Bylong Coal Project

Reply to KEPCO Bylong Australia's Response to IEEFA

Institute for Energy Economics and Financial Analysis
IEEFA.org

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Acknowledgement

Tim Buckley and Simona Nicholas have been engaged by EDO NSW on behalf of the Bylong Valley Protection Alliance to prepare this reply. The authors acknowledge that they have read Division 2 of Part 31 of the *Uniform Civil Procedure Rules 2005* (UCPR) and the Expert Witness Code of Conduct in Schedule 7 of the UCPR and that they agree to be bound by it.

Tim Buckley and Simon Nicholas declare that they have made all the inquiries which they believe are desirable and appropriate (save for any matters identified explicitly in the report), and that no matters of significance which they regard as relevant have, to their knowledge, been withheld.

Introduction

In June 2018, the Institute for Energy Economics and Financial Analysis (IEEFA) submitted an Expert Review to the New South Wales (NSW) Government's Planning and Assessment Commission review of the Bylong Coal Project.[1]

In October 2018, the NSW Department of Planning and Environment released its assessment report for the Bylong Coal Project and also published a response from the project proponent, KEPCO Bylong Australia Pty Ltd (KEPCO Bylong), to IEEFA's Expert Review[2] which was also summarised in its submitted Supplementary Information.[3]

In this report, we respond to claims made in KEPCO Bylong's submission on our Expert Review.

Response to KEPCO Bylong

KEPCO Bylong begins its response by calling into question IEEFA's ability to write a reliable expert review. For clarity, IEEFA's mission statement is as follows:

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

IEEFA's team of financial analysts have a range of banking and financial markets experience across a range of financial institutions including JP Morgan, Citigroup, Macquarie Bank, Commonwealth Bank of Australia, the Federal Reserve Bank of New York, Merrill Lynch and UBS. Detail about the authors experience is set out at page 10, below. Biographies of IEEFA analyst's backgrounds can be found on the IEEFA website.[4]

In its response to our Expert Review, KEPCO Bylong accuses IEEFA of selectively referencing data. Rather than referencing data selectively, IEEFA's submission referenced more up-to-date, material data that ought to be provided to any decision-makers considering a new thermal coal mine but was left out of KEPCO Bylong's previous submissions.

KEPCO Bylong's submission on our Expert Review then goes on to selectively reference data, most obviously in its referencing of the International Energy Agency's (IEA) Current Policies Scenario in an attempt to support the need for the project.

IEA's Current Policies Scenario

The IEA is an independent intergovernmental organization established under the framework of the Organization for Economic Co-operation and Development (OECD) in 1974 following the oil crisis. Each year, the IEA releases a World Energy Outlook report which, among other things, projects future fossil fuel demand under three scenarios; the central New Policies

[1] IEEFA, Bylong Coal Project: Expert Review, June 2018
[2] KEPCO Bylong Australia Pty Ltd, Response to the Institute for Energy Economics and Financial Analysis Submission, July 2018
[3] Bylong Coal Project, Supplementary Information, July 2018
[4] IEEFA

Scenario (NPS), the Current Policies Scenario (CPS) and the Sustainable Development Scenario (SDS).

In defense of the need for a new thermal coal mine at Bylong, KEPCO Bylong choose to point out that, under the IEA's Current Policies Scenario, the quantity of thermal coal projected to be traded will increase. KEPCO Bylong further states in its response to IEEFA that "only the CPS represents the current state of play".

The IEA defines the Current Policies Scenario as follows:

> "This scenario only considers the impact of those policies and measures that are firmly enshrined in legislation as of mid-2017. It provides a cautious assessment of where momentum from existing policies might lead the energy sector in the absence of any other impetus from government." [5]

In addition to the accelerated decline in global renewable energy costs well ahead of any forecasts, any policies and measures that have taken place since mid-2017 clearly render the CPS out-of-date and as such the CPS cannot represent the "current state of play". KEPCO Bylong appear to have misunderstood the CPS.

A good example of policy change since mid-2017 comes from South Korea itself. In addition to a carbon price, South Korea has a tax on coal. Coal consumption taxes were increased 20% to KRW36/kg (US$32/t) in April 2018.[6] Furthermore, the South Korean Government now plans to raise the coal tax by another 28% to KRW46/kg (US$41/t), while concurrently cutting the tax on LNG imports by 75% beginning in April 2019.[7] The object of these significant tax adjustments is clear – the South Korean Government is attempting to incentivise a switch from coal-fired to lower pollution, lower emissions LNG-fired power generation.

