WA Electricity Consultative Forum

16 September 2020

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.
We pay our respects to their Elders past, present and emerging.

Agenda

ITEM	TIME	TOPIC	PAPERS	RESPONSIBLE	ACTION
1.	1.00 pm – 1.05 pm	Welcome and Minutes – WAECF (24 June 2020)	Minutes	Chair (AEMO)	Endorsement
2.	1.05 pm – 1.25 pm	AEMO Power System update	Presentation	(AEMO)	Note / Discussion
3.	1.25 pm – 2.15 pm	AEMO Operational Updates			Note / Discussion
		3.1 Quarterly Energy Dynamic (QED) Report	Presentation	Nicholas Nielsen (AEMO)	
		3.2 WEMS Updates 3.2.1 WEM Market Data Website Refresh 3.2.2 Releases for RC_2017_02	Presentation	Rick Dolling (AEMO)	
		3.3 Energy Price Limits	Verbal Update	Lisa Laurie (AEMO)	
		3.4 2020 WEM ESOO Supplementary Analysis -Individual Reserve Capacity Requirement (IRCR)	Presentation	Grace Liu and Rachel Tandy (AEMO)	
		3.5 Reserve Capacity Mechanism (RCM) update	Verbal Update	Neetika Kapani (AEMO)	
4.	2.15 pm – 2.40 pm	AEMO Project Updates			Note / Discussion
		4.1 AEMO Projects Status update	Presentation	James Harris (AEMO)	
		4.2 Reduction of Prudential Exposure (RoPE) – Final Update 4.3 STEM Fortran Replacement – Final Update	Presentation	Mark Katsikandarakis (AEMO)	
		4.4 DER Roadmap Update	Verbal Update	Tom Butler (AEMO)	
		4.5 SMST MPI update	Presentation	Nicole Markham (AEMO)	
5.	2.40 pm – 2.55 pm	Stakeholder Updates			Note / Discussion
		5.1 Energy Transformation Information Unit (ETIU) - Energy Transformation Strategy (ETS) high level update and Energy Policy WA Update	Verbal Update	Jai Thomas (EPWA)	
		5.2 Rule Change update	Verbal Update	Stephen Eliot (RCPWA)	
		5.3 Benchmark Reserve Capacity Pricing (BRCP)	Verbal Update	Sara O'Connor (ERA)	
7.	2.55 pm – 3.00 pm	Other Business			Note / Discussion
8.	3.00 pm	Next meeting – TBA	NA	(Chair)	Note

Please note this meeting will be recorded to aid minute production

Current Power System Updates

Presented to WA Electricity Consultative Forum

By Julius Susanto, Principal Engineer

16 September 2020

Outline

1. New system records on the SWIS
2. Update on the commissioning of new facilities
3. Management of the North Country network contingency
4. Increase in load following requirements

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New System Records

- In the past few weeks, a number of system records have been broken on the SWIS:

• Operational minimum demand	992 MW	Sunday 13 September 2020 at 12:10pm
• Rooftop PV output	1,189 MW	Saturday 12 September 2020 at 12:10pm
• Aggregate wind farm output	809 MW	Sunday 6 September 2020 at 2:53pm

- Why now all of a sudden?
  - The Spring shoulder season (Sep-Nov) is the sweet spot for daytime minimum demand and solar PV output:
    - Mild daytime ambient temperatures (20-25°C) is a comfortable temperature requiring little space heating and/or cooling, while also being cool enough for efficient PV performance
    - The position of the sun (solar declination angle) is shifting towards the Summer equinox
    - There are naturally lower loads on weekends, particularly on Sundays
  - An estimated 200 MW of rooftop PV capacity has been installed since the start of the year
  - 520 MW of additional wind and solar farm capacity is currently being connected to the SWIS (at different stages of completion)

- Records are expected to keep falling over the next few months

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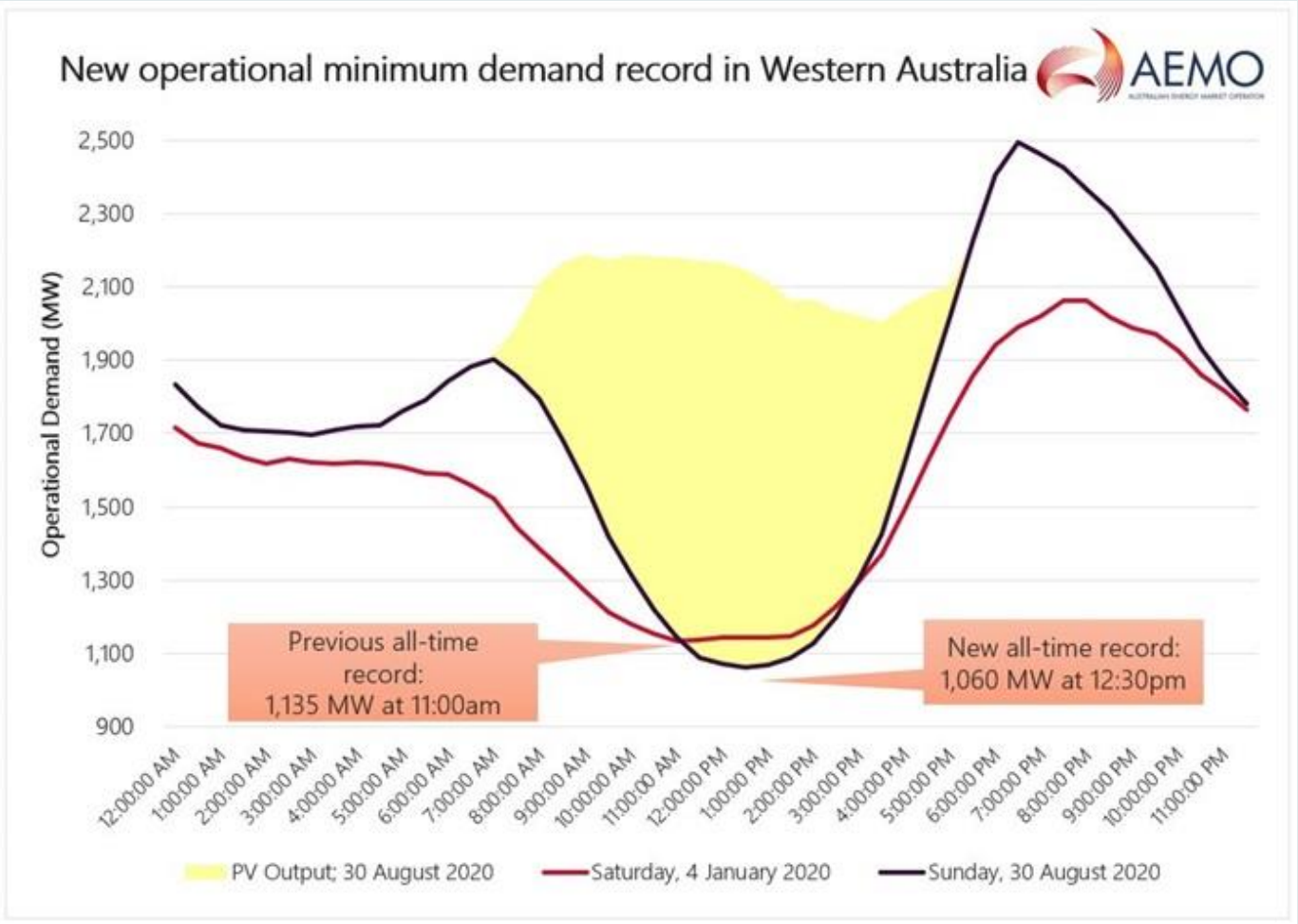
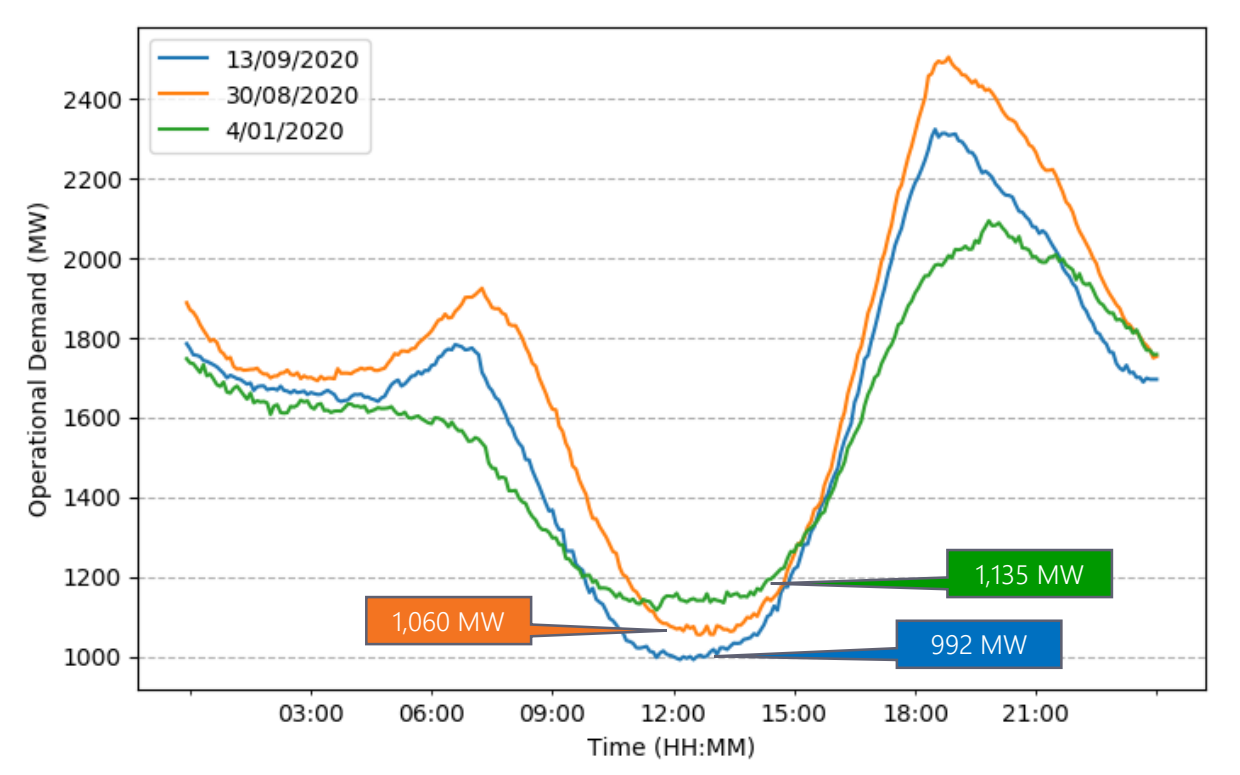
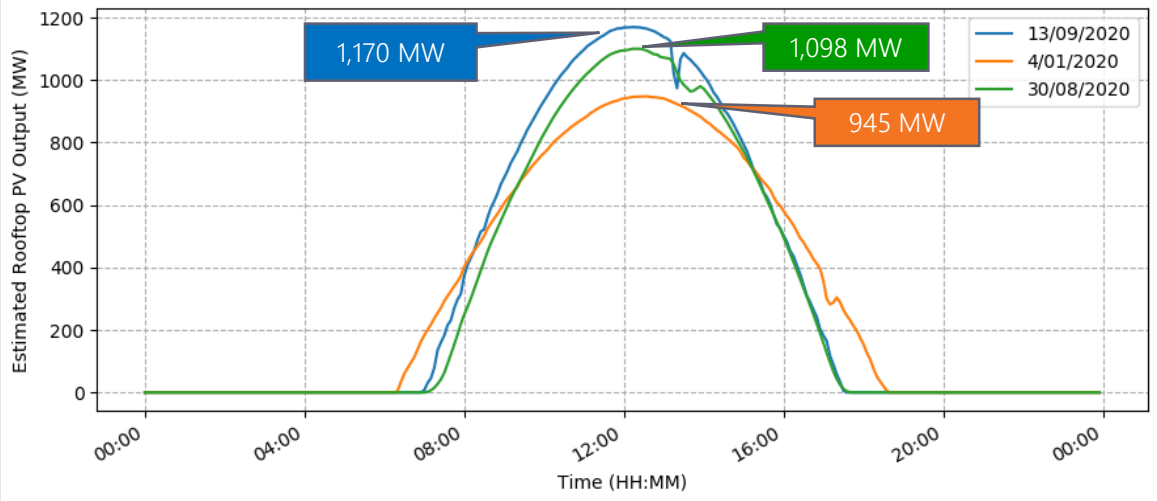
Minimum Demand and Rooftop PV

