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February 2019

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IEEFA.org

Vickery Extension Project (SSD 7480)

IEEFA's submission to the NSW Government, Independent Planning Commission NSW

Executive Summary

Thank you for the opportunity to make a submission to this proposal.

The Institute for Energy Economics and Financial Analysis (IEEFA) conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy.

The Vickery Extension Project is a proposed doubling of Whitehaven Coal's Vickery Coal Project proposal to 8 million tonnes per annum (Mtpa) of thermal coal for export. Vickery is located approximately 25 kilometres north of Gunnedah, New South Wales, Australia, on a mine site that ceased production in 1998.[1]

IEEFA objects to the Vickery Extension Project.

Our reasons include:

- **DECLINING GLOBAL COAL FORECASTS: South Korea, Japan and other key Australian export markets are likely to halve their long-term demand for thermal coal imports.**

  Global forecasts show the seaborne thermal coal market will more than half within two decades should the world successfully act on the Paris Agreement. South Korea's President Moon and Japan's Prime Minister Shinzo Abe new energy, climate and pollution policies and statements both call into question the strategic merit of new mines like the one envisioned at Whitehaven's Vickery.

- **INCREASING GLOBAL DIVESTMENT FROM COAL: The need to follow the economics, policy and financial progression and plan for an urgent transition away from thermal coal.**

  Since the start of 2018, 32 major banks and insurers divested or tightened their coal divestment policies, including Standard Chartered UK, Munich Re, Swiss Re, Nedbank of South Africa, Citigroup and the Asian Development Bank. Global financial institutions and key customers of Australian coal are increasingly divesting from thermal coal and/or raising coal taxes / carbon emission levies.

[1] Whitehaven Coal, About us, sourced 6 Feb 2019

- **ACCELERATING PIVOT TO RENEWABLES: Ever cheaper renewable energy technologies are set to make imported thermal coal uncompetitive in an increasing number of Australia's coal export markets.**

  Thermal coal imports for power generation are now entirely uncompetitive in India – the world's second largest producer, consumer and importer of thermal coal – against ever lower cost, deflationary, domestic renewable energy projects. The Indian government has a clear priority to cease reliance on expensive foreign thermal coal in favour of domestic coal and renewables at half the price.

- **IMPACT ON AUSTRALIA'S EXPORTERS: The likely collateral damage to Australia's existing thermal coal mining operations from oversupply.**

  Flooding the seaborne market with a significant new supply of thermal coal will lower the value of Australia's existing coal mining businesses.

- **STRANDED ASSETT RISK: The likely stranded asset risks are creating significant financial risks for Australia and the Hunter Valley community.**

  IEEFA views India 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 thermal power sector within India.

- **COMMITMENT TO PARIS AGREEMENT: The need for Australia to meet its Paris targets and accelerate the transition to a carbon free economy.**

  The global scientific consensus suggests we need to act urgently on climate change. Developing the Vickery Extension Project is in direct contradiction to Australia's Paris commitments. Any plan expands Australia's thermal coal export capacity is overtly contrary to our national and global interests.

- **INCREASED COLLATERAL DAMAGE: Mining is likely to damage the local environment, alternate NSW industries and local communities, including polluting local water supplies. The cumulative impact of overdevelopment has not been assessed, and legacy damage is permanent and irreparable.**

  Increasing thermal coal mining capacity will likely cause permanent collateral damage to NSW industries like agriculture and tourism as extreme weather events become more frequent, and more extreme, as evident across Tasmania and Queensland already this year. Of big concern is water pollution with the Vickery mega-mine in close proximity to the Namoi River while the path of a proposed rail line crosses a flood plain, and there is likely to be significant air, light and noise pollution.[2]

IEEFA objects to the Vickery Extension Project.

[2] The Northern Daily Leader, Live blog: Vickery coal mine extension meeting before independent panel, 5 February 2019.

Reason One: Declining Global Coal Forecasts

IEA's Sustainable Development Scenario and Coal's Collapse

The International Energy Agency (IEA) is an independent intergovernmental organisation established in 1974 under the framework of the Organisation for Economic Cooperation and Development (OECD).

Each year, the Agency releases a World Energy Outlook report which, among other things, attempts to model global energy demand using various scenarios, including:

- sustainable development scenario (SDS);
- new policies scenario (NPS);
- current policies scenario (CPS); and
- Beyond 2°C scenario (B2DS).

IEEFA believes the Agency's SDS is the most likely reflection of the world's energy future. An increasing number of the world's leading financial institutions and corporations are making commitments to comply with the Paris Agreement. This is an explicit objective of constraining global temperature rise to 1.5-2.0°C, an outcome modelled by the B2DS, which assumes coal use virtually ceases by 2050, absent widescale deployment of coal carbon, capture and storage (CCS).

Sustainable Development Scenario

The Sustainable Development Scenario (SDS)[3] presents the more desirable scenario in terms of human and global safety whereby nations work together to successfully limit climate change, by transforming the energy market and addressing air pollution, starting with thermal coal, the most emissions intensive energy source.

Under the SDS, the planet's 'carbon budget' will be exhausted as early as 2023 under a 1.5°C target and by 2040 under a 2°C objective. The SDS falls short of tracking a path towards meeting the Paris Agreement's target of restricting global warming to well below 2°C with any certainty.

In a carbon constrained world, the SDS projects a significant decline in thermal coal demand, with global trade in thermal coal plummeting 57.4% by 2040, should the world make the necessary efforts to limit climate change to just 2.0°C.

