
Large-scale renewables market update

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February 2023

Enlightening environmental markets



Green Energy
Markets

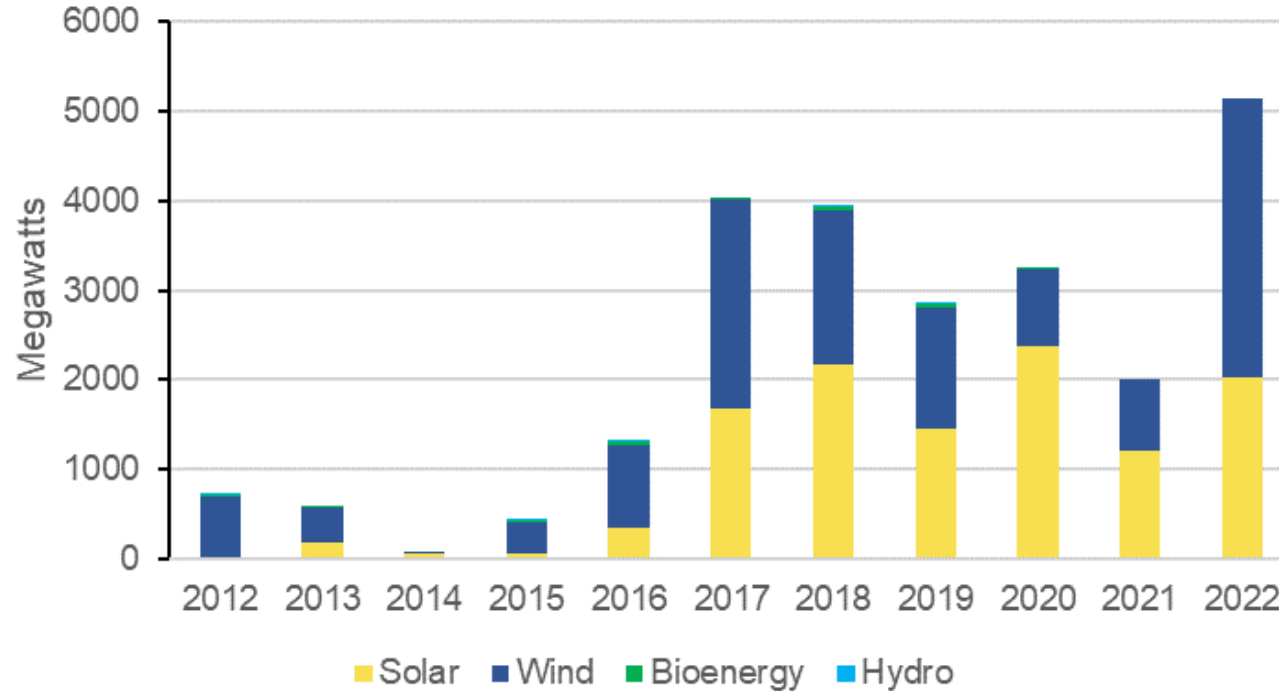
- **We produce subscription reports which help clients such as power utilities, renewable energy businesses, financiers and governments understand:**
 - The market for large scale renewable energy projects
 - The market for small-scale rooftop solar
 - The market for energy efficiency and carbon abatement certificates
 - The market for electricity
- **We also produce more in-depth customised research on the economic outlook for clean energy and prospects for businesses and products in this area.**
- **This helps our clients to make decisions on:**
 - What projects and businesses to invest in.
 - How they should trade and manage price risk in abatement certificate markets.
 - How to develop policy and regulations to efficiently decarbonise the economy and take advantage of the opportunities for economic development and employment.
- **We've been working on these issues since the inception of these markets back in the late 1990's.**

- **Environment for investment looks very rosy based on current market prices and policy settings**
- **But be careful, there are potential pitfalls ahead**

Investment levels

- **2022 was a break-out year for investment with over 5GW committed to construction, the highest ever.**

