

Galilee Basin (Coal Prohibition) Bill 2018

IEEFA's submission to the Senate Environment and Communications Legislation Committee inquiry into the Galilee Basin (Coal Prohibition) Bill 2018



Institute for Energy Economics
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Executive Summary

In IEEFA's view, there are many reasons why we entirely support this bill to introduce an Act to prohibit the mining of thermal coal in the Galilee Basin. These include:

- The likely collateral damage to Australia's existing thermal coal mining basins. Any plan that could lead to a more than doubling of Australia's thermal coal export capacity is overtly contrary to our national interest at a time when global forecasters say the seaborne thermal coal market will more than halve within two decades if the world acts on the Paris Agreement.
- The very low quality of coal in the Galilee Basin is in direct contrast to Australia's coal export production from existing regions. The remote location compounds the adverse cost implications of having to transport long distances potentially unprecedentedly large volumes this low energy, high ash coal. The global market is now pricing low quality thermal coal exports at an unprecedented discount.
- Global financial institutions and key customers of Australian coal are increasingly divesting from thermal coal and/or raising coal taxes / carbon emission levies.
- Thermal coal imports for power generation are now entirely uncompetitive in India against ever lower cost, domestic renewable energy projects. IEEFA views India – the world's second largest producer, consumer and importer of thermal coal – as a leading example how quickly stranded asset risks associated with new coal power proposals are rising. India's banking system is drowning under the burden of over US\$100bn of non-performing loans to the coal power sector within India.
- Developing the Galilee Basin is in direct contradiction to Australia's Paris Climate commitment to do all we can to reduce carbon emissions.
- The likely permanent collateral damage to Queensland industries like agriculture and tourism as extreme weather events become more regular, and more extreme.

As such, given the scientific consensus on the need to act urgently on climate change, to IEEFA the Galilee Basin cost-benefit equation is unambiguously skewed to the negative for Australia. The Galilee Basin is likely to prove both a stranded asset while also creating significant financial risks for Australia. Prohibiting development before any project has commenced construction is clearly in Australia's national interest.

The Galilee Basin is the world's **largest** new thermal coal basin proposed for development, approaching 300Mtpa of new thermal coal export capacity. Proposals include but are not limited to:

- the Adani Carmichael proposal of up to 60Mtpa for 60 years;
- three Hancock Prospecting proposals, that being Alpha, Alpha West and Kevin's Corner, totalling up to 84Mtpa;
- Clive Palmer's long delayed Waratah Coal variously slated for up to 80Mtpa;
- China's Macmines China Stone proposal for up to 38Mtpa; and
- Hyde Park's 10Mtpa product coal proposal.

In a carbon constrained world the IEA expects coal exports to drop two-thirds by 2040 under its Sustainable Development Scenario: To IEEFA it is clear that any attempt to develop up to 300Mtpa of new, isolated, low quality thermal coal export capacity four years post the peak of the global seaborne thermal coal market is not in Australia's national interest.

Combined, the Galilee Basin equates to up to a proposed 30% expansion of global seaborne thermal coal capacity at the same time as the International Energy Agency

(IEA) estimates that the global seaborne thermal coal market needs to shrink globally by over 60% by 2040 if the world is to have any chance of limiting global warming to a remotely acceptable level. Flooding the seaborne market with huge new supply will only serve to lower the value of Australia's existing coal mining businesses and further erodes the value of existing infrastructure investment in coal railways and coal ports.

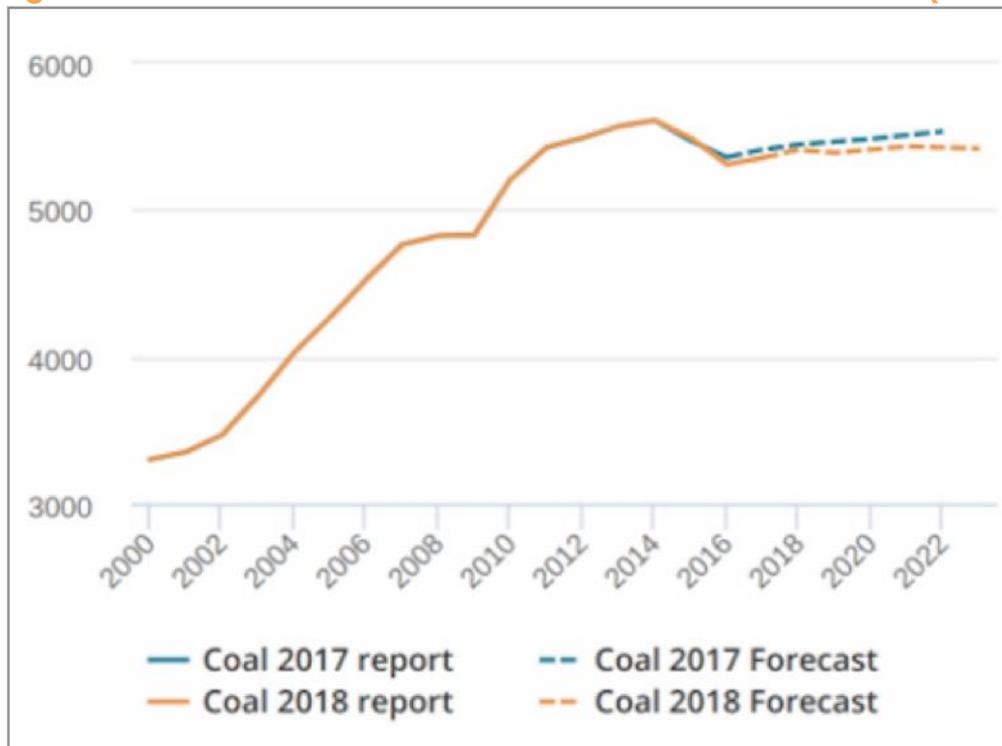
In this submission, we will detail the IEA's coal forecasts under its scenarios, as detailed in its' World Energy Outlook 2018 (Section 1). This submission then briefly examines global financial institutions moves to exit thermal coal sector (Section 2). India has seen a dramatic and unexpected onset of massive stranded asset losses - now running at upwards of US\$100bn – across the thermal power sector. The increasingly unviable profile of imported coal- and LNG-fired power plants in India is a clear lead example of what is likely to emerge across Asia within the next five to ten years (Section 3). We examine the high stranded asset risk associated with the remote location combined with the very low quality of coal in the Galilee, in clear contrast to high quality coal from other Australian coal basins that are already in production and in close proximity to export ports using established, tax-payer funded rail infrastructure (Section 4). Finally, we briefly discuss other risks – water, carbon and sovereign risks (Section 5).

1. The IEA Sustainable Development Scenario: Coal's Collapse

The International Energy Agency's (IEA) central New Policy Scenario (NPS) as per its 2018 World Energy Outlook (WEO 2018) forecasts global coal demand will rise marginally (+1.5%) by 2040 relative to 2017 levels. The IEA also estimates this will likely see global temperature rises averaging 2.7 °C by 2100.¹ However, in stark contrast to this, should the world make the necessary efforts to limit climate change to just 2.0 °C, the IEA estimates global coal demand will collapse (-57.4%) by 2040. This is detailed in the IEA's Sustainable Development Scenario (SDS). Limiting temperature rise to a 1.5 °C outcome requires the virtual cessation of coal use by 2050. The IEA doesn't actually release to the public its model for a successful Paris Agreement outcome.

The IEA has acknowledged that global coal use likely peaked five years back in 2014, and models a flat near term outlook to 2022 – Figure 1.1.

