

Real Assets Quarterly: Australian renewable energy market and battery storage outlook

June Quarter, 2022



Summary

The Australian renewables market has been volatile but there are positive developments ahead

Historically, the development of renewables in Australia has been unpredictable, driven by repeated regulatory changes and differing policy views leading to investor uncertainty. However, structural tailwinds, positive corporate sentiment and significant recent investor activity, may support the sector.

1 Market structure

Structure of the Australian market plays an important role in assessing the opportunity set and the historical issues

2 Generation growth

Significant growth in intermittent renewable generation – surpassing initial targets, thus creating electricity market and grid stability issues

3 The market has changed over time

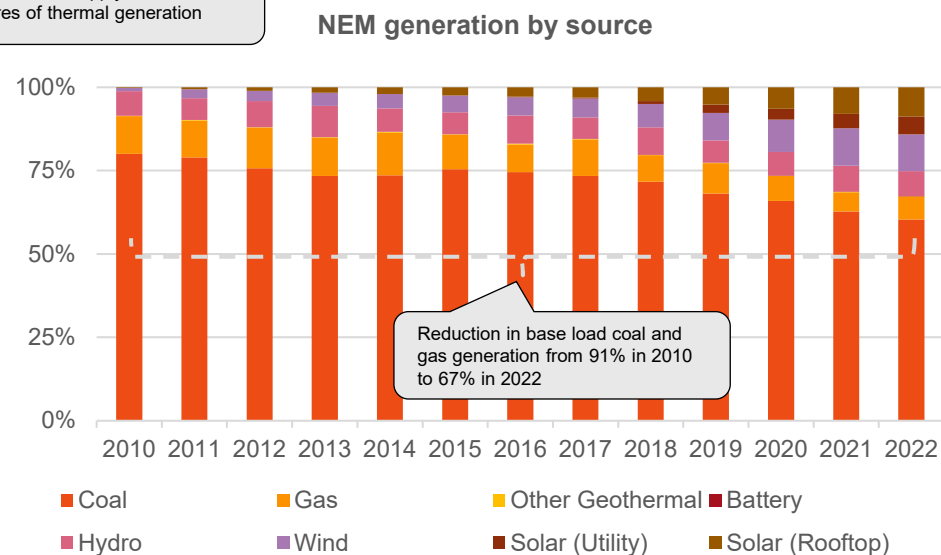
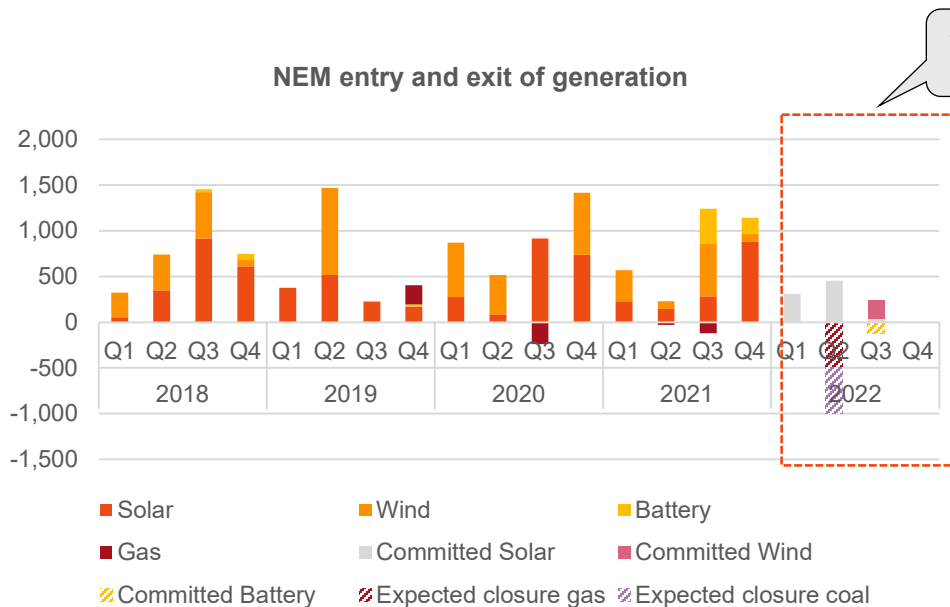
Evolution of the Australian electricity market has made the investment landscape challenging to navigate

