Draft 2022 Demand Side Participation forecasts

For the 2022 ESOO

29 June 2022

Forecasting Reference Group Meeting

Purpose and agenda

The purpose of this presentation is to *consult* with the FRG on draft 2022 Demand Side Participation (DSP) forecasts.

Today's Agenda includes:

- Definitions
- DSP Components and Methodology
- Analysis of DSP Information Submissions
- Wholesale Demand Response (WDR)
- DSP Forecast for Upcoming Summer
- NSW Peak Demand Reduction Scheme
- Discussion

Timing	Relevant topic	Responsible
31 March till 1 May	Submissions to the DSP Information portal	Stakeholders
Today	**FRG presentation and discussion on DSP forecasts**	**AEMO, FRG**
End Aug	2022 ESOO publication	AEMO

Demand Side Participation (DSP) structure

All demand flexibility categories are included in AEMO's reliability forecasts, with categories reflected under Demand, DSP or Supply forecasts*.

Demand flexibility

Hot water load control
Time of Use Tariffs
EV charging (non V2G)
ONSG – non peaking type
Energy Storage (non VPP)

Demand Forecast

Market exposed customers
Aggregated dynamic customer response
Network event programs
ONSG – peaking type
Wholesale Demand Response (WDR)

DSP Forecast

Energy storage VPP
EV vehicle to grid (V2G)
Scheduled loads (pumped storage)

Supply Forecast

DSP forecasts capture market-driven and reliability event responses by electricity consumers or generators, not already accounted for elsewhere.

