Consumer Forum

20 April 2023

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

We pay respect to their Elders past and present.

Agenda

(all times AEST)

10:00am (10 mins)	Welcome and Acknowledgement of Country	Kirstan Wilding
10:10am (15 mins)	NEM 2025 update	Chris Muffett
10:25am (40 mins)	Draft 2023 Summer Demand Review	Magnus Hindsberger
11:05am (20 mins)	Budget and fees consultation	Margaret Lynch
11:25am (20 mins)	AEMO Advisory Council on Social Licence	Kirstan Wilding
11:45am (15 mins)	Other business and next meeting	Kirstan Wilding
12:00pm	Close	Kirstan Wilding

What’s happened since the last Consumer Forum (21 Feb)?

- Integrated System Plan (ISP) milestones were:
  - A Draft 2023 Inputs Assumptions and Scenarios Report submission reflections webinar (recording available)
  - Publication of the Draft ISP Methodology (Public forum to be held today, 20 April, subs close 1 May).
- VNI West
  - The Victorian Government issued the National Electricity (Victoria) Act 2005 (NEVA) order
  - Publication of VNI West Consultation Report – Options Assessment 23 February
  - Ongoing community engagement
- Release of the Gas Statement of Opportunities (GSOO) on 27 March 2023
  - A public webinar on 30 March 2023, attended by over 150 people (recording available).
- NEM Participant Fee Consultation
  - A consultation paper was open for submissions to 3 March. 11 submissions received.
  - Six nominations to the Consultative Committee, with first meeting scheduled for 27 April.

NEM 2025 reform update

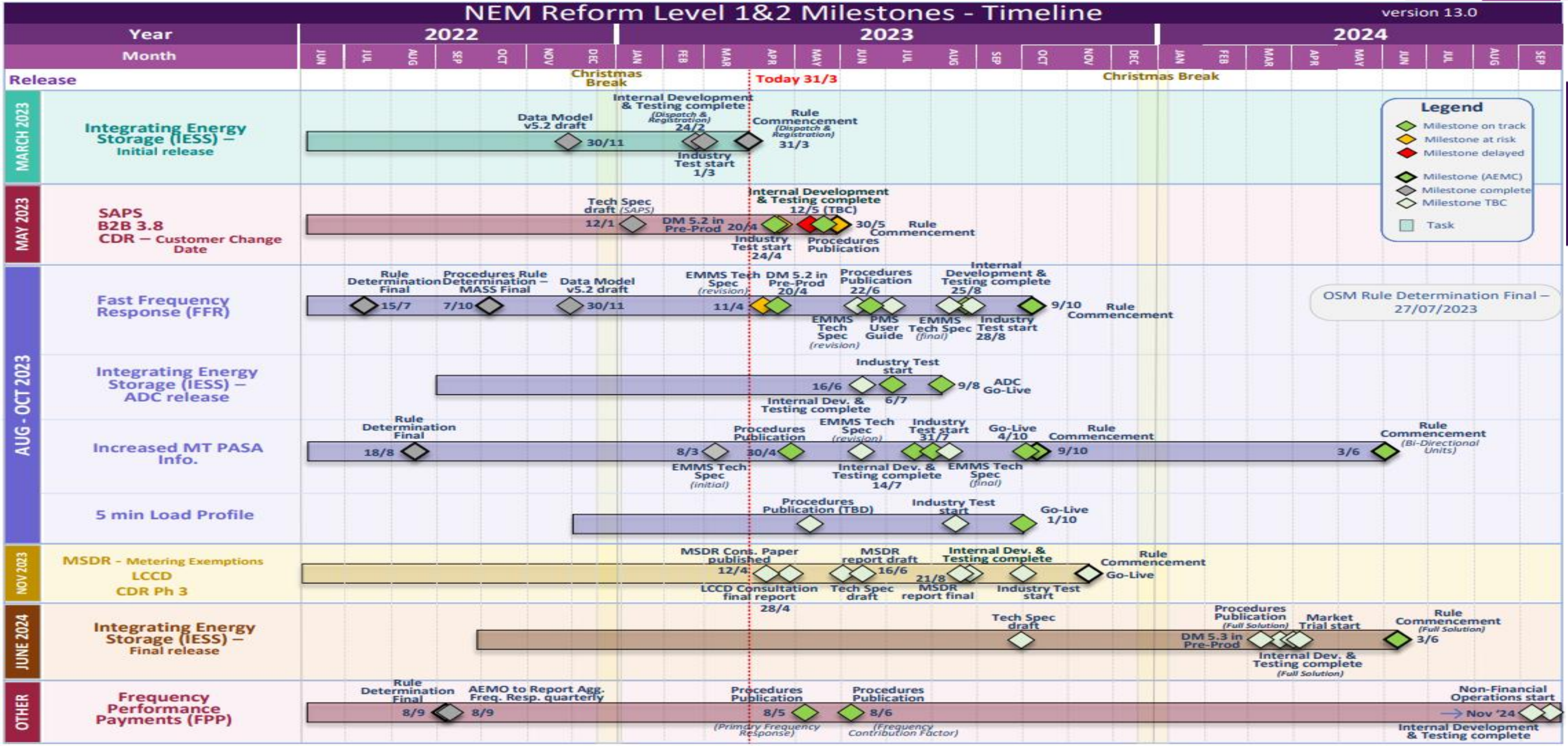
Chris Muffett

Program Update

- Overall good progress has been made by the program team, IESS March successfully deployed, key concern remains for SAPS testing as part of the May Release.
- Key emerging project challenges relate to Test environment management and availability, impacting on SAPS directly and potential impact on other initiatives, working through these now to mitigate. SME capacity continues as a key challenge for the project to manage.
- Industry engagement commenced for IDAM/IDX/PC

Release	Initiatives	Status	Key Points	Impacted Stakeholders
MAR-23	Integrating Energy Storage Systems [Initial]		Deployment successful, awaiting MSGA registrations	Market Small Generation Aggregators
	SAPS MSRP Registration		Software deployed, MSRP registration accepted from 17th April	LNSP, FRMP, MP/MDP
MAY-23	SAPS		Internal Testing late, program team is replanning and looking at options to maintain key dates	LNSP, FRMP, MP/MDP
	CDR (excluding LCCD)		Performance concerns with complex API's, may impact some NFR's	Major retailers
	B2B v3.8 and other ICFs		On Track for 30th May	LNSP, FRMP, MP/MDP
AUG-23	Integrating Energy Storage Systems [ADC]		Development proceeding	Aggregate Systems
	~~MSDR~~		~~Metering exemptions go-live date being confirmed.~~	~~MC and MP/MDP~~
	Fast Frequency Response - Dispatch & Reg		Initial release On Track	Generators, Market Customers
OCT-23	Fast Frequency Response		Draft Tech Spec release for 11 April, Service commencement plan draft available 6 April	Generators, Market Customers
	5 Minute load profile		1 October go-live date confirmed.	Market Customers / FRMP
	Increased MT PASA Information		On track, procedures finalised, Tech Specs issued	Scheduled Generators
NOV-23	Metering Exemptions (MSDR)		Effective Date TBC – subject to consultation	MC and MP/MDP
	CDR (LCCD)		Procedure consultation to confirm 1 November effective date	FRMPs
JUN-24	Integrating Energy Storage Systems [Final]		Procedure consultation in progress.	IRPs, NSPs, FRMP, MP/MDP, Vendors
JUN-25	Frequency Performance Payments		Procedure consultation underway.	Generators, Market Customers

External Milestones



NEM2025 Forums update

Channel	Current focus	Next meeting
NEM2025 Electricity Wholesale Consultative Forum (EWCF)	• The current focus is on regular updates for inflight reform IESS, FFR, FPP, MT PASA and OSM, and the Procedures Consultation Roadmap. • Spotlight update on industry consultation on IDX/IDAM/PC.	18 April 2023
NEM2025 Industry Testing Working Group (ITWG)	• ITWG is progressing planning for SAPS Invitation Industry Testing and approach to industry testing for remainder of May release components. • Approach to testing for Q3 and Q4 2023 releases discussed.	27 April 2023
Electricity Retail Consultative Forum (ERCF)	• This Forum maintains a watching brief on NEM Reform Program initiatives associated with metering and retail procedural impacts. • NEM Reform scope focused on formal consultation progressing on retail and metering procedures under IESS and a spotlight update on industry consultation on IDX/IDAM/PC.	24 April 2023

NEM2025 Implementation Forum	• 2023 Releases – Progress and Deployment updates, including:
	    • IESS March release go-live confirmation
	    • May Release update – deliverables and testing
	• Readiness Approaches for MT PASA, FFR, IESS
	• Spotlight update on industry consultation on IDX/IDAM/PC.
		26 April 2023

NEM2025 Executive Forum	• Dates ear marked. Agenda is being confirmed to ensure appropriate engagement.	3 or 10 August 2023

For more information and meeting papers for each of the forums, please refer to the NEM Reform program website.

