2025 **Transmission Network** Forum

Future Queensland Power System

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Operations and Planning
Powerlink Queensland

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Acknowledgement

Powerlink acknowledges the Traditional Owners and their custodianship of the lands and waters of Queensland and in particular the lands on which we operate.

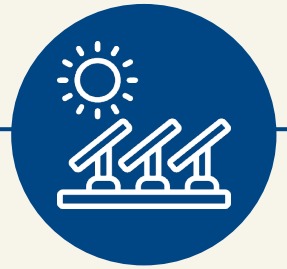
We pay our respect to their Ancestors, Elders and knowledge holders and recognise their deep history and ongoing connection to Country.

Queensland’s competitive advantage

GOC ownership of energy supply chain

Youngest coal fleet

Good quality wind



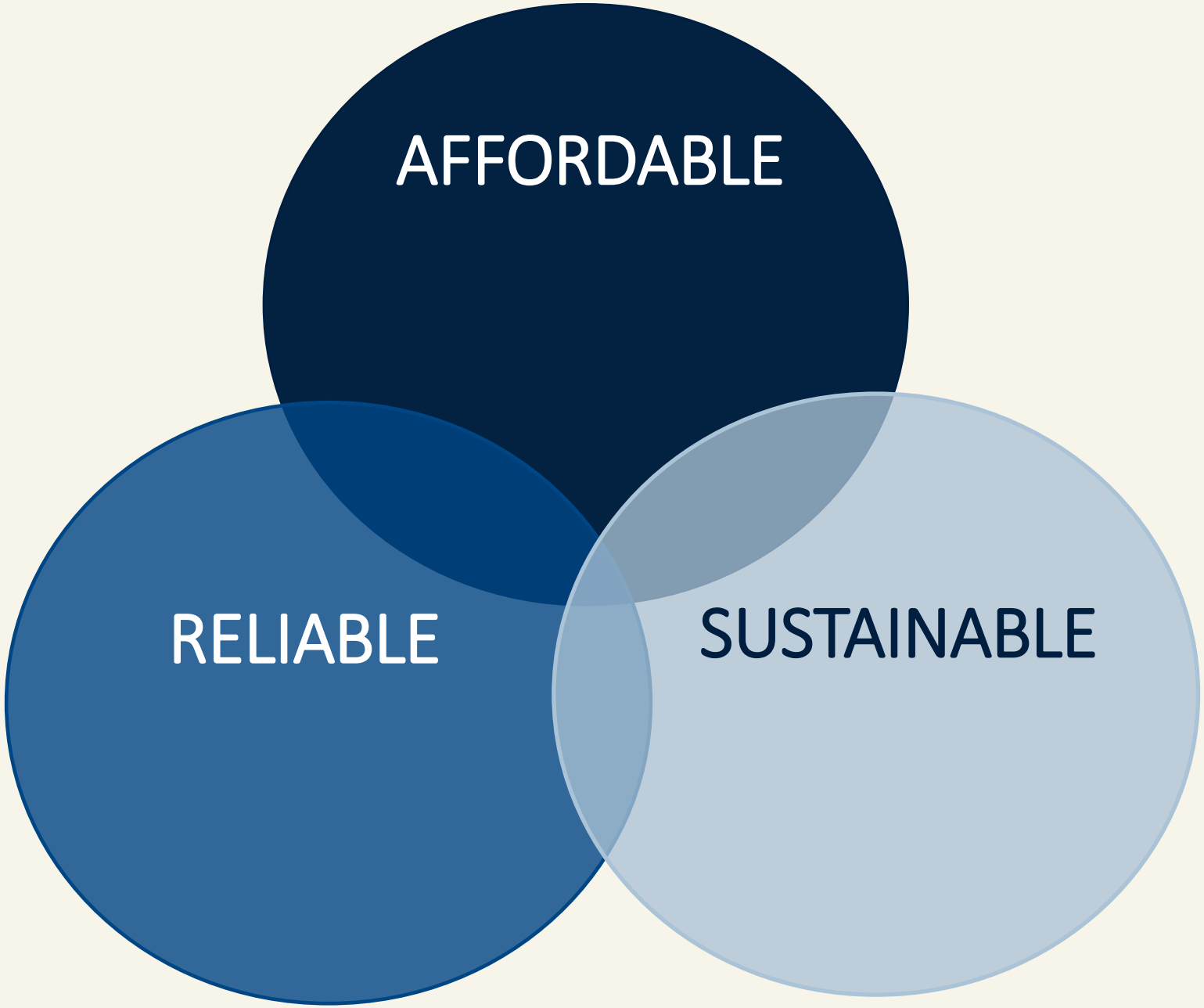
Good solar

PHES geography

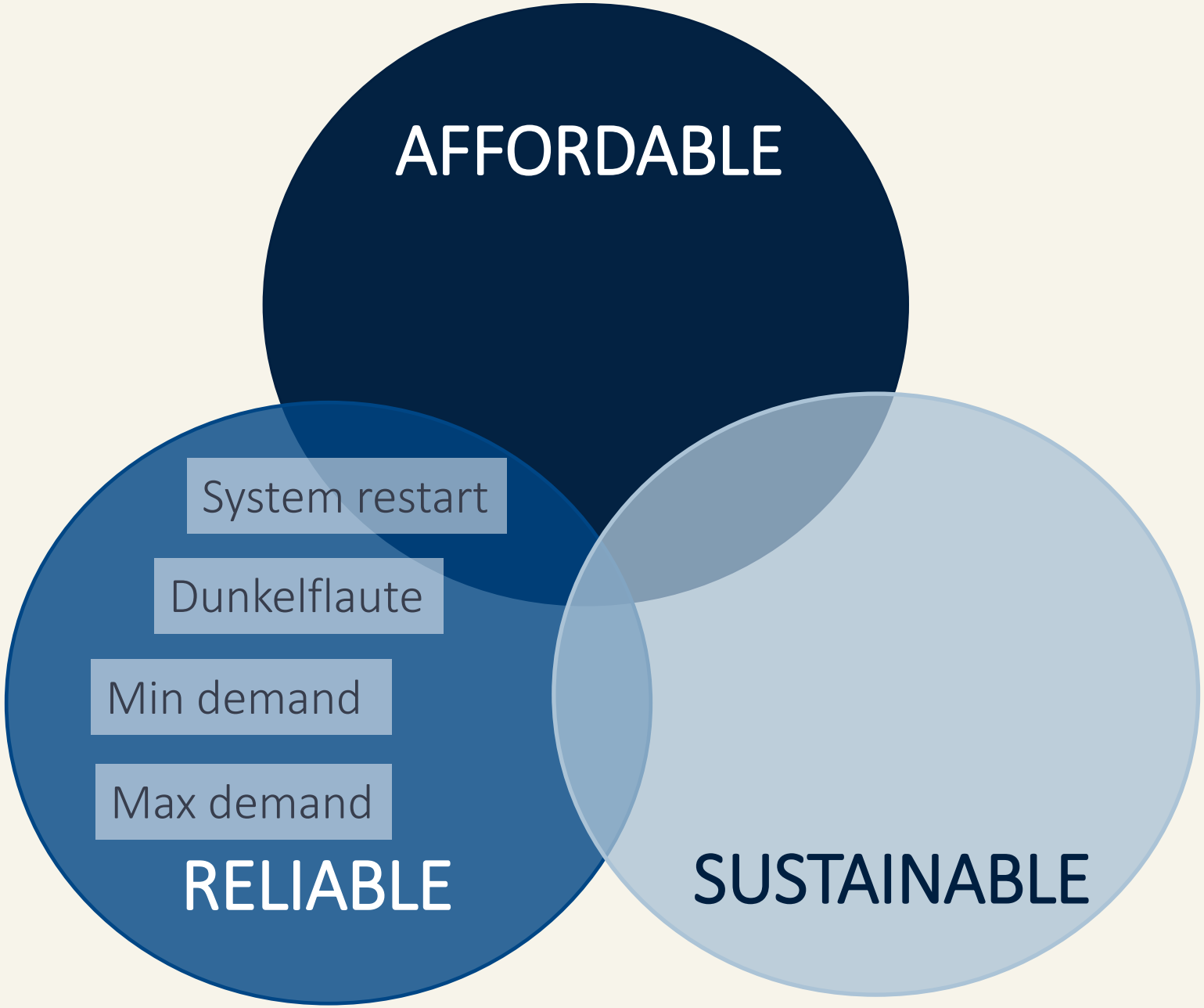
Future network operation

Image: J Briggs

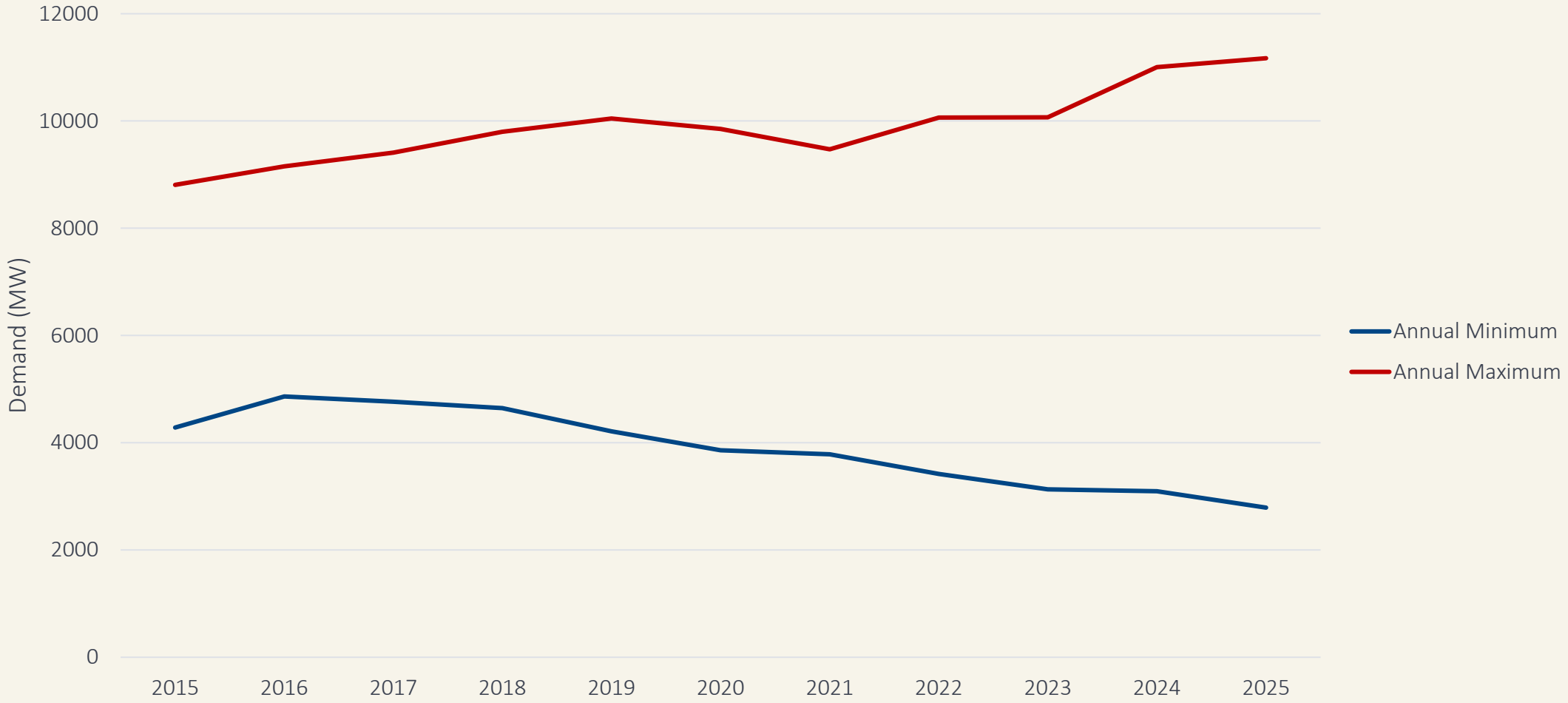
The energy trilemma



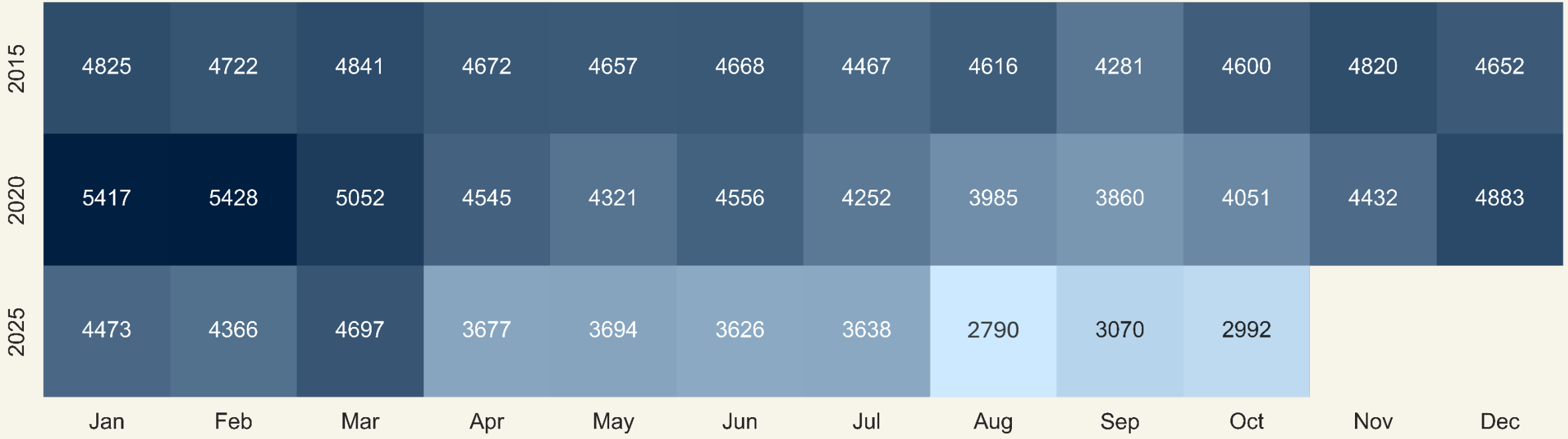
The energy trilemma



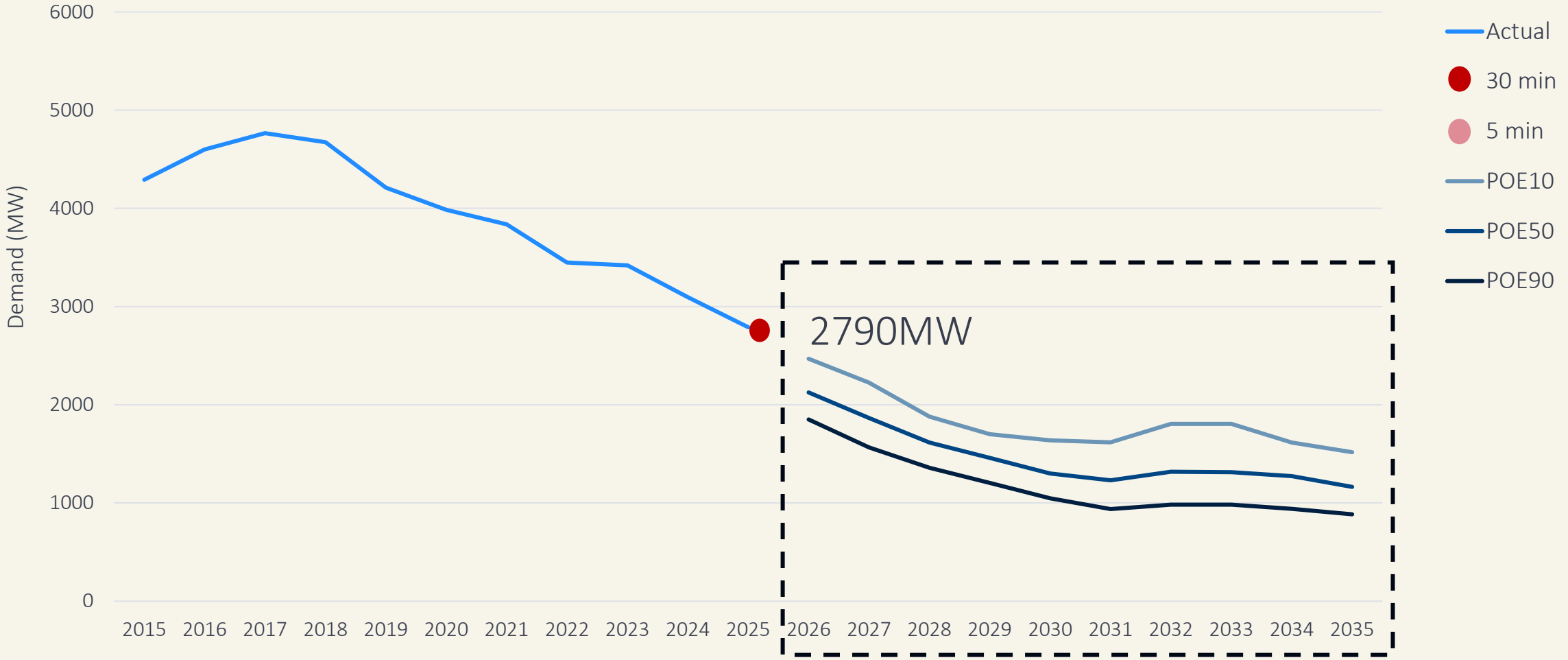
Growing spread of demand



Queensland minimum demand (MW)

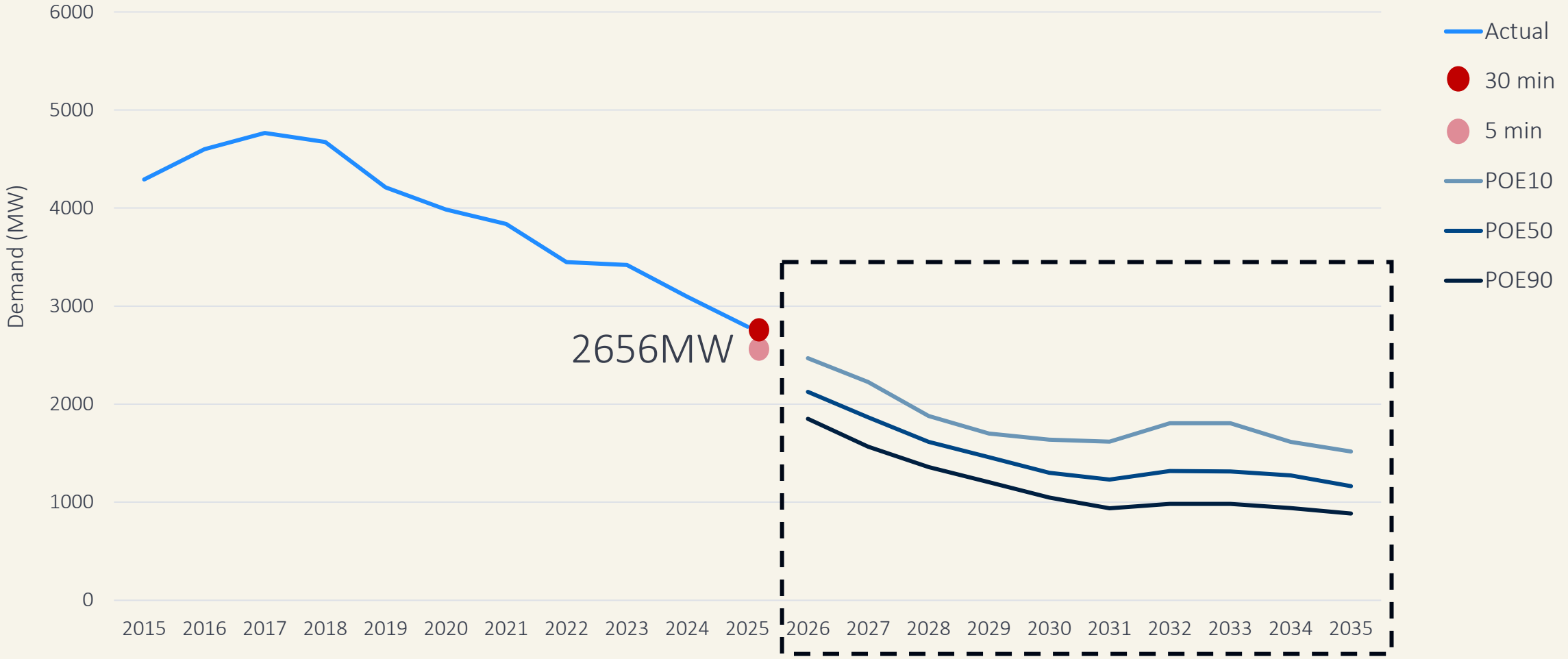


Minimum demand forecast



Source: AEMO, 2025 Electricity Statement of Opportunities, August 2025

Minimum demand forecast



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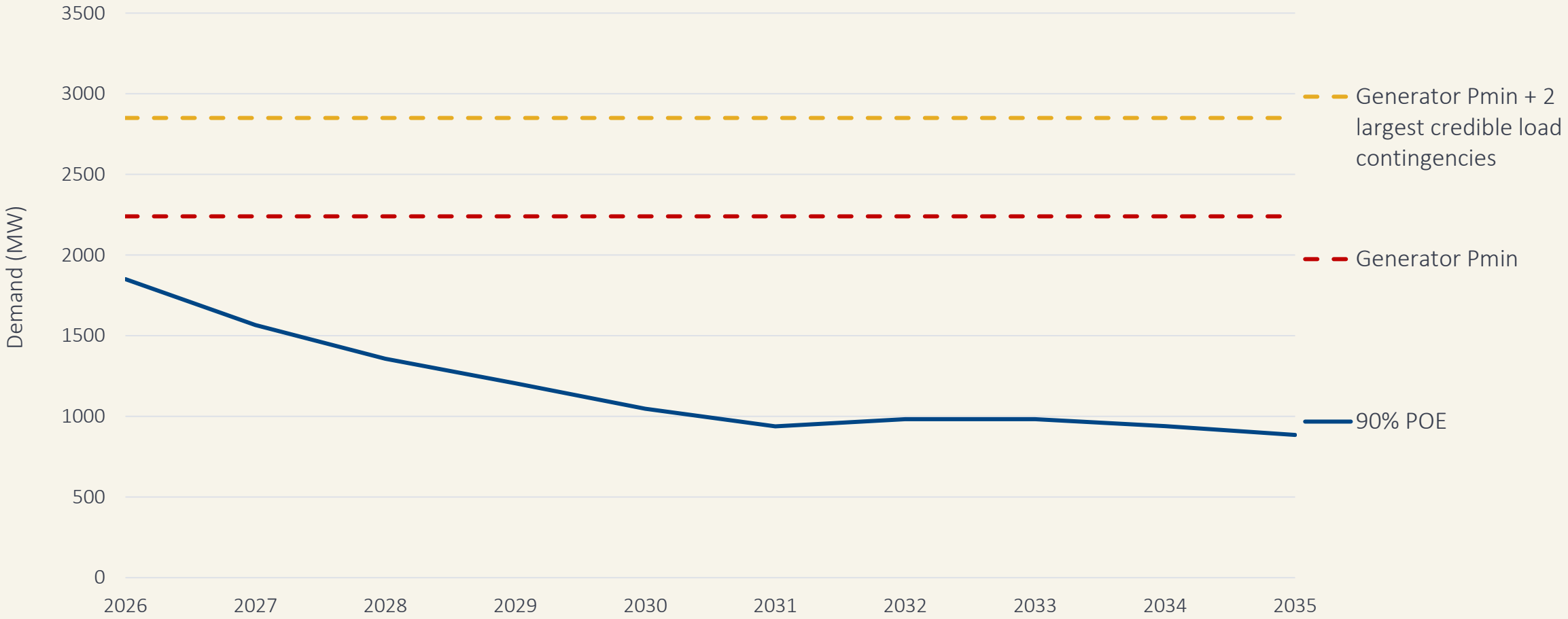
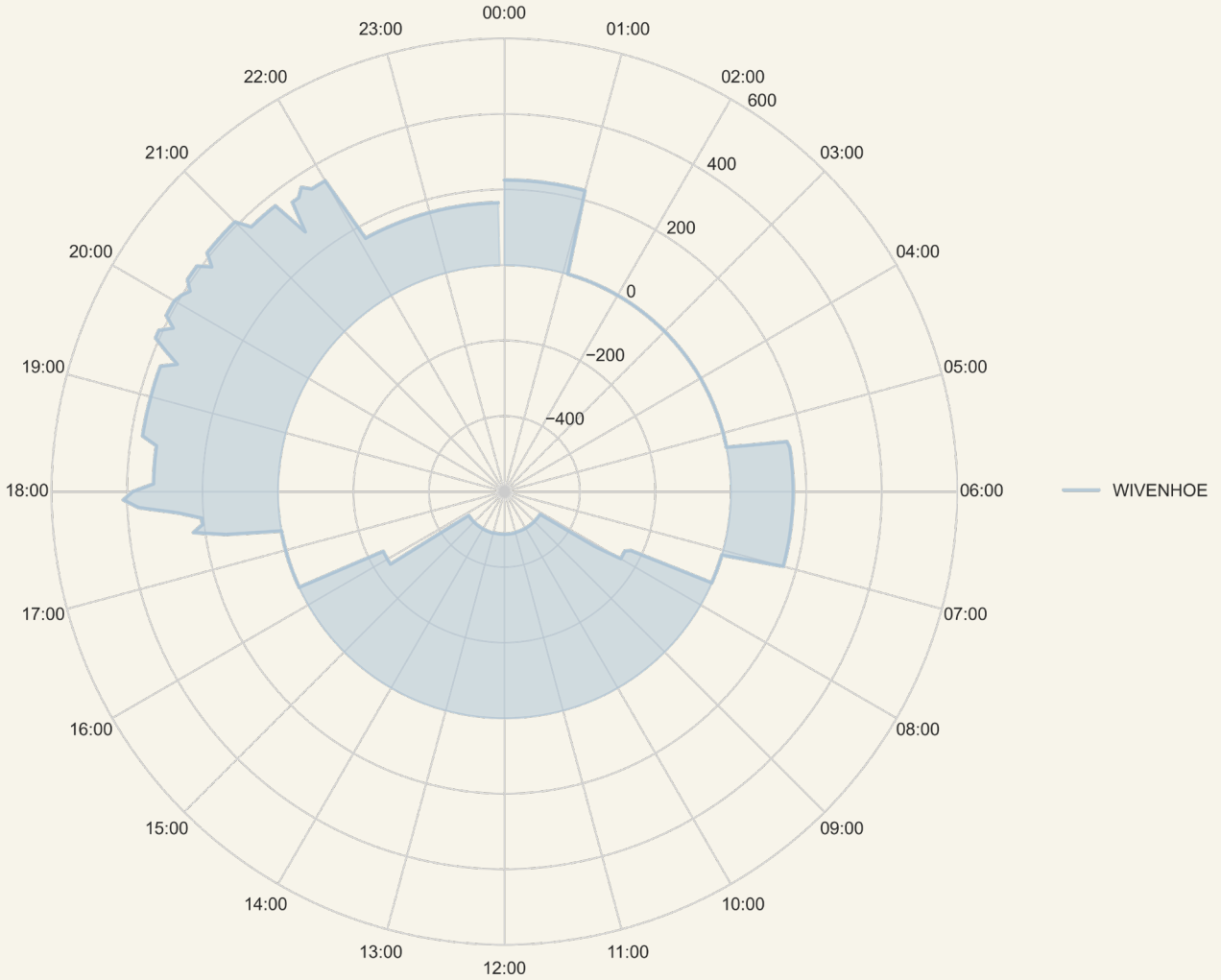
Minimum synchronous generation