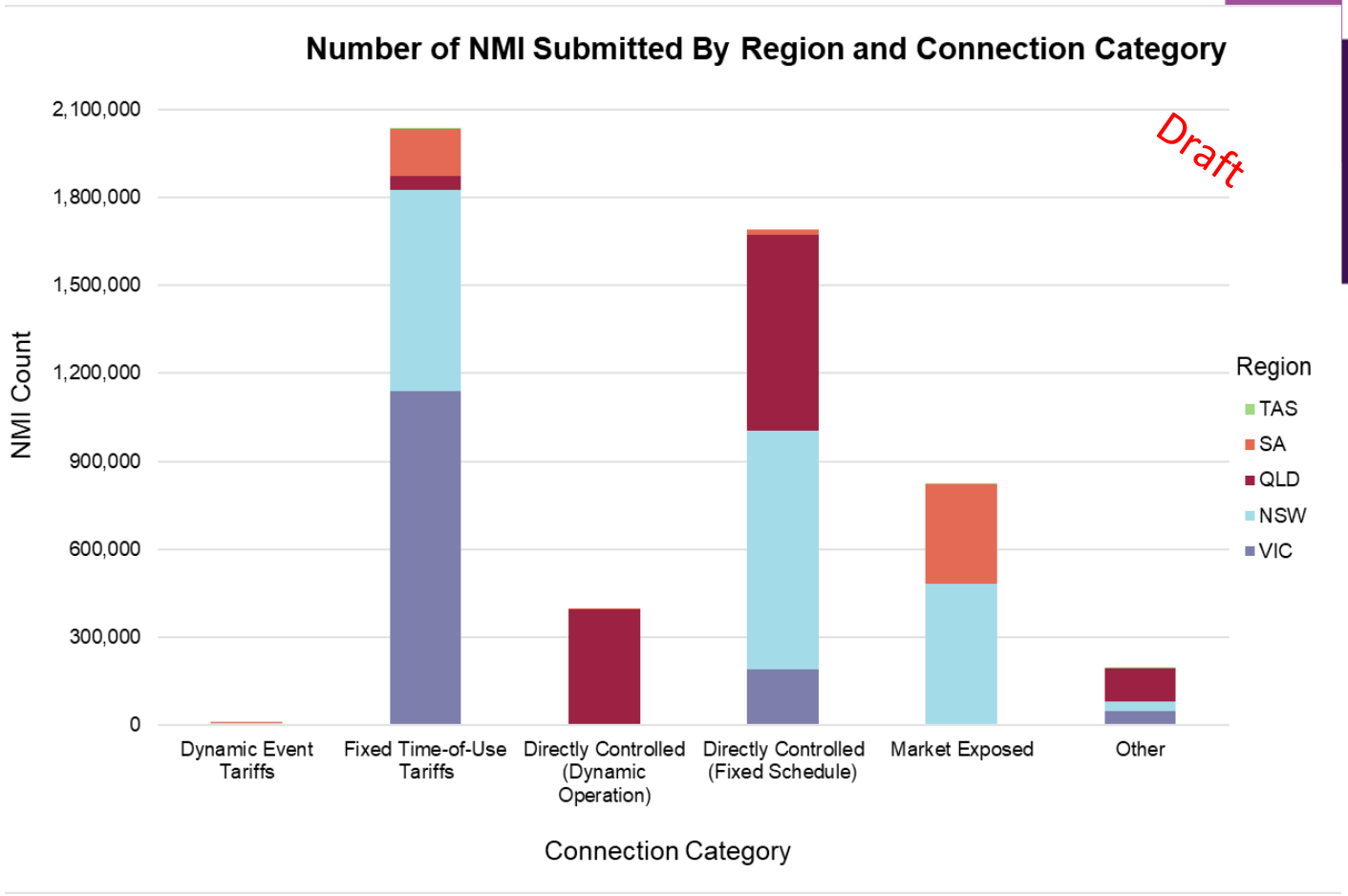
Key for Data Sources

DSP Portal Submission - Registered participants must provide DSP information NER 3.7D (b)
AEMO databases from multiple sources
Dispatched WDR

* Details of the Methodology can be found at https://aemo.com.au/DSP Methodology paper

More customers are reported to have demand flexibility, but most are already accounted for in Demand and Supply forecasts.

Submission Year	Count of Unique NMIs Submitted
2020	3.3 Million
2021	3.6 Million
2022	4.0 Million



The demand forecast already includes:

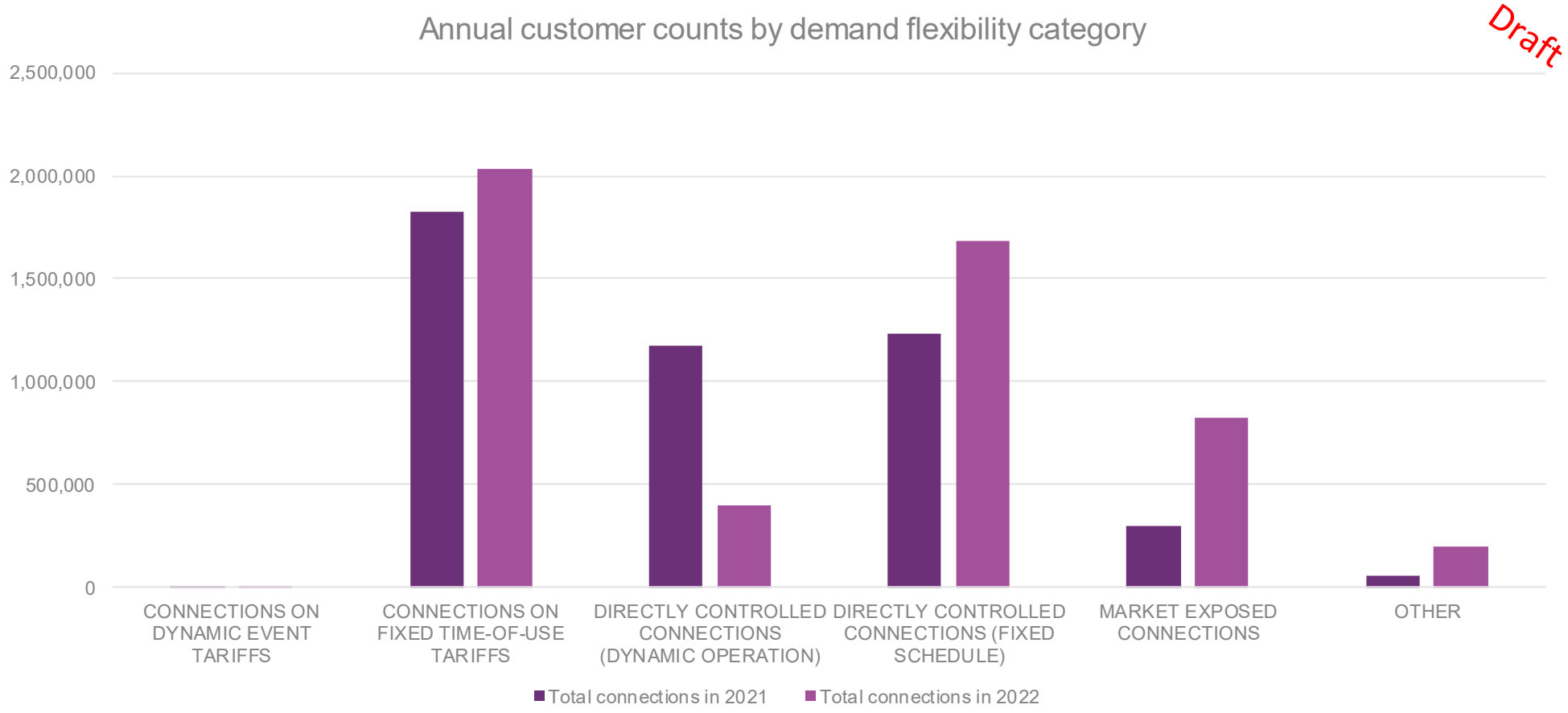
- Fixed time of use
- Directly controlled (fixed schedule)
- Some of market exposed (PV and hot water connections)
- Behind the meter storage not controlled by third party