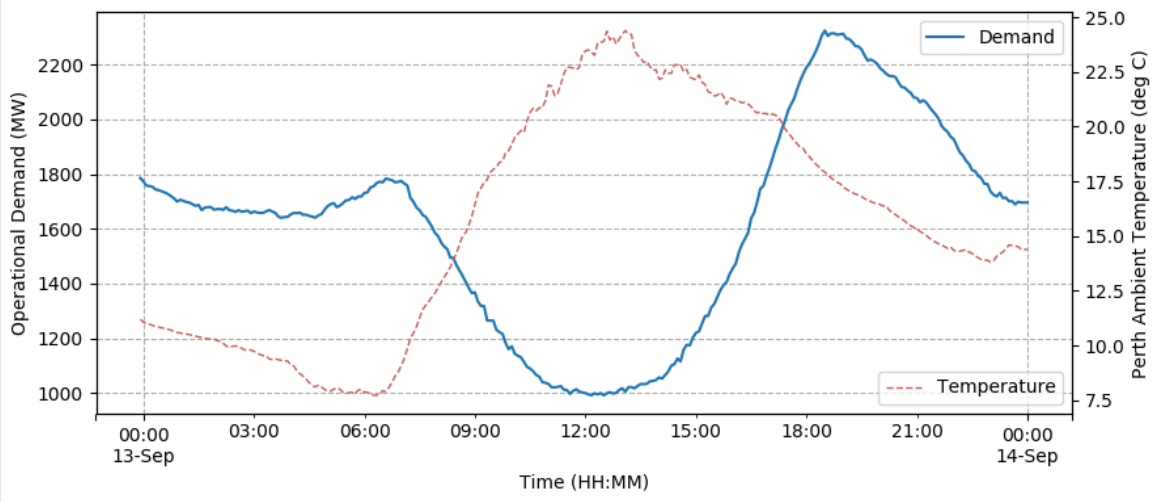


Source: https://aemo.com.au/newsroom/news-updates/min-op-demand-records

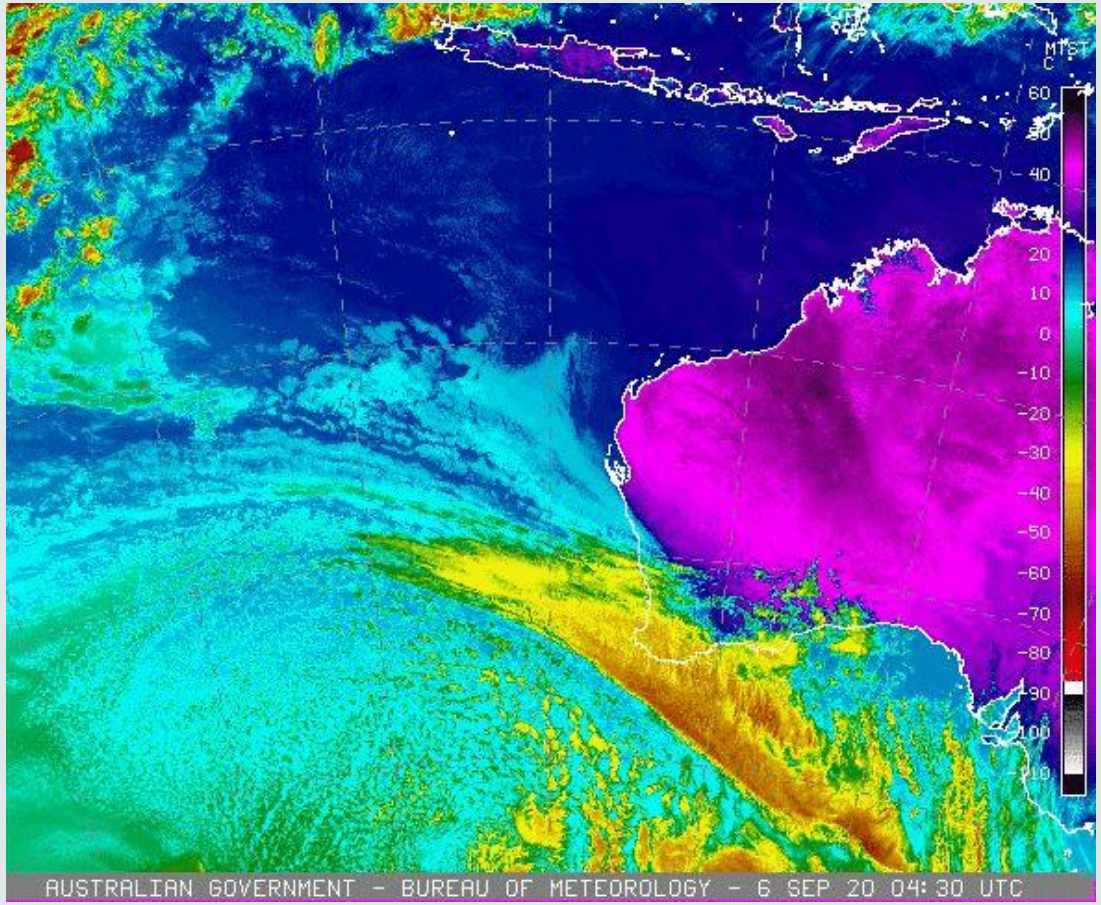
Minimum Demand and Rooftop PV

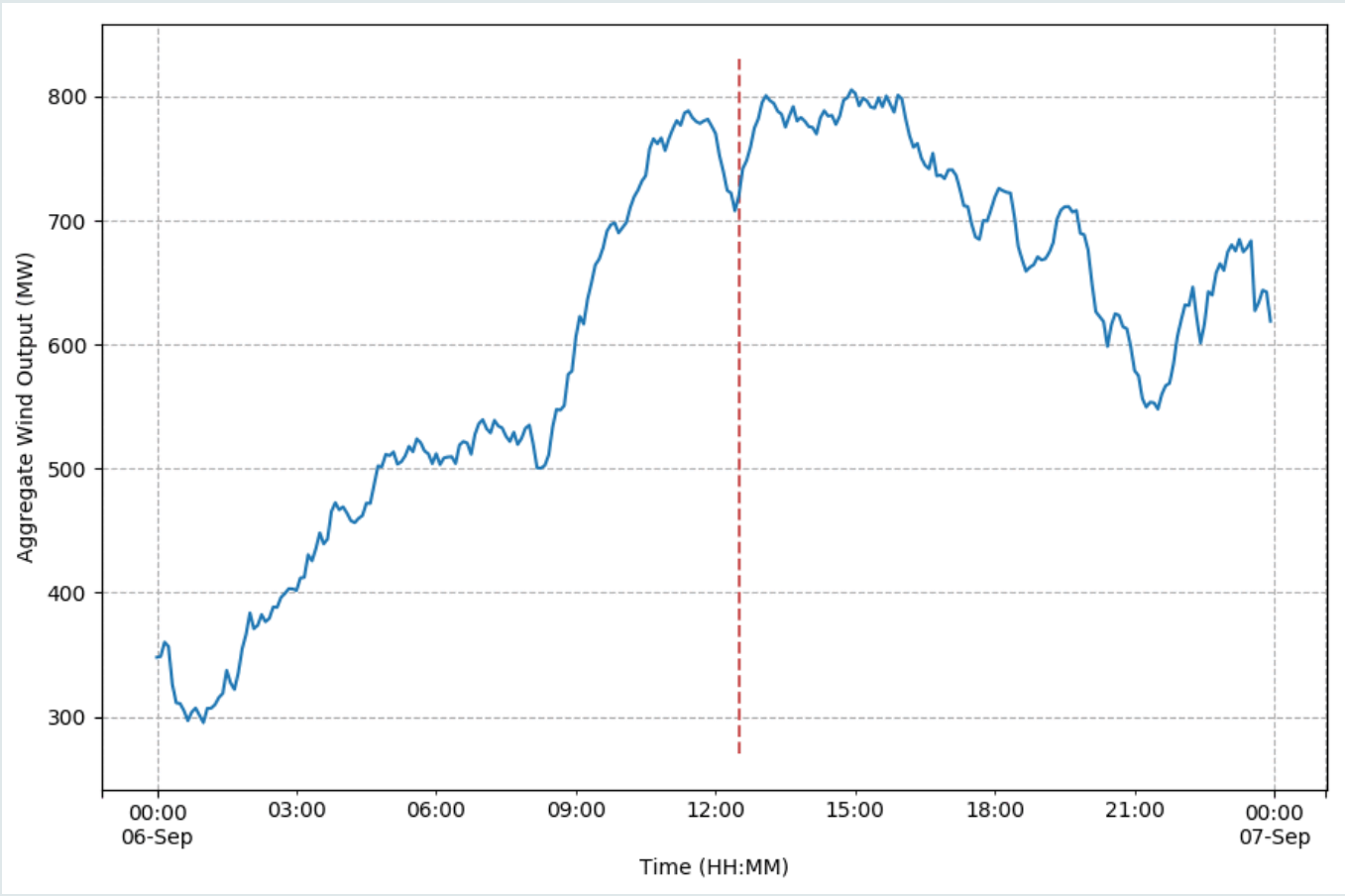






Aggregate Wind Output



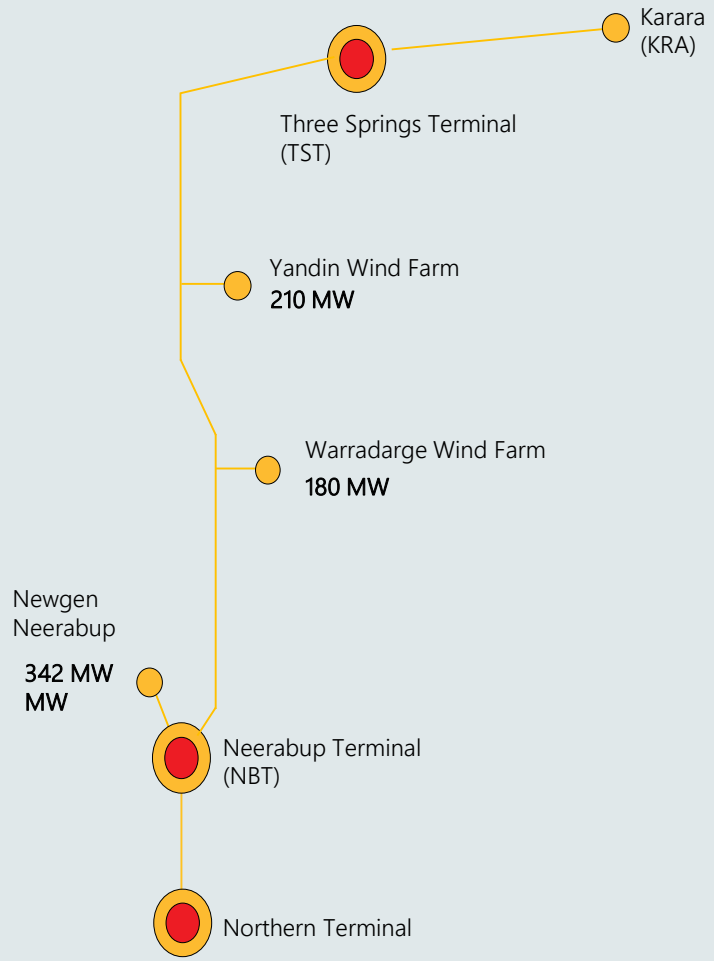


New Facility Commissioning Update

Facility	Capacity (MW)	Commissioning Status
Greenough River Solar Farm (Expansion)	40 MW (+30 MW)	Complete. Interim approval to operate issued at the end of July 2020
Merredin Solar Farm	100 MW	Interim approval to operate issued at end of August, but still resolving a number of issues
Warradarge Wind Farm	180 MW	Ongoing (~35 out of 51 WTGs hot commissioned as at 14 September 2020)
Yandin Wind Farm	210 MW	Ongoing (~39 out of 51 WTGs hot commissioned as at 14 September 2020)

Management of North Country Network Contingency

- Yandin and Warradarge wind farms are connected to a single circuit 330 kV transmission line between Neerabup Terminal and Three Springs Terminal.
- A fault anywhere along the line between Northern Terminal and Three Springs Terminal will trip both wind farms (up to 390 MW if Karara is not online and up to 732 MW if NBT T2 is out of service), leading this to potentially become the largest contingency in the SWIS.
- In order to mitigate the risk of frequency collapse, AEMO System Management has developed a *GIA Contingency Limit* to provide real-time advice to Western Power on the largest contingency size that the SWIS can bear without triggering under-frequency load shedding (UFLS) under the assumption that AEMO is carrying exactly 70% of the largest contingency in spinning reserve.
- AEMO understands that Western Power will use this real-time advice to formulate a limit to constrain Yandin and Warradarge (under the Generator Interim Access (GIA) scheme).



