



# Rix's Creek South Continuation of Mining Project (SSD 6300)

## *IEEFA's expert opinion to the NSW Independent Planning Commission*

The Institute for Energy Economics and Financial Analysis (IEEFA) provides the following expert advice in relation to the Rix's Creek Continuation of Mining Project (Rix's Creek Extension) in response to the KPMG Submissions providing an Economic Assessment of the Cost Benefit Analysis.

The IEEFA conducts public interest research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy.

This advice was prepared at the request of the EDO NSW, acting on behalf of the Hunter Environment Lobby Inc. EDO NSW has provided me with a copy of the *Uniform Civil Procedure Rules 2005* (UCPR), and the Expert Witness Code of Conduct contained in Schedule 7 of the UCPR. I have read and agree to be bound by these rules and code of conduct.

A copy of my curriculum vitae, including my relevant qualifications, is attached (Appendix A).

Tim Buckley

11 October 2019

## Executive Summary

Coal mining is an industry that makes a significant contribution to the Australian economy, both through the direct investment and employment it creates, and through the significant contribution it makes to Australia's export balance.

But it is also an industry that exists on the basis of using a very finite public asset for private gain. Profits are maximised by internalising benefits, and externalising costs onto the environment and public. The cost-benefit analysis (CBA) provided by KPMG extenuates this imbalance; talking up the benefits (as outlined in this advice), and minimising the cost externalities to the people of NSW.

### 1. THE COST-BENEFIT ANALYSIS LACKS CREDIBILITY

KPMG uses an outdated carbon price from March 2017 (a near record low and a quarter of the current price in October 2019) and then pro-ratas NSW's population as a share of the world total to take what would otherwise be a total scope 3 carbon emissions cost of \$832m and reduce it to a NSW share of \$0.46m. In my opinion, the global cost of this project's scope 3 emissions are 1,808 times the cost included in KPMG's CBA.

KPMG assumes the Rix's Creek Extension Project will generate \$159m of corporate tax, an entirely unrealistic assumption, based on 100% equity financing. We provide two NSW case studies showing the actual corporate cash tax paid by Australian coal mining firms is minimal, largely due to the ongoing use of significant interest expense deductions, a factor KPMG assumes to be zero.

A logical assessment would likely derive a negative incremental net cost of the Rix's Creek Extension Project from the additional rehabilitation workload involved, particularly with regard to the perpetual costs of the final void. Instead, KPMG finds a net financial *benefit* to the proponent of \$16m from the Rix's Creek Extension Project, ignoring the final void cost issue completely.

### 2. COAL'S STRUCTURAL DECLINE HAS ALREADY STARTED

South Korea, Japan and other key Australian export markets are already in a state of volume decline - technological obsolescence is building and eroding the coal market. The 40-50% coal price decline over 2018/19 means the revenue and royalty projections included in the CBA are likely materially overstated (Section 1).

Global forecasts by the International Energy Agency (IEA) show the seaborne coal market will more than halve within two decades as the world acts on the Paris Agreement (Section 2).

### 3. INCREASING GLOBAL CAPITAL FLIGHT FROM COAL

Over 110 globally significant financial institutions have put in place increasingly strict coal divestment and/or coal lending restrictions. Since the start of 2019, there has been a new coal investment / lending / insurance announcement almost every week from a globally significant financial institutions, including QBE Insurance, Suncorp and Commonwealth Bank in Australia.

The last month alone has seen FirstRand of South Africa, the African Development Bank, the European Investment Bank and Axis Capital (a major Lloyds insurer) all announce new coal exclusion policies.

Equally telling, we have seen the key Australian financial regulators likewise warning of the need for financial institutions to properly manage the growing financial system risk resulting from the inevitable response to global warming. The Australian Prudential Regulation Authority (APRA),<sup>1</sup> the Australian Securities & Investment Commission (ASIC), the Reserve Bank of Australia (RBA) and the Australian Securities Exchange (ASX) have all raised new polices and highlighted the financial risks, including the massive, growing taxpayer burden of disaster funding of clean-up and recovery<sup>2</sup> (Section 3).

IEEFA notes the critically important message delivered in July 2019 by BHP's Chief Executive Officer (CEO) Andrew Mackenzie in his landmark speech "Confronting Complexity: Evolving our approach to climate change". BHP has acknowledged the threat Australia and the world faces, with Mackenzie concluding: "But we must also face the challenges that come with these benefits. Because the world's dependence on fossil fuels carries risks with it that could be existential."<sup>3</sup> NSW needs to prepare for an inevitable transition, and the first thing to do is to stop investing in even more fossil fuel capacity.

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<sup>1</sup> APRA Executive Board Member, Geoff Summerhayes - [Speech to the International Insurance Society Global Insurance Forum](#), 21 June 2019

<sup>2</sup> Australian Financial Review, [Northern insurance crisis requires action: APRA](#), 7 October 2019

<sup>3</sup> BHP, [Confronting Complexity: Evolving our approach to climate change](#), 23 July 2019.

## Section 1: The Cost-Benefit Analysis is Overstated

In IEEFA's view, the KPMG cost-benefit analysis (CBA) for the Rix's Creek Extension Project overstates benefits and understates costs in terms of:

- I. **Carbon Emissions:** KPMG reduces the incremental A\$892m of current carbon emissions values (scope 3) to just \$0.46m. KPMG and Hansen Bailey use an outdated carbon price sourced from March 2017 at A\$9.60, a figure that is a quarter of the current EU carbon price of A\$38/t.
- II. **Corporate Tax:** KPMG assumes the project to be entirely equity financed, ignoring the reality that proponents almost always use a mix of debt and equity. By assuming a fictional capital structure, KPMG creates a \$159m NPV of Australian corporate tax. Historic precedent suggests a number of close zero is a lot more realistic, and I illustrate this with reference to NSW's two largest listed miners, Yancoal Australia and Whitehaven Australia.
- III. **Coal Price Declines:** KPMG assumes a US\$73.80/t thermal and US\$111.10/t soft coking coal price and an exchange rate of US\$0.75, giving an A\$98/t & A\$148/t price respectively. IEEFA notes the collapse of coal prices over 2019, and I reference the comments by industry leaders including the CEOs of Cerrejon and Nextera Energy who warn a structural decline is underway, consistent with the IEA SDS modelling (refer Section 2). Sustained coal price weakness erodes project revenues and therefore the coal royalties due to the NSW Government.
- IV. **Mine Rehabilitation and the Uncosted Final Void:** KPMG models that extracting 24Mtpa of additional run-of-mine (ROM) coal will *reduce* the net present value (NPV) of mine rehabilitation by \$16m. KPMG uses the logic that the time value of money means that deferring cleaning up the massive environmental disturbance of the Rix's Creek mine combined with the Rix Creek Extension Project for up to two decades is a value-creating outcome. Combined with the uncosted nature of leaving a huge final void of increasing toxicity and salinity in perpetuity, KPMG finds this somehow boosts the NSW economy by \$16m. The final void rehabilitation costs avoided leave unfunded costs likely to be several \$100m to NSW rate payers – a key coal mining failure in terms of the intergenerational equity principle that is assigned a zero cost in KPMG's CBA.

