

Clean Economy Jobs Bill 2024

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Committee Secretary
Clean Economy Jobs, Resources and Transport Committee
Parliament House
George Street
Brisbane Qld 4000

Via email: cejrta@parliament.qld.gov.au

Dear Committee Secretary

Re: Clean Economy Jobs Bill 2024

The Queensland Electricity Users Network (QEUN) appreciates the opportunity to provide a submission to the Clean Economy Jobs, Resources and Transport Committee's Inquiry into the *Clean Economy Jobs Bill 2024* (the Bill).

About the Queensland Electricity Users Network

The Queensland Electricity Users Network (QEUN) is one of only a handful of energy consumer advocates in the National Electricity Market based in regional Australia.

QEUN is active at both a state and national level providing input to the Australian Energy Market Operator, Australian Energy Regulator, Australian Energy Market Commission, Energy Queensland and Powerlink.

QEUN represents small business and middle Australian residential consumers with a particular emphasis on energy consumers in regional Australia.

We advocate for affordable reliable electricity from a resilient National Electricity Market where the pace of the transition to a renewable energy future is not at the expense of the economy, jobs or reasonable living standards.

Summary

Renewable energy generation, energy storage and transmission infrastructure projects currently under construction, or in an advanced state of planning, are struggling with multi-billion dollar cost blowouts in Queensland, the National Electricity Market (NEM) and throughout the world.

Even if the Queensland Government was able to find the funds to transform and retain majority ownership of Queensland's energy assets (by reducing the funds available to roads, hospitals, police, social housing and cost of living rebates), the massive cost blowouts are evidence there is not enough skilled labour to build the energy infrastructure necessary to support the Bill's emissions reduction target of 75% by 2035 (the Target).

The Queensland Energy and Jobs Plan (QEJP) and the Queensland SuperGrid Infrastructure Blueprint (QSIB) cannot by 2035, physically build around 21,000 MW of new wind & solar generation, 3,000 MW of hydrogen-ready gas generation, 6,000 MW of new long duration energy storage & thousands of kms of new transmission.

Since the Bill is highly dependent on the energy sector delivering 20% of the 75% reduction in emissions by 2035, the Target is not achievable. Legislated targets should be achievable not aspirational. The inability of the energy sector to meet the 20% reduction will place undue pressure on other industry sectors and households to make up for the shortfall. This will adversely impact the economy, jobs & living standards. The Bill should not be passed.

Energy sector is incapable of meeting its 20% of the 75% Target

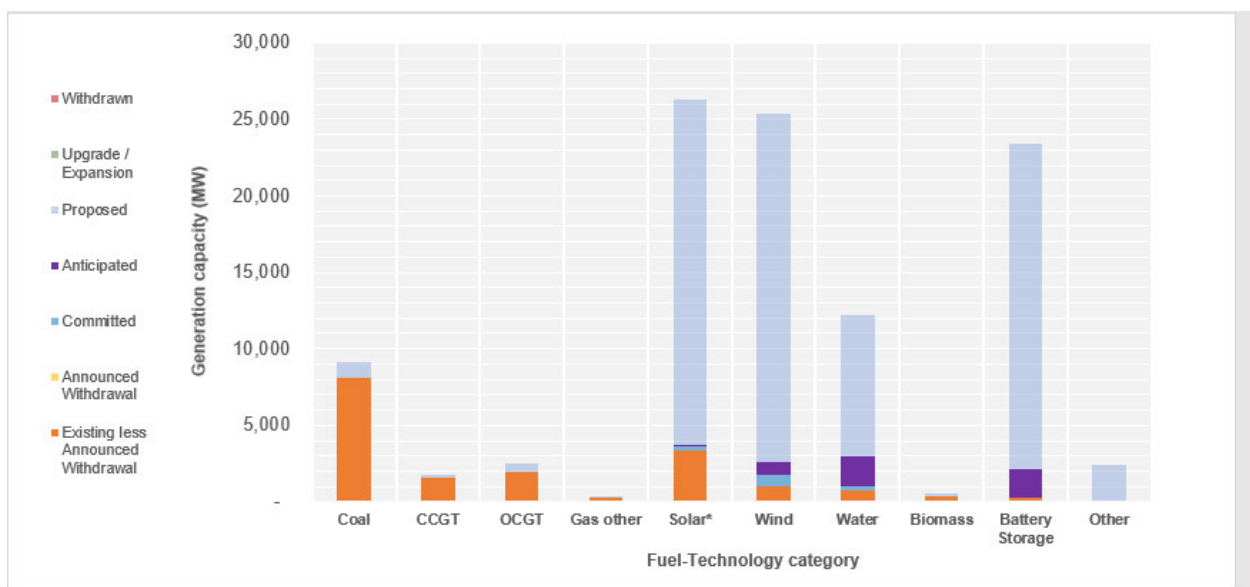
Progress to date clearly demonstrates there is insufficient time, money, labour and equipment for the renewable energy transformation as detailed in the QEJP and QSIB. This means the Target is not achievable.

Renewable generation – insufficient capacity to meet the Target

As of June 2022, the Queensland SuperGrid Infrastructure Blueprint states there was 2,882 MW of existing operational wind and grid-scale solar capacity.