The supply forecast already includes:

- Energy storage controlled by a third party*
- VPP*

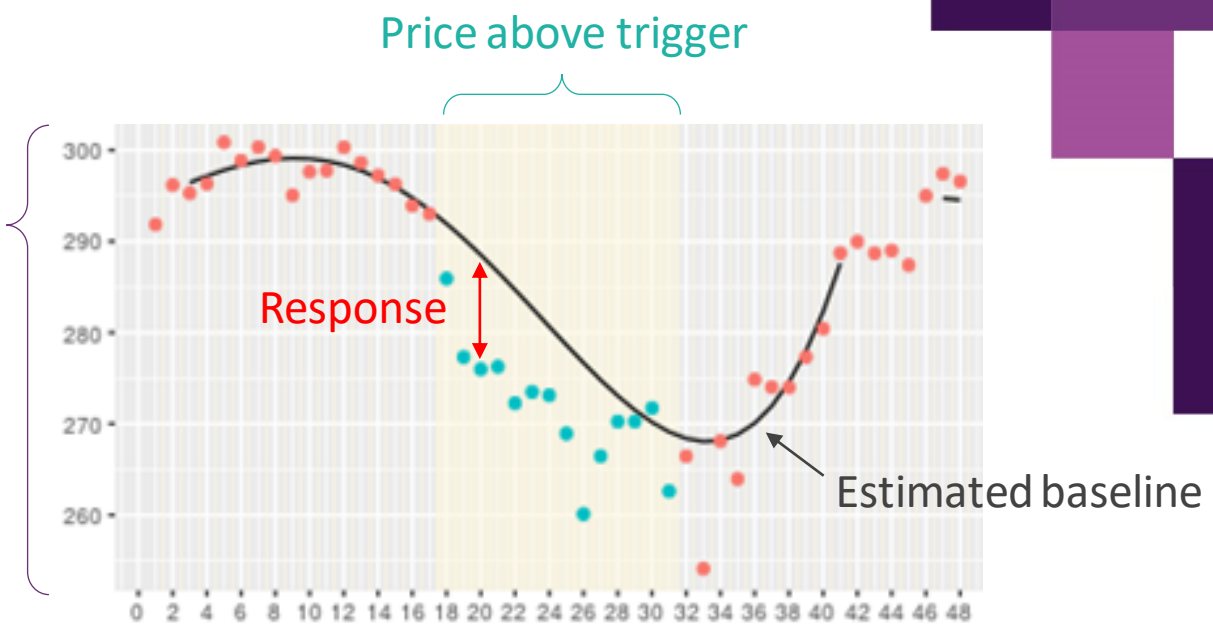
* too small to see on graph

Most DSP portal categories are up in 2022, but Directly Controlled (dynamic) connections, which dominate DSP, are down