Figure 1.1: IEA Global Coal Demand Actual and Estimates 2018 vs 2017 (Mtce)



Source: OECD / IEA

The global seaborne thermal coal market is a small sub-section of the global coal market. The IEA estimates that seaborne thermal coal exports likely peaked in 2015. Before examining the IEA forecasts to 2040, we think it important to clarify this statement of coal being well past its peak, particularly in light of claims by coal lobbyists that South-East Asia will provide significant thermal coal demand into the future despite it representing a small subset of the global seaborne thermal coal market.

The idea that South East Asia will remain an isolated and untouched growth market to the benefit of Australian coal exporters is rather optimistic or even false hope, in IEEFA's view.

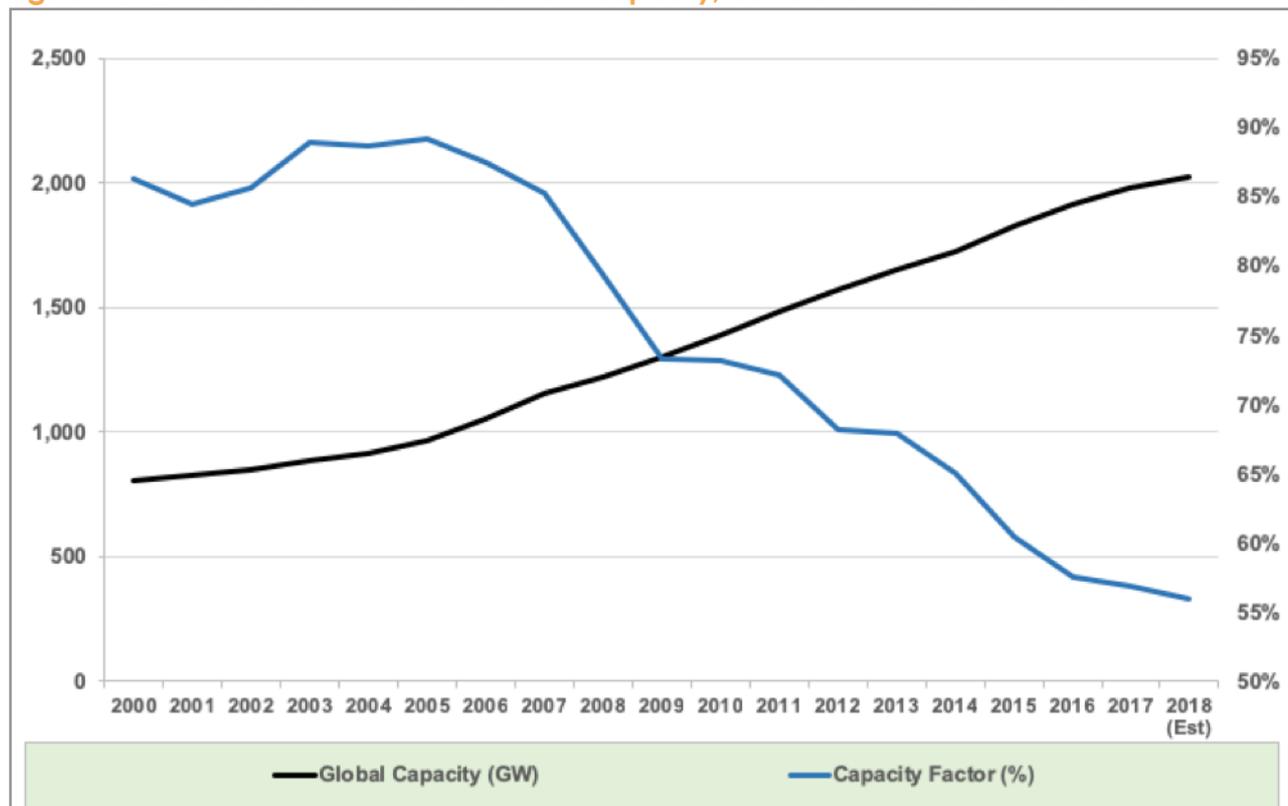
In IEEFA's view the global seaborne thermal coal market is not likely to reverse the inevitable technology, cost and policy driven direction of a slow and steady decline in

¹ IEA, [Where are we on the road to clean energy?](#), 4 May 2018

volumes. This is not going to happen overnight, it will likely take several decades, but the technology disruption of global energy markets is well entrenched and unstoppable. We say this relatively categorically given the rate of decline of the cost of renewable energy and on the premise the world collectively makes further efforts to implement the Paris Climate Agreement, and absent the long touted but increasingly unlikely development of ultra-low cost, carbon capture and storage for coal fired power plants. Rather than sinking more capital into expanding capacity, far better for Australia to optimise existing investments and invest in new low emissions industries of the future, to best transition the Australian economy and limit our collective exposure to stranded assets.

Coal lobbyists often justify a positive outlook commentary by referencing the continued commissioning of new coal fired power plants globally over the last decade – a trend confirmed in Figure 1.2 (LHS, in black), but which only tells the optimistic half of the story.

Figure 1.2: IEA Global Coal Fired-Power Plant Capacity, Generation & Utilisation Rate



Source: Global Coal Plant Tracker, BP Statistics, RMI, IEEFA estimates & calculations

This narrative misses several key globally entrenched developments:

- **As coal plant capacity has risen, coal plant capacity has declined (Figure 1.2).** The global capacity utilisation rate of the coal fired power plant fleet hit a new record low in 2018, exceeding the record low set in 2017, and previously in 2016 and in fact every year this past decade – Figure 1.2 (RHS in blue). Coal consumption is not linked to increased coal power plant capacity, it is linked to the use of a coal plant. An idle new plant does not use any coal, it just represents a stranded asset.
- **Many coal lobbyists often cite new coal plant development pipelines but then fail to mention the rate of coal plant retirements.** Commenting on only the positive half gives a falsely optimistic perspective. Globally, coal power plant retirements are accelerating, and by 2022 are forecast to exceed new plant completions.²

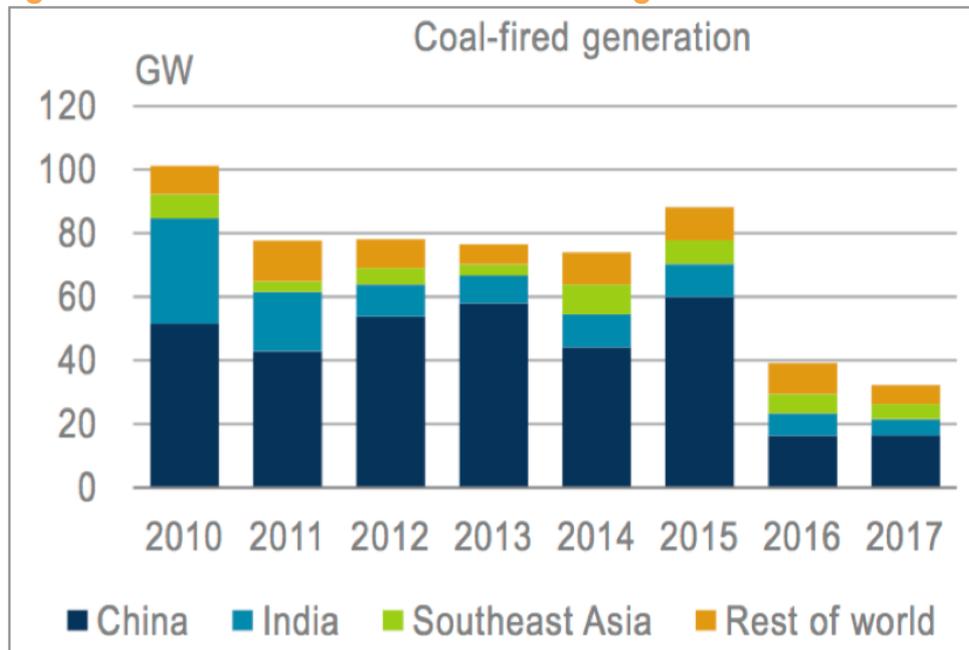
² Carbon Brief, Global Coal Plant Tracker, “Guest post: ‘Peak coal’ is getting closer, latest figures show”, July 2018

- **The global coal plant pipeline has shrunk by two-thirds; a cumulative US\$1 trillion or 744 GW in just the 30 months to July 2018.** Stranded asset losses are rapidly rising, as renewable energy competition gets increasingly competitive.
- **The IEA identifies that 2017 saw a record low level of new coal plant proposals moving to a final investment decision** as investors reassess coal's merits – refer Figure 1.3.
- **Coal plants are becoming on average more efficient**, generating 0.5-1.0% more electricity per tonne of coal used each year.