As of 7 February 2024, the Australian Energy Market Operator (AEMO) states there was 4,395 MW of existing operational wind (1,018 MW) and grid-scale solar (3,377 MW) capacity (Figure 1).

Figure 1: Queensland generation by fuel technology by project status – 7 February 2024



Summary Table: QLD1 Scheduled, Semi-scheduled & Non-scheduled Generation (MW) - Existing and New Developments by Fuel-Technology Category

Summary Status	Fuel - Technology Category										Total
	Coal	CCGT	OCGT	Gas other	Solar*	Wind	Water	Biomass	Battery Storage	Other	
Existing	8,130	1,541	1,985	295	3,377	1,018	738	349	252	11	17,695
Announced Withdrawal	-	-	-	-	-	-	-	-	-	-	-
Existing less Announced Withdrawal	8,130	1,541	1,985	295	3,377	1,018	738	349	252	11	17,695
Upgrade / Expansion	-	-	-	-	-	-	-	-	-	-	-
Committed	-	-	-	-	223	702	250	-	-	-	1,175
Anticipated	-	-	-	-	161	923	1,998	-	1,891	-	4,974
Proposed	990	207	517	23	22,508	22,706	9,236	182	21,283	2,436	80,088
Withdrawn	-	-	-	-	-	-	-	-	-	-	-

Notes:
 "Existing" summary status includes "Announced Withdrawal".
 "Committed" summary status includes "Committed".
 "Solar*" Fuel-Technology category excludes Rooftop PV installations.
 Projects with "TBA" Dispatch Type are not included in the Summary Table.
 Projects with "Confidential" FuelBucketSummary are not included in the Summary Table.

Note: Pumped hydro is included in the water category for Fuel – Technology – the 1,998 MW ‘anticipated’ water project is the Queensland Government’s proposed 2,000 MW Borumba Pumped Hydro

Source: Generation Information Database, Australian Energy Market Operator, 7 February 2024

The Queensland SuperGrid Infrastructure Blueprint estimates total operational wind and solar capacity should be 5,230 MW by 2024 to meet the 80% by 2035 Renewable Energy Target (RET) – the 80% RET is necessary to meet the Bill’s 75% by 2035 emissions reduction target (Table 1).

Table 1: Renewable energy capacity targets to meet 25,000 MW renewable energy target by 2035

Renewable capacity	Unit	2022-24	2024-28	2028-35	Total
Solar capacity (aggregated)	MW	3,620	500	7,990	12,110
Wind capacity (aggregated)	MW	1,610	2,980	8,300	12,890
Total renewable capacity	MW	5,230	3,480	16,290	25,000

Source: Queensland SuperGrid Infrastructure Blueprint, September 2022

To meet the 5,230 MW RET in the QSIB at least 835 MW of new large-scale wind and solar capacity needs to be in commercial operation in 2024.

The Australian Energy Market Operator (AEMO) considers projects with a ‘committed’ or ‘anticipated’ status as likely to progress to commercial operation.

AEMO has 6 projects (2,009 MW) classified as committed and anticipated projects: wind (1,625 MW) and solar (384 MW) (Table 2).

Table 2: Committed and anticipated solar and wind projects in Queensland

Solar Project	Capacity (MW)	Ownership	Power Purchase Agreement with Queensland Govt	Status		Full Commercial Use Date	Expected Closure Year
				Committed	Anticipated		
Woolooga	223	Foreign	No	Yes		September 2022	not declared
Aramara	101	Foreign	No		Yes	June 2026	2048
Banksia	60	Foreign	No		Yes	September 2025	2055
Total Solar MW	384						
Wind Project	Capacity (MW)	Ownership	Power Purchase Agreement with Queensland Govt	Status		Full Commercial Use Date	Expected Closure Year
				Committed	Anticipated		
Clarke Creek	450	Australian	Stanwell 347 MW 15 years	Yes		August 2024	2049
Wambo Stage 1	252	50/50 Joint Venture Foreign/Qld Govt (QGovt - Stanwell)	Stanwell 126 MW ? years	Yes		February 2025	not declared
MacIntyre	923	Foreign	CleanCo 400 MW ? years		Yes	December 2024	2053
MacIntyre - Karara	103	Qld Govt (QGovt - CleanCo)			cancelled - see note		
Total Wind MW	1,625						
Total Solar + Wind MW	2,009						

Note: Proponent advised AEMO to change status from anticipated to publicly announced in July 2023

Source: Compiled by QEUN from AEMO Generation Information database dated 7 Feb 2024 and company websites

Should the 2,009 MW of committed and anticipated projects reach full commercial operation in 2024, the total wind and solar capacity would be 6,404 MW. However, according to the information provided by the project proponents to AEMO, only about 70% of the 2,009 MW or 1,323 MW could be in full commercial operation by 2024. There is significant risk some of the 1,323 MW will not be operational in 2024.