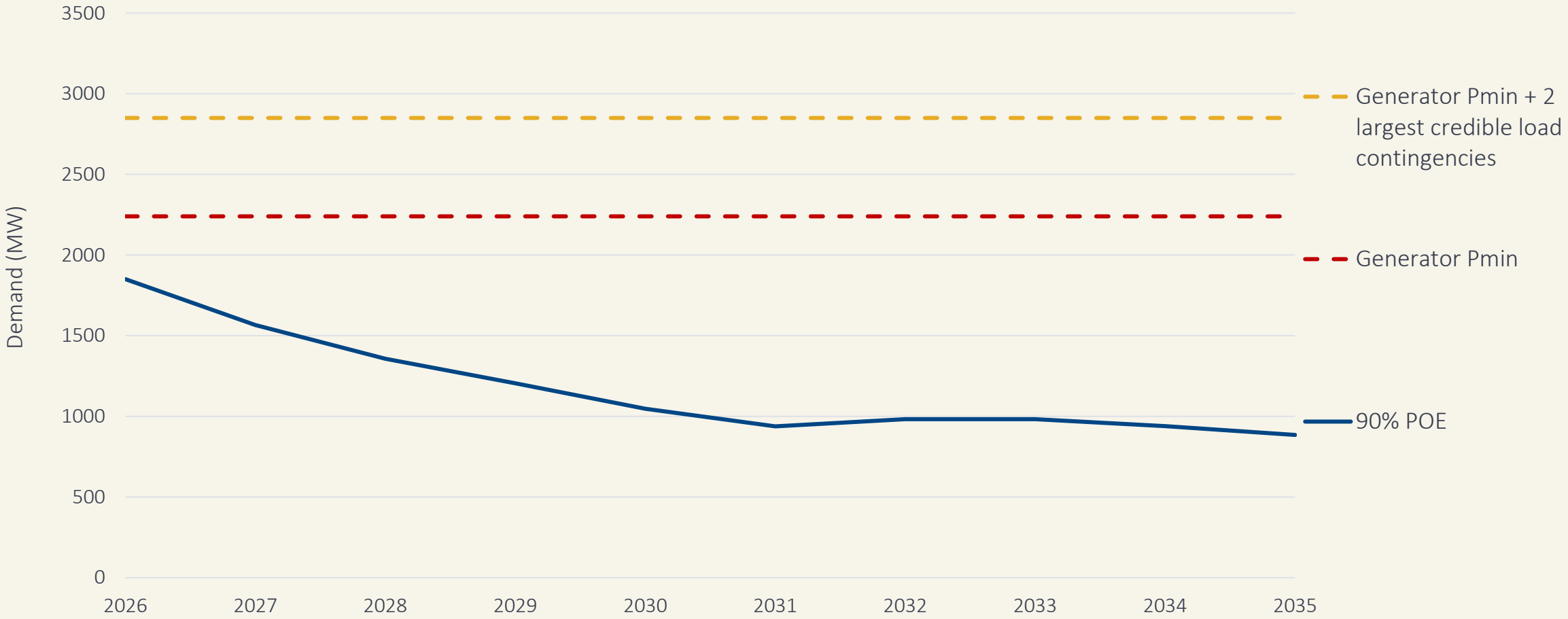
Notes

1. Source: AEMO, 2025 Electricity Statement of Opportunities, August 2025
2. Assumes Queensland is islanded and 165 MW FCAS required from synchronous generation

Pumped Hydro Energy Storage



Pumped hydros help



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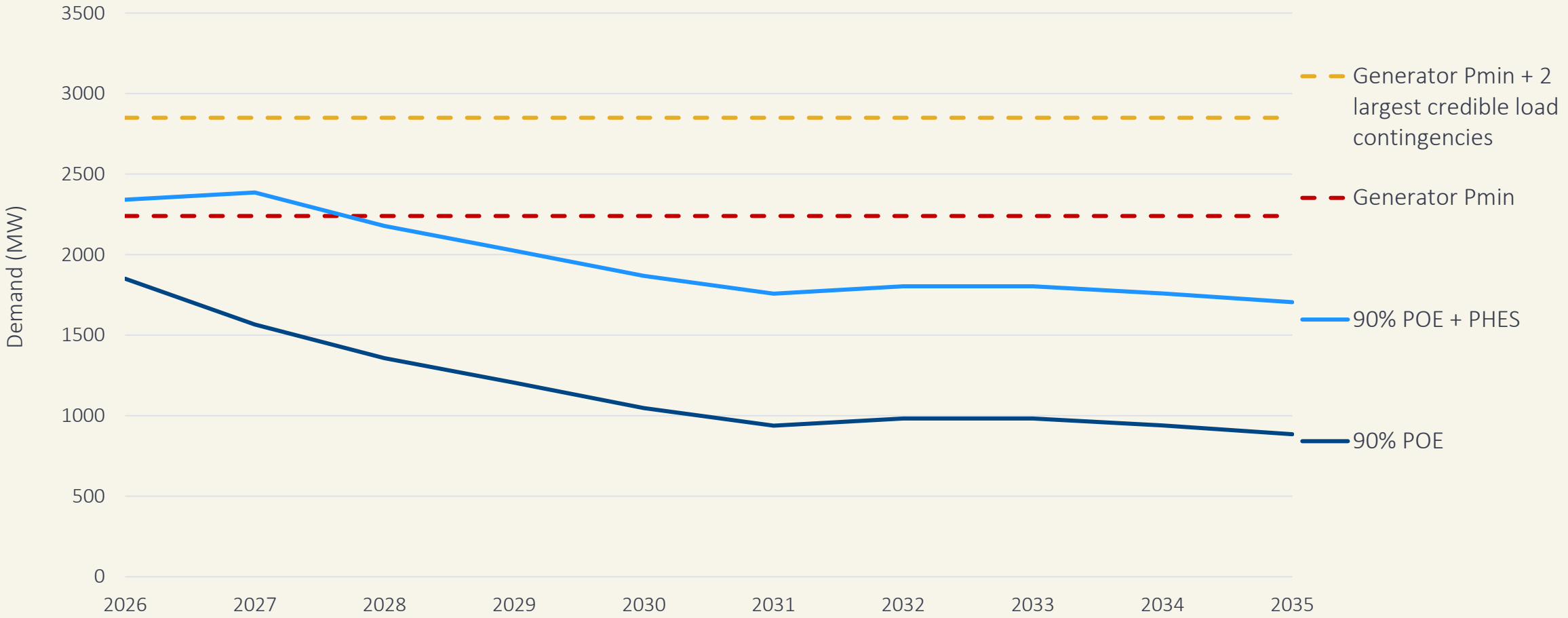

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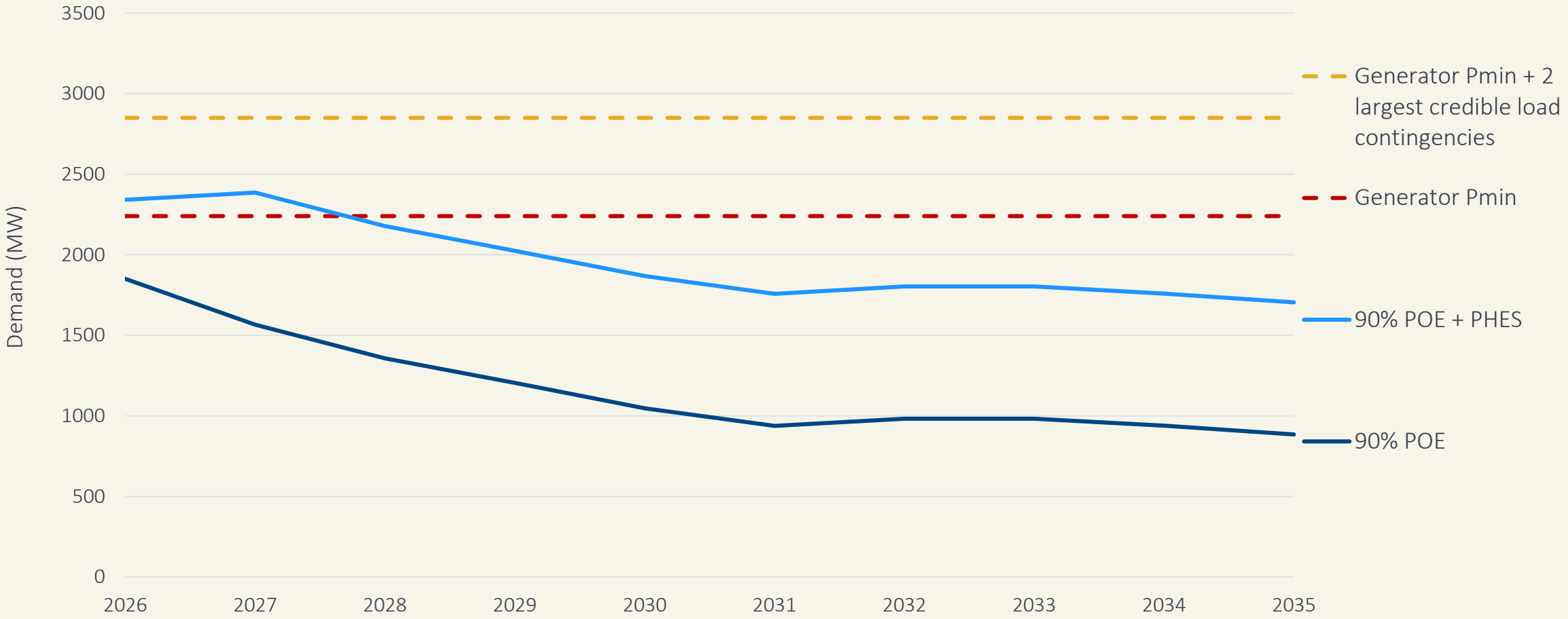
Synchronous condensers

Synchronous condensers help



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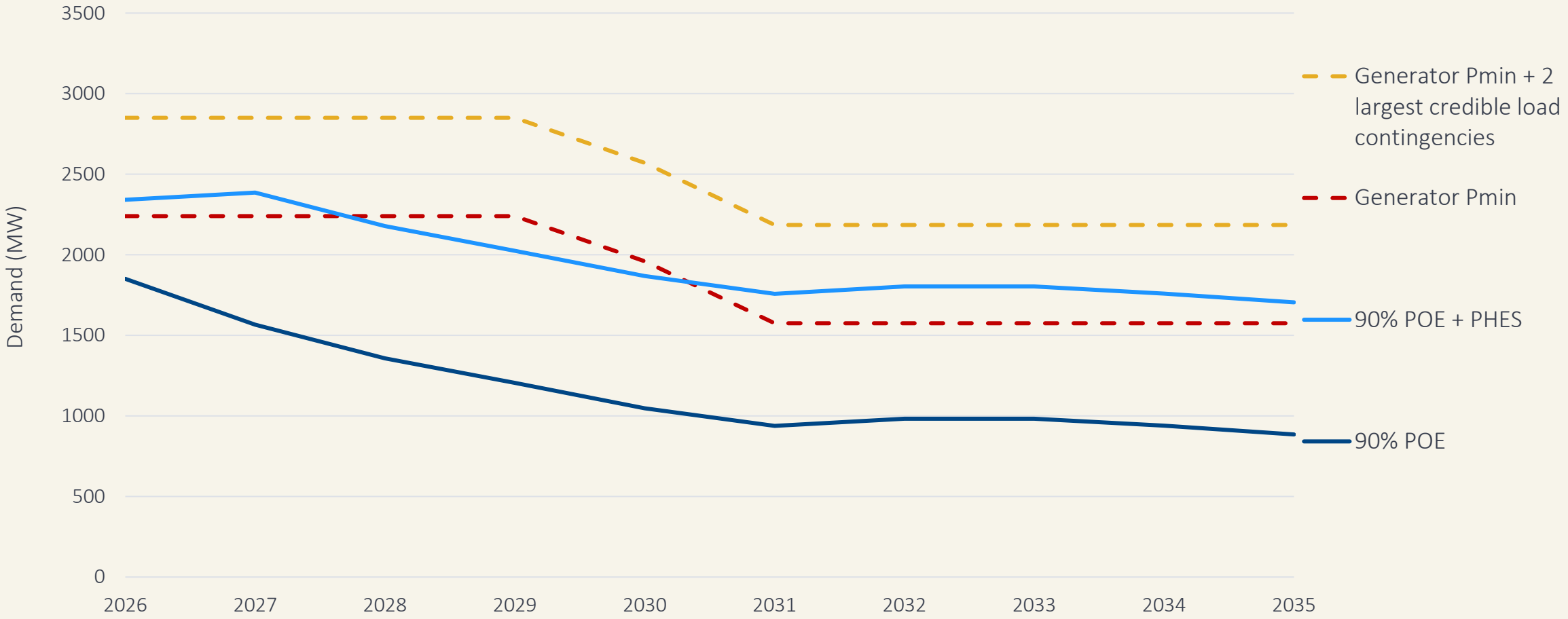