Upcoming Engagements

April

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

May

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

June

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Legend

Program forums
- NEM2025 Program Consultative Forum
- Reform Delivery Committee
- Refrom Delivery Committee - Collab W.
- Implementation Forum
- Electricity Wholesale Consultative Forum
- Electricity Retail Consultative Forum
- Industry Testing Working Group
- AEMO Consumer Forum
- All Stakeholder NEM Reform and Roadmap briefing

Inititiative specific meetings
- NEM Reform Foundational and Strategic initiatives

Other
- National Public Holiday
- State/Territory Public Holiday

To learn more about these events, please visit AEMO's Industry meeting calendar or contact the program at NEMReform@aemo.com.au.

Draft 2022-23 Summer demand review

Magnus Hindsberger

Energy.forecasting@aemo.com.au

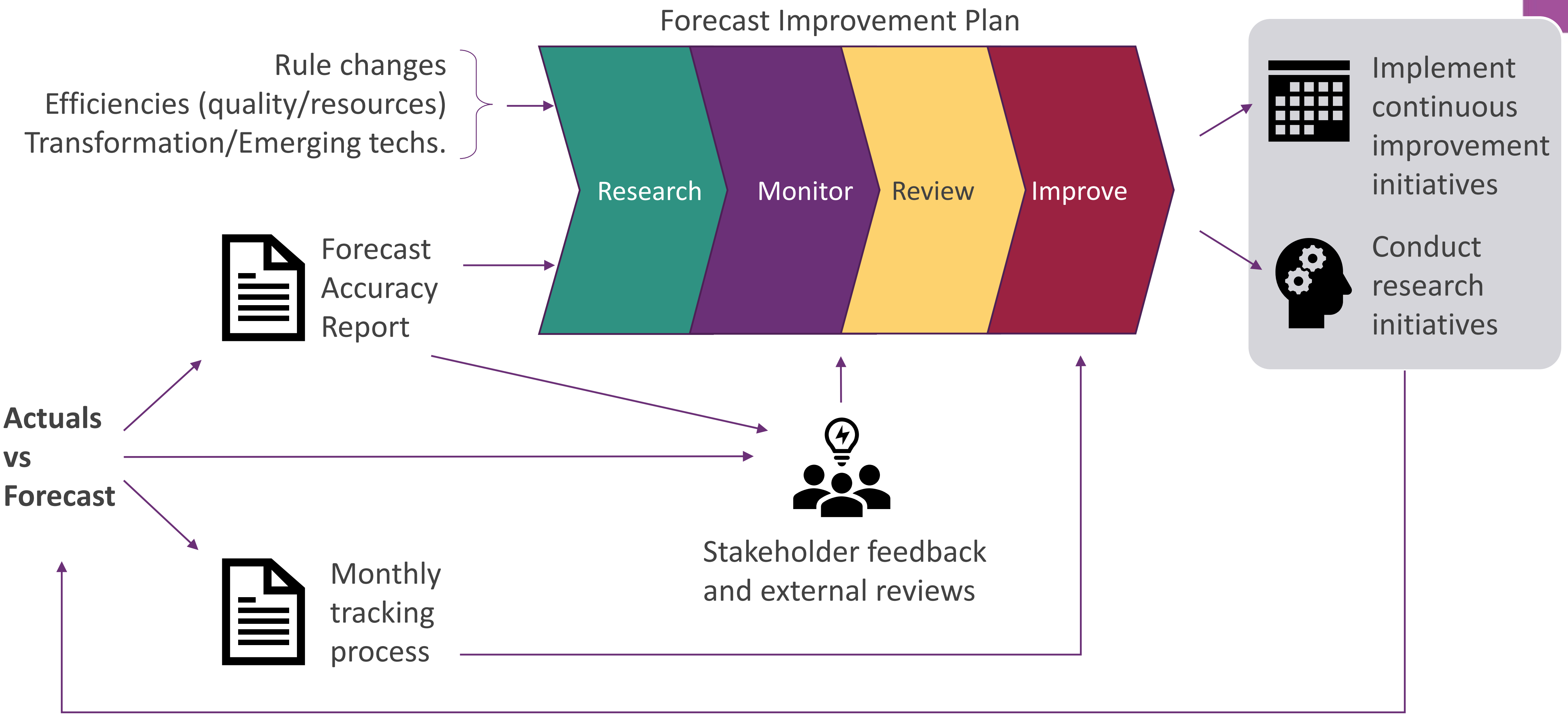
Purpose and agenda

The purpose of this presentation is to provide insight into AEMO's processes to ensure demand forecast accuracy and outline how its forecasts performed for the 2022-23 summer.

Agenda:

- Forecasting improvement processes
- Explaining Probabilities of Exceedance (POEs)
- Unpacking how maximum demand is achieved
- Results overview

AEMO's demand forecasting continuous improvement process



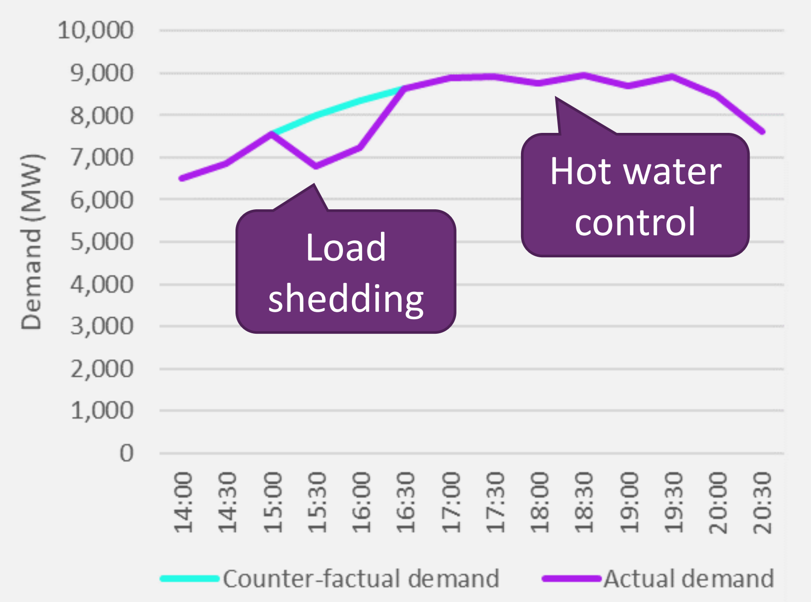
Measuring maximum and minimum demand

AEMO's maximum and minimum demand forecasts represents forecast demand in the absence of:

- Directed load shedding
- Network outages
- Mandatory restriction schemes in effect
- Call for voluntary reduction in demand
- Demand side participation (DSP) including any under RERT

It does account for daily operation of load control, such as timer controlled hot water, or ripple controlled hot water/pool pump loads.

Any load shedding or atypical reduction in demand should be added back to the actual demand (counterfactual) when comparing with the forecast. For peak demand days, any such adjustments are accounted for and documented in the annual Forecast Accuracy Reports.



Note that "demand" refers to the "*as-generated*" definition (including generation aux load) and is *half-hourly* average values.

Time reference is NEM-time (AEST) unless otherwise noted.