What IEEFA concludes from Figures 1.2 is that there has been a decade long over-investment in new coal fired power generation capacity, way in excess of demand. The commercial viability of the entire global coal fired power fleet in aggregate is technically challenged by collapsing utilisation rates down towards just 55% i.e. they sit idle every second day on average. This is way below the optimal 75-85% assumption erroneously factored into optimistic projections made upwards of a decade ago.

Investors have responded by dramatically curtailing expansion plans, as per Figure 1.3.

Figure 1.3: IEA Global Coal Power Plants Reaching Final Investment Decision Sign-off



Source: IEA, 2018

Figure 1.4: IEA Global Coal Use 2014-16 vs Forecast 2040: NPS vs SDS (Mtce)

	2014	2015	2016	2017	NPS 2040	NPS Chg vs 2017	SDS 2040	SDS Chg vs 2017
Total Coal (Mtce)	5,680	5,531	5,225	5,360	5,441	1.5%	2,282	-57.4%
Coking Coal (Mtce)	1,016	994	956	960	806	-16.0%	579	-39.7%
Thermal Coal (Mtce)	4,374	4,254	3,979	4,134	4,412	6.7%	1,609	-61.1%
Coking Coal % of total Vol.	17.9%	18.0%	18.3%					

Source: IEA WEO 2017 page 644-645, WEO 2018 pages 520-521, IEEFA calculations

According to the IEA, if the world takes a sustainable development path consistent with limiting average warming to 2.0°C, total global coal demand will drop by more than

halve by 2040 (-57.4%). The consequences for thermal coal would be even more dire with thermal coal consumption dropping in the realms of 61.1% (Figure 1.4).³

Under this scenario, the IEA models an even worse outlook for seaborne traded thermal coal. Under its NPS, demand by 2040 drops a relatively benign -5.6% in volume terms. Under a possible 2.0 °C SDS outcome, demand declines 65.1% vs 2017 levels – Figure 1.5.

Figure 1.5: IEA Global Seaborne Coal 2014-17 vs 2040: NPS vs SDS (Million Tonnes coal equivalent)

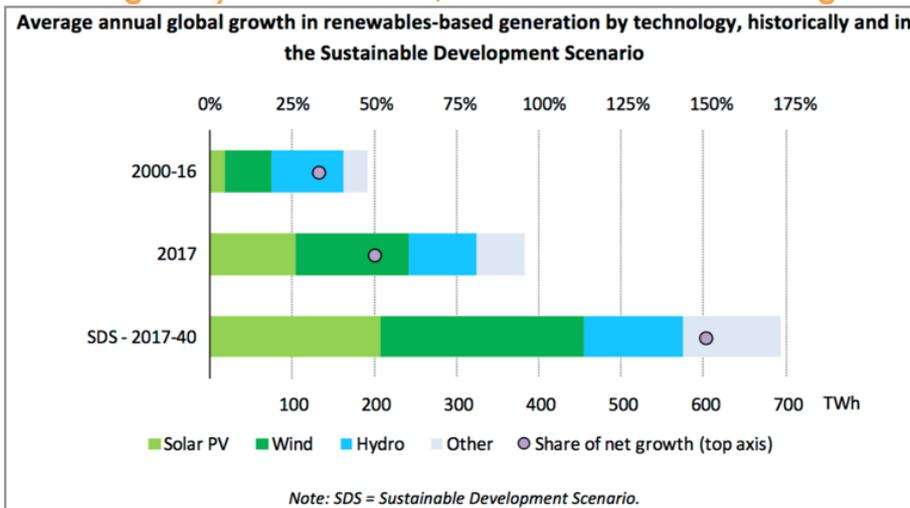
Mtce	2014	2015	2016	2017	NPS 2025	NPS 2040	NPS Chg vs 2017	SDS 2040	SDS Chg vs 2017
Thermal	801	761	756	805	736	760	-5.6%	281	-65.1%
Coking	284	293	292	302	320	346	14.6%	250	-17.2%

Source: IEA WEO 2016 page 206, WEO 2017 page 207, COAL 2017, NPS page 134, WEO 2018 p.218

For all that new coal plants are still be planned to be built across Asia, this needs to be contextualised that global finance is moving away from funding potential stranded fossil fuel assets – refer Section 2). The IEA SDS models a more than doubling of electricity generation from new zero emissions technologies each year through to 2040 relative the record high set in 2017 – refer Figure 1.6.

As we discuss in Section 3, India is already talking about a quadrupling of renewable energy installs annually in the next two years relative to the record high installs recorded in 2017/18. Like the IEA, IEEFA sees this shift to the lowest cost sources of electricity generation i.e. wind and solar in India as indicative of the likely shift across the greater Asian market over the coming decade. Whether motivated by any or all of the energy security, economics, financial flows or policies to deal with rising fossil fuel pollution pressures logic, this trend is accelerating. The implications are clear – the demand for seaborne thermal coal is past its peak and potentially entering terminal decline. For more detail, please refer IEEFA's major review of this released in November 2018.⁴

Figure 1.6: The IEA SDS Forecasts Renewable Energy will supply 150% of net growth in electricity demand globally over 2017-2040, with installation rates doubling relative to 2017



Source: IEA WEO2018

³ As measured in millions of tonnes of coal equivalent (Mtce), an adjustment to standardise coal use by energy content.

⁴ IEEFA, "Past their peak, NSW coal export volumes head toward terminal decline as markets transition", Nov 2018

2. Financial Institutions Pivot Away from Coal

The single biggest pressure holding back the opening up of the Galilee Basin is the ongoing and accelerating global shift away from financing thermal coal and coal-fired power plants. The inability to find global financial sector support for these investment proposals stems from the rapid cost declines of renewable energy technology and the very clear message of the UN IPCC highlighting the need to virtually cease global coal use by 2050.

Global investors managing US\$32 trillion released a policy statement in December 2018 calling for a global price on carbon and an accelerated coal phase out:⁵

“Expert analysis shows that to meet the Paris Agreement goals of limiting the increase in global temperatures by 2°C, while striving to limit the increase to 1.5°C, a coal phase-out is needed by 2030, in the OECD countries and in the European Union; by 2040, in China; and by 2050, in the rest of the world.”

Australian banks have all moved to recognise the global financial risks of climate change, making strong commitments to reduce funding for thermal coal mining and coal fired power plants. For example, [Westpac](#) in April 2017 ruled out financing new thermal coal basins.

Commonwealth Bank (CBA) [reported](#), as part of its 2017/18 financial results in August 2018, substantial progress in measuring, reporting and acting on this commitment, with a substantial decarbonisation shift well underway. This includes “carbon foot-printing” its equity portfolio of Colonial First State, one of Australia's largest fund managers. CBA has also shifted its lending programs towards funding low emissions technologies. Direct exposure to coal mining was down 7% year on year (yoy) to \$270m and coal infrastructure was down 30% yoy to \$1,000m, while lending to renewable energy was +32% year-on-year to \$3,700m.