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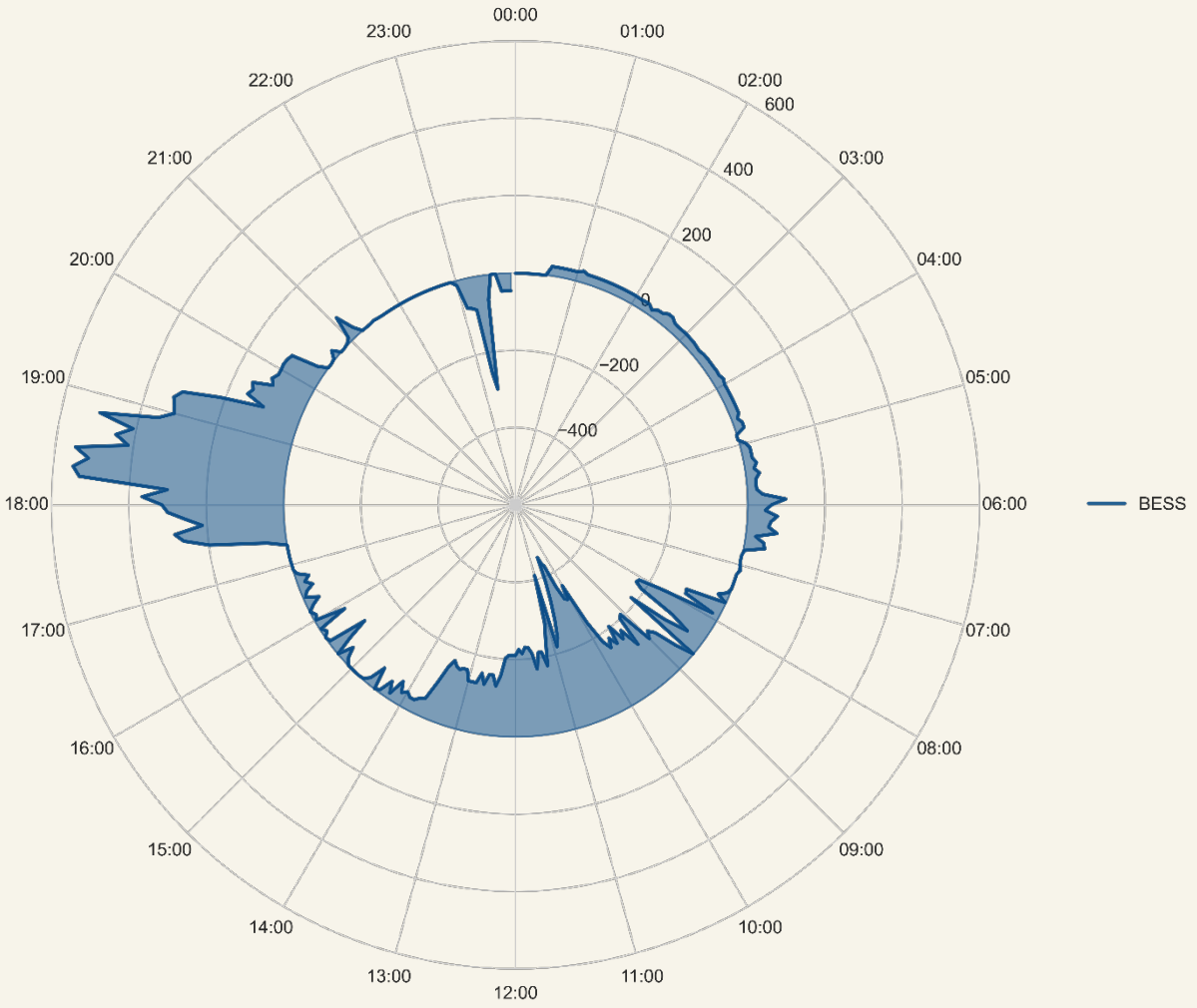
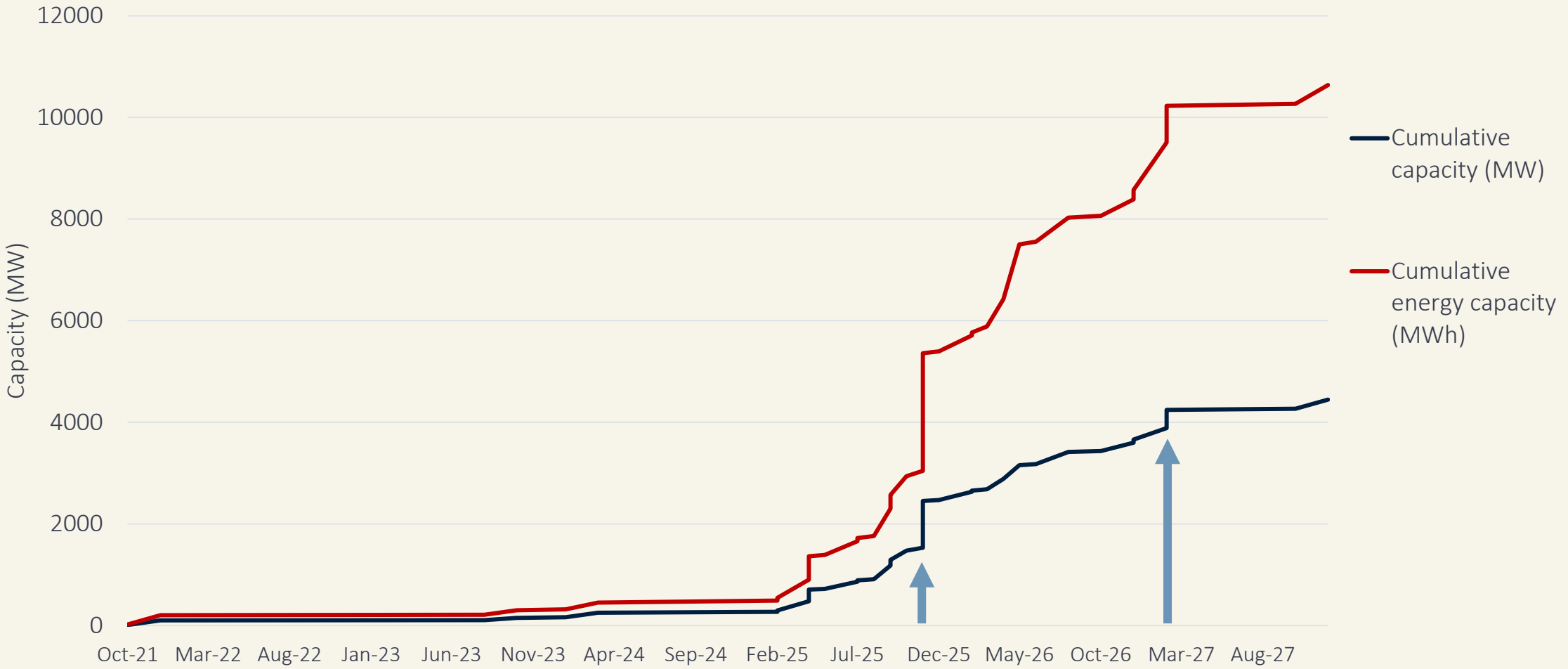
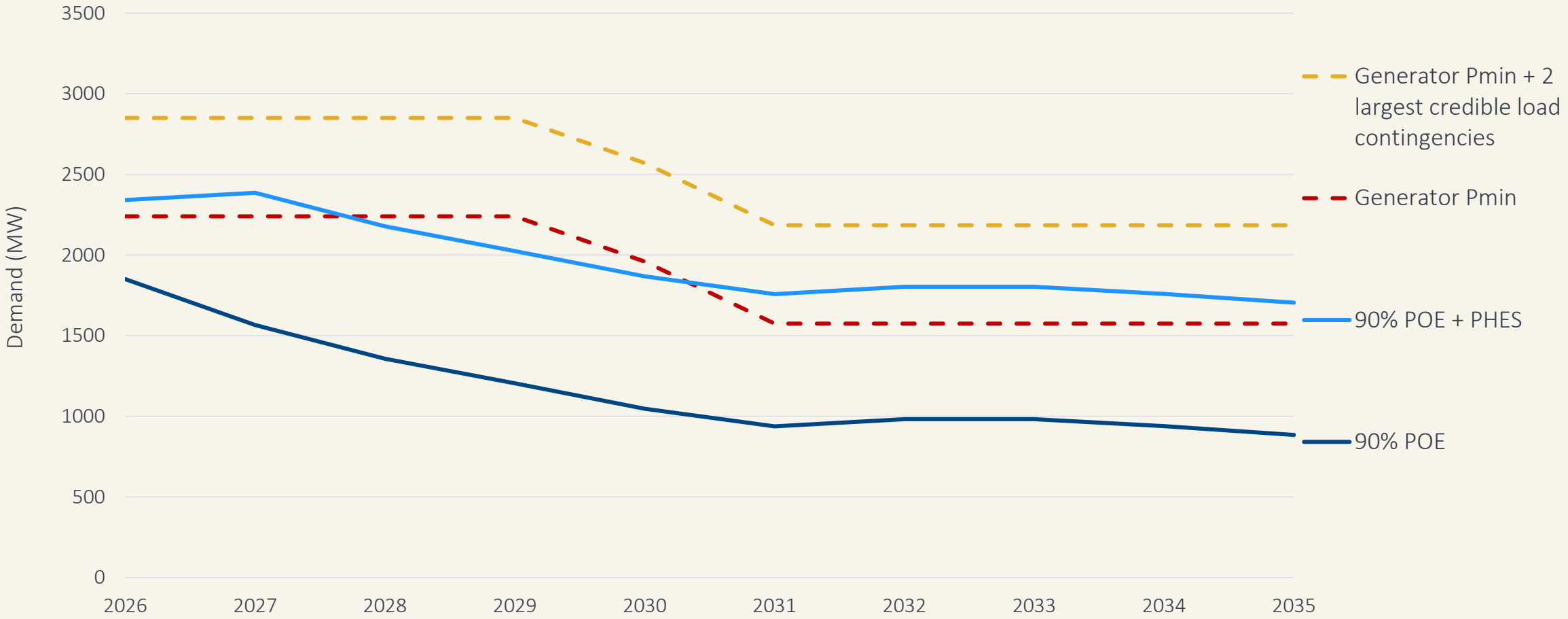
Battery Energy Storage Systems



Battery outlook in Queensland



A potential way forward



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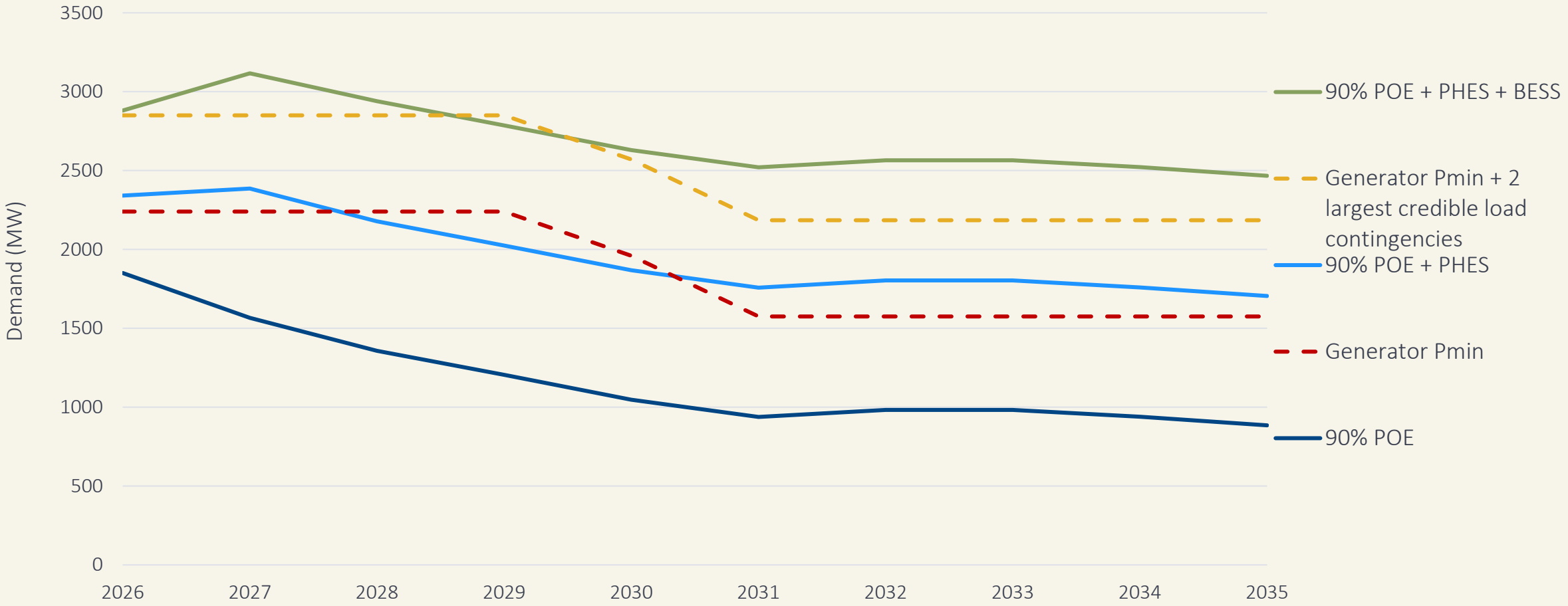