Project construction commitments by year

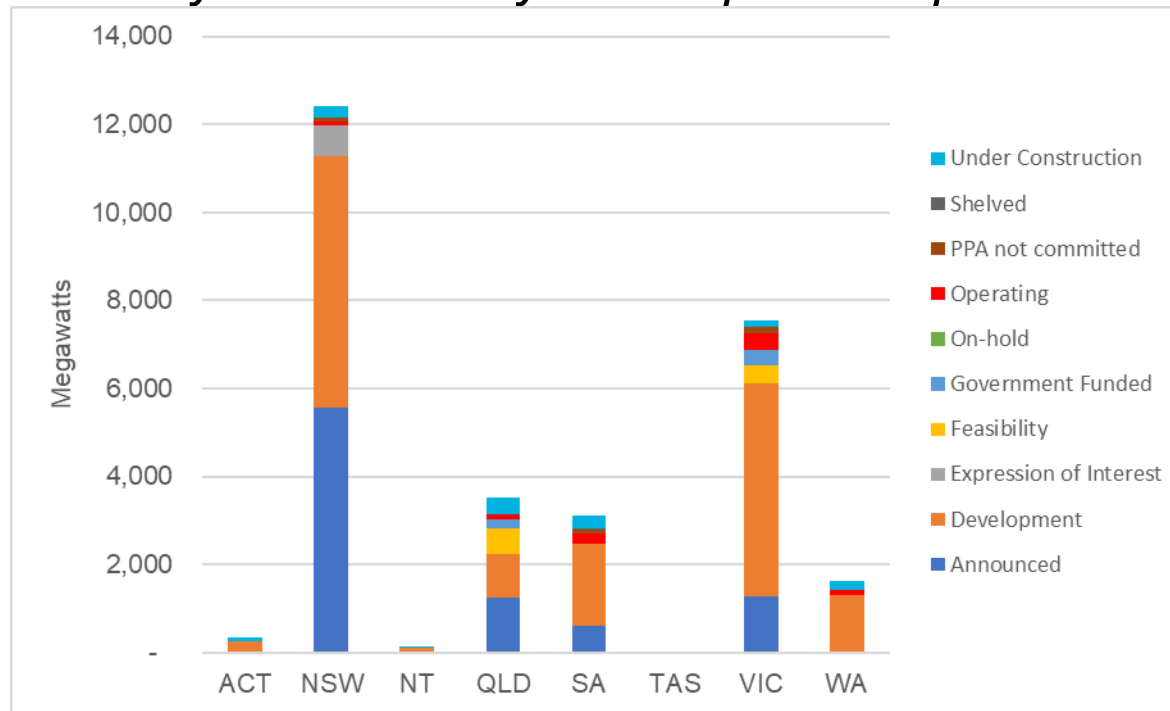


Source: Green Energy Markets Power Project Database

Investment levels

- **Battery pipeline is huge but conversion to projects on the ground is still relatively small**