Of great concern is Acciona, the owner of the 923 MW MacIntyre Wind Farm (the largest project slated for commercial operation in 2024), is already replacing 7 of the 35 turbines installed at its Mortlake Wind Farm in Victoria. The 157 MW Mortlake Wind Farm became fully operational in July 2023. Acciona intend to install the same turbines in its MacIntyre Wind Farm (Figure 2).

In July 2023 the wholly Queensland Government owned generator CleanCo advised AEMO to change the status of its proposed 103 MW Karara Wind Farm (part of then \$2 billion 1,026 MW MacIntyre Wind Farm Precinct), from anticipated to a 'publicly announced' project. In January 2024, AEMO deleted the Karara Wind Farm project from its Generation Information database stating "*project record deleted as project temporarily discontinued*".

The problems of the onshore and offshore wind industry have escalated since western wind turbine manufacturer Siemens Gamesa shocked the wind sector in June 2023 when it warned of faulty components and possible design faults in its onshore wind turbines. Siemens Gamesa subsequently revealed multi-billion dollar losses. In October 2023, Reuters reported Siemens Energy was in talks with the German government about state guarantees following big setbacks at its wind unit.

Siemens Gamesa is not alone. Reuters reported in October 2023 that the four biggest western wind turbine manufacturers – Vestas, GE, Siemens Energy's Siemens Gamesa and Nordex made combined sales of more than 41 billion euros (A\$68 billion) but combined losses exceeded 5 billion euros (A\$8 billion).

Losses were not confined to western wind turbine manufacturers.

Wind farm 'developers' experienced difficulties ranging from faulty equipment, delayed delivery and the sustained high cost of financing. Late last year Reuters reported the world's largest offshore wind farm developer Denmark's Orsted, announced USD4.13 billion (A\$7 billion) in impairments.

Figure 2: RENEUECONOMY article – 22 January 2024

Turbines at newly installed Victoria wind farm pulled down to fix faulty parts



Spanish energy giant Acciona is pulling down turbines at its brand new Mortlake South wind farm in Victoria to fix faulty parts, just months after the project was commissioned.

The parts being replaced are bearings in the nacelle because they aren't performing to the standard the company needs, an Acciona spokesperson told *RenewEconomy*. He said that not all of the 35 Nordex turbines will need to be dismantled.

The wind energy giant, which is also building Australia's first gigawatt-scale wind project at MacIntyre in Queensland, told residents in December that some parts of the turbines needed to be replaced and it would start the work over the Christmas holiday period.

The 157.5 megawatt (MW) wind farm was commissioned in July last year, but has been producing energy at relatively low capacity factors, presumably to do with faults at the turbines.

"There will be minimal impact in terms of traffic or noise, but you can expect increased movement of large trucks from the Christmas period through to the end of January, and cranes being set up," Acciona said in its update.

"Turbine parts, including blades, may be visible on the ground as turbines are dismantled."

In a letter to residents, Acciona said an initial seven turbines were affected and replacement parts wouldn't arrive until the new year.

The turbines are supplied by Nordex, a German company of which Acciona owns 29.9 per cent, and whose turbines are also being used in the MacIntyre project.

Nordex has struggled to be profitable, as inflation has eaten into project margins and supply chain issues has led to a backlog of installations.

But unlike Siemens Gamesa, the company hasn't had any notable systemic problems with equipment faults.

A Nordex tower collapsed in 2021 at a wind farm in North Rhine-Westphalia in Germany, which was found to be due to weaknesses in its concrete-steel hybrid tower, and in 2022 a turbine running at overspeed for more than four hours was the cause of a failure at the 25MW Pant-y-Wal wind farm in south Wales in 2022.

In 2022, Nordex replaced all six turbines at the Jüchen A44n wind farm in Germany after finding faults in the towers before the farm was commissioned.

Maintenance follows long delayed launch

The Mortlake South wind farm has been a long time coming, following delays caused by the Covid19 pandemic and obtaining grid connection approval.

The project won planning approval in 2017 and was one of six winners of the Victorian government's renewable energy auction in September of 2018.

Construction [began in 2019](#) and the first turbine – at the time the second largest to be erected in Australia at 4.5 MW – was installed in 2020.

The wind farm was supposed to be finished by 2021, but it faced long delays in being connected to the grid because of a lack of transmission capacity in that area.

In December, network company AusNet said it [started work on the Mortlake Turn-In Project](#) to open up hosting capacity for 1,500 MW of new renewables.

Currently, there are two 500kV transmission lines which run past the Mortlake Terminal Station, but only one connects to the station. This Turn-In will upgrade the current layout and connect the second 500kV line.

