

SUSTAINABILITY OF ENERGY SUPPLY AND RESOURCES IN NSW

Organisation: Institute for Energy Economics and Financial Analysis (IEEFA)

Date Received: 13 September 2019



NSW Coal Exports Outlook

Submission to Sustainability of Energy Supply and Resources in NSW Inquiry

Executive Summary

New South Wales' coal export industry is facing permanent, structural decline in the long term.

The state's big four thermal coal export destinations (Japan, China, South Korea and Taiwan), representing 90% of all 2018 exports, are all set to use less thermal coal or replace imports with domestic coal in the long run.

Coal demand growth in smaller electricity markets in South Asia and Southeast Asia will *not* be enough to make up for the decline in the big four markets.

NSW thermal coal exports peaked back in 2014 but the approaching decline will not happen overnight – there is still time for policy makers to prepare for the coming transition in order to plan for the inevitable social and economic consequences.

At its heart, this will be a technology transition and is hence unavoidable – it will happen whether policy makers want it or not. A lack of planning will result in a chaotic transition with significantly negative social and economic impacts.

As tends to happen in technological transitions, new technology will replace the old faster than most predict.

According to Bloomberg New Energy Finance (BNEF), two-thirds of the world's population already live in countries where wind or solar (or both) are the cheapest source of new power generation.

**Two-thirds of the world's
population already live in
countries where wind or solar
(or both) are the cheapest
source of new power**

BY 2030, NEW WIND AND SOLAR WILL BE CHEAPER THAN RUNNING EXISTING COAL- or gas-fired plants virtually everywhere.

By 2032, BNEF forecasts there will be more solar and wind power capacity installed globally than coal-fired power. Coal-fired power generation will decline 51% by 2050 by which time it will supply just 12% of the world's electricity.

Global mining giants such as Rio Tinto, BHP, Anglo American and South32 have either already withdrawn from the seaborne thermal coal market or are now considering it. Glencore has capped its output.

The coal terminals at the Port of Newcastle are already operating with 25% spare capacity. Concern over thermal coal's long-term sustainability has led the chairman

of the Port of Newcastle to recognise an “urgent need” for the port to diversify away from a reliance on coal.

Financial institutions are now abandoning the coal industry at a significant and increasing rate. Since 2018, a financial institution has announced a restriction on coal financing every two weeks on average. In the first half of 2019, that rate increased to one per week and well over 100 financial institutions around the world, including Australian banks, have already made a move away from coal.

IN THE LONG RUN, THE MARKET FOR SEABORNE THERMAL COAL IN ASIA WILL REFLECT ASIAN ENERGY POLICY SETTINGS, not those of NSW or Australia:

- **Japan:** Japan has 8.7 gigawatts (GW) of coal plants currently under construction but these will replace older units due for retirement, a situation often glossed over by the Australian coal industry. There are 8.2GW of old, subcritical coal plants due for retirement in Japan over the next five years according to Global Energy Monitor (GEM) data, based on an expected 40-year operating life.

Japan’s coal-fired power capacity will peak in 2023 and progressively decline out to 2050

With no new coal plants scheduled to come on line after 2025, Japan’s coal-fired power capacity will peak in 2023 and progressively decline out to 2050 as existing plants reach the end of their operating life.

- **China:** China is set to move away from imports in the longer term as domestic coal, renewables, gas, hydro and nuclear power fulfil growing power demand.

The Australian government’s Office of the Chief Economist sees China’s thermal coal imports declining at an average annual rate of 5.2% per year out to 2024 in its most recent medium-term projection.

- **South Korea:** Driven by air pollution concerns as well as carbon emissions, the South Korean government is aiming to “drastically” cut power generation from coal by banning new coal-fired power plants and closing old ones.

South Korea is now considering retiring 20 coal-fired power plants and placing output caps on a number of others as it prepares to further increase its rate of energy transition.

- **Taiwan:** Over the last four years Taiwan’s pipeline of proposed coal-fired power plants has shrunk from 2.4GW to zero after a series of project cancellations.

WITH NSW’S MAIN EXPORT MARKETS SET TO DECLINE, EXPORTERS WILL SEEK ALTERNATIVE MARKETS. However, the growth of thermal coal demand in other Asian nations is likely to disappoint the coal industry.

India was the destination for just 1.2% of NSW thermal coal exports in 2018. India’s coal ministry is now preparing a new plan to cut coal imports by one-third by 2024.

Vietnam's Ministry of Industry and Trade has reported significant development delays being experienced at many of the nation's coal-fired power projects. Meanwhile, Vietnam's solar power capacity has increased 400 times within 12 months – from 10 megawatts (MW) in June 2018 to 4.5GW by June 2019. Vietnam has now overtaken Australia in total utility-scale solar capacity.

At the same time as NSW's major export destinations will be moving away from coal, the main off-takers of Indonesian and South African coal will be doing likewise.

Indonesia, the world's largest thermal coal exporter, is set to see its two largest destinations - China and India - move away from thermal coal imports. India is also South Africa's biggest export destination by far. As these markets close out, Indonesia and South Africa, and possibly Russia and the U.S., will all be targeting alternative markets like South Asia and Southeast Asia at the same time that Australian exporters are also targeting these markets.

Meanwhile, the idea that NSW thermal coal's high energy content will help it seize share in a declining market is a myth.

The idea that NSW thermal coal's high energy content will help it seize share in a declining market is a myth

Much of the planned or under-construction coal power capacity in growth markets such as Pakistan and Bangladesh is intended to burn mainly cheaper Indonesian coal.

Tata Power's huge Mundra coal plant in India, which is under severe financial stress due to the cost of imported coal, is lowering the average energy content of the coal it consumes to reduce costs.

A DECLINING SEABORNE THERMAL COAL MARKET WILL SEE INCREASED COMPETITION as major exporters fight over the same emerging off-takers.

In an oversupplied market, it will make little sense to keep opening up new mines. Coal prices and royalties are likely to be depressed in an oversupplied market.

A cessation of new thermal coal mine approvals represents a rational economic step for NSW to take in the face of a structurally declining market.

Table of Contents

Executive Summary	1
Introduction	6
Status of NSW Thermal Coal Exports.....	7
Finance for Coal is Drying Up	8
Threat from LNG as well as Renewable Energy.....	8
Renewable Energy Getting Ever Cheaper	9
Thermal Coal Trade Forecasts.....	10
International Energy Agency	10
Bloomberg New Energy Finance.....	11
NSW Main Thermal Coal Export Markets	12
Japan	12
Coal-Fired Power Projects Cancelled	13
Power Companies Shift Away from Coal, Towards Renewables.....	14
Japanese Trading Houses and Financial Institutions Abandoning Thermal Coal	15
Business-As-Usual: Japan's Thermal Coal Capacity Rapidly Declines from 2023	16
China	17
Air Pollution Concerns	18
South Korea	20
South Korea Was Already Moving Away from Coal	21
IEA Foresees Plummeting South Korean Coal Imports	23
Taiwan.....	23
Offshore Wind.....	24
Other Asian Thermal Coal Import Markets	25
India	26
National Electricity Plan	27
Thermal Power Sector in Financial Stress	28
India to Overachieve Paris Agreement Renewables Target by Almost 60%	29
Energy Security and Fossil Fuel Imports	29
Vietnam.....	31
Malaysia.....	33
Philippines.....	33
Thailand.....	34
Pakistan	35
Bangladesh	36
Implications of a Declining Market.....	38

Myth-busting: Countries Are NOT Likely to Turn to Australia’s Higher-Energy Coal to Reduce Emissions..... 39

Stranded Asset Risk: Newcastle Coal Port..... 40

About IEEFA..... 42

About the Authors..... 42

Introduction

Australia is the world's second-largest exporter of thermal coal after Indonesia, with more than two-thirds of thermal coal exported from the state of NSW. A total of 207 million metric tonnes (Mt) of thermal coal was exported from Australia in the calendar year 2018. Of this total, 144Mt was from NSW.

The great majority of NSW thermal coal exports are shipped out of the Port of Newcastle—the world's largest coal export terminal. As such, it is highly significant that the chairman of the Port of Newcastle has recognised an “urgent need” for the port to diversify away from its reliance on coal, further stating that “the long-term outlook for coal is a threat to the port and the Hunter region.”¹

This noteworthy assertion was followed only a few months later with the announcement that the long-planned Terminal 4 (T4) extension at the Port of Newcastle had been formally cancelled.² T4 was planned by coal terminal operator Port Waratah Coal Services (PWCS) on the back of highly optimistic expectations over future growth in thermal coal exports out of Newcastle. That growth never materialised however, and with spare capacity at existing terminals, the extension plan was officially dropped.

The NSW coal industry contends that the port's spare capacity is sufficient to cover future growth in thermal coal exports.

NSW THERMAL COAL EXPORTS PEAKED BACK IN 2014 and in this report IEEFA explains how, rather than growing, NSW thermal coal export volumes are approaching permanent long-term decay. This is part of thermal coal's structural decline now occurring globally – an inevitable technology transition which is being driven even faster by concerns about energy security, carbon emissions, air pollution concerns, and the economic impact of relying on fossil fuel imports.

With over 100 global financial institutions having already moved away from supporting coal³, coal-fired power plant proposals around Asia will increasingly struggle to find private capital support. Rising international pressure also appears to be limiting public financial support. The appetite of Japanese and South Korean export credit agencies for further coal projects seems to be waning and China is under pressure to ‘green’ the public financial support it provides for power capacity under its Belt and Road Initiative around Asia and Africa.

Global mining giants have started to prepare themselves for the seaborne thermal coal market's permanent decline. Rio Tinto has already left the coal mining business

¹ Sydney Morning Herald, “[World's largest coal export port Newcastle has ‘urgent need’ to diversify](#)”, 17 December 2017.

² Port Waratah Coal Services press release, “[Port Waratah Terminal 4 Announcement](#)”, 31 May 2018.

³ IEEFA, [Over 100 and Counting – Financial institutions are restricting thermal coal funding](#)

altogether whilst BHP is now considering its final exit of thermal coal.⁴ Glencore has made it clear its thermal coal production capacity will be limited going forward.

South32 is approaching the final stages of the sale of its South African thermal coal assets and has recognised an impairment of US\$502m based on the offer it received and the outlook for thermal coal demand.⁵ Anglo American is now considering the future of its remaining thermal coal mines given its limited future.⁶

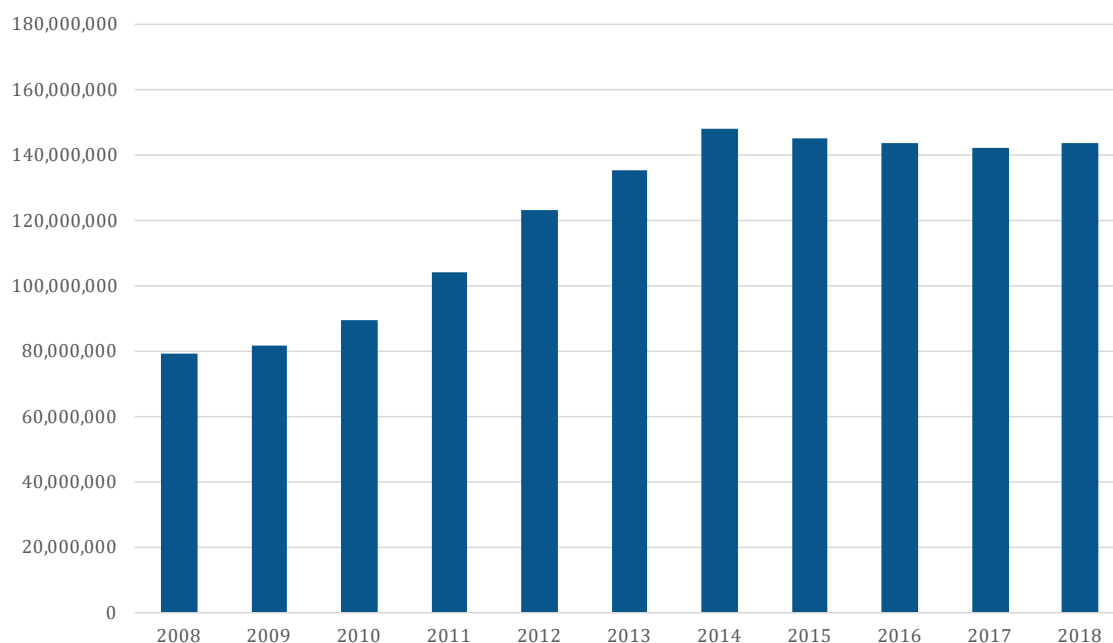
Status of NSW Thermal Coal Exports

Media coverage of the status of the coal export industry often focuses on revenues, a tendency hiding the fact that NSW thermal coal export volumes peaked in 2014 (Figure 1).

Although it is possible that export volumes could rebound in the short term, the longer-term outlook for thermal coal suggests we are fast approaching a time when thermal coal export volumes enter long-term decline on a permanent basis.