Utility-scale Battery Development Pipeline

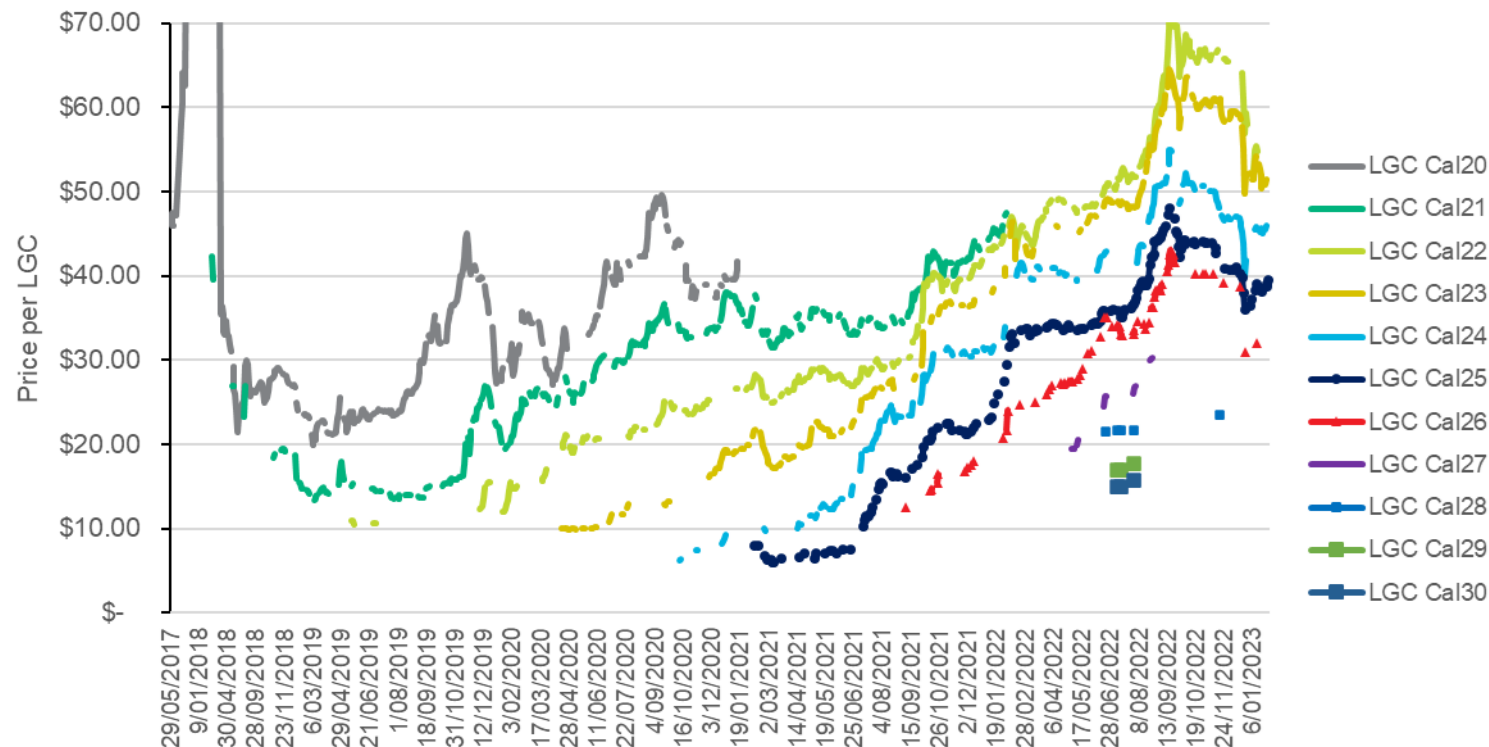


Source: Green Energy Markets Power Project Database

LGC Prices

- After a collapse in LGC prices in 2018, they have experienced a surge since 2020 that has extended into later and later forward years.

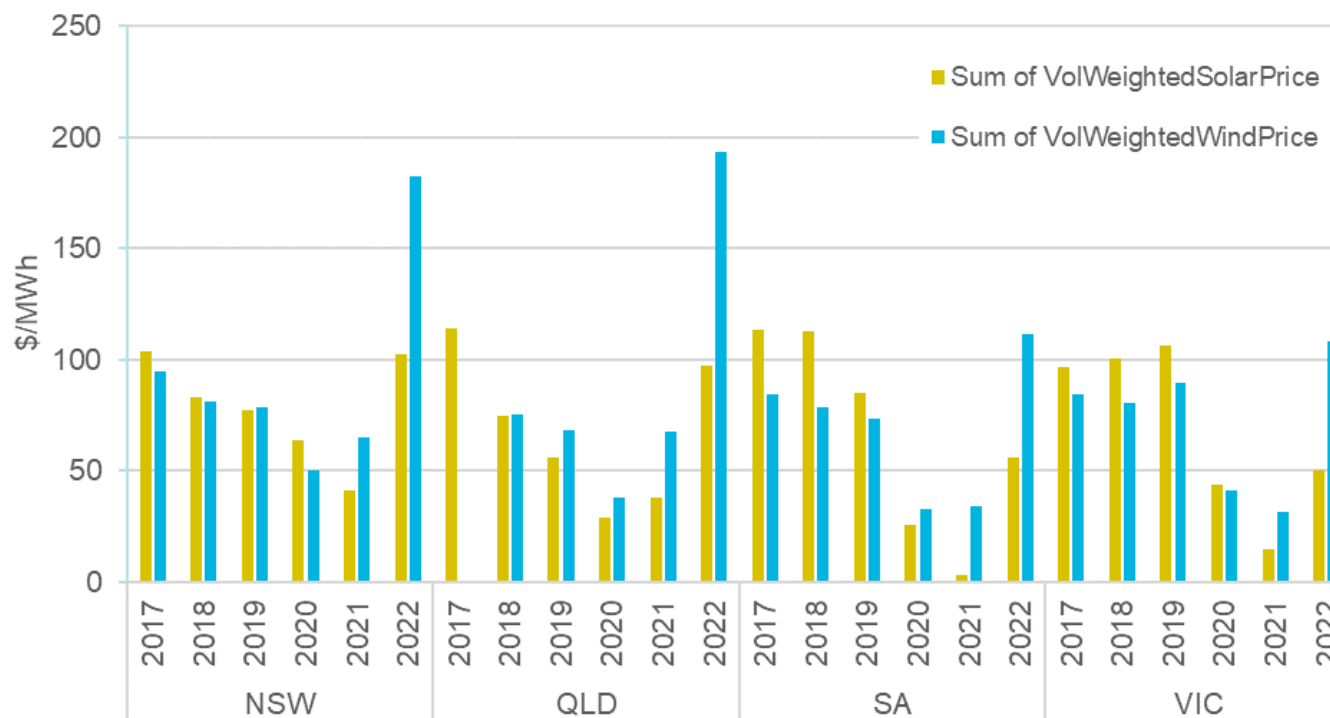
Forward LGC brokered market prices by year