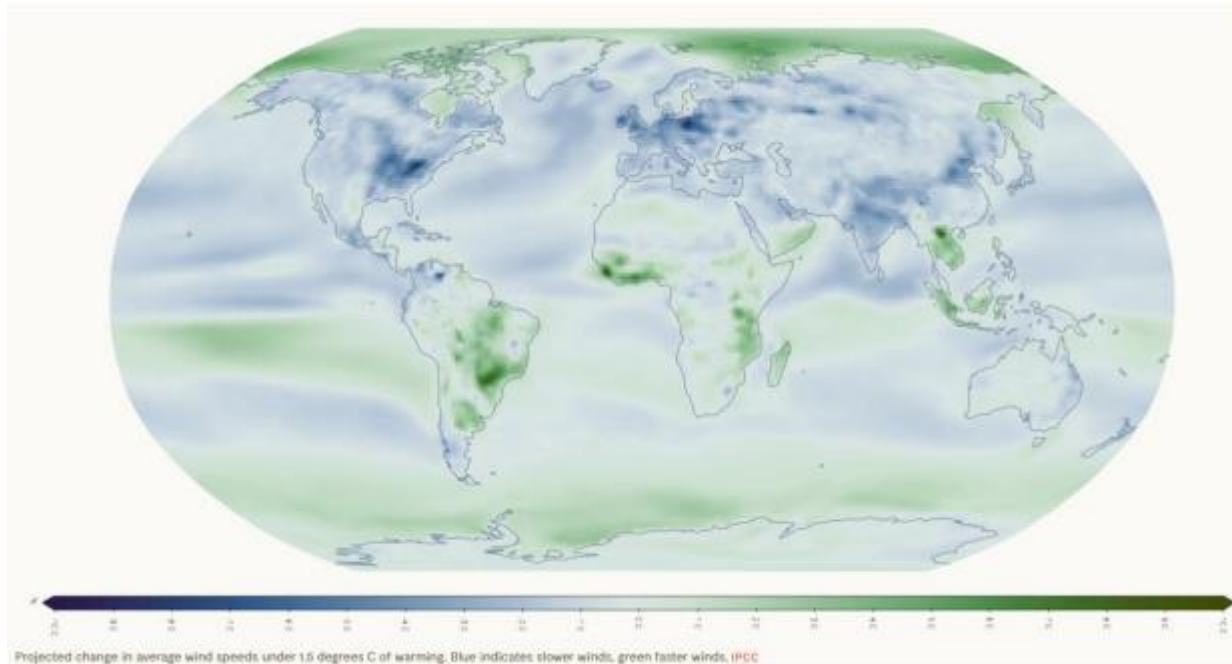
AusNet says connecting both circuits at the Mortlake Terminal Station will allow a more balanced sharing of power between the two parallel circuits, making the network more stable.

Wind generation – lower wind speeds already impacting wind output

The struggling wind industry will be hoping the forecast of the Intergovernmental Panel on Climate Change (IPCC) of lower wind speeds in future decades does not come to fruition.

One of the countries forecast to experience a stilling of winds is Australia (Figure 3).

Figure 3: Projected change in average wind speeds under 1.5 degrees C of warming



Note: Blue indicates slower winds, green faster winds Source: IPCC

A drop in wind speed can have a dramatic effect on wind output.

For example, a 10 percent drop in wind speed can drop the output from a wind farm by 30 percent.

Some areas in the world are already experiencing the impact of slowing wind speeds on wind output.

On 8 September 2023, the Reuters article **US wind power generation breaks out of summer doldrums** said:

After months of low wind speeds in several key wind farm areas, U.S. wind power generation hit its highest levels in nearly five months in early September as wind speeds picked up.

Unusually low wind speeds caused U.S. wind generation to slump by more than 4.5% over the first eight months of 2023 from the same period in 2022, according to data compiled by LSEG.

That drop in wind generation came despite new additions to wind supply capacity throughout the country, and forced several major utilities, including in top power market Texas, to offset lower wind generation with higher natural gas-fired output as they tried to keep up with increases in electricity demand.....

Of the six largest wind power producing states - Texas, Iowa, Oklahoma, Kansas, Illinois and North Dakota - only Texas managed to generate more electricity from wind sites in January through May 2023 compared to the same period in 2022, data from think thank Ember shows.

*The remaining states recorded an average wind generation drop of 7.1%, **which contributed to a 3.1% decline in total national wind generation in the January to May period.***

The shortfalls in wind power have been evident in the output data of major U.S. power pool markets.

The Electric Reliability Council of Texas (ERCOT), the Midcontinent Independent System Operator (MISO), and the Southwest power pool recorded wind power drops of 2.3%, 8.9% and 1.3% respectively in the first eight months of 2023 from the same period in 2022.

*As these markets cover over 30 U.S. states as well as the areas with the largest concentrations in wind power generation in the United States, **the declines in wind power in these power pools had a direct impact on national level wind output, with knock-on effects for power generation mixes across the country.....***

The key factor behind the below-average wind speeds in 2023 has been the El Nino weather pattern that has led to a warming in Pacific Ocean water temperatures, lower pressure in subtropical areas and a slowing in the trade winds across the United States.

Average U.S. wind speeds in key wind power generation areas were between 1 and 3 meters per second below the long term average in May of 2023, according to an analysis by Climate Impact Company using data from the National Oceanic and Atmospheric Administration (NOAA).

The U.S.' Climate Prediction Center says there is a greater than 95% chance of an El Nino weather pattern holding through the remainder of 2023 and into 2024, which historically would suggest that overall wind speeds would remain below normal during that period.