Increase in Load Following Requirements

- The entry of new intermittent wind and solar facilities, as well as the year-on-year increase in rooftop PV, are expected to increase volatility (in both generation and load) and require a corresponding increase in the Load Following Ancillary Service (LFAS) requirements.
- While building operational experience with the new large-scale facilities (e.g. correlations of outputs across the facilities), AEMO has proposed to the ERA a staged change in the LFAS requirements:

Timeframe	Current FY 19/20	Proposed FY 20/21 Stage1	Proposed FY 20/21 Stage 2 (*)
Day time requirement (5:30am to 7:30pm)	85 MW	95 MW	105 MW
Night time requirement (7:30pm to 5:30am)	50 MW	70 MW	80 MW

(*) If required

Questions

wa.sm.operations@aemo.com.au

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Q2 2020 Quarterly Energy Dynamics Report

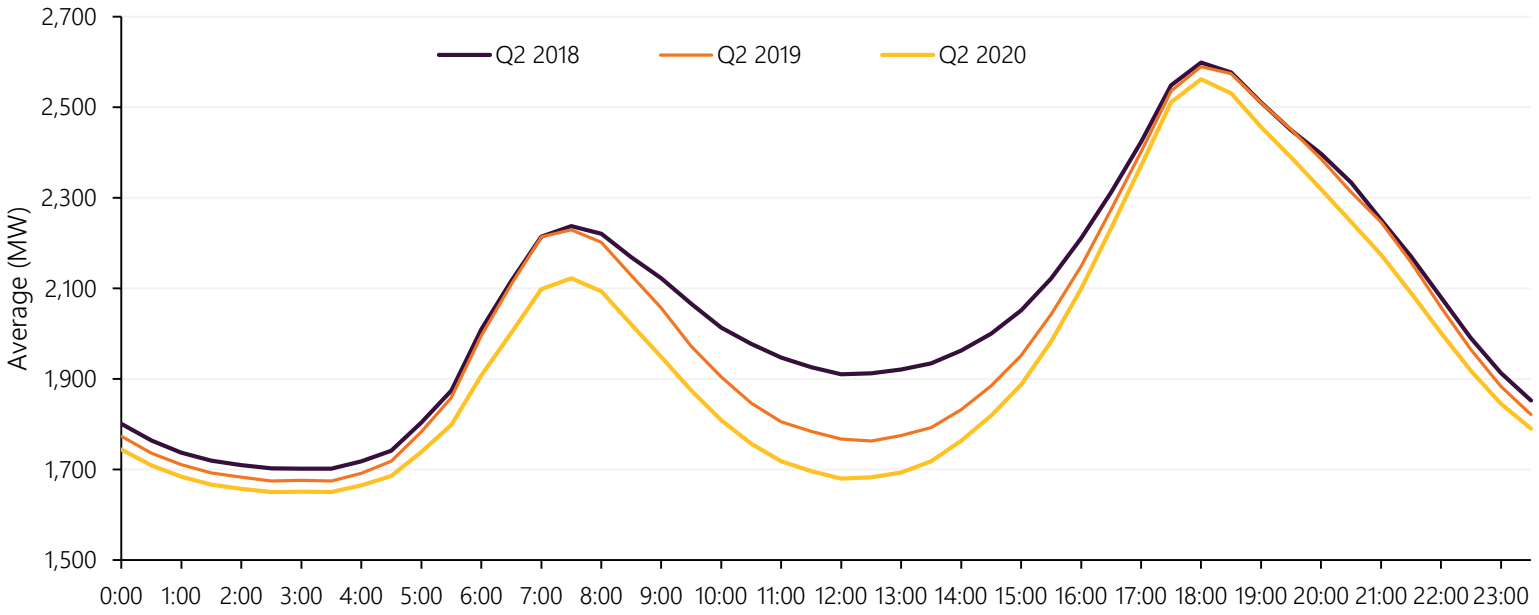
Presented to WA Electricity Consultative Forum

By Nicholas Nielsen – Market Analyst, WA Market Operations

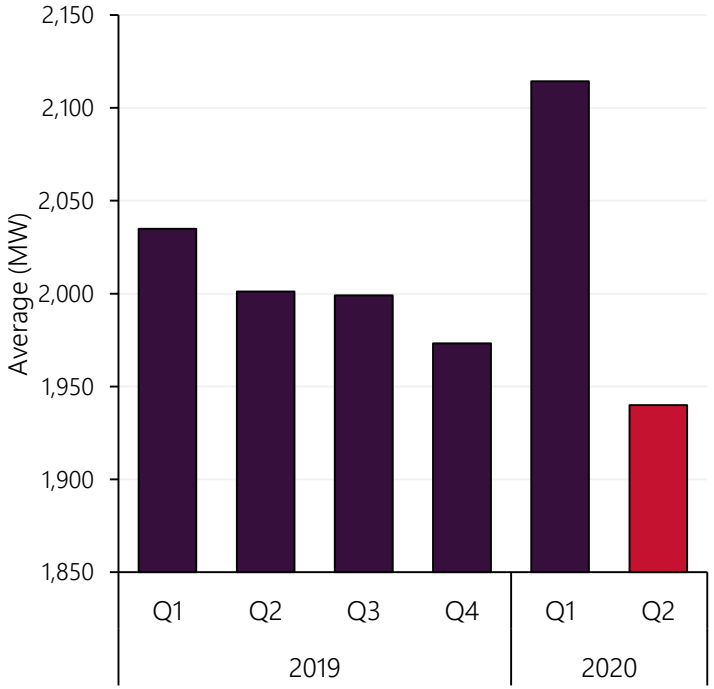
16 September 2020

Warm temperatures and rooftop PV drive demand decreases

Q2 hourly average operational demand by year



Average operational demand



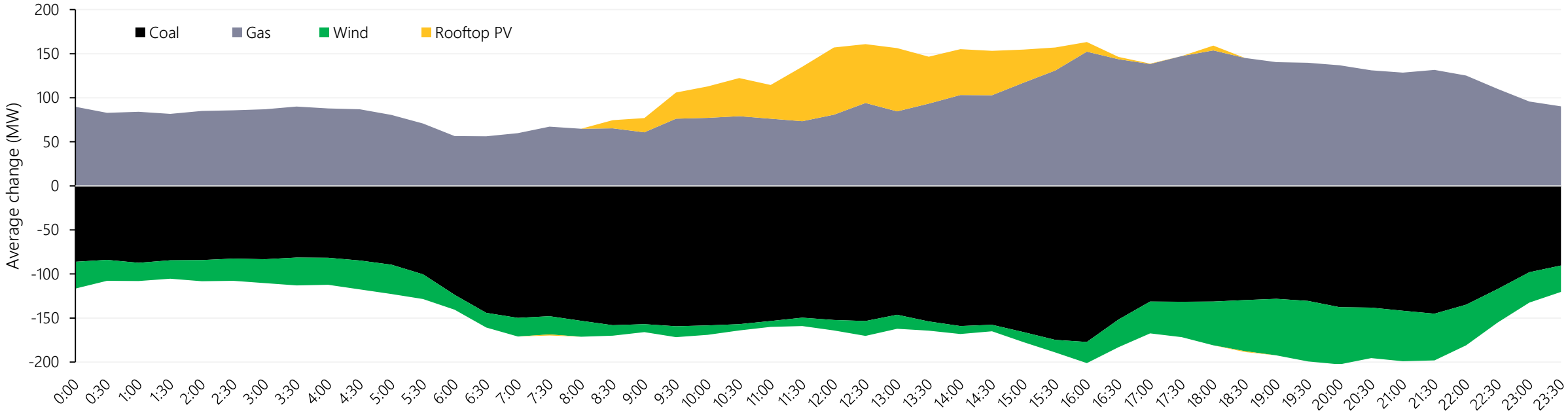
Summary

A High Q2 temperatures and increasing uptake of PV resulted in reduction in average Operational Demand by 4.7% versus Q2 2019.

B A new record low Operational Demand was set (1,155 MW at 1100hrs on 26 April 2020). This was the fourth consecutive quarter in which a minimum quarterly demand was set, mainly driven by continuing uptake of Rooftop PV.

Decline in coal-fired generation met by increased GPG; Rooftop PV uptake continues

Change in supply by time of day by fuel type – Q2 2020 versus Q2 2019

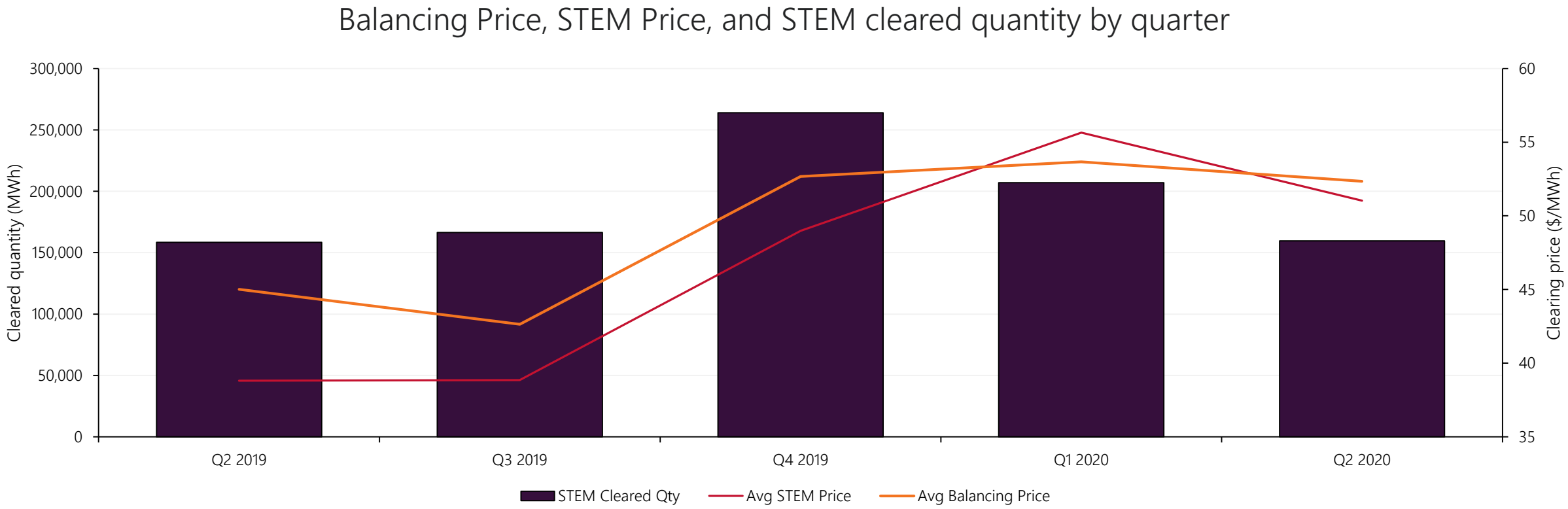


Summary

A Average coal-fired generation decreased by 130 MW (14%), due to a decrease in coal-fired generation availability (from 99.7% to 83.9%), primarily due to planned outages (78% of all outages). This decrease was mostly met by GPG (increased by 100 MW). This shift led to an increase in Balancing Prices of 16.5%.

B Rooftop PV increased by 14 MW on average.

Lower coal availability leads to higher STEM & Balancing Prices despite lower demand vs 2019



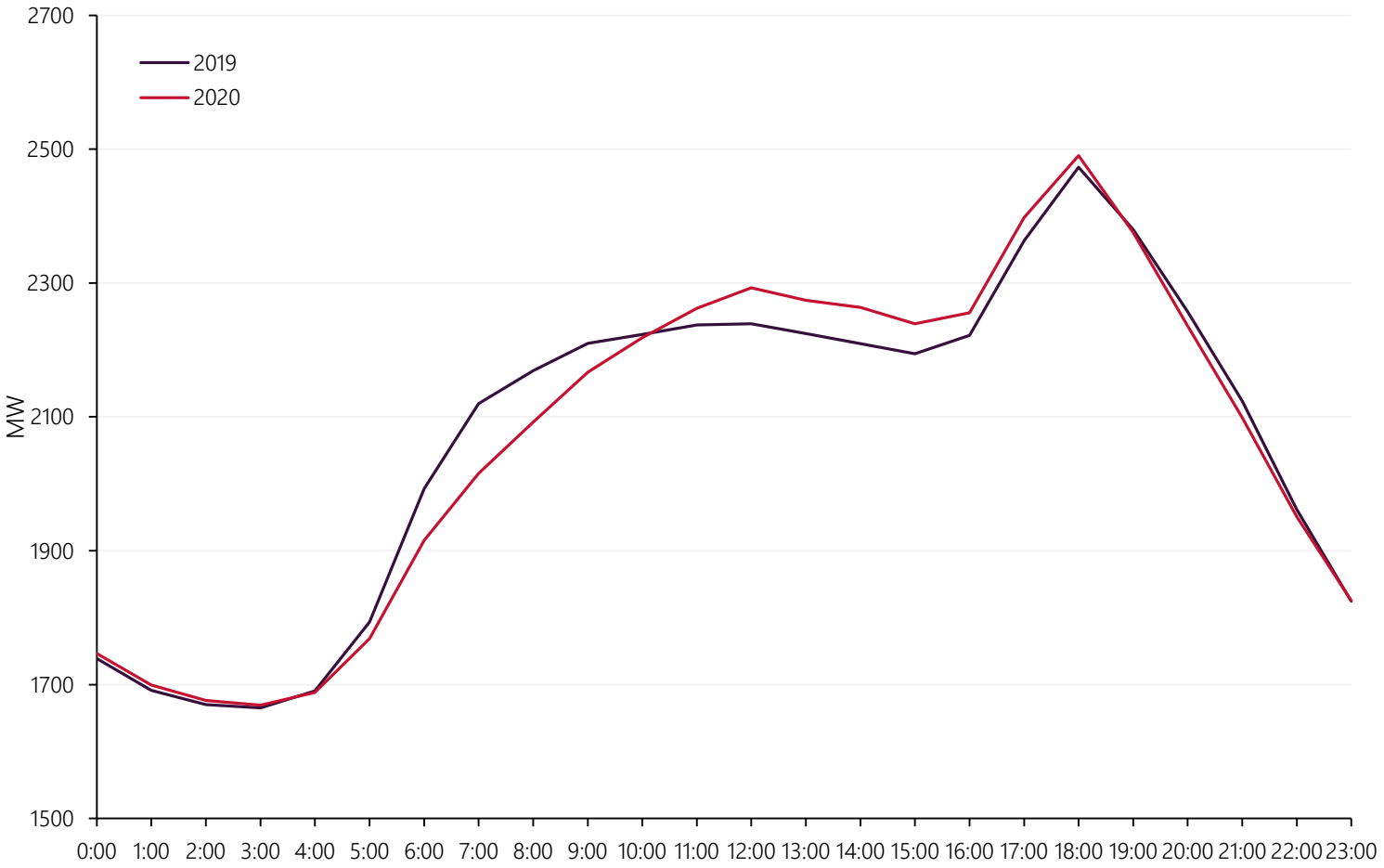
Summary

A Balancing prices remained high (increased 16.1% compared to Q2 2019). This was mainly driven by decreased coal availability (which decreased 26.0% compared to Q2 2019) and the associated increase in GPG generation.