Source: Green Energy Markets Certificate
Trading Dataset

- After several years of decline, 2022 saw a surge in power prices received by wind and solar to very high levels

Wholesale spot market prices received by wind and solar by year by state



Source: Green Energy Markets LGC/Carbon Credits Price Drivers Report

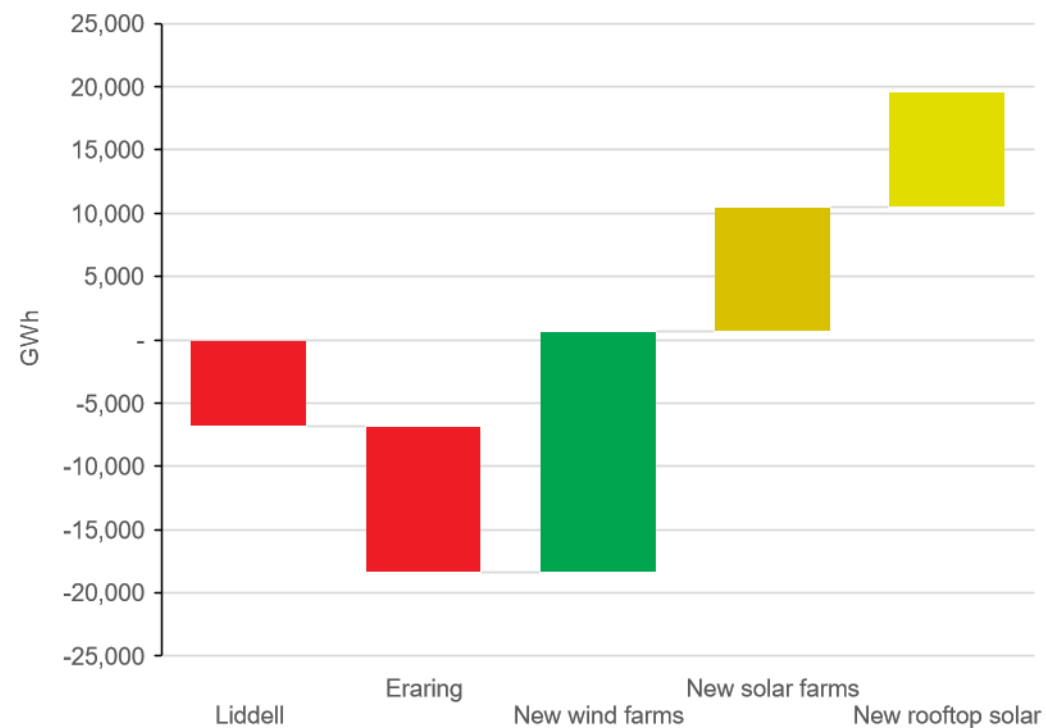
Policy outlook appears very promising

- **Victoria to close remaining 2 coal power stations by 2035**
- **WA to close it's state-owned coal generators by 2029**
- **Queensland to close its state-owned coal generators by 2035**
- **NSW Infrastructure Roadmap to underwrite 12GW of wind and solar**
- **Federal Government aiming for 82% renewables by 2030 and has announced Capacity Investment Mechanism to underwrite \$10B in investment**

Words of caution – power prices

- We are on track to add a very large amount of new power supply that far exceeds what will be lost from exiting coal

