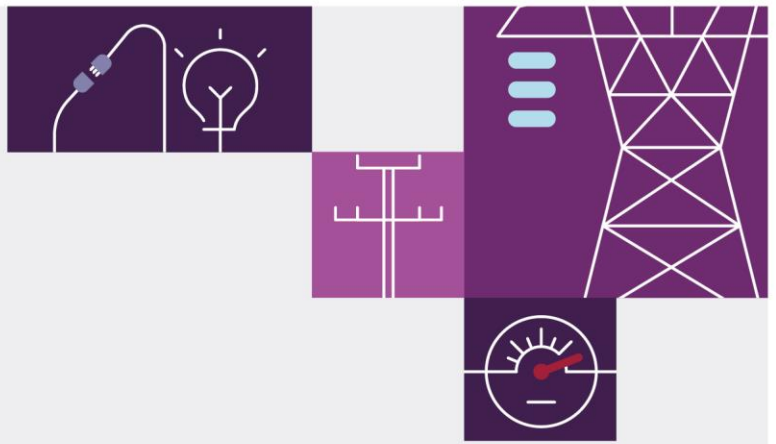


South Australian Generation Forecasts

May 2023

South Australian Advisory Functions





Important notice

Purpose

The purpose of this publication is to provide information to the South Australian Minister for Energy and Mining about South Australia's electricity generation forecasts.

AEMO publishes this South Australian Generation Forecasts report in accordance with its additional advisory functions under section 50B of the National Electricity Law. This publication is generally based on information available to AEMO as at 16 December 2022, as modelled for the 2023 Gas Statement of Opportunities (published on 16 March 2023).

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1 Electricity generation forecasts

The *South Australian Generation Forecasts* report provides forecasts of the potential future electricity generation mix in South Australia over the next 10 years.

1.1 Overview

The electricity generation and storage projections are based on analysis conducted for AEMO's 2023 *Gas Statement of Opportunities* (GSOO)¹ for eastern and south-eastern Australia, which modelled future generation and interconnector flows in the National Electricity Market (NEM) under a range of plausible scenarios.

Key forecast trends

The key generation and storage forecast trends highlighted by the projections are:

- The amount of forecast generation beyond 2022-23 will be influenced by the announced retirement of existing assets, the development of currently proposed generation, storage and transmission projects, and the potential for increased demand (in scenarios with high economic growth, high electrification and/or hydrogen industry growth).
- Both wind generation and large-scale solar generation are forecast to increase in the near term due to commissioning of new projects. The forecast degree of growth beyond this point varies between scenarios depending on future demand growth, government policies, carbon emission trajectories and subsequent coal generation closures.
- The annual volume of gas and diesel generation is forecast to decrease relative to history. This is driven by a combination of factors: the retirement of Torrens Island B and Osborne power stations, the commissioning of new variable renewable energy (VRE) generation and the commissioning of Project EnergyConnect (PEC) in 2025-26.
 - Following the development of these forecasts, AEMO was informed that the Osborne power station closure date was delayed from 2023 to 2026.
 - Exports from South Australia show a substantial increase from 2025-26 to coincide with the commissioning of PEC.
- Forecast growth in battery technologies, including both large-scale battery generation and Virtual Power Plants (VPPs), demonstrates the growing value in generation technologies that can complement the natural variability of renewable generation, by providing rapid start capabilities and increased operational flexibility.
- Rooftop photovoltaics (PV) and PV non-scheduled generation (PVNSG) are forecast to continue increasing over the next decade.

¹ At <https://aemo.com.au/en/energy-systems/gas/gas-forecasting-and-planning/gas-statement-of-opportunities-gsoo>.

1.2 Scenarios analysed

This report is based on scenarios and sensitivities described in AEMO's 2023 *Gas Statement of Opportunities* (GSOO). More detail is available in the Draft 2023 *Inputs Assumptions and Scenarios Report*²; Table 1 summarises the high-level narratives, and the 2022 *Integrated System Plan* (ISP)³ scenario the transmission augmentations and generation builds and retirements (development path) that was applied for each scenario. The scenarios are selected to provide perspective on the range of outcomes possible under different future scenarios.