In another significant South Korean example, South Chungcheong province announced it had joined the Powering Past Coal Alliance in October 2018.[8] South Chungcheong province is home to half of South Korea's coal-fired power generation.

The Powering Past Coal Alliance is a coalition of national governments, sub-national governments, organisations and businesses that are seeking to accelerate the transition away from coal-fired power and towards clean energy sources. National government members of the alliance include Canada, U.K., France, Italy and New Zealand. At the provincial level, members include California, New York state, Australian Capital Territory and Ontario. Electricity utilities including EDF, Engie and Iberdrola are also members.

This was followed later in October 2018 by a major announcement by South Korean President Moon Jae-in. The President announced an US$8.8bn investment in a "mega-scale" solar, batteries and wind development totalling 4 GW. The plan includes 1 GW of offshore wind and a 3 GW solar park – which will be the world's largest.[9]

In his announcement, President Moon stated that "The renewable energy production in this area will be a turning point for Korea's renewable energy business" and went on to describe the fact that the nation has previously lagged behind other OECD countries on renewables as "shameful".

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[5] IEA, World Energy Model
[6] Platts, "S Korea unveils power mix plan for 2030 focused on renewables, LNG", 14 December 2017
[7] Reuters, "S.Korea to raise coal tax; lower LNG tax for power generation", 30 July 2018
[8] Powering Past Coal Alliance, "South Chungcheong Province, home to half of South Korea's coal power generation, joins PPCA", 2 October 2018
[9] PV Magazine, "Korea to build world's largest solar park", 1 November 2018

Furthermore, the CPS does not take into account the announced policies that make up the Nationally Determined Contributions that each nation, including Australia and South Korea, pledged to adhere to as part of the Paris Climate Agreement. To assume that the CPS is the best indication of the world's energy future is to assume that all nations will renege on their commitments to meet their national emissions reduction targets.

Meanwhile at the October 2018 annual general meeting of Australian coal mining company Whitehaven Coal, the company's chairman confirmed that it will continue to track the IEA's New Policies Scenario to assess future coal demand.[10] Clearly even Bylong Coal's potential local competitors reject the Current Policies Scenario as being out-of-date.

In our opinion KEPCO Bylong's constant referencing of the already-out-of-date 2017 Current Policies Scenario in response to our Expert Review gives a highly unlikely view of the future of global coal demand and does not provide any meaningful support as to why the Bylong Coal Project should proceed.

IEA's New Policies Scenario

KEPCO Bylong admit that under the NPS, the global thermal coal trade will decline and then describes the NPS as "speculative".

The NPS is, in fact, far from speculative – it is the IEA's central scenario. The IEA describes the NPS as follows:

> "The NPS aims to provide a sense of where today's policy ambitions seem likely to take the energy sector. It incorporates not just the policies and measures that governments around the world have already put in place, but also the likely effects of announced policies, including the Nationally Determined Contributions made for the Paris Agreement."[11]

Given that almost all nations globally have consistently re-committed to their Paris Agreement targets, and that the U.S.A's non-compliance is likely to prove temporary, anyone making a reasonable review of energy trends would have to accept that the NPS or even the SDS is a far more likely indication of future energy trends than the CPS.

Despite attempting to write-off the NPS as speculative, KEPCO Bylong refer to the fact that, under this scenario, global coal demand will increase going forward. IEEFA would note that projections of international coal trade are far more relevant to the Bylong Coal Project than overall global demand. This is because the great majority of coal demand is met by coal that is mined and consumed within the same country, principally in nations such as China, India and the U.S.

Bylong is clearly a coal export proposal so projections of the future international trade of coal are more relevant than overall demand. As KEPCO Bylong noted in their response, the quantity of thermal coal traded between nations is expected to decline under the NPS.

Even more significantly for the Bylong proposal, imports of coal into South Korea are projected to reduce significantly under the NPS, with the IEA stating:

[10] Australian Financial Review, "Whitehaven shareholders back board on remuneration", 25 October 2018
[11] IEA, World Energy Model

> "we see Korean coal imports dropping by nearly 50% to less than 60 Mtce in 2040."[12]

KEPCO Bylong's only response to this highly significant statement that was raised in our Expert Review was to say that, even if the above projection from the IEA is correct, South Korean coal demand "will still be over 10 times the average annual production from the Bylong Coal Project".