In contrast, [Macquarie Group](#) has flown under the radar to-date and made no public commitment to exit coal. Yet its actions speak louder than words, and Macquarie has made renewable infrastructure investing one of its four global pillars of growth. Landmark [renewable energy](#) and [storage](#) deals across Europe and Asia show the momentum of global infrastructure investing towards decarbonisation.

Global coal divestment has been progressing, with global financial institutions pivoting to boost lending to renewable energy infrastructure and other low emissions alternatives.

- In February 2018 Generali of Italy announced it would cease new investments in coal.⁶
- In March 2018 [BBVA of Spain](#) committed to US\$100bn of renewables lending by 2025 as well as to cease financing any new coal mines and coal-fired power stations or extensions to existing ones.
- In April 2018 [HSBC](#) committed to stop financing new coal-fired power stations in all countries, except for Indonesia, Bangladesh and Vietnam.
- In July 2018 [Swiss Re](#) announced it would no longer provide insurance or reinsurance to businesses with more than 30% exposure to thermal coal.⁷
- In August 2018 [Munich Re](#), the world's second largest reinsurer, committed to stop offering insurance for new coal-fired power plants and mines in industrialised countries.

⁵ IGCC, “[Briefing Paper on the 2018 Global Investor Statement to Governments on Climate Change](#)”, Dec 2018

⁶ Generali press release, “[GENERALI APPROVES CLIMATE CHANGE STRATEGY. IT WILL DIVEST €2 BILLION FROM COAL](#)”, 21 February 2018

⁷ AFR, “[Screws tighten on thermal coal as Swiss Re pulls plug](#)”, 5 July 2018

In addition, Munich Re will no longer invest in shares and bonds of coal companies that generate more than 30% of their revenues in the coal sector.

- September 2018 also saw [Standard Chartered's](#) Chairman Jose Viñals announced its coal exit strategy, titled “Here for good means saying no to coal”.
- In September 2018 the Netherlands' ING Bank announced it would assess its entire US\$600bn lending book for alignment with a less than 2 °C temperature change world, consistent with the Paris Agreement. The bank had previously announced a phase-out of lending to coal and expects to have zero coal lending exposure by 2025.⁸
- October 2018 saw the [World Bank](#) exit underwriting the Kosovo coal power plant, its last coal finance proposal. The World Bank's [IFC](#) also announced it would shift its indirect partner financing to move away from coal.
- November 2018 saw the biggest public life insurer in Norway, the US\$85bn manager Storebrand ASA, announce a progress exit from coal, to be completed by 2026.⁹
- December 2018 saw The European Bank for Reconstruction and Development announced its even tighter policies under its “[The Switch from Coal](#)”.

Even [China has ruled out funding](#) the Carmichael Galilee proposal in November 2017.

2.1 Japan

The progressive coal fired power divestment announcements from Japan (Australia's largest thermal coal export destination) over 2018 have been nothing short of staggering. New thermal coal exits were announced by [Dai-ichi Life](#) in [May 2018](#) and [Nippon Life](#) in [July 2018](#). Japanese banks have also changed their lending standards to exclude all lending to out-dated coal-fired power plant technologies, as was reported in October 2018 for [Sumitomo Mitsui Banking Corporation](#).

IEEFA has written extensively about this emerging trend, most notably with respect to Marubeni Corp.¹⁰ In September 2018 [Marubeni Corp](#) announced a radical pivot, one reinforced by the concurrent personal op-ed by the [Prime Minister of Japan Shinzo Abe](#) in the Financial Times acknowledging the rise of extreme weather events and need to act decisively to deal with “climate change can be life-threatening to all generations”.

Most recently, two of Marubeni's fellow sōgō shōsha (Mitsubishi Corp. and Mitsui & Co.) have divested their last remaining thermal coal mine holdings. In December 2018 it was announced that another domestic coal-fired power proposal had been cancelled – JFE Steel and Chugoku Electric Power's 1 GW project near Tokyo.¹¹ Meanwhile Tokyo Electric Power Company (TEPCO) announced it would begin construction of its first commercial offshore wind plant in Japan in January 2019.¹² TEPCO's aim is to achieve two to three gigawatts of offshore wind as part of its strategic move away from thermal and nuclear power and towards renewables, [announcing](#) a potential US\$9bn Japanese offshore wind project in January 2019.

For more detail, please refer IEEFA's recent briefing.¹³

⁸ Financial Times, “ING will steer portfolio towards two-degree goal to help combat climate change”
Leslie Hook, 16 September 2018

⁹ Bloomberg, “An \$85 Billion Asset Manager Is Planning a Total Exit From Coal”, 30 November 2018

¹⁰ IEEFA, “Marubeni's Coal Problem: A Japanese Multinational's Power Business is at Risk”, 30 July 2018

¹¹ Bloomberg, “JFE Steel, Chugoku Electric Scrap Coal-Fired Power Plant Plans”, 27 December 2018

¹² TEPCO, “TEPCO's First Commercial Offshore Wind Power Facility to Launch January 2019”, 27 November 2018

¹³ IEEFA, “Early days, but momentum away from coal is building”, 21 December 2018

2.2 South Korea

South Korea's position on investing in new thermal coal mines has also moved dramatically. For more than a decade South Korea was a key investor in new Australian coal mines and associated rail and port infrastructure. POSCO had even signed a non-binding EPC MoU to build the 400km, \$2.5bn Carmichael railway line back in 2014, including a commitment to procure South Korean Government debt and equity funding support. But by July 2015 POSCO had closed its Brisbane office and effectively withdrew from the Carmichael proposal.

More recently, the momentum in South Korea has changed considerably, primarily since the May 2017 election of President Moon Jae-in on an anti-pollution platform. This has seen a growing range of government moves to reduce reliance on thermal coal and progressively decarbonise the South Korean economy.

December 2017 saw South Korea announce plans to build 58.5 GW of renewables by 2030, sufficient to supply 20% of all electricity.

July 2018 saw South Korea announce plans to increase its coal tax by 30% to US\$40/t from April 2019, while lowering its tax on LNG by 70% as part of a strategic pivot from coal and nuclear towards renewables and gas.

October 2018 saw the province of South Chungcheong joined the Powering Past Coal Alliance, accelerating the closure of 14 coal-fired power units.

October 2018 also saw two major public investors investing a total of US\$22bn, Korea's Teachers Pension and Government Employees Pension System, announce they would no longer finance new coal fired power plants.