DSP is estimated on Price Response and Reliability Response

- Price response (not used in ESOO)
  - Estimate of historical responses for different price triggers from reported DSP sites in submissions (as per inclusions listed in slide 3)
    - Excludes responses from WDR (see below) and RERT
  - Estimate of Wholesale Demand Response (WDR) – new type of response:
    - Last year estimated based on likely uptake
    - This year estimated based on real WDR dispatch as explained on the next two slides



- Reliability response (used in ESOO) =

Price response (from above) for highest trigger (>$7500/MWh)

+

Network event programs (if not modelled above)

+

Additional response (if not reflected in modelling otherwise)

As per DSP methodology

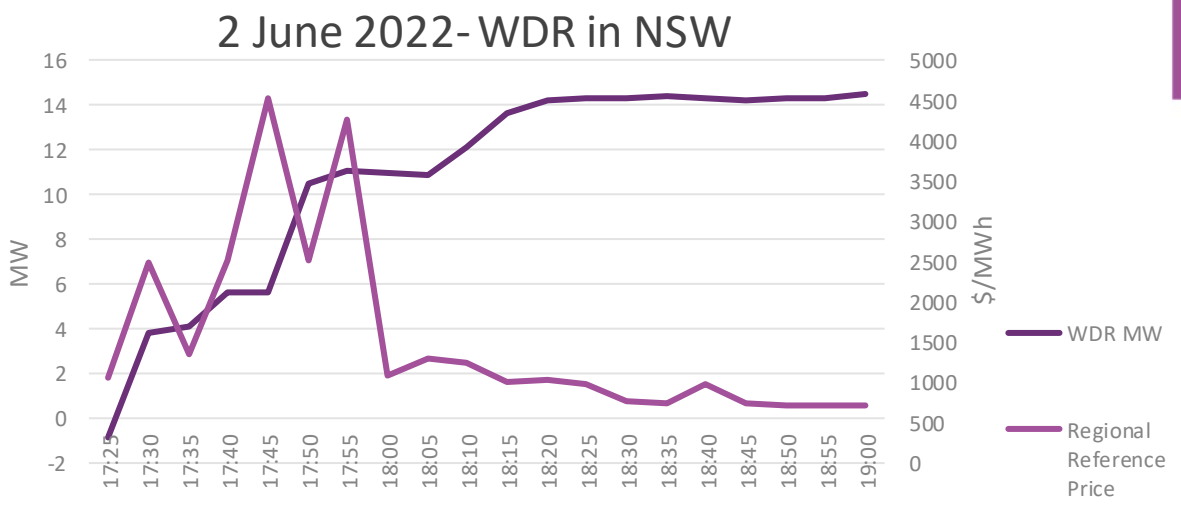
Wholesale Demand Response (WDR) registrations have grown dramatically, and response performance is being understood