This is a nonsensical statistic as, if it goes ahead, the Bylong Coal Project will not be the only thermal coal mine seeking to secure coal offtake. The Bylong Coal Project would be competing with other existing and proposed new mines in a declining market. The point of highlighting declining thermal coal trade is that it signifies that no new thermal coal mines are required. Declining future trade can be met by current thermal coal mines with some low-cost brownfield extensions to existing mines where required. Opening new greenfield mines with all the associated long-life infrastructure into a declining market will only serve to push down prices and royalties which is clearly not in the best interests of NSW.

It is also worth noting that the IEA is not the only influential energy institution that is projecting a decline in South Korean coal demand. In its New Energy Outlook 2018 report, Bloomberg New Energy Finance (BNEF) sees the South Korean electricity generation mix moving from 72% coal and nuclear in 2017 to 71% gas and renewables by 2050.[13] As the nation's coal and nuclear plants retire, BNEF foresees the electricity system becoming increasingly based on renewables supported by Korea's battery storage manufacturing capacity as well as gas peaking plants.

In its central scenario, the IEA is clearly projecting a major drop in South Korean coal imports. KEPCO Bylong have not adequately responded to this highly significant statement. It is not in the best interests of New South Wales to open up new thermal coal mines in a declining market as it will push down coal prices and royalties.

IEA's Sustainable Development Scenario

The third scenario featured in the IEA's World Energy Outlook 2017 is the Sustainable Development Scenario (SDS) which it describes as follows:

> "This new scenario was developed for WEO-2017 and outlines an integrated approach to achieving internationally agreed objectives on climate change, air quality and universal access to modern energy."[14]

In their response to IEEFA, KEPCO Bylong provide tables copied from the 2017 World Energy Outlook. However, they deliberately cut off the table so that Sustainable Development Scenario projections are left out. For instance, KEPCO Bylong provide Table 5.1 from the WEO 2017 report on page nine of their response to IEEFA but cut off the final two columns. The full table as it appears in the 2017 World Energy Outlook report is shown below in Figure 1. The last two columns outlined in red were left out in KEPCO Bylong's submission.

In our opinion, the final two columns were left out of KEPCO Bylong's response due to the significant decline in thermal coal demand projected under the Sustainable Development Scenario. Under this scenario, global trade in thermal (steam) coal plummets 59% by 2040.

[12] IEA, World Energy Outlook 2017, page 226
[13] BNEF, "New Energy Outlook 2018"
[14] IEA, World Energy Model

Figure 1: World Coal Demand, Production and Trade by Scenario

			New Policies		Current Policies		Sustainable Development	
	2000	2016	2025	2040	2025	2040	2025	2040
Demand	**3 301**	**5 364**	**5 488**	**5 613**	**5 950**	**7 208**	**4 318**	**2 539**
Power generation	2 236	3 320	3 339	3 359	3 731	4 693	2 311	826
Industrial use[2]	856	1 714	1 854	2 040	1 902	2 240	1 733	1 580
Other sectors	209	330	295	214	318	274	274	132
Power generation share	*68%*	*62%*	*61%*	*60%*	*63%*	*65%*	*54%*	*33%*
Production	**3 254**	**5 271**	**5 488**	**5 613**	**5 950**	**7 208**	**4 318**	**2 539**
Steam coal	2 504	4 049	4 319	4 574	4 734	6 040	3 300	1 834
Coking coal	449	967	900	806	923	875	826	595
Lignite*	301	255	269	233	293	293	193	110
Steam coal share	*77%*	*77%*	*79%*	*81%*	*80%*	*84%*	*76%*	*72%*
Trade**	**471**	**1 046**	**1 004**	**1 009**	**1 167**	**1 336**	**783**	**529**
Steam coal	310	756	735	721	875	1 023	546	309
Coking coal	175	292	280	306	301	329	248	233
Production which is traded	*14%*	*20%*	*18%*	*18%*	*20%*	*19%*	*18%*	*21%*

Source: IEA 2017, p. 207

The SDS presents a scenario where nations work to successfully limit climate change and address air pollution – two key issues of rising importance across Asia. Although there can be no guarantee that this is the path that the world will take, there is at least a strong probability that this scenario most accurately represents the energy path forward. In our opinion, this chance will only increase into the future as demand for action on air pollution and carbon emissions continues to escalate.

Coal Price

In response to our questioning of the high coal price assumptions made in the economic assessment of the Bylong Coal Project, KEPCO Bylong note in their defence that their coal price forecast is "considerably lower than current prices".