3. India's Pivot to Renewables

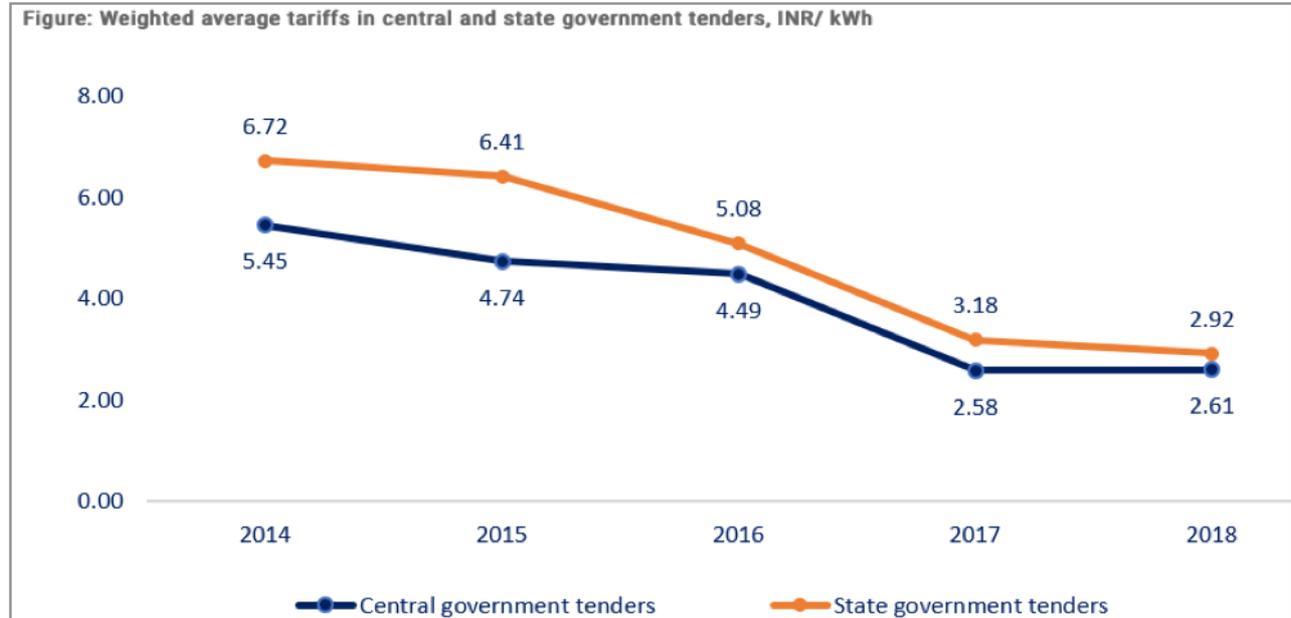
Under Prime Minister Narendra Modi, India has accelerated its national pivot to lower cost, zero emissions renewable energy. October 2018 saw Modi reconfirm that by 2030, India seeks to generation 40% of its total electricity from non-fossil fuel sources.

India's Power Minister R. K. Singh has repeatedly talked up the opportunities for India to lift the development of renewables up to a massive 40 GW annually, nearly triple the current run-rate. In January 2019 Power Minister R. K. Singh yet again lifted the level of renewables ambition, calling for India to install 500GW of renewables by 2028.¹⁴

The Indian Coal and Railways Minister Piyush Goyal has repeatedly stated his target for India to cease thermal coal imports, recognising the threat to India's energy security of India's excessive and unsustainable reliance on fossil fuel imports.

India's progress has been astonishing. With wind and solar tariffs regularly being tendered for Rs2.40-3.00/kWh (Figure 3.1), existing domestic thermal power generation is struggling to compete. NTPC, India's largest power generator, had an average 2017/18 tariff for coal-fired power of Rs3.26/kWh. Non-mine mouth coal requires tariffs of Rs4-5/kWh and new imported coal fired power generation requires a tariff of Rs4-6/kWh. September 2018 saw Gujarat complete a 500 MW solar tender at a record low of Rs2.44 / kWh, zero indexation for 25 years. And this trend is set to accelerate, given global solar module prices fell by 30-38% over 2018, the biggest annual decline in a decade. New coal can't compete with these deflationary tariffs that are contractually set to decline in real terms every year.

Figure 3.1: Solar Tariff Declines Continue to Drive Deflation for India's Electricity Sector



Source: Bridge to India, January 2019

Major private power generator Tata Power has suspended all new coal fired power plant development, instead preferring to acquire financially distressed existing power plants. Newly appointed CEO Praveer Sinha in May 2018 announced a US\$5bn renewable energy investment plan.

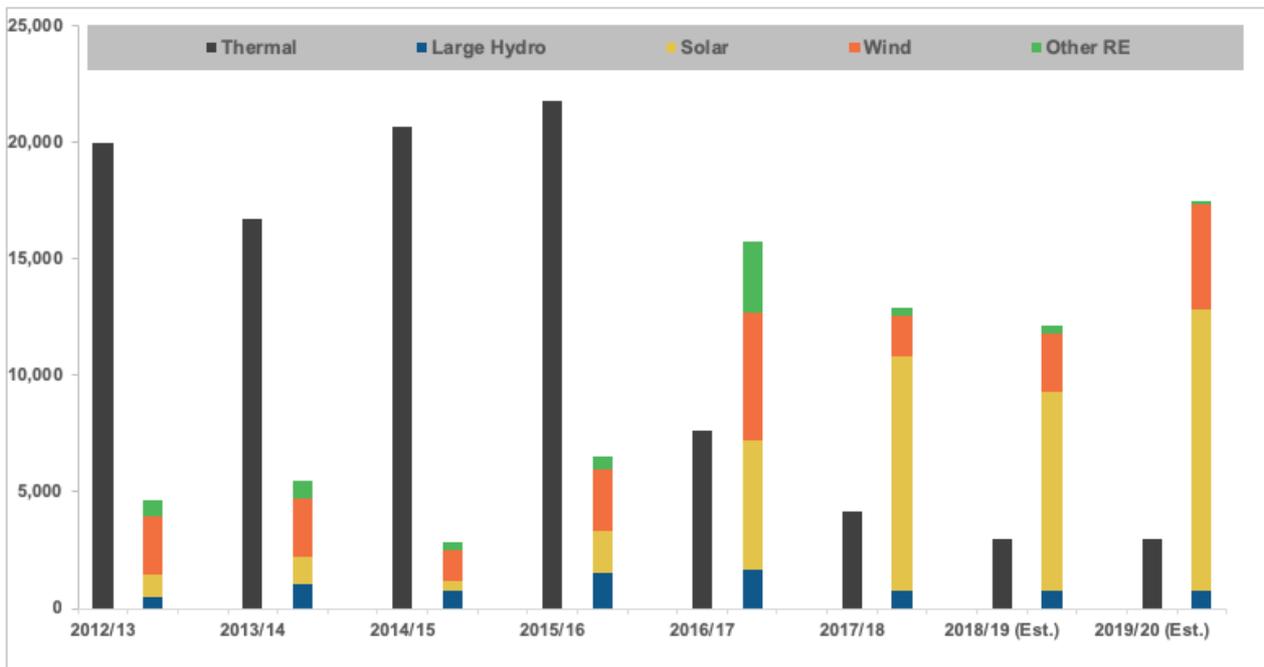
¹⁴ ETEnergyWorld, "India to bid out 500 GW renewable energy capacity by 2028", 7 January 2019

NPTC Ltd has likewise commenced a pivot into renewables, with a plan to facilitate or build upwards of 10-20GW over the coming decade. NTPC has also announced it has [cancelled 10.5 GW of proposed new coal power plants to-date in 2018](#).

The Adani Group has expanded into renewable energy development, floating its renewable energy business (Adani Green Energy) on the Bombay Stock Exchange in June 2018. With 3 GW of renewable energy infrastructure in operation, and another 3 GW in planning, it is one of the top 5 corporate investors in Indian renewables. In Australia, Adani announced a 1,500 MW solar investment program across Queensland and South Australia.

As a result, India's renewable energy installs have more than doubled to 12-15 GW annually, while thermal power installs (net of closures) have dropped 80% to just 4 GW annually vs the 20 GW annual installs evidenced in 2012/13-2015/16 – Figure 3.2.