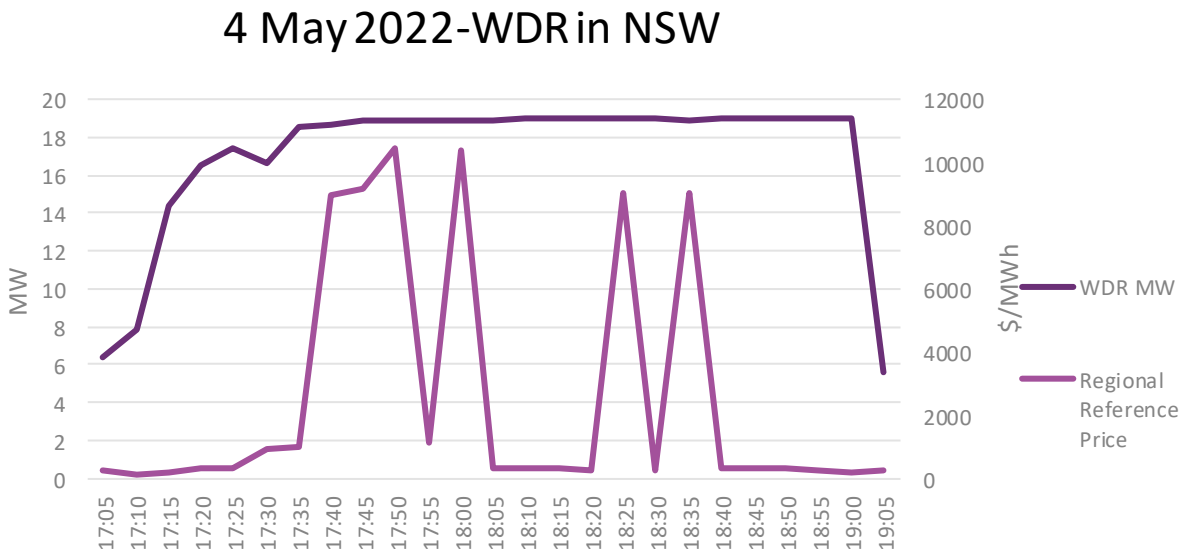
The WDR mechanism allows demand-side participation in the wholesale electricity market at any time. Registrations to perform WDR have grown from 2 last year, to 24 currently.

'Demand Response Service Provider' (DRSPs) are registered organisations aggregating demand response of large market loads. They receive payment for the dispatched response against a baseline estimate, at the electricity spot price.

The graphs show that:

- The response takes up to an hour to ramp up
- The response has a minimum duration, and may persist beyond spot price spikes





WDR estimates are revised downward, based on first year of results

2021 WDR forecasts were based on a high-level assumption of possible responses prior to the WDR commencing: 25% of the 50th percentile of historical responses by price trigger from Short Notice RERT providers, plus 2 MW of firm capacity identified in the DSP Information Portal.

The 2022 WDR estimates can be based on 2021/22 dispatches. NSW estimates reduce from 16 to 15 MW, and VIC reduces from 32 to 6 MW. In the absence of WDR dispatches in other states, AEMO assumes for next summer:

- WDR in QLD is the same level as VIC
- SA is one-third of VIC (based on market size)
- TAS is zero (little incentive for DSP)

Calculations

WDR occurs in 5 minute settlement intervals, and is mapped to 30 minute reliability periods for the ESOO.

- Each price trigger's response ratio is the ratio between settlement intervals where WDR was dispatched and intervals with the price above the trigger
- A weighted response for 30-minutes intervals is estimated based on response ratios and the median of dispatched WDR

Statistics of WDR based on 5 minutes settlement intervals

Region	Trigger ($)	Count of responses	Average (MW)	Median (MW)	Maximum (MW)	Count of price level	Response ratio
NSW	500	269	6.32	1.18	23.35	778	0.35
NSW	2500	32	16.78	18.91	23.35	40	0.80
NSW	7500	26	18.41	18.95	23.35	32	0.81
VIC	500	25	2.76	3.14	7.48	341	0.07
VIC	2500	11	4.00	3.42	7.48	11	1.00
VIC	7500	6	5.93	6.67	7.48	6	1.00

Estimated WDR for 30-minutes intervals

Region	Trigger ($)	Count of responses	Median (MW)	Response ratio	2022 Weighted response (MW)	2021 WDR estimates (MW)
NSW	500	59	1.24	0.35	0.43	7.30
NSW	2500	7	18.02	0.80	14.42	16.10
NSW	7500	3	18.02	0.81	14.64	16.10
VIC	500	7	2.36	0.07	0.17	19.70
VIC	2500	2	3.48	1.00	3.48	30.40
VIC	7500	1	5.93	1.00	5.93	32.30

Both tables based on <6 months of data, that includes WDR dispatched in 496 settlement intervals in NSW and 61 settlement intervals in VIC

2022 DSP Estimates: Queensland leads in DSP growth, with WDR related estimate revisions prominent in other state reductions

Draft

This estimate takes into account recent WDR up to the 10th June, and includes anticipated WDR in regions where it has not occurred yet.

