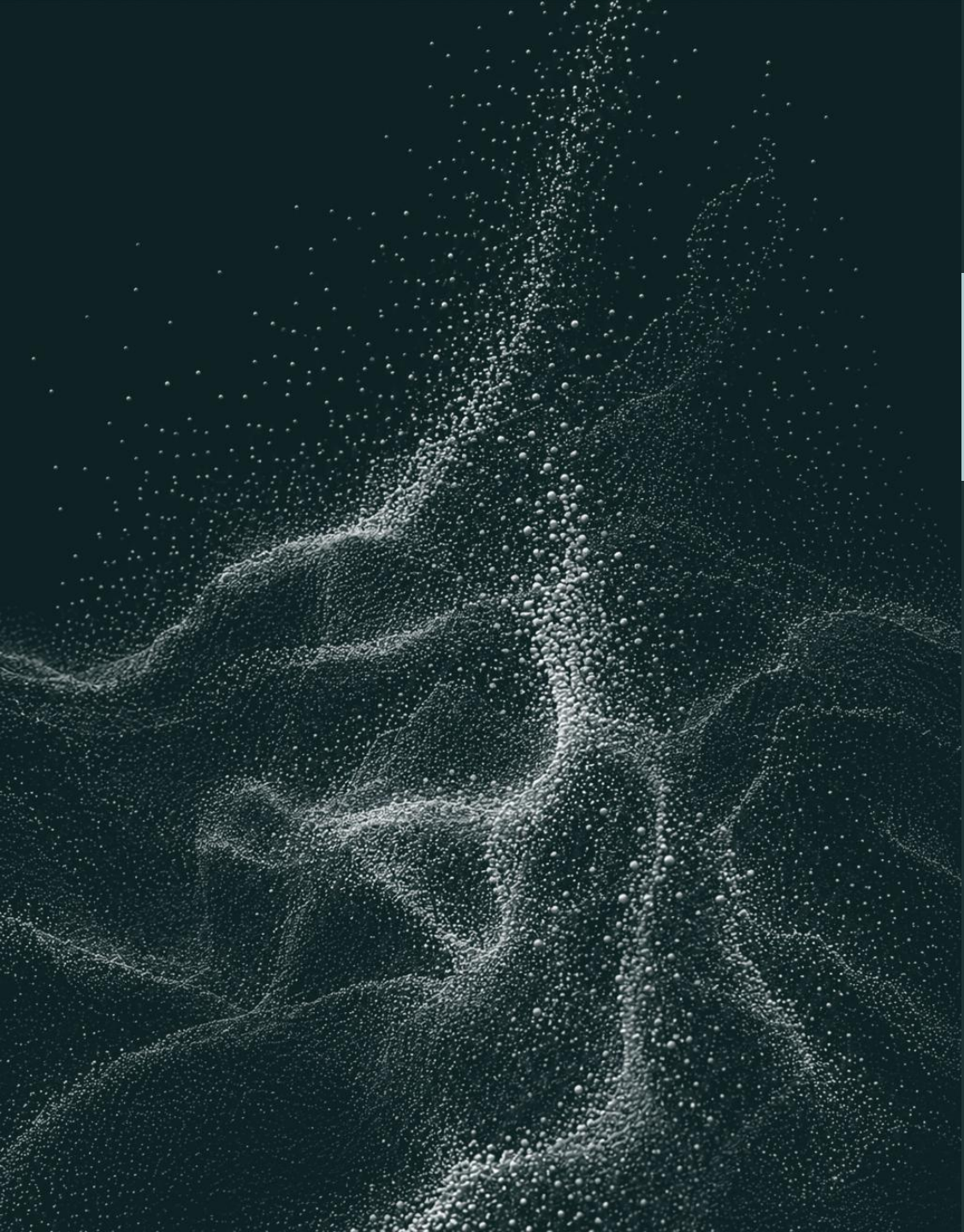




Network Access Quantities (NAQ) Benchmarking

2025 Reserve Capacity Cycle

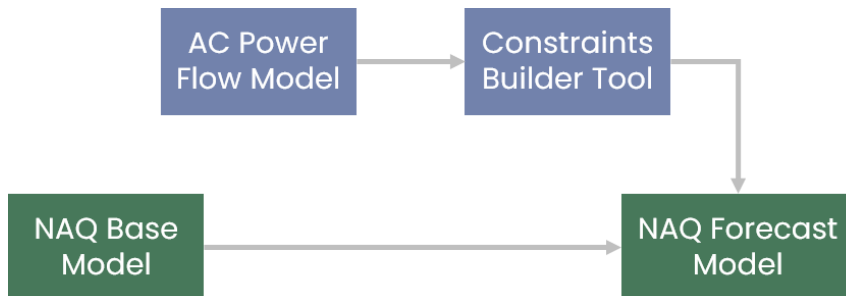
Ampere Labs NAQ model

NAQ Assessment Framework

We have developed an independent replica of AEMO's NAQ model that yields very similar outcomes to the published NAQs from previous Reserve Capacity Cycles.

Our NAQ modelling framework includes the following key components:

- **AC Power Flow Model:** a full network model of the SWIS that is used to flexibly calculate active power flows.
- **Constraints Builder Tool:** uses the AC power flow model to calculate RCM thermal constraint equations for an arbitrary set of facilities.
- **NAQ Base Model:** a replicated version of AEMO's NAQ model that is validated using input data from the previous reserve capacity cycle.
- **NAQ Forecast Model:** combines the base NAQ model with new and augmented constraint equations for forecast scenarios to simulate future NAQ outcomes.



2025 Reserve Capacity Cycle Benchmark

This report provides a comparison of our NAQ model against [AEMO's model for the 2025 Reserve Capacity Cycle](#).

The results are divided into two parts:

- NAQ outcomes for each facility at every NAQ stage
- Frequency of most binding NAQ constraints

The Ampere Labs model was able to arrive at the same final NAQ outcomes for each facility. The frequency of binding constraints were also very similar, although there were some differences with a few constraints where constraint binding was either more or less frequent in AEMO's model.

Comparison of NAQ outcomes: Ampere Labs vs AEMO models for 2025 RCC (1)

NAQ Entity	Stage 3A		Stage 3B		Stage 3C		Stage 4		Stage 5		Stage 6A	
	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO
N_ALBANY_WF1	7.736	7.736	7.736	7.736	7.986	7.986	7.986	7.986	7.986	7.986	7.986	7.986
N_ALCOA_WGP	18.88	18.88	18.88	18.88	26	26	26	26	26	26	26	26
N_ALINTA_PNJ_U1	141.164	141.164	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447
N_ALINTA_PNJ_U2	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447	142.447