Figure 3.2: Indian Thermal and Renewable Power Capacity Additions (MW)



Source: Central Electricity Authority, MNRE, IEEFA Estimates
 Note: The renewables estimates include large scale hydro

While not directly related to the stranded asset risks of coal fired power plants, January 2019 saw the acknowledgement by Rajnish Kumar, Chairman of State Bank of India, the country's largest public sector lender, that there is no future for the 25GW of gas based power plants in the country. Kumar concluded that the bank may have to write-off its investments in the sector.¹⁵

We reference this to highlight the severity of the problem of stranded asset risk for fossil fuel projects in India. India is grappling with upwards of US\$100bn of non-performing loans to the thermal power sector alone as a result of under-estimating the rate of technology change and renewable energy deflation.

¹⁵ ETEnergyWorld, "SBI chairman says no future for gas-based power plants in the country", 4 January, 2019

4. Inferior Galilee Coal Quality

4.1 6,000kcal Thermal Coal at US\$100/t

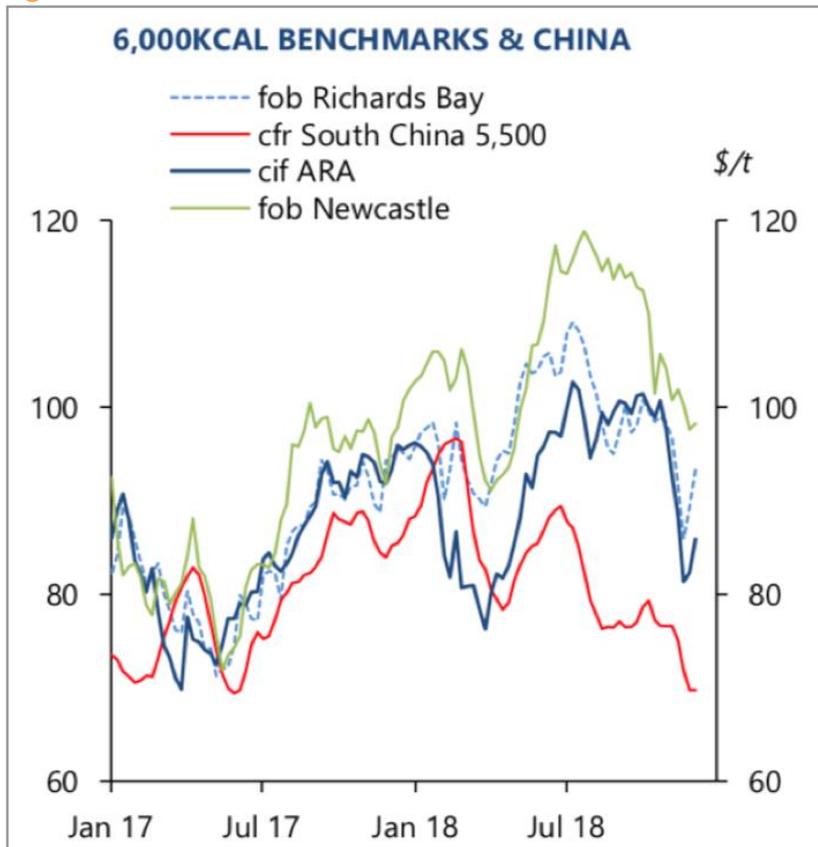
As per Figure 4.1, the Australian benchmark 6,000kcal (net as received) 12-14% ash content thermal coal export price ended the 2018 year at US\$100t/ free on board (fob) at Newcastle. This is a dramatic improvement, double the 2015/16 lows of US\$50/t.

In justifying new investment proposals, coal lobbyists often refer to Australian export coal as higher quality than international competitors. The 6,000kcal benchmark thermal coal is definitely higher energy content than Indonesian export coal, which has a range around a 5,000kcal average, 15-20% below the top Australian, south African, Columbian and Russian thermal coal exports. But in contrast, Carmichael coal is significantly lower quality than the benchmark Australian export coal, with an energy content below 5,000kcal and a high ash content (26%).

However, coal quality is measured in terms of a number of attributes, with ash content the second most important determinant of pricing.

Indonesian thermal coal has an average ash content of 5-6%, half the Australian top benchmark. On a third quality measure, Indonesian coal is also materially lower sulphur content than most Australian thermal coal. IEEFA would argue the market prices the top Australian grades of coal at a premium to international seaborne markets, and this premium reflects a view of relative quality.

Figure 4.1: The 6,000kcal Newcastle Benchmark Thermal Coal Price 2017-2018 (US\$/t)



Source: Argus Consulting, December 2018¹⁶

¹⁶ Argus Consulting Services, "Thermal Coal Outlook 2019", 7 December 2018

Some coal lobbyists talk about Australian thermal coal being higher quality than domestic inland thermal coal in India, which is generally very low energy and high ash content.

While the statement is correct, it is in IEEFA's view also entirely misleading. Indian coal is located inland and is largely unconnected to any distant coal ports. As such, the vast majority of Indian coal power plants are unable to use imported coal, even if they could afford the significant premium price (mine-mouth coal in India wholesales for ~US\$20/t). Further, these inland Indian coal plants are designed and engineered to use low energy, high ash thermal coal. That is why the low energy, high ash coal deposits of the Galilee were of interest to Indian coal promoters, it is nothing like the high energy, low ash coal found in the Hunter Valley in NSW or Surat/Bowen Basins of Queensland.

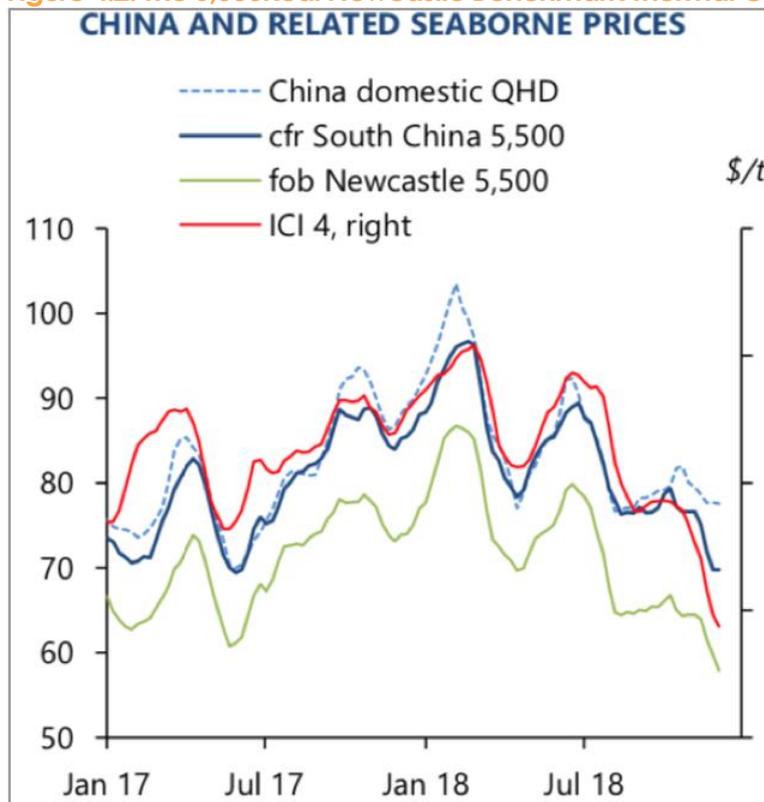
As a general rule, seaborne coal has to command a higher price, given it has significantly higher all-in costs than mine-mouth coal, given all the extra rail, port and shipping costs. So when comparing Australian export coal to its competitors, it is logical to compare it to Indonesia, Russia or South Africa, or coal mines in coastal China where there is direct port and rail access, not to the coal used by inland Indian coal power plants it can't supply.

4.2 5,500kcal Thermal Coal at a 2018 Low

A very important divergence has emerged over 2018 in the seaborne thermal coal market. During the year, the price differential between high quality 6,000kcal coal and the lower quality 5,500kcal coal also produced in Australia has reached a record high. This is a critical issue for the Galilee Basin, which is a high ash and low energy product compared to the Australian export market average.