Modelling maximum and minimum demand

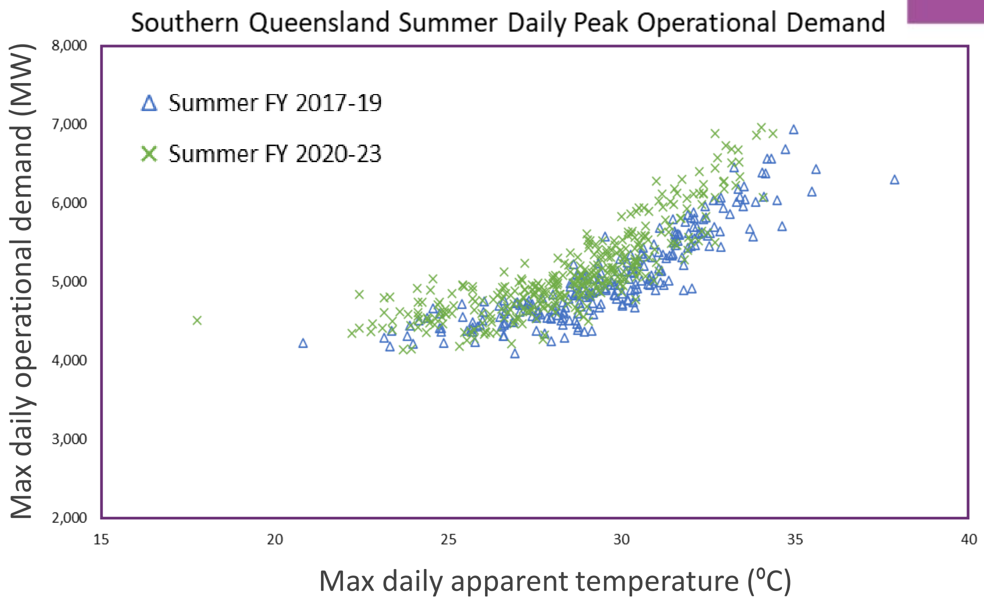
Maximum demand depends among other things on temperature*. The realised temperature outcomes differ from year to year.

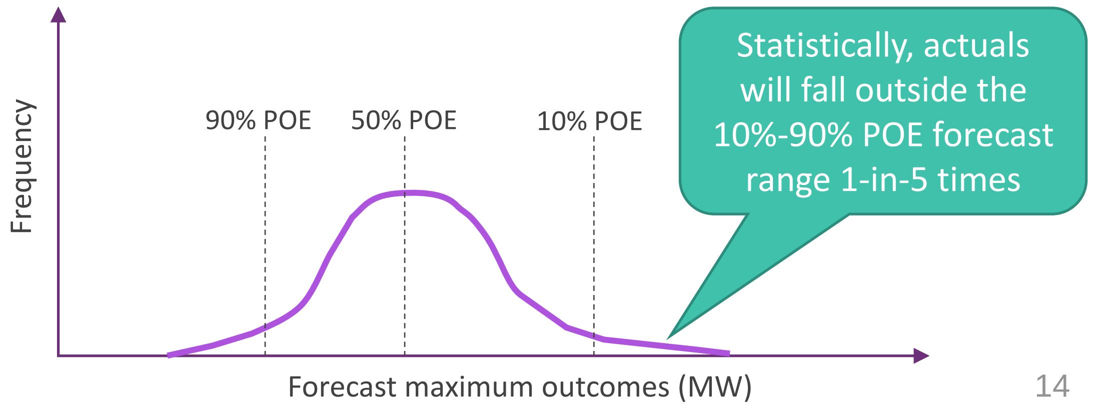
AEMO therefore applies a probabilistic forecast to account for difference in weather, among other things. This results in a forecast distribution of max (and min) demand outcomes.

AEMO publishes different points of the forecast distribution to stakeholders.

Typically, the 10%, 50% and 90% probability of exceedance (POE) values are provided. The 10% POE forecast represent a forecast value that only will be exceeded across the season with a probability of 10%.

* Minimum demand is temperature dependent too, typically occurring during weekends with high PV generation and mild weather, so without any significant cooling/heating load.



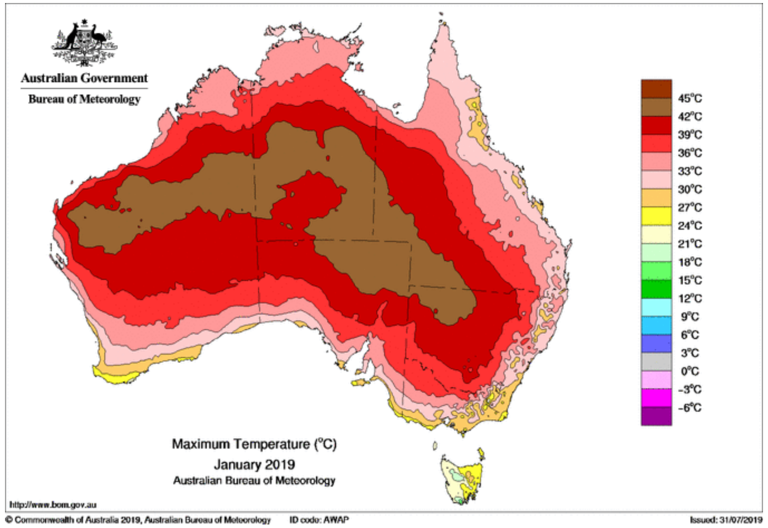


Generally cooler in Eastern Australia

- Once again, a summer dominated by La Niña weather and relatively few, and less intense heat waves in the East, while Western Australia (around the SWIS) maintained more normal temperatures.
- The relativities between actuals and forecast outcomes reflect this.

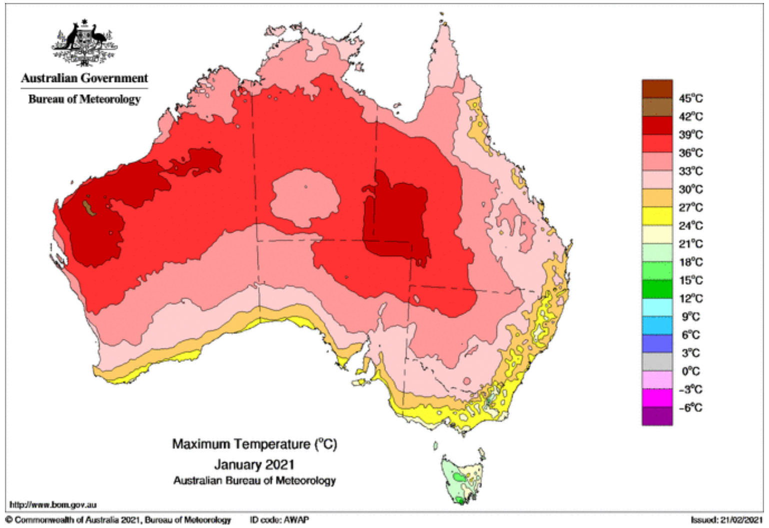
In March, eastern states have experienced higher temperatures atypical for late summer, as climate moved back into Neutral.