4 Opportunities

With renewed political and regulatory support, the investment landscape is improving for renewables and battery storage

Renewable generation over time

From a very slow start, renewable generation in Australia has grown significantly



Source: Australian Energy Regulator (AER)

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- Renewable generation grew significantly from a standing start in the early 2010s when the initial Renewable Energy Target (RET) of 33TWhr by 2020 was established. Australia met the target in 2019, ahead of schedule.
- Grid-scale solar generation (specifically solar photovoltaics or solar PV), which significantly lags wind generation, is proliferating through continued reductions in levelised cost of energy (LCOE).
- Given the need for climate change mitigation, net-zero ambitions, electrification, and growth in grid-scale renewable generation are expected to continue; may require policy support. This support may include additional subsidies, specific land designations, and government-led procurement processes to underwrite grid-scale developments.
- The additional level of intermittent generation – specifically renewable generation – in conjunction with the continual reduction in coal-fired baseload generation (retirement of coal-fired plants) has elevated the role of battery energy storage systems (BESS) in the renewable energy thematic. However, the BESS sector is still nascent, requiring government funding to be economically feasible – however the requirement of additional funding.

Change required in Australian renewables investment landscape

Strong political will and positive sentiment to bring about change to the Australian electricity market

- A perfect storm has impacted renewable energy developers and operators, including:
 - curtailment of renewable generation (to stabilise electricity network)
 - uncertainty for long-term investors (energy policy, investment)
 - lack of planning on a future-proof electricity network
 - new renewable generation developments held up waiting for grid connection.
- Federal and state governments and regulators have acknowledged these issues. They are drafting new policies, setting investment plans and creating new rules, respectively, to enable the growth in renewable energy investments and generation. Recent announcements include:
 - the new incoming Federal Government is reviewing policy to target an increased reduction in greenhouse gas emissions
 - the NSW Government released a long-term investment plan to create fit-for-purpose transmission zones
 - the Victorian Government announced a target of 9GW of offshore wind capacity build-out by 2040
 - most states expecting to integrate battery storage to improve the economics of renewable energy projects, and stability of the electricity market.

— The AFR View

Energy fix must keep the market in the NEM

This week's electric shock had mostly outside causes. But it is a grim warning for the politicians supervising an electricity system with a huge transition in front of it.

Albanese to outline climate plan at summit

CIP partners with Cbus in the Australian offshore wind project, Star of the South

Victoria announces 9GW offshore wind target by 2040

Renewable Energy Zones

The Victorian Government is developing Victoria's Renewable Energy Zones (REZs), supported by a \$540 million REZ Fund to invest in needed REZ network infrastructure.

Hostplus, CEFC back Octopus in \$10b renewables push

Recent government announcements and commitments towards clean, green energy generation has provided some certainty to investors – this creates opportunities for stable, long-term renewable energy investors

Battery storage outlook

Battery storage will also play a key role in managing increasing levels of intermittent generation



Grid support

Increasing intermittent generation across the rooftop and grid-scale generation has led to the energy grid requiring increasing levels of support, ensuring proper operations and maintenance of grid services.



Climate mitigation

More regular and severe weather events continue adding to grid stress, requiring new solutions and technologies to ensure continuing operations.



curtailment

Curtailment of generation is rising. Utilising BESSs as part of projects likely increases grid stability and may allow generation that would otherwise go unutilised captured, enhancing returns.



Improving economics

Reduced need for government support through improvement in unit economics driven by a decline in the levelised cost of storage – providing a supportive backdrop.



Managing demand

Continued demand for intermittent generation, as well as the development of Australia's offshore wind sector, require continued investment – either as standalone projects, or add-ons to greenfield or operating assets.