Draft 2022-23 Summer DSP (incl. WDR) reliability response (MW)

	Trigger	New South Wales	Queensland	South Australia	Tasmania	Victoria
Draft 2022 forecast	>$300	25	35	2	9	7
	>$500	35	48	5	16	9
	>$1000	45	51	7	16	9
	>$2500	47	56	8	17	22
	>$5000	48	68	12	17	32
	>$7500	48	69	13	17	35
	Reliability	290	128	13	17	182
Final 2021 forecast	Reliability	308	104	33	26	212
	Drivers	WDR revisions	High prices drove DSP capacity increase	Lower industrial response	Estimation fluctuations in non-constrained region	WDR revisions

More difficult to estimate given recent sustained high price periods

Network event programs are consistent with previous year, adjusted for growth in customers signed up and validated against recent event responses.

Includes voluntary response from some large providers otherwise on RERT

Draft

New South Wales' Peak Demand Reduction Scheme drives growth in forecast NSW DSP out to 2030

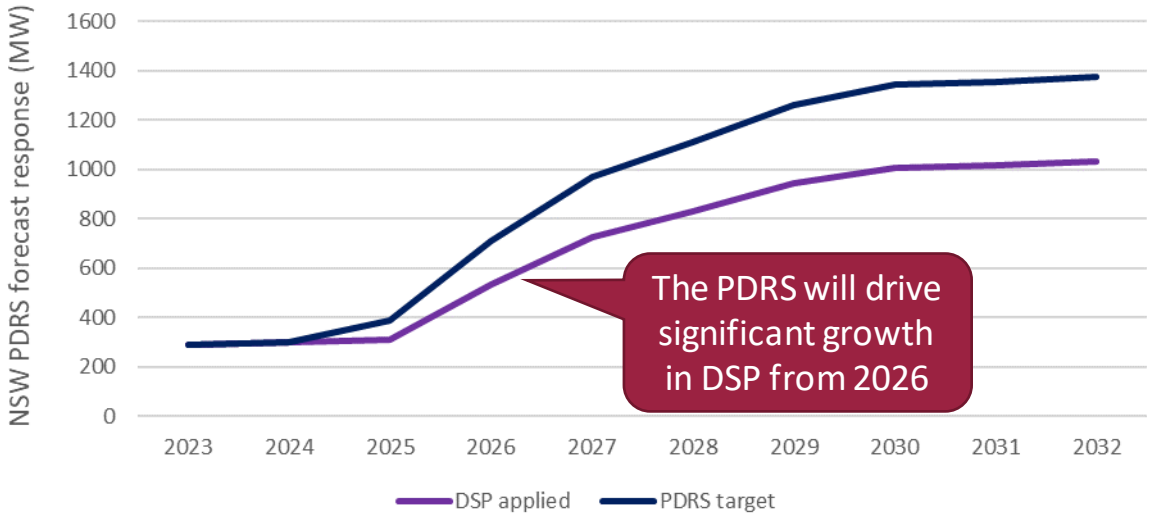
As with supply forecasts, AEMO only includes existing and committed DSP in its ESOO reliability assessment.

The NSW Peak Demand Reduction Scheme (PDRS) is now committed, and creates a financial incentive to reduce electricity consumption during peak times in New South Wales. The targeted reduction is to be met through DSP, energy efficiency and coordinated battery storage/EV operation.

AEMO only applies the PDRS proportion relating to AEMO's definition of DSP.

Legislated PDRS targets*

Compliance period	PDRS target
2022-2023	0.5%
2023-2024	1.0%
2024-2025	3.0%
2025-2026	5.5%
2026-2027	7.5%
2027-2028	8.5%
2028-2029	9.5%
2029-2030	10%
2030-2031	10%
2031-2032	10%



AEMO applies only ~75% of the reduction target as coming from DSP, the rest is assumed to be captured in energy efficiency measures or controlled batteries/EVs.

