

QRC STATE OF THE SECTOR

JUNE QUARTER 2017



POWER PRICES SWITCHING OFF GROWTH

From the A of aluminium smelting through to Z of refining zinc, the whole alphabet of Queensland resource exports depends on a stable and affordable electricity supply. Electricity is an essential input for resource operations – it powers compression and refrigeration for LNG plants, runs draglines in open cut mines, and drives crushing plant and locomotives alike.

As wholesale electricity costs rise, the industry cannot simply pass on these increases to customers. The Queensland resources sector is trade-exposed and must remain globally competitive. High electricity costs will price Queensland projects out of global commodity markets.

Queensland's average electricity price has more than tripled from \$30 in 2011-12 to \$103 in 2016-17. Since 2015-16 alone, the price has increased by over 60 per cent (See Chart 1).

As dramatic as these price increases look, they have been accompanied by far greater volatility, with spot prices surging hundreds (and sometimes thousands) of dollars from hour to hour.

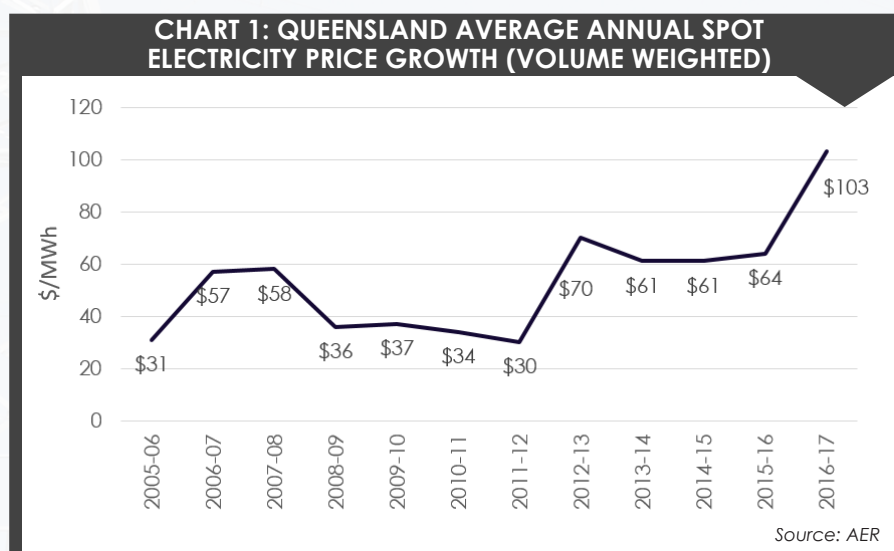
Worryingly, resources sector CEOs are braced for further increases—79% of QRC member CEOs surveyed said they expect similar or higher growth in electricity costs over the next five years. Not a single CEO expects electricity costs to decrease:

“Electricity costs are a major issue, our expectation is that costs will increase significantly”

QRC member CEO sentiment survey, June 2017

As electricity costs rise, energy-intensive operations are forced to reduce costs or they go out of business. This is what we saw at the [Boyne Island aluminium smelter earlier this year](#), where 100 workers were stood down and production was cut by 14 per cent.

The real cost from similar or higher growth in electricity costs over the next five years will be the jobs lost. But rising electricity costs do not just hurt existing operations—they impact future Queensland projects and employment growth. 39% of surveyed CEOs said that recent growth in electricity costs have hurt investment opportunities.



“Cost and security of [electricity] supply have been factors in whether to proceed with new projects”

“Electricity costs and the availability of electrical infrastructure have both impacted the viability of existing operators and decisions on commencing new projects”

QRC member CEO sentiment survey, June 2017

To remain globally competitive, the resources sector needs a plan to deliver reliable and affordable electricity sooner rather than later. In June 2017, the Australian Energy Market Operator (AEMO) said that over the next two years, electricity supply in the national electricity market, particularly in southern states, may fall short of demand in extreme conditions¹. Furthermore, the Minerals Council of Australia (MCA) has estimated that over the next 15 years, around 8 gigawatts of coal-fired generation capacity is likely to retire.

It's a concern that there are no plans to replace this retiring capacity with similarly reliable and affordable baseload capacity. The Queensland Government has set a target of 50% renewable energy by 2030, with the Finkel Review of the security of the national electricity market implying Queensland would achieve around 42% renewables by 2030. Either way it is a massive influx of renewable generation capacity into a market where demand is at best flat (and perhaps declining if large energy users are forced out of business).