B Average traded quantity in the Short-Term Energy Market (STEM) were steady, but high Balancing Prices drove an increase in average STEM prices by 31.5% from Q2 2019.

COVID-19: Minimal overall impact on demand, but drives change in consumption patterns

Average Underlying Demand by time of Day - Period of Restrictions (March 23 – May 25) 2020 vs 2019



Summary

A Underlying demand (which allows for changes in Rooftop PV output) changed negligibly as a result of Covid-19 (decreased by 0.1%).

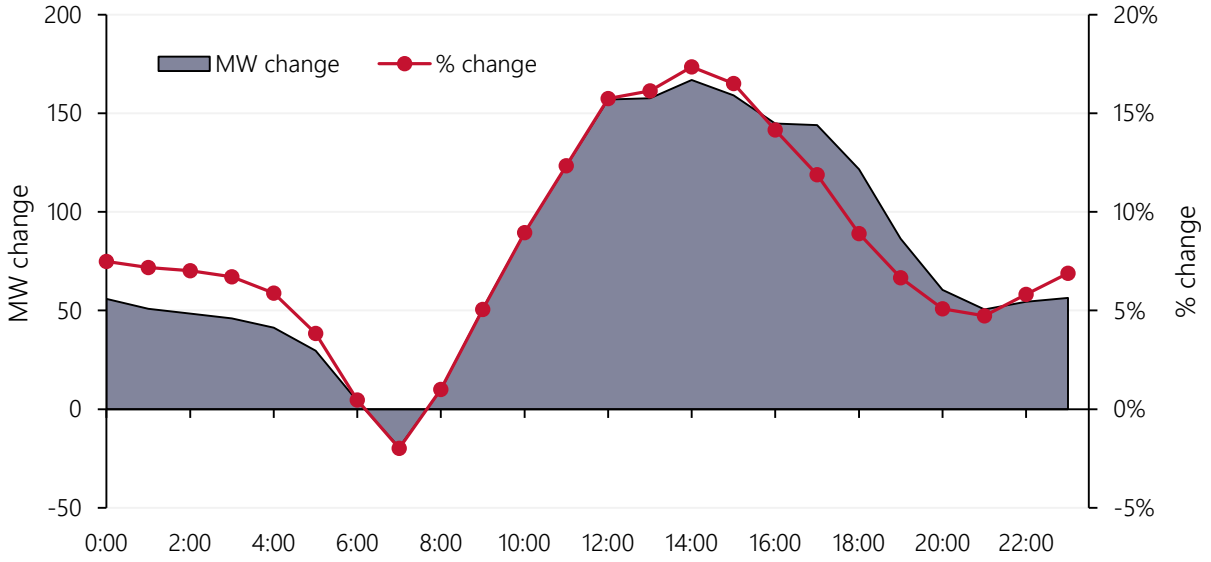
B As the Lockdown Period fell in the shoulder season, and based on simplified analysis, AEMO has assumed negligible impact on demand from weather for the period.

C There was a shift in consumption from the morning period (average decrease of 3.1% from 0500hrs to 1000hrs) to later in the day (average increase of 1.7% from 1100hrs to 1900hrs).

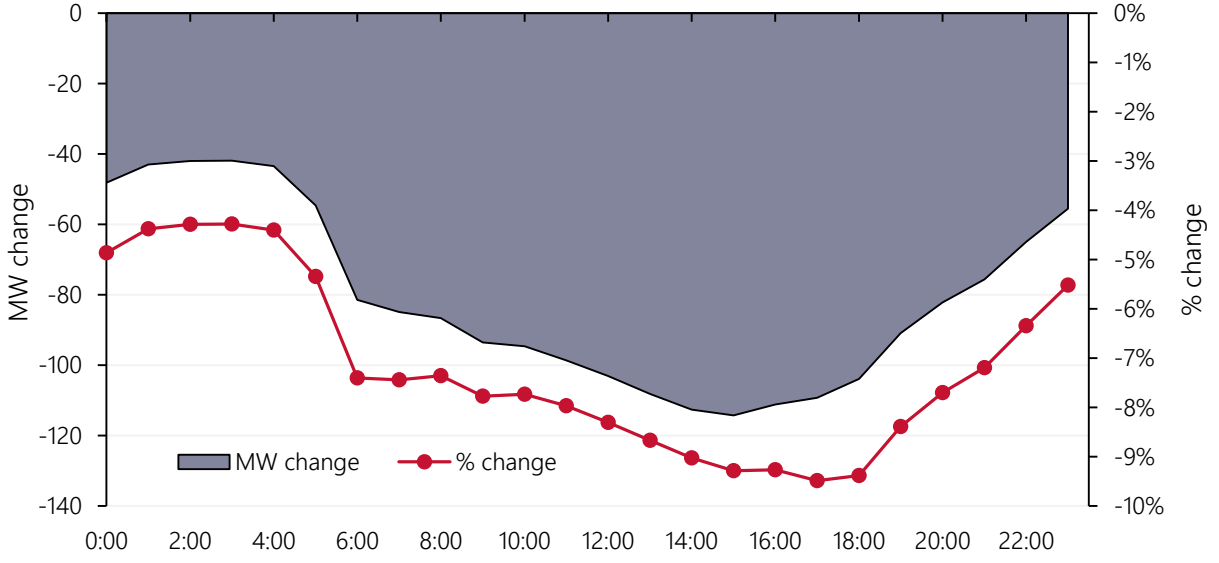
COVID-19: Consumption by larger users decreases, smaller users increase

Change in Operational Demand by time of Day
Period of Restrictions (March 23 – May 25) 2020 vs 2019

Small users



Large Users



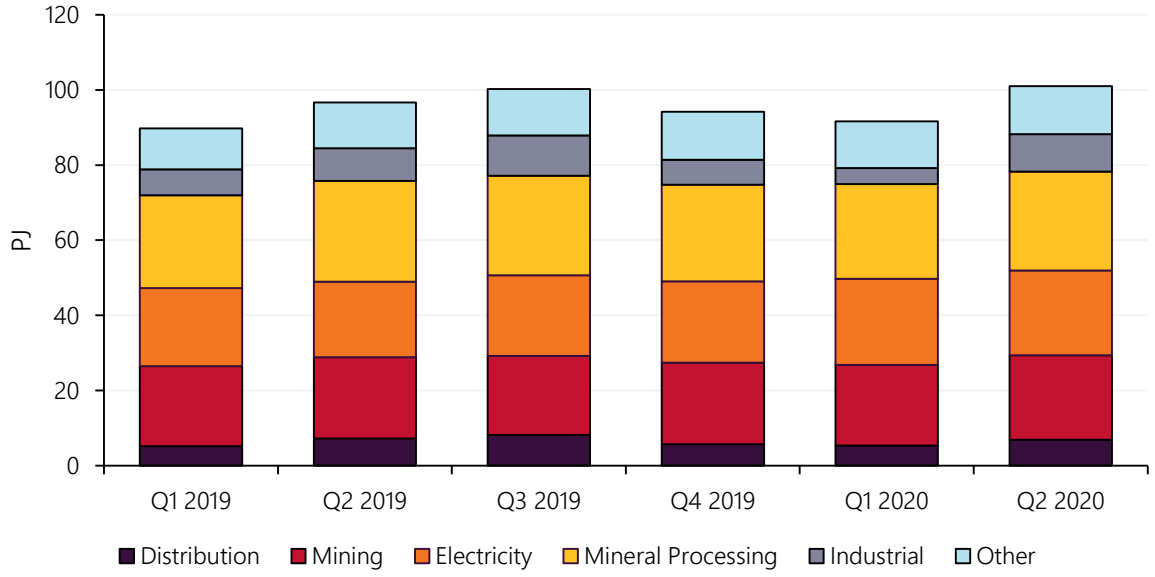
Summary

A Large industrial/commercial user consumption decreased by 7.3% whilst small commercial and residential consumption was up by 8.2% on average.

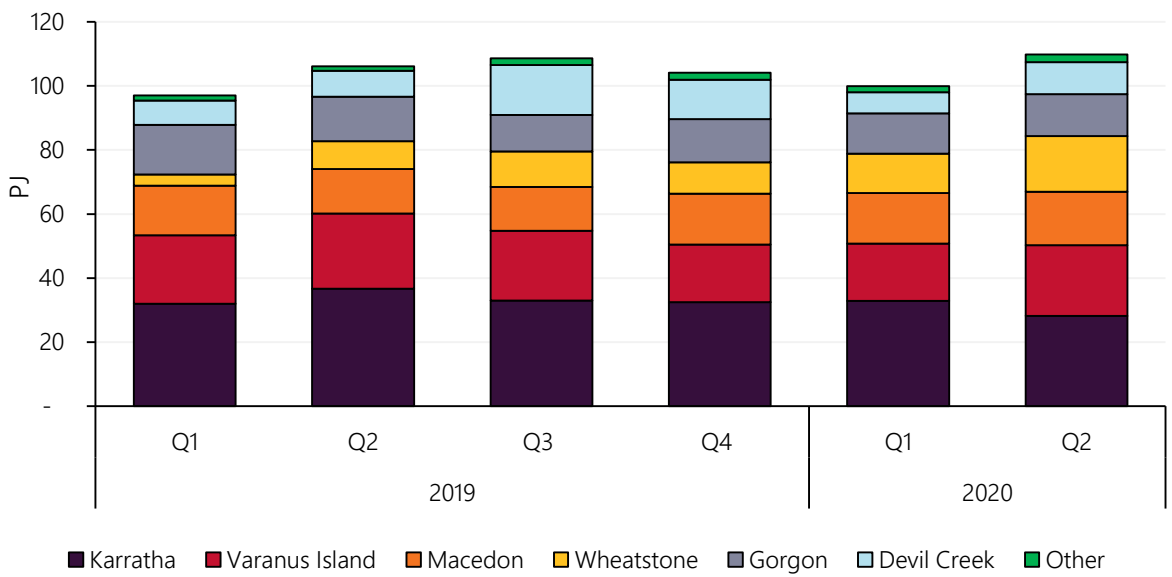
B Decreases in the morning were mainly driven by large industrial/commercial users due to decreased economic activity resulting from Covid-19. Increases in the afternoon/evening were mainly driven by increased residential consumption consistent with social distancing measures. Given these different consumption impacts and noting WA does not have Full Retail Competition, impacts on Retailers will be quite diverse.

Gas

Gas Consumption up 10%



Gas Production up 10%



Summary

A Gas Consumption increased by 10% compared to Q1 2020, mainly driven by industrial consumers coming back online after extended maintenance shutdowns. There was a 5% increase compared to Q2 2019, mainly driven by increased demand for electricity production.

B Gas Production increased by 10%.