The -3.7% compound annual decline in world thermal coal trade volumes outlined in the SDS is the most likely trend going forward, a terminal outcome over three decades.

[3] IEA, Sustainable Development Scenario: A cleaner and more inclusive energy future, sourced 5 February 2019

New Policy Scenario

The New Policies Scenario (NPS) is the Agency's central scenario. Under this scenario, emissions continue to slowly rise to 2040 and global temperatures will likely increase by at least 2.7°C by mid-century.

The NPS assumes people, corporations and countries in the world will not take significant action to act on carbon emissions in line with the commitments included in the Paris Agreement, even though 181 countries have signed to do just that.

The NPS ignores future increases ('ratchet') in climate policy ambition and further technology change that is virtually certain to happen. International pressure to act on carbon emissions is growing and will continue to do so into the future.

The NPS also fails to take into account continuing gains in efficiency or declining costs of renewable energy and energy storage technology going forward. These trends will drive policy ambition on clean energy worldwide over the coming decades.

The NPS as per the IEA's World Energy Outlook 2018 (WEO 2018)[4] forecasts global coal demand rising marginally (+1.5%) by 2040 relative to 2017 levels, but staying below the global coal use peak reached in 2014. The IEA estimates this will likely see global temperature rises averaging 2.7°C by 2100,[5] which is a breach of the Paris Agreement.

It is IEEFA's opinion that the IEA's SDS is a more likely reflection of the world's energy future than the NPS.

Current Policies Scenario

The Current Policies Scenario (CPS) assumes a possible climate change scenario whereby the globe's carbon dioxide levels continue to increase and the global warming target of 1.5°C is exceeded by as early as 2022.

The CSP ignores policies that make up the Nationally Determined Contributions each country has pledged to adhere to as part of the Paris Agreement.

To accept the CPS as the best indication of the world's energy future is to assume all nations will renege on their commitments to meet their national emissions reduction targets. As some countries are already meeting their targets, this scenario is not reflective of the true state of the world.

Limiting temperature increases to a 1.5°C outcome requires the virtual cessation of coal use by 2050. The IEA does not release its model for a successful Paris Agreement outcome to the public.

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[4] IEA, World Energy Outlook 2018, sourced 5 February 2019
[5] IEA, Where are we on the road to clean energy?, 4 May 2018

IEA's Beyond 2°C Scenario (B2DS)

The IEA has developed an alternative scenario that offers a more definite chance of meeting the Paris target of restricting global warming to well below 2ºC.

In the B2DS, global policies are set to give the world a 66% chance that the 1.5-2ºC Paris target is met through an 'an unparalleled ramp up of all low-carbon technologies in all countries' and the 'rapid phase out of fossil fuel subsidies', including massive increases to carbon pricing and 'extensive energy market reforms' and mandates.

66% 2ºC projects the fastest structural decline for the thermal coal industry.

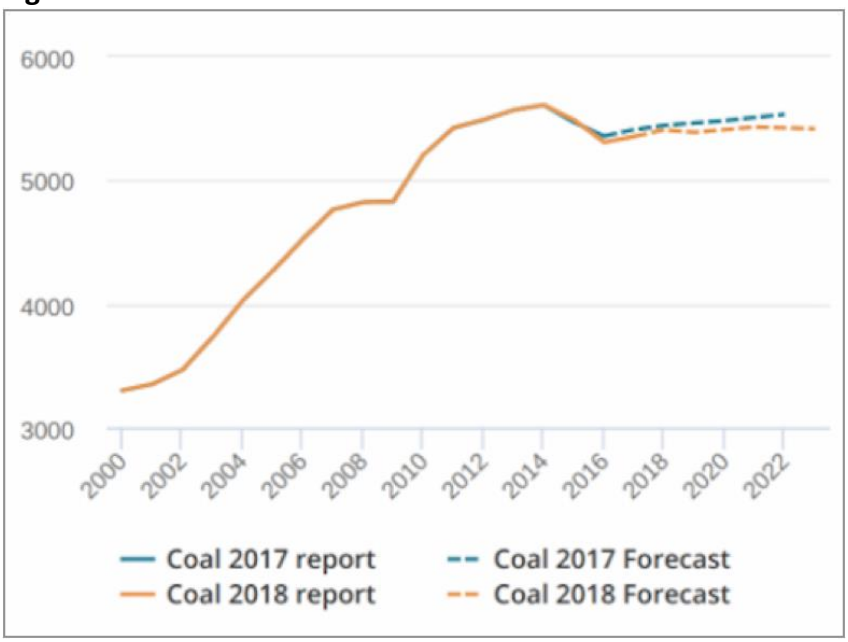
Although global climate ambition is likely to rapidly increase to meet the Paris commitments, IEEFA believes the SDS is currently a more likely representation of the world's energy pathway than the B2DS.

Reviewing IEA's thermal coal forecasts to 2040

The IEA acknowledges that global coal use likely peaked five years back in 2014 while modelling a flat near-term outlook to 2022. (See Figure 1.1)

The global seaborne thermal coal market is a small sub-section of the global coal market. The IEA also estimates seaborne thermal coal exports to have likely peaked in 2015.

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



Source: OECD / IEA

Despite coal's peak, coal lobbyists may say that Southeast Asia will provide significant thermal coal demand into the future.

Southeast Asia represents a small subset of the global seaborne thermal coal market. The idea that this region will remain isolated and an untouched growth market to the sole market share gain of Australian coal exporters is rather optimistic or even false hope, in IEEFA's view.