Portfolio integration

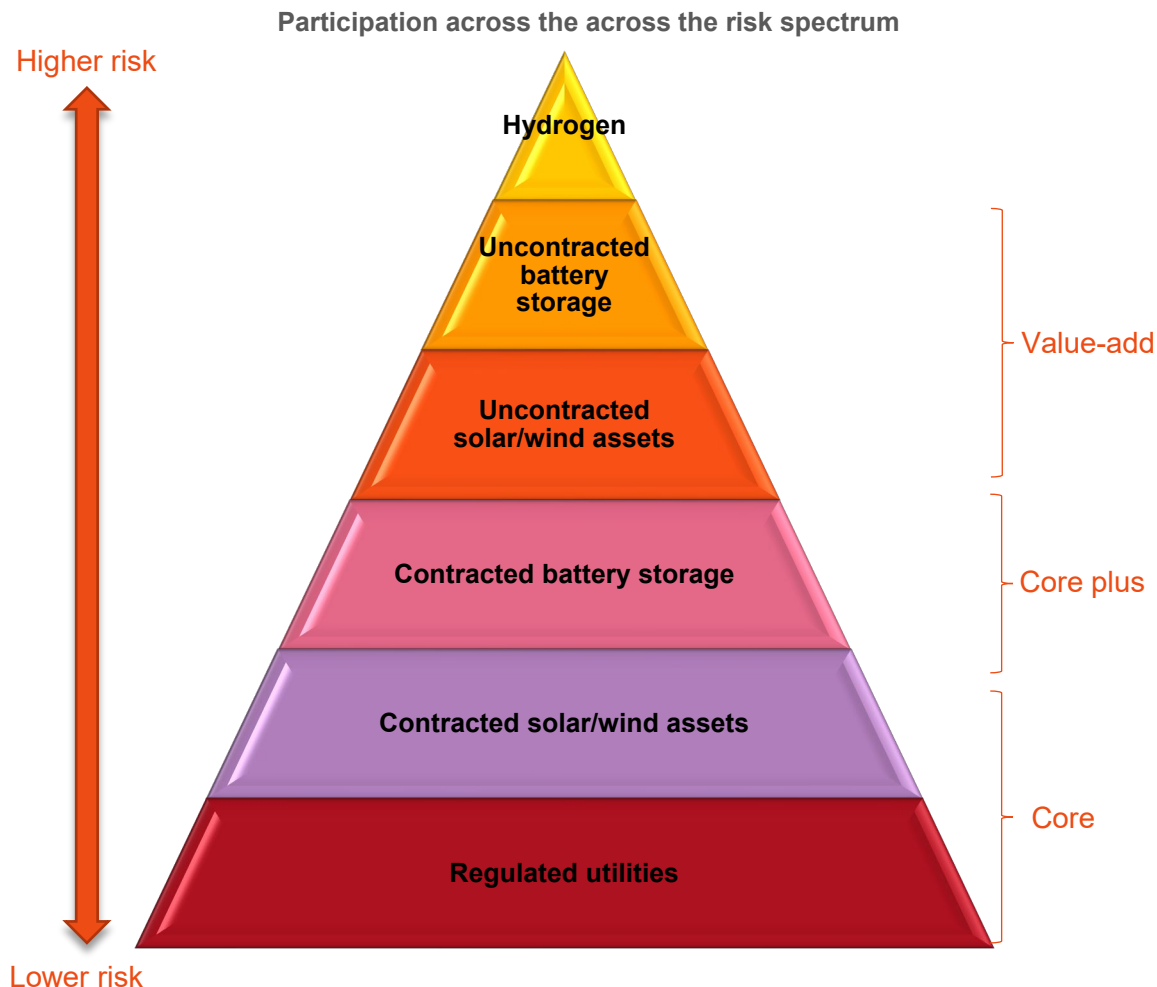
Stand-alone storage is presently limited. As such, investments are likely to form part of an overall renewable/energy transition platform.