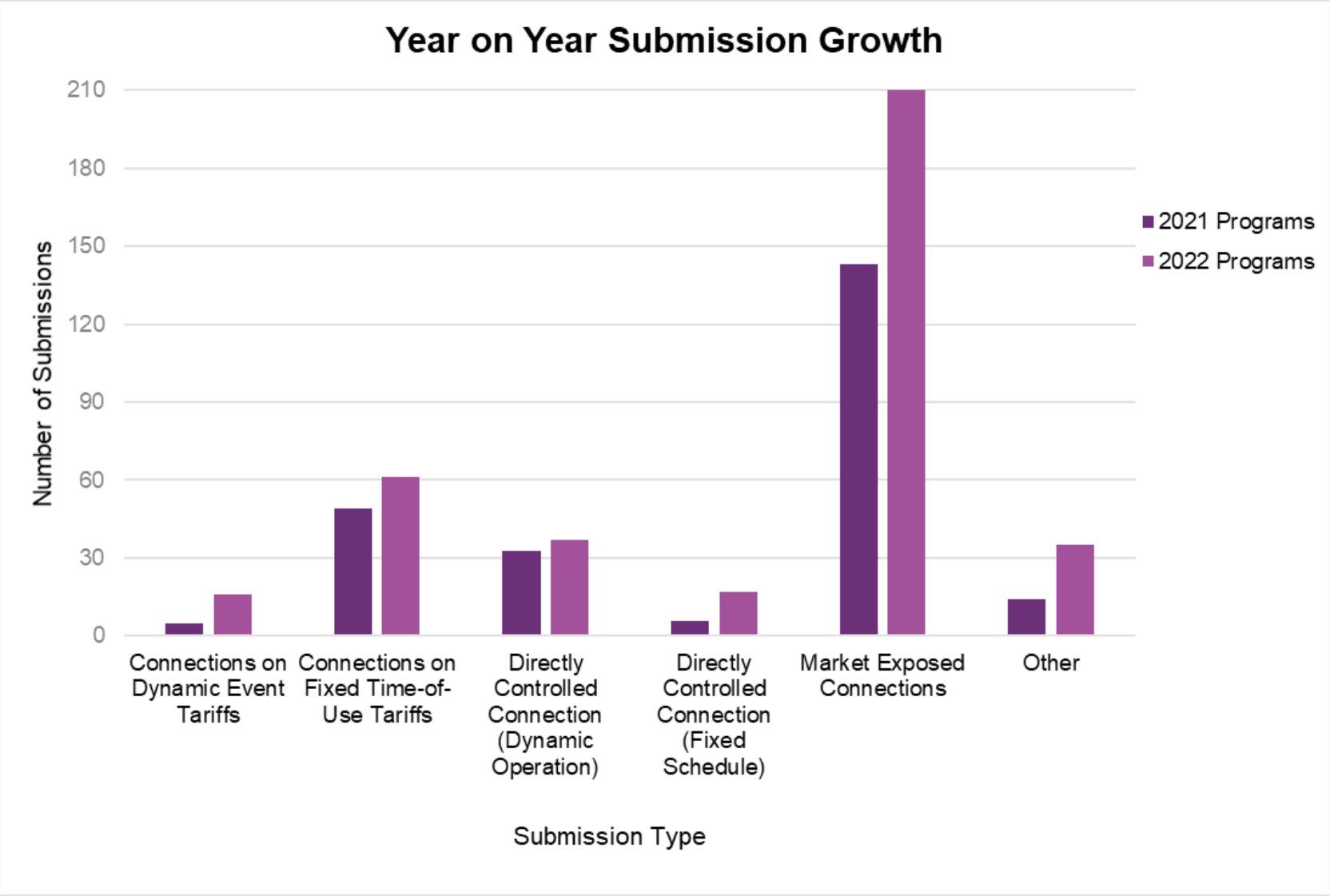
* Targets set for summer only. Target is for NSW only excluding ACT

Stakeholder discussion

Do you think these forecast trends are reasonable?

Are there any others material impacts that we have not taken into consideration?

What other considerations should we include in the future?

Submission Growth, 2021 vs 2022

Draft