The entire CBA fails to mention or quantify the compounding or cumulative effects of extensive coal mining activity across the Hunter Valley.

## Scope 3 Carbon Costs

The severe, multiple climate risks to NSW's critically important agriculture and tourism sectors are in their own right significant enough to warrant the precautionary stance of leaving untapped coal/carbon reserves in the ground. Multiple economic experts have reported at length on this risk.<sup>4</sup>

KPMG references the European Union's Emissions Unit Allowance (EUA) pricing as a guide to the cost of carbon and methane emissions from this project. EU EUA's are currently trading at €23.37 per tonne (t) – Figure 1.1. The EUA prices have risen dramatically over the last two years, reflecting a significantly tighter carbon emissions framework as the European Union becomes increasingly concerned about the need to rapidly transition their economy to limit carbon emissions.

**Figure 1.1: European Union's Emissions Unit Allowance (€/t)**



Source: <https://markets.businessinsider.com/commodities/co2-emissionsrechte>, 9 October 2019

KPMG uses an EUA of A\$9.60/t (in 2018 dollars) taken from March 2017 (the near all time low of the EUA pricing). Converting the 7<sup>th</sup> October 2019 EUA €23.37/t at the current exchange rate gives a current EUA price of A\$38.09/t, four times the current cost KPMG uses for Rix's Creek. Hansen Bailey's August 2019 update carries the same March 2017 EUA price forward, despite updating their other inputs.

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<sup>4</sup> The Australia Institute, "Great Barrier Bleached: Coral bleaching, the Great Barrier Reef and potential impacts on tourism", June 2016.

Referencing the Bloomfield Group's Hansen Bailey updated 5 August 2019 assessment of scope 1 & 2 emissions at 990,613t (Table 5), this gives a current value of A\$38m for the entire project, or \$12m current value for the cumulative 1.1Mtpa run-of-mine (ROM) extension, using the near record low EUA price of March 2017.

The Hansen Bailey updated scope 3 assessment of carbon emissions gives a cumulative 71.4Mt for the entire project, or 21.8Mt from the Rix's Creek Extension share. At the current €23.37 or A\$38/t value, this puts a current value of A\$832m for the extension – 1,808 times that of Gillespie Economics (Figure 1.2).

Using a significantly out-of-date carbon price and other questionable assumptions, the Hansen Bailey / Gillespie Economics analysis has come up with a NSW community cost of scope 3 carbon emissions from this project proposal of just A\$0.46m.

**Figure 1.2: Total Value of Carbon Emissions – A\$832m vs A\$0.46m!**

	<b>Total project</b>	<b>Extension</b>
EU EUA (€/t) as at 7 Oct 2019		€ 23.37
Euro/A\$		1.63
EUA in A\$/t		\$38.09
ROM Coal (Mtpa)	3.6	1.1
Share of Total		31%
Scope 1&2 Carbon Emissions - cumulative	1.0	0.3
Value (A\$m, current dollar)	38	12
Scope 3 Carbon Emissions - cumulative	71.4	21.8
Value (A\$m, current dollar)	2,721	832
Scope 3 Gillespie Economics cost to NSW (A\$m)		0.46
Scope 3 IEEFA cost to NSW (A\$m)		831.51
Difference (times)		1,808

*Source: Hansen Bailey / Gillespie Economics, 5 August 2019, IEEFA calculations*

In isolation, just the incremental current market value of carbon emissions imposed on the global community from the Rix's Creek Extension Project of A\$832m exceeds the net production benefits of \$614m that KPMG calculates,<sup>5</sup> even without considering the overestimate of other net benefits that we detail elsewhere in this section. This gives the Project a negative CBA.

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<sup>5</sup> KPMG, [Rix's Creek Extension Project – Economic Assessment](#), 13 March 2018

The financial, legal, and fiscal risks and costs of climate change have been well articulated by the [RBA](#), [APRA](#) and in our [legal system](#). Access to financial capital (debt, equity and insurance) for coal mining is increasingly problematic (refer Section 3) and a recent study by Ernst & Young (EY) found that mining companies are increasingly under investor pressure to secure a social licence to operate, including taking responsibility for scope 3 emissions.<sup>6</sup>

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<sup>6</sup> The Australian Financial Review, [Scope 3 accountability inevitable for miners, says EY](#), 2 October 2019

## **Corporate Tax Leakage Risk**

New investment in regional Australia is important but where coal mining is concerned, the benefits are short lived, illusory and mostly privately gained and invariably almost corporate tax free. Various planning approvals are predicated on the reported benefits that will accrue to the Australian Government from increased corporate taxes. Many approvals rely on proponent-created "models" that assume 100% equity financing of every coal project, including KPMG's analysis for the Rix's Creek Extension Project, yet the standard industry practice is to use substantial debt leverage to legally minimise tax expense and hence maximise the proponent's return on equity invested.

It has been well documented that Australia's largest coal mining and coal-fired power plant owners pay little if any corporate tax in Australia.<sup>7</sup> Yet KPMG assumes this project is 100% equity financed, without citing how this assumption was justified. KPMG calculates a net present value of A\$159m in company tax benefit for Australia, and taking 32% of this, allocates a A\$50.9m benefit to NSW. IEEFA provides two real world examples that if applied to Rix's Creek would see this benefit to NSW reduced by up to 100%.