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So what's to be done? Ensuring sufficient dispatchable generation is essential. Renewable energy clearly has a role in Queensland's generation mix to drive down emissions, although it alone can't replace reliable and affordable baseload power. The ideal answer is a portfolio of generation which allows a blend of technologies to deliver on all three goals - stable prices, reliable electricity supply and lower emissions.

Any investment in new generation capacity must be available when needed—and at an affordable price. The experiences of South Australia tell us that relying too heavily on intermittent renewable energy sources is an expensive gamble, with South Australia recently surpassing Denmark in having the world's most expensive electricity.

Installing new renewable energy generation capacity is an expensive way to power economic growth. According to reports from Solstice and GHD for the MCA, a High Efficiency Low Emission (HELE) coal-fired power station is the cheapest source of electricity at \$40 - \$78 MWh, compared to gas at \$69 - \$115 MWh, wind at \$64 - \$115 MWh and solar at \$90 - \$171 MWh.

Furthermore, these estimates of wind and solar exclude the additional costs of adding battery storage to firm up reliability. While battery storage is getting cheaper, adding enough batteries to intermittent renewables is still a very expensive proposition. The research shows that bolstering the reliability of renewables with enough batteries increases the total cost to \$211-\$693 per MWh. For solar, the total cost of including batteries is \$328 – \$913 per MWh. Renewable energy that includes storage capacity is at least seven times more expensive than a HELE coal-fired power station.

Under the *Powering Queensland Plan*, the Queensland Government has undertaken several short-term measures to steer Queensland away from the blackouts and high prices of our southern neighbours. Returning the 385 MW Swanbank E gas-fired power station to service in late 2017 will help to secure Queensland's electricity supply for the coming summer. The development of Queensland's abundant coal seam gas resources will also help to alleviate pressure on gas supplies and prices. The Australian Government too has made energy security a priority policy area, with the 2017 COAG Energy Council meetings amending the Gas Supply Strategy to focus on conventional onshore gas reserves, as well as establishing an Energy Security Board.

The QRC understands the need for sufficient and reliable gas reserves for the east coast, especially given the role of gas in powering our manufacturing sector. However, the QRC continues to advocate for new gas supplies to be brought online, in preference to measures such as the Federal Government's *Australian Domestic Gas Security Mechanism*. CEOs are concerned about the impact this measure will have on future investment, just 13% of CEOs believe the mechanism hasn't hurt Australia's reputation as a low sovereign risk country.

Queensland has an immediate opportunity to reduce the cost of gas, with regulations estimated to add a third to the cost of production. Streamlining these regulations could reduce production delays and reduce the cost of producing gas. But it is not enough. Private sector investment in new electricity generation and new sources of gas are required to achieve an affordable and secure energy supply. But the message from QRC member CEOs is that investment is unlikely to occur while policy uncertainty remains:



The disconnect between Federal and State and between states creates an uncertain and confusing investment environment"

"Continued government intervention in the [energy] market will continue to stall investment"

QRC member CEO sentiment survey, June 2017

What is the solution on electricity costs? QRC calls on all parties to provide certainty on emissions policy to allow investment in affordable and reliable new supply.

Dr Finkel's report delivered 50 recommendations for the orderly transition to a lower emission economy. The Australian Government has agreed to 49 of those 50, however the outstanding issue for consideration is of course the controversial clean energy target. An essential, and often overlooked, element of this orderly transition is the Generator Reliability Obligation, which guides investment towards dispatchable supply.

The lesson for Queensland from South Australia's experience is the need to plan for an orderly transition to lower emissions without forgoing system reliability. Queensland's fleet of modern gas and coal-fired power plants mean we can use our dispatchable generation capacity to level out the variations in intermittent renewable energy supply.

Ensuring a continued balance between renewable energy and adequate dispatchable capacity will allow us to enjoy the best of both worlds – the lower emissions from renewable energy alongside the reliability of the existing generation fleet.

KEY INDICATORS

QRC PRODUCTION VOLUME INDEX

Beware the slides in March

The QRC's quarterly Production Volume Index tracks changes in the total production of Queensland's major commodity exports—alumina, aluminium, bauxite, coal, copper, gold, lead, silver, zinc and now, for the first time, LNG.