Q3 2020 Preliminary Observations

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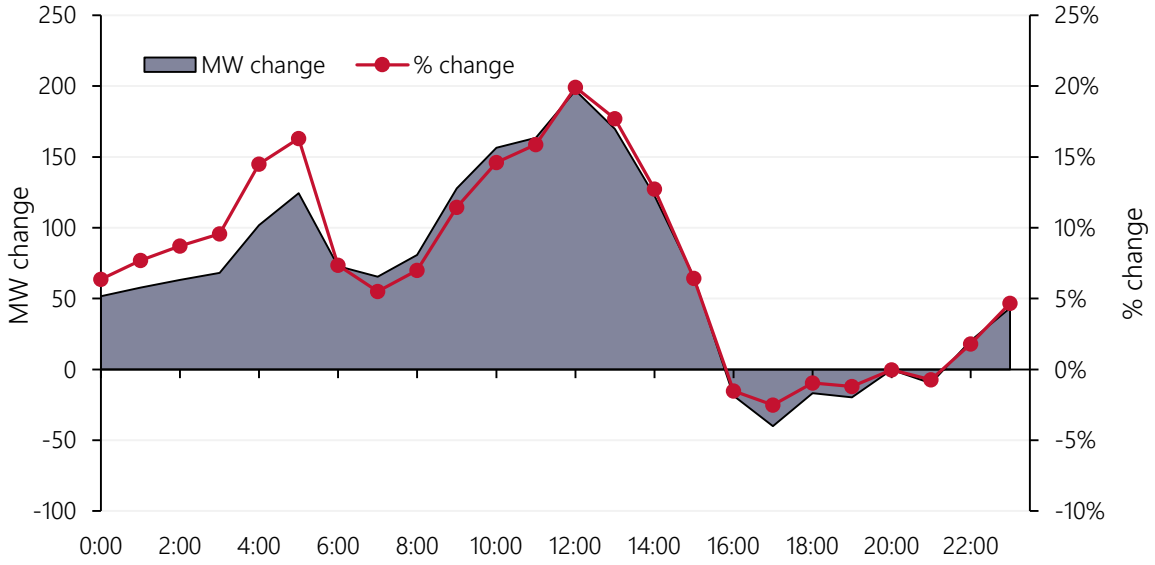
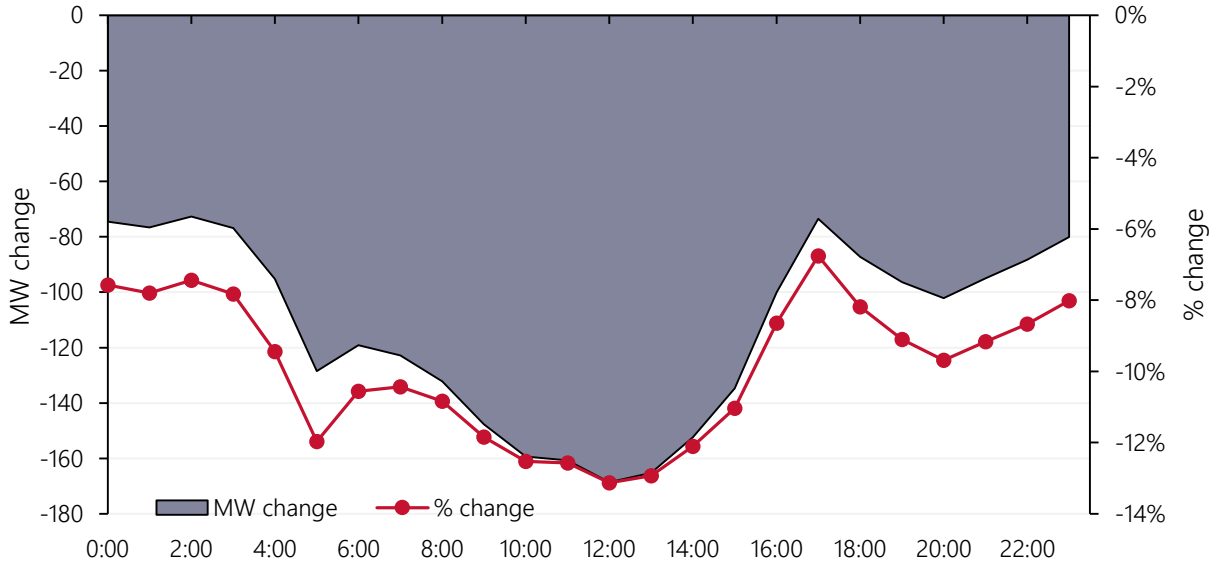
COVID-19: Impact of restrictions continues, but partial recovery is observed

Change in Operational Demand by time of Day
Post-Phase 3 (June 6 – July 11) 2020 vs 2019

Small users



Large Users



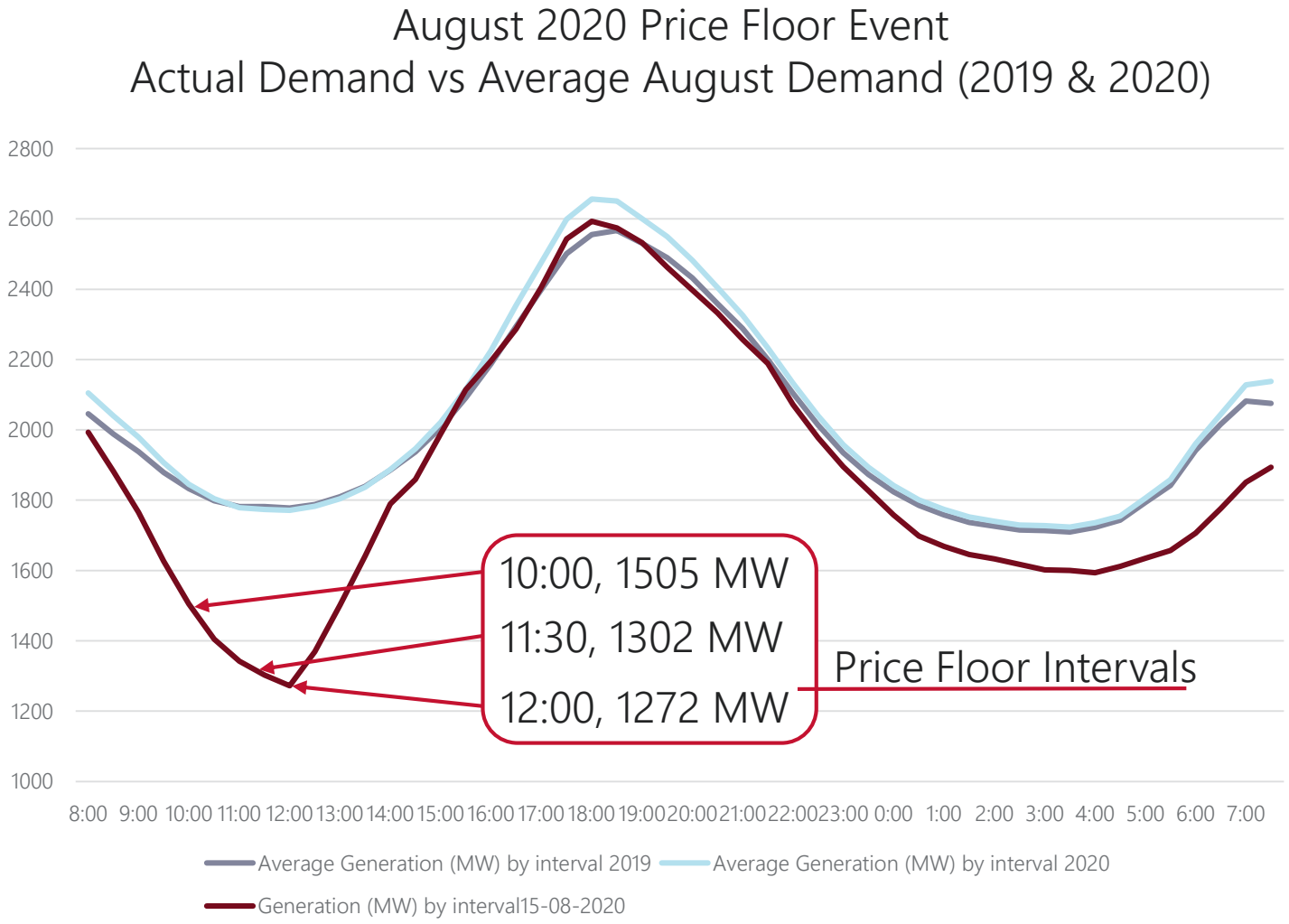
Summary

A Large industrial/commercial user consumption decreased by 11.4% on average. After allowing for temperature the impact is similar to the restrictions period, but with a sharper recovery between 16:00 & 18:00, suggesting increasing afternoon commerce.

B Average consumption by small users increased by 6.3% on average (compared to 8.2% in the restrictions period). After allowing for temperature the impact is similar to the restrictions period, but with some distinct changes to the consumption pattern:

- Consumption between 16:00 and 22:00 returned close to normal.
- Large increases in morning consumption (04:00 – 09:00) may reflect a partial return to normal working conditions (i.e. commuting rather than working from home).

Price floor events



Summary

A The Balancing Market cleared at -$1000 / MWh in 3 intervals on 15 August 2020.

B Primarily, this was a result of low demand (1262 MW to 1435 MW) in the relevant intervals, driven by Rooftop PV uptake, which in recent years has resulted in lower minimum demand intervals.

C The morning of 15 August was unusually warm and sunny for August, resulting in relatively high Rooftop PV output. The 24-hr forecast over-estimated demand by circa 200 MW.

D Commissioning Tests (which are obliged to bid at the Price Floor) accounted for 164 MW – 183 MW in the Balancing Merit Order, resulting in increased capacity at the Price Floor.

Note: Demand figures quoted are Operational Demand, which is the average measured total of all wholesale generation in the South West Integrated System (SWIS), based on non-loss-adjusted sent-out SCADA data.

Q3 2020 QED

- Potential special topics for the Q3 2020 QED:
  - Ongoing impact of COVID-19
  - Price floor events
  - Minimum Load Events
  - Demographic analysis of consumers in the WEM

- To provide feedback or suggestions please contact:
  - Market Operations (WA)
  - wa.operations@aemo.com.au

Questions and Feedback

Market Operations

wa.operations@aemo.com.au

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WEMS Updates

Presented to WA Electricity Consultative Forum

By Rick Dolling, Principal Lead – Operations, WA Market Operations

16 September 2020

WEMS Market Data Website Refresh

As part of the Digital Transformation Strategy project pipeline the WEM Data Dashboard website will be refreshed and hosted on the main AEMO website.

Go Live Date: 24 September 2020

Summary:

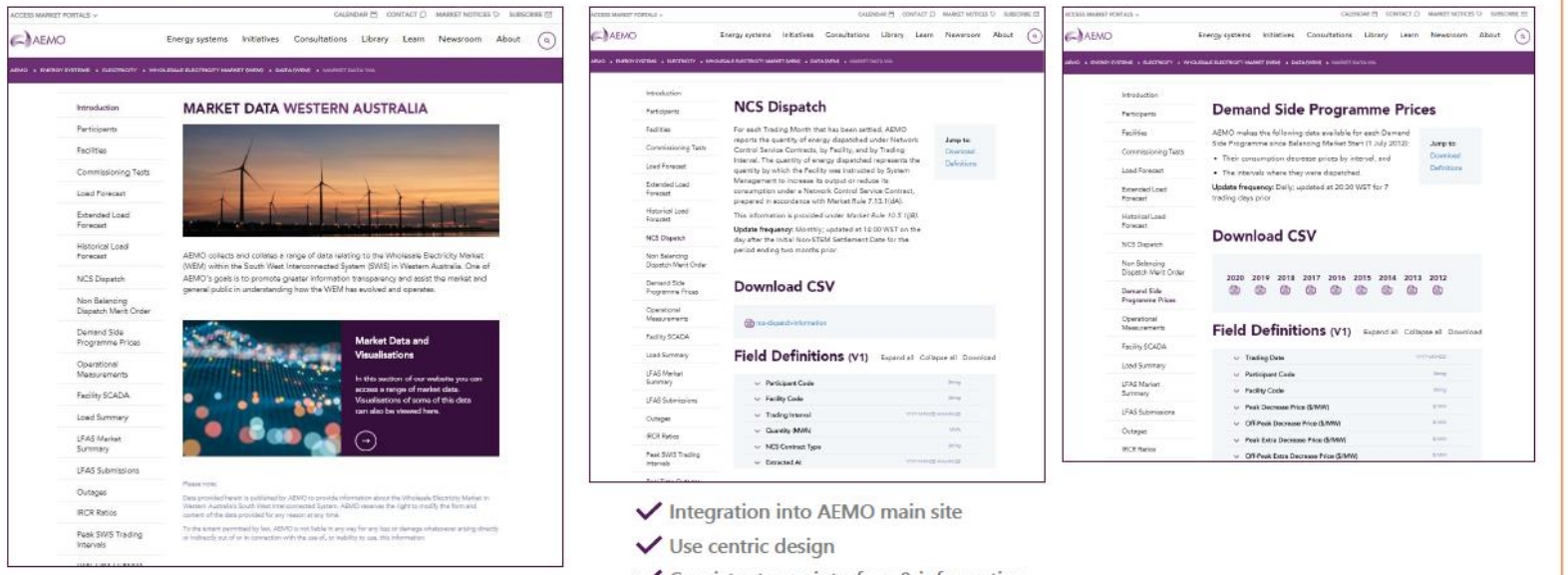
- ✓ No changes have been made to URLs
- ✓ No changes to website content
- ✓ No changes to data sets

Test Strategy:

Comprehensive testing and UAT has been undertaken to ensure the changes introduced are aesthetic in nature only and no not change any core functionality or data sets.

Current Market Data Western Australia

Re-skinned Market Data Western Australia



- ✓ Integration into AEMO main site
- ✓ Use centric design
- ✓ Consistent user interface & information architecture

RC_2017_02 Release

Summary[1]:

- A 90-minute Balancing Gate Closure (instead of 2 hours).
- Synergy's gate closure for the Balancing Market will be an hour before the Balancing Gate Closure (i.e. 150 minutes ahead of the Delivery Interval) and it will move from block bidding to rolling bidding.
- The LFAS Gate Closure will be the same for IPPs and for Synergy, and will be an hour ahead of Synergy's gate closure (i.e. 210 minutes ahead of the Delivery Interval). Block bidding will remain but it will move from 6-hour blocks to 4-hour blocks.