The Australian coal sector firms legally avoid paying most of their corporate tax obligations by using weaknesses in the thin-capitalisation, related party transactions and transfer pricing rules of the Australian tax system. BHP paid the Australian Taxation Office (ATO) A\$529m in November 2018 in settlement of its Singapore tax haven marketing hub practice,<sup>8</sup> yet the 2018 Senate Inquiry into Multinational Tax Avoidance by mining companies highlighted BHP's offshore actions as likely just the 'tip of the iceberg'.<sup>9</sup>

We analyse the financial accounts of Yancoal Australia and Whitehaven Coal - the two leading NSW Stock Exchange listed coal mining firms' - financial performance over the last six years to illustrate that corporate tax expenses are matched or dwarfed by the interest expense deductions that KPMG assumes away to zero. And we illustrate that corporate cash tax paid (as opposed to the corporate tax accounting expense) is either minimal or precisely zero for the two leading Australian coal mining firms. The accumulation of previous year losses means the Australian government receives cash tax that is at best a minor fraction of the reported tax expense. I therefore question KPMG's assumption that the Rix's Creek Extension Project will see the proponent pay an additional \$159m of corporate tax.

Figure 1.3 provides an extract of the consolidated financial results of Yancoal Australia over the six calendar years 2013-2018. On revenues of a cumulative \$13 billion, Yancoal booked interest expenses totalling a cumulative \$1,240m, many multiples of the corporate tax expense of \$55m. Cash tax paid was a cumulative \$15m over the six years,

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<sup>7</sup> MichaelWest.com.au, "[Sneaky coal giant Glencore drops off the Top40 Tax Dodgers](#)", 28 December 2018.

<sup>8</sup> The Australian Financial Review, "[BHP to pay ATO \\$529m in tax settlement over Singapore marketing hub](#)", 19 November 2018.

<sup>9</sup> Parliament of Australia, "[Corporate Tax Avoidance report - Part III: Much heat, little light so far](#)", 30 May 2018.



just a quarter of the tax expense, due to continued use of accumulated past year tax losses carried forward. Cash tax paid over this six-year period was 0.1% of total revenues.

**Figure 1.3: Yancoal Australia: Revenue, Interest vs Tax (2013-2018, A\$m)**

Year to December	2013	2014	2015	2016	2017	2018	Total 2013-2018
Revenue (A\$m)	1,530	1,432	1,319	1,238	2,601	4,850	12,970
Interest expense	-125	-165	-162	-209	-287	-293	-1,240
Corporate tax expense	282	-83	63	85	-82	-320	-55
Corporate tax paid	2	0	-17	0	0	0	-15
Cash tax paid / revenue	-0.2%	0.0%	1.3%	0.0%	0.0%	0.0%	0.1%

*Source: Yancoal Australia Annual Reports, IEEFA calculations*

Figure 1.4 provides an extract of the consolidated financial results of Whitehaven Coal over the six financial years to June 2019. On revenues of a cumulative \$9.2 billion, Whitehaven booked interest expenses totalling a cumulative \$335m, almost equal to the corporate tax expense of \$361m. Cash tax paid was a cumulative zero over the six years, thanks to continued use of accumulated past year tax losses carried forward.

**Figure 1.4: Whitehaven Coal: Revenue, Interest vs Tax (2013-2018, A\$m)**

Year to June	2014	2015	2016	2017	2018	2019	Total 2014-2019
Revenue (A\$m)	755	763	1,164	1,773	2,257	2,488	9,200
Interest expense	-58	-73	-67	-51	-42	-43	-335
Corporate tax expense	18	141	-7	-70	-234	-208	-361
Corporate tax paid	21	36	-42	0	0	-15	0
Cash tax paid / revenue	-2.8%	-4.7%	3.6%	0.0%	0.0%	0.6%	0.0%

*Source: Whitehaven Coal Annual Reports, IEEFA calculations*

KPMG assumes that Rix's Creek will pay the Australian government \$159m of corporate tax (on an NPV basis), a 12.5% share of total cumulative revenues of \$1,272m (on an NPV basis). By comparison, Yancoal paid just 0.1% of revenues as corporate tax (less than a one-hundredth of the rate KPMG assumes), and Whitehaven Coal paid zero percent of revenues in total over the last six years.

## Coal Price Assumptions Are Under Threat

Commodity prices are extremely difficult to forecast and KPMG relied on credible industry forecasts of the long term nominal price estimate for thermal coal of US\$73.80/t and for soft coking coal of US\$111.10/t. While these forecasts were entirely reasonable 18 months ago, we note the global coal market is in a state of technology driven flux, and dramatically increasing oversupply at a time of increasing cost competitiveness of zero emissions alternatives is undermining pricing. Coking coal prices have dropped more than 40% to-date in 2019, and thermal coal prices have halved since the start of 2018 to US\$64/t.

IEEFA notes the October 2019 observations of Guillermo Fonseca, CEO of Cerrejon of Chile (one of the largest and historically most profitable export thermal coal mines in the world) noted the likely sustained weakness in coal prices going forward. Having relatively recently completed a [US\\$1.3bn capital investment to expand capacity to 40Mtpa](#), Fonseca announced a major cut to production expectations to just 26Mtpa because of the unexpectedly rapid decline in global coal prices, stating: "Accepting that prices are going to stay there, the decision was taken to reduce the size of the mine. The mine will be reduced between 15% and 18% as a result of what we're seeing."<sup>10</sup>

The price of hard coking coal has also unexpectedly dropped 40% to-date in 2019 to US\$138/t, as showing in Figure 1.5. The soft coking coal of Rix's Creek would receive a significant discount to the premium pricing of hard coking coal price, generally trading at a US\$10-20/t premium to the 6,000kcal thermal coal price – Figure 1.6.

**Figure 1.5: Seaborne Hard Coking Coal Prices (US\$/t)**

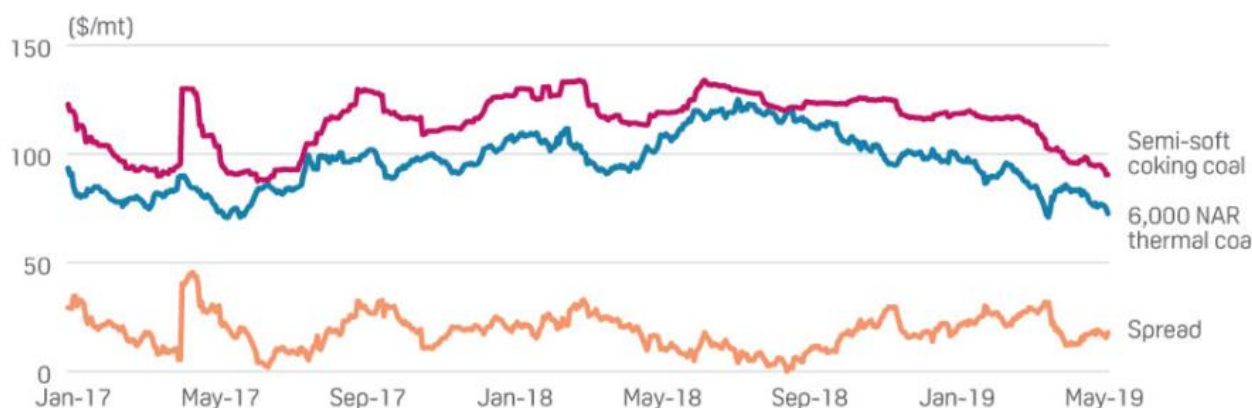


Source: S&P Global Platts, 27 September 2019

<sup>10</sup> Reuters, [Coal mine Cerrejon to reduce output amid low prices, possible court ruling](#), 8 October 2019