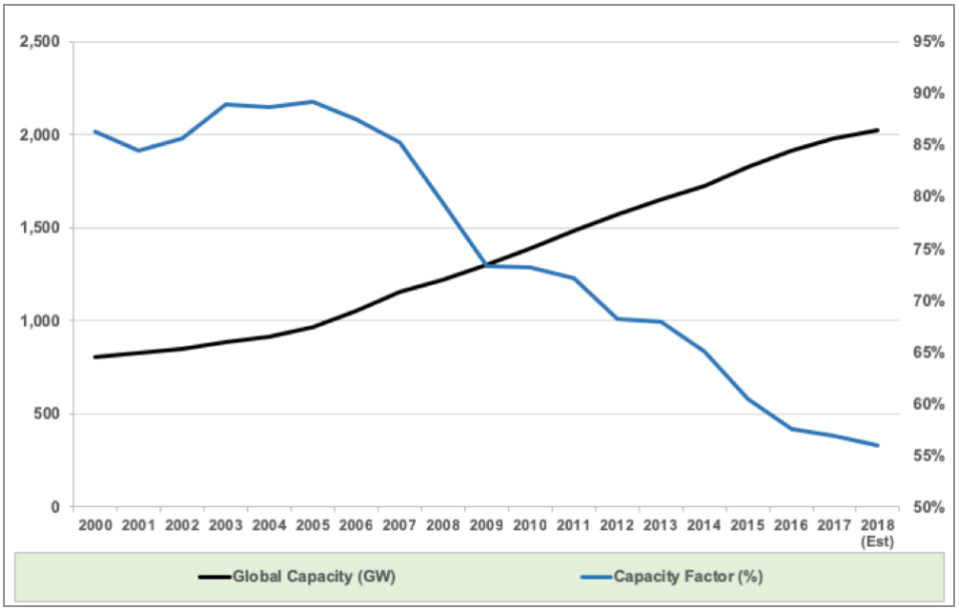
IEEFA notes the global seaborne thermal coal market is *not* likely to reverse the inevitable technology, cost and policy driven direction of a slow and steady decline in volumes. This cessation will *not* happen overnight; more likely it will take several decades, but the technological disruption of global energy markets is well entrenched and unstoppable.

IEEFA makes this point relatively categorically given the rate of decline in the cost of renewable energy and on the premise the world collectively makes further efforts to implement the Paris Agreement, and absent the long touted but increasingly unlikely development of ultra-low cost, carbon capture and storage (CCS) for coal-fired power plants.

Rather than sinking more capital into expanding thermal coal capacity, Australia would be better placed optimising existing ventures and investing in new low emissions industries of the future while best transitioning the Australian economy and limiting our collective exposure to stranded assets.

A decade-long global over-investment in new coal

Figure 1.2: IEA Global Coal-fired-Power Plant Capacity, Generation and Utilisation Rate



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

Coal supporters often justify a positive outlook for thermal coal by referencing the continued commissioning of new coal-fired power plants globally over the last decade – a trend confirmed in Figure 1.2.

This outlook however only tells the optimistic half of the story, with the narrative missing several key globally entrenched developments:

- **As coal plant capacity globally has risen, coal plant utilisation has declined.**

  Coal consumption is *not* linked to increased coal-fired power plant capacity but to the *use* of a coal plant. An idle new coal plant does *not* use any coal; it simply represents a stranded asset.

  The capacity utilisation rate of the global coal-fired power fleet hit a new record low in 2018, exceeding the record low set in 2017, and that set previously in 2016, and in fact every year this past decade. (See Figure 1.2 (RHS in **blue**)).

- **Many coal lobbyists often cite new coal plant development *pipelines* while failing to mention the rate of coal plant *retirements*.**

  Globally, coal-fired power plant retirements are accelerating and by 2022 are forecast to exceed new plant completions.[6]

  For example, in January 2019 Germany announced it would close 12 gigawatts (GW) of coal-fired power plants by 2022 as part of its accelerated 100% coal phaseout of its remaining 42GW by 2038.[7] Japan's Tokyo Gas in February 2019 announced it would cancel a long proposed 2GW import coal plant as unviable.[8]

- **The global coal plant pipeline has shrunk by two-thirds.**

  The pipeline has shrunk by a cumulative US$1 trillion or 744GW in a small timeframe (the 30 months to July 2018).

  Stranded asset losses are rapidly rising as renewable energy competition gets increasingly competitive.

- **New coal plant proposals moving to final investment decisions are slowing.**

  The IEA identifies 2017 as having a record low level of new coal-fired power plant proposals moving to final investment decision, due to investors reassessing coal's future. (Refer Figure 1.3).

- **Coal-fired power plants are becoming, on average, more efficient.**

  Coal-fired power plants are generating 0.5-1.0% more electricity per tonne of coal used each year.