Tentative Deployment Schedule:

- A one month Market Trial period, commencing 28 October 2020, will be available for Market Participants to test any system changes that may be required.
- The tentative deployment schedule is summarised in the follow table:

Environment	Deployment Date	RC_2017_02 Effective Date
Market Trial	28 October 2020	28 October 2020
Production	25 November 2020	1 December 2020

[1] Participants can find full details of the Rule Change at https://www.erawa.com.au/rule-change-panel/market-rule-changes/rule-change-rc_2017_02

Questions and Feedback

Market Operations

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Analysis of 2019-20 response to Individual Reserve Capacity Requirement (IRCR)

A 2020 WEM ESOO supplementary analysis - September 2020

Presented to WA Electricity Consultative Forum
By Grace Liu, Principal Analyst and Rachel Tandy, Graduate Analyst

16 September 2020

Agenda

1. IRCR mechanism
2. Background
3. Analysis on IRCR
4. Summary
5. Questions and feedback

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IRCR mechanism

- An IRCR (in MW) is allocated to every Market Customer[1] to fund Capacity Credits costs.

- It is typically determined based on the median consumption of each metered load in a Market Customer's portfolio during the **12 Peak SWIS Trading Intervals** from the previous Hot Season.

- The total IRCR is scaled to ensure it equals the Reserve Capacity Requirement.

- The IRCR financially incentivises Market Customers to reduce their consumption during high and peak demand periods and consequently reduces their exposure to Capacity Credits costs.

1. A Rule Participant who is registered as a Market Customer under clauses 2.28.10, 2.28.11 or 2.28.13 of the Wholesale Electricity Market Rules (WEM Rules). A Market Customer represents a person who sells or intends to sell electricity to Customers.

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Background

- This IRCR analysis is supplementary to the 2020 WEM ESOO.
- This analysis was published on 27 August 2020 and can be found on the AEMO website: https://aemo.com.au/-/media/files/electricity/wem/planning_and_forecasting/esoo/2020/2020-wem-esoo-ircr-analysis.pdf?la=en.
- It investigates Customers'[2] IRCR response during the peak demand day and Hot Season of the 2019-20 Capacity Year.
- IRCR response was analysed on a sample of the largest 500 Customers, including:
  - Estimated reductions in Customers' consumption; and
  - Numbers of Customers who responded to reduce their consumption.

2. A person to whom electricity is sold for the purpose of consumption.

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Analysis on IRCR

Two topics of discussion:

1. How much are customers responding to IRCR?

2. What are the lead indicators of peak demand intervals?

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Analysis on IRCR

Two topics of discussion:

1. How much are customers responding to IRCR?

How much are customers responding –

12 Peak SWIS Trading Intervals

Trading Date	Trading Interval	Estimated reduction in consumption (MW)	Estimated number of customers reducing consumption from the sample
12 December 2019	17:30 – 18:00	147	72
	18:00 – 18:30	141	70
	18:30 – 19:00	142	74
3 February 2020	17:30 – 18:00	102	61
	18:00 – 18:30	120	62
	18:30 – 19:00	121	66
4 February 2020	17:30 – 18:00	140	75
	18:00 – 18:30	140	71
	18:30 – 19:00	138	72
14 February 2020	17:00 – 17:30	125	70
	17:30 – 18:00	125	73
	18:00 – 18:30	123	75

2019-20 Capacity Year peak interval (3,919 MW)

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Analysis on IRCR

Two topics of discussion:

2. What are the lead indicators of peak demand intervals?

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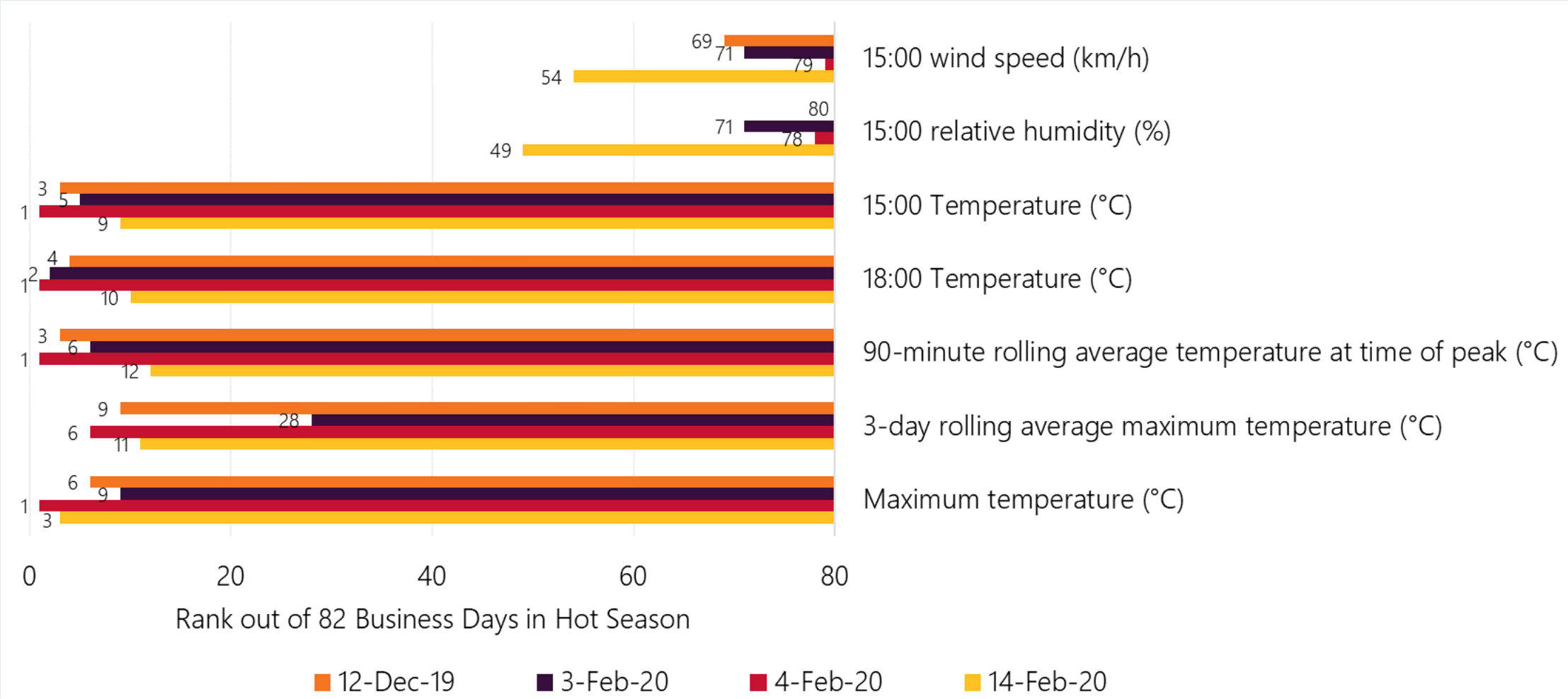
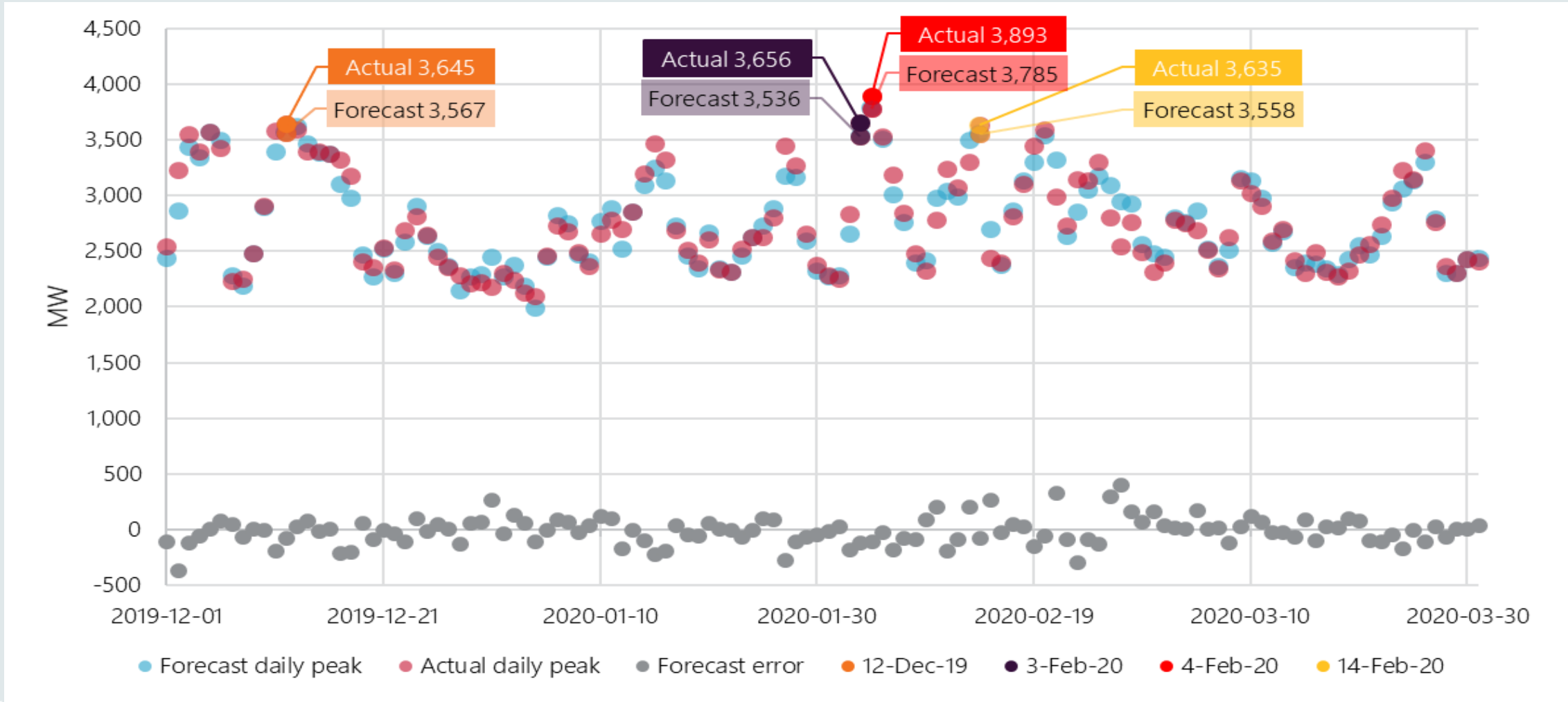
Lead indicators – weather attributes



Source: AEMO and Bureau of Meteorology (BOM).

Lead indicators – load forecasts



Summary

- Consistent IRCR responses across all the 12 Peak SWIS Trading Intervals indicates the IRCR mechanism continues to incentivise Customers to reduce consumption during high demand periods.

- Weather attributes and AEMO Load Forecasts could provide some useful information in assisting Customers in their decision making process regarding when to trigger an IRCR response.

Questions and Feedback

Reserve Capacity

wa.capacity@aemo.com.au

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AEMO Project Status Update

Presented to WA Electricity Consultative Forum

By James Harris, Program Manager - WA, Systems Engineering, Operations

16 September 2020

Status Update – Live Projects

G Project is continuing within agreed tolerances.
A Project is at risk. Monitor and apply corrective action as required
R Project is not meeting requirements. Corrective action required
C Project is New or Complete

Project	Status	Commentary	Driver
Reduction of Prudential Exposure (RoPE)	G	• Status update provided as a separate Agenda Item	
Reserve Capacity Mechanism (RCM) Pricing	G	• *On track for Release 1* - focusing on Trade Declaration, Assignment of Capacity Credits, DSM Security and the Reserve Capacity Price. • Target for *Release 1 Market Trial* is 23 September 2020. • Target for *Release 1 Production* is 7 October 2020.	*Implementation of the RCM Pricing Rule Changes gazetted by the Minister of Energy on the 22 February 2020.*
WEM Reform (Foundation Reg Frameworks)	A Time	• Since last WAECF, the *Energy Transformation Taskforce approved design parameters for the Compliance and Monitoring Framework*, Storage Accreditation for the RCM, ESS Supplementary Mechanism and movement of GPS into the WEM Rules. • AEMO's first four WEM Reform implementation projects were initiated in July and are now undertaking Planning activities (GPS, WEMDE, Constraints Management, Digital Platform) • The fourth WEM Reform Implementation Group (WRIG) was held 27th August 2020 with the next meeting scheduled for 1st October. • The first WRIG-IT sub-forum was also held on 20th August 2020 to discuss aspects of the technology implementation and design.	*This is AEMO's program to prepare for and implement constrained network access and WEM reforms in line with WA Government's Energy Transformation Strategy.*
POMAX Metering Upgrade -Upgrade metering system	G	Currently finalising joint testing with the vendor, functional testing will then commence New version - POMAX MDW 20.5 on track for delivery October 2020	*Legacy metering system currently deployed at AEMO is 11 product releases behind current 2020 version. Vendor no longer able to provide upgrades for current product in Production and no longer offer support post June 2020.*
PASA Process Improvement – ST and MT	G	On track to be completed and ready for Deployment post delivery of SMST. • Development work commenced in July	*Replacing existing tool with fit-for-purpose, interim tool which will be used until replaced in WEM Reform. This will address Market Audit Findings and address*

Status Update – Live Projects

G Project is continuing within agreed tolerances.
A Project is at risk. Monitor and apply corrective action as required
R Project is not meeting requirements. Corrective action required
C Project is New or Complete