James Robo, CEO of Nextera Energy, the largest and most successful power utility in the U.S., gave an investor presentation in October 2019 in which he forecast that renewable energy would entirely force all coal-fired power generation out of the U.S. market by 2030, even with the removal of investment subsidies for renewables post 2020.<sup>11</sup>

**Figure 1.6: Seaborne Soft Coking Relative to thermal Coal Prices (US\$/t)**



Source: S&P Global Platts, June 2019

Figure 1.6 shows the KPMG assumption of a US\$38/t spread premium for soft coking coal over thermal coal is not supported by the pricing trends over the last three years. IEEFA notes the average US\$20/t spread in this period.

As such, IEEFA would argue that there is material downside risk to the revenue projections the CBA relies on, both in terms of the benefit the proponent is likely to receive, and also the flow-on negative implications for KPMG's estimate of \$104m (present value) of coal royalties likely to flow to the NSW Government.

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<sup>11</sup> NextEra Energy, *Investor Presentation*, October 2019

## **Coal Mine Rehabilitation Deferral Gives a \$16m Net Benefit while Water Treatment of the Final Void in Perpetuity is Uncosted**

KPMG's CBA perversely includes a \$16m net financial benefit to the proponent of delaying rehabilitation works for up to two decades while the Rix's Creek Extension Project is undertaken, despite the additional 21Mt of coal extracted, as well as almost 200Mt of extra overburden being removed over the 21 year Project.<sup>12</sup>

The cumulative impact of final voids from coal mining across NSW is unknown, with the latest research estimating there are at least 45 voids of a cumulative 6,050 ha planned or approved by the NSW Government as of June 2016, covering a total area greater than all of Sydney Harbour.<sup>13</sup>

In Germany, a special purpose government vehicle will fund an estimated annual €220m cost in perpetuity needed to finance the measures for a permanent management of coal mine- and groundwater decontamination in the former Saar, Ruhr and Ibbenbüren coalfields.<sup>14</sup>

Australia has over 50,000 abandoned, unrehabilitated mine sites, and the Australian taxpayer has to fund the containment and eventual clean-up of these sites.<sup>15</sup> While mining industry lobby groups proclaim there is no issue, and the KPMG CBA includes a hypothetical net benefit to NSW from the massive disturbance of 212 ha of land and removal of over 220 million tonnes of overburden and coal, the more than 200 year history of mining in Australia suggests otherwise to IEEFA.

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<sup>12</sup> IEEFA calculates the 200 million tonnes of additional overburden using the KPMG strip ratio of 5.75 bank cubic metres (BCM) per tonne of ROM coal (16.1BCM per 2.8Mtpa of ROM, as referenced in Table 1 of "Rix's Creek South Continuation of Mining Project Final Assessment report by KPMG, and converting a BCM of overburden at the IEEFA estimated rate of 1 BCM = 2 tonnes.

<sup>13</sup> Energy Resource Insights, [The Hole Truth: The mess coal companies plan to leave in NSW](#), June 2016.

<sup>14</sup> IMVA Mine Water and Circular Economy, [Mine Water Management in the Ruhr coalfield](#), 2017

<sup>15</sup> The Conversation, [What should we do with Australia's 50,000 abandoned mines?](#), 23 July 2014

## **Opportunity Costs of Land Use – a net \$0.2m cost**

KPMG's CBA finds that there is a \$0.6m cost of locking up 213 ha of agricultural land for several decades, and then largely offsets this community cost by adding a \$0.4m gain on residual value of grazing land returned post mining and post rehabilitation. That coal mine rehabilitation can be undertaken so as to return land to a productive agricultural grazing use equivalent to its pre-mining quality is largely hypothetical. The Australia Institute report of April 2017<sup>16</sup> found there are almost no examples of successful end of mine life rehabilitation completed, none that have been independently verified. According to the government statistics, almost all end of life coal mines in Australia have been left in care and maintenance rather than fully rehabilitated.

The Singleton and Lake Macquarie Councils have both testified in October 2019 to the Federal government '*Jobs for the Future in Regional Areas*' inquiry<sup>17</sup> about their growing concerns over coal mining combined with associated coal fired power plants having too much control over large parts of the shire, limiting the effectiveness of the shire to transition from coal and diversify the "single engine economy", as reported in the regional press.<sup>18</sup> This points to the growing need for the NSW planning process to consider the cumulative impact on land use, the economy, employment, health, noise, water use and pollution et al of so many coal mines in a condensed area.

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<sup>16</sup> The Australia Institute, [Dark side of the boom](#), 15 April 2017

<sup>17</sup> Parliament of Australia, [Jobs for the Future in Regional Areas](#)

<sup>18</sup> The Newcastle Herald, [Singleton and Lake Macquarie councils have asked a federal jobs inquiry to help unlock mining's grip on Hunter land](#), 8 October 2019