The QRC has updated its production volume and value indices to include Queensland's LNG export data from the December 2016 quarter onwards. The QRC chose the December 2016 quarter as the baseline for LNG production given the last of the six LNG trains on Curtis Island had commenced by October 2016. The QRC is grateful for the assistance of [EnergyQuest](#), who has generously provided the QRC with the necessary LNG data.

The Production Volume Index is weighted by the value of each commodity. This means changes in the volume of coking coal (which is just over half the total index value) has a proportionately larger impact on the quarterly index result than, for example, changes in thermal coal volumes (representing approximately 10–15 % of total value).

The QRC's Production Volume Index for the March 2017 quarter (latest available data) decreased to 112 points, down 7 points from the December 2016 quarter. But avid QRC index observers are unlikely to be surprised, given the QRC's production index has decreased every March quarter since 2007. In fact, the decrease in March 2017 quarter represents the equal-lowest decrease in a March quarter since 2007.

Chart 2 plots the change in the QRC Production Index for this quarter—including the impact of EnergyQuest's LNG data on the index. EnergyQuest is an Australian-based energy advisory firm, which specialises in independent energy market analysis and strategy with a focus on oil, gas, power, LNG, coal seam gas, renewable energy, pipelines and liquid fuels.

Two of the major drivers of the index decrease this quarter were:

- a 10% decrease in coal exports (around five million tonnes) when compared to the previous quarter — with coking coal exports accounting for nearly 4 million of those tonnes.
- including LNG in the index decreases the index by 4 points — given the diluting effect on volume growth by including a new commodity into the index base.

Copper was the only commodity to increase production volumes over the March 2017 quarter—up 16% or approximately 10,000 tonnes from the December 2016 quarter. While Queensland's LNG exports decreased slightly—down 2% from the record December 2016 quarter.

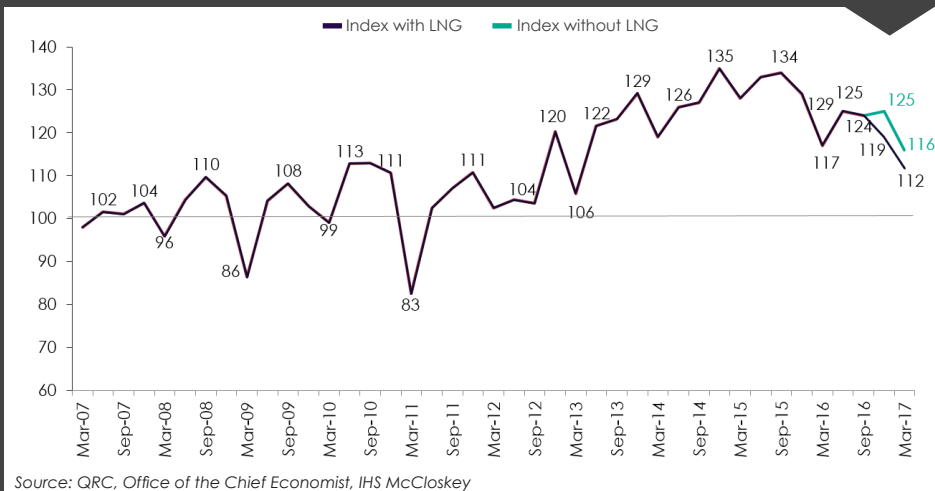
The remaining commodities experienced larger decreases across the quarter with zinc volumes down 19%—largely due to lower feed grades² and production fluctuations across Queensland mines³. Finally, lead and silver both decreased by 16% and gold volumes decreased 13% when compared to the December 2016 quarter.

EXPORTS

Queensland coal exports for the March 2017 quarter reached 51.3 million tonnes or an annualised rate of 205.3 million tonnes per annum. This was a 3% decrease on the 53 million tonnes of coal exported in the same quarter last year and well short of the 221 million tonnes exported in calendar 2016. Coal exports for the March 2017 quarter experienced several supply-side impacts including reduced rail capacity caused by Cyclone Debbie (with further volume impacts in the June 2017 quarter) as well as reduced production from several central Queensland coal mines.