Project	Status	Commentary	Driver
STEM Fortran Replacement	G	• Status update provided as a separate Agenda Item	*- Reduce the risk associated with supporting an antiquated codebase.* *- Remove the reliance on Fortran specialist availability and knowledge.* *- Provide AEMO with better control over systems that support the operation of STEM.*
Settlements Enhancements	G	• Project scope and timeline have been re-baselined. This is due to delayed start of the project because of resource availability, and the addition of the North Country rule change to be incorporated into this project. • Internal development team have transitioned from completion of RoPE Project and external development and test resources are engaged through PSC and are actively engaged.	*The current legacy Settlements system will be out of vendor support from early 2021. The project will replace this system to reduce business risk from utilising unsupported technology.*
System Management Systems Transition (SMST)	G	• Budget and timeline re-baselined. Go-live now on 20 Oct 2020 • UAT in final stages with signoff (including regression) on 25 Sep 2020 • Market trails and participant engagement booked for week starting 28 Sep 2020 • Finalised cutover and runbook planning – WP feedback received and workshop scheduled • Operational and organisational readiness activities in final stages	*System Management Systems Transition project is delivering the IT systems to perform the System Management functions which have been transferred from Western Power.*
Power Systems Operations (PSO)	R Time Budget	• A base model has been established and is being maintained, the Demand Forecasting System went live late June after running in parallel for several months. • SMST was prioritised ahead of PSO. Replanning exercise for the remainder of the work is complete, with formal change being prepared • Key activities such as Single Line Diagram validation and training preparation have commenced removing them from the critical path to expedite delivery • High level milestones: Tech readiness Nov 2020, Operational readiness Jan 2021, Training and Parallel Run dates TBC.	*Power System Operations (PSO) project will establish a new Energy Management System and Demand Forecasting System for the WEM.* *PSO is transitioning from Western Power's XA21 platform to the AEMO eTerra Energy Management System, including a new Demand Forecasting System for the WEM.*

Questions and Feedback

WAelectricityforum@aemo.com.au

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Reduction of Prudential Exposure (RoPE) and STEM Fortran Replacement Final Updates

Presented to WA Electricity Consultative Forum

By Mark Katsikandarakis, Manager WA Market Operations

16 September 2020

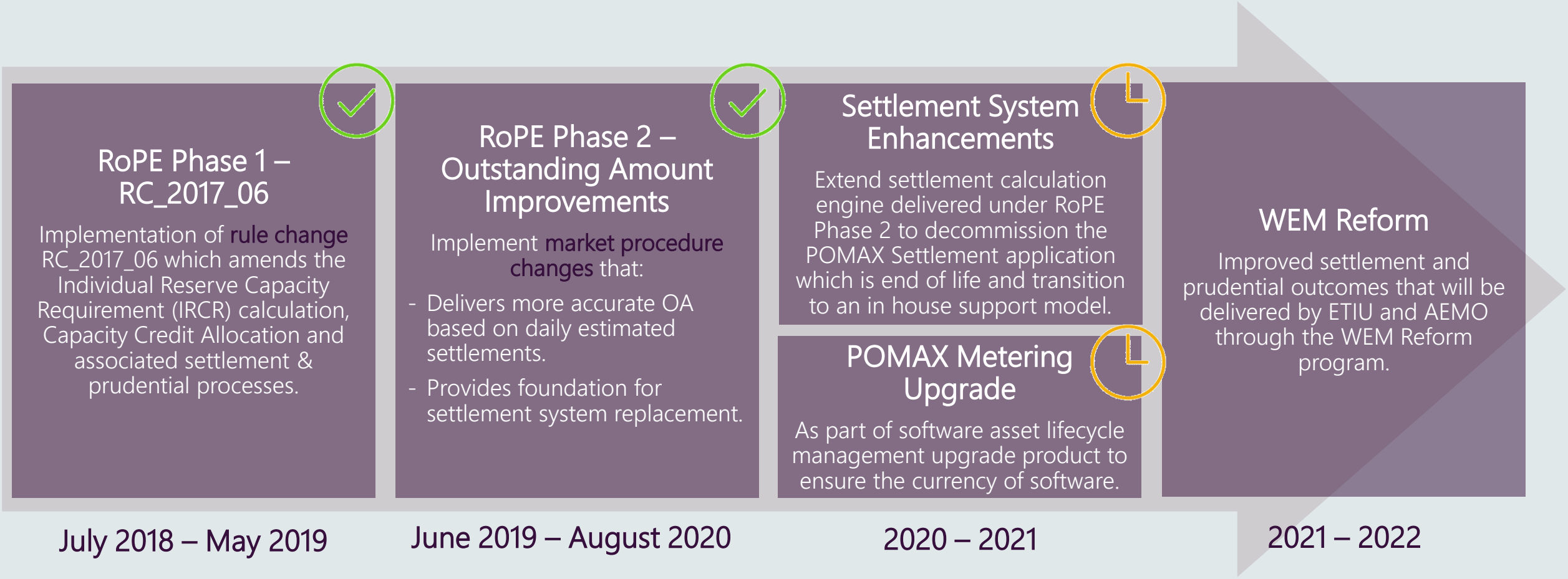
RoPE

Project Update – Closure

16 September 2020

Settlements Work Program

The Reduction of Prudential Exposure (RoPE) project was a key step in AEMO's Settlements work program



Stakeholder Engagement

Rule Change (RC_2017_06) Development (2017)

WA Electricity Consultative Forum and Market Advisory Committee

Engagement on Rule Design and throughout rule change process

Participant Workshop – Outstanding Amount

Targeted workshop to discuss proposed changes to Outstanding Amount.

Phase 1 & Phase 2 Development (2018-2020)

WEM Rule Change Working Group

Established to present concepts, showcase development and request feedback on software design. Discussions held at 8 meetings.

Procedure Change Working Group

Discussions held at 2 meetings to seek feedback on procedure changes.

WA Electricity Consultative Forum

Regular project updates

Market Trials

Market trial periods for each release provided with corresponding release notes. A participant parallel run period was provided in production for the Outstanding Amount changes.

Milestones – RC_2017_06

- **RC_2017_06 Submitted:** 26 July 2017
- **RC_2017_06 Approved**: 27 June 2018
- Phase 1 Commences: June 2018
- Allowable Revenue 5 Approved: June 2019
- Phase 1 Completes (Rules, Procedure and System Effective): 1 June 2019
- Phase 2 Commences: June 2019
- Participant Parallel Test: 3 July 2020 – 1 August 2020
- Phase 2 Completes (Rules, Procedure and System Effective): 24 August 2020
- Project Closure: September 2020

RCP | Rule Change Panel

Rule Change Notice:
Reduction of the prudential exposure in the Reser
Capacity Mechanism (RC_2017_06)

This notice is given under clause 2.5.7 of the Wholesale Electricity Market (WEM) (Market Rules).

Submitter: Martin Maticka, Australian Energy Market Operator

Date submitted: 17 July 2017

The Rule Change Proposal

The Australian Energy Market Operator (AEMO) has identified a prudential risk in the relating to Market Customers' Individual Reserve Capacity Requirement (IRCR) obliga The Credit Support held for any Market Customer with an IRCR, as required by the M Rules, is unlikely to be sufficient to cover all prospective amounts owed to AEMO in the of a default under section 9.23 of the Market Rules. In that situation, the defaulting M Customer's liability would be recovered from all of the other non-defaulting Market Partici

The current prudential requirements only ensure sufficient Credit Support is held by A when a Market Participant's Outstanding Amount accurately reflects the amount it woul in the event of a default. The Outstanding Amount calculation in clause 2.40.1 of the M Rules underestimates prospective amounts a Market Participant would owe in resp Reserve Capacity Mechanism (RCM) related payments on any given day for two reaso

- following the date it defaults, a Market Customer will continue to incur RCM r charges for up to approximately 160 days instead of approximately 70 days as cove the prudential requirements; and
- the Outstanding Amount calculation assumes the level of historical bilateral Ca Credit Allocations will remain the same, although this may not be the case for s reasons.

While amending the Market Rules to require additional Credit Support from Market Cust would mitigate the identified prudential risk, it would also tie up additional working c representing a cost to Market Participants and ultimately consumers.

AEMO's Rule Change Proposal seeks to reduce the need for any additional Credit Supp making the following changes to the Market Rules:

- a change to the responsible party reference month in the IRCR calculation from mor to month n, to reduce the period of time an IRCR liability is held by three months; a
- amendments to the Capacity Credit Allocation process, to allow Capacity Allocations to be made by Market Generators and accepted by Market Customers p

Rule Change Notice: RC_2017_06 Pa

RCP | Rule Change Panel

Final Rule Change Report:
Reduction of the prudential exposure in the Reserve Capacity Mechanism (RC_2017_06)

Standard Rule Change Process

31 May 2018

Milestones – Phase 1

- RC_2017_06 Submitted: 26 July 2017
- RC_2017_06 Approved: 27 June 2018
- Phase 1 Commences: June 2018
- Allowable Revenue 5 Approved: June 2019
- Phase 1 Completes (Rules, Procedure and System Effective): 1 June 2019
- Phase 2 Commences: June 2019
- Participant Parallel Test: 3 July 2020 – 1 August 2020
- Phase 2 Completes (Rules, Procedure and System Effective): 24 August 2020
- Project Closure: September 2020

Market Procedures
AEPC_2019_03

System Changes

WEMS 3.28 & RCM 1.10

November 2018

WEMS 3.30 and RCM 1.11

March 2019

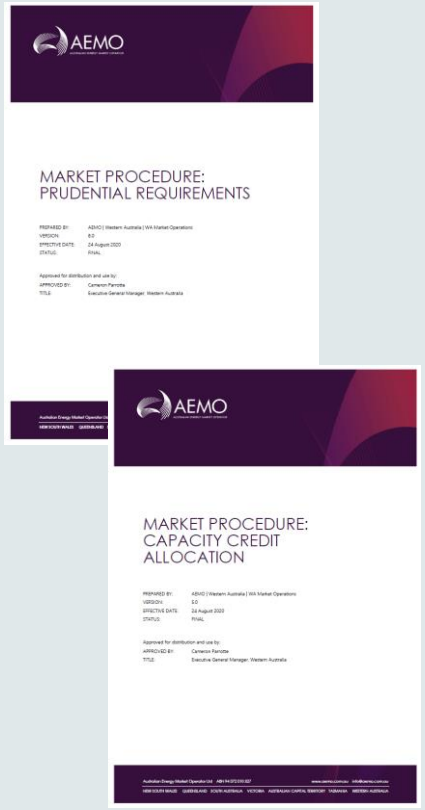
WEMS 3.32

June 2019

Milestones – Phase 2

- RC_2017_06 Submitted: 26 July 2017
- ✓ RC_2017_06 Approved: 27 June 2018
- Phase 1 Commences: June 2018
- $ Allowable Revenue 5 Approved: June 2019
- ✓ Phase 1 Completes (Rules, Procedure and System Effective): 1 June 2019
- Phase 2 Commences: June 2019
- Participant Parallel Test: 3 July 2020 – 1 August 2020
- ✓ Phase 2 Completes (Rules, Procedure and System Effective): 24 August 2020
- ✓ Project Closure: September 2020

AEPC_2020_06



WEM Metering, Settlement & Prudential Calculation Formulation

4.4.1 STEM Payments and Charges

These equations are based on the equations stated in 9.6.1. They have been modified to aggregate to a Trading Day and to separate quantities into supply and demand.

$$STEMSAS\_P\_D(p,d) = \sum_{i \in I(d)} STEMSAS\_P\_I(p,i) \quad (102)$$

$$STEMSAD\_P\_D(p,d) = \sum_{i \in I(d)} STEMSAD\_P\_I(p,i) \quad (103)$$

$$STEMSAS\_P\_I(p,i) = \begin{cases} STEMP\_G\_I(i) \times STEMSQ\_P\_I(p,i) & SSF\_G\_D(i) = 1 \\ 0 & SSF\_G\_D(i) = 0 \end{cases} \quad (104)$$

$$STEMSAD\_P\_I(p,i) = \begin{cases} STEMP\_G\_I(i) \times STEMDQ\_P\_I(p,i) & SSF\_G\_D(i) = 1 \\ 0 & SSF\_G\_D(i) = 0 \end{cases} \quad (105)$$

$$STEMSQ\_P\_I(p,i) = max(0, STEMQ\_P\_I(p,i) \times SSF\_G\_D(i)) \quad (106)$$

$$STEMDQ\_P\_I(p,i) = -min(0, STEMQ\_P\_I(p,i) \times SSF\_G\_D(i)) \quad (107)$$