Notes

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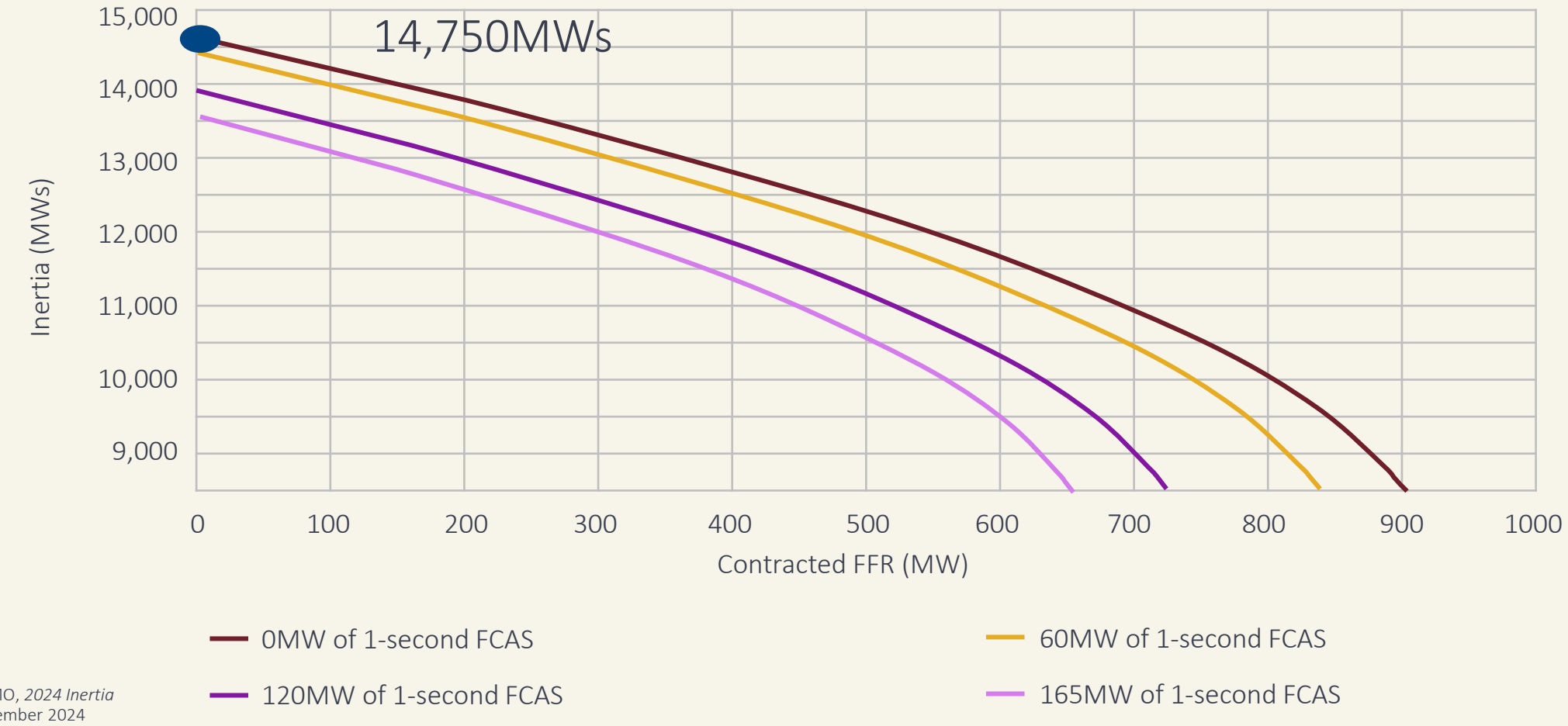
3. Includes BESS in pipeline at 50% capacity

Inertia

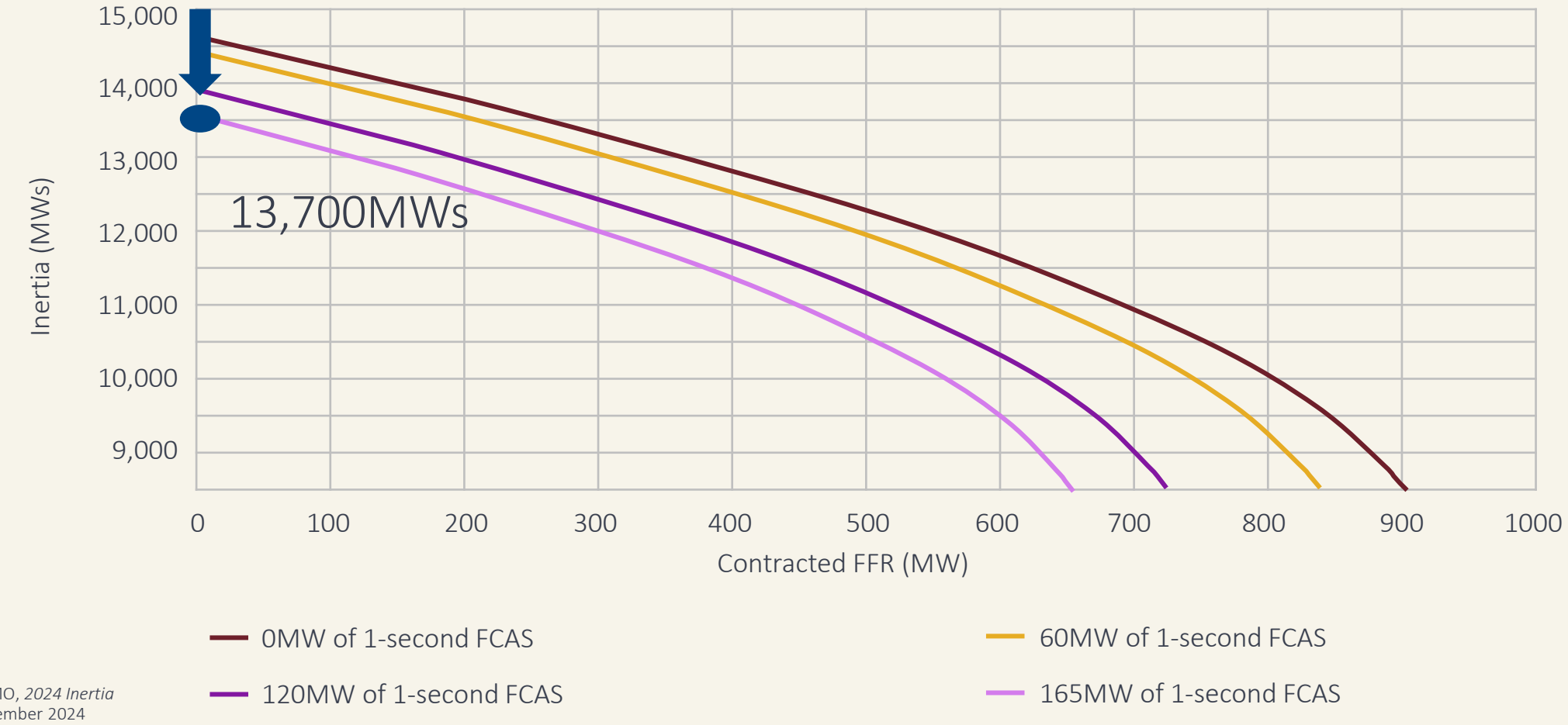
Relationship between inertia and fast frequency response in Queensland



Source: AEMO, *2024 Inertia Report*, December 2024

Inertia

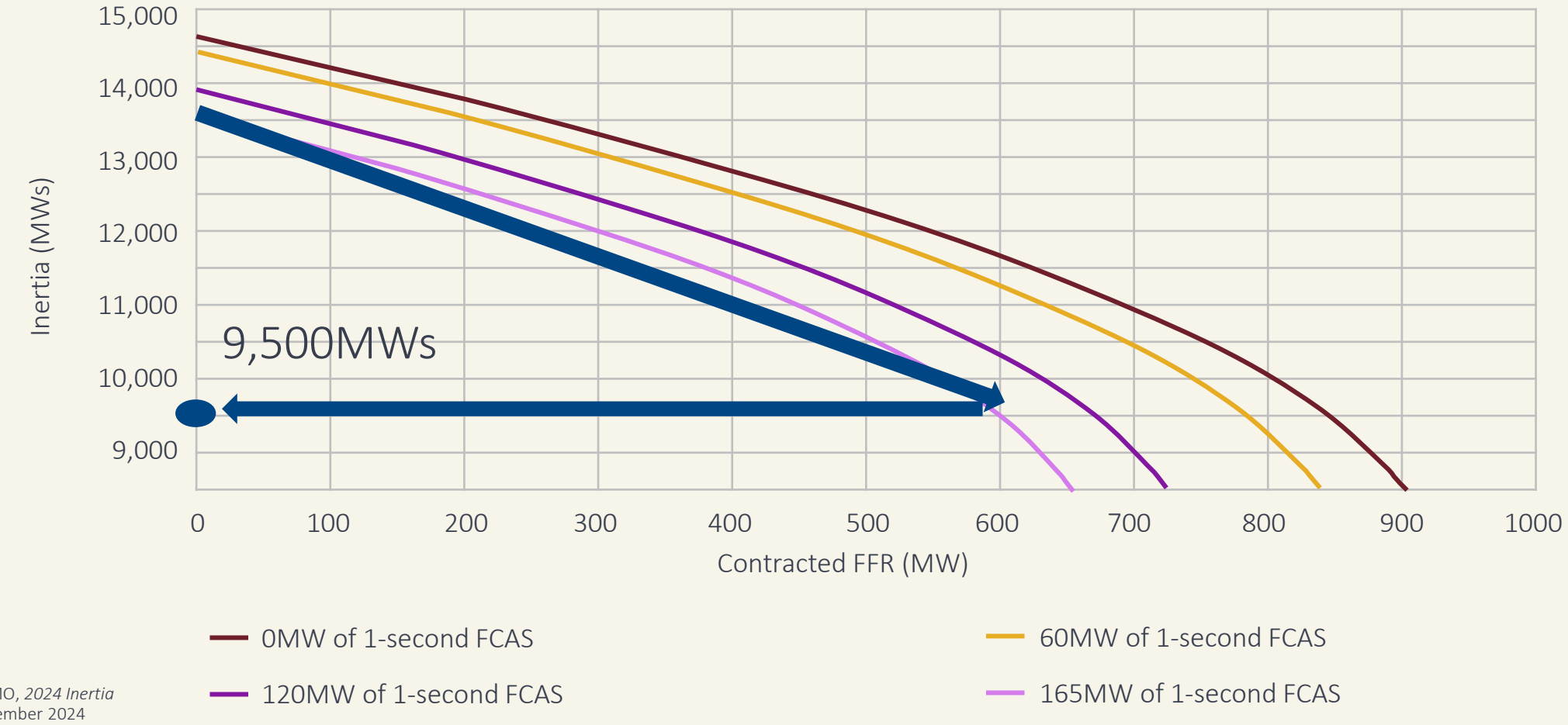
1-second Frequency Control Ancillary Services