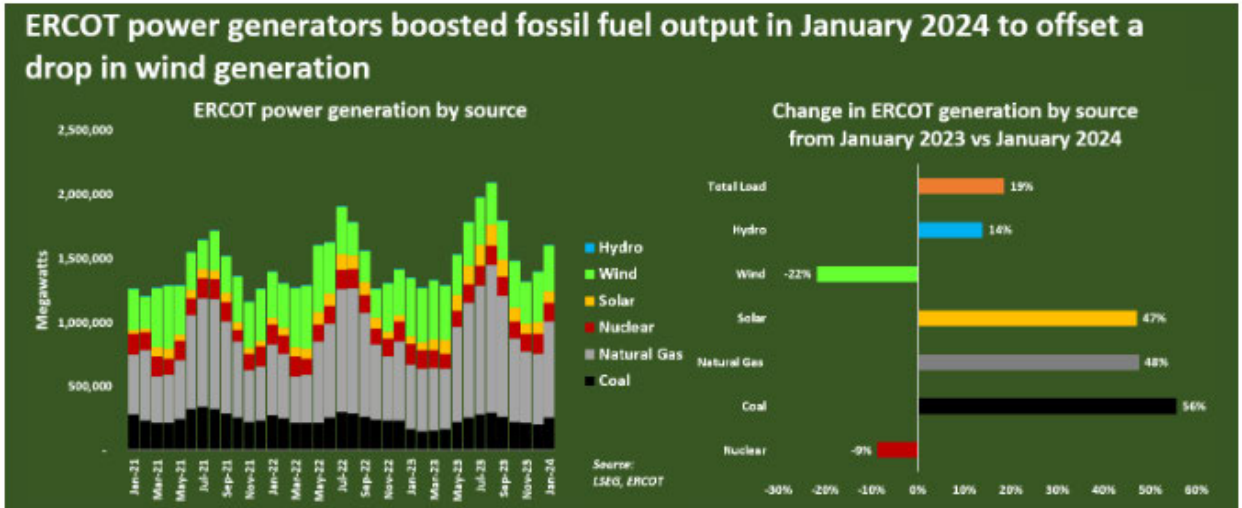
However, there is a strong seasonal tendency for wind speeds to pick up during the fall and winter months from the relatively low levels typically seen over the northern hemisphere summer.

Despite a forecast in September 2023 of higher wind speeds in the U.S. over the fall and winter, on 16 February 2024 the Reuters article **Wind woes persist for Texas power system** reported:

Power generated by Texas wind farms dropped by 22% in January 2024 from the same month in 2023 as low wind speeds continue to stifle output across the main power system in Texas, the largest power market in the United States.

Wind generation in January was 356,000 megawatts (MW), compared to 455,000 MW in January 2023, data from the Electric Reliability Council of Texas (ERCOT) compiled by LSEG shows.

As wind power is the second largest source of electricity behind natural gas in Texas, the drop in wind output so far this year has forced utilities to sharply increase generation from fossil fuels to balance system needs.



ERCOT power generators boosted fossil fuel output in January 2024 to offset a drop in wind generation

Combined output from natural gas and coal was close to 50% greater in January 2024 than in January 2023, underscoring the enduring importance of fossil fuels within the ERCOT system despite the ongoing build-out of renewable generation capacity.

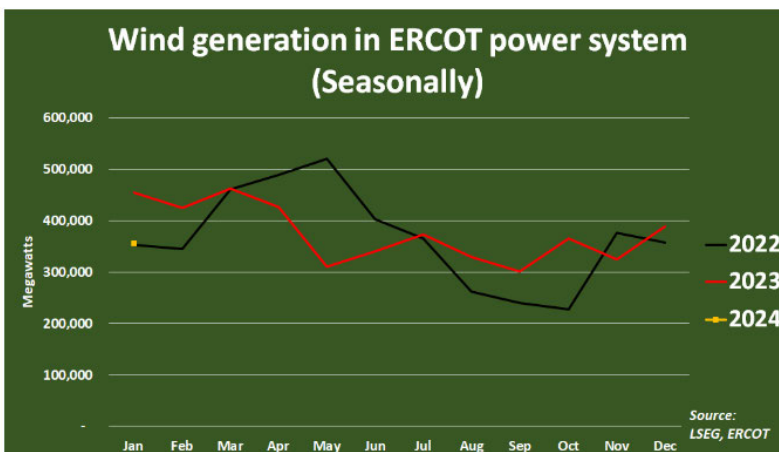
Month-on-month swings in wind generation are normal, so utilities across the United States are becoming increasingly adept at deploying other forms of dispatchable power onto system grids whenever wind or solar power output slumps.

But the drop in Texas wind output in January from a year ago follows a disappointing wind generation total for 2023 as a whole, and suggests that even with steep increases in wind generation capacity the ERCOT system may remain unable to rely on wind to supply a steady share of Texas' power needs

Cumulative wind power output in 2023 was 4,500,000 MW, compared to 4,400,000 MW in 2022, LSEG data shows.

That 2.4% climb in annual wind output is less than the roughly 3% rise in wind generation capacity within the system in 2023, according to ERCOT.

Unusually low wind speeds were the main cause of the stunted growth, with output in April, May and June all falling sharply from the prior year totals.