Over the next twelve months, the Office of the Chief Economist forecasts Australia's export volumes of coking coal to increase by 10 per cent from 2016–17 levels, to 201 million tonnes—as stockpiles delayed by Cyclone Debbie outweigh weaker Chinese demand. Queensland can expect to supply most of these tonnes—producing around 85% of Australia's coking coal exports. Thermal coal exports are forecast to remain steady over the same period.

**CHART 2: QRC PRODUCTION INDEX MAR 2017 QUARTER (WITH LNG)
(A\$) (QUARTERLY) (INDEX BASE JUNE 05/06=100)**



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As for LNG, Queensland exports decreased by 2% over the March quarter when compared to the record LNG exports in the December 2016 quarter—but 28% above the March 2016 quarter. China and South Korea were again our largest customers, receiving approximately 1.9 million tonnes and 1.5 million tonnes of LNG across the quarter.

Meanwhile, the Office of the Chief Economist expects Australia's LNG exports to increase by 24% over the next twelve months as key LNG projects ramp up production across Australia. However, most of this growth is expected to occur in Western and Northern Australia, with an estimated 5.3% growth in Eastern Australian LNG production.

QRC VALUE OF PRODUCTION INDEX

Ramped up with LNG

QRC's Value of Production Index reflects changes in the prices of the resources that Queensland produces. The weighted index reflects the same mix of commodities as the QRC production index and therefore now includes LNG production from the December 2016 quarter onwards.

Over the March 2017 quarter, the QRC's Value of Production Index decreased from 250 to 178 points—largely expected given coking coal prices decreased by 35% from the highs of the December 2016 quarter to US\$172 per tonne. Similarly, the average price for thermal coal was US\$81 per tonne for the quarter, down 13% from the December quarter.

Consistent with the Production Volume Index, integrating LNG into the QRC's value of production index has dampened the impact of coal price changes over the previous two quarters. Including LNG the index reduced by 46 points in the December 2016 quarter, while the index fell 27 points less in the March 2017 quarter than it would have in the absence of LNG.

In dollar terms, the value of the commodities produced by the sector reached A\$14.6 billion in the March 2017 quarter.

This represents an A\$6 billion (or 29%) decrease in value since the previous quarter—again, largely due to declining coal prices and volumes.

Outside of coal—LNG spot prices increased 17%, while Alumina 23%, zinc 10% and copper 11% also achieved large gains.

However, most of the LNG exported from Queensland is not traded at spot prices, but rather in oil-linked contracts, which include a cap and floor to protect the buyer and seller from extreme price variations.

Chart 4 provides a breakdown of this quarter's average price changes for each commodity.

CHART 3: QRC VALUE OF PRODUCTION INDEX MAR 2017 QUARTER (WITH LNG) (A\$) (QUARTERLY) (INDEX BASE JUNE 05/06=100)