N_ALINTA_WGP_ESR1	48.536	48.536	48.536	48.536	49.693	49.693	49.693	49.693	49.693	49.693	49.693	49.693
N_ALINTA_WGP_GT	207.076	207.076	207.076	207.076	207.969	207.969	208	208	208	208	208	208
N_ALINTA_WGP_U2	207.076	207.076	207.076	207.076	207.936	207.936	208	208	208	208	208	208
N_ALINTA_WWF	16.859	16.859	16.859	16.859	21.011	21.011	21.011	21.011	21.011	21.011	21.011	21.011
N_AMBRISOLAR_PV1	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
N_AMBRISOLAR_PV2							3.155	3.155	3.155	3.155	3.155	3.155
N_ARROWSMITH_EAST_G1	85	85	85	85	85	85	85	85	85	85	85	85
N_BADGINGARRA_WF1	26.098	26.098	26.098	26.098	26.117	26.117	26.117	26.117	26.117	26.117	26.117	26.117
N_BALDIVIS_ESR1							0.576	0.576	0.576	0.576	0.576	0.576
N_BIOGAS01	0.425	0.425	0.425	0.425	0.425	0.425	0.425	0.425	0.425	0.425	0.425	0.425
N_BLAIRFOX_KARAKIN_WF1	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
N_BOONANARRING_PV_ESR									1.481	1.481	1.48	1.48
N_BREMER_BAY_WF1	0.227	0.227	0.227	0.227	0.227	0.227	0.227	0.227	0.227	0.227	0.227	0.227
N_BW1_BLUEWATERS_G2	217	217	217	217	217	217	217	217	217	217	217	217
N_BW2_BLUEWATERS_G1	217	217	217	217	217	217	217	217	217	217	217	217
N_CAREYPARK_ESR1							0.209	0.209	0.209	0.209	0.209	0.209
N_CAREYPARK_ESR2							0.209	0.209	0.209	0.209	0.209	0.209
N_COCKBURN_CCG1	240	240	240	240	240	240	240	240	240	240	240	240
N_COLLIE_BEES2	293.56	293.56	293.56	293.56	293.56	293.56	293.56	293.56	293.56	293.56	293.56	293.56
N_COLLIE_ESR1	185.975	185.975	185.975	185.975	185.975	185.975	185.975	185.975	185.975	185.975	185.975	185.975
N_COLLIE_ESR4	176.01	176.01	176.01	176.01	250	250	250	250	250	250	250	250
N_COLLIE_ESR5	175.347	175.347	175.347	175.347	250	250	250	250	250	250	250	250
N_DCWL_DENMARK_WF1	0.566	0.566	0.566	0.566	0.566	0.566	0.566	0.566	0.566	0.566	0.566	0.566
N_EDWFMAN_WF1	10.409	10.409	10.409	10.409	10.409	10.409	10.409	10.409	10.409	10.409	10.409	10.409
N_ENELX_DSP_01	110	110	110	110	112	112	112	112	112	112	112	112
N_ENELX_DSP_02									18	18	18	18
N_FLATROCKS_WF1	25.341	25.341	25.341	25.341	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432