Supporting the energy transition

Several ways investors can participate in the energy transition thematic, across the risk spectrum

- The energy transition will continue driving the incorporation of renewables into electricity grids, requiring investment across technologies.
- With increased levels of pricing volatility in the grids, asset owners/investors continue to analyse new battery storage installations within operating assets for further value capture.
- Contracted and non-contracted grid-scale storage will likely be part of a value capture process however participation, at least in the short term, is expected to be alongside other investments or require a specific allocation to a specialist manager.
- An investment in battery storage may diversify a highly concentrated renewable portfolio, de-risking existing assets and providing a long-term platform to participate in newly established energy markets/contract structures

Falling unit economics increased pricing volatility, and a strengthened focus on grid stability provides ongoing support for privately developed investments





**2022 March quarter notable real estate
and infrastructure transactions**

Key infrastructure transactions

Notable infrastructure transactions

Key transactions – Q1 2022

Region	Transaction	Sector	Vendors	Equity providers	AUD (\$m)	Description
Australasia	Pluto Train 2 LNG Facility	Energy	Woodside Petroleum	Global Infrastructure Partners	6,765	Pluto LNG processes gas from the offshore Pluto and Xena gas fields in Western Australia
	ElectraNet Sale	Power	YTL Corporation	Australian Utilities	1,000	Regulated electricity transmission network through South Australia
	AusNet	Power	Singapore Power, State Grid Corporation of China	Brookfield Asset Management	18,418	Take-private of AusNet, which operates electricity transmission networks in Australia
	Australia Pacific LNG Sale	Energy	Origin Energy	EIG	2,120	Small minority sale of company responsible for upstream exploration, development and production
	Sydney Airport	Transport	Take-Private	IFM Investors, Global Infrastructure Partners and QSuper	32,000	Take-private of the international airport in Sydney
	Integrated Clinical Oncology Network	Social Infrastructure	Goldman Sachs, QIC Global Infrastructure, Pagoda Investment	EQT Infrastructure	2,400	Operates 31 radiation and medical oncology clinics in Australia and New Zealand
	Intellihub Smart Metering Business	Power	Pacific Equity Partners, Landis+Gyr	Brookfield Asset Management	922	Smart metering business in Australia
Europe	ERG Hydropower Assets Sale	Renewables	ERG	Enel-Infra	1,647	Portfolio of 527MW of hydroelectricity across 19 power plants in central Italy
	Voyage Care Homes	Social Infrastructure	Partners Group, Duke Street, Tikehau Capital Partners	Wren House Infrastructure Management	1,054	Over 100 care homes across the UK for people with mental disabilities
	Telia Scandinavian Towers Portfolio	Telecoms	Telia	Brookfield Asset Management, Alecta	1,205	Sale of portfolio of telecommunication towers across Finland, Norway and Sweden

Source: Inframation

Notable infrastructure transactions

Key transactions – Q1 2022

Region	Transaction	Sector	Vendors	Equity providers	AUD (\$m)	Description
Europe	Thyssengas	Energy	DIF Capital Partners, EDF Invest	Macquarie Super Core Infrastructure Fund	1,218	German gas transmission business which operates 4,200km transmission network
	Reintel	Telecoms	Red Electrica	KKR	1,531	Spain's national power grid operator with 50,000 km of dark fibre
	Nobina	Transport	Private Shareholders	Basalt Infrastructure Partners	2,246	Swedish cross-region bus operator with nearly 4,000 buses with contracts with public transport authorities
	Esvagt	Other	AMP Capital	I3 Infrastructure	1,581	Fleet of more than 40 vessels used for emergency and rescue services on oil and gas installations
	Falck Renewables	Renewables	Falck	JP Morgan Asset Management	2,349	1.32GW of installed capacity in UK, Italy, US, Spain, France, Norway and Sweden with an asset mix of wind, solar, energy-from-waste and biomass
	HEDNO	Power	Public Power Corp	Macquarie Super Core Infrastructure Fund	2,043	Privatisation of Greece network of medium and low voltage power lines
	Roadchef	Transport	Antin Infrastructure Partners	Macquarie	1,624	UK operator of motorway service
	Scotia Gas Networks (SGN)	Energy	Scottish and Southern Energy (SSE), ADIA	Ontario Teachers' Pension Plan, Brookfield Super-Core Infrastructure Partners	3,217	Gas distribution network across the UK
	CK Hutchinson European Towers	Telecoms	CK Hutchison Holdings	Cellnex	15,112	28,500 telecoms towers in UYK, Italy, Sweden, Denmark, Australia and Ireland