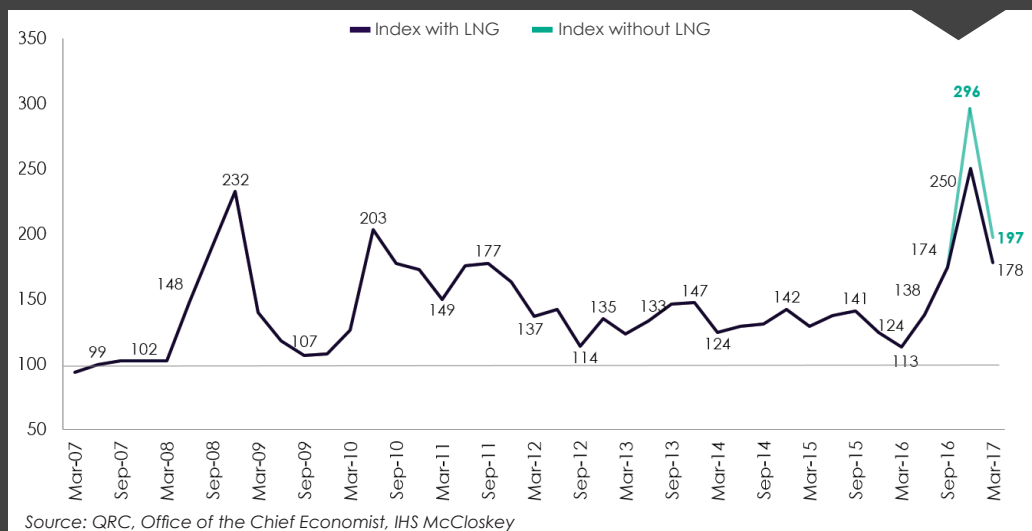
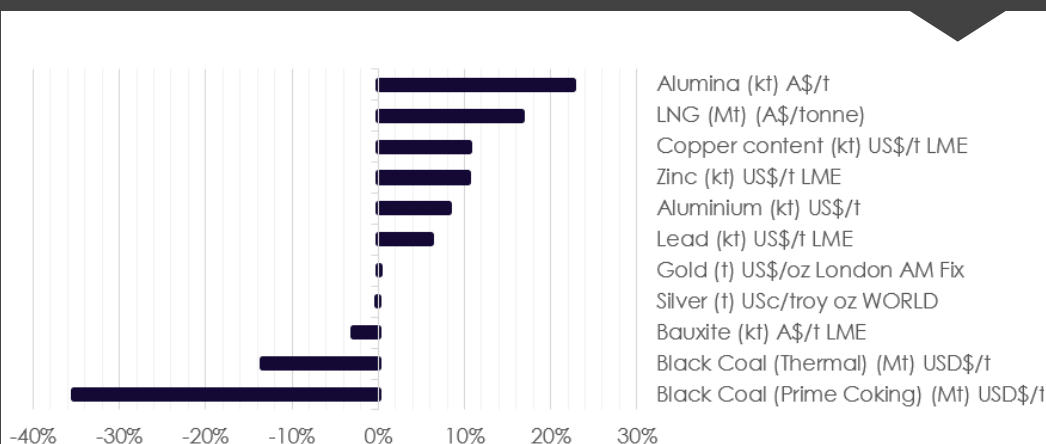


CHART 4: AVERAGE QUARTERLY COMMODITY PRICES CHANGES, MARCH QUARTER 2017



² https://www.south32.net/docs/default-source/all-financial-results/reports-and-presentations/quarterly-report-march-2017.pdf?sfvrsn=907f9134_7

³ http://www.glencore.com/assets/investors/doc/reports_and_results/2017/GLEN-2017-Q1-Production-Report.pdf

KEY INDICATORS CONTINUED

Despite the decrease in volumes over the quarter and price decreases for coal, chart 5 below shows that Queensland resources export values remain well above long-term results—particularly over the previous five years. Furthermore, since the QRC's value of production index began in June 2006, the export value of Queensland's resources has increased by over \$8 billion—from \$6.5 billion in June 2006 to \$14.6 billion in March 2017.

Furthermore, the resources sector is continuing to build on the employment achievements of previous quarters.

According to the Australian Bureau of Statistics, in the year to May 2017, 8,600 new jobs were created in the Queensland mining sector—a 17% increase over the year.

Moreover, 2,000 of these new jobs were created in coal mining since February 2017.

Chart 6 below provides a breakdown of the value of Queensland's resource production in the March quarter. LNG has had a material impact on the value of Queensland's resource production—accounting for 15% of the sector's production value in the March quarter.

Looking ahead, according to the Office of the Chief Economist's latest Resources and Energy Quarterly, prices for many of Queensland's key commodities are expected to moderate. Over the year to June 2018, coking coal is forecast to decrease to US\$135, a fall in value of approximately 30%, thermal coal is expected to decrease by 9% to US\$77 per tonne, while zinc is forecast to decrease by 8%. LNG prices are forecast to remain relatively steady, increasing by 3% over the year.

Finally, the Office of the Chief Economist expects the Australian dollar to depreciate slightly against the US dollar over the remainder of the year—averaging 0.74 US cents in 2017–18 and reaching 0.75 US cents in 2018-19.