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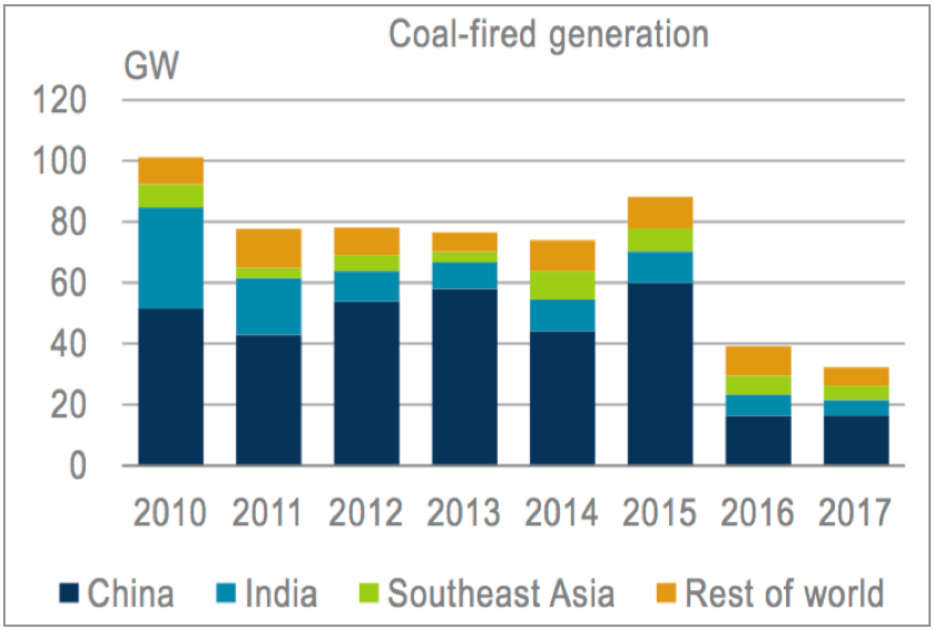
[6] Carbon Brief, Global Coal Plant Tracker, "Guest post: 'Peak coal' is getting closer, latest figures show", July 2018
[7] Financial Times, "Germany plans to phase out coal-fired power stations by 2038", 28 January 2019
[8] AsianPower, "Tokyo Gas, Kyushu Electric, and Idemitsu scrap 2GW coal plant in Japan", 4 Feb 2019

IEEFA notes there has been a decade-long over-investment in new coal-fired power generation capacity, in excess of demand.

The commercial viability of the global coal-fired power fleet on aggregate is technically challenged by collapsing utilisation rates which are sitting near 55%, suggesting the plants sit idle every second day on average. This is a long way below the optimal 75-85% assumption erroneously factored into optimistic projections made upwards of a decade ago.

Investors have responded by dramatically curtailing coal-fired power plant expansion plans. (Figure 1.3)

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



Source: IEA, 2018

According to the IEA, if the world takes an SDS path consistent with limiting average warming to 2.0°C, total global coal demand will drop by more than half by 2040 (-57.4%). This is measured in millions of tonnes of coal equivalent (Mtce), an energy adjusted normalisation process. The consequences for thermal coal is even more dire with thermal coal consumption dropping in the realms of 61.1%.[9] (Figure 1.4).

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

Figure 1.4: IEA Global Coal Use 2014-17 vs Forecast 2040: NPS vs SDS

	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

Under the NPS, the IEA models an even worse outlook for seaborne traded thermal coal. Demand by 2040 drops a relatively benign -5.6% in volume terms. (Figure 1.5.)

Under the SDS, which is a possible 2.0°C outcome, demand declines 65.1% against 2017 levels.

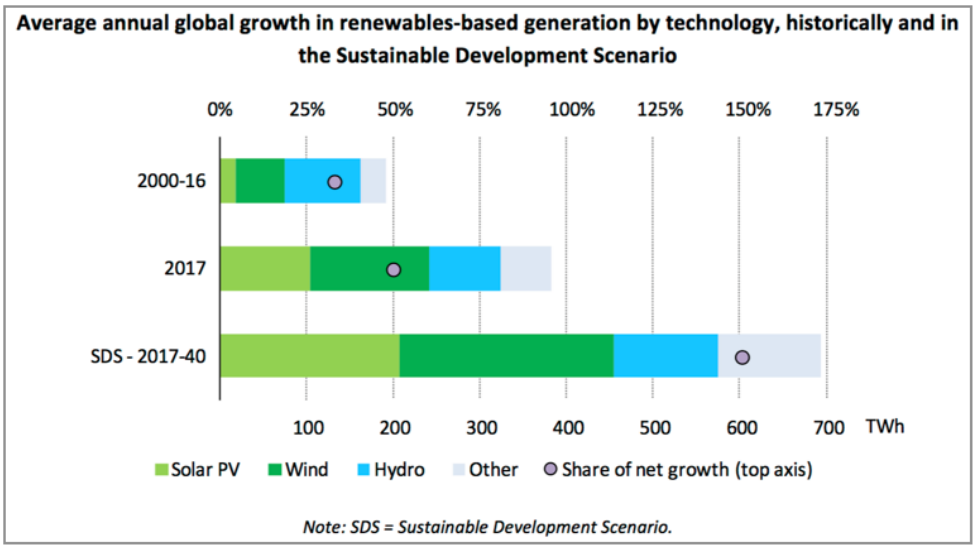
Figure 1.5: IEA Global Seaborne Coal 2014-17 vs 2040: NPS vs SDS (Mtce)

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

The SDS models electricity generation from new zero emissions technologies more than doubling each year through to 2040 relative to the record high set in 2017. (Refer Figure 1.6)

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

Despite new coal plants still being planned across Asia, global finance is moving away from funding potential stranded fossil fuel assets. (Refer Reason Two). 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. (see Reason Five)

Similar to the IEA, IEEFA sees India's shift to the lowest cost sources of electricity generation, being wind and solar, 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 and/or polices to deal with rising fossil fuel pollution and other pressures, 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 to IEEFA's major review of this trend released in November 2018.[10]

[10] IEEFA, "Past their peak, NSW coal export volumes head toward terminal decline as markets transition", November 2018.