Table 1 Descriptions of AEMO's scenarios used in this report

Scenario	Description	2022 ISP Development Path
Orchestrated Step Change (1.8°C)	This scenario centres around Australia's energy transformation required to limit the global temperature rise below 2 °C. In this scenario, consumers embrace opportunities to reduce emissions through strong uptake of consumer energy resources (CER) and orchestration of the use of these to best address system needs. It also has a significant electrification across all sectors where technically practical.	Step Change
Green Energy Exports (1.5°C)	This scenario reflects very strong decarbonisation activities domestically and globally to limit temperature increases to 1.5°C, resulting in rapid transformation of Australia's energy sectors, including greater development of alternative energy sources domestically, particularly green hydrogen.	Hydrogen Superpower
Progressive Change (2.6°C)	This scenario follows a slower global recovery from the COVID-19 pandemic and ongoing disruptions affecting the international energy markets and associated supply chains, which affect energy consumers' actions to decarbonise the economy. This scenario anticipates slow economic growth and a challenging economic environment including the greatest industrial closure risks.	Progressive Change

1.3 Electricity forecasts

A summary of forecast electricity generation, interconnection, and loads for South Australia from 2022-23 to 2031-32, across three scenarios, is shown in Table 2.

For this analysis, all modelling assumptions are described in the 2023 GSOO. Key assumptions include:

- New generator developments, and closures, are as in AEMO's November 2022 Generation Information publication⁴.
- Transmission and generation developments (beyond those considered committed within the November 2022 Generation Information publication) are as forecast in the 2022 ISP, including the commissioning of Project EnergyConnect and system security constraints. Transmission and generation developments (beyond those committed) are as in the 2022 ISP. This includes the commissioning of Project EnergyConnect and system security constraints.
- Forecast gas prices from the Draft 2023 *Inputs, Assumptions and Scenarios Report (IASR)*.

² At https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/2023-inputs-assumptions-and-scenarios-consultation/draft-2023-inputs-assumptions-and-scenarios-report.pdf.

³ At <https://www.aemo.com.au/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp>.

⁴ At <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information>.



- Electricity demand and consumption forecasts and corresponding rooftop PV forecasts as per the 2022 Electricity Statement of Opportunities (ESOO)⁵.

⁵ At <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-reliability/nem-electricity-statement-of-opportunities-esoo>

In Table 2:

- S stands for Scheduled, SS for semi-scheduled, NS for non-scheduled generation.
- Rooftop PV means behind-the-meter PV systems up to 100 kilowatts (kW).
- PVNSG means distributed PV systems greater than 100 kW, up to 30 megawatts (MW).
- ONSG (other non-scheduled generation) is small non-scheduled generation less than 30 MW (a mix of renewable and non-renewable generation). Peaking generation is excluded from the Other Non-Scheduled Generation (ONSG) in this year's forecast as outlined in AEMO's Electricity Demand Forecasting Methodology. Peaking generation is now considered as a form of demand side participation (DSP).
- VPP stands for Virtual Power Plant, that is, orchestrated behind-the-meter battery storage systems.

Table 2 Forecast annual energy supply mix for South Australia (gigawatt hours [GWh])

Financial year	Generation									Interconnector flow			Load
	Wind (SS, NS)	Solar (SS)	Battery (S)	ONSG	PVNSG	Rooftop PV	VPP	Gas ⁶ and diesel (S)	Total	Imports to SA	Net interchange (+ve import)	Exports from SA	Battery (S) and VPP
Orchestrated Step Change (1.8°C)													
2021-22 Actuals	6,131	698	88	69	371	2,385	40 †	4,118	13,860	1,083	444	639	158
2022-23 ††	6,776	883	83	57	453	3,243	53	4,290	15,838	1,646	371	1,217	161
2023-24	6,889	1,117	168	57	534	3,652	92	3,487	15,996	2,052	741	1,311	308
2024-25	7,587	1,091	149	57	629	3,995	130	2,202	15,841	2,621	1,305	1,316	330
2025-26	10,248	1,611	132	57	729	4,310	159	1,251	18,498	2,734	-751	3,486	345
2026-27	11,084	1,566	125	57	830	4,620	188	1,188	19,658	2,497	-1,420	3,917	370
2027-28	10,935	1,484	111	57	939	4,931	218	1,206	19,881	2,646	-1,221	3,866	388
2028-29	12,386	1,402	97	57	1,044	5,191	242	1,088	21,507	2,415	-2,412	4,827	401
2029-30	12,232	1,436	276	51	1,151	5,476	282	1,297	22,202	2,286	-2,544	4,829	664
2030-31	12,308	1,421	288	51	1,258	5,718	331	1,428	22,803	2,421	-2,629	5,050	735
2031-32	12,113	1,312	246	52	1,369	6,028	395	897	22,411	1,946	-1,729	3,676	762