Losses and gains in NEM supply by 2026 relative to 2022

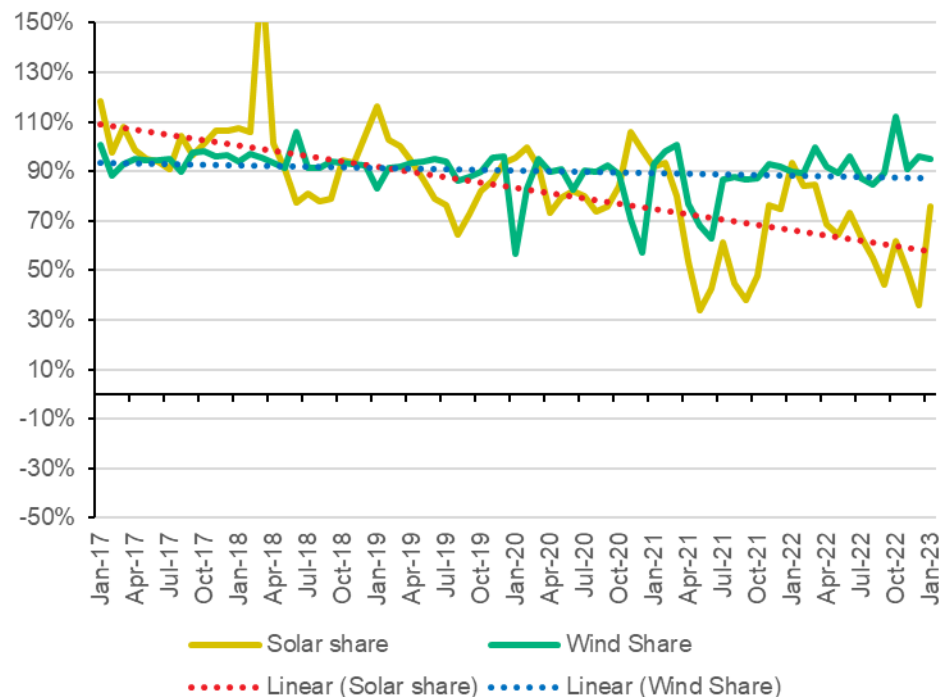


Source: Green Energy Markets LGC/Carbon Credits Price Drivers Report

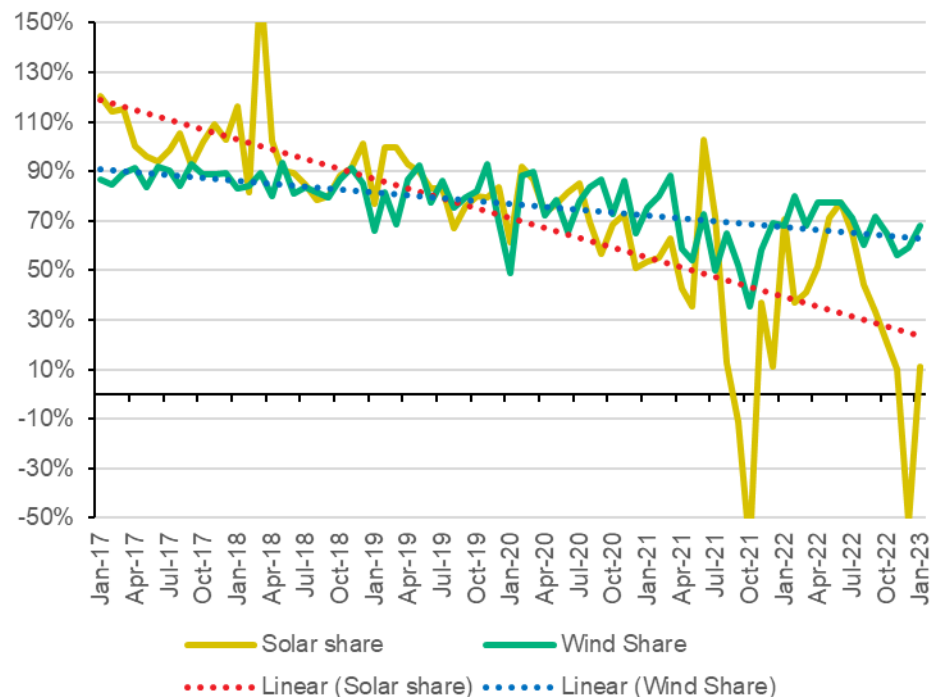
Words of caution – power prices

- We can see a very clear signal of declining market price value capture from solar and wind over time as capacity grows. Muted so far for NSW wind, but this likely to change as more capacity comes online

NSW wind & solar power average spot price as proportion of overall market average



Victorian wind & solar power average spot price as proportion of overall market average

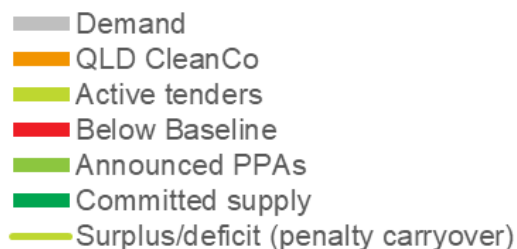