January 2019



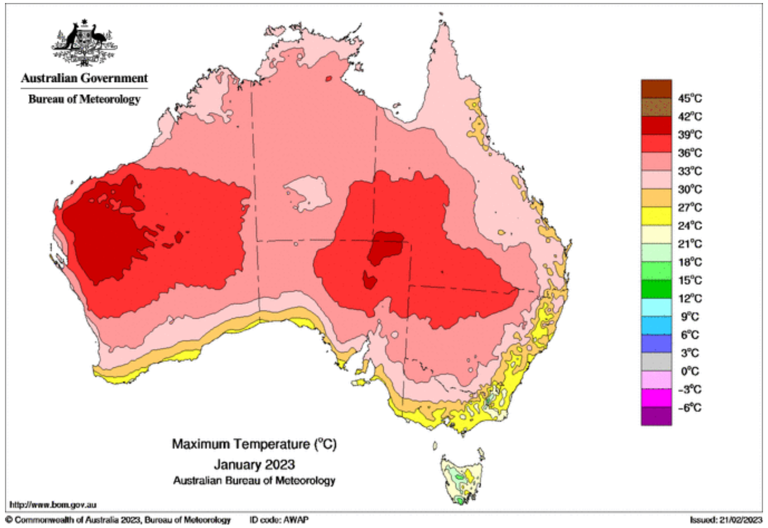
El Niño

January 2021



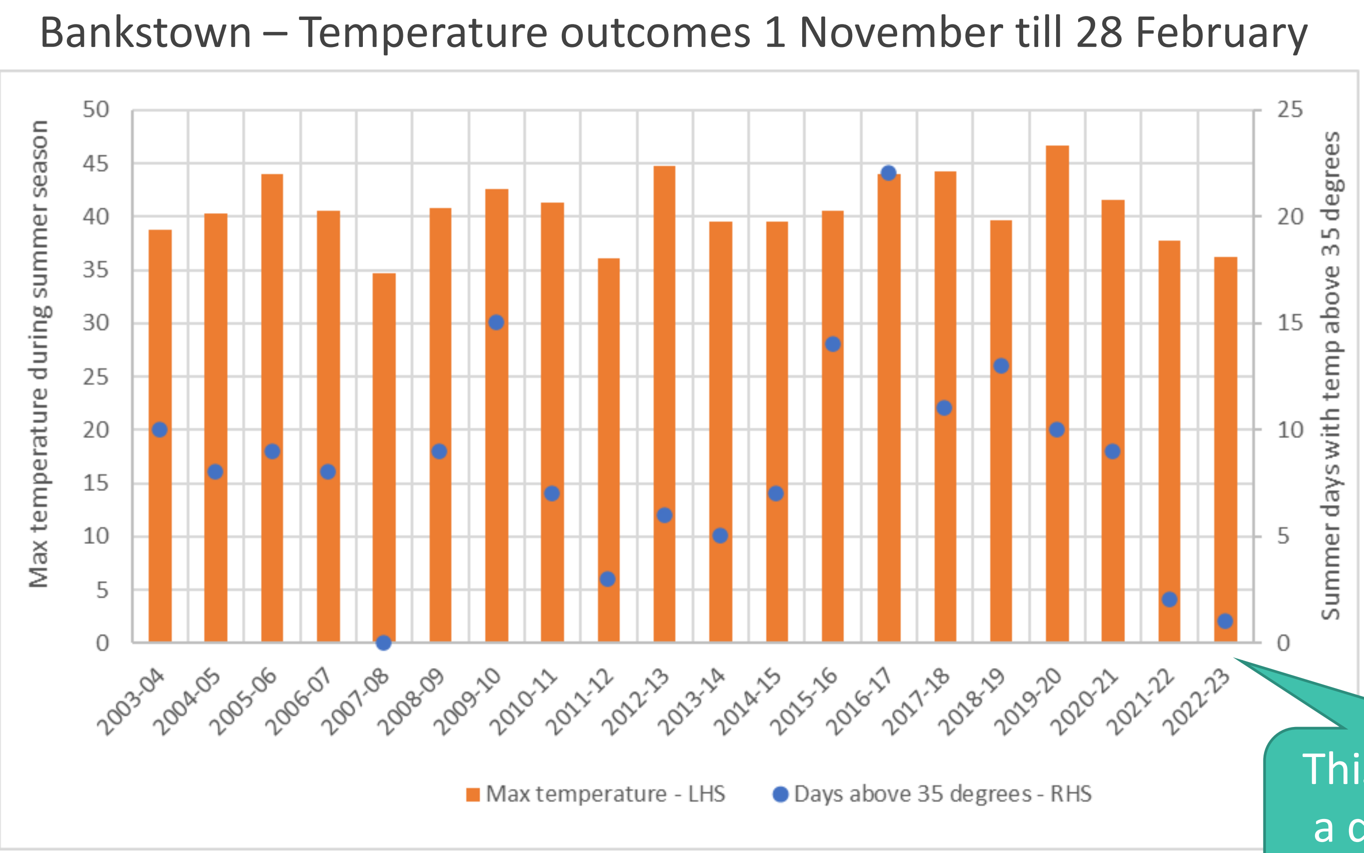
La Niña

January 2023



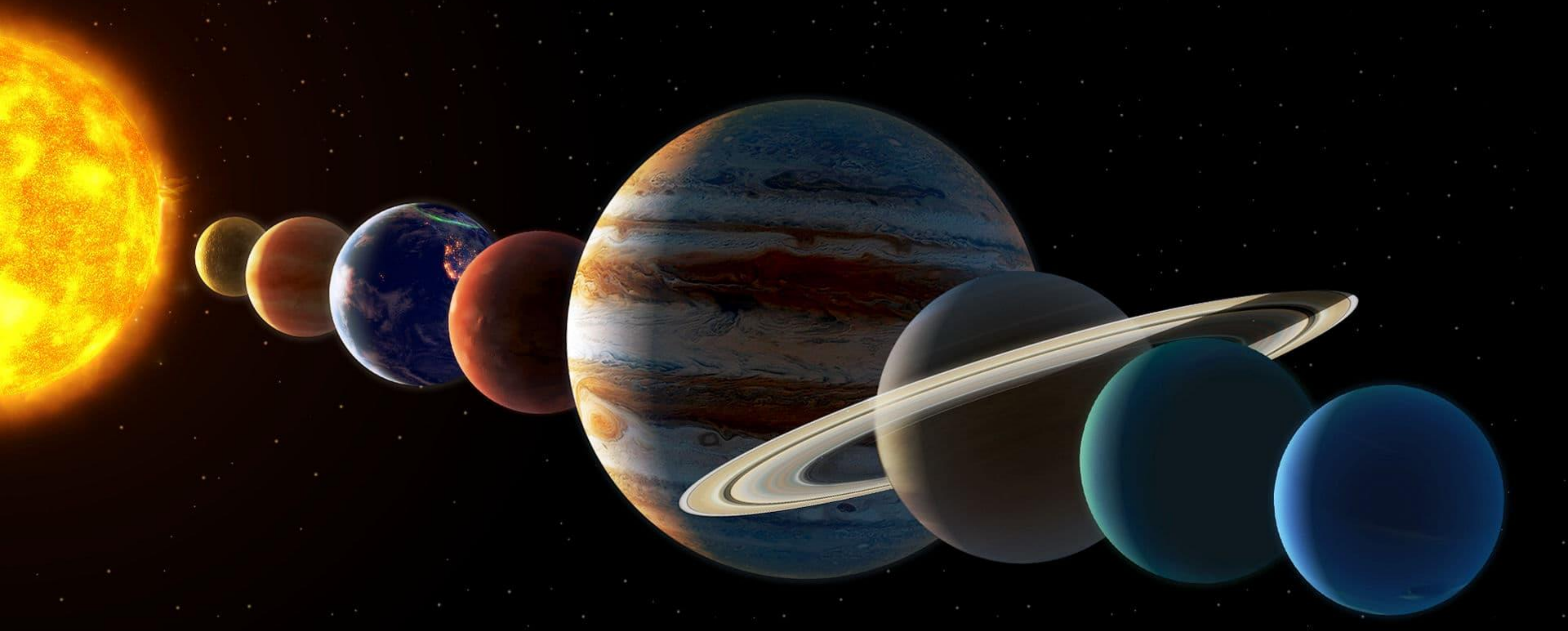
La Niña

Example: NSW faced an unusual summer



This was on track for a demand outcome lower than 90% POE

To get a really high demand outcome…



…many planets have to align

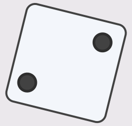
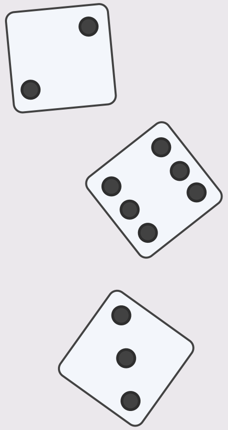
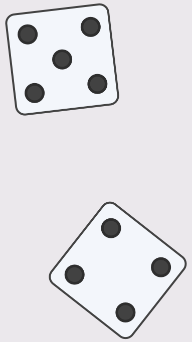
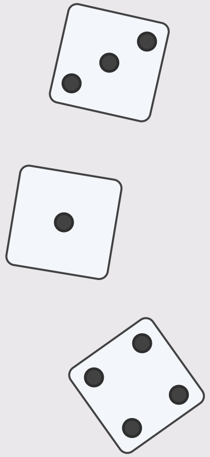
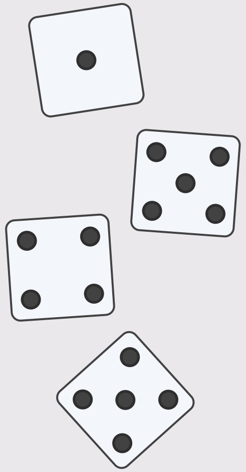
Things that must align for a high demand outcome…

- Hot weather days (cold for winter max)
- Extended heatwave giving little relief/cooling between days (cold snaps for winter max)
- High humidity (wind chill for winter max)
- PV generation lower than usual
- Weekday
- Outside holiday periods
- High aggregate random consumer demand

For each of these events, there is a chance they fall at a time that results in higher demand. One way to see it, is that we get to roll a die for each of these events, and the highest roll will be the max demand.

Some years we get many dice to roll, other years only one or two

Things that must align for a high demand outcome

Year	Historical year 1	Historical year 2	Historical year 3	Historical year 4	Historical year 5
Days with temp above 35 degrees	1	3	2	3	4
Dice rolls					
Top roll	2	6	5	4	5

Overview of max/min demand results

Outcomes for 2022-23 summer compared with ESOO 2022 forecast

Region	Summer maximum	Summer minimum
Queensland	Just under 50% POE	Just below 90% POE
New South Wales	Just above 50% POE	Between 90% and 50% POE
Victoria	Between 90% and 50% POE	Between 90% and 50% POE
South Australia	Between 10% and 50% POE	Between 10% and 50% POE
Tasmania	Below 90% POE	Between 10% and 50% POE
Western Australia	Between 90% and 50% POE	TBA

Note that green and red colours simply represent whether the forecast falls within the 10%-90% POE interval. Being red may not be due to input/model error, but due to more extreme drivers than usual.