Source: AEMO, *2024 Inertia Report*, December 2024

Inertia

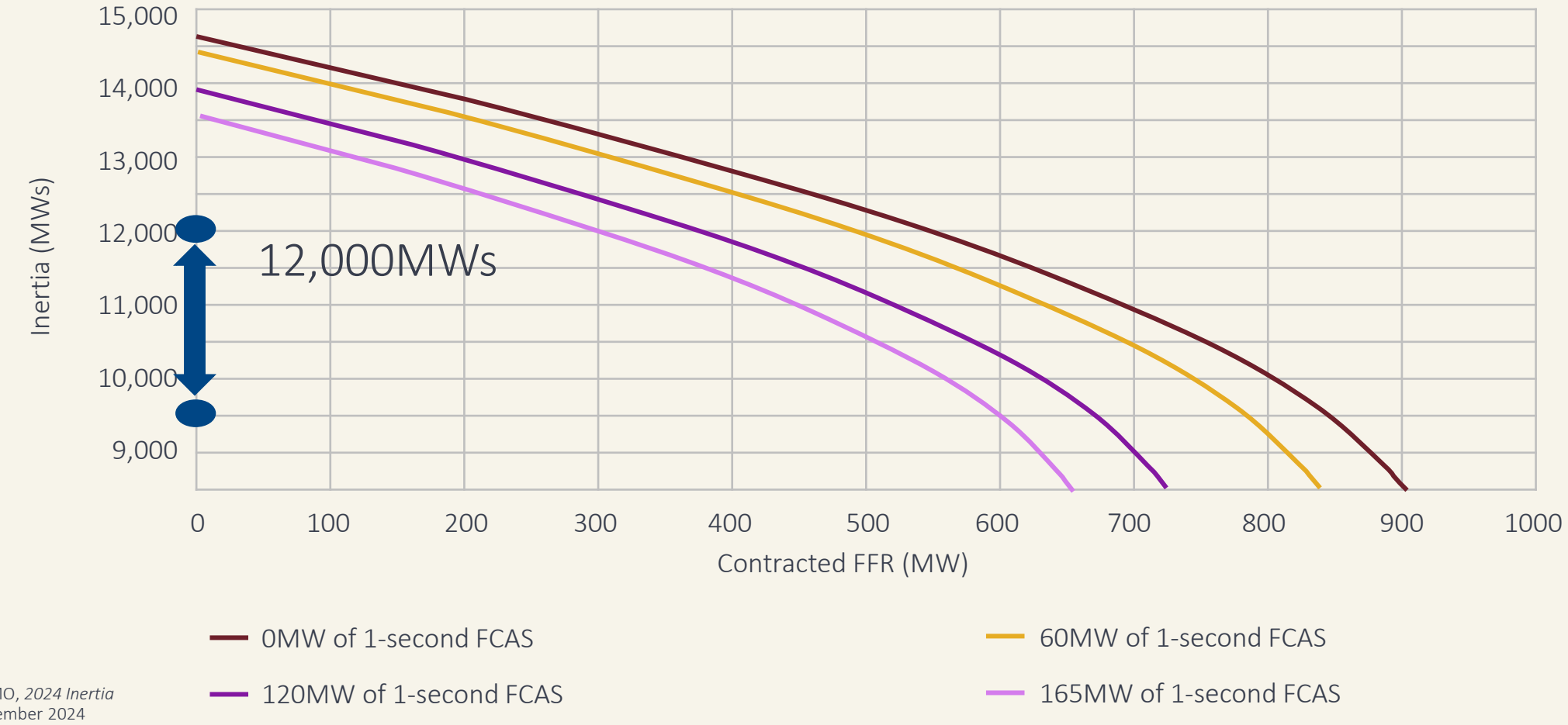
Fast frequency response



Source: AEMO, *2024 Inertia Report*, December 2024

Inertia

At minimum demand



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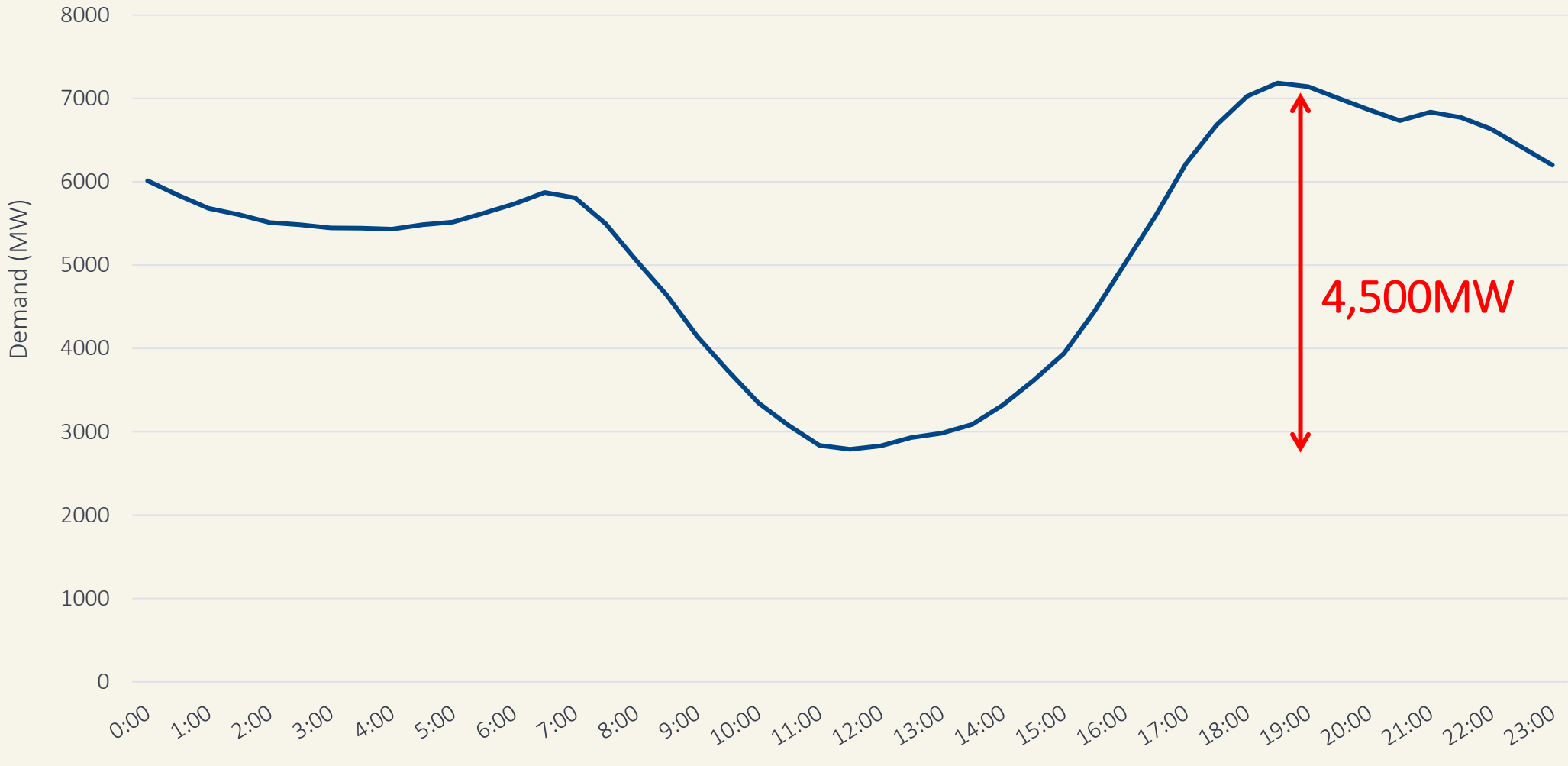
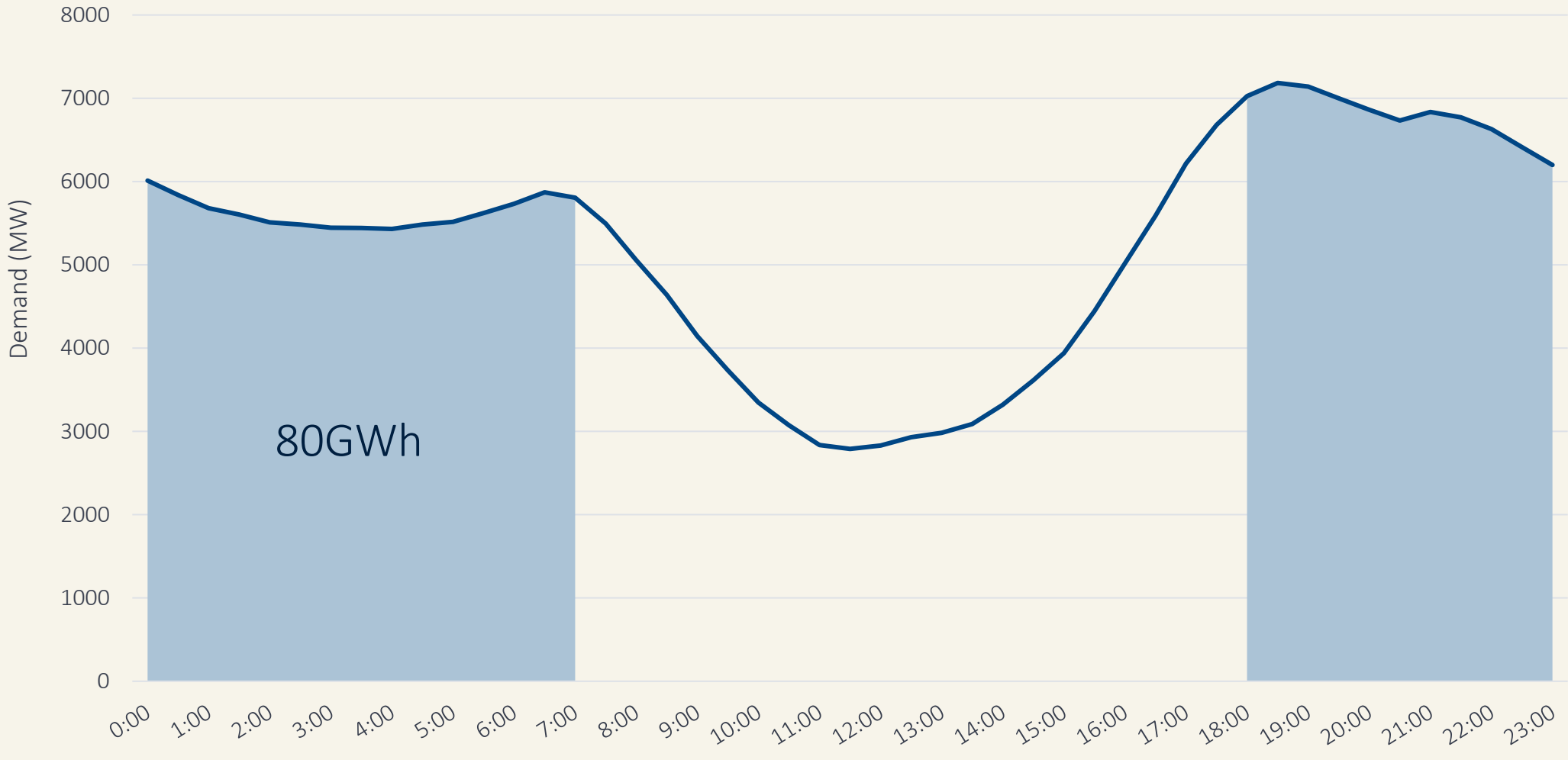
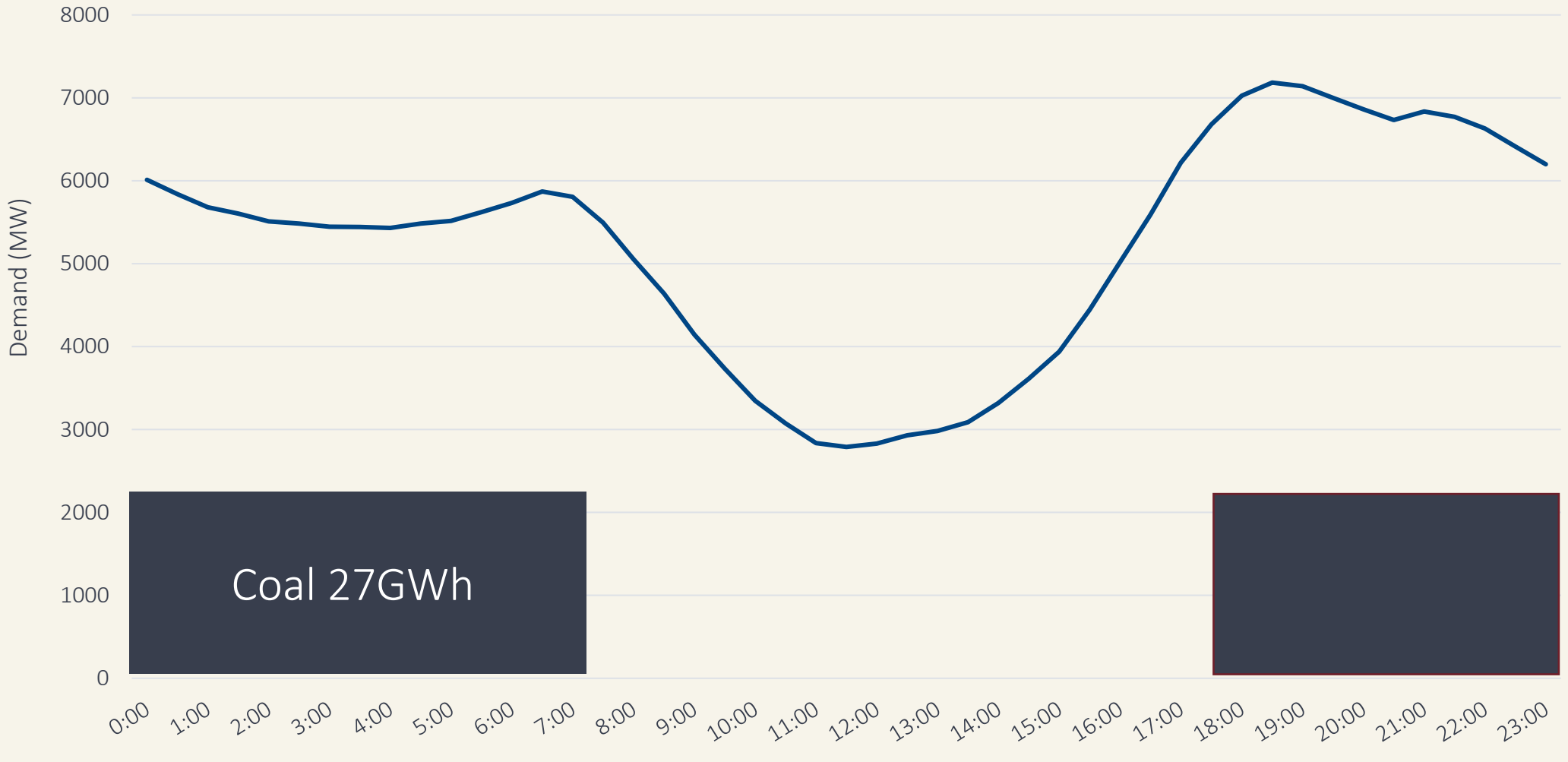
Operational profile on low demand days