Wind generation in ERCOT power system (Seasonally)

As those months were just as demand for air conditioners picked up across the state due to rising temperatures, utilities were forced to lift output from fossil fuels to meet system demand levels, raising emissions in the process.

The dip in wind generation totals this January also came during a period when overall system demand was high - this time for heating - and may further undermine confidence that utilities will be able to replace fossil fuels with renewable power sources any time soon.

Neither the QEJP nor the QSIB appear to take into consideration the IPCC forecast of lower wind speeds or the current experience of the U.S. that more wind generation capacity does not necessarily mean higher wind output.

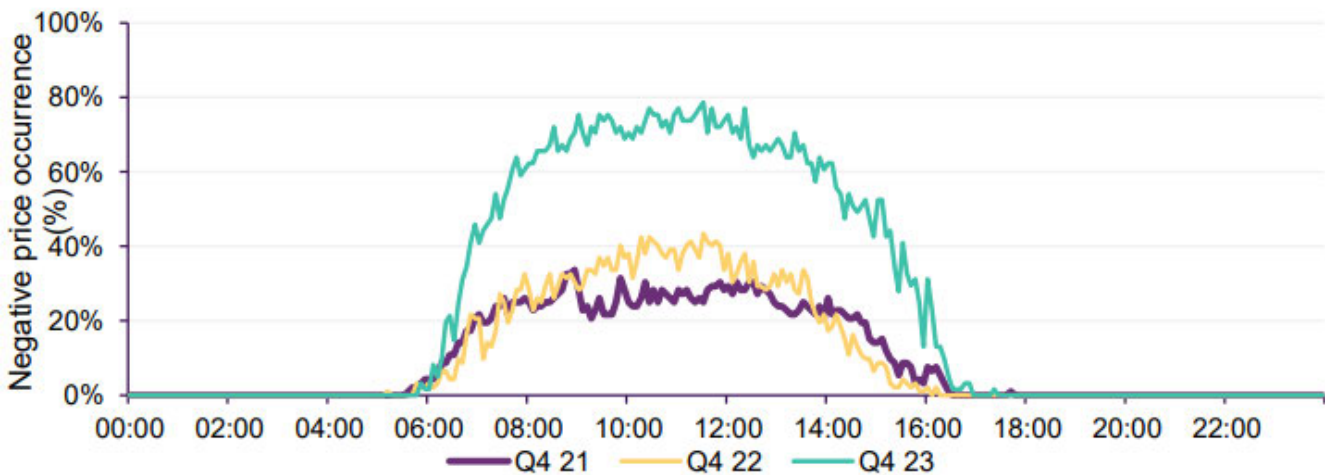
The QSIB in the period 2024-2028 requires 2,980 MW of new wind generation to be built but QSIB is focused on megawatts not megawatt hours. The Queensland Government needs to carry out a risk analysis on the impact of lower wind speeds on wind output, especially during El Nino and La Nina events.

Potential investors in renewable generation struggling with the increasing occurrence of negative prices

In addition to the challenges of labour and equipment costs, potential investors in renewable energy projects need to overcome the financial risk of the growing occurrence of intervals with negative or zero spot prices.

In Quarter 4 2023, Queensland’s negative price occurrence between 1000 hours and 1400 hours increased by 28 percent points to 62% - a new record (Figure 4).

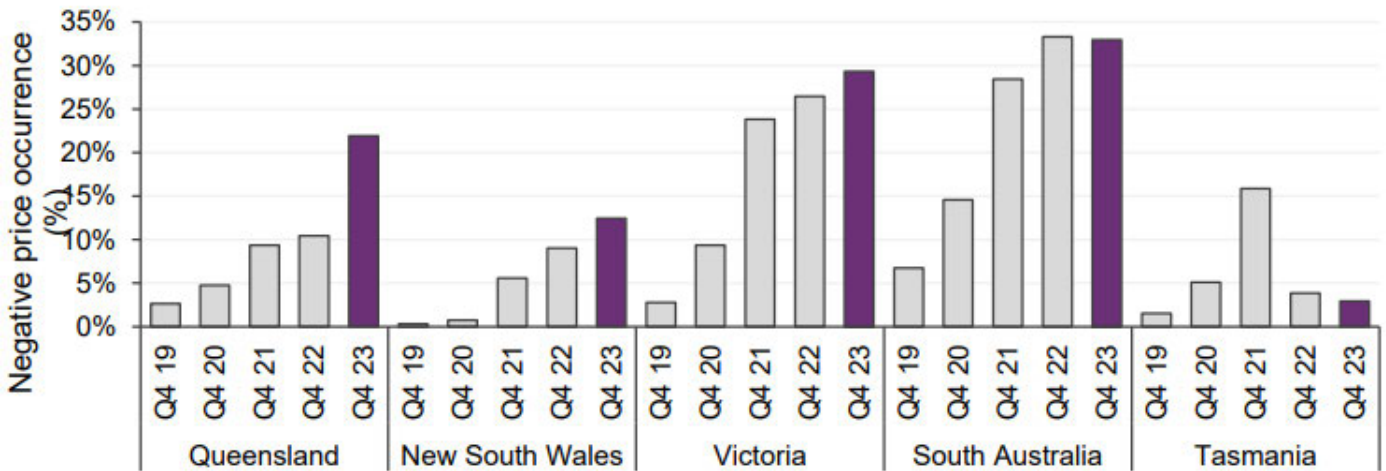
Figure 4: Queensland negative price occurrence by time of day - Q4s



Source: Quarterly Energy Dynamics Q4 2023, Australian Energy Market Operator, January 2024

A record high of 20% of intervals experienced negative or zero spot prices across the National Electricity Market, with New South Wales and Victoria reaching their highest ever number of negative or zero prices, at 12% and 29% respectively (Figure 5).