Source: Inframation

Notable infrastructure transactions

Key transactions – Q1 2022

Region	Transaction	Sector	Vendors	Equity providers	AUD (\$m)	Description
North America	Arkansas Gas and Oklahoma Gas LDC	Energy	CenterPoint Energy	Summit Utilities	2,998	Two Natural gas local distribution companies in Arkansas and Oklahoma
	Phoenix Tower International	Telecoms	John Hancock Infrastructure	Blackstone Infrastructure	2,365	Operator of towers, fiber and wireless infrastructure throughout Europe, US, Latin America and the Caribbean
	Freeport LNG	Energy	Global Infrastructure Partners	JERA	3,517	Sale of LNG export terminal in Freeport, Texas
	Urban Grid	Renewables	Urban Grid Solar	Brookfield Renewables	907	Pipeline of 13,000 MW of utility-scale solar and 7,000 MW of energy storage capacity in the mid0Atalntic, Midwest and Southeast
	CyrusOne Houston Data Centres	Telecoms	CyrusOne	DataBank Holdings	915	Four data centers in the Houston-metro area
	Massachusetts Hospitals Portfolio	Social Infrastructure	Medical Properties Trust	Macquarie	1,204	Eight general acute care hospitals
	CyrusOne	Telecoms	CyrusOne	KKR, Global Infrastructure Partners	20,418	49 data centres, primarily in the US, that encompasses more than 8 million net rentable square feet

Source: Inframation

Key property transactions

Recent Australian property transactions

Key transactions – Q1 2022

Asset	Location	Grade/type	AUD (\$m)	Yield	Buyer	Seller
Major office transactions (\$200m+)						
Atlassian Tower, 8-10 Lee Street	Sydney	Premium	840	4.50%	Dexus	Atlassian
101 Miller Street ¹	North Sydney	A Grade	330	5.16%	CapitaLand Integrated Commercial Trust	Nuveen Real Estate
Blue Tower, 12 Creek Street	Brisbane	A Grade	420	5.90%	Marquette Properties	Dexus
Darling Quarter	Sydney	Premium	630	4.20%	Allianz and NPS	ADIA
2-4 Blue Street	North Sydney	A Grade	238	4.50%	Keppel REIT	Thirdi Group
Major retail transactions (\$100m+)						
Casuarina Square	Darwin	Super-Regional	397	6.25%	Sentinel Property Group	GPT
Grand Plaza Shopping Centre	Brisbane	Regional	215	6.00%	EG Funds Management	Invesco Australia
West Village Precinct	Brisbane	Mixed Use	202	-	Centuria Capital	Sekisui House
Helensvale Shopping Centre	Gold Coast	Sub-regional	185	6.25%	IP Generation	QIC

¹Price excludes Greenwood Plaza retail component

Source: CBRE, Cushman & Wakefield, Knight Frank, press releases

Recent Australian property transactions

Key transactions – Q1 2022

Asset	Location	Grade/type	AUD (\$m)	Yield	Buyer	Seller
Major industrial transactions (\$50m+)						
5 Yarrowa Street, Prestons	Sydney	Industrial	58.3	3.35%	Pittwater Industrial	Loftex
88 Moreton Street, Heathwood	Brisbane	Industrial	75	3.81%	Charter Hall	Private Investor
Pipeclay Lawson portfolio	Sydney and Brisbane	Industrial	210	3.40%	Hines Asia Property Partners	Pipeclay Lawson
Andrew Fairley Avenue, Greater Shepparton	Melbourne	Industrial	66	6.06	Charter Hall	SPC
1 Augusta Street, Huntingwood	Sydney	Industrial	201	Land	Logos	China Lesso
82 Rodeo Road, Gregory Hills	Sydney	Industrial	70	3.70%	Centuria Industrial REIT	Private Investor
98 Montpelier Road, Bowen Hills	Brisbane	Industrial	60	4.40%	Charter Hall, PGGM	OPD Lennon
300 Richmond Road, Netley	Adelaide	Industrial	71.3	4.45%	Harmony Corporate	Charter Hall