It is entirely possible that NSW has already passed peak thermal coal exports for good.

Figure 1: NSW Thermal Coal Exports Peaked in 2014 (tonnes)



Source: DFAT STARS Database, based on ABS Cat No 5368.0, December 2018 data.

⁴ Bloomberg, [BHP is Latest Giant Miner to Plan Exit From Thermal Coal](#), 11 July 2019

⁵ South32, [South Africa Energy Coal Divestment Update and Impairment](#), 22 August 2019

⁶ Business Day, [Anglo plots SA coal exit and warns on latest Mining Charter](#), 29 July 2019

Finance for Coal is Drying Up

Financial institutions are now abandoning the coal industry at a significant and increasing rate. Since 2018, a bank, insurer or other financial institution has announced a restriction on coal financing on average every two weeks.⁷

In the first half of 2019, that rate increased to one per week and over 100 global financial institutions have made a move away from coal already.⁸ In August 2019, Australia's largest bank committed to exiting the thermal coal mining and coal-fired power sectors by 2030.⁹

Major global investors are increasingly abandoning the tactic of engaging with fossil fuel companies on climate risk, and instead are simply divesting their fossil fuel holdings.¹⁰

The coal industry has already begun to notice the increased difficulty in finding finance for new projects.¹¹ Dileep Srivastava, director at Bumi Resources, Indonesia recently stated, "Banks are increasingly reluctant to fund coal related projects".¹²

**Banks are increasingly
reluctant to fund coal
related projects**

Threat from LNG as well as Renewable Energy

How relative thermal coal and liquefied natural gas (LNG) prices stack up into the future is hard to predict, however it is possible that LNG pricing could be highly competitive with thermal coal in the long run as LNG supply continues to expand.¹³

There have already been some indications of coal to LNG switching in the shorter term in Europe. Despite lower recent thermal coal prices due to market over-supply, LNG prices have also dipped enough to fall below thermal coal on an energy equivalent basis. This has convinced some Japanese utilities to consider some coal-to-LNG switching in the shorter term, which could see LNG-fired plant utilisation increase and coal-fired power utilisation decline.¹⁴ Japan is the world's largest LNG importer.

Coal to gas switching has been evident in Europe in 2019 due to a combination of lower gas prices and higher carbon price. The European Union (EU) carbon price

⁷ IEEFA, [Over 100 Global Financial Institutions Are Exiting Coal, With More to Come](#), 26 February 2019.

⁸ IEEFA, [Asian banks add to growing number of major financial institutions exiting coal – now 112 and counting](#), 14 May 2019.

⁹ Commonwealth Bank of Australia, [CBA Environmental and Social Framework](#), 2019.

¹⁰ Bloomberg, [Big Money Starts to Dump Stocks That Pose Climate Risks](#), 7 August 2019.

¹¹ Reuters, [Future tense: Fastest-growing market Asia rethink's coal prospects](#), 4 July 2019.

¹² Reuters, [Asia's coal developers feeling left out by cold shoulder from banks](#), 25 June 2019.

¹³ Reuters, [Asia's thermal coal trade faces threats, with LNG the silent assassin: Russell](#), 26 June 2019.

¹⁴ Bloomberg, [Diving Gas Costs Spark Potential Rare Switch Away From Coal in Japan](#), 5 June 2019.

has doubled over the past year. Increased LNG supply from Australia and the U.S. has helped push prices down and allowed the higher level of switching to gas. The head of generation at Italian utility Enel stated, “We have an alignment of economics, of saying switch to gas and most importantly switch to renewables because it’s cheaper, safer and easier.”¹⁵

In April 2019, Tokyo Gas signed a long-term LNG supply deal with Royal Dutch Shell which partly uses a coal-linked pricing formula – believed to be the first time this has been done by a Japanese LNG buyer. With LNG supply on the rise, more moves away from oil-linked pricing of LNG and the greater influence of U.S. Henry Hub gas pricing could help it increase competition with thermal coal in the Asian market.

Renewable Energy Getting Ever Cheaper

The dramatic decline in the cost of renewable energy technology has caught many, including the fossil fuel industries, by surprise. There is no sign that these cost reductions are going to cease anytime into the future.

According to Bloomberg New Energy Finance (BNEF), two-thirds of the world’s population live in countries where wind or solar (or both) are the cheapest source of new power generation. By 2030, new wind and solar will be cheaper than running existing coal- or gas-fired plants virtually everywhere. In China, BNEF expects this tipping point to be reached as soon as 2027.¹⁶

In July 2019, the 1.18 gigawatt (GW) Sweihan solar plant in the United Arab Emirates began operations. In 2016, this project made headlines when it broke the world record for solar photovoltaic (PV) power tariffs with a new low of US\$24.2/megawatt-hour (MWh). The project is owned by a consortium of Abu Dhabi Power Corporation, Chinese solar PV manufacturer Jinko Solar, and Japanese trading house Marubeni. The latter has historically been one of the most significant constructors of coal-fired power in Asia until it put distance between itself and further coal projects with a new coal policy announced in September 2018.¹⁷

In 2019, the US\$24.2 tariff for the Sweihan project was well beaten. July 2019 saw the lowest bid in a Portuguese solar auction at US\$16.44/MWh.¹⁸

Even more significant are the most recent tariffs for solar with battery storage; installations that can not only push coal out of the supply mix during the middle of the day, but which can also supply power during peak evening periods as well.

In June 2019, Los Angeles Power and Water struck a deal on the largest solar and battery storage project in the world. As well as being the largest such project globally, it is also the cheapest with tariffs of US\$19.97/MWh for solar power and

¹⁵ Bloomberg, [Coal’s Demise Quickens in Europe as Market Shift Idles Plants](#), 22 July 2019.

¹⁶ BNEF, [New Energy Outlook 2019](#)

¹⁷ Marubeni, [Notification Regarding Business Policies Pertaining to Sustainability](#), 18 September 2018.

¹⁸ PV-Tech, [Portugal claims spot in solar history with record-low auction prices](#), 30 July 2019.

US\$13/MWh from batteries.¹⁹ The project is expected to qualify for the U.S. federal solar investment tax credit.

Thermal Coal Trade Forecasts

Long term forecasts for the seaborne thermal coal trade paint a grim outlook for any nations or regions where coal exports make up a significant part of their economy.

International Energy Agency

The International Energy Agency (IEA), which publishes its influential World Energy Outlook (WEO) on a yearly basis, reports a declining long-term global thermal coal market in its latest projections.

Under the IEA's Sustainable Development Scenario (SDS) which assumes nations take a path toward achieving climate stabilisation, reduced air pollution, and universal access to modern energy,²⁰ global thermal coal trade volumes drop 65% by 2040. Thermal coal demand for power generation drops by 79% by 2040 from 2017 levels under this scenario.

Under the New Policies Scenario (NPS), which is based on current global announced policy settings, and hence is not aligned to the Paris Agreement target of limiting global warming to less 2 degrees, the global coal trade declines 6% by 2040.

To assume the NPS is the more accurate projection of the direction of energy markets going forward is to assume the world will not take significant action to act on climate change in line with limiting warming to below 2 degrees, even though most of the world has signed on to do just that, and the current reluctance by the U.S. to cooperate is likely to be temporary. International pressure to act on carbon emissions is growing²¹ and will continue to do so into the future.

“We see signs that the Sustainable Development Scenario is becoming increasingly likely”: Moody’s

The NPS does not take into account future increases in climate policy ambition and further continued technology change that IEEFA sees as virtually certain to happen. IEEFA is not alone in believing the SDS is a more accurate reflection of the path the world will take going forward, rather than the NPS. Global credit rating agency

¹⁹ Forbes, New Solar + Battery Price Crushes Fossil Fuels, Buries Nuclear, 1 July 2019.

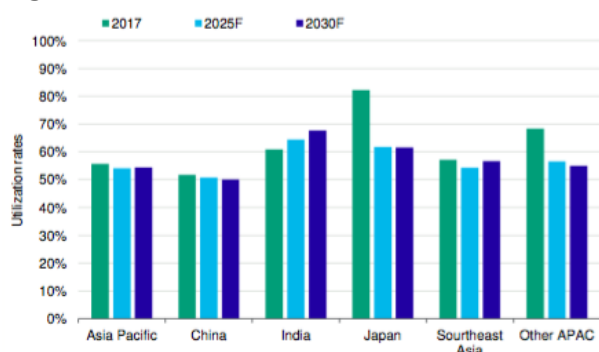
²⁰ IEA, “[Commentary: A new approach to energy and sustainable development - the Sustainable Development Scenario](#)”, 13 November 2017.

²¹ Bloomberg, [Climate Crisis Spurs UN Call for \\$2.4 Trillion Fossil Fuel Shift](#), 8 October 2018.

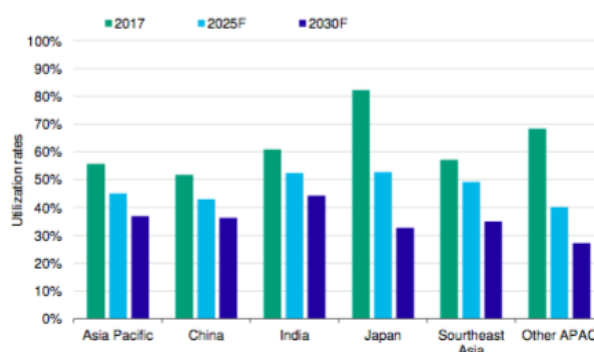
Moody's has stated that, "We see signs that the SDS is becoming increasingly likely".²²

According to Moody's, the utilisation of Asia's coal plants will decline, even under the NPS.²³ However, the decline will be even greater under the SDS. Across the Asia-Pacific, average coal power plant utilisation drops under the NPS from around 55% to around 37% by 2030 (Figure 2).

Figure 2: Asian Coal Plant Utilisation Rates Under IEA's New Policies Scenario (NPS) (Left Chart) and Sustainable Development Scenario (SDS) (Right Chart)



Sources: IEA, Moody's Investors Service



Sources: IEA, Moody's Investors Service

Bloomberg New Energy Finance

In its latest New Energy Outlook report, BNEF forecasts a dire future for coal-fired power globally.²⁴

By 2032, BNEF foresees there will be more solar and wind power capacity installed globally than coal-fired power. Coal-fired power generation will decline 51% by 2050 by which time it will supply just 12% of the world's electricity.

In Japan, NSW's largest thermal coal market, renewable energy supplies more than 75% of total electricity generation by 2050 according to BNEF's forecast. Meanwhile, China will pass through peak coal-fired power generation as soon as 2027. South Korea's power generation mix moves from 68% coal and nuclear in 2018 to 71% gas and renewables by 2050.

Parts of Asia expected by the coal industry to replace lost demand elsewhere will also undergo a transformation in the long term, according to BNEF. In India, zero-carbon power technologies are forecast to supply 67% of power by 2050, whilst in

²² Moody's, [Climate Goals, declining costs of renewables signal decreasing reliance on coal power](#), 8 May 2019.

²³ Ibid.

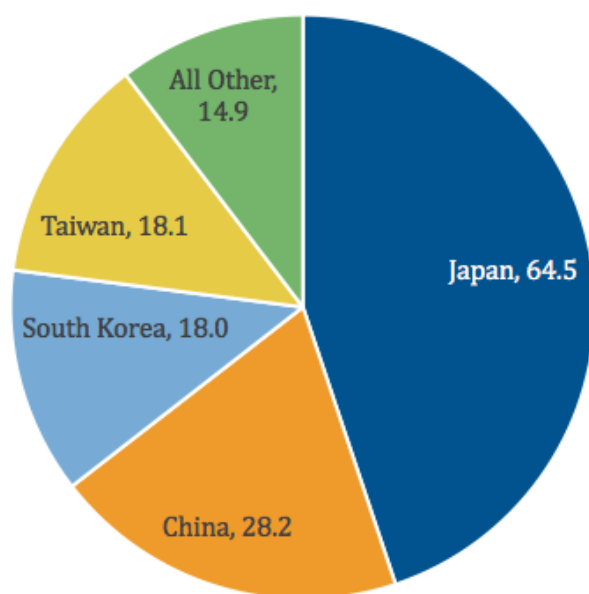
²⁴ BNEF, [New Energy Outlook 2019](#).

Southeast Asia the power generation mix will have switched from 84% fossil fuels to 58% renewables by that time.

NSW Main Thermal Coal Export Markets

In 2018, 90% of NSW thermal coal exports went to Japan, China, South Korea and Taiwan (Figure 3). However, the outlook for coal imports into these main markets looks poor in the long term.

Figure 3: Countries Receiving NSW Thermal Coal Exports 2018 (million tonnes)



Source: DFAT STARS Database, based on ABS Cat No 5368.0, December 2018 data.

Japan

Japan was the destination for 45% of NSW thermal coal exports in 2018, making it by far the largest thermal coal export destination for NSW (Figure 3).