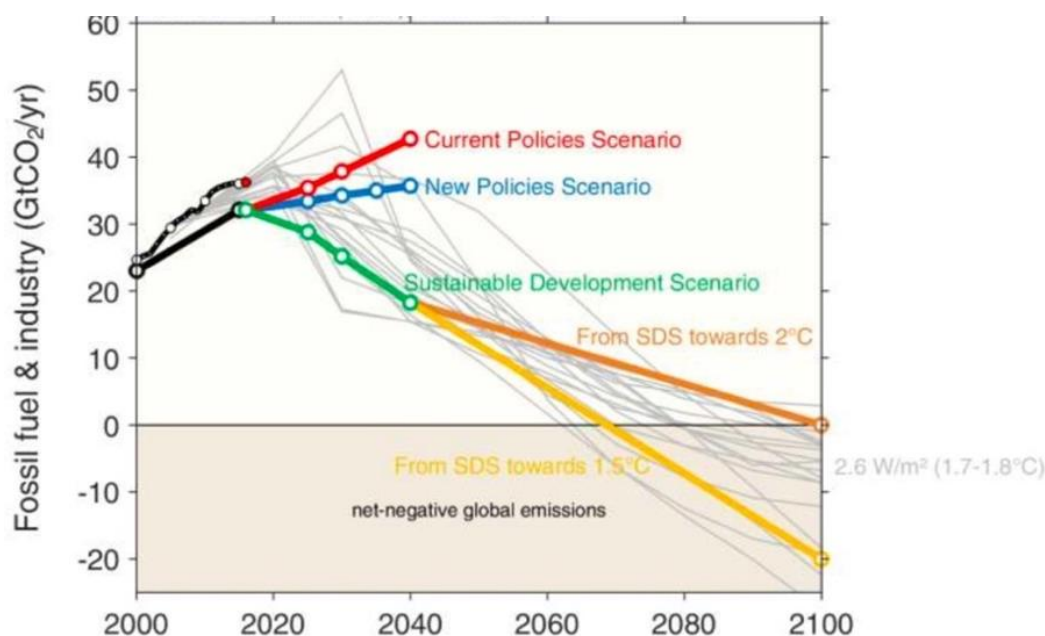
## Section 2. Coal's Structural Decline

Each year, the International Energy Agency (IEA) releases the [World Energy Outlook \(WEO\)](#) which, among other things, [models](#) global energy demand using various [scenarios](#). The scenarios are not predictions, rather tools to assess risks. The scenarios respond to global [Paris Agreement](#) targets aimed at keeping temperature rises to well below 2°C while collectively pursuing efforts to limit increases to 1.5°C.

Should the world successfully limit climate change to well below 2°C of warming, fossil fuel extraction must rapidly decrease towards zero net emissions, starting immediately. Thermal coal demand is the most negatively exposed commodity in this scenario. All countries must instead accelerate reliance on sustainable, affordable and renewable non-fossil sources of energy to avoid catastrophic climate change.

IEEFA sees the IEA's Sustainable Development Scenario (SDS) as the most likely reflection of the world's energy future. Global financial institutions exiting coal are generally committing<sup>19</sup> to the IEA's SDS or an even more ambitious transformation as outlined in the Beyond 2°C Scenario when they set Paris Agreement compliant targets.

**Figure 2.1: Possible Carbon Emissions Pathways Reflecting IEA Scenarios**



Source: Glen Peters, IEA WEO 2017, SS database (IIASA)P.<sup>20</sup>

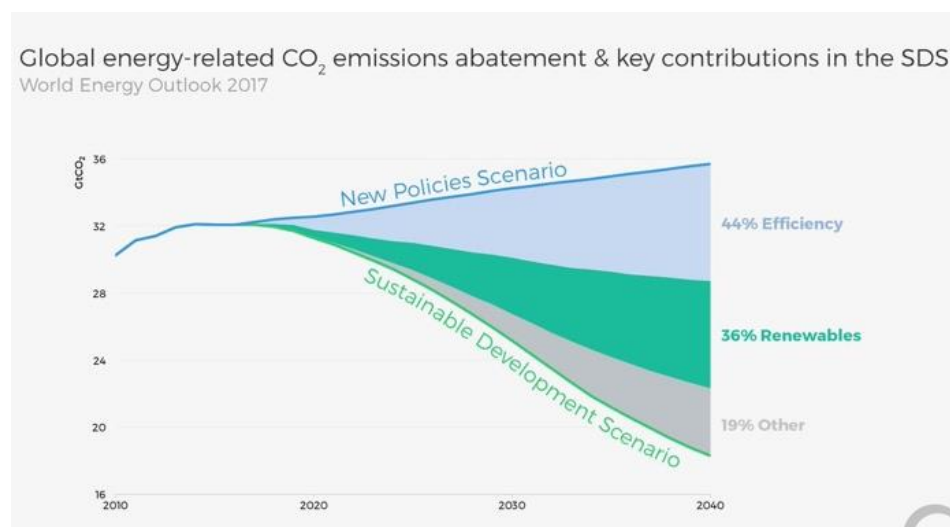
<sup>19</sup> See IEEFA, [Over 100 Global Financial Institutions Are Exiting Coal, With More to Come Every Two Weeks a Bank, Insurer or Lender Announces New Restrictions on Coal](#), 27 February 2019.

<sup>20</sup> Centre for International Climate Research (CICERO), [Beyond Carbon Budgets and Back to Emissions Scenarios](#), Glen Peters, September 2018.

The **Sustainable Development Scenario** (SDS) presents a realistic, desirable scenario whereby nations work together to successfully limit climate change including a transformation of the energy market. Under the SDS, the planet's 'carbon budget' will be exhausted as early as 2023 under a 1.5°C target and by 2040 under a 2°C objective.

The SDS projects a significant decline in thermal coal demand, with global trade plummeting 65% by 2040. The SDS falls short of meeting the Paris Agreement's target with any certainty, given the IEA now questions its own presumption that coal carbon capture and storage (CCS) is commercialised at scale by 2030. IEEFA sees this as an improbable assumption given the IEA state the breakeven for power CCS is a US\$60/t price on carbon emissions.<sup>21</sup>

### **Figure 2.2: Global Energy-Related CO<sub>2</sub> Emissions Abatement Tools are Energy Efficiency and Renewable Energy**



Source: International Energy Agency.<sup>22</sup>

The **Beyond 2°C Scenario** (B2DS) sets out a rapid decarbonisation pathway aligned with international goals. To achieve net-zero emissions by 2060, technological innovation is heavily invested in and deployed across the energy system consistent with a 50% chance of limiting average future temperature increases to 1.75°C. The B2DS falls within the Paris Agreement range of ambition.

The **New Policies Scenario** (NPS) models emissions continuing to rise until 2040 with global temperatures likely increasing more than 2.7°C by mid-century. The NPS assumes countries collectively will *not* take significant action to act on carbon emissions in line with 'ratchet-up' commitments in the Paris Agreement. Under the NPS, global coal trade declines 5% by 2040.