⁶ In February 2023 AEMO was advised that Osborne Power Station will delay its closure timing from 2023 to 2026. This 2023 South Australian Generation Forecast does not capture this change, however sensitivity testing undertaken to evaluate the impact of the closure delay has indicated that total gas generation may increase by approximately 5-10% over the 2023-24 to 2025-26 period.

Financial year	Generation									Interconnector flow			Load
	Wind (SS, NS)	Solar (SS)	Battery (S)	ONSG	PVNSG	Rooftop PV	VPP	Gas ⁶ and diesel (S)	Total	Imports to SA	Net interchange (+ve import)	Exports from SA	Battery (S) and VPP
Green Energy Exports (1.5 °C)													
2021-22 Actuals	6,131	698	88	69	371	2,385	40 †	4,118	13,860	1,083	444	639	158
2022-23 ††	6,785	885	70	57	468	3,417	58	5,992	17,732	1,041	-610	1,626	152
2023-24	6,935	1,117	132	57	586	3,911	110	3,940	16,788	2,380	1,267	1,114	285
2024-25	9,627	1,084	105	57	735	4,379	163	2,101	18,252	2,259	589	1,670	317
2025-26	12,884	1,483	165	57	886	4,800	200	1,035	21,510	2,412	-1,795	4,207	433
2026-27	14,786	2,477	202	57	1,039	5,215	226	1,485	25,487	2,718	-1,390	4,108	507
2027-28	14,453	3,307	242	57	1,194	5,647	258	1,994	27,152	2,555	-2,330	4,885	594
2028-29	22,073	6,493	236	57	1,341	6,024	294	1,759	38,278	3,011	-2,212	5,223	629
2029-30	21,932	7,008	233	51	1,490	6,427	364	1,546	39,051	2,983	-2,125	5,109	708
2030-31	27,692	9,416	251	51	1,636	6,768	434	1,610	47,859	1,898	-3,861	5,759	813
2031-32	28,152	9,534	206	52	1,785	7,176	520	1,112	48,537	2,847	-1,654	4,500	862
Progressive Change (2.6 °C)													
2021-22 Actuals	6,131	698	88	69	371	2,385	40 †	4,118	13,860	1,083	444	639	158
2022-23 ††	6,703	842	73	57	456	3,303	59	3,625	15,118	1,482	-60	1,546	154
2023-24	6,804	1,000	139	57	514	3,644	80	2,769	15,008	1,870	286	1,584	260
2024-25	6,646	951	130	57	550	3,894	111	1,814	14,152	2,551	1,186	1,365	284
2025-26	6,821	1,450	111	57	586	4,125	120	1,162	14,431	4,675	1,412	3,263	273
2026-27	6,788	1,422	109	57	629	4,370	151	1,078	14,604	4,746	1,544	3,203	307
2027-28	6,770	1,403	119	57	671	4,625	182	1,303	15,130	4,758	1,389	3,369	356

Financial year	Generation									Interconnector flow			Load
	Wind (SS, NS)	Solar (SS)	Battery (S)	ONSG	PVNSG	Rooftop PV	VPP	Gas ⁶ and diesel (S)	Total	Imports to SA	Net interchange (+ve import)	Exports from SA	Battery (S) and VPP
2028-29	6,750	1,443	188	57	709	4,830	207	1,663	15,849	3,550	812	2,738	468
2029-30	5,981	1,421	187	51	759	5,033	229	1,202	14,864	3,902	1,824	2,078	492
2030-31	6,919	1,466	210	51	832	5,184	253	2,164	17,080	2,850	-111	2,961	546
2031-32	8,676	1,470	183	52	923	5,423	297	1,527	18,550	2,683	-952	3,635	567

† The 2021-22 actuals for VPP generation and load are estimated using a forecast value from AEMO's South Australian generation dashboard

†† The 2022-23 forecast generation for the orchestrated step change, green energy export, and progressive change scenarios represent full-year forecast values, and are not adjusted to reflect actuals that have already happened during FY22-23.