In 2018, NSW exports to Japan were 64.5Mt, down 0.4% on the prior year and down 1.5% from the peak of NSW exports to Japan in 2015. The Australian Government's Office of the Chief Economist forecasts that Japan's thermal coal imports will decline

at an average annual rate of 1.1% per year out to 2024 it is latest medium-term projection.²⁵

Beyond this, Japan's coal consumption looks set to decline further as significant capacity reaches retirement age in the 2030s and early 2040s under a business-as-usual scenario (Figure 4).

The last 18 months has seen significant Japanese momentum away from coal domestically

The last 18 months has seen significant Japanese momentum away from coal domestically. This has been characterised by the decision-making of Japanese banks, insurers, trading houses and power utilities, as well as politicians to some extent.

Coal-Fired Power Projects Cancelled

In January 2019, the largest remaining coal plant in Japan's project pipeline was cancelled – the 2GW Chiba project.²⁶ Proponent Kyushu Electric Power Corp. noted the plant would be unable to yield the required investment returns. This is unsurprising given Japan's electricity demand has dropped 12% over the last decade and will at best plateau going forward as Japan faces a continued declining population trend. Bloomberg New Energy Finance forecasts that Japanese electricity demand will decline another 10% by 2050.²⁷

This cancellation followed the 2017 cancellation of the Kansai Electric Power's 1,200 MW Ako project and the 2018 cancellations of J-Power's 1,200MW project in April and JFE Steel and Chugoku Electric Power's 1,000MW proposal in December.

New coal-fired plants make increasingly less sense given Japan's power demand stagnation, the government's determination to bring nuclear power units back online, and the prospect of more renewable energy, with offshore wind poised to breakout in Japan as it is around Asia.²⁸

Japan's pipeline of new coal-fired power plants has collapsed 64% in four years. From almost 12.7GW of projects in Japan's pipeline at January 2015, the latest figures put the pipeline at under 4.6GW. Furthermore, more than half of the remaining project pipeline capacity now appears to be in doubt; the 1.3GW Akita coal power proposal of Marubeni and Kansai Electric Power Corp. was supposed to begin construction in August 2019 but has now been pushed back. It has been

²⁵ Office of the Chief Economist, [Resources and Energy Quarterly](#), March 2019.

²⁶ Kyushu Electric Power Co., [Changes in the Thermal Power Plant Project in Sodegaura City, Chiba Prefecture](#), 31 January 2019.

²⁷ Bloomberg New Energy Finance, [New Energy Outlook 2019](#).

²⁸ IEEFA, [Offshore wind power, the unexplored opportunity that could replace coal in Asia](#), 30 August 2018.

reported that Marubeni and Kansai Electric have given up grid access rights for the project – possibly indicating the proponents have effectively cancelled the project.²⁹

In addition, although approval for new coal plants comes from the Ministry of Economy, Trade and Industry, Japan's Environment Ministry announced in March 2019 that it would not sanction any more coal-fired power plants or upgrades to existing ones.³⁰

Japan does have 8.7GW of coal plants currently under construction but these will replace older units due for retirement, a situation often glossed over by the Australian coal industry. There are 8.2GW of old, subcritical coal plants due for retirement in Japan over the next five years according to Global Energy Monitor (GEM) data, based on an expected 40-year operating life. Furthermore, the new plants' much-vaunted "efficiency" means they use less coal than old plants, so replacing the old with the new will contribute to reduced thermal coal demand.

Power Companies Shift Away from Coal, Towards Renewables

JERA, Japan's biggest thermal power generator (both coal- and Liquefied Natural Gas (LNG)-fired), and the world's largest LNG buyer, announced in April 2019 that it will focus on LNG-fired power and renewables going forward, stating that it wants to "become the global leader in LNG and renewable energy to enhance the transition to a clean energy economy."³¹

The company, a joint venture between Tokyo Electric Power Co (TEPCO) and Chubu Electric Power Co, owns about half of all of Japan's thermal power capacity but now wants to increase renewable energy capacity to 5GW within seven years, up from 650MW currently.

Having shifted its thermal power assets into its JERA joint venture, TEPCO is now focusing on an initial target of adding 6-7GW of renewable energy in Japan and overseas, with a particular emphasis on offshore wind.

TEPCO's President has stated, "We must gain competitive advantage in renewable energy."³² In January 2019, TEPCO signed a Memorandum of Understanding with global offshore wind leader Ørsted to jointly develop such wind projects. Ørsted believes 7-8GW of offshore wind can be built in Japan by 2030 without the need for floating turbine technology.³³

²⁹ Reuters, [Kansai Electric, Marubeni delay construction of coal-fired power plant](#), 15 August 2019.

³⁰ Asahi Shimbun, [Japan to rule out coal-fired plants as international criticism rises](#), 28 March 2019.

³¹ Reuters, [INTERVIEW-JERA aims to double profit by FY25/26 with focus on LNG, renewable energy](#), 23 April 2019.

³² Nikkei Asian Review, [Tepco seeks overseas partners in renewable energy pivot](#), 24 July 2018.

³³ Asian Power, [7-8GW of bottom-fixed offshore wind can be built in Japan by 2030: Ørsted](#), 23 January 2019.

Kansai Electric Power - another leading Japanese power utility – announced in March 2019 a renewable portfolio target of 6GW by 2030, up from a token 11MW currently.³⁴

Japanese Trading Houses and Financial Institutions Abandoning Thermal Coal

Japan's large and influential trading houses (the sōgō shōsha) have recently announced policies that turn them away from thermal coal, including the sale of investments in Australian thermal coal mines.

Marubeni announced a change in policy on coal-fired power in September 2018.³⁵ The company stated that it will cut its coal-fired power capacity of around 3GW by half by 2030. Marubeni also said it will not enter into any new coal-fired business “as a general principle”. Finally, Marubeni committed to increase the ratio of generation from renewables in its power portfolio from 10% to 20% by 2023.

In December 2018, both Mitsui & Co. and Mitsubishi Corp. released significant statements. Mitsubishi announced the sale of its two Australian thermal coal investments in the Clermont and Ulan mines.³⁶

Mitsui announced the sale of its investment in the Bengalla thermal coal mine in NSW.³⁷ Mitsui also stated, “For thermal coal, Mitsui has the corporate strategy to refrain from accumulating new assets while existing assets are under thorough review for divestiture possibilities.”

Then in February 2019, Itochu Corp. announced it will no longer develop any new coal-fired power plants or thermal coal mines.³⁸

Following this, in March 2019, Sojitz Corp. announced the divestment of its Indonesian coal mine investment as part of its own shift away from thermal coal.³⁹ Sojitz stated that: “This strategic share sale furthers Sojitz’s shift away from thermal coal investments as the company continues to rebalance its coal assets in light of rising global concern for the environment and long-term business sustainability.”

³⁴ The Guardian, [Japan to oppose new or expanded coal-fired power plants in blow to Australian exports](#), 31 March 2019.

³⁵ Marubeni, [Notification Regarding Business Policies Pertaining to Sustainability](#), 18 September 2018.

³⁶ Mitsubishi Corp, [Mitsubishi Corporation has Reached Agreement to Sell its Interests in the Clermont and Ulan Coal Mines in Australia](#), 18 December 2018.

³⁷ Mitsui & Co, [Mitsui to Sell Its Interest in Bengalla Joint Venture](#), 3 December 2018.

³⁸ Itochu Corp, [Coal-related business policy](#), 14 February 2019.

³⁹ Sojitz Corp, [Sojitz Divests Interest in Thermal Coal Assets, BAU Coal Mine, in Indonesia](#), 11 March 2019.

A growing number of major Japanese financial institutions have started their own moves away from coal including the banks Mitsubishi UFJ⁴⁰ and Sumitomo Mitsui Trust Bank, and the insurance firms Nippon Life and Dai-ichi Life.

Business-As-Usual: Japan's Thermal Coal Capacity Rapidly Declines from 2023

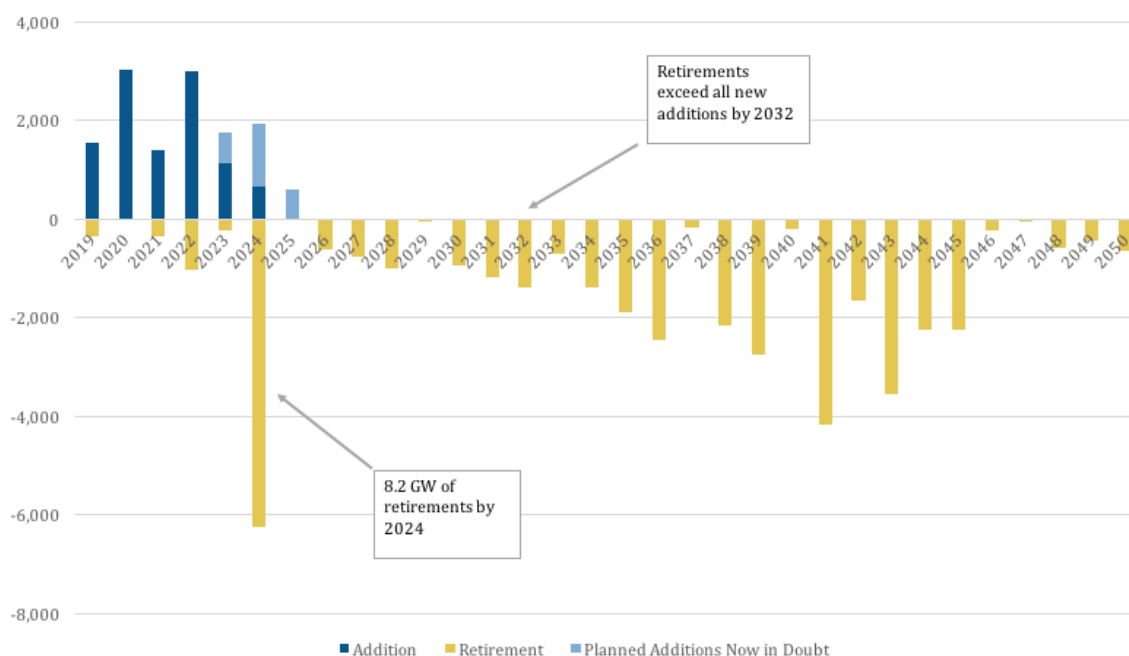
The age profile of its operating coal power fleet means Japan is on track for a significant reduction in coal-fired power capacity in the long term.

The pipeline of coal-fired power plants under development is shrinking precipitously as projects get cancelled. It now seems clear that no new coal plant proposals will be made in Japan.

It now seems clear that no new coal plant proposals will be made in Japan.

The 8.7GW of plants under construction will quickly be offset by closures of existing plants as they reach the end of their operating life, assuming they do not have their operating lives extended.

Figure 4: Planned Coal Capacity Additions and Future Retirements (MW)



Source: Global Energy Monitor, IEEFA calculations

⁴⁰ Mitsubishi UFJ, MUFG Sets Sustainable Finance Goals and Revises Environmental and Social Policy Framework, 15 May 2019.

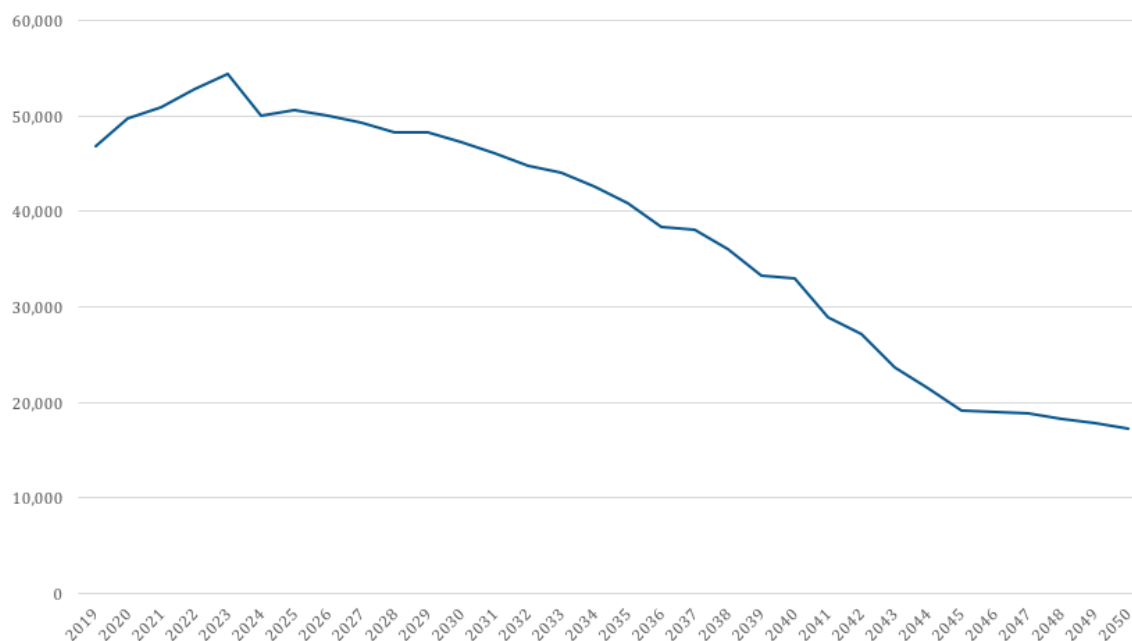
By 2024, 8.2GW of coal-fired power capacity is due for retirement according to GEM data, based on an expected 40-year operating life. Furthermore, total planned additions to the fleet, which includes 8.7GW under construction and 4.6GW of projects in the development pipeline, will be exceeded by retirements by 2032 (Figure 4).