Reason Two: Increasing Global Divestment Away from Coal

Financial Institutions Pivot Away from Coal

There is an ongoing and accelerating global shift away from financing thermal coal and coal-fired power plants, matched with the rapid cost declines of renewable energy technology and the very clear message of the *United Nation's Intergovernmental Panel on Climate Change* (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:

"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." [11]

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.

Westpac ruled out financing new thermal coal basins in April 2017.

Commonwealth Bank (CBA) reported in August 2018, as part of its 2017/18 financial results, substantial progress in measuring, reporting and acting on their 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 also been progressing, with global financial institutions pivoting to boost lending to renewable energy infrastructure and other low emissions alternatives.

[11] IGCC, "Briefing Paper on the 2018 Global Investor Statement to Governments on Climate Change", December 2018.

In the last year alone, IEEFA has identified 32 examples of new policy restrictions specific to coal mining and/or coal-fired power plant financing by globally significant financial institutions, including:

- March 2018 - **BBVA of Spain** committed to US$100bn of renewables lending by 2025 as well as ceasing financing any new coal mines and coal-fired power stations or extensions to existing ones.
- April 2018 - **HSBC** committed to stop financing new coal-fired power stations in all countries except for Indonesia, Bangladesh and Vietnam.
- June 2018 - the world's third largest reinsurer **Hannover Re** (US$64bn AUM) introduced a 25% coal revenue maximum for its investment universe.
- July 2018 - **Swiss Re** announced it would no longer provide insurance or reinsurance to businesses with more than 30% exposure to thermal coal.
- August 2018 - **Munich Re**, the world's second largest reinsurer, committed to cease offering insurance for new coal-fired power plants and mines in industrialised countries. 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 - the Chairman of **Standard Chartered** José Viñals announced the bank's coal exit strategy entitled "Here for good means saying no to coal: Why we're stopping our financing of new coal-fired power plants".
- September 2018 - the Netherlands' **ING Bank** announced it would assess its US$600bn lending book against alignment with a less than 2.0°C global temperature change, 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.[12]
- September 2018 - **Standard Bank of South Africa** announced a withdrawal from new coal power plant financing.
- October 2018 - the **World Bank** exited underwriting of the Kosovo coal power plant, its last coal finance proposal.
- October 2018 - the **International Finance Corporation** (IFC) announced it would shift its indirect partner financing away from coal.
- October 2018 - the **Asia Development Bank** (ADB) acknowledged coal plants were becoming unviable investments. The ADB incorporates a US$36/t price on carbon on all lending decisions, has a strong bias to renewable energy (targeting US$3bn annual renewables lending by 2020),

[12] Financial Times, "ING will steer portfolio towards two-degree goal to help combat climate change", 16 September 2018.

and last approved funding for an imported lignite plant back in February 2014 in Pakistan.

- October 2018 saw Korea's **Teachers' Pension and Government Employees Pension System** (total AUM of US$22bn) both announce they will not consider financing any new coal-fired power plants, becoming the first Korean financial institutions to boycott coal financing.

- November 2018 - the biggest public life insurer in Norway, the US$85bn manager **Storebrand ASA** announced a progress exit from coal to be completed by 2026.[13]

- November 2018 - **Banco Santander** of Spain committed to a new coal exclusion policy.

- November 2018 - **Generali of Italy** (US$581bn AUM) limited its coal insurance, having divested from coal in February 2018.

- November 2018 saw France's **Caisse des Dépôts Group** (€150bn AUM) reduce its exclusion to any mining or power firm with more than 10% exposure to coal (previously 20%).

- December 2018 - The **European Bank for Reconstruction and Development** (EBRD) announced its even tighter policies under its Energy Strategy away from coal in "The Switch from Coal".

- December 2018 - **Citi**, the number one U.S. banker of coal power in 2017, announced an updated coal policy excluding project financing of new coal-fired power plants.

- January 2019 - **Export Development Canada** (EDC) revealed its new Climate Change Policy, including: "No new financing for coal-fired power plants, thermal coal mines or dedicated thermal coal-related infrastructure – regardless of geographic location."

- January 2019 - **Barclays Bank** UK expanded on its April 2018 exclusion of project finance for coal mining to also exclude coal plants.

- January 2019 saw **Nedbank** of South Africa build upon its new coal power exclusion policy in April 2018, with its decision to withdraw funding of two proposed new coal power stations at Thabametsi and Khanyisa, saying it would redirect its funding to energy efficiency and renewables instead.

- February 2019 – **Varma of Finland** updated its Investment Blacklist and divested its exposure to the thermal coal and coal-fired power plants.

[13] Bloomberg, "An $85 Billion Asset Manager Is Planning a Total Exit From Coal", 30 November 2018.

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 reported in July 2018 for Sumitomo Mitsui Trust Bank (assets of US$483bn). IEEFA has written extensively about this emerging trend, most notably with respect to Marubeni Corp.[14]

In September 2018 Marubeni Corp announced a radical pivot, one reinforced by the opinion piece by Prime Minister of Japan Shinzo Abe acknowledging the rise of extreme weather events and the need to act decisively to deal with global warming, noting "climate change can be life-threatening to all generations". More recently, two of Marubeni's fellow sōgō shōsha (Mitsubishi Corp.[15] and Mitsui & Co.[16]) 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 1GW project near Tokyo.[17]

In January 2019 Tokyo Gas decided not to push ahead with the proposed but long delayed 2,000 megawatt (MW) Chiba imported coal-fired power plant[18]. In a separate development, a proposed 112MW Able Company plant in Iwaki which was to be fuelled by coal with up to 30% biomass has been revised to operate as a biomass-only plant. The change represents the ninth proposed coal unit cancellation or modification in Japan since 2012.