CHART 5: QUEENSLAND'S QUARTERLY RESOURCES EXPORT VALUES AND VOLUMES

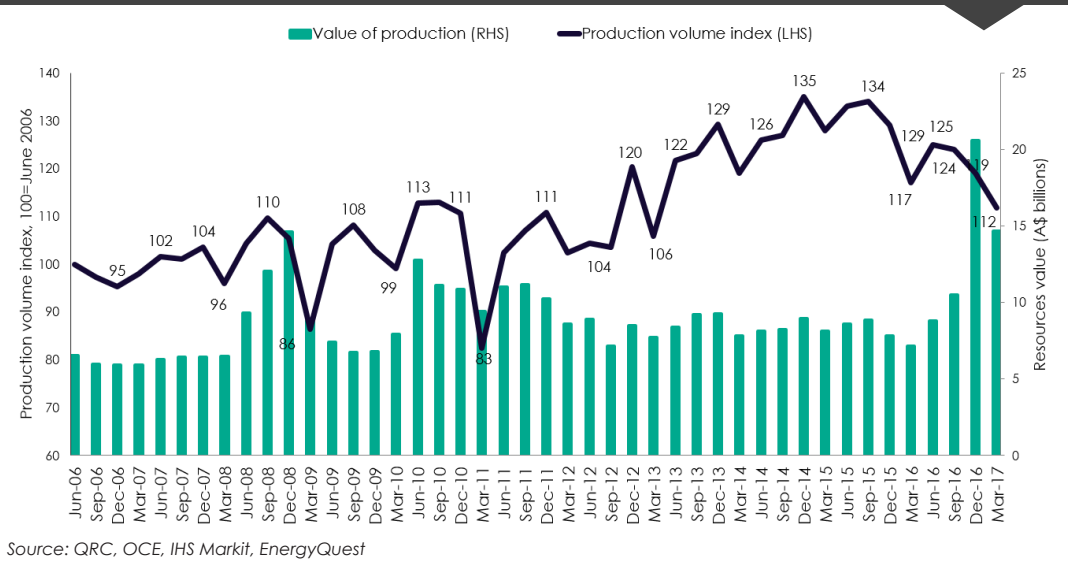
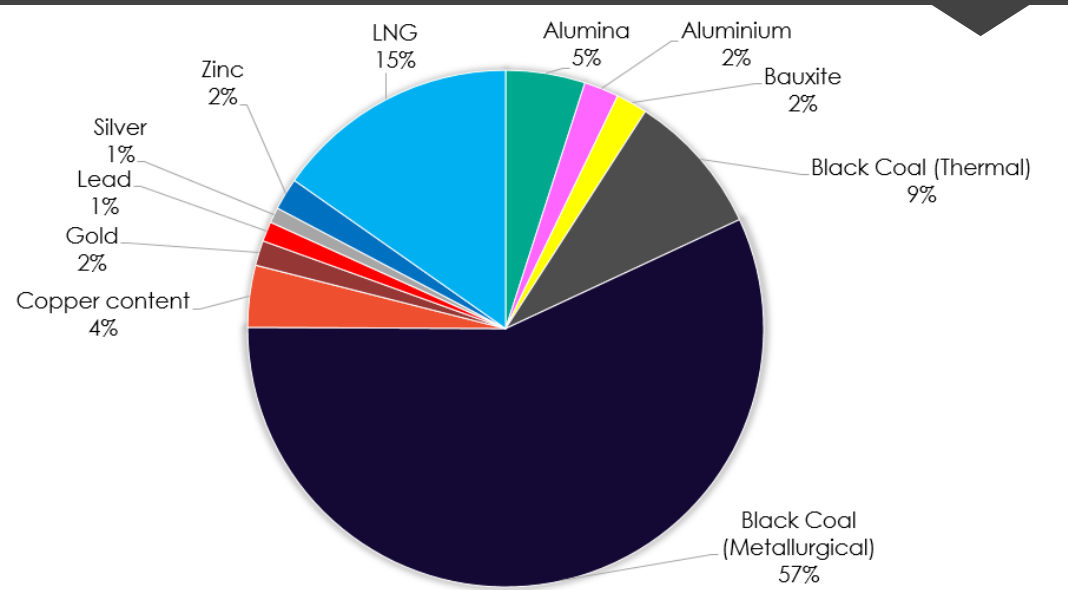