In addition, the 4.6GW of projects under development includes 2.5GW of projects which are in doubt (the 1.3GW Akita project and the 1.2GW Ube project).

With no new coal plants scheduled to come on line after 2025, coal-fired power capacity will peak in 2023, then progressively declines out to 2050 as existing plants reach the end of their operating life (Figure 5).

In addition to declining capacity, Japan's thermal coal consumption will be further reduced by decreasing utilisation of its coal-fired power plants. According to its calculations using IEA data, global credit rating agency Moody's sees the utilisation of Japanese plants fall from over 80% in 2017 to an uneconomic 32% by 2030 under the IEA's Sustainable Development Scenario (Figure 2).

Figure 5: Japan's Business-As-Usual Coal-Fire Power Capacity (MW)



Source: Global Energy Monitor, IEEFA calculations

China

China was NSW's second largest thermal coal destination in 2018, representing nearly 20% of all exports as shipments to China increased on the prior year. This is unlikely to be repeated in 2019 given the seemingly deliberate customs stoppages specifically targeted at Australian coal in the first half of the year.

However, whatever China's reasons are for holding up Australian coal imports in 2019, the bigger picture is that China is likely to move away from any imports in the longer term as domestic coal, renewables, gas, hydro and nuclear power fulfil growing power demand.

The Australian government's Office of the Chief Economist sees China's thermal coal imports declining at an average annual rate of 5.2% per year out to 2024 in its most recent medium-term projection.⁴¹

**The Australian government's
Office of the Chief Economist
sees China's thermal coal
imports declining at an
average annual rate of 5.2%
per year out to 2024**

Significantly, imports of thermal coal make up only a small proportion of overall Chinese thermal coal consumption, which is dominated by domestic supply. China is in the process of rationalising its domestic coal market and improving mining efficiency which is likely to see the replacement of imported coal with domestic coal in the long run.

China added 194Mt of new domestic coal mining capacity in 2018⁴², not far off the total thermal coal imported into China in 2018 (216Mt). New domestic coal mine approvals have continued into 2019 with 141Mt of annual capacity given the go-ahead in the first six months of the year.⁴³ As it expands domestic production, China is also increasing coal rail transport connectivity with the aim of increasing capacity by 650Mt, or 30%, by 2020.⁴⁴

China is also building power transmission capacity to better utilise domestic coal. The world's longest ultra-high voltage transmission line is under construction to link coal-rich Xinjiang province in the west to the country's highly populated east. Coal transportation out of Xinjiang has proved difficult and the new transmission line is expected to reduce thermal coal imports into eastern China by about 30Mt per annum.⁴⁵

Air Pollution Concerns

Although overall coal consumption in the power system is increasing as electricity demand continues to rise, the proportion of power generated by coal is declining. In 2018, coal's share in the power mix dropped to 59% from the 2012 peak of 68.5%.

This shift is driven in part by the technological transition that increasingly means renewables are the more economic option, as well as the need to act on carbon emissions. However, much of the driving force behind Chinese plans to increase its

⁴¹ Office of the Chief Economist, [Resources and Energy Quarterly](#), March 2019.

⁴² Reuters, [China boosts coal mining capacity despite climate pledges](#), 26 March 2019.

⁴³ Reuters, [China coal mine approvals surge despite climate pledges](#), 6 August 2019.

⁴⁴ Bloomberg, [China's Mammoth Coal Industry Gets Bigger, Crowding Out Imports](#), 9 April 2019.

⁴⁵ S&P Platts, [Chinese thermal coal demand to fall with launch of new power transmission line](#), 4 July 2019.

reliance on renewables, nuclear and gas is linked to its ongoing commitment to reduce air pollution.

China is now in its sixth year of its “war on pollution” and in July 2018 released its 2018-20 air pollution action plan. The plan aims to take measures to reduce smog, including cutting coal consumption.⁴⁶ The expanded plan now applies to 82 Chinese cities and the major coal producing provinces of Shanxi and Shaanxi.

Renewable energy and coal-to-gas switching is being prioritised as China grapples with its air pollution crisis. China recently increased its renewable energy consumption targets from 20% to 35% by 2030.⁴⁷ China has been rolling out renewable energy at a rapid pace, with 2017 a landmark year for clean energy including a world-leading 53GW of solar power installed. Although 2018 did not match that rate, China continues to add to its enormous renewable energy capacity.

For the six months to June 2019, China’s renewable power capacity was up 9.5% year-on-year after adding more than 9GW of wind capacity and more than 11GW of solar capacity in the first half of the year. Renewable capacity increases, and continuing action to prevent curtailment of wind and solar led to a 14% increase in renewable power generation in the first half of 2019 compared to the same period in 2018.⁴⁸

The government is aiming for 210GW of wind power by 2020 according to its five-year plan for wind power and is on track to beat this target according to a 2018 report from Wood Mackenzie Power & Renewables. Cumulative Chinese wind capacity will exceed 400GW by 2027, including a significant uptake of offshore wind, according to the report.⁴⁹

China became the world’s biggest importer of natural gas in 2018 (overtaking Japan) boosted by increased imports of LNG as it continues to progressively wean itself off coal.⁵⁰ The IEA projects a significant increase in China’s gas imports going forward under its “Blue Skies” anti-pollution policy. By 2023, China is expected to be importing 171 billion cubic metres (bcm) of natural gas, up 82% from 94bcm in 2017. This will include 93bcm of LNG in 2023, up from 51bcm in 2017. China’s overall gas demand is expected to increase 59% to 376bcm by 2023.⁵¹

With domestic coal, renewables and gas combining with hydro and nuclear power set to squeeze out China’s thermal coal imports going forward, Indonesia and Australia will be the coal exporters most impacted (Figure 6).

⁴⁶ Reuters, “China to cut coal use, curb steel in 2018-2020 pollution plan”, 4 July 2018.

⁴⁷ Bloomberg, [China Steps Up Its Push Into Clean Energy](#), 26 September 2018.

⁴⁸ Reuters, [China’s renewable power capacity up 9.5% year-on-year in June](#), 25 July 2019.

⁴⁹ Asian Power, [China’s wind power capacity could reach 400GW after 2027: report](#), 3 August 2018.

⁵⁰ Bloomberg News, [China Takes Gas Crown as Clean-Air Push Powers it Past Japan](#), 24 June 2018.

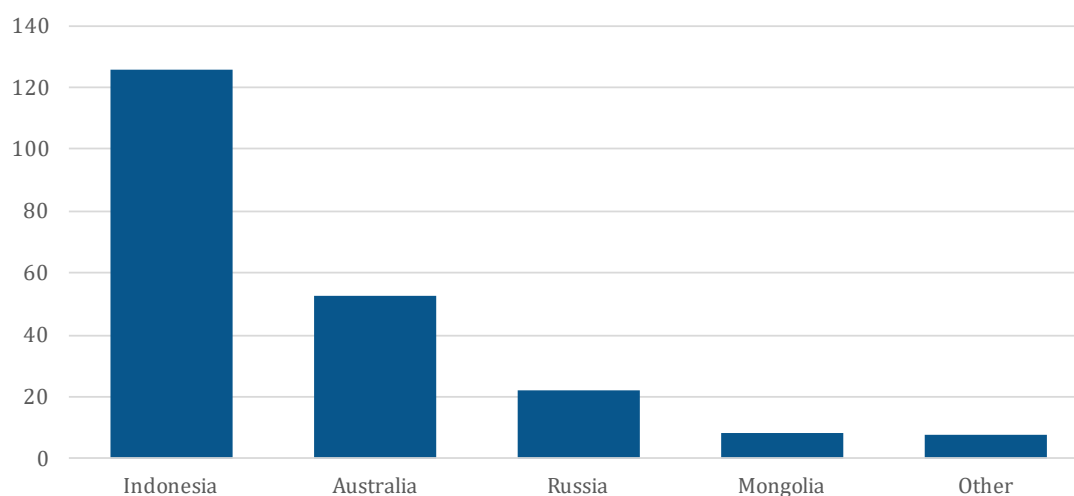
⁵¹ IEA, Gas Market Report 2018.

Given that China is the world's largest thermal coal export destination, the decline of this market will have major knock-on effects on the globally. Australian coal exporters to China will need to find other markets to replace it going forward and are likely to have their eyes on countries such as Vietnam and India. Unfortunately for NSW exporters, by far the largest supplier to China is the world's largest thermal coal exporter – Indonesia – which is also already the largest supplier to India and will itself also be targeting Vietnam and other Southeast Asian nations.

As the Asian seaborne coal market shrinks, competition to supply the remaining demand will intensify.

As the Asian seaborne coal market shrinks, competition to supply the remaining demand will intensify.

Figure 6: China's 2018 Thermal Coal Imports by Source (Mt)



Source: Office of the Chief Economist, Australian Government

South Korea

Currently a major thermal coal importer, South Korea's power system will rely on renewable energy and LNG in the longer term.

During a public hearing for South Korea's new energy master plan on 19th April 2019, the South Korean Ministry of Trade, Industry and Energy announced it would seek to significantly cut reliance on coal-fired power generation whilst shifting even more towards renewable energy. South Korea's energy master plan sets long-term energy policy and is renewed every five years.

Under the new plan, the government intends to increase the share of power output from renewable energy sources by up to 35% by 2040, up from around 8% currently.⁵² The previous renewable energy target set in 2017 was to reach 20% by 2030.

Park Jae-young, Director of the Ministry of Trade, Industry and Energy, stated that the role of coal-fired power is to be cut further. Driven by air pollution concerns as well as carbon emissions, the government would “drastically” cut power generation from coal by banning new coal-fired power plants and closing old ones.⁵³

**The government will
“drastically” cut power
generation from coal by
banning new coal-fired power
plants and closing old ones.**

South Korea is now considering retiring 20 coal-fired power plants and placing output caps on a number of others as it prepares to increase its rate of energy transition yet again.⁵⁴

In addition, the government will favour the use of LNG and stop the construction of nuclear power reactors.

In 2018, coal accounted for 41.9% of South Korea's power generation, followed by LNG with 26.8% and nuclear energy with 23.4%.

South Korea Was Already Moving Away from Coal

The announcement of the new energy master plan comes on top of previous announcements that saw South Korea already making its move away from coal-fired and nuclear power and towards renewable energy and LNG. There has been a significant change in the long-term thermal coal demand outlook in South Korea since President Moon Jae-in was elected in 2017.

The government's 2017 plan for the South Korean electricity system called for a dramatically reduced reliance on coal and nuclear and a boost to renewable energy and LNG-fired power generation. This move was driven by air pollution concerns in addition for the need to reduce carbon emissions. In April 2018, the Organisation for Economic Cooperation and Development (OECD) reported that South Korea had the worst air quality of any economically advanced nation.⁵⁵

In April 2019, South Korea's coal tax increased by another 28% to KRW46/kg (US\$40/t). At the same time, the tax on LNG imports was cut by 75%.⁵⁶ This

⁵² Reuters, [South Korea steps up shift to cleaner energy, sets long-term renewable power targets](#), 19 April 2019.

⁵³ The Korea Bizwire, [S. Korea to Cut Dependency on Fossil Fuel, Shift to Renewable Energy](#), 19 April 2019.

⁵⁴ Reuters, [South Korea fires up on renewables, to close more coal plants](#), 18 June 2019.

⁵⁵ The Korea Times, [Korea has the worst air of advanced economies, report shows](#), 19 September 2017.

⁵⁶ S&P Platts, [South Korea to cut LNG taxes by 74% in April, raise thermal coal tax by 27%](#), 1 February 2019.

followed a 20% increase in the coal tax in April 2018. The South Korean government is clearly attempting to prompt a shift away from coal use in power generation.

The coal tax is in addition to South Korea's carbon price which was introduced in 2015 via a cap-and-trade system that currently prices carbon at around US\$20/t.