We would note that current prices are irrelevant as the proposed mine is not currently operating, it is future prices that are relevant to a decades-long coal mining proposal. KEPCO Bylong correctly note that price forecasts can vary from month to month but it is worth noting the latest forecasts from the Federal Government's Office of the Chief Economist (OCE) that have been published since our Expert Review and KEPCO Bylong's response. KEPCO Bylong highlight current coal prices are around US$105/t in their response. The latest Resources and Energy Quarterly Report from the OCE forecasts thermal coal prices dropping significantly to US$73/t (real, spot) by 2020.[15]

[15] Office of the Chief Economist, Resources and Energy Quarterly, September 2018

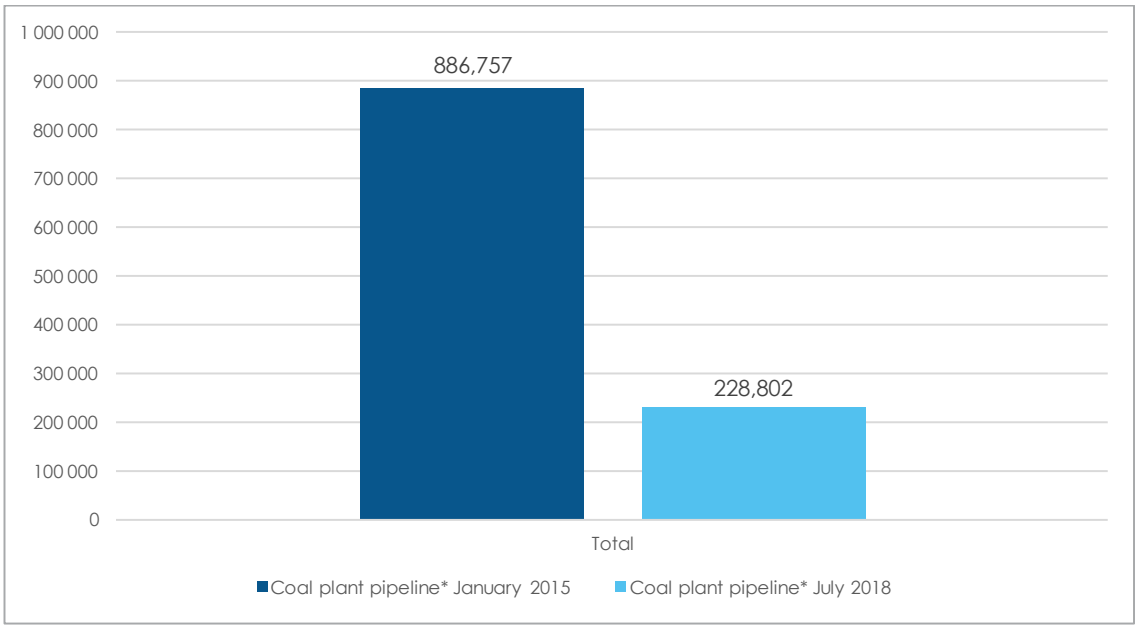
The fact that price forecasts vary over time only serves to highlight how out-of-date Bylong's price assumptions are – the price forecast used by Bylong dates from 2014 and is no longer relevant. Because of the variability of coal price forecasts, the assessment process of any new mine ought to include the requirement for up-to-date pricing assumptions to be used in order for an up-to-date assessment of the economic benefits of a project to be made.

Declining Coal Plant Pipeline

KEPCO Bylong state that there are 286 advanced technology coal-fired power plants planned or under construction around the world, including 11 in South Korea. These figures are referenced from the Office of the Chief Economist's September 2017 Energy and Resources Quarterly report. Already more than a year old, this data is significantly out-of-date.

The latest granular data from the Global Coal Plant Tracker released in July 2018[16] shows how significantly the pipeline of coal-fired power plants across Asia has declined since as recently as 2015 (Figure 2). The Global Coal Plant Tracker provides the most detailed data on global coal-fired power plants currently available and is increasingly referenced by financial and industry press.[17]

Figure 2: Coal Plant Pipeline Across Major Asian Electricity Markets (MW)



Source: Global Coal Plant Tracker.
*Projects that are announced or in the pre-permit or permitted stages of development.

The latest data shows that the pipeline of coal-fired power plants across major Asian markets has declined 74% since the start of 2015 and is expected to continue shrinking. At the current rate, plant retirements will exceed construction as soon as 2022 and the global coal plant fleet will be shrinking from that date onwards. In South Korea itself, there have been 7.5 GW of coal plant projects cancelled or shelved since 2010. Currently there is only one coal-fired

[16] Global Coal Plant Tracker, July 2018
[17] Reuters, "War on coal is heating up, but China is still the key: Russell" 9 October 2018

power proposal left in the pipeline – the Samcheok power project. Projects currently under construction will replace older plants that are to be retired as part of South Korea's efforts to tackle the worst air pollution problem in the OECD.