Next steps

- Apply learnings to ESOO 2023 forecast
- Forecast Improvement Plan update presented at April FRG
- Final 2022 Forecast Improvement Plan publication
- Draft ESOO maximum and minimum demand forecasts presented at June FRG
- 2023 Forecast Accuracy Report to be published in November
- Consultation on Forecast Accuracy Reporting Methodology tentatively planned for November 2023 - April 2024

Appendix – Detailed results

Queensland

Max/min	10% POE	50% POE	90% POE	Actual
Max	10,553	10,118	9,769	DSP 10,070
Min	4,258	3,936	3,681	3,676

Factor	Check
Hot day	Yes
Extended period of hot weather	Partial
High humidity	Yes
Low PV outcome	TBA
Weekday	Yes
Non-holiday	Yes
Consumer behaviour	?

2022 Forecast Improvement Plan: Humidity will be considered in the 2023 ESOO forecast

- Maximum demand (Friday 17 March) reached just under the 50% POE forecast (likely to be just over when correcting for DSP). Compared to the other high demand day (3 February), it was slightly warmer and there wasn't the late afternoon change that for some time reduced temperatures and humidity).
- It was a new all-time high Queensland demand outcome – and still just around 50% POE. The forecast range still seems reasonable given the events on 3 February:
  - At morning and midday temperatures and dew points were tracking well above day-ahead forecast and underlying demand 550 MW above day-ahead forecast. Pre-dispatch forecast for the late afternoon exceeded AEMO's 10% POE forecast!
  - The combination of stronger and earlier sea breeze, emerging cloud cover, and storms dropped temperatures and dew point and resulted in a much lower outcome in the end.
- Minimum demand outcome (Sunday 6 November) was lower than the 90%POE forecast, but not a lot. As the annual minimum is typically set at another season, it is not a significant concern, but will be taken into account for the 2023 ESOO forecast.

Dew point temp. (°C)	How it feels
>24	Oppressive, uncomfortable for most, possible heat stress issues
20-24	Muggy, quite uncomfortable
15-20	Starting to feel muggy, though still comfortable for most
10-15	Comfortable
5-10	Dry
<5	Very dry

Dew point description by BOM

New South Wales

Max/min	10% POE	50% POE	90% POE	Actual
Max	14,071	12,921	12,037	13,136
Min	4,915	4,746	4,449	4,481

Factor	Check
Hot day	Partial
Extended period of hot weather	No
High humidity	Yes
Low PV outcome	TBA
Weekday	Yes
Non-holiday	Yes
Consumer behaviour	?

- Generally mild summer with few hot days. Only one day with temperatures above 35°C till end of February.
- The maximum demand day (Monday 6 March) saw the record high March demand and above the 50% POE forecast for the full summer. Humidity was quite high.
- March was warmer than usual (with 18:00 on 6 March being the second warmest 18:00 in March since 2002) and the hot weather penetrated from the west all the way to the CBD.
- From an overall summer perspective, temperature outcome was close to average.
- Minimum demand was as expected on a Sunday (20 November) and fell within the forecast interval.

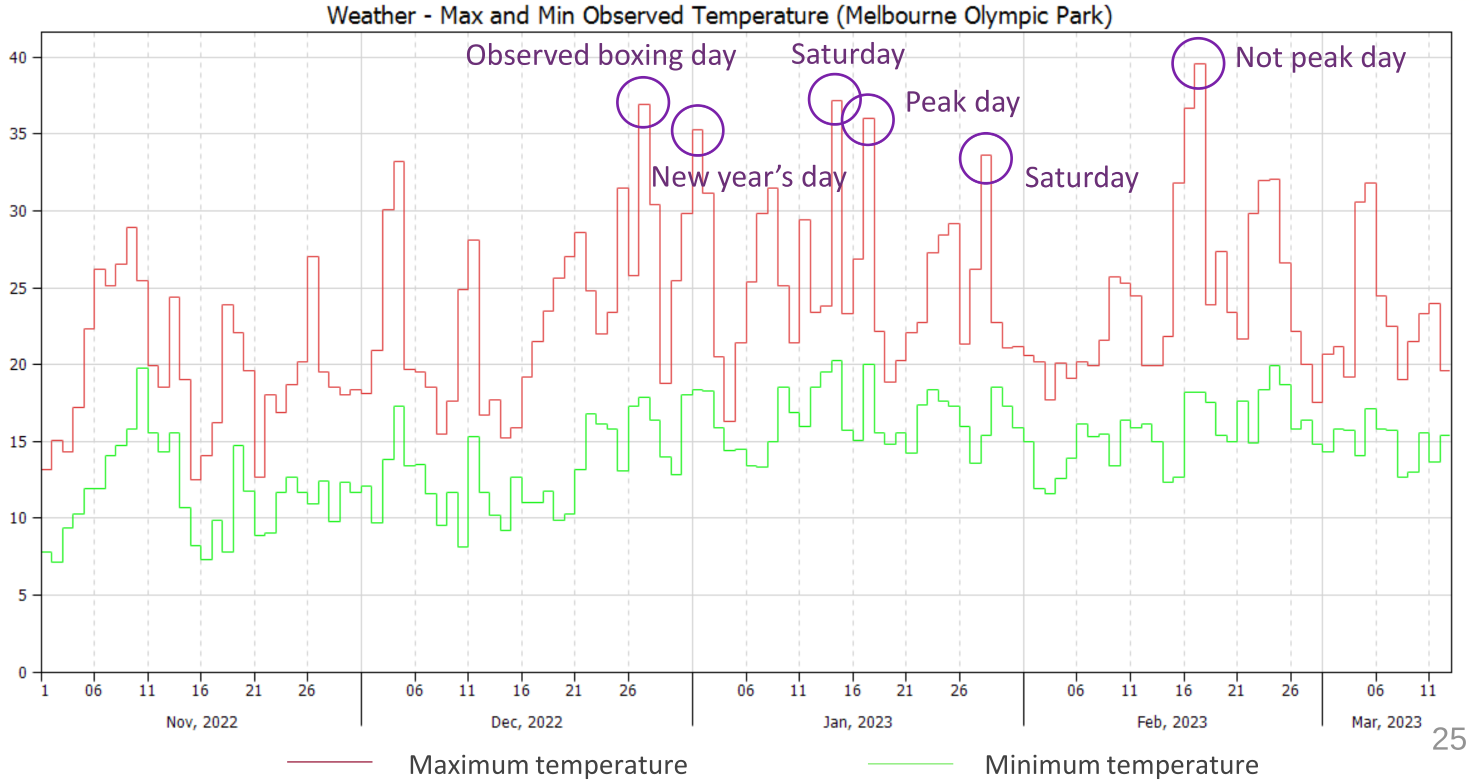
Temperature in Bankstown at 18:00			
Year	Count of Days >=26	Max	Max in March
2002	23	33.8	27.9
2003	21	37.5	26.9
2004	27	38.9	34.1
2005	32	35.9	26.4
2006	34	41.2	29.2
2007	19	37.6	31.4
2008	24	31.6	28.6
2009	39	37.3	25.9
2010	34	34.3	30.7
2011	30	39.4	28.2
2012	20	33.5	26.5
2013	38	39	28.1
2014	31	32	26.3
2015	36	37.5	27.5
2016	44	36.1	28.2
2017	34	41.2	29.7
2018	47	37.2	36.2
2019	46	33.6	29.1
2020	37	39.5	32.5
2021	24	32.9	32.6
2022	18	30	26.3
2023	17	35.8	35.8

Victoria

Max/min	10% POE	50% POE	90% POE	Actual
Max	10,474	9,386	8,569	DSP 8,988
Min	2,426	2,295	2,177	2,195

Factor	Check
Hot day	Partial
Extended period of hot weather	Partial
High humidity	Partial
Low PV outcome	TBA
Weekday	Yes
Non-holiday	Yes
Consumer behaviour	?

- Victoria generally had a mild summer, and coincidentally, most warmer days fell on weekends or holidays
- Max demand occurred on Tuesday 17 Jan. With a max of 36.5°C, that day was not as hot as 17 Feb, when temperature peaked at 39.6°C. But the latter day had an early cool change and temperature had dropped to 20.1°C at 18:00.
- With a dew-point exceeding 20, it was more humid than most other warm days as well.
- Minimum demand was as expected on a Sunday (18 Dec) and fell within the forecast interval.