Comparison of NAQ outcomes: Ampere Labs vs AEMO models for 2025 RCC (2)

NAQ Entity	Stage 3A		Stage 3B		Stage 3C		Stage 4		Stage 5		Stage 6A	
	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO
N_GER_ESR1									9.999	9.999	9.999	9.999
N_GRASMERES_WF1	5.434	5.434	5.434	5.434	5.552	5.552	5.552	5.552	5.552	5.552	5.552	5.552
N_GREENOUGH_RIVER_PV1	3.403	3.403	3.403	3.403	3.403	3.403	3.403	3.403	3.403	3.403	3.403	3.403
N_GRIFFINP_DSP_01					45.01	45.01	45.01	45.01	45.01	45.01	45.01	45.01
N_HENDERSON_RENEWABLE_IG1	1.474	1.474	1.474	1.474	1.474	1.474	1.474	1.474	1.474	1.474	1.474	1.474
N_INVESTEC_COLLGAR_WF1	27.964	27.964	27.964	27.964	29.982	29.982	29.982	29.982	29.982	29.982	29.982	29.982
N_KALBARRI_WF1	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096
N_KEMERTON_GT11	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919
N_KEMERTON_GT12	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919	151.919
N_KING_ROCKS_WF1							17.13	17.13	17.13	17.13	17.13	17.13
N_KWINANA_ESR1	42.75	42.75	42.75	42.75	42.75	42.75	42.75	42.75	42.75	42.75	42.75	42.75
N_KWINANA_ESR2	224.045	224.045	224.045	224.045	224.045	224.045	224.045	224.045	224.045	224.045	224.045	224.045
N_KWINANA_GT2	106.763	106.763	106.763	106.763	106.763	106.763	106.763	106.763	106.763	106.763	106.763	106.763
N_KWINANA_GT3	106.804	106.804	106.804	106.804	106.804	106.804	106.804	106.804	106.804	106.804	106.804	106.804
N_MERREDIN_ESR1	94.168	94.168	94.168	94.168	94.168	94.168	94.168	94.168	94.168	94.168	94.168	94.168
N_MERSOLAR_PV1	5.561	5.561	5.561	5.561	5.561	5.561	5.561	5.561	5.561	5.561	5.561	5.561
N_MUCHEA_ESR1							150	150	150	150	150	150
N_MUJA_G7	211	211	211	211	211	211	211	211	211	211	211	211
N_MUJA_G8	211	211	211	211	211	211	211	211	211	211	211	211
N_MWF_MUMBIDA_WF1	7.561	7.561	7.909	7.909	7.996	7.996	7.996	7.996	7.996	7.996	7.996	7.996
N_NAMKKN_MERR_SG1	82	82	82	82	82	82	82	82	82	82	82	82
N_NEWGEN_KWINANA_CCG1	327.8	327.8	327.8	327.8	327.8	327.8	327.8	327.8	327.8	327.8	327.8	327.8
N_NEWGEN_NEERABUP_GT1	330.6	330.6	330.6	330.6	330.6	330.6	330.6	330.6	330.6	330.6	330.6	330.6
N_NOR_ESR1									9.9	9.9	9.9	9.9
N_NORTHAM_SF_PV1	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
N_OSBORNEPARK_G1							4.99	4.99	4.99	4.99	4.99	4.99
N_PERTHENERGY_KWINANA_GT1	109	109	109	109	109	109	109	109	109	109	109	109
N_PERTHENERGY_KWINANA_GT2							176	176	176	176	176	176
N_PHOENIX_KWINANA_WTE_G1	33.909	33.909	33.909	33.909	35.684	35.684	35.684	35.684	35.684	35.684	35.684	35.684
N_PINJAR_GT1	29.07	29.07	29.07	29.07	32	32	32	32	32	32	32	32
N_PINJAR_GT10	110.5	110.5	110.5	110.5	110.5	110.5	110.5	110.5	110.5	110.5	110.5	110.5