CHART 6: QUEENSLAND RESOURCES PRODUCTION VALUE (A\$14.6 BILLION) MARCH 2017 QUARTER



QRC CEO SENTIMENT INDEX

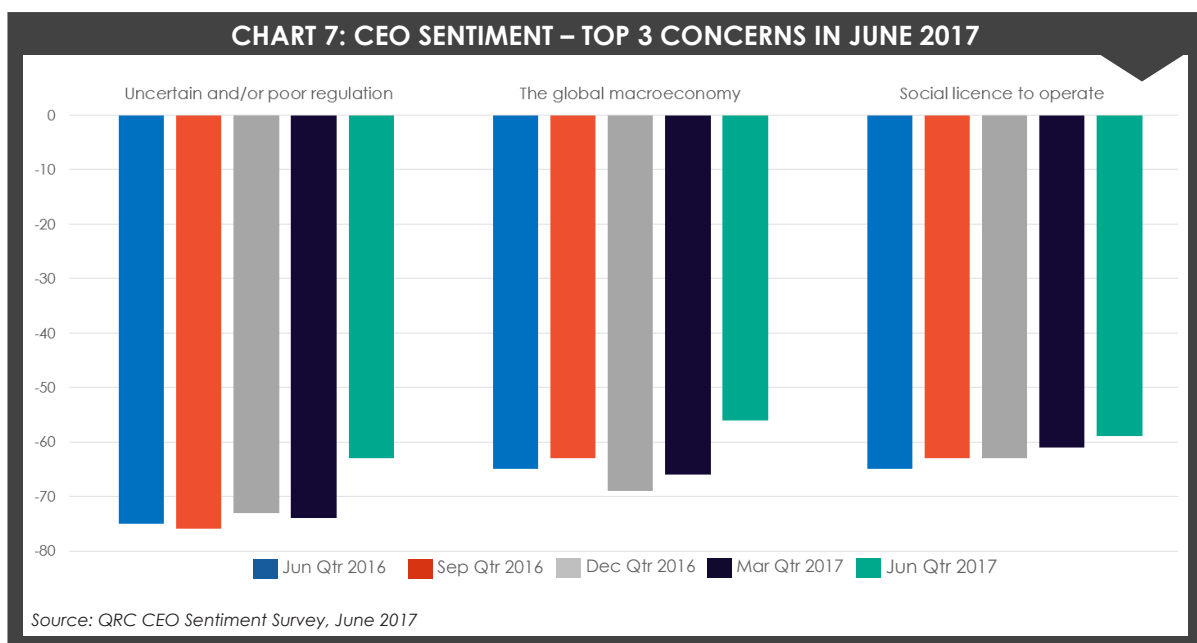
The QRC CEO Sentiment Index is collected through a quarterly survey of QRC's producer and explorer members with responses from between 20-35 companies. The companies surveyed cover mining and energy, minerals processing, contracting, exploration, electricity generation and oil and gas extraction activity in Queensland.

Each quarter CEOs are asked to nominate to what extent they expect a series of eleven factors will impact on the objectives of their organisation over the next 12 months. All responses are weighted to arrive at a single sentiment value for that factor. The weighting means the factors generating the greatest concern receive the lowest scores and are lower down on the negative axis.

CEOs appear to be cautiously optimistic in the June 2017 quarter, as CEO sentiment improved across most categories—with raising capital the only category to deteriorate in sentiment (although only a 2 point decrease). Consistent with the March 2017 edition, the top three concerns for CEOs were: Uncertain or poor regulation (1st), social licence to operate (2nd) and the global macroeconomy (3rd).

Chart 7 (on right) illustrates the change in sentiment over recent quarters for our member CEOs' top three concerns. The good news is that, each of the top 3 sentiment categories displayed an improvement over the June 2017 quarter.

Compared to the previous quarter, social licence to operate improved by two points, yet in comparison to other sentiment categories, social licence escalated up the rankings—moving from 3rd to the 2nd most negative category. Indeed, comments from QRC member CEOs support this concern:



“There is a strong anti-coal movement that is impacting not only licence to operate issues and reputation, but also access to funds and to a smaller degree good talent to work within the industry”

“...pressures from social media [means] more emphasis has been placed on non value add processes”

“...there are increasingly hostile NGO groups”

“Acceptance for coal projects is decreasing, despite the clear need for coal for decades.”

QRC member CEO sentiment survey, June 2017

However, as a cause for optimism, social licence sentiment remains 6 points more positive than the index average of -65 and is in a far better position than the sentiment lows of 2010 and 2011. Moreover, social licence is still moving in the right direction as CEO sentiment on social licence has improved every quarter since June 2016.



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