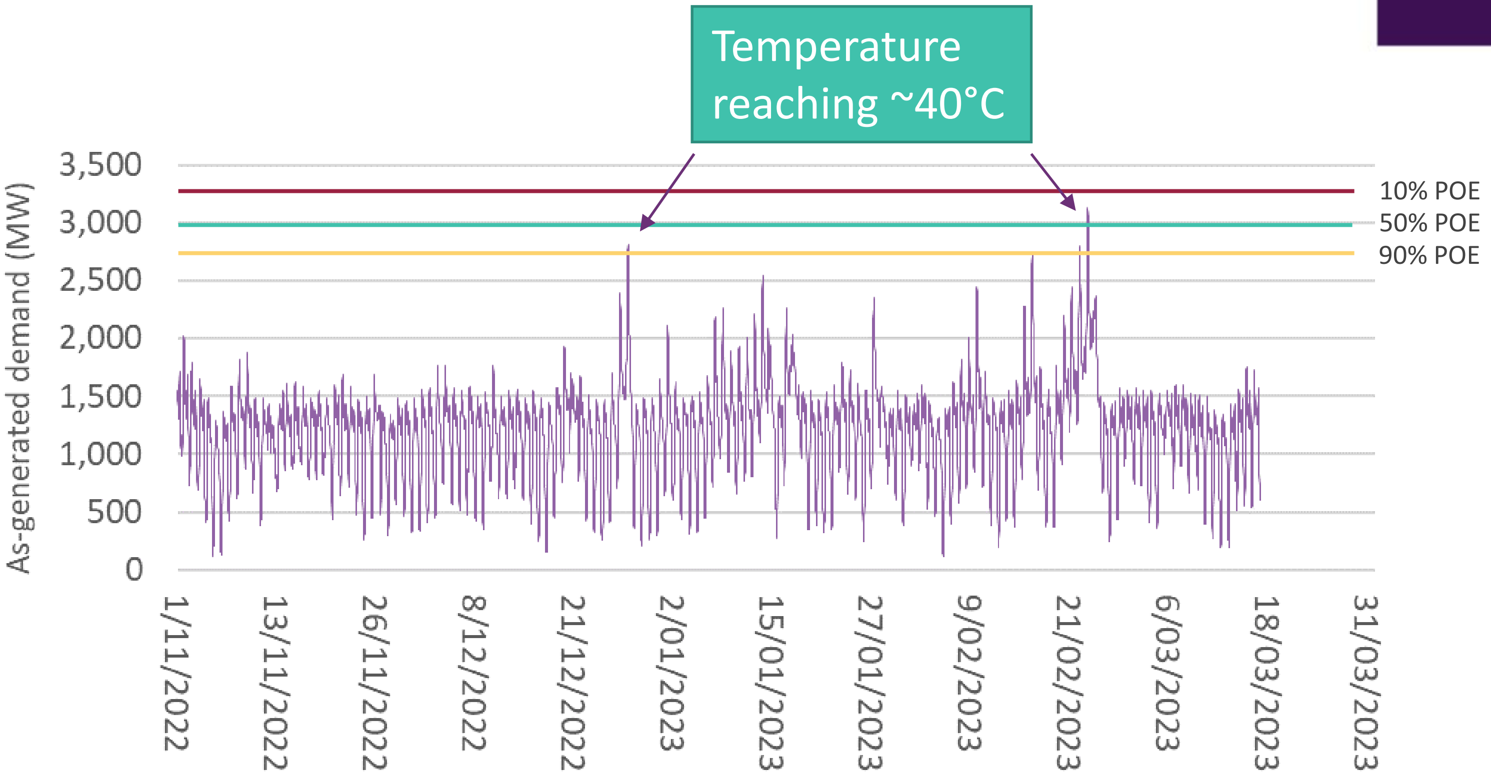


South Australia

Max/min	10% POE	50% POE	90% POE	Actual
Max	3,329	2,989	2,740	3,125
Min	125	84	38	117

Factor	Check
Hot day	Partial
Extended period of hot weather	Yes
High humidity	Yes
Low PV outcome	TBA
Weekday	Yes
Non-holiday	Yes
Consumer behaviour	?

- The maximum demand day (Thursday 23 February) saw the highest max demand outcome since 2014.
- Summer temperature were not extreme by Adelaide standard, only two days reached ~40°C. The max demand day was one of them and came following four days in a row with temperatures above 30°C.
- Min demand fell on a Sunday (5 February) in the higher end of the forecast range.



Tasmania

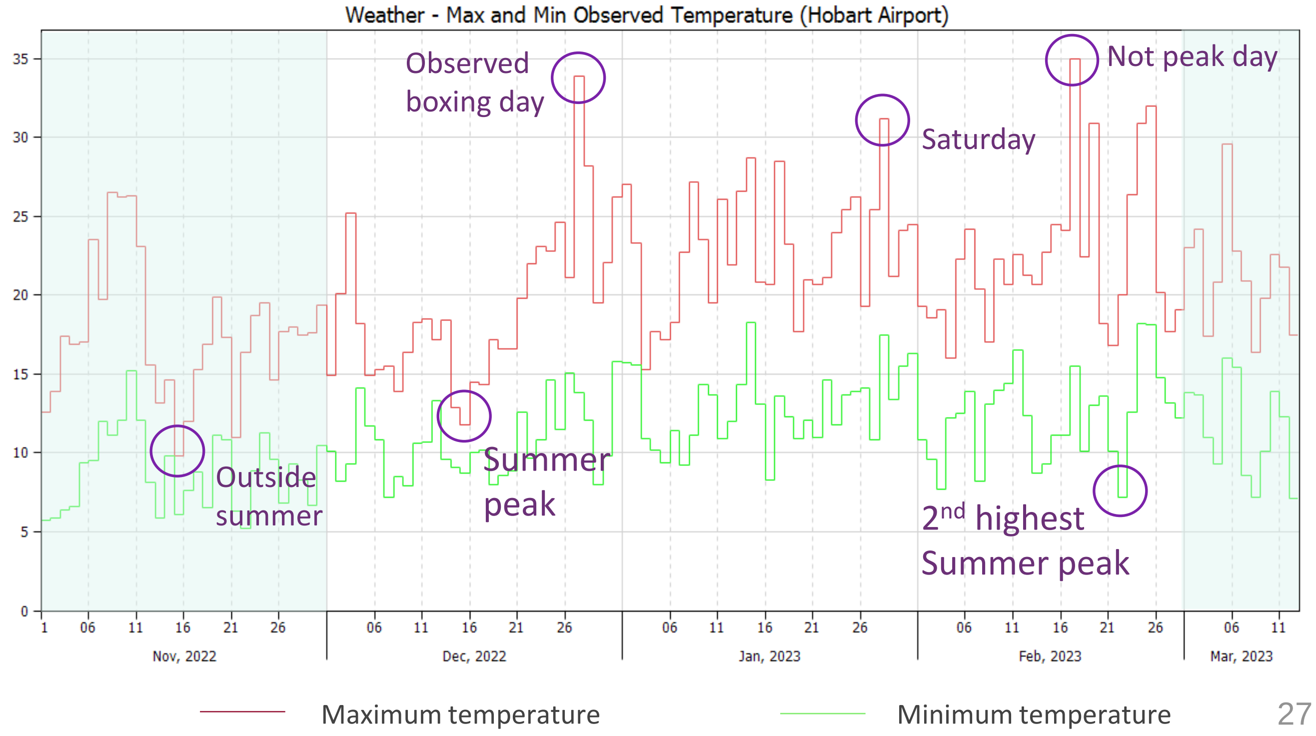
Max/min	10% POE	50% POE	90% POE	Actual
Max	1,507	1,476	1,442	1,392
Min	926	900	865	915

Factor	Check
Cold day	Partial
Extended period of cold weather	No
High humidity	n/a
Low PV outcome	TBA
Weekday	Yes
Non-holiday	Partial
Consumer behaviour	?