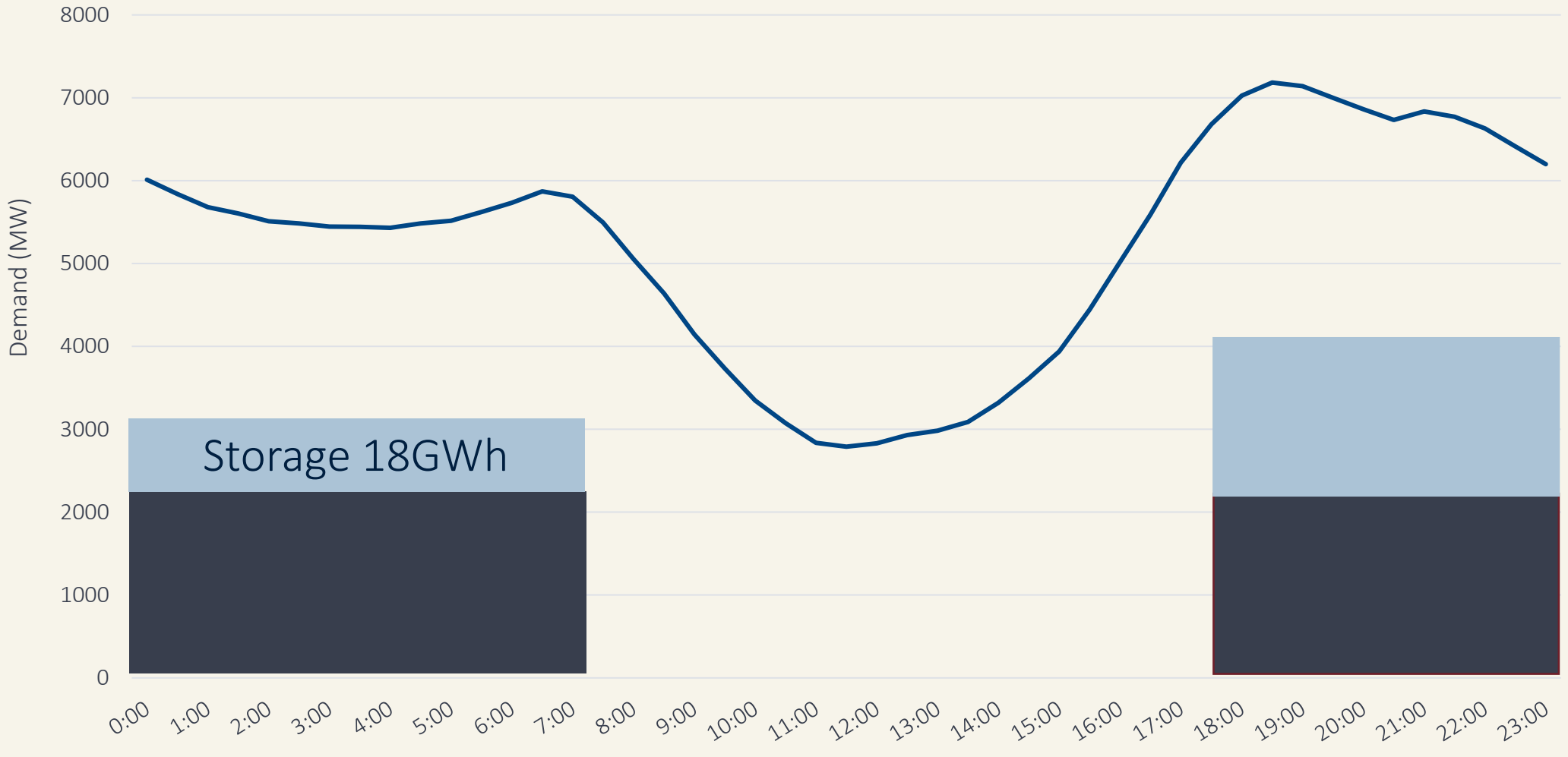
Meeting overnight demand



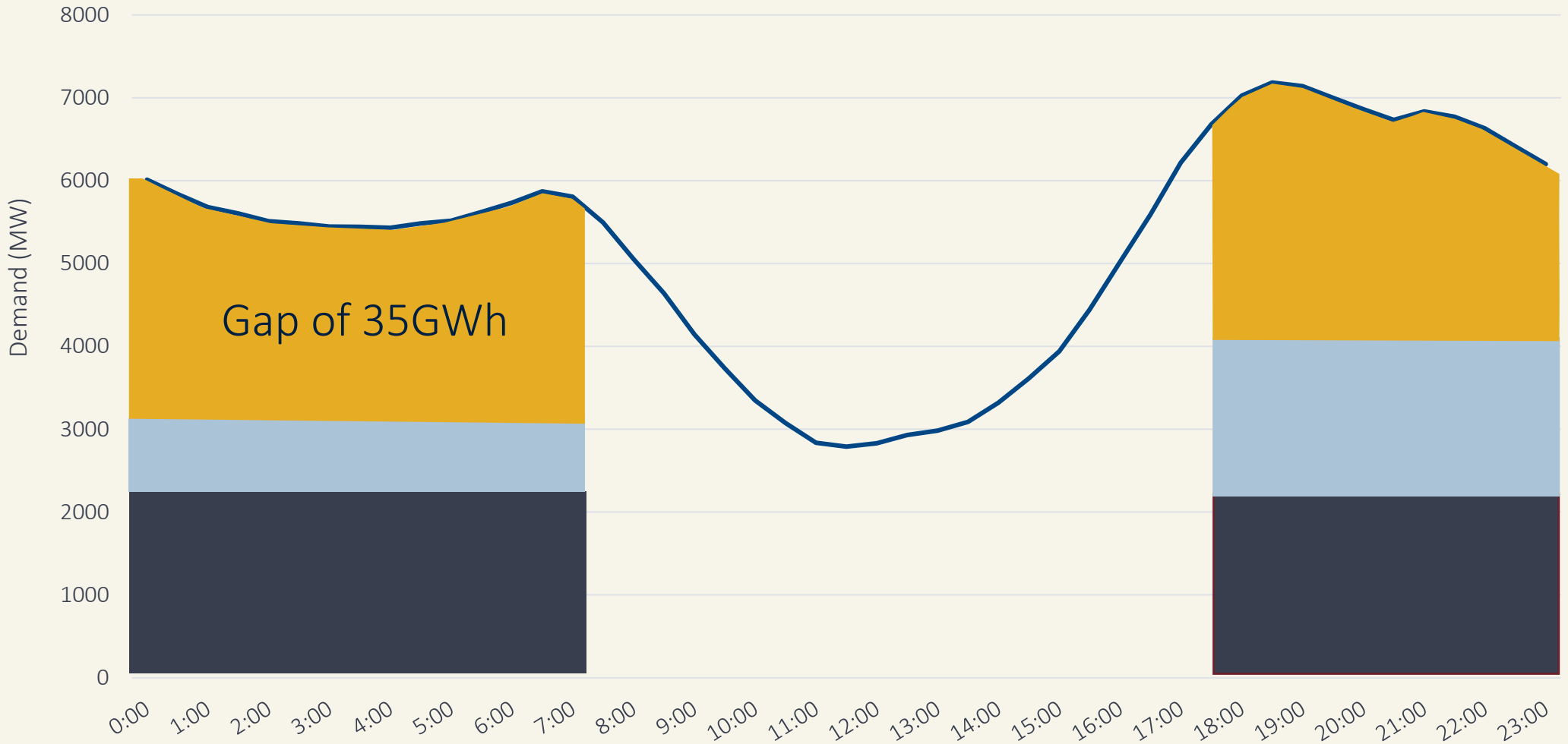
Coal generation support



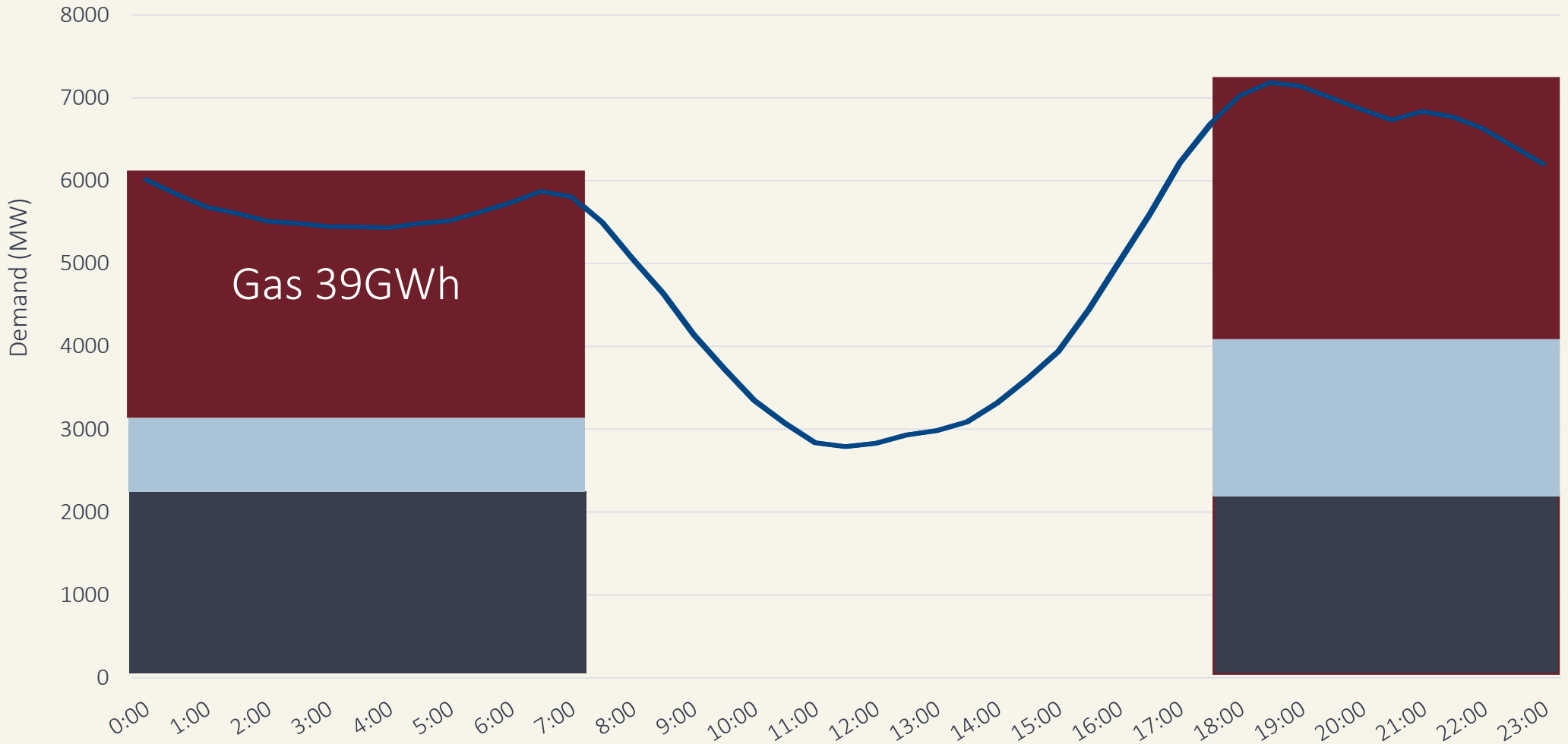
Storage support



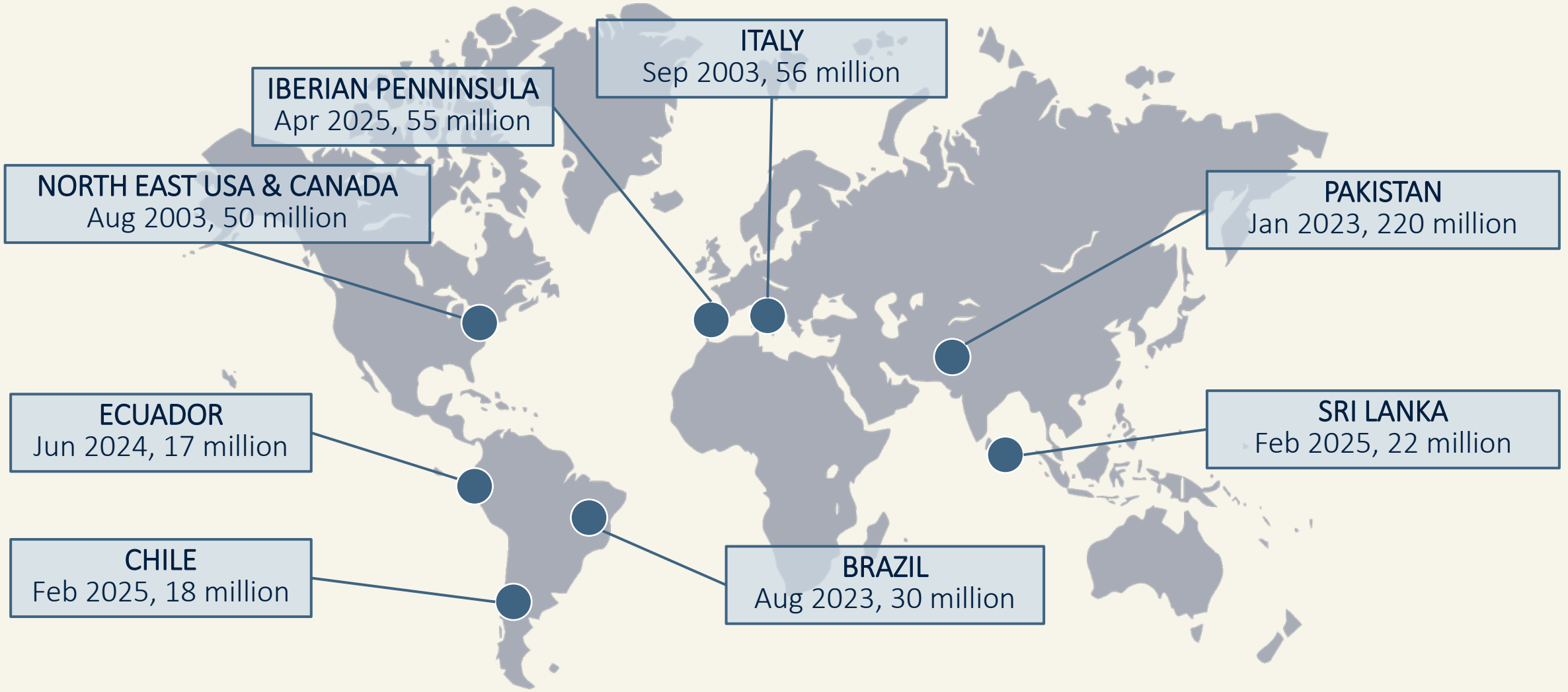
Wind generation support



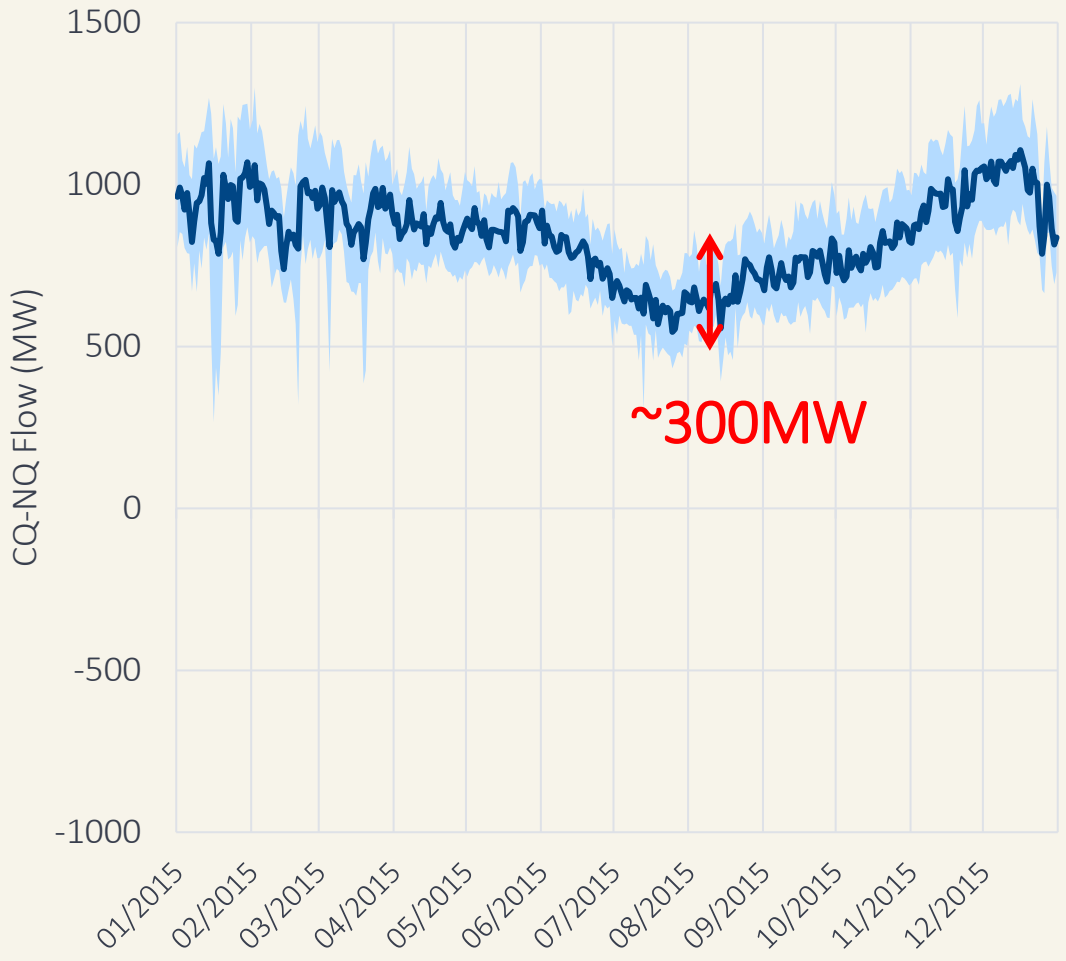
Storage support

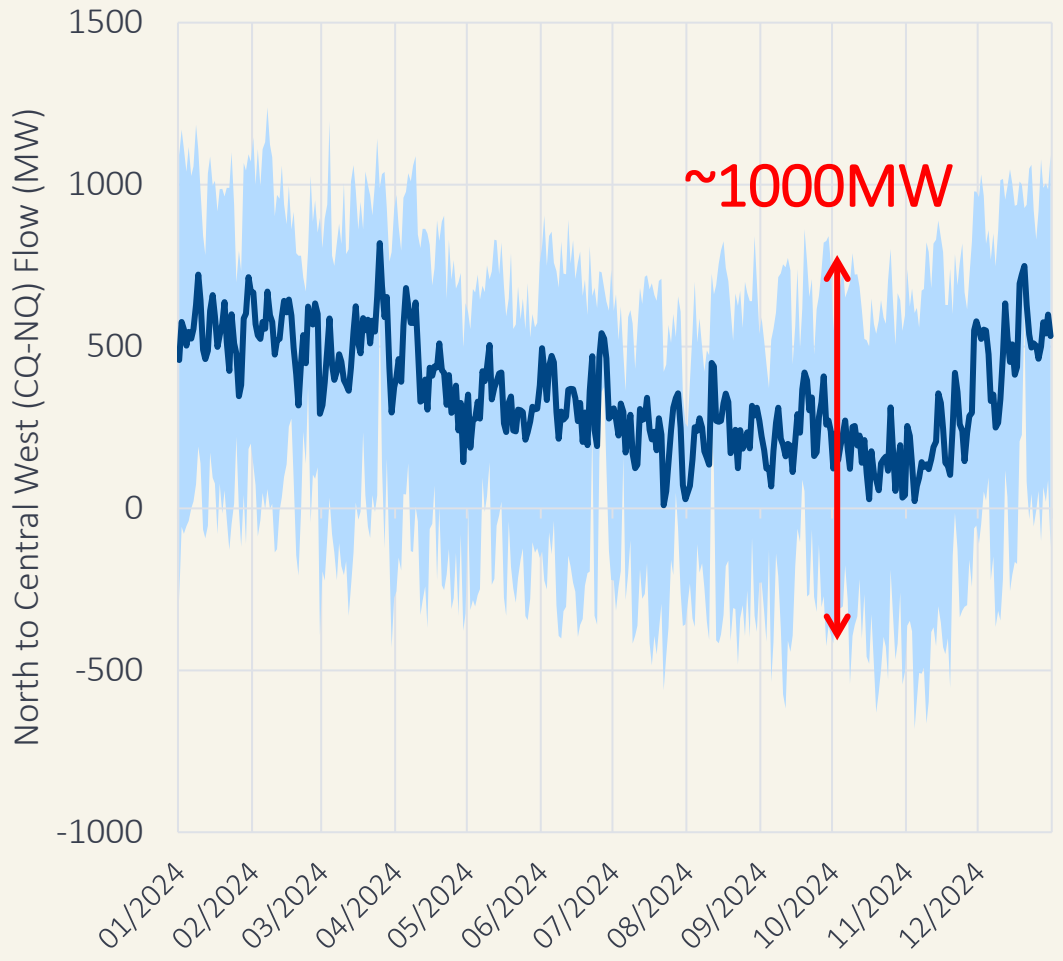


System restart

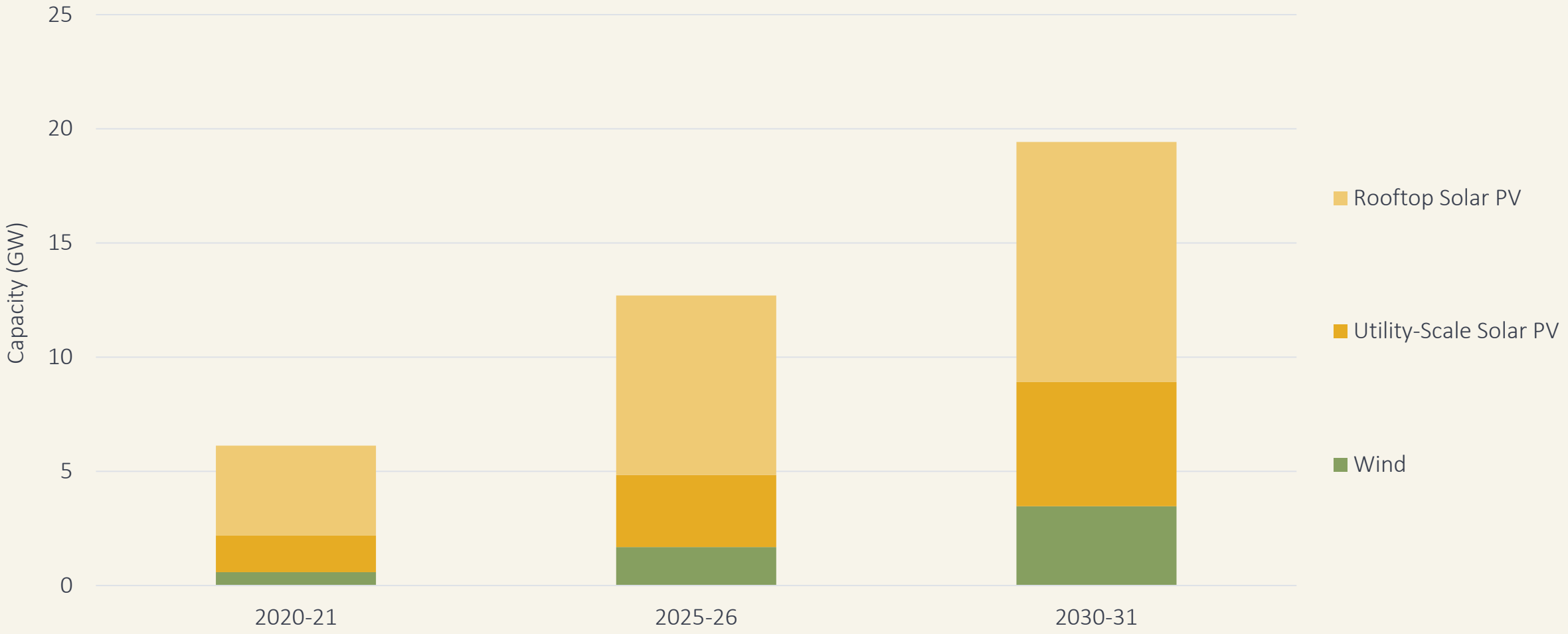


Increased variability in network flows



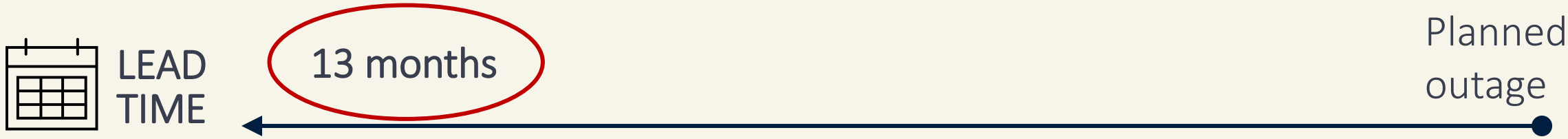