The Newcastle benchmark for 5,500kcal coal with 20% ash declined over 2018 and exited the year at just US\$57/t – Figure 4.2 (green).

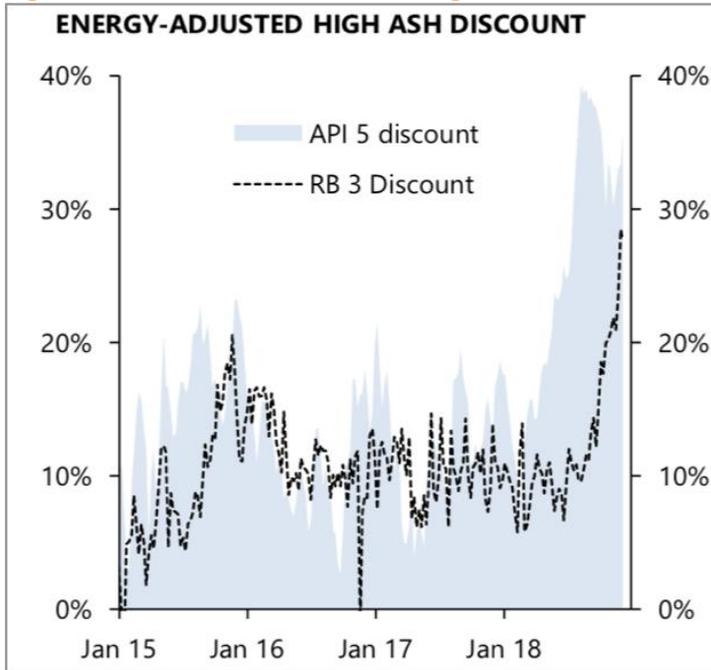
Figure 4.2: The 6,000kcal Newcastle Benchmark Thermal Coal Price 2017-2018 (US\$/t)



Source: Argus Consulting, December 2018

As part of the ongoing push to deal with critically dangerous air pollution, China has joined Japan, Taiwan and South Korea in paying a record high price for low ash coal. Figure 4.3 details this. Argus has normalised the coal pricing to calculate that on an equivalent energy content basis, high ash coal is now trading at a 30-40% discount to equivalent energy content coal of lower ash. This is double to triple the discount that applied in previous years

Figure 4.3: The Price Discount for High Ash Coal Hit an Unprecedented High in 2018



Source: Argus Consulting, December 2018

To illustrate, IEEFA estimates that the Carmichael coal with a 4,950kcal energy and 26% raw ash content would currently be valued at a 60.5% discount to the Newcastle 6,000kcal benchmark, putting a price of ~US\$39.50/t at current spot prices – Figure 4.4. Adani could wash the raw coal and marginally reduce the ash content and boost the energy content of product coal, subject to water availability, but this would significantly increase production costs.

Figure 4.4: The Carmichael Coal Quality Discount is Now Extreme

	US\$/t	Ash
Newcastle Benchmark (12-14% ash)	6,000	13%
Newcastle Benchmark	5,500	20%
Price discount (%)	-43.0%	
Carmichael Coal	4,950	26%
Discount vs 5,500kcal	-10.0%	
Implied Carmichael Price (US\$/t)	\$39.50	
Discount 5,500kcal vs 6,000kcal	-43.0%	
Discount vs 5,500kcal	-10.0%	
Discount 26% vs 20% ash	-7.5%	
Total Discount	-60.5%	

Source: Argus, IEEFA estimates

As such, it is important to differentiate the remotely located, low quality thermal coal of the Galilee Basin from Australia's existing coal basins with premium priced coal which have the major advantage of proximity to coast and where all the sunk costs have been incurred to establish all the required dedicated rail, port, power and road infrastructure. Additionally, the established coal basins have established, generally locally based coal miners. In contrast, any new Galilee Basin operation will be an almost entirely fly-in, flyout operation. Any suggestion of local development merits should see a rigorous impartial cost-benefit analysis relative to alternative regional investment alternatives.

An example of this is evident in Adani Australia. While this company has explored the feasibility of a Galilee Basin operation for eight years without success, more recently the company has talked about building up a multi-billion dollar solar infrastructure business. In short order, Adani has built and recently commissioned its first solar project at Moranbah. For all the talk this company has made about thermal coal mining, it is interesting it has actually got on with developing a successful solar business, a zero emissions industry of the future.

We note that any discussion of relative coal deposit merits ignores the obvious point that even if electricity is generated from a high energy low ash coal, it is still almost 100% more emissions intensive and 100% more polluting than a zero emissions, zero air / water / particulate pollution renewable energy project.

When referencing the relative merits of industry development for regional Australia, it is critically important to examine the growth prospects and associated risks. A thermal coal export industry in Australia will cease to exist if our customers decide the zero emissions, zero pollution, cheap and deflationary domestic sourced renewable energy is their preferred source of electricity going forward. Arguing the drug pusher's excuse that if we don't supply the coal, some other country will is irrelevant if the IEA's SDS analysis is correct. The thermal seaborne coal market is in terminal decline, there won't be a viable market for new, low quality, high cost remote coal basins.

Rather than risking substantial capital developing the Galilee Basin in a vain attempt to prop up a dying industry of the past, Australia would be far better served directing new regional investment into growth industries of the future, be that wind, solar, pumped hydro storage or zero emissions hydrogen. As Senator Matt Canavan said in December 2018, new markets like lithium mining and the downstream manufacturing opportunities are growing exponentially, and Australia is set to be a world leader:¹⁷

“A new strategy commissioned by the Liberal-National Government will help to maximise Australia's potential as a world powerhouse in lithium-ion battery manufacturing.”

¹⁷ Senator Matt Canavan, “Unlocking Australia's potential in lithium-ion battery manufacturing”, 11 December 2018

5. Other Risks

There are numerous reasons why the proposed Galilee Basin Coal Prohibition Act makes economic, financial and environmental sense. We briefly touch on five major factors that suggest the financial risks for Australia far outweigh any short term promise of gains from yet more thermal coal mine developments at a time of increasingly frequent, extreme weather events and record temperatures across Australia.¹⁸

Water Risk

The severe water draw-down risks of additional huge new coal mining activity are large. The financial risks of gaps in Australia's environmental approval analysis are clear: no **cumulative** impact analysis has been undertaken on the implications of developing up to 300Mtpa of new thermal coal mines in the Galilee Basin.

Any corporate funded water modelling of an individual coal mine proposal in isolation ought to be treated with significant scepticism. The vested interests in downplaying irreversible community risks are obvious. This was well illustrated by the NSW Department of Planning and Environment's rejection of the Hume Coal mine proposal on groundwater fears.¹⁹ Concurrently with this rejection, the NSW government's expert panel concluded that the water loss from coal mining in a water catchment area were clearly evident, despite the corporate's extensive modelling suggesting this wouldn't happen.²⁰

The financial costs of the Adani Carmichael proposal alone is clear – Adani has asked for approval for hugely subsidised annual water use of up to 16-22 billion litres annually.²¹ The adverse financial costs for Queensland and Australia are enormous. The impacts of mining on water often turn out to be much greater than expected.²²

Carbon Risk

The severe, multiple climate risks to the critically important agriculture and tourism sectors for Queensland are likewise in their own right significant enough to warrant the precautionary stance of leaving untapped the remote and isolated low quality thermal coal / carbon reserves in the ground. Multiple economic experts have reported at length on this risk.²³

Australia is a legal signatory to the Paris Climate Agreement to work as part of a global effort to limit temperature rise to 1.5-2.0 °C above pre-industrial era levels. Climate change experts like Professor Will Steffen have long **testified** in court and in the public domain²⁴ as to the challenges of delivering on this:

“There is no way you will meet any of these targets if you continue to increase emissions and I think that's a clear and very robust outcome of applying a carbon budget approach to the Paris targets ... So step number 1, if you're really serious about the Paris targets, is no new fossil fuel developments. I mean, it doesn't take an Einstein to work that out-that you cannot reduce emissions by increasing them.”