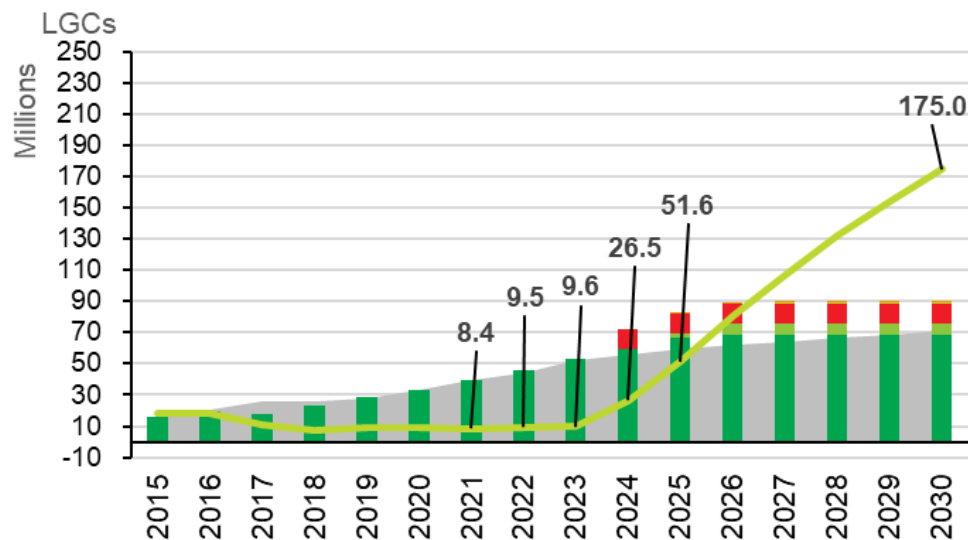


Source: Green Energy
Markets LGC/Carbon Credits
Price Drivers Report

Words of caution – LGC prices

- We are headed for substantial oversupply of LGCs in near future even with ongoing growth in voluntary demand (corporate 100% renewables commitments).
- This oversupply will be particular bad if the Federal Government awards renewable energy certificates to old hydro generators as is currently being proposed

LGC supply-demand balance assuming significant voluntary demand growth



Source: Green Energy Markets LGC/Carbon Credits Price Drivers Report

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