Comparison of NAQ outcomes: Ampere Labs vs AEMO models for 2025 RCC (3)

NAQ Entity	Stage 3A		Stage 3B		Stage 3C		Stage 4		Stage 5		Stage 6A	
	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO
N_PINJAR_GT11	123.35	123.35	123.35	123.35	123.35	123.35	123.35	123.35	123.35	123.35	123.35	123.35
N_PINJAR_GT2	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72	29.72
N_PINJAR_GT3	37	37	37	37	37	37	37	37	37	37	37	37
N_PINJAR_GT4	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95
N_PINJAR_GT5	37	37	37	37	37	37	37	37	37	37	37	37
N_PINJAR_GT7	35.166	35.166	35.166	35.166	35.166	35.166	35.166	35.166	35.166	35.166	35.166	35.166
N_PINJAR_GT9	110.5	110.5	110.5	110.5	114.314	114.314	114.314	114.314	114.314	114.314	114.314	114.314
N_PRDSO_WALPOLE_HG1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
N_RED_HILL	2.274	2.274	2.274	2.274	2.274	2.274	2.274	2.274	2.274	2.274	2.274	2.274
N_ROCKINGHAM	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999
N_SBSOLAR1_CUNDERDIN_PV1	40.794	40.794	40.794	40.794	40.794	40.794	40.794	40.794	40.794	40.794	40.794	40.794
N_SIMCOA_DSP_01	20.994	20.994	23	23	23	23	23	23	23	23	23	23
N_SKYFRM_MTBARKER_WF1	0.924	0.924	0.924	0.924	0.924	0.924	0.924	0.924	0.924	0.924	0.924	0.924
N_SOUTH_CARDUP	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
N_SOUTHERNRIVER_ESR1							0.284	0.284	0.284	0.284	0.284	0.284
N_STHRNCRS_EG							23	23	23	23	23	23
N_SYNERGY_DSP_04	38.123	38.123	42	42	42	42	42	42	42	42	42	42
N_TAMALA_PARK	3.242	3.242	3.242	3.242	3.242	3.242	3.242	3.242	3.242	3.242	3.242	3.242
N_TESLA_COLLSMALL_ESR1									4.999	4.999	4.999	4.999
N_TESLA_KEMERTON_G1	9.205	9.205	9.999	9.999	9.999	9.999	9.999	9.999	9.999	9.999	9.999	9.999
N_TESLA_KEMERTON_G2							9.999	9.999	9.999	9.999	9.999	9.999
N_TESLA_KEMERTON_G3							9.999	9.999	9.999	9.999	9.999	9.999
N_TESLA_PICTON_G1					4.9995	6.22	9.999	9.999	9.999	9.999	9.999	9.999
N_TIWEST_COG1	36	36	36	36	36	36	36	36	36	36	36	36
N_USHER_ESR1							0.209	0.209	0.209	0.209	0.209	0.209
N_WADDI_WF1							18.169	18.169	18.169	18.169	18.169	18.169
N_WAROONA_PV1											88.06	88.06
N_WARRADARGE_WF1	34.902	34.902	34.902	34.902	36.95	36.95	36.95	36.95	36.95	36.95	36.95	36.95
N_WARRADARGE_WF1_IGS_01_UPG_01							19.438	19.438	19.438	19.438	19.438	19.438
N_WITHERS_ESR1							0.209	0.209	0.209	0.209	0.209	0.209
N_WITHERS_ESR2							0.209	0.209	0.209	0.209	0.209	0.209
N_YANDIN_WF1	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5	37.5