Similar to the national government, provincial governments in South Korea are also taking measures to reduce reliance on coal. South Chungcheong province, also known as Chungnam, is home to around half of South Korea's coal-fired power plants, yet the province has declared a vision to cut reliance on coal to zero by 2050 while rapidly scaling up renewable energy capacity. The province joined the global Powering Past Coal Alliance in October 2018.⁵⁷

South Korea's build-out of renewable energy capacity is under way. The year 2017 saw annual solar PV capacity additions in South Korea cross 1GW.⁵⁸ With its long coastline, offshore wind will also play an important role in South Korea's energy future. As offshore wind costs continue to drop, South Korea has inaugurated its first offshore wind farm off the coast of Jeju Island.⁵⁹ South Korea already has 16GW of offshore wind in the pipeline.⁶⁰

Korea Electric Power Corp. (KEPCO), the state-owned power utility, has historically based its power generation on nuclear and fossil fuel technology. However, it is now ramping up investment in renewables both in South Korea and overseas.⁶¹ The size of its renewable infrastructure investment supports IEEFA's view of a step-change in ambition and strategic shift.

The previous government announced in late 2016 that KEPCO would invest US\$3bn in domestic renewable energy across 2017 and 2018 as part of a plan to boost renewable energy generation, a plan that has since been replaced with an even more ambitious one by the current government.⁶²

KEPCO is already investing in the rapidly growing energy storage sector, and South Korea is set to be a key growth market in this segment, with policies mandating that certain commercial and industrial companies install energy storage capacity. This move suits South Korea, given it is a major manufacturer of batteries for energy storage from companies such as LG Chem and Samsung SDI.⁶³

⁵⁷ Powering Past Coal Alliance, [Ten new Powering Past Coal Alliance members announced at Global Climate Action Summit](#), 13 September 2018.

⁵⁸ IRENA, [Renewable Capacity Statistics 2018](#), March 2018.

⁵⁹ Offshorewindbiz, [South Korea's First Commercial Offshore Wind Farm Goes Live](#), 17 November 2017.

⁶⁰ S&P Platts, [Europe's offshore wind industry expanding into Asia: event](#), 25 June 2019.

⁶¹ Yonhap News, [KEPCO buys interests in 3 solar projects in U.S.](#), 30 March 2018.

⁶² Pulse News, [Korea's 6 power firms under KEPCO to invest total \\$3bn in renewable energy over next 2 yrs](#), 27 December 2016.

⁶³ Energy Storage News, [IHS Markit: 40% of energy storage pipeline is co-located with solar PV](#), 18 April 2018.

Australia's Macquarie Bank has recently invested in the largest energy storage system in South Korea.⁶⁴

IEA Foresees Plummeting South Korean Coal Imports

Even before the latest announcement from the Ministry of Trade, Industry and Energy, the IEA had seen enough moves from the South Korean government for it to foresee South Korean coal imports collapsing by 2040.

In its 2017 World Energy Outlook, the IEA stated, "We see Korean coal imports dropping by nearly 50% to less than 60 Mtce in 2040".⁶⁵

Importantly, this was under the IEA's central, New Policies Scenario – a scenario in which the world fails to limit global warming below dangerous levels (+2°C or below).

"We see Korean coal imports dropping by nearly 50% to less than 60 Mtce in 2040."

Under the IEA's Sustainable Development Scenario, in which the world takes further attempts to limit climate change—a scenario that IEEFA believes represents the future more accurately than the New Policies Scenario—the decline in South Korean coal imports will happen even faster.

Taiwan

NSW thermal coal exports to Taiwan in 2018 were 3.7% down on the prior year total and almost 14% down on the peak of exports to Taiwan in 2016.

Over the last four years, the pipeline of proposed coal-fired power plants has shrunk from 2.4GW to zero after a series of project cancellations (Figure 7). Most recently, the 1,200MW Shenao power proposal was cancelled in October 2018.⁶⁶ This was the last major coal-fired power plant in Taiwan's pipeline.

Taiwan's electricity generation from coal peaked in 2007 according to BP data.⁶⁷ Coal's share of generation is expected to drop from 46% to 30% by 2025 as renewable energy is increased from 6% to 20% of generation over the same timeframe.

Taiwan's renewable energy target requires a roll-out of 25GW of renewables by 2025 and solar will be a major contributor. A solar development zone was declared

⁶⁴ PV-Tech, [Macquarie to finance solar hybrid and 'largest' energy storage project in South Korea](#), 6 September 2018.

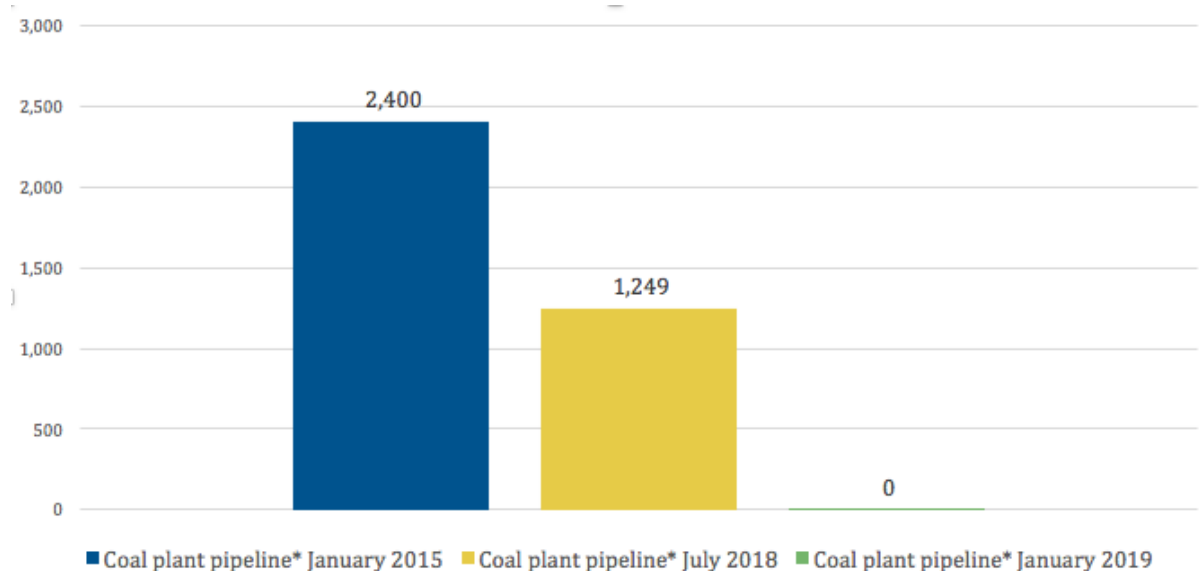
⁶⁵ IEA: World Energy Outlook 2017, p. 226.

⁶⁶ Taiwan News, [Government to scrap Shenao power plant project: Taiwan premier](#), 12 October 2018.

⁶⁷ BP - [Statistical Review of World Energy 2019](#).

in Changhua in July 2018—fast becoming a renewables hub within Taiwan—for the development of Taiwan’s largest solar farm (320MW).⁶⁸

Figure 7: Taiwan’s Coal-Fired Power Pipeline Has Shrunk to Zero (MW)



Source: Global Energy Monitor

*Plants announced or in the pre-permit or permitted stages of development

Offshore Wind

Much of Taiwan’s renewables development will be driven by offshore wind. This sector was spearheaded by northern Europe but now other countries around the world including China, Japan, India, Vietnam and South Korea, are set to benefit from the experience and cost reductions discovered.

The Taiwanese government is accelerating plans for offshore wind deployment, aiming to install a total capacity of 5.5GW by 2025.⁶⁹ Major global offshore wind players are already present in the Taiwan market including Danish power utility Ørsted and offshore wind turbine manufacturers MHI Vestas and Siemens Gamesa.

Taiwan looks like becoming a major hub for offshore wind as the industry builds its Asia focus in the next stage of global offshore wind development beyond Europe.

⁶⁸ Taipei Times, [Special zone for solar power set up in Changhua](#), 18 July 2018.

⁶⁹ Reuters, [Offshore wind power firms see Taiwan as a battleground to expand in Asia](#), 1 May 2018.

Offshore wind across Asia has the potential to displace a significant proportion of global seaborne thermal coal volumes. The IEA expects global offshore wind installations to more than triple to over 60GW by 2025,⁷⁰ and Asian nations have the potential to build a combined 100GW of offshore wind by 2030. China has a target of 10GW by 2020 and Wood Mackenzie Power & Renewables suggests China could reach 30GW by 2030. India has an initial target of 5GW by 2022 and then 30GW by 2030, and is currently preparing its first 1GW offshore wind tender for projects off the coast of Gujarat state. South Korea has an 18GW target by 2030 while Japan and Taiwan have targets of 10GW and 5.5GW, respectively.

Offshore wind across Asia has the potential to displace a significant proportion of global seaborne thermal coal volumes.

These targets are ambitious given that Asia is in the early stages of its offshore wind build-out. However, with utilisation rates of offshore wind having the potential to reach 55%, if only 70% of this 100GW target is installed, this could still displace 300m-350m tonnes of thermal coal annually—about 35%-40% of the global seaborne thermal coal trade.⁷¹

With no more coal-fired power plants in the planning phase and Taiwan increasingly turning towards alternatives including renewable energy, it would appear that there is little to no hope of Taiwan providing any long-term support to NSW thermal coal exports in the long run.

Other Asian Thermal Coal Import Markets

NSW thermal coal exports are dominated by the four export destinations outlined above. It is clear that in each of these countries, coal imports are heading towards a permanent, structural decline. As such, Australia's thermal coal mining industry often promotes the idea that other Asian nations will pick up the coming shortfall, allowing coal exports to continue to grow.

Figure 8 puts this idea into perspective. Countries that the mining industry sees picking up the slack such as Vietnam, Thailand, Bangladesh, Pakistan and the Philippines, are tiny electricity markets compared to China, Japan and South Korea. Although many of these small markets are expected to see significant power demand growth, this will be from a very small base.

With the major markets expected to significantly reduce coal imports in the long term, these smaller nations will not be able to fill the gap, even though some are dependent on imports for their coal. Furthermore, although coal imports by nations like Vietnam, Bangladesh and Pakistan will grow, coal will inevitably face increasing

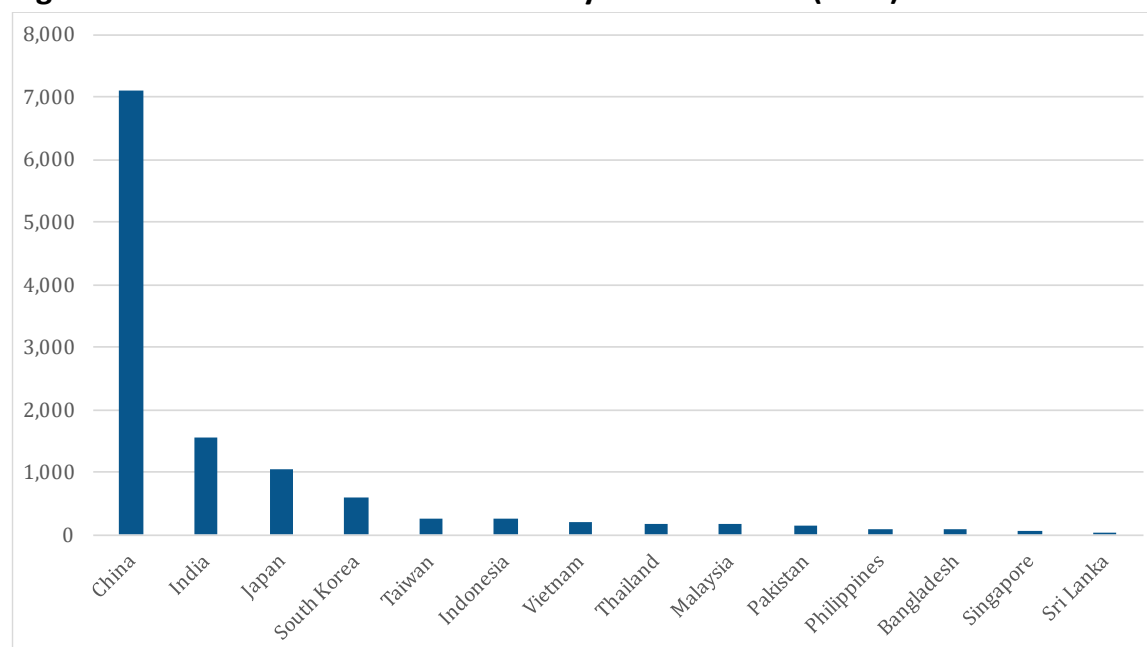
⁷⁰ IEEFA, "IEA: Offshore wind capacity could top 200GW by 2040", 26 September 2018.

⁷¹ IEEFA, "Offshore wind power: the underexplored opportunity to replace coal in Asia", 30 August 2018.

competition from ever-cheaper renewables and from LNG. Meanwhile, public opposition to coal plant proposals across Southeast Asia is mounting.

The exception in Figure 8 is India, the second-largest electricity market in Asia. Currently NSW exports very little thermal coal to India but the industry continues to maintain this is a key future destination for exports. However, this assertion is not aligned with stated Indian government policy or developments taking place on the ground in India.