- Unlike the mainland, Tasmanian summer peaks are often set by cold spells increasing heating load rather than heat waves. Winter maximum demand is higher than summer.
- Weather is less impactful in Tasmania as large industrial load (LIL) is ~60% of consumption. Daily LIL contribution:

Date	15 Dec	27 Dec	28 Jan	17 Feb	22 Feb
LIL at time of peak	732 MW	623 MW	734 MW	723 MW	751 MW

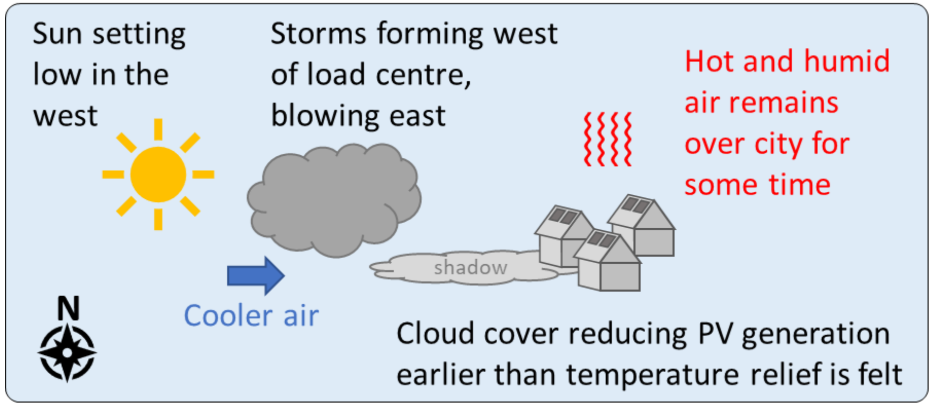
- Maximum demand was on Thursday 15 Dec at 7:00 driven by cold weather. It fell outside the 10%-90% POE range and *will be further assessed* ahead of the 2023 ESOO.
- Demand did reach 1,456 MW on 15 November i.e. outside Tasmanian summer
- Minimum demand fell within the forecast range. It excludes the min on 15 Feb that was a result of Basslink tripping.



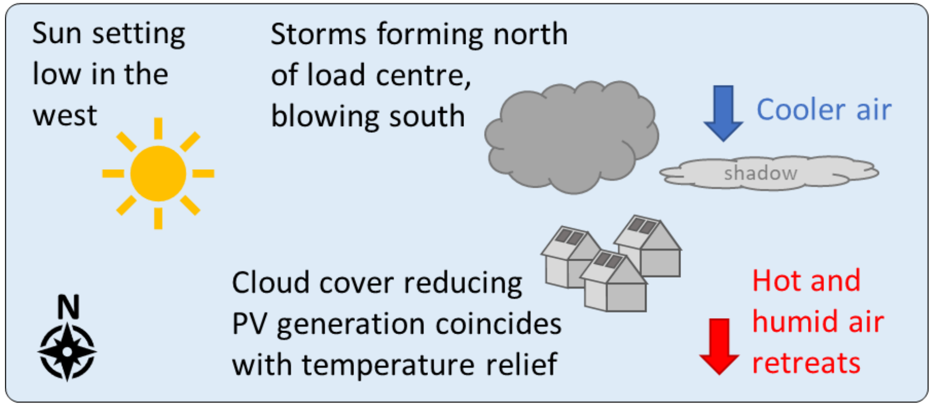
Western Australia

Max/min	10% POE	50% POE	90% POE	Actual
Max	4,042	3,781	3,533	3,676

- Western Australia had its summer peak happening quite early (4 pm local time) on 2 March.
- Afternoon storms may give relief, lowering temperatures – which can reduce demand more than PV generation is reduced. The net impact is a lower peak demand.
- Afternoon storms may reduce PV before any temperature relief is felt, increasing peak demand relative to a situation without storms. This was the case for Western Australia this year, with cloud cover causing demand to rise in the half-hour leading up to 4pm, after which the reduced relief from the sun caused demand to decline.



Example: Cloud cover increases operational demand



Example: Cloud cover decreases operational demand

Budget and fees FY2024

General Manager Strategic Finance

Judd Johnston

Key things to know

- AEMO needs to reform the market and operate the grid in response to consumer demand, new technologies, and large-scale capital replacement.
- The FY24 budget includes AEMO’s core work to run today’s market and our work to evolve our systems and the energy market.
- AEMO is mindful that we must deliver reforms effectively and efficiently, reduce and remove costs for industry participants where possible and enable consumers to experience the benefits of a renewable energy market as soon as possible.
- The FY24 budget demonstrates AEMO’s planned expenditure and revenue requirements (realised through fees and charges) in each market segment. In FY24, overall fees and tariffs are marginally higher due to an increase in NEM Core fees of 4.5%.
- Budgeted expenditure reflects AEMO’s regulatory responsibilities, reform priorities and is consistent with our financial principles.

AEMO’s financial principles

- Efficient and cost-effective delivery
- Balanced and sustainable cost recovery
- Clear, ringfenced participant and member funds
- Funding pathways for new investment
- Low risk finance and funding for contracted activities
- Debt-to-assets ratio <100%
- Liquidity ratio >50%
- Timely provision of AEMO budgets to market participants

AEMO budgets by market segment

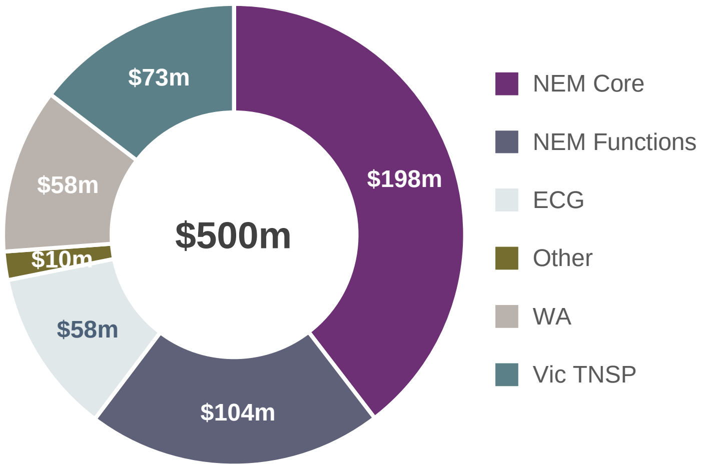
NATIONAL ENERGY MARKET (NEM):
• NEM CORE
• NEM FUNCTIONS

EAST COAST GAS
(ECG)

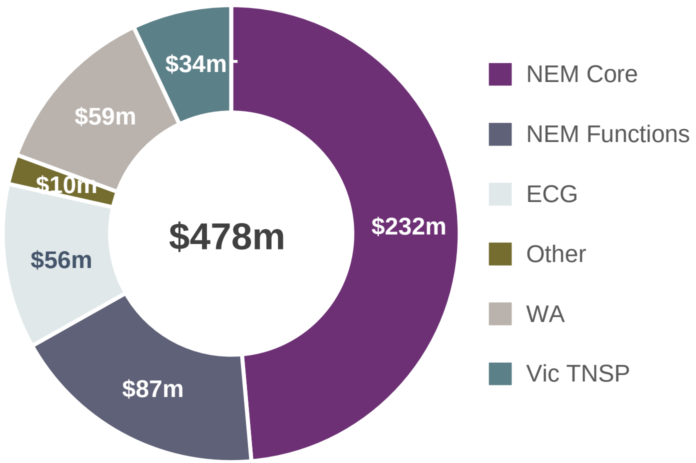
WESTERN AUSTRALIA
ELECTRICITY AND GAS

VICTORIAN TRANSMISSION
NETWORK SERVICE PROVIDER
(VIC TNSP)

Operating expenditure by segment FY2024, $m



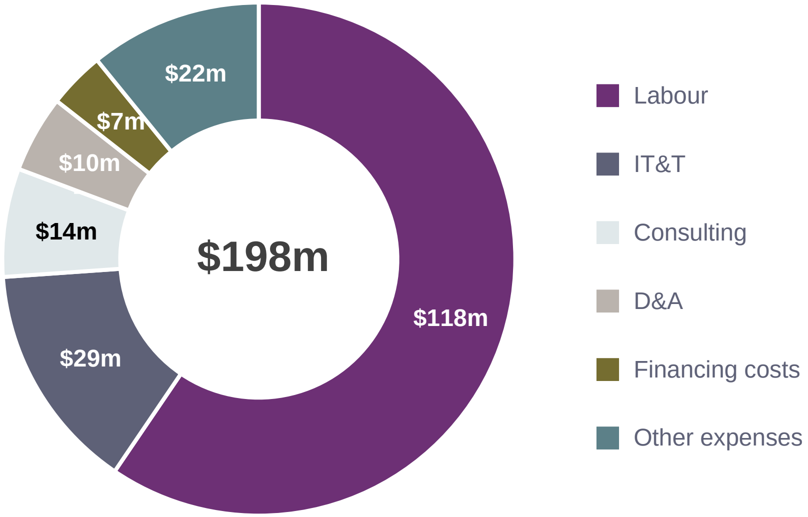
Revenue requirement by segment FY2024, $m