Figure 5: Negative price occurrence in National Electricity Market regions – Q4s



Source: Quarterly Energy Dynamics Q4 2023, Australian Energy Market Operator, January 2024

Without the financial support of a Power Purchase Agreement (PPA) or a Capacity Investment Scheme Agreement from the Federal government, wind and solar projects will struggle to reach financial close.

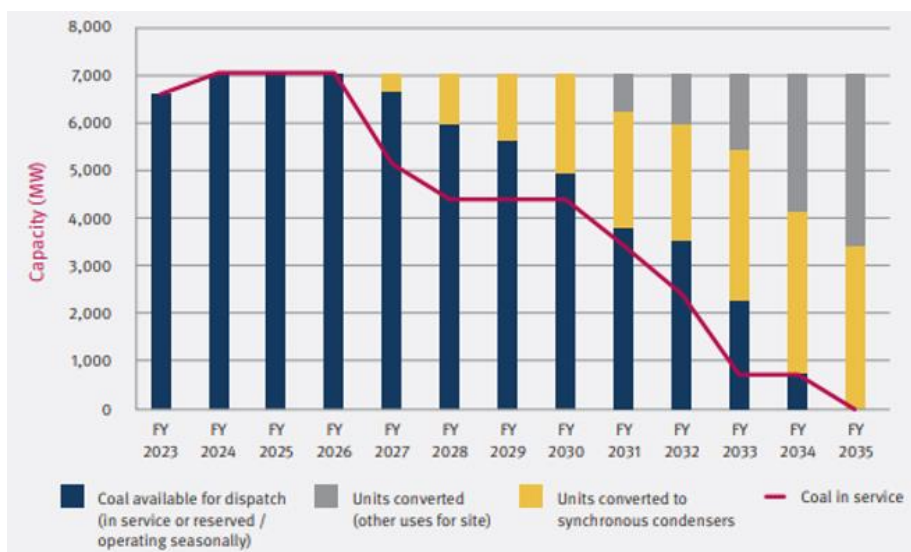
Australia and Queensland’s renewable energy transition is stalling.

This means less renewable energy generation by 2035 and higher emissions.

Queensland SuperGrid Infrastructure Blueprint in tatters due to out-of-control rising peak demand

The Queensland SuperGrid Infrastructure Blueprint states Queensland’s coal generation will be closed by 2035. According to the QSIB the first publicly owned coal generator will close by 2028 and 2,000 MW of dispatchable coal generation will be taken out of service and converted to synchronous condensers by 2030 (Figure 6).

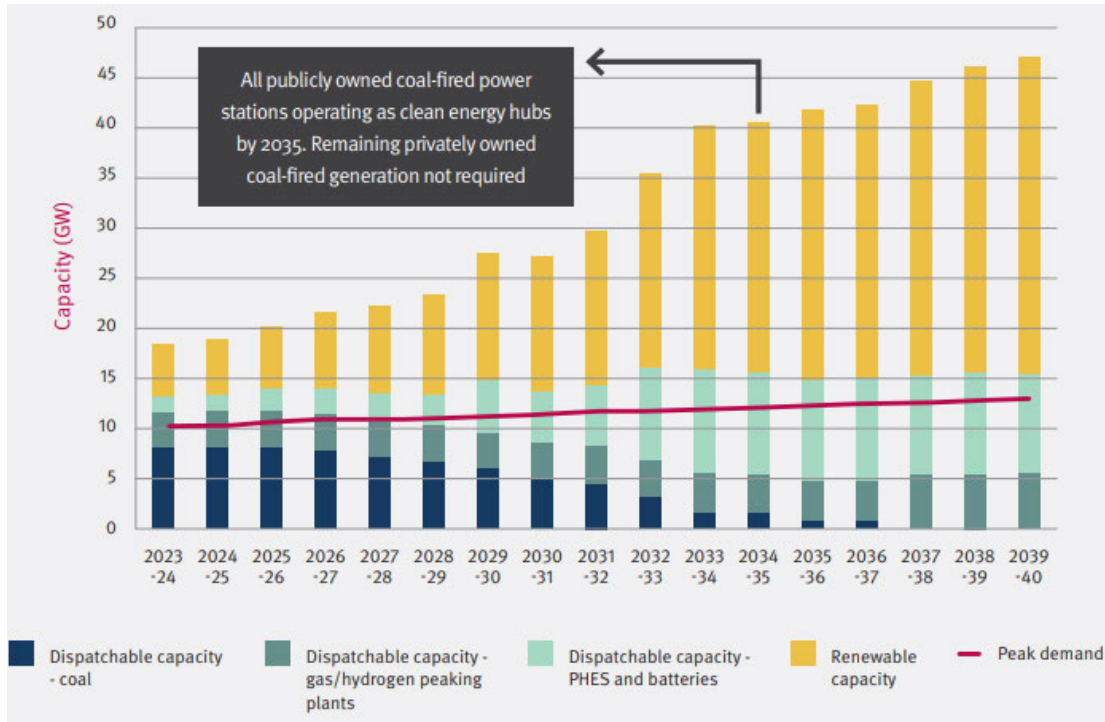
Figure 6: Queensland coal generation capacity according to the Queensland SuperGrid Infrastructure Blueprint