Figure 8: Relative Size of Asian Electricity Markets 2018 (TWh)



Source: BP Energy Statistics 2019

India

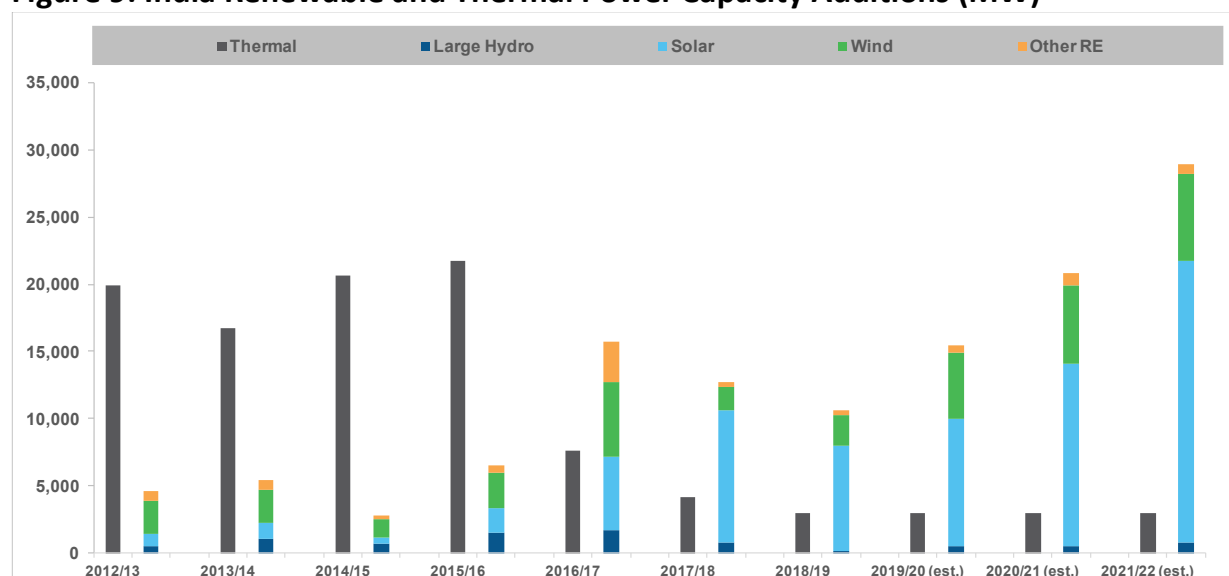
India, the destination for just 1.2% of NSW thermal coal exports in 2018, is transforming its national electricity system via a major roll-out of deflationary renewable energy. In doing so, it is improving energy security, reducing reliance on imported fossil fuels, addressing air and water pollution, and lowering emissions intensity.

There were large reductions in the cost of Indian solar PV and wind power in 2017, to the extent that Indian renewables are now cheaper than existing domestic coal-fired power. The Indian fiscal year ending in March 2017 was the first year that combined renewable installations outpaced coal-fired power construction (with net thermal installs falling 65% year-on-year to a decade low of 7.7GW (Figure 9).

The following fiscal year, from April 2017 to March 2018, saw India install just a net 4.2GW of coal-fired power (down another 46% year-on-year) and more solar PV capacity than all other technologies combined, with a total of 10.4GW added.

The last fiscal year (to March 2019) saw India's renewables ambition increase even further. The government is already looking beyond its initial target of installing 175GW of renewable energy by 2022, a target many thought highly ambitious at the time it was set, and which was followed by a further target of 275GW by 2027. The Ministry of New and Renewable Energy is now targeting 40GW of renewable energy auctions each year until 2028, comprising 30GW of solar and 10GW of wind power.⁷²

Figure 9: India Renewable and Thermal Power Capacity Additions (MW)



Source: Central Electricity Authority of India (CEA), MNRE India, IEEFA estimates.

National Electricity Plan

India's newest electricity sector blueprint - National Electricity Plan (NEP) 2018 - released in January 2018, retained the core target of 275GW of renewables by 2027 from its draft in 2016.

The NEP 2018 includes a target for closing 48.3GW of end-of-life coal plants. Specifically, the plan forecasts 22.7GW of coal power plant closures over five years from FY2017-FY2022. This would include 5.9GW of normal end-of-life retirements and 16.8GW of closures due to inadequate space for flue gas desulfurization (FGD) equipment. An additional 25.6GW of coal capacity is slated for retirement in the five

⁷² Economic Times Energyworld, [India to auction 40 GW renewables every year till 2028](#), 1 July 2018.

years to FY2027.⁷³ Over the decade to FY2027, closures will average 4.8GW per annum.

Taking retirements and planned new construction totalling 94.3GW into account, the NEP 2018 sees India's coal power capacity reaching 238GW in 2027, 11GW lower than the 2016 draft forecast, with the great majority of future capacity additions based on wind and solar energy.

However, FY2018-19 has seen the expansion of thermal power capacity in India slow much faster than previously anticipated, suggesting peak coal capacity in India may be closer than many predicted. The deep financial stress of the thermal power sector has been a major contributor to this slowdown.

Thermal Power Sector in Financial Stress

Although Global Energy Monitor estimates 94GW of thermal power plants in the development pipeline in India (including 36GW under construction), the cancellation of 239GW of planned projects since January 2015 puts this into context. New, non-mine mouth and imported coal-fired power plants are both unbankable and unviable in India.

India's coal-fired power sector is suffering clear stranded asset risk, making access to capital increasingly problematic.

India's coal-fired power sector is suffering clear stranded asset risk, making access to capital increasingly problematic.

Stranded assets commonly reflect a myriad of problems, including outdated technologies, legal issues around land acquisition, promoter financial distress, a geographical misfit between proposed plant locations and the distance coal supplies must travel, and unviable tariffs.

Coal plant proposals in India are generally requiring tariffs at increasingly high rates. As per India's CEA estimates, the tariff for a new emission controls compliant pit-head supercritical coal-fired power plant should be Rs4.39/kilowatt hour (kWh) – around USc 6.2/kWh - for a plant load factor of 60%. With competitive renewable energy power purchase agreements (PPAs) now regularly priced in the Rs2.50-3.00/kWh (USc 3.5 to 4.2/kWh) range, new non-mine mouth coal power plants are struggling for viability across India.

The impact of stalled projects is far reaching. Right now, US\$100bn of distressed power sector loans are clogging the Indian banking system. The government estimates there are about 40.1GW of stranded coal-fired power projects, of which

⁷³ India's National Electricity Plan Annexure 5.4, 5.5, 5.6.

15.7GW are yet to be commissioned,⁷⁴ and 25GW of gas-fired power projects that are likewise stranded.⁷⁵

India to Overachieve Paris Agreement Renewables Target by Almost 60%

The result of India's policy commitment to renewable energy and the dramatic slowdown in coal-fired power build out is that the nation is now on course to significantly exceed the renewable energy target that made up its Paris Agreement commitment.

According to the CEA, India is on course for renewables to reach 63% of installed power capacity by 2029-30. The committed Paris target was 40%. Renewable energy is expected to provide 44% of all power generated by the same date.⁷⁶

Although renewable energy capacity is expanding rapidly, coal-fired power in India is not going to be disappearing in the near future. In the longer term, India's power demand will be largely met by a combination of renewable energy and coal-fired power, with some hydro and nuclear power. However, financial and energy security concerns mean that India's coal power demand will increasingly be met by domestic Indian coal, not imports.

Energy Security and Fossil Fuel Imports

India is highly dependent on fossil fuel imports, a clear energy security issue for the nation.⁷⁷

The concern is clearly demonstrated by India's determination to roll out electric vehicles (EVs) despite being in an early phase of economic advancement relative to developed nations, and with its pressing need to alleviate poverty. India is a major oil importer, with import dependence reaching 84% in June 2019,⁷⁸ and the government sees EVs as an opportunity to reduce this strategic vulnerability. In the latest national budget, the Indian government offered up a number of incentives designed to increase the uptake of EVs.⁷⁹

Reducing coal imports has long been a stated aim of the Indian government. Reliance on imports of thermal coal adds to energy security issues and places additional burden on Indian power plant operators already under financial stress. In

⁷⁴ Ministry of Power/Standing Committee on Energy, [Stressed/Non-performing Assets in Electricity Sector](#), March 2018.

⁷⁵ Economic Times: Energyworld, [SBI Chairman says no future for gas-based power plants in the country](#), 4 January 2019.

⁷⁶ IEEFA, [India Energy Transition Fuels Growth Path for Sustainable Development](#), 19 July 2019.

⁷⁷ IRENA, [A New World: The Geopolitics of the Energy Transformation](#), January 2019.

⁷⁸ Economic Times: Energyworld, [India's crude oil production falls 7%; pushes import dependence to 85% in June](#), 24 July 2019.

⁷⁹ LiveMint, [Govt steps on the gas to put India's EV mission in fast lane](#), 5 July 2019.

July 2019 the Indian coal minister stated, “Reduction in import of coal in the country is always a priority area of the Government”.⁸⁰

Recently, India’s imports of thermal coal have risen as state-owned Coal India has not been able to increase domestic coal production in line with demand growth, whilst also dealing with coal logistics issues.

However, India is now taking steps to further boost production and improve logistics for domestic coal. Reforms that will allow private companies to commercially mine coal (currently about 94% of coal in India is mined by state-owned companies, mainly Coal India, Singareni Collieries and NLC India), may be the biggest reform to the Indian coal sector since nationalisation in 1973. The game-changing move will increase competition and drive efficiency in the domestic coal sector and is expected to lead to a reduced need to import thermal coal.⁸¹ Indian credit rating agency CRISIL, owned by Standard and Poor’s, expects this reform alone will cut India’s current account deficit by US\$4.4bn annually due to reduced coal imports.⁸²

In addition, new dedicated railways are being built to transport coal, while Coal India is investing in its own coal rakes to get around the shortages holding up delivery. A recently approved new railway in Chhattisgarh could increase coal production by 100 million tonnes per annum in that state alone.⁸³ The Adani Group, India’s largest coal importer, has stated it expects coal imports to stagnate from the Indian fiscal year 2022 as the logistical issues with domestic coal are resolved.⁸⁴ With increasing self-sufficiency in mind, the coal minister has also noted that state-run enterprises NTPC and Bharat Heavy Electricals will convert coal-fired power stations designed for imported coal so that they can use domestic supply.⁸⁵ Coal supply reform has so far reduced the average rail trip and hence rail costs for coal deliveries by 25% since 2012.

India’s coal ministry is now preparing a new plan to cut coal imports by one-third by 2024

As such, the recent increase in Indian thermal coal imports is likely to prove short-lived. The Australian government’s Office of the Chief Economist (OCE) sees India’s thermal coal imports peaking in 2020 in its most recent medium-term projection.

⁸⁰ Economic Times: Energyworld, [India’s coking coal imports at 51.84MT in 2018-19](#), 16 July 2019.

⁸¹ Economic Times: Energyworld, [Approval for auction methodology for commercial coal mining a game changer: Experts](#), 20 February 2018.

⁸² CRISIL, [Commercial coal mining can cut import bill by Rs 30,000 cr](#), 6 March 2018.

⁸³ Economic Times: Energyworld, [Cabinet approves new broad-gauge rail line in Chhattisgarh](#), 26 September 2018.

⁸⁴ Reuters, [India’s Adani sees six-fold rise in coal mining volume despite challenges in Australia](#), 24 July 2018.

⁸⁵ Economic Times: Energyworld, [BHEL-NTPC recalibrating turbines to reduce dependence on imported coal: Piyush Goyal](#), 4 April 2018.

The OCE projects that Indian thermal coal imports will decline at an average rate of 1.5% per annum out to 2024.⁸⁶

India's coal ministry is now preparing a new plan to cut coal imports by one-third by 2024.⁸⁷ If it is successful, the impact will be felt more by India's biggest coal import suppliers (Indonesia and South Africa) than by Australia.

Vietnam

Vietnam is currently a small market for NSW thermal coal – just 0.3% of all NSW thermal coal exports in 2018 went to Vietnam. However, the nation is seen as a major growth market for NSW exporters.

Like other emerging Asian nations, plans to build expensive coal-fired power stations in Vietnam are reliant on heavily concessional government finance from the export credit agencies (ECAs) of Japan, China and South Korea. But with increasing international pressure on these ECAs to cease international coal financing on climate grounds, and the agencies instead starting to finance renewable energy projects, there is a serious likelihood this concessional coal finance will dry up in the future.

Without financial subsidises, the high cost of new imported coal-fired power plants will then mean that the expected build-out of such plants in places like Vietnam, Bangladesh and the Philippines will never happen to the extent predicted by the Australian coal industry.

