause 2.40.1(c).

# Phase 1 – Outstanding Amount

- Estimated Exposure (EE) is currently calculated as:

$$EE = \frac{Days_{STEMexp}}{Days_{STEMinv}} \times STEM_{Inv} + \frac{Days_{NSTEMexp}}{Days_{NSTEMinv}} \times NSTEM_{Inv}$$

- Estimated Exposure (EE) is proposed to be calculated as:

$$EE = \frac{Days_{STEMexp}}{Days_{STEMinv}} \times STEM_{Inv} + \frac{Days_{NSTEMexp}}{Days_{NSTEMinv}} \times [NSTEM_{Inv} + (CCA_{rec,Inv} - CCA_{made,Inv}) \times 1.1 \times MRCP_{Inv}] - \sum_{d \in D} [(CCA_{rec,d} - CCA_{made,d}) \times 1.1 \times RCP_d]$$

Variable	Units	Definition
$Days_{STEMexp}$	days	The number of complete Trading Days in the past for which no STEM invoice has been issued.
$Days_{STEMinv}$	days	The number of Trading Days in the most recent Trading Week for which a STEM invoice was published.
$STEM_{Inv}$	\$ (inc GST)	The amount payable by Market Participant p for the most recent Trading Week for which a STEM invoice was published.
$Days_{NSTEMexp}$	days	The number of complete Trading Days in the past for which no NSTEM invoice has been published.
$Days_{NSTEMinv}$	days	The number of Trading Days in the most recent Trading Month for which an NSTEM Initial invoice was published.
$NSTEM_{Inv}$	\$ (inc GST)	The amount payable by Market Participant p for the most recent Trading Month for which an NSTEM Initial invoice was published.
$CCA_{rec,Inv}$	Capacity Credits	The number of Capacity Credits allocated to the Market in the most recent Trading Month for which an NSTEM Initial invoice was published.
$CCA_{made,Inv}$	Capacity Credits	The number of Capacity Credits that were allocated to other Market Participants in the most recent Trading Month for which an NSTEM Initial invoice was published.
$MRCP_{Inv}$	\$ per Capacity Credit (ex GST)	The Monthly Reserve Capacity Price which was applied in the most recently published NSTEM Initial invoice.
$D$	N/A	The set of all complete Trading Days in the past for which no NSTEM invoice has been issued.
$CCA_{rec,d}$	Capacity Credits	The number of Capacity Credits allocated to Market Participant p in the Trading Month in which Trading Day d falls.
$CCA_{made,d}$	Capacity Credits	The number of Capacity Credits allocated by Market Participant p to other Market Participants in the Trading Month in which Trading Day d falls.
$RCP_d$	\$ per Capacity Credit (ex GST)	The daily Reserve Capacity Price calculated as the Monthly Reserve Capacity Price which applies to the Trading Month in which Trading Day d falls, divided by the number of days in the Trading Month for which Trading Day d falls.

# Phase 1 – Outstanding Amount Example

- Determine the Estimated Exposure for a Market Participant (MP) on 2 November 2019 based on the following information:
  - MP does not participate in STEM.
  - MP paid AEMO \$300k (inc GST) in its August 2019 NSTEM Invoice
  - MP's Capacity Credit Allocations are detailed in the table below.

Trading Month	CCA Received	CCA Made	Monthly RCP
August 2019	10	0	\$10k
September 2019	10	0	\$10k
October 2019	5	0	\$12k
November 2019	1	0	\$12k

$$EE = \frac{Days_{STEMexp}}{Days_{STEMinv}} \times STEM_{Inv} + \frac{Days_{NSTEMexp}}{Days_{NSTEMinv}} \times [NSTEM_{Inv} + (CCA_{rec,Inv} - CCA_{made,Inv}) \times 1.1 \times MRCP_{Inv}]$$

$$- \sum_{d \in D} [(CCA_{rec,d} - CCA_{made,d}) \times 1.1 \times RCP_d]$$

$$\begin{aligned}
 EE &= \$0 \\
 &+ \frac{30 + 31 + 1}{31} \times [\$300k + (10 - 0) \times 1.1 \times \$10k] \\
 &- 30 \times \left[ (10 - 0) \times 1.1 \times \frac{\$10k}{30} \right] \\
 &- 31 \times \left[ (5 - 0) \times 1.1 \times \frac{\$12k}{31} \right] \\
 &- 1 \times \left[ (1 - 0) \times 1.1 \times \frac{\$12k}{30} \right] \\
 &= \$0k + \$820k - \$110k - \$66k - \$0.44k = \$643.56k
 \end{aligned}$$



# Phase 1 - API Documentation

- The RCM system introduced new APIs for Market Participants
- AEMO will provide new / updated APIs to Market Participants in the RoPE project.
- The detail of these APIs is documented in swagger.
  - <https://wems.aemo.com.au/rcm/api/docs/>
- RoPE – Phase 1 will introduce new and modified web service APIs for external consumption.
  - RCM (REST)
    - Peak Intervals
    - Capacity Credit Allocations
    - IRCR
  - WEMS (Soap)
    - Prudential Risk Indication

# What's next in Phase 1?

## Changes to IRCR

- Process Changes
  - Indicative IRCR
  - Adjusting IRCR as part of Settlement Adjustments
- System Changes
  - Moving IRCR PIR and IRCR Log files from Settlement Portal to RCM screens
  - New API to provide IRCR results and detailed information

## Changes to RCM Settlements

- Process Changes
  - Settle Market Customer over-allocations at Monthly Reserve Capacity Price
- System Changes
  - Modification to settlement calculations
  - New variables in PIR files
  - New RCM Settlement PCS

Next RoPE Working Group – 16 November 2018

# Questions and Feedback

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