•Budgeted operating cost profile for NEM core FY2024, $m

NEM core

Budgeted operating cost profile for NEM core FY2024, $m



NEM core budget deficit recovery

Cost increases of approximately 5% are budgeted in NEM Core. This is primarily due to:

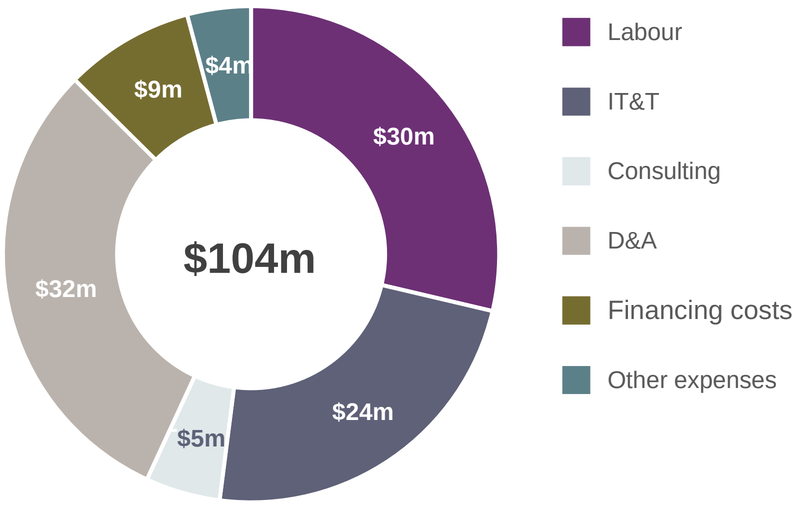
- labour cost increases as we build our capability and capacity to manage the increasing complexity of the energy transition
- increased financing costs as a result of interest rate environment.

	BUDGET FY2023	BUDGET FY2024	VARIANCE ($M)	VARIANCE (%)
Revenue	222.4	232.2	9.8	4.4%
Operating costs	188.6	198.1	9.5	5.0%
Annual surplus/deficit	33.8	34.1	0.3	N/A
Accumulated surplus/deficit	**(70.1)**	**(25.7)**	**44.4**	**N/A**

•Budgeted operating cost profile for NEM core FY2024, $m

NEM functions

Budgeted operating cost profile for NEM functions FY2024, $m



Cost increases in NEM Functions of 10% are primarily due to:

- higher depreciation & amortisation and operating cost with the go live of NEM2025 functionality in FY24*
- higher interest rates, applied to large debt-financed capital cost, specifically related to 5 Minute Settlements
- additional consulting services and employees to support the development of the 'supercharged ISP'.

	BUDGET FY2023	BUDGET FY2024	VARIANCE ($M)	VARIANCE (%)
Revenue	92.8	87.2	(5.6)	(6.1%)
Operating costs	94.3	103.6	9.3	9.9%
Annual surplus/deficit	(1.5)	(16.4)	(14.9)	N/A
Accumulated surplus/deficit	**1.6**	**(3.6)**	**(5.2)**	**N/A**

*The segment budget captures the forecast operating costs for the NEM2025 Reform Program but has no corresponding forecast revenue until FY24. AEMO is consulting with industry participants on a fee structure for the NEM2025, which is expected to be finalised in late August 2023, subsequent to which costs incurred will be recovered. To stay informed, visit AEMO's website.

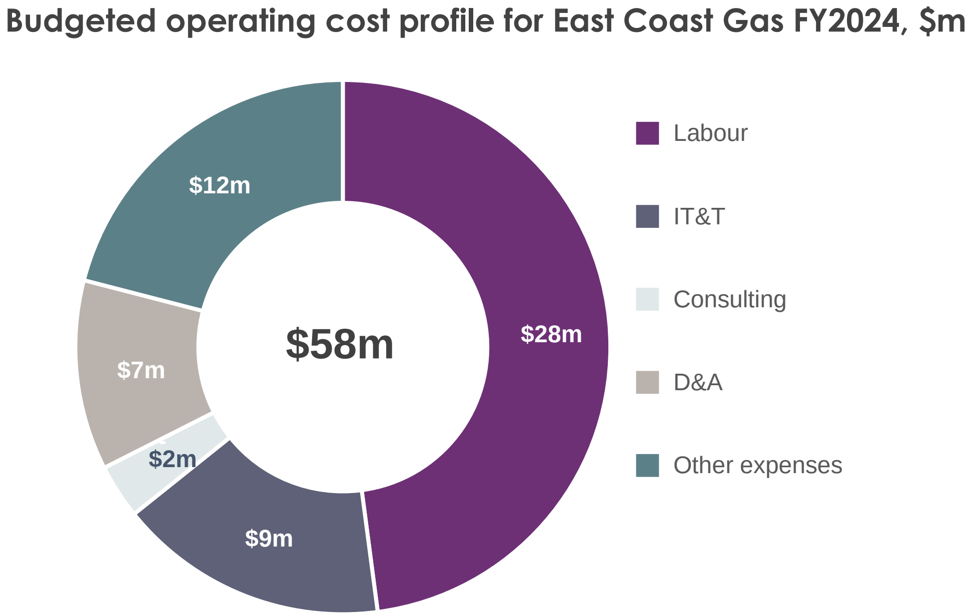
AEMO's budgeted impact on consumer bills

Based on an average residential and small business customers' annual bill.

	NEM Core	NEM Functions	Total
Residential	$6.43 ▲$2.71	$4.83 ▲$1.48	$11.26/ 0.56% ▲$4.19*
Small business customers'	$9.99 ▼-$3.22	$6.59 ▲$0.19	$16.58/ 0.27% ▼-$3.03*

*Reflects the change to AEMO's cost recovery basis for market customers from 100% consumption basis to a combination of $/MWh and $/NMI on a 50/50 basis. While taking effect from this year, this was consulted on in 2020, with the final determination published in March 2021. The change impacts residential and small businesses differently because of the proportion of National Meter Identifier (NMI) costs in comparison to consumption.

East Coast Gas



Cost increases of 10% in East Coast Gas are largely driven by additional storage costs (~$8m) due to Dandenong LNG rule changes that require AEMO to hold more capacity (140TJ to 420 TJ).

These are offset by lower financing costs (~$3m) due to higher cash holdings from FY2023.

	BUDGET FY2023	BUDGET FY2024	VARIANCE ($M)	VARIANCE (%)
Revenue	47.6	55.8	8.2	17.2%
Operating costs	52.5	57.8	5.3	10.1%
Annual surplus/deficit	(4.9)	(2.0)	2.9	N/A
Accumulated surplus/deficit	**14.1**	**58.6**	**44.5**	**N/A**

Advisory Council on Social Licence

Kirstan Wilding

About the ACSL

An inability to secure community acceptance or ‘social licence’ for new projects could create significant delays, increase costs and threaten the delivery of infrastructure that is vital for Australia’s transition to net zero emissions by 2050.

AEMO has established the ACSL to further understand and consider social licence challenges as part of our network planning role, including developing the Integrated System Plan, as well as contributing to energy policy and actions to support the transition.

The ACSL has three main functions:

- Provide input on community sentiment, social licence and issues/risks and opportunities/pathways forward on the ISP.
- Provide social licence insight and advice to assist AEMO in carrying out other non-ISP functions.
- Engage relevant diverse community networks to provide AEMO with greater insight, understanding and potential action regarding social licence and the energy transition.

The ACSL has 11 Members and one observer. It is Chaired by AEMO’s EGM of Government and Stakeholder.

ACSL Meeting 2

Held in Sydney and remotely on 13 March 2023.

AEMO provided an update on recent relevant developments, including in Victorian transmission network development and from the Commonwealth Government.

AEMO and the Council discussed the treatment of social licence in the last Integrated System Plan (ISP) and options for additional measures in the 2024 ISP, including social licence sensitivities and an ISP chapter on the issue (see meeting summary for some specific comments).

The next meeting will be on 24 May 2023.

Next Consumer Forum potential topics

Kirstan Wilding

Future Consumer Forums

Potential future Consumer Forum topics – for discussion:

- AEMO Corporate Plan FY2024
- Results of our 2023 annual stakeholder research
- Final Budget and Fees
- Electricity Statement of Opportunities
- Transmission Expansion Options Report for ISP
- Update on VNI West project
- Update on the Wholesale Demand Response mechanism (requested by PIAC).

AEMO

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