Japanese and South Korean coal plant builders appear to be moving away from new coal projects beyond those already committed to. A succession of Japanese trading houses have announced new policies that move them away from coal-fired power and coal mining.⁸⁸

Korean involvement in Vietnam's coal build out may also be slowing. At a 2018 Korean National Assembly hearing, the CEO of Korean Western Power, a subsidiary of Korean electricity utility KEPCO, disclosed that it was considering turning its Quang Tri 3 coal-fired power project in Vietnam into a renewable energy project.⁸⁹

Difficulties in financing power projects have been identified as an issue in a June 2019 report from Vietnam's Ministry of Industry and Trade. The report also notes the significant development delays being experienced at many of the nation's coal-

⁸⁶ Office of the Chief Economist, [Resources and Energy Quarterly March 2019](#).

⁸⁷ Bloomberg, [India, World's No. 2 Coal Buyer, Plans to Cut Imports by a Third](#), 1 August 2019.

⁸⁸ IEEFA, [Japanese Thermal Coal Consumption Approaching Long Term Decline: Australia's Biggest Export Destination to Transition Away From Coal](#), 9 July 2019.

⁸⁹ SFOC, [중부발전 사장, 국감에서 피레본 3호기 중단하였다고 밝혀 - 중부발전/서부발전 국정감사 질의 응답](#), 19 October 2018.

fired power projects.⁹⁰ With Vietnam's power demand rising fast, these delays risk leaving the country short of power in the near future.⁹¹

Meanwhile, coal is facing increasing competition from LNG⁹² and renewables in Vietnam. In June 2018, Vietnam announced a significantly increased ambition for renewable energy, aiming to triple electricity output from renewable sources and for 26% of households to use solar by 2030.⁹³

The rate of renewable energy installation in particular has exploded in recent months as projects were being rushed to finish in time to qualify for 20-year feed-in-tariffs. Vietnam's solar power capacity has increased 400 times within 12 months – from 10MW in June 2018 to 4.5GW by June 2019. The rate of installation was such that Vietnam has now overtaken Australia in total utility-scale solar capacity.⁹⁴

**Vietnam's solar power capacity
has increased 400 times within
12 months – from 10MW in June
2018 to 4.5GW by June 2019**

In contrast to the delays being experienced by Vietnamese coal power projects, the average build time for Vietnam's solar power projects over the last 12 months was just 275 days.

Although the extraordinary rate of Vietnam's solar installation cannot be maintained at this level, future cost declines will support continued installation. In addition, Vietnam is looking to exploit its long coastline which makes it an ideal place to develop offshore wind.⁹⁵

Although renewable energy will continue to make significant inroads into the Vietnamese power system as it will all over Asia, Vietnam will remain a coal growth market, although the growth may end up disappointing coal exporters. In addition, Australian exporters hoping to capitalise on rising Vietnamese imports will find increasing competition from Indonesia as the latter's biggest export destinations – China and India – reduce imports in the longer term.

⁹⁰ Ministry of Industry and Trade, On the Implementation Progress of Power Projects in the Revised Power Development Plan 7, 4 June 2019.

⁹¹ Reuters, [Vietnam will face severe power shortages from 2021: ministry](#), 31 July 2019.

⁹² VN Express, [PM talks up Mekong Delta potential for gas-fired power plants](#), 27 July 2018.

⁹³ Reuters, [Vietnam sets out green ambitions with bold targets for solar, rare earth](#), 4 June 2018.

⁹⁴ PV Magazine, [Vietnam overtakes Australia for commissioned utility scale solar following June FIT rush](#), 5 July 2019.

⁹⁵ IEEFA, [Vietnam looks to tap huge offshore wind potential](#), 16 April 2019.

Malaysia

Malaysia was the fifth biggest export destination for NSW thermal coal in 2018 with 3.6% of total exports.

Following project cancellations, Malaysia does not have any new coal-fired power plants under pre-construction development. It seems likely that the opportunity for a major build-out of new coal-fired power capacity is now in the past and that newer, renewable energy technology will dominate capacity additions in the coming decades.

The energy minister stated in a 2018 speech that renewables are the key to Malaysian energy security and affordability. She specifically called out the nation's reliance on imported coal as an energy security risk and stated that more renewables will help address this issue.⁹⁶ The government has committed to raise Malaysia's renewable energy capacity (excluding large hydro) from 2% to 20% by 2025.⁹⁷

Philippines

The Philippines represented just 0.8% of NSW exports in 2018. A July 2019 directive from the President of the Philippines requires the nation to reduce dependence on coal.⁹⁸

In the Philippines, high electricity prices, partly driven by a reliance on expensive coal, diesel and oil imports, means that renewable energy alternatives can already outcompete fossil-fuel based generation across many islands of the Philippines archipelago.⁹⁹ Meanwhile, an over-commitment to coal-fired power has led to declining utilisation rates and the prospect of stranded assets.

A July 2019 directive from the President of the Philippines requires the nation to reduce dependence on coal

Coal-fired power plant owners in the Philippines are already acting to avoid this stranded asset risk. In May 2018, Ayala Group, one of the Philippines largest listed companies, announced that its AC Energy power generation arm will seek to sell 50% of its coal-fired power assets.¹⁰⁰ Coal-fired power currently accounts for about 80% of Ayala's power portfolio with the rest coming from wind, solar and geothermal sources. The company is now seeking to change direction by moving

⁹⁶ The Star, [Ministry to review IPP contracts, four cancelled](#), 12 July 2018.

⁹⁷ IHS Markit, [Impact of Malaysia's new government on the electricity market](#), 31 May 2018.

⁹⁸ Reuters, [Philippines readies new renewable energy policies to curb coal dependence](#), 25 July 2019.

⁹⁹ Eco Business, [Electricity in the Philippines does not to be so expensive – or dirty](#), 16 May 2018.

¹⁰⁰ Manila Standard, [Ayala selling \\$1-billion coal plants](#), 20 May 2018.

away from coal with its clouded outlook, while raising capital to invest in more sustainable power projects.

Ayala is investing in renewable energy projects in Australia¹⁰¹ and Vietnam and, along with other companies, will increasingly invest in renewables in the Philippines as the technological and economic advantages of clean energy become ever more apparent. In August 2018, Philippines utility Meralco received bids in a solar power tender as low as US\$44/MWh – the lowest bid for large scale solar in Southeast Asia at that date.¹⁰²

The Philippines is now preparing two new renewable energy policies to comply with the President's July 2019 coal directive. One policy will mandate a minimum proportion of renewable energy that power distributors will have to source, with the minimum to increase each year. The other is believed to be aimed at making it easier for retail power customers to demand more renewable energy.

As an archipelago dependent on fossil fuel imports, energy security is a major concern for the Philippines. Motivation to reduce coal dependence is likely to be as much about energy security as it is about economic or climate concerns.

Thailand

Exports to Thailand represented 2.1% of total 2018 thermal coal exports out of NSW. Thailand looks like it will disappoint thermal coal producers seeking to replace lost export markets with growth in South-East Asia.

In April 2019 the Thai government approved a new national energy plan that will see Thailand's power generation capacity reach 77GW by 2037, up from 40GW currently. Coal-fired power is planned to contribute 12% to overall capacity, down from 25% in the previous energy plan.¹⁰³

Reduced reliance on coal will be compensated for with increased emphasis on LNG and renewables. The new energy plan calls for Thailand to achieve 20% power capacity from renewable energy by 2037. However, a July 2019 amendment to Thailand's Alternative Energy Development Plan suggests the nation could target 33% renewable energy capacity by 2037.¹⁰⁴

Large Thai companies are embracing renewables. Thailand's largest company, the energy conglomerate PTT is boosting investment in electricity generation with an emphasis on renewables, citing a subdued oil outlook, energy security and climate

¹⁰¹ Nikkei Asian Review, [Ayala enters Australia energy market with \\$30m venture stake](#), 23 May 2018.

¹⁰² PV Magazine, [Philippine utility Meralco receives Southeast Asia's lowest solar bid](#), 13 August 2018.

¹⁰³ Reuters, [Thailand approves power plan, expects capacity to reach 77 GW by 2037](#), 30 April 2019.

¹⁰⁴ National News Bureau of Thailand, [Energy Ministry increases Renewable Energy ratio](#), 4 July 2019.

change as justification.¹⁰⁵ Meanwhile Gulf Energy Development is seeking to electrify Southeast Asia without the use of coal-fired power.¹⁰⁶

Pakistan

NSW does not currently export thermal coal to Pakistan. However, with a fleet of new coal plants on the drawing board, supported by Chinese finance under the China-Pakistan Economic Corridor (CPEC) program, coal exporters have hopes that Pakistan will be a major growth destination as more established markets sag.

Unfortunately for coal exporters, there are already signs the Pakistan opportunity will be more limited than hoped.

In January 2019, the 1,320MW Rahim Yar Khan imported coal-fired power project, a CPEC project, was cancelled. The reasons given for this was that Pakistan already has enough power capacity on the drawing board, as well as the growing burden of fossil fuel imports on the economy.¹⁰⁷

As such, with the recent completion of the 1,320MW Hub coal power station, the majority of the planned capacity that will use imported coal has already been completed, suggesting there is limited upside to come for thermal coal exporters.

“Chinese investors are closely following Pakistan’s power-sector policies and are keen to invest in renewable energy”

Concerns about the fossil fuel import burden have grown substantially as the nation’s economy has deteriorated. Pakistan’s economy has recently been characterised by declining GDP growth, falling foreign currency reserves, increasing current account deficit, and a significant depreciation of the rupee. The weakness of the rupee makes imports traded in U.S. dollars, such as coal, increasingly expensive.

The weakened rupee and consequent cost of coal imports is already impacting the CPEC coal-fired power plants that are already operational. The Port Qasim coal plant near Karachi is reportedly having financial difficulties partly caused by the expense of coal imports.¹⁰⁸ Meanwhile, the Sahiwal coal plant in Punjab province is also apparently having severe financial difficulties.¹⁰⁹ This Sahiwal plant is using imported coal despite the fact it is many hundreds of kilometres from the nearest port, leading to major coal logistics issues.

Pakistan’s inauspicious start to its coal-fired power development comes within the context of the rapidly declining cost of renewable energy in the country. Power

¹⁰⁵ Bloomberg, [Thai Oil Giant Boosts Renewables Funding Over ‘Uncertain’ Crude Outlook](#), 2 July 2019.

¹⁰⁶ Bloomberg, [Tycoon Declares Coal Doomed in Last Bastion of Big Bank Aid](#), 18 May 2019.

¹⁰⁷ Dawn, [Govt puts major CPEC power project on hold](#), 14 January 2019.

¹⁰⁸ Express Tribune, [CPEC’s first power project mired in financial difficulties](#), 10 May 2019.

¹⁰⁹ The News, [Sahiwal coal-fired power plants feared closure on non-payment of dues](#), 3 April 2018.

tariffs approved by Pakistan's National Electric Power Regulatory Authority (NEPRA) across all generation sources in 2018 showed that wind and solar are now the cheapest forms of new power in the country.

This tariff decline has occurred despite limited policy support for renewables to date. Some solar has been installed, as well as some wind power, within Sindh province's identified wind resource corridors.

However, policy support for renewables in Pakistan looks like it is about to receive a significant boost. The national government has drafted a new renewable energy policy which sets national targets for renewables (excluding hydro) to reach 20% of capacity by 2025, and 30% by 2030, up from the current level of 4%.¹¹⁰

Furthermore, China, the major enabler of coal-fired power in Pakistan, appears to be on board with the power ministry's plan. The Chinese ambassador to Pakistan has stated, "Chinese investors are closely following Pakistan's power-sector policies and are keen to invest in renewable energy".¹¹¹

Pakistan's significantly increased enthusiasm for renewable energy is likely driven not only by the declining cost of the technology, but also because wind and solar do not require the expensive fossil fuel imports that are placing its economy under such burden. Import pressure also helps explain Pakistan's continued belief in the need for it to exploit its domestic lignite resources.

As such, with hydro, nuclear, and domestic coal-fired power development continuing, and an intention now to significantly increase wind and solar power, it seems likely that imported coal and LNG projects are the most likely to lose out. Such an approach would appear to make the most sense given the state of Pakistan's economy and the usual energy security concerns that any nation state has.

Although there will be some growth in Pakistan's thermal coal imports going forward, this growth is likely to prove disappointing to many coal exporters.

Bangladesh

NSW does not currently export thermal coal to Bangladesh.

Like Pakistan, Bangladesh is a nation receiving significant construction and financing support from China to build coal-fired power plants as it seeks to move away from reliance on declining reserves of domestic gas and expensive oil- and diesel-fired generation. Chinese support amounts to about 14GW of coal plants and around US\$7bn of proposed finance but the majority of these proposals are delayed with funding yet to be committed.¹¹²

¹¹⁰ Alternative Energy Development Board, Draft [ARE Policy 2019 version 2](#), 21 July 2019.

¹¹¹ Express Tribune, [Power ministry strives to raise renewable energy share to 30%](#), 18 January 2019.

¹¹² IEEFA, [China at a Crossroads: Continued Support for Coal Power Erodes China's Clean Energy Leadership](#), 22 January 2019.