Comparison of binding constraint frequency for 2025 RCC

Binding Constraint Equation	Stage 3A		Stage 3B		Stage 3C		Stage 4		Stage 5		Stage 6A	
	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO	Ampere	AEMO
RCM-RCC2025-CY2027-S3>{LWT-ST 91, SPS_WGP}[PNJ81-PPBK (PNJ-)]	2.073%	1.900%	2.270%	2.085%	5.672%	5.583%						
RCM-RCC2025-CY2027-S3>{MU BTT1, SPS_MU_BTT23_OLOAD}[PIC-MRR 81 (MRR~)]	1.730%	1.630%	1.651%	1.795%	0.721%	1.135%						
RCM-RCC2025-CY2027-S3>{RO-WAI 81, SPS_WGP}[PNJ81-PPBK (PNJ-)]	0.918%	0.405%	1.002%	0.403%	2.055%	1.104%						
RCM-RCC2025-CY2027-S3>{PIC-PNJ-BSN-KEM 81}[PIC-MRR 81 (MRR~)]	0.052%	0.058%	0.088%	0.088%	0.053%	0.093%						
RCM-RCC2025-CY2027-S3>{ST T1}[NT81-NEB (NT~)]	0.000%	0.005%	0.000%	0.000%	0.004%	0.002%						
RCM-RCC2025-CY2027-S4>{LWT-ST 91, SPS_KND, SPS_PPBK, SPS_WGP}[PNJ81-PPBK (PNJ-)]							5.934%	5.453%	5.667%	5.570%	5.360%	5.198%
RCM-RCC2025-CY2027-S4>{LWT-ST 91, SPS_PPBK, SPS_WGP}[PNJ81-PPBK (PNJ-)]							0.126%	1.365%	0.161%	1.375%	0.147%	1.415%
RCM-RCC2025-CY2027-S4>{MU BTT1, SPS_KND, SPS_MU_BTT23_OLOAD}[PIC-MRR 81 (MRR~)]							0.699%	0.933%	0.513%	0.710%	0.785%	0.875%
RCM-RCC2025-CY2027-S4>{WT-CTE 81}[ST-SF 81 (SF-)]							0.336%	0.348%	0.436%	0.418%	0.554%	0.443%
RCM-RCC2025-CY2027-S4>{PIC-PNJ-BSN-KEM 81, SPS_KND}[PIC-MRR 81 (MRR~)]							0.223%	0.273%	0.202%	0.245%	0.414%	0.413%
RCM-RCC2025-CY2027-S4>{MU BTT1, SPS_MU_BTT23_OLOAD}[PIC-MRR 81 (MRR~)]							0.012%	0.170%	0.004%	0.133%	0.028%	0.145%
RCM-RCC2025-CY2027-S4>{PIC-PNJ-BSN-KEM 81}[PIC-MRR 81 (MRR~)]							0.000%	0.043%	0.000%	0.048%	0.000%	0.080%
RCM-RCC2025-CY2027-S4>{ST-EP 82}[SF-AMT 81 (AMT-)]							0.024%	0.020%	0.025%	0.008%	0.013%	0.020%
RCM-RCC2025-CY2027-S4>{NT-SPK 81}[NT81-NEB (NT~)]							0.002%	0.000%	0.024%	0.010%	0.010%	0.013%
RCM-RCC2025-CY2027-S4>{ST-BTY 81}[SF-AMT 81 (AMT-)]							0.002%	0.005%	0.002%	0.000%	0.002%	0.005%
RCM-RCC2025-CY2027-S4>{GLT-ST 91, SPS_KND}[ST-BTY 81 (BTY-)]							0.000%	0.000%	0.000%	0.000%	0.003%	0.003%



Thank you!

Please feel free to reach out for more
information