Variable	Units	SC	GR	Rule	Description	Ref
STEMSAS_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy sold in STEM for Market Participant p in Trading Day d	(102)
STEMSAD_P_D(p, d)	$	P	D	9.6.1	Settlement amount for energy purchased in STEM for Market Participant p in Trading Day d	(103)
STEMSAS_P_I(p, i)	$	P	I	9.6.1	Settlement amount for energy sold in STEM for Market Participant p in Trading Interval i	(104)
STEMSAD_P_I(p, i)	$	P	I	9.6.1	Settlement amount for energy purchased in STEM for Market Participant p in Trading Interval i	(105)
STEMSQ_P_I(p, i)	MWh	P	I		Energy sold in STEM by Market Participant p in Trading Interval i	(106)
STEMDQ_P_I(p, i)	MWh	P	I		Energy bought in STEM by Market Participant p in Trading Interval i	(107)
STEMQ_P_I(p, i)	MWh	P	I	6.9.13(b), 6.9.13(c), 6.10.2	Energy purchased (sold) in STEM by Market Participant p in Trading Interval i	I
SSF_G_D(d)	Flag	G	D		0 if STEM was suspended in Trading Day d, and 1 otherwise	I
STEMP_G_I(i)	$/MWh	G	I	6.9.7, 6.10.2	STEM Clearing Price declared for Trading Interval i	I
I(d)	{}	G	D		Set of Trading Intervals in Trading Day d	I

Certified document which details all the settlement rules and prudential estimates in the WEM in a mathematically accurate representation as basis of system implementation

Milestones – Phase 2

- **RC_2017_06 Submitted:** 26 July 2017
- **RC_2017_06 Approved:** 27 June 2018
- **Phase 1 Commences:** June 2018
- **Allowable Revenue 5 Approved:** June 2019
- **Phase 1 Completes (Rules, Procedure and System Effective):** 1 June 2019
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- **Project Closure:** September 2020

WEMS 3.33 & Prudential Service 1.0

October 2019

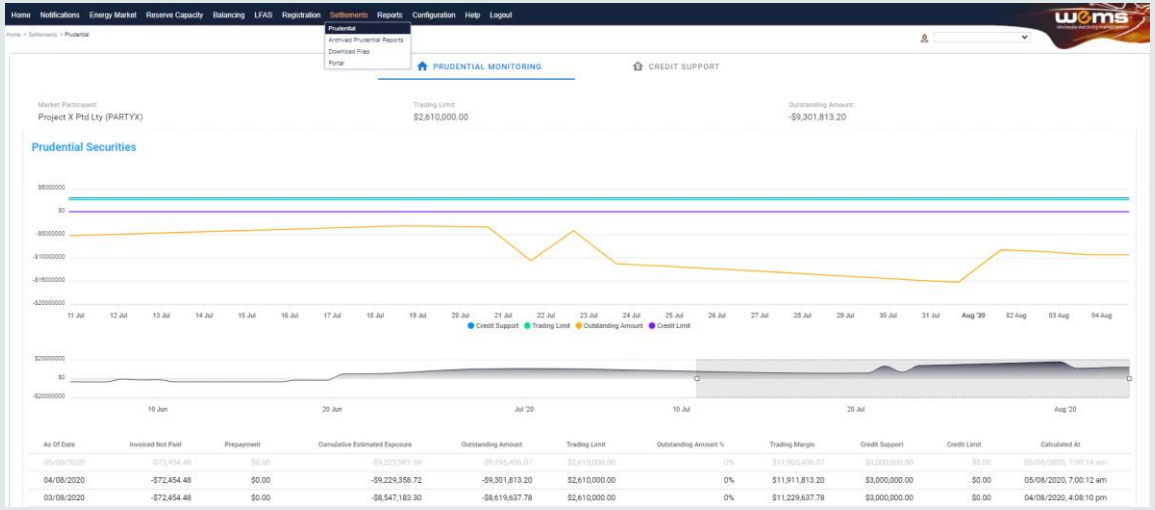
WEMS 3.35 & Prudential Service 1.3

June 2020

WEMS 3.35 & Prudential Service 1.4

August 2020

System Changes



New Prudential Service with:

- Improved Outstanding Amount Calculation
- More detailed settlement variables
- Participant Invoice Estimates
- New Credit Support and Credit Limit module
- New participant screens and APIs

Project Completion & Benefits

Improved prudential framework reducing risk of shortfalls for Participants

- Resolves underestimation of prudentials due to RCM settlement timeframes (RC_2017_06)
- Improved accuracy of liability estimates (Outstanding Amount) for prudential monitoring

Lower support costs

- Lays the foundations for AEMO to move from a third party owned and supported settlement, which is in its end of life phase, to an inhouse settlement system.

More efficient system operability

- Automated scheduled jobs in a single system replaces several manual tasks across systems
- Delivered a single certified calculation engine that will replace two calculation systems.
- Calculation time has been reduced from 13.3 minutes/day to 4.7 minutes/day.

Improved clarity for participants

- Publishes reports to participants that allow them to reconcile calculations to a more detailed level than ever before.

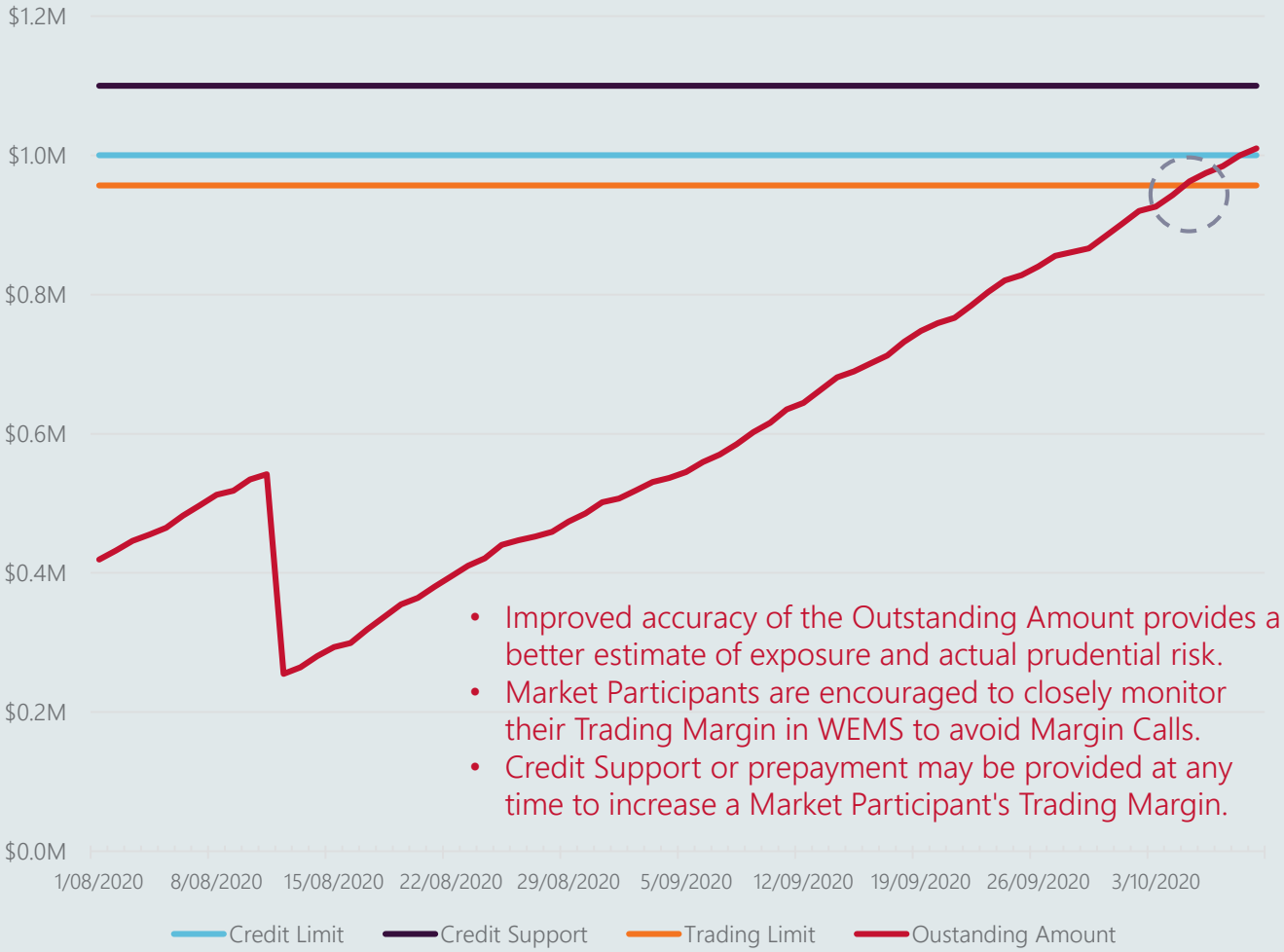
Foundation reform work

- Important preparatory step for the implementation of settlements under the ETS.

Project has been delivered within budgets approved under AEMO's allowable revenue 4 & 5

Prudential Monitoring

The prudential framework is an essential risk management mechanism to protect all WEM Participants in the event of a default.



- Improved accuracy of the Outstanding Amount provides a better estimate of exposure and actual prudential risk.
- Market Participants are encouraged to closely monitor their Trading Margin in WEMS to avoid Margin Calls.
- Credit Support or prepayment may be provided at any time to increase a Market Participant's Trading Margin.

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.
- AEMO reviews Credit Limits for all Market Participants at least twice per year.
- AEMO will monitor the accuracy of the Outstanding Amount calculation for a period (e.g. 6 months) and consider if changes to the Credit Limit methodology under the Market Procedure can be progressed.

Credit Support [WEM Rule 2.38]

A Bank Guarantee or cash Security Deposit, in the form specified by AEMO, to at least the level of the most recently determined Credit Limit.

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.

Trading Margin [WEM Rule 2.41]

Amount by which Trading Limit exceeds its Outstanding Amount

Margin Call [WEM Rule 2.42]

If a Market Participant's Trading Margin is less than zero, AEMO may issue a Margin Call Notice. The Market Participant must provide the specified amount as Credit Support by the deadline (usually 1 business day). Failure to do so is considered a Suspension Event.

STEM Fortran Replacement

Project Update – Project Closure

16 September 2020

Project Scope

- **Project Concept:** 2008 IT Roadmap
- ✓ **Project Commenced**: November 2019
- **Market Trial WEMS 3.36:** 19 August 2020
- **Production WEMS 3.36:** 2 September 2020
- ✓ **Project Closure:** September 2020

Previous State

FORTRAN

Modules that support the STEM auction have been developed in Fortran, an antiquated programming language which is not aligned with AEMO's digital strategy and is expensive to maintain.

New State

.NET

STEM auction application has been rewritten in .NET and is aligned to AEMO's digital strategy, allows for easier integration with WEM Reform and is cheaper to maintain.

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Project Completion & Benefits

Reduced Non-Compliance Risk

Reduce the risk of market suspension due to the failure of legacy, non-standard technology

Reduced Support Risk

Reduce the risks associated with supporting an antiquated codebase and provide AEMO with better control over systems that support the operation of STEM

Improved Operations

Improved system performance and efficiency

Foundation Reform Work

Provide AEMO with a baseline system for WEM Reform requirements and reduce the delivery risk of STEM related changes required as part of WEM Reform

Project has been delivered within budget approved under AEMO's allowable revenue 5

Feedback?

AEMO is keen to receive any feedback from participants, including project engagement model, to incorporate into future projects.

Please send to WAelectricityforum@aemo.com.au

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SMST cut-over

Presented to WA Electricity Consultative forum
By Nicole Markham, Manager - Operations, Governance and Integration

16 September 2020

Operational impacts

Avoiding any outage requests between 20 – 23 October 2020

- SMST project target **cut-over** date is **20 October 2020**
- AEMO is looking to limit the number of outages during the cut-over period between 20 – 23 October 2020
- Aim to minimise the number of variables that the AEMO Controllers will have to navigate during this critical period
- Every effort to mitigate any undue risks to the security of the power system during this time
- Previously approved outages for this period already in the system, will be managed it as planned

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SM MPI process changes

- High level change impacts to SM MPI users
  a) Access will no longer be via the current Western Power portal, instead it will be directly accessed via AEMO website
  b) Process changes for provisioning and de-provisioning of end-users
  c) End-users will no longer be able to self-serve to reset passwords
- AEMO Support Hub will be managing end-user and password management processes post cut-over, with support from a designated AEMO IT Contact for each organisation

AEMO IT Contact

- Participant organisation representative responsible for coordinating with AEMO Support Hub
  - Registration and de-registration of SM MPI end-users
  - Resetting of end-user passwords (when required)
- Need not be an IT specialist - merely a coordination and key contact point for AEMO Support Hub
- Each Participant must nominate an AEMO IT Contact by 30 September 2020 by providing nominee details
  - Full Name
  - Email address
  - Contact phone number
- AEMO Support Hub will process system set-up and contact individuals to confirm a "secure code" which will be required for all future interactions between the AEMO IT Contact and Support Hub

Demo & information sessions

- Tue : 13 October 2020
- Wed : 14 October 2020

NOTE:

Invitations to register for these sessions will be sent out on the 9th September 2020

- Just in time approach closely aligned to cut-over date - based on minimal change impacts to Participants
- Virtual sessions via Microsoft TEAMS
- Attendance is optional – however please encourage end-users within your organisation to attend
- Demo sessions will address
  - How to access MPI in AEMO domain
  - New Login details into AEMO domain
  - New end-user and password management process in AEMO domain
- SM MPI User Guide will be updated to reflect all process changes and be published on AEMO website on the 19th October 2020
- For any further queries relating to these changes please contact

Nicole Markham
Manager Operations, Governance & Integration
nicole.markham@aemo.com.au
(08) 9469 9983

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Questions and Feedback

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