Proponents of the one coal-fired power plant that is nearing completion have recently signed a coal supply agreement with Indonesia in a move that seems to signal limited upside for South African and Australian thermal coal exporters in Bangladesh. PT Bayan Resources of Indonesia will supply lower-energy content coal to the first unit of the Payra coal-fired power plant that is expected to come on line in late 2019.¹¹³

This appears to be another move suggesting coal price is a more important factor in determining coal supply than energy content. With Asian coal power tariffs under pressure from the rise of renewables and LNG, securing lower cost coal is taking precedence over coal with a higher energy content that can slightly reduce emissions (see ‘[Mythbusting](#)’ section).

Meanwhile, as coal-fired projects languish, LNG-fuelled power plants have been gaining momentum in Bangladesh. In July 2018, agreements valued at US\$7.4bn to build 6GW of LNG-based power generation and related infrastructure were announced.¹¹⁴ In June 2018, the Asian Development Bank approved a US\$500m loan for an 800MW gas-fired plant in Khulna¹¹⁵ and in September 2018, an agreement was signed with Siemens to develop a 3.6GW LNG-fired plant.¹¹⁶ In June 2019, it was revealed that multiple international companies have expressed an interest in building Bangladesh’s first onshore LNG terminal.¹¹⁷

Renewable energy is now also gaining momentum in Bangladesh after having previously fallen behind the progress achieved across the rest of Asia. In October 2018, the nation’s first truly utility-scale solar plant was commissioned. The impetus has continued since then with multiple agreements signed for the building of further solar power capacity during 2019.

Wind power is also making some progress in Bangladesh following a 2018 U.S. National Renewable Energy Lab study that demonstrated significantly more wind power potential than previously thought. Bangladesh’s Power Development Board has consequently invited bidders for wind power projects totalling around 150MW.

The long development times of coal proposals and the rise of renewables and LNG are likely to limit opportunities for coal exporters in Bangladesh below expectations. Furthermore, there is already evidence that cheaper Indonesian coal will be favoured, especially given Indonesia faces the prospect declining exports to China, its biggest market.

¹¹³ Jakarta Post, [Indonesian firm to export coal to Bangladesh](#), 19 June 2019.

¹¹⁴ Daily Star, [\\$7.4b deals inked to produce 6,000MW](#), 12 July 2018.

¹¹⁵ Daily Star, [ADB gives \\$500m for 800MW plant](#), 27 June 2018.

¹¹⁶ Dhaka Tribune, [Bangladesh seals deal for another 3,600 MW power plant](#), 8 September 2018.

¹¹⁷ Reuters, [Bangladesh receives interest from 12 companies to build LNG terminal](#), 20 June 2019.

Implications of a Declining Market

As long term demand in the Asian seaborne thermal coal market fades, Australia will not be the only exporter impacted. The other major export sources will also see their primary markets decline and will seek alternatives, just as Australian coal exporters will.

A decline in China's thermal coal imports will impact Indonesia above all as it is China's major overseas supplier. Indonesia will seek other markets to fill the gap, very possibly at the expense of Australia and South Africa. The impact could be compounded if Indonesia's number two export destination – India – also begins to reduce imports. India is also South Africa's top export destination by far.

With the Australian government's Office of the Chief Economist forecasting a 5.2% average annual decline in imports by China, and a 1.5% average annual decline in imports by India out to 2024, it seems likely there will be plenty of Indonesian coal available to undercut and outcompete Australian coal in the Asian market, despite growing Indonesian domestic coal demand.¹¹⁸

Meanwhile, as well as being one of NSW's major export destinations, South Korea is the third largest thermal coal export destination for both South Africa¹¹⁹ and Indonesia.¹²⁰

The loss of major destinations is likely to see significantly increased competition between Australia, Indonesia and South Africa for Asian growth markets such as Vietnam. Other exporters into the Asian market, such as Russia and the U.S., will also be eyeing such markets. Vietnam is already considering thermal coal imports from the U.S. as American domestic coal demand continues to decline.¹²¹

With all the main exporters within the Asian seaborne thermal coal market expecting to replace lost export destinations, the market seems set to enter a period of sustained oversupply with reduced prices and royalties unless rational steps are taken.

A cessation of new thermal coal mine approvals represents a rational economic step for NSW to take in the face of a structurally declining market.

A cessation of new thermal coal mine approvals represents a rational economic step for NSW to take in the face of a structurally declining market.

¹¹⁸ Office of the Chief Economist, [Resources and Energy Quarterly](#), March 2019.

¹¹⁹ IEEFA, [South African coal exports face long-term decline](#), 29 January 2019.

¹²⁰ S&P Platts, [Indonesian coal faces uphill struggle to diversity exports away from China](#), 7 March 2019.

¹²¹ Reuters, [Vietnam mulls importing U.S. coal for power generation](#), 6 August 2019.

Myth-busting: Countries Are NOT Likely to Turn to Australia's Higher-Energy Coal to Reduce Emissions

NSW thermal coal exports are assessed against two benchmarks:

- the higher energy Newcastle 6,000 kilocalories per kilogram (kcal/kg) net as received (NAR), 11-14% ash benchmark; and
- the lower energy Newcastle 5,500 kcal/kg NAR, 20% ash benchmark.

Exports to Japan are dominated by the 6,000 kcal/kg NAR benchmark. As such, as Japan's imports decline, Australian producers will need to find new markets for the higher energy, higher priced product.

The Australian coal industry has often suggested that nations around Asia will switch from lower energy Indonesian coal to higher energy Australian coal to address carbon emissions concerns (emissions from higher energy coal are marginally lower than those from lower energy coal). The theory suggests finding new markets for Newcastle 6,000 kcal/kg coal will be straightforward.

There is little evidence that nations will favour higher energy Australian coal in the long term

However, IEEFA considers this 'switch to higher energy' theory to be a myth. There is little evidence that nations will favour higher energy Australian coal in the long term unless the energy-adjusted price is favourable.

Now that renewable energy is increasingly cheaper than new coal-fired power plants across an increasing share of the Asian market (China is set to reach grid parity for both solar and wind by 2020 with zero subsidy support¹²², while Indian renewables are well below grid parity, which was reached back in 2017), any nation concerned with lowering carbon emissions and stranded asset risk will simply turn away from new coal plants altogether and use cheaper, zero-emission technology. Furthermore, any nation that is less concerned about lowering emissions will likely stick with cheaper, lower energy coal.

Even Japan, which has historically favoured high-energy thermal coal, is now beginning to turn more towards the cheaper, lower energy 5,500 NAR benchmark. A number of Japanese power utilities have reportedly been experimenting with a blend of higher and lower grade coals in order to benefit from the lower price of the 5,500 product,¹²³ which could also reduce Japan's dependency on Australia as a coal supplier.

¹²² Bloomberg, [China Unveils First Batch of Solar, Wind Farms That Won't Be Supported by Subsidies](#), 22 May 2019.

¹²³ Platts, [Japanese thermal coal buyers try out Newcastle HA blend in power plants](#), 27 June 2019.

Meanwhile, new entrants to imported coal-fired power are unlikely to turn to Australian coal.

Pakistan's nascent coal power fleet is funded by government capital subsidies from China and fuelled by South African and Indonesian coal. Meanwhile, Bangladesh signed an agreement in June 2019 for the supply of Indonesian coal for its nearly complete, Chinese-funded Payra coal power plant.¹²⁴

Coal price appears to be the primary concern for Asian coal power plant operators, and this does not favour Australian coal. With ever-cheaper renewable energy on the rise around Asia effectively pulling down PPA tariffs, some coal-fired power generators that use imported coal are finding it difficult to operate profitably.

At Mundra in the state of Gujarat, India, almost 10GW of relatively new coal-fired power generation has operated at significant losses over the last decade due to the higher-than-expected cost of imported coal, mostly from Indonesia. These three power stations, owned by Tata Power, Adani Power and Essar Power, are now hoping that a state government bailout will help reduce their losses, while placing additional burden on consumers via an increased tariff. Tata Power's Managing Director, Praveer Sinha has stated the PPA uplifts would only halve its Mundra plant's losses from the current level of US\$-225m to US\$-240m per year.¹²⁵

Tata Power's loss-making Mundra plant reported that its average coal cost for the 2017-18 fiscal year rose 24% to US\$61.50/t. This increase in fuel cost caused the power plant to make an after-tax loss of US\$-241m, higher than the US\$-119m loss from the prior year.¹²⁶ As a result, Tata Power has increased the consumption of cheaper, lower energy coal in order to address its growing fuel cost. The proportion of lower energy coal blended in at its Mundra plant rose from 20% to 42% in fiscal year 2018-19.¹²⁷

It seems unlikely that coal plant operators in Asia can be convinced to switch to higher energy, more expensive Australian coal. This may be especially true if Indonesia needs to find new markets for its lower energy coal as its biggest export destination - China - reduces thermal coal imports.

Stranded Asset Risk: Newcastle Coal Port

After the announcement that the T4 coal terminal project was being cancelled at the Port of Newcastle, the coal industry was quick to put a positive spin on the event by highlighting there was still spare coal export capacity at the Port for future growth in coal exports out of NSW. Figure 10 shows coal terminals at the port are operating at three-quarters of capacity, with 25% unused.

¹²⁴ Jakarta Post, [Indonesian firm to export coal to Bangladesh](#), 19 June 2019.

¹²⁵ Economic Times, [After tariff relief, our Mundra losses would come down by 50%: Praveer Sinha, Tata Power](#), 6 December 2018.

¹²⁶ Tata Power, [Analyst Presentation Q4 FY18](#), 2 May 2018.

¹²⁷ Tata Power, [Analyst Presentation Q4 FY19](#), 2 May 2019.

Given the likely decline in NSW thermal coal export volumes over the next decades, this existing spare capacity seems more of a problem than a solution. Thermal coal exports from NSW peaked in 2014, and there is no guarantee that volumes will rise above the 2014 figure in the short or medium term. In the long term, exports will certainly fall, as any rise in thermal coal imports by the smaller Asian electricity markets will be more than offset by declining imports by current major destinations.

As a result, the unused capacity at the Port of Newcastle is set to grow over the next few decades - the coal terminals will become progressively stranded.

Figure 10: Port of Newcastle Capacity and Utilisation

	Capacity Mtpa	Capacity Mtpa	Cancelled
Carrington Coal Terminal	25		
Kooragang Coal Terminal	120		
Port Waratah Coal Services Limited (PWCS)		145	
Newcastle Coal Infrastructure Group (NCIG)		66	
T4 Proposal			70
Total Newcastle Coal Port Capacity		211	
Total Coal Throughput (Thermal and Coking Coal, 2018)		158.6	
Unused capacity		25%	

Source: Port of Newcastle, Port Waratah Coal Services, Newcastle Coal Infrastructure Group.

Port of Newcastle coal terminal operator Newcastle Coal Infrastructure Group (NCIG) launched a US\$200m loan in August 2018 with Japanese bank Sumitomo Mitsui Banking Corp as lead arranger. Despite the launch, it was reported that “some bankers are concerned about the long-term sustainability of the coal sector.”¹²⁸

It is this concern over coal’s long-term sustainability that has led the chairman of the Port of Newcastle to recognise an “urgent need” for the port to diversify away from a reliance on coal.¹²⁹

¹²⁸ IFRAsia, “Australia’s NCIG taps Ninja loan market”, 15 August 2018.

¹²⁹ Sydney Morning Herald, “World’s largest coal export port Newcastle has ‘urgent need’ to diversify”, 17 December 2017.

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. <http://ieefa.org>

About the Authors

Simon Nicholas ()

Simon Nicholas is an energy finance analyst with IEEFA in Australia. Simon holds an honours degree from Imperial College, London and is a Fellow of the Institute of Chartered Accountants of England and Wales. He has 16 years' experience working within the finance sector in both London and Sydney at ABN Amro, Macquarie Bank and Commonwealth Bank of Australia.

Tim Buckley ()

Tim Buckley, IEEFA's director of energy finance studies, South Asia/Australia, has 30 years of financial market experience covering the Australian, Asian and global equity markets from both the buy and sell side. 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 firm that was jointly owned by management and Westpac Banking Group.

This report is for information and educational purposes only. The Institute for Energy Economics and Financial Analysis ("IEEFA") does not provide tax, legal, investment, financial product or accounting advice. This report is not intended to provide, and should not be relied on for, tax, legal, investment, financial product or accounting advice. Nothing in this report is intended as investment or financial product advice, as an offer or solicitation of an offer to buy or sell, or as a recommendation, opinion, endorsement, or sponsorship of any financial product or class of financial products. IEEFA is not responsible for any investment or other decision made by you. You are responsible for your own investment research and investment decisions. This report is not meant as a general guide to investing, nor as a source of any specific or general recommendation or opinion in relation to any financial products. Unless attributed to others, any opinions expressed are our current opinions only. Certain information presented may have been provided by third parties. IEEFA believes that such third-party information is reliable, and has checked public records to verify it where possible, but does not guarantee its accuracy, timeliness or completeness; and it is subject to change without notice.