KEPCO Bylong's data on the new coal-fired power pipeline is out-of-date. The most recent data supports our opinion that the importance of thermal coal to South Korea in the long term is fading significantly and quickly. A new thermal coal mine is not required to support South Korea's energy future.

KEPCO's Energy Transition Continues

Despite KEPCO Bylong's claim in its response about the continuing role of coal in South Korea, KEPCO has itself demonstrated that it is continuing its energy transition away from coal.

At a recent Korean National Assembly hearing, the CEO of Korean Midland Power, a subsidiary of KEPCO, disclosed that its Cirebon 3 coal-fired power proposal in Indonesia has been suspended and will be converted into a renewable energy project.[18] At the same hearing, the CEO of Korean Western Power, another KEPCO subsidiary, disclosed that it was considering turning its Quang Tri 3 coal-fired power project in Vietnam into a renewable energy project.[19]

In a September 2018 report IEEFA's Hong Kong energy finance consultant Melissa Brown, a former securities analyst at JP Morgan and Citigroup, noted that KEPCO can expect difficult questions from investors after the company was included on the Climate Action 100 list. The Climate Action 100 initiative was formed by major investors to engage with carbon emitting companies and help drive the transition to clean energy. Currently 310 investors with US$32 trillion of assets under management have joined the initiative.[20]

With 2019 likely to be a year of heightened investor attention on KEPCO, particularly in light of the coal exit announcement by KEPCO's major global competitor Marubeni Corp. (Japan)[21] and massive shareholder wealth destruction at General Electric (U.S.A)[22], the company can expect scrutiny of how its overseas projects match up to changes in domestic energy policy including South Korea's planned move away from coal and nuclear power and towards renewables and LNG.

This is likely to include tough questions over its overseas projects including the Bylong Coal Project and the controversial Nghi Son 2 coal-fired power plant project in Vietnam according to the September report which stated that "both projects will require meaningful additional investment and have repeatedly raised red flags as project fundamentals come under increased scrutiny given rapid changes in coal power markets."[23]

KEPCO's continuing transition, being further prompted by investors, supports IEEFA's opinion that a new thermal coal mine is not required to meet South Korea's future electricity demand and is therefore not in the best interests of NSW.

[18] Electric Times, "Chubu Electric Power, Chrybon coal power plant", 23 October 2018
[19] SFOC, Trade, Industry and Energy Committee of the Korean National Assembly, 19 October 2018
[20] Climate Action 100
[21] Marubeni, Notification Regarding Business Policies Pertaining to Sustainability, 18 September 2018
[22] Australian Financial Review, "GE's $32b lesson for Australian investors", 2 October 2018
[23] IEEFA, Korea's Clean Energy Challenge – Time for a Check Up, September 2018

Debt Funding

KEPCO Bylong note in their response that the profit and loss calculations used in their discounted cash flow analysis assumes 100% equity funding. This means it is materially over-estimating the amount of profits that will be taxed and hence the economic benefit to NSW. KEPCO Bylong state that, in practice, the level of debt funding "may range from 0% to 60%".

The reality is that presenting a range of 0% to 60% is misleading. Despite KEPCO being a major corporation with a strong balance sheet, there is no chance that the Bylong Coal Project will be 0% debt funded (i.e. 100% equity funded) or anything like that figure. In our experience, major international corporations that initiate resources projects in Australia always fund such projects with the maximum level of debt allowable so as to lower corporation taxes payable. This is done in the best interests of the company's shareholders but it is not in the best interests of NSW.

KEPCO Bylong claim that the reduction in corporation tax payable as a result of debt funding will be compensated for by a 15% reduction in costs that have occurred in the industry since 2015. No supporting statistics are referenced to back up this figure.

Further, reductions in mining costs are primarily the result of automation replacing jobs; We would question whether such assumed cost reductions mean fewer jobs resulting from the proposal and consequently an acknowledgement that the social and economic benefits for NSW are likely to have declined materially.

Institute for Energy Economics and Financial Analysis

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About the Authors

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

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Simon Nicholas is a research 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 and has 16 years' experience working within the finance sector in both London and Sydney at ABN Amro, Macquarie Bank and Commonwealth Bank of Australia.

Important Information