The **Current Policies Scenario** (CPS) assumes no effective concerted action on climate with the globe's carbon dioxide levels continuing to increase and the global warming target of 1.5°C exceeded by 2022. By definition, the CPS is consistently out-of-date as policies and measures since mid-2018 are not included.

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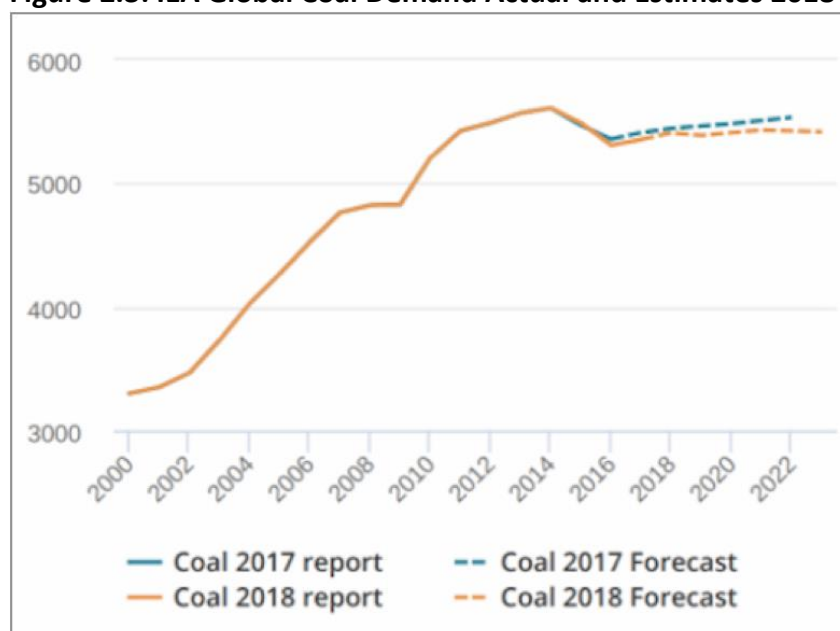
<sup>21</sup> IEA, [Carbon capture, utilisation and storage](#)

<sup>22</sup> International Energy Agency [World Energy Outlook 2017](#).

## Reviewing IEA's coal forecasts to 2040

The IEA acknowledges that global coal use likely peaked five years ago in 2014 while modelling a stagnant near-term outlook to 2022 (See Figure 2.3).

**Figure 2.3: IEA Global Coal Demand Actual and Estimates 2018 vs 2017 (Mtce)**



Source: OECD / IEA

IEEFA notes the global seaborne thermal coal market is *not* likely to reverse the inevitable technology, cost and policy driven direction of a slow, steady and ultimately terminal decline in volumes by 2050, consistent with the IEA forecasts under a Paris aligned outlook.

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

Investors have responded by dramatically curtailing coal-fired power plant expansion plans (Figure 2.4). The momentum away from thermal coal is building and, with the arrival of a higher price on carbon emissions, zero emissions hydrogen-based virgin steel is likewise progressing towards commercialisation and widespread deployment within the 21 year life of the Rix's Creek Extension Project,<sup>23</sup> whilst the increased global availability of steel scrap from recycling likewise will continue to progressively erode the virgin steel market, along with its need for coking coal.

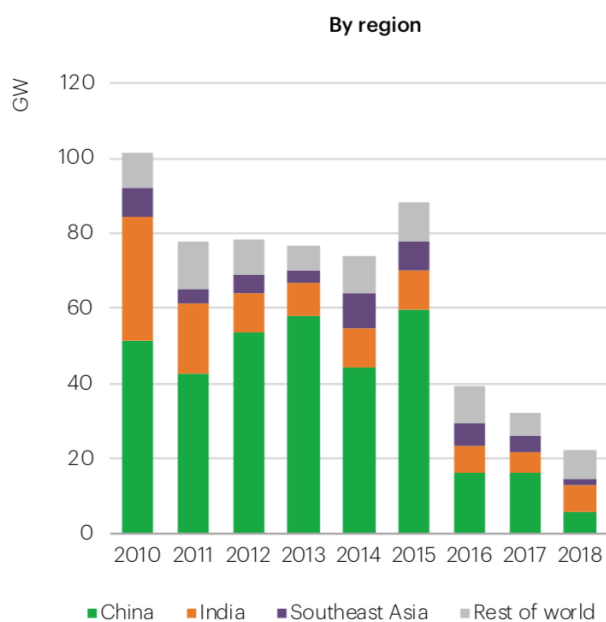
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<sup>23</sup> International Mining, [HYBRIT hydrogen storage facility finds financial backing](#), 3 October 2019



**Figure 2.4: IEA Global Coal Power Plants Reaching Final Investment Decision Sign-off**

Coal-fired power generation capacity subject to an FID



Note: GW = gigawatt.

Source: IEA analysis with calculations based on McCoy Power Reports (2019)

Source: IEA, May 2019

As per the IEA, if the world delivers on an SDS or B2DS path consistent with limiting average warming to 2°C, global coal demand will drop by more than half to 2040 (-57%) (Figure 2.5).<sup>24</sup> This dramatic decline in both coking and thermal coal demand makes the Rix's Creek Extension Project capacity unnecessary and would in IEEFA's view challenge the project viability well within its planned life of operation.

**Figure 2.5: IEA Global Coal Use 2014-16 vs Forecast 2040: NPS vs SDS (Mtce)**

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

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

<sup>24</sup> As measured in millions of tonnes of coal equivalent (Mtce), an adjustment to standardise coal use by energy content.

Under the SDS, which is a possible 2°C outcome, traded seaborne thermal coal demand declines 65.1% against 2017 levels (Figure 2.6).