Committed and anticipated entrants (ESOO 2025)



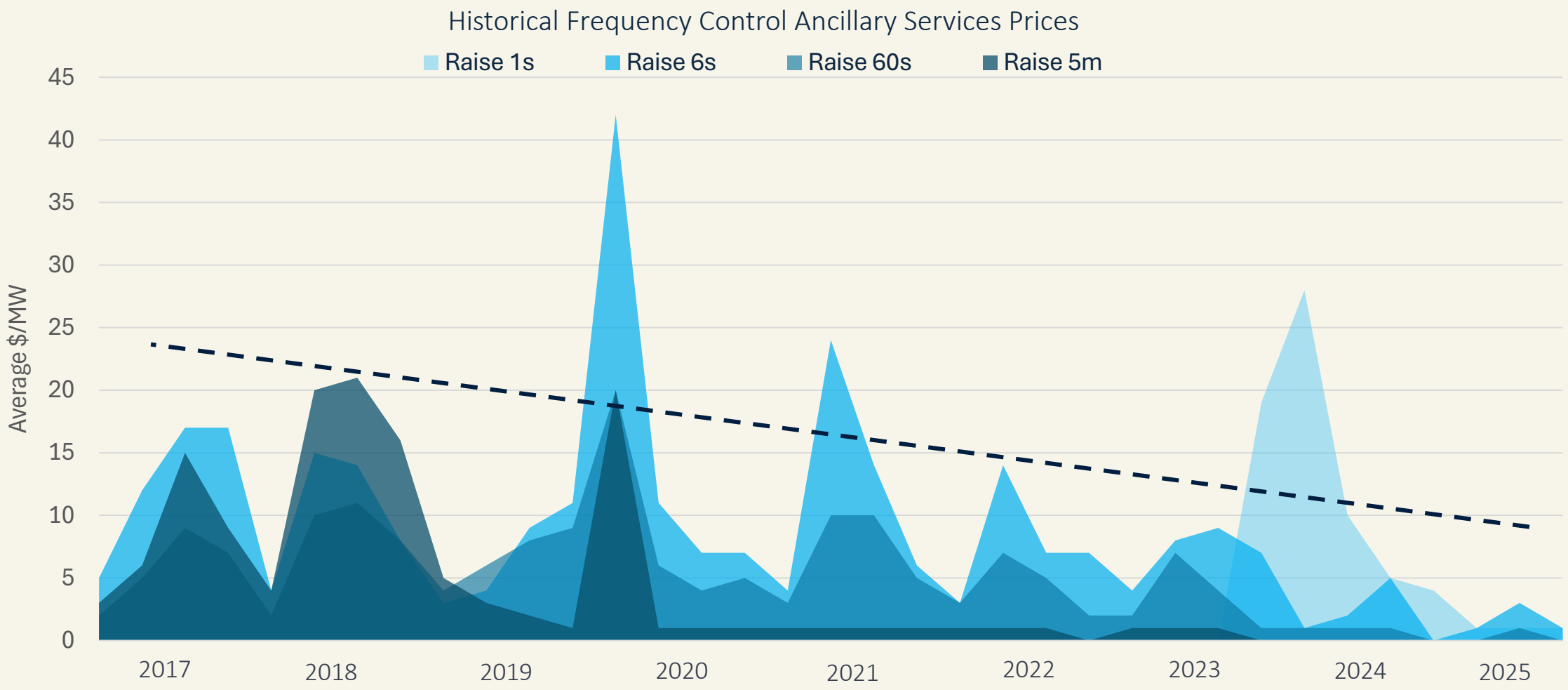
Limited weather forecast horizon

Limited weather forecast horizon



MARKET NOTIFICATION TIMEFRAMES

The price of network support falling



Flexible loads

Future operational needs and potential solutions

Operational need	GT	BESS	Syn cons	Flexible loads
System strength – voltage	✓✓	✓✓	✓✓	X
System strength – fault level	✓✓	TBC	✓✓	X
Inertia	✓	✓✓	✓✓	X
Dunkelflaute conditions	✓✓	✓	X	✓
System restart	✓✓	✓	X	X
Facilitate network outages	✓	✓✓	X	✓✓