Source: Queensland SuperGrid Infrastructure Blueprint, September 2022

The Queensland SuperGrid Infrastructure Blueprint also states that “the Government will ensure that significant new wind, solar, hydrogen ready gas peakers, batteries and long duration storage is in place at critical steps in the energy transformation” (Figure 7).

Figure 7: Queensland generation mix and storage – 2024 to 2040



Source: Queensland SuperGrid Infrastructure Blueprint, September 2022

The problem is the QSIB assumes peak demand in Queensland will not exceed 11,000 MW until 2029 (Figure 8)..

Queensland recorded a new record peak demand at 5 pm on 22 January 2024 of 11,005 MW. The previous record was achieved on 17 March 2023 at 10,070 MW.

Figure 8: Indicative modernisation schedule for Queensland’s publicly owned generation based on peak demand forecasts

Power Station	22-23	23-24	24-25	25-26	26-27	27-28	28-29	29-30	30-31	31-32	32-33	33-34	34-35	→	
Stanwell (4 units)	No Change				Phase 1			Phase 2		Phase 3					
Tarong & Tarong North (5 units)	No Change				Phase 1			Phase 2		Phase 3					
Callide B (2 units)	No Change				Phase 1	Phase 2	Phase 3								
Kogan Creek (1 unit)	No Change												Phase 1	Phase 3	
Large-scale Renewable Capacity (total)		5.2	5.6	6.2	7.7	8.7	9.9	12.7	13.6	15.4	19.4	24.4	25.0	→	
Dispatchable Capacity (total)		13.2	13.3	14.0	14.0	13.6	13.5	14.8	13.7	14.3	16.0	15.8	15.7	→	
Peak Demand		10.3	10.4	10.7	10.9	11	11.1	11.3	11.5	11.7	11.7	12.0	12.1		

Source: Queensland SuperGrid Infrastructure Blueprint, September 2022

Higher peak demand driven by out-of-control air-conditioning demand will require more fossil fuelled generation which in turn will increase emissions from the energy sector.

Rising peak demand and a stalled rollout of renewable generation & long duration energy storage, will make it highly likely Queensland will not be able to achieve a 75% reduction in emissions by 2035.

The Queensland SuperGrid Infrastructure Blueprint is silent on consumer demand response initiatives.

The 2032 Brisbane Olympics - collateral damage of a 75% by 2035 emissions reduction target?

The Queensland Government has not publicly released Queensland Treasury modelling which determined that a 75% emissions reduction target by 2035 would not harm the Queensland economy, jobs or living standards.

As per evidence provided earlier, the energy sector is highly likely to be unable to meet the 20% emissions reduction target needed for Queensland to meet its 75% by 2035 emissions reduction target. This will force other sectors of the economy to make up for the energy sector shortfall.

One of the biggest infrastructure investments in Queensland's history will be the 2032 Brisbane Olympics. The cost to the Queensland Budget is massive. Many Queenslanders, particularly regional Queenslanders, did not support Queensland's bid to win the one horse race.

Australia and Queensland are traditionally regarded as an "aspirational" holiday destination due to the expense of air and sea travel.

Qantas and Virgin are included in the Federal Government's Safeguard Mechanism. An easy way for the airlines to comply with their obligations would be to reduce the number of long haul flights.

If the aviation and cruise sector are expected to make up for some of the energy sector's shortfall, it's possible a decarbonisation plan could include the mandated use of sustainable aviation and marine fuels – the sustainable fuels industry is very much in its infancy with exhaustive safety testing required plus substantial investment in fuel storage. A mandated sustainable fuel industry could substantially increase the cost of long haul travel, reducing Olympic visitation and potentially pushing the 2032 Brisbane Olympics into a loss making event.

It's not just Brisbane tourism that would be affected by any sustainable fuel mandate. Cairns has an international airport and many regional cities are increasingly dependent on the income from the cruise sector.

It is critical Queensland Treasury releases to the public its modelling on the 75% by 2035 emissions reduction target.

We strongly urge the Queensland Government to consider our submission as we believe Queensland jobs, the Queensland economy and Queensland living standards are at risk should this Bill be passed.

We thank you for the opportunity to provide a submission.

We believe it is important for the Committee to hear from an energy consumer advocate active at a state and national level and based in regional Queensland where much of the direct impact from the transition is being felt.

Yours faithfully

A solid black rectangular box used to redact the signature of Jennifer Brownie.

Jennifer Brownie
Coordinator