Meanwhile Tokyo Electric Power Company (TEPCO) announced it would begin construction in January 2019 of its first commercial offshore wind plant in Japan.[19] 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 details on Japan, please refer to IEEFA's recent briefing note.[20]

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[14] IEEFA, "Marubeni's Coal Problem: A Japanese Multinational's Power Business is at Risk", 30 July 2018.
[15] Reuters, "Mitsubishi exits thermal coal sector, sells stakes in Australia mines", 18 December 2018.
[16] Reuters, "Japan's Mitsui may sell stake in Australia thermal coal mine", 31 October 2018.
[17] Bloomberg, "JFE Steel, Chugoku Electric Scrap Coal-Fired Power Plant Plans", 27 Dec 2018.
[18] Reuters, "Japan's Idemitsu, Kyushu Elec, Tokyo Gas scrap coal-fired power plant plan", 31 January 2019.
[19] TEPCO, "TEPCO's First Commercial Offshore Wind Power Facility to Launch January 2019", 27 November 2018.
[20] IEEFA, "Early days, but momentum away from coal is building", 21 December 2018.

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.

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. There have been a growing range of government moves to reduce reliance on thermal coal and progressively decarbonise the South Korean economy.

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

In July 2018 South Korea announced 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 away from coal and nuclear towards renewables and gas.

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

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

Reason Three: Accelerating Pivot to Renewables

Global Financiers Are Pivoting to Clean Energy

IEEFA tracks zero emissions lending targets as the flip-side of global banks exiting thermal coal. Many of the same financial institutions that have historically financed coal are rapidly awakening to the enormous opportunities and growth in financing renewables.

To date, nine of the largest banks in the world have each committed to financing at least US$100bn of clean energy investments, a staggering US$1,388bn total. (Figure 2.1)

The largest commitment to low carbon solutions globally to-date has been from Morgan Stanley in April 2018 at US$250bn by 2030, having to-date already funded US$84bn since 2006. This is closely followed by Wells Fargo with US$200bn by 2030, building upon JPMorgan Chase's August 2017 commitment to lend US$200bn by 2025, in particular backing the development of the global green bond market.

In 2015 Citigroup announced a new US$100bn 2025 target, having already delivered on its US$50bn target by 2015 two years ahead of schedule. Goldman Sachs, Bank of America, Credit Agricole of France, BBVA of Spain and HSBC UK have all made similar pledges.

Figure 2.1: Global Private Financial Investing in Clean Energy Commitments (US$bn)

Morgan Stanley	Pledged US$250bn by 2030	Apr-18	250
Wells Fargo	Pledged US$200bn by 2030	Apr-18	200
JPM Chase	Pledged US$200bn by 2025	Aug-17	200
Goldman Sachs	Pledged US$150bn by 2025	Nov-15	150
Citigroup	Pledged US$100bn by 2025, US$50bn done by 2013	Feb-15	150
Bank of America	Pledged US$125bn by 2025	Jul-15	125
Credit Agricole SA	Euro100bn in green investments by 2020	May-18	113
BBVA	Pledged US$100bn by 2025	Mar-18	100
HSBC	Pledged US$100bn by 2025	Nov-17	100
	Total (US$ billion)		1,388

Source: Corporate websites, IEEFA Calculations

Reason Four: Stranded Asset Risk

India's Pivot to Renewables

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

India's Power Minister R. K. Singh has repeatedly talked up opportunities for India to lift the development of renewables to a massive 40GW 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.[21]

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 Railways in February 2018 announced plans to electrify and to build 5GW of solar power for self-use as a way to drive down operating costs.

India's progress has been astonishing. With wind and solar tariffs regularly being tendered for Rs2.40-3.00/kilowatt hour (kWh) and averaging Rs2.61-2.92/kWh in 2018 (Figure 3.1), existing domestic thermal power generation is struggling to compete.

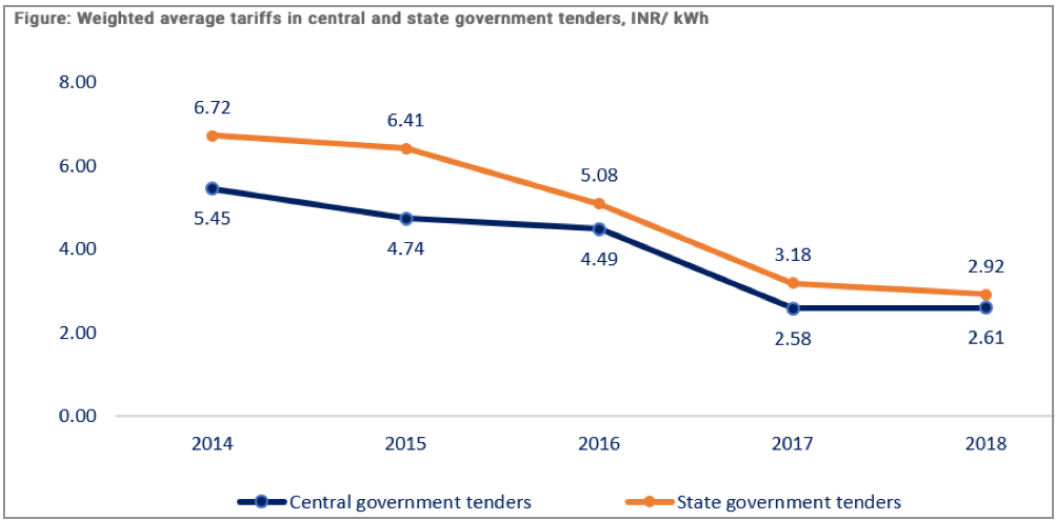
NTPC, India's largest power generator, had an average 2018/19 (year-to-date to December 2018) tariff of Rs3.47/kWh for existing domestic coal-fired power, up 6% year-on-year. Non-mine mouth coal requires tariffs of Rs4.00-5.00/kWh and new imported coal-fired power generation requires a tariff of Rs5.00-6.00/kWh.