¹⁸ The Conversation, “Australia's 2018 in weather: drought, heat and fire”. 10 January 2019

¹⁹ ABC, Hume Coal mine gets damning assessment from NSW Government department over groundwater fears, 12 December 2018

²⁰ The Sydney Morning Herald, “No place for mining!: coal mines drain water from dams”, 7 January 2019

²¹ Lock the Gate, “Adani Water Factsheet”, March 2018

²² SMH, “No place for mining!: coal mines drain water from dams, 7 January 2019

²³ The Australia Institute, “Great Barrier Bleached: Coral bleaching, the Great Barrier Reef and potential impacts on tourism”, June 2016.

²⁴ The Climate Council, “Unburnable Carbon: Why we need to leave fossil fuels in the ground”, 2015

Opening a globally significant new, low quality thermal coal basin is clearly moving in diametrically opposite direction to Australia's Paris commitment.

Australia is already in the top three countries globally in terms of exported emissions. In November 2018 Australia overtook Qatar to become the world's largest exporter of liquid natural gas (LNG). Australia is already the world's largest exporter of coking coal (with a 60% global share of seaborne coking coal) and the world's second largest exporter of thermal coal with a seaborne share of 20% behind only Indonesia at 37%.²⁵ As a nation we continue to expand our export capacity of each of LNG, coking and thermal coal – all in direct contradiction of our Paris Climate commitment.

Australia is likely to come under increasing international pressure to do more to reduce carbon emissions going forward. This will include calls for action to reduce Australia's major global role in the export of fossil fuels to other countries.

Sovereign Risk?

Coal lobbyists occasionally give the unsubstantiated opinion that banning new thermal coal basin development would have a material adverse impact on Australia's global financial standing. The "Sovereign Risk" argument.

But to IEEFA this is a hollow claim that has no standing. At a time when our key global trading partners have been discussing climate risks for many decades already, any modernisation of the government approval process that takes into account the growing global financial market consensus on the need for a high price on carbon and clear and rapid exit from use of unabated coal within the 2030-2050 timeframe will be accepted as belated and entirely justified.

Back in 2017 the US\$6.3 trillion asset manager BlackRock's global head of infrastructure, Jim Barry, made it very clear: ²⁶

"It's been amusing sitting back and watching Australia from afar because in effect it's been denying gravity, ... Coal is dead. That's not to say all the coal plants are going to shut tomorrow. But anyone who's looking to take beyond a 10-year view on coal is gambling very significantly."

IEEFA would elaborate and say that allowing the development of the Galilee Basin actually raises a sovereign risk for Australia. Why? Australia is a signatory to the Paris Climate Agreement. A global treaty ratified and entering into force back in November 2016 with almost universal agreement. Should Australia now approve the development of one of the largest proposed but undeveloped carbon sinks globally, this clearly marks Australia as a hypocrite, a country that signs global treaties with no intent of adhering to them. In fact we are heading in the wrong direction at a canter, out of step with the rest of the world. That is the definition of "Sovereign Risk". IEEFA speaks with global financial institutions on a very regular basis, and not once has any of the world's largest investors, corporates or banks ever suggested the controversial discussion over the Galilee Basin would have any impact on Australia's country credit rating. Banning the development of an entirely undeveloped isolated new coal basin prior to a single mining licence being issued is entirely consistent with both the majority of Australians views on the subject, and also increasingly consistent with the stance of global financial institutions.

²⁵ Office of the Chief Economist, "Resources and Energy Quarterly", December 2018

²⁶ The Australian Financial Review, "BlackRock says coal is dead as it eyes renewable power splurge", 26 May 2017

Corporate Tax Leakage Risks

New investment in regional Australia is important, but where coal mining is concerned, the benefits are short lived, illusory and mostly privately gained and relatively tax free. Various planning approvals are predicated on the reported benefits that will accrue to the Australian Government from increased corporate taxes. Many approvals really on proponent created “models” that assume 100% equity financing, yet in my experience the standard industry practice is for maximum debt leverage at all times, particularly where the proponent is a foreign corporation.

We note over 80% of coal mines in Australia are foreign owned, with a very significant percent of the owners “residing” in tax havens. It has been well documented that Australia’s largest coal mining and coal fired power plant owners pay little if any corporate tax in Australia.²⁷ The gaming of the Australian tax system by foreign companies operating in the Australian coal sector are masters at leveraging the gaping loop-holes in the thin-capitalisation, related party transactions and transfer pricing rules. BHP paid the ATO A\$529m in November 2018 in settlement of its Singapore tax haven marketing hub port,²⁸ yet the Senate Inquiry into Multinational Tax Avoidance by mining companies in 2018 highlighted this is likely just the tip of the iceberg.²⁹

Mine Rehabilitation Risks

Coal lobbyists operate with a vested interest to promote the various merits of their corporate sponsors, while concurrently downplaying or denying the externalities imposed on the environment and communities. One of the largest externalities of coal mining relates to the issue of mine rehabilitation. Thermal coal mining is relatively unique even within the mining industry. For every tonne of product coal generated from an open cut mine, an average of 14-16 tonnes of overburden need to also be move. The fuel costs alone are enormous in coal mining, hence with the diesel fuel rebate for mining companies is such a key subsidy, worth A\$1-2bn annually to the coal industry. It is more than ironic that foreign coal miners pay little if any corporate tax yet are the single biggest beneficiaries of this subsidy – all while the Australian government claims as part of our climate change commitments internationally that Australia has no fossil fuel subsidies.

Coal mining companies claim their rehabilitation efforts are world-class, but over two hundred years of mining in Australia has left more than 50,000 abandoned, unrehabilitated mines³⁰ – many of which are continuing to see leeching of toxic chemicals into our water system and ongoing subsidence.

Open cut mining on a scale bigger than that underway in the Hunter Valley is proposed for the Galilee Basin. The benefits largely accrue to private corporations, but the environmental implications will be evident for centuries. The rehabilitation risks for Australia are immeasurable, particularly with respect to the issue of massive final voids.³¹

²⁷ MihcaelWest.com.au, “[Sneaky coal giant Glencore drops off the Top40 Tax Dodgers](#)”, 28 December 2018

²⁸ The Australian Financial Review, “[BHP to pay ATO \\$529m in tax settlement over Singapore marketing hub](#)”, 19 November 2018

²⁹ Parliament of Australia, “[Corporate Tax Avoidance report - Part III: Much heat, little light so far](#)”, 30 May 2018

³⁰ The Conversation, Corrin Unger, “[What should we do with Australia’s 50,000 abandoned mines?](#)”, 23 July 2014

³¹ Energy Resource Insights, “[The Hole Truth: The mess coal companies plan to leave in NSW](#)”, 8 June 2016

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Tim Buckley, IEEFA's director of energy finance research, Australasia, has over 25 years of financial market experience covering the Australian, Asian and global equity markets from both a buy and sell side perspective. Tim was a top-rated Equity Research Analyst and has covered most sectors of the Australian economy. Tim was a Managing Director, Head of Equity Research at Citigroup for many years, as well as co-Managing Director of Arkx Investment Management P/L, a global listed clean energy investment company that was jointly owned by management and Westpac Banking Group.

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