Source: CBRE, Cushman & Wakefield, Knight Frank, press releases

Property performance

Performance to 31 March 2022

Property performance

Performance to 31 March 2022

	1 year return			Total returns						Index composition		
	Income	Capital	Total	3 years % p.a.	5 years % p.a.	10 years % p.a.	15 years % p.a.	20 years % p.a.	25 years % p.a.	Assets	Value A\$m	%
All Australian property	4.7	6.5	11.4	6.4	8.0	9.5	8.5	9.8	10.0	1,403	210,476	100
Retail	4.9	1.9	6.9	-0.7	2.3	6.2	6.3	8.7	9.1	248	60,080	29
Office	4.6	4.4	9.2	8.3	10.3	10.7	9.2	10.0	9.9	325	99,007	47
Industrial	4.5	23.0	28.4	18.5	16.0	14.2	11.0	11.8	12.1	540	35,548	17
Others	4.2	11.9	16.5	10.1	10.7	12.5	11.5	11.5	-	300	17,398	8
Retail - Australia												
Super regional and major regional	4.6	0.7	5.3	-2.4	1.2	4.9	5.7	8.2	8.7	58	33,023	16
Regional	6.2	2.9	9.3	-0.7	2.0	6.0	6.2	8.7	8.8	23	4,993	2
Sub regional	6.1	5.1	11.5	2.3	3.8	7.5	6.8	9.4	9.8	62	8,348	4
Neighbourhood	5.3	8.6	14.3	5.3	5.7	8.9	7.3	9.5	10.5	63	3,644	2
Other	4.5	0.6	5.1	0.5	3.9	7.8	7.9	-	-	41	9,888	5
Office - Australia												
Premium grade CBD	4.9	4.6	9.7	8.0	9.6	10.4	9.3	9.9	9.9	66	34,602	16
Grade A CBD	4.4	3.6	8.2	7.9	10.2	10.6	9.2	9.8	9.6	126	45,972	22
Grade B CBD	4.4	6.5	11.2	8.9	11.4	11.4	9.4	10.8	10.5	18	1,918	1
Non CBD	4.7	6.1	11.0	10.1	11.6	11.6	9.6	10.1	10.5	97	14,244	7
Industrial - Australia												
Warehouse	4.4	22.1	27.3	18.3	16.0	15.0	11.8	12.5	12.4	236	11,041	5
Distribution	4.6	20.8	26.3	17.9	15.4	13.6	11.0	12.1	12.1	167	14,197	7
Industrial estate	4.3	30.2	35.7	20.8	18.0	14.5	10.7	11.3	12.3	36	4,131	2
International unlisted												
IPD Europe Ex-UK ¹	3.4	6.7	10.3	8.3	8.6	7.5	6.5	6.8	N.A.	N.A.	N.A.	N.A.
IPD UK All Property ²	4.9	18.0	23.7	8.5	8.4	9.0	5.2	7.6	6.3	N.A.	N.A.	N.A.
NCREIF US Property Index ²	N.A.	N.A.	21.9	9.6	8.5	9.6	7.3	8.9	9.5	N.A.	N.A.	N.A.
REITs												
S&P/ASX 300 AREIT ²	N.A.	N.A.	19.2	6.0	8.4	12.6	3.1	6.8	7.8	N.A.	N.A.	N.A.
FTSE EPRA GREIT \$A (H) ²	N.A.	N.A.	15.7	4.2	5.9	8.7	3.7	N.A.	N.A.	N.A.	N.A.	N.A.

Source: Bloomberg, NCREIF, MSCI, Frontier

Note:

1. EU data to 31 December 2021
2. AU, US and UK data to 31 March 2022



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