In September 2018 Gujarat completed a 500MW solar tender at a record low of Rs2.44/kWh with 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 cannot compete with the current deflationary tariffs that are contractually set to decline in real terms every year for the next 25 years.

[21] ETEnergyWorld, "India to bid out 500 GW renewable energy capacity by 2028", 7 January 2019.

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 developments. They instead are preferring to acquire financially distressed existing power plants which are selling at 40% of the face-value of debt, valuing completed projects at 30% of total investment value (Indian power projects generally carry 80:20 Debt: Equity ratios).[22] Newly appointed CEO Praveer Sinha announced a US$5bn renewable energy investment plan in May 2018.

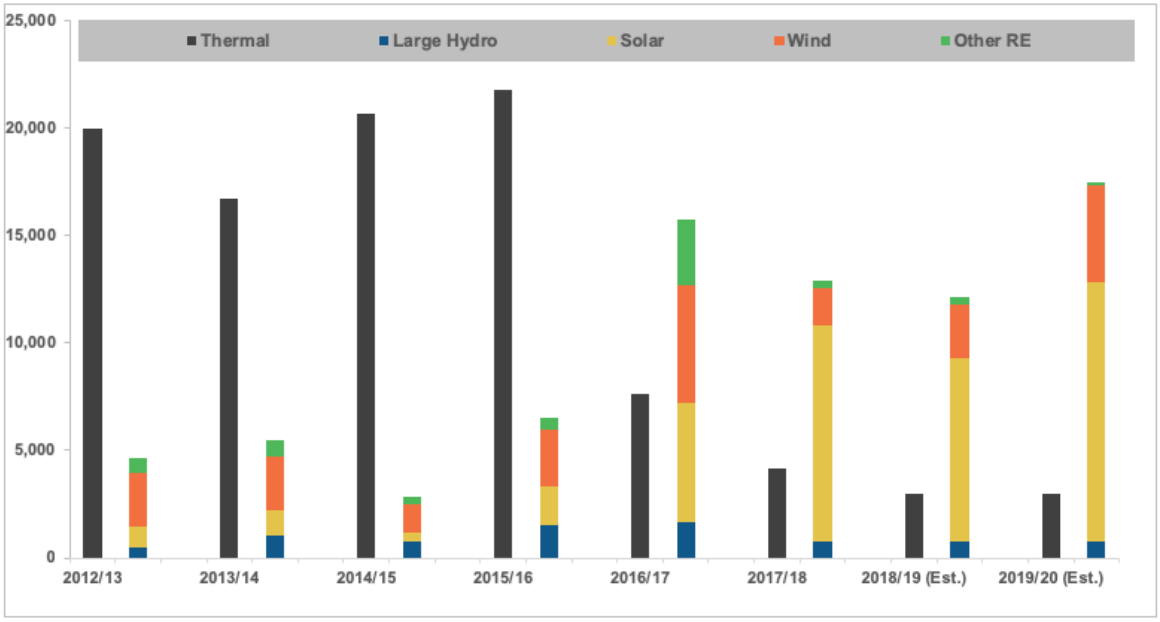
NPTC Ltd has likewise commenced a pivot into renewables with a plan to facilitate or build upwards of 10-20GW over the coming decade. NTPC has also announced it has cancelled 10.5 GW of proposed new coal power plants to-date in 2018.

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 3GW of renewable energy infrastructure in operation and another 3GW in planning, it is one of the top corporate investors in Indian renewables. In Australia, Adani announced a 1,500MW solar investment program for Queensland and South Australia.

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

[22] LiveMint, "Adani to win 3 out of 7 power projects under Samadhan scheme", 10 January 2019.

Figure 3.2: Indian Thermal & 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, in January 2019 the Chairman of the State Bank of India Rajnish Kumar, the country's largest public sector lender, acknowledged 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.[23]

IEEFA references 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, imported fossil fuel inflation and renewable energy deflation.

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

Reason Five: Commitment to Paris Agreement

Australia is a legal signatory to the Paris Agreement and have committed 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 domain[24] as to the challenges of delivering on this target while fossil fuels continue to burn:

"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."

Opening a new thermal coal mine is clearly moving in diametrically the 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 exported emissions contained in LNG, coking and thermal coal – all in direct contradiction to our Paris 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.

The NSW Department of Planning and Environment's landmark court case win with the Gloucester community against the Rocky Hill coal mine sets the precedent that approves need to take climate change and exported carbon emissions into the assessment process. Failure to do so leaves the cost burden on the community and taxpayers of Australia.[26]

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[24] The Climate Council, "Unburnable Carbon: Why we need to leave fossil fuels in the ground", 2015.
[25] Office of the Chief Economist, "Resources and Energy Quarterly", December 2018.
[26] The Guardian, "The win to stop the Rocky Hill coalmine happened in the right place and just in time", 11 February 2019, by Elaine Johnson

Sovereign Risk?