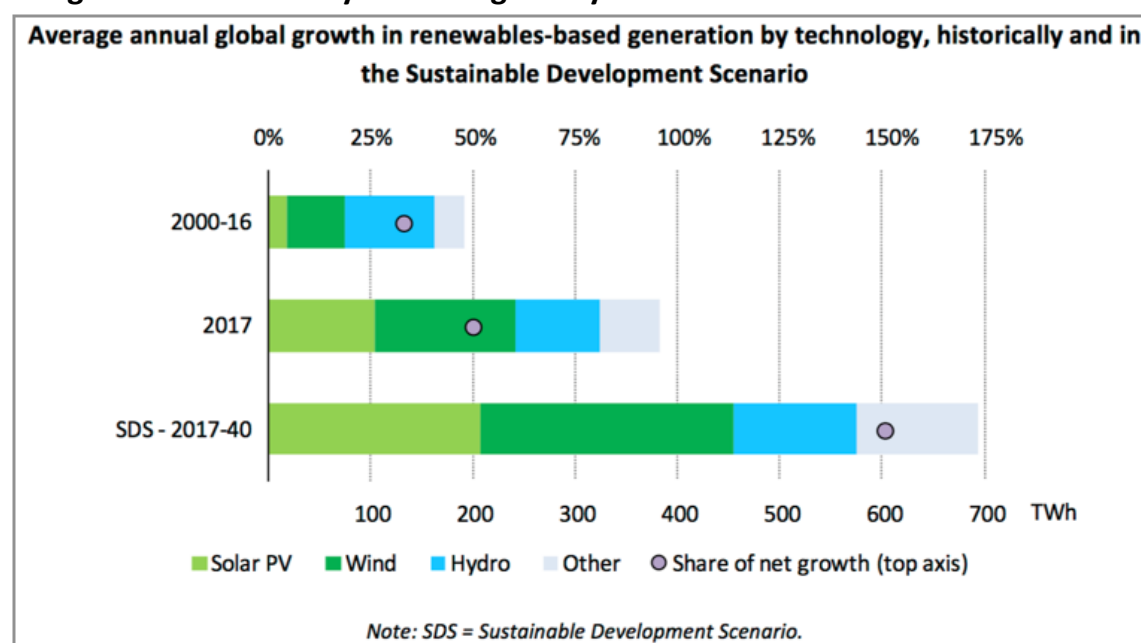
**Figure 2.6: IEA Global Seaborne Coal 2014-17 vs 2040: NPS vs SDS (Mtce)**

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

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

The SDS models electricity generation from zero emissions technologies more than doubling through to 2040 relative to the record high set in 2017 (Figure 2.7).

**Figure 2.7: The IEA SDS Forecasts Renewable Energy will supply 150% of net growth in electricity demand globally over 2017-2040**



Source: IEA WEO2018

## Section 3. Increasing Global Capital Flight from Coal

### *Financial Institutions Pivot Away from Coal, Towards lower Cost, Lower Emissions Alternatives*

There is an accelerating global shift away from financing thermal coal and coal-fired power plants, matched with the rapid cost declines of renewable energy technology and the very clear message of the *United Nation's Intergovernmental Panel on Climate Change* (UN IPCC) highlighting the need to virtually cease global coal use by 2050.

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

*"Expert analysis shows that to meet the Paris Agreement goals of limiting the increase in global temperatures by 2°C, while striving to limit the increase to 1.5°C, a coal phase-out is needed by 2030, in the OECD countries and in the European Union; by 2040, in China; and by 2050, in the rest of the world."*<sup>25</sup>

Australian banks have all moved to recognise the global financial risks of climate change, making strong commitments to reduce funding for thermal coal mining and coal-fired power plants.

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

[Commonwealth Bank](#) reported in August 2019 that it would: "ensure our business lending policies support the responsible transition to a net zero emissions economy by 2050... continuing to reduce our exposures to thermal coal mining and coal fired power generation, with the view to exiting the sector by 2030 subject to Australia having a secure energy platform; only providing financing activity to new oil, gas or metallurgical coal projects if supported by an assessment of the environmental, social and economic impacts of such activity, and if in line with the goals of the Paris Agreement".

[Macquarie Group](#) has flown under the radar to-date and made no public commitment to exit coal. Yet its actions speak louder than words and Macquarie has made renewable infrastructure investing one of its four global pillars of growth, and in September 2019 [committed](#) to invest in 20GW of renewable energy over the coming five years. Landmark [renewable energy](#) and [storage](#) deals across Europe and Asia show the momentum of global infrastructure investing towards decarbonisation.

Global coal divestment, policy exclusions and lending restrictions have all been progressing, with global financial institutions pivoting to boost lending to renewable energy infrastructure and other low emissions alternatives.

Today, over 110 globally significant financial institutions have divested from thermal coal, including 45% of the top 40 global banks and 24 globally significant insurers.

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<sup>25</sup> IGCC, "[Briefing Paper on the 2018 Global Investor Statement to Governments on Climate Change](#)", December 2018.

Since the beginning of 2019, 30 coal restriction policies have been announced, including:

- January 2019 - **Export Development Canada** revealed its new Climate Change Policy: “No new financing for coal power plants, thermal coal mines or dedicated thermal coal-related infrastructure – regardless of geographic location.”
- January 2019 - **Barclays Bank** UK expanded on its April 2018 exclusion of project finance for coal mining to also exclude coal plants.
- January 2019 – **Varma of Finland** announced cessation from investing in coal.
- January 2019 - **Nedbank of South Africa** withdrew financing for two major coal-fired power plant projects in South Africa.
- February 2019 - **VIG of Austria** ceased coal insurance.
- March 2019 – **MAPFRE** of Spain and **UNIQA** of Austria excluded coal insurance.
- March 2019 – **State Development & Investment Corporation** is the first leading Chinese financial institution to completely exit the coal industry.
- March 2019 - **BNP Paribas Asset Management** (€537bn AuM) announced a new coal exclusion policy.
- March 2019 – **QBE Insurance** announces its progressive exit from coal, globally.
- April 2019 – **DBS, UOB** and **OCBC of Singapore** each announce they will cease coal-fired power plant financing.
- April 2019 - Mitsubishi UFJ Financial Group (**MUFG**) is planning to establish quantitative targets for restricting both domestic and overseas coal project financing.
- April 2019 – **Hannover Re** tightened its existing coal fired power plant insurance criteria citing increased coal based risks.
- July 2019 – **Suncorp** of Australia and **Chubb** of the U.S. announced it would no longer provide insurance for new thermal coal projects.
- August 2019 - **FirstRand Bank** announced a formal coal exclusion policy.
- October 2019 – **Axis Capital** announced plans for a new coal exclusion policy.

While initial measures vary in effectiveness, IEEFA has found the trend is for financial institutions to ratchet up the strength of coal exclusion, restriction or investment policies once they are in place. With environmental and reputational concerns certainly driving factors for capital fleeing coal, investors are also increasingly aware that coal industry forecasts are increasingly dour.

## About IEEFA

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

## About the Author

### Tim Buckley

Tim Buckley, IEEFA's director of energy finance research, Australasia, has over 30 years of financial market experience covering the Australian, Asian and global equity markets from both a buy and sell side perspective. Tim was a top-rated Equity Research Analyst and has covered most sectors of the Australian economy. Tim was a Managing Director, Head of Equity Research at Citigroup for many years, as well as co-Managing Director of Arkx Investment Management P/L, a global listed clean energy investment company that was jointly owned by management and Westpac Banking Group.