Coal lobbyists occasionally give the unsubstantiated opinion that banning new thermal coal developments would have a material adverse impact on Australia's global financial standing. This is the "Sovereign Risk" argument. In IEEFA's view, this is a hollow claim that has no standing.

At a time when our key global trading partners have already been discussing climate risks for many decades, 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 the clear and rapid exit from the 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:[27]

"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 extension of the Vickery Project actually raises a sovereign risk for Australia.

Australia is a signatory to the Paris Agreement, a global treaty ratified and entered into back in November 2016 with almost universal agreement. Should Australia now approve the development of further new coal mines, this clearly marks Australia as a hypocrite, a country that signs global treaties with no intent of adhering to them, leaving some of the poorest nations in the world – the Vulnerable Twenty (V20) – as the most affected and least able to mitigate and adapt. It would identify Australia as 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 new coal plants would have any impact on Australia's credit rating.

Banning the development of an entirely new coal plant is entirely consistent with both the majority of Australians views on the subject, and also increasingly consistent with the stance of global financial institutions.

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

Reason Six: Increased Collateral Damage

Additional Risks

IEEFA would briefly touch on other 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.[28]

Water Risk

The severe water draw-down risks of additional new coal mining activity are large, and the cumulative impacts of many new coal mine developments in close proximity on the Hunter Region have never been evaluated.

The financial risks of gaps in Australia's environmental approval analysis are clear.

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.[29] Concurrently, the NSW government's expert panel concluded that the water loss from coal mining in a water catchment area was clearly evident, despite the corporate's extensive modelling suggesting this would not happen.[30]

The potential adverse financial costs for New South Wales and Australia are enormous. The impacts of coal mining on water often turn out to be much greater than expected.[31]

Corporate Tax Leakage Risks

New investment in regional Australia is important, but where coal mining is concerned the benefits are short lived, illusionary 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. Approvals really on proponent-created "models" that assume 100% equity financing, yet in IEEFA's experience the standard industry practice is for maximum debt leverage at all times, particularly where the proponent is a foreign corporation.

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[28] The Conversation, "Australia's 2018 in weather: drought, heat and fire", 10 January 2019.
[29] ABC, Hume Coal mine gets damning assessment from NSW Government department over groundwater fears, 12 December 2018.
[30] The Sydney Morning Herald, "'No place for mining': coal mines drain water from dams", 7 January 2019.
[31] The Sydney Morning Herald, 'No place for mining': coal mines drain water from dams, 7 January 2019.

We note that 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.[32] As noted in Section 3 below, Whitehaven Coal is an Australian stock exchange listed firm, but an analysis of its share register suggests it is majority foreign owned.

Foreign firms 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 of the Australian tax system. BHP paid the Australian Taxation Office (ATO) A$529m in November 2018 in settlement of its Singapore tax haven marketing hub practice,[33] yet the 2018 Senate Inquiry into Multinational Tax Avoidance by mining firms highlighted BHP's actions as just the 'tip of the iceberg'.[34]

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 needs to also be moved.

The fuel costs alone are enormous in coal mining, hence why the diesel fuel rebate is such a key subsidy, worth up to A$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. At the same time, 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. However, more than two hundred years of mining in Australia has left more than 50,000 abandoned, unrehabilitated mines,[35] many of which continue to leech toxic chemicals into the water system, while suffering ongoing subsidence. The benefits largely accrue to private corporations, but the environmental implications will be evident locally for centuries. The rehabilitation risks for Australia are immeasurable, particularly with respect to the issue of massive final voids.[36]

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[32] MichaelWest.com.au, "Sneaky coal giant Glencore drops off the Top40 Tax Dodgers", 28 December 2018.
[33] The Australian Financial Review, "BHP to pay ATO $529m in tax settlement over Singapore marketing hub", 19 November 2018.
[34] Parliament of Australia, "Corporate Tax Avoidance report - Part III: Much heat, little light so far", 30 May 2018.
[35] The Conversation, Corrin Unger, "What should we do with Australia's 50,000 abandoned mines?", 23 July 2014.
[36] Energy Resource Insights, "The Hole Truth: The mess coal companies plan to leave in NSW", 8 June 2016.

Background on Whitehaven Coal and the Vickery Coal Mine Proposal

Whitehaven Coal is an Australian Stock Exchange listed firm controlled by foreign shareholders Farallon Capital Management LLC, as well as Fritz Kundrun and Hans Mende, via their AMCI Group.[37]

Whitehaven Coal is a thermal coal mining company operating in the Gunnedah coal basin of New South Wales, exporting coal by rail then via the Newcastle coal port. Whitehaven Coal's 2017/18 production was 83% thermal coal for power generation, and 17% coking coal for steel production.

The new Vickery thermal coal mine proposal is seeking to lift its current 4.5 million tonnes per annum (Mtpa) approval from 2014 so as to enable the production of up to 8Mtpa of product coal (10Mtpa of run-of-mine coal) from 2021/22.[38]

Whitehaven Coal's presentation shows the company strategy is entirely predicated on the IEA NPS, making no material reference to climate change and the financial and operational risks should any of the IEA scenarios that show the collapsing thermal coal demand profile should the Paris Agreement is successful.

Whitehaven Coal has claimed it reports consistent with TCFD, but this claim is clearly not supported by the presentations of the company.

[37] Whitehaven Coal, 2018 Annual Report, page 150.
[38] Whitehaven Coal, 2018 Annual Results Presentation, slide 23

About IEEFA

The Institute for Energy Economics and Financial Analysis conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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Tim Buckley, IEEFA's director of energy finance research, Australasia, has 30 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.