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**Appendix A**  
**Resume - Tim Buckley**  
**Director, Energy Finance Studies, Australasia at IEEFA**  
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Mobile 0408 102 127 email [tbuckley@ieefa.org](mailto:tbuckley@ieefa.org)



**Employment History**

**Director, Energy Finance Studies, South Asia / Australasia  
Institute for Energy Economics and Financial Analysis (IEEFA) (June 2013 – present)**

- Publishing of financial analysis into energy projects that impact on the global transition to a low carbon economy, analysis of energy efficiency and renewables and evaluation of the associated risks to stranded assets in the fossil fuel sector, particularly the seaborne thermal coal market for Australia.
- Primary market of focus is the Indian Electricity Sector.
- Presenting on global energy transformation at numerous energy finance conferences across China, India, Bangladesh, Singapore, Japan, U.S., Germany and Australia.

**Arkx Investment Management - Managing Director (Jan 2010 – Aug 2013)**

- Co-founder and Joint Portfolio Manager for the *Arkx Global Clean Energy Fund*, Australia's first wholesale global listed equities fund dedicated to investing in low carbon technology opportunities. Arkx was part owned by Westpac Banking Group.
- Undertook investment research analysis into global listed company stock selection through to portfolio construction and maintenance. Maintained financial models on 100 of the world's leading firms most leveraged to the move to a low carbon future.

**Shaw Stockbroking – Head of Equities (Feb 2008 –Jan 2010)**

- Headhunted from Citi to take on a newly created position, Head of Equities. Responsible for oversight of Shaw's Research, Institutional Research Sales and Corporate Finance arms, leveraging an excellent retail equities advisor business.
- The role was designed to provide Shaw a leadership transition to allow the CEO to retire on a 3 year timeframe. The GFC's onset meant this transition did not eventuate.

**Citigroup – Managing Director, Head of Equity Research (1998-2007)**

- 2006-2007: Managing Director, Equity Research - Equity Capital Markets – Investment Banking co-ordination and transaction vetting. A member of the five person Australasian Commitments Committee (CC). Evaluation and approval of all initial public offering and equity market issuance roles of Citigroup. A key project in this time was the \$15bn bid for Alinta (jointly with Macquarie).
- 2002-2006: MD, Head of Research with a equity research staff of 100; Citigroup Australasia Executive (a management board of 8 covering Citibank, Diners Club, GCIB, Private Clients, Research & Insurance); Australasian CC; Equities Executive.
- 1998-2001: Deputy Head of Research, Appointed Managing Director in 2000.
- 1998-2003: Equity Market Research in Diversified Industrials and Beverages.

**Deutsche Morgan Grenfell Asia – Director, Head of Equity Research (1996-98)**

- Singapore based, Tim was co-head of DMG Singapore Equities, and worked closely with our retail equity partner, DMG & Partners (Singapore), a top 10 institutional and retail broker covering Singapore and Malaysia.
- Equity Market Research in the Asia Region Pulp & Paper (P&P) Sector.
- Singapore Equity Strategist / Head of Research with a team of 20.

**County Natwest Securities – Director, Senior Equity Analyst (1992-1996)**

- Equity Market Research in the Diversified Industrials, Beverages and P&P sectors. Key stocks under coverage included Foster's, BTR Nylex, Pacific Dunlop, Southcorp, Lion Nathan, Amcor, Fletcher Challenge, Carter Holt Harvey, Spicers Paper, Howard Smith, Wesfarmers and FIF.
- Career highlights: consistently ranked Top 3 in the Diversified Industrials, Beverages and P&P categories; and being ranked by BRW as Australia's top analyst in 1994/5.

**Macquarie Equities – Senior Industrial Analyst (1988-1991)**

- Equity Market Research in the Diversified Industrials sector. Key stocks covered included: Elders IXL, BTR Nylex, Pacific Dunlop, Southcorp, AFP and Wormald.
- Career highlights included being black-banned by Elders IXL's CEO John Elliott, and achieving Top 3 rankings in the Diversified Industrials category of the BRW and ABM analyst polls.



## **Education**

HSC achieved at Barker College Hornsby (graduating in 1984, Top 1% in NSW)

Bachelor of Business, University of Technology, Sydney (1985-87)

- Graduated with Distinction
- Double Major in Accounting and Finance, Minors in Marketing and Computing

Lecturer in Finance and Accounting, University of Technology, Sydney – 1988

Lecturer in SIA – Advanced Equity Market Analysis 1990-1991

American Securities Exams      Series 7 Financial Analysts – 1998  
Series 24 General Securities Representative Exam- 2003

ASIC required PS146 Registered Representative – 2003-2010

ASX Responsible Executive exam – 2008

## **A Selection of Tim Buckley's Major Reports Published**

- *“Remote Prospects: A Financial Analysis of Adani's coal gamble in Australia's Galilee Basin”* in November 2013.
- *“Shenhua Watermark Coal: A Stranded Asset”*, November 2014.
- *“A Better Way Forward for Electrification in Bangladesh”*, November 2016
- *“Japan: Greater Energy Security Through Renewables”*, March 2017
- *“State-Owned Utility NTPC Takes a Lead Role in India's Electricity Transition”*, May 2017
- *“Winners and Losers Among Big Utilities as Renewables Disrupt Markets Across Asia, Europe, the U.S., and Africa”*, October 2017
- *“India's Electricity Sector Transformation”*, November 2017.
- *“China in 2017 Continued to Position Itself for Global Clean Energy Dominance”*, Jan 2018
- *“Tamil Nadu's Electricity Sector Transformation”*, February 2018
- *“Adani Godda Power Project: Too Expensive, Too Late, and Too Risky for Bangladesh”*, April 2018
- *“Advances in Solar Energy Accelerate Global Shift in Electricity Generation”*, May 2018
- *“Marubeni's Coal Problem: A Japanese Power Business Is at Risk”*, July 2018
- *“Karnataka's Electricity Sector Transformation”*, July 2018
- *“Tata Power exemplifying the Indian energy transition”*, April 2019
- *“GE made a massive bet on the future of natural gas and thermal coal, and lost”*, June 2019
- *“Conflating Queensland's Coking and Thermal Coal Industries”*, June 2019