ashurst

UNITED WAMBO OPEN CUT COAL MINE

Submission to the Independent Planning Commission

RESPONSE TO THE FINDINGS IN THE *ROCKY HILL* AND *WALLARAH 2* CASES ON CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS

14 April 2019

ACKNOWLEDGMENTS

Glencore and Peabody Australia provided guidance throughout the preparation of this submission.

We acknowledge the support of Baker McKenzie in respect of Part C of this submission and Appendix 2.

Mark Brennan (Partner) and Guy Dwyer (Senior Associate)
Ashurst

TABLE OF CONTENTS

CLAUSE **PAGE**

GLOSSARY

Abbreviation/Acronym	Meaning
2006 IPCC Guidelines	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
ACA	Australian Coal Alliance
ACARP	Australian Coal Association Research Program
ACCUs	Australian carbon credit units
AGEIS	Australian Greenhouse Emissions Information System
Applicant	United Collieries Pty Ltd
A-USC	Advanced ultra-supercritical
BAU	Business-as-usual
Campbell Report	Expert report produced by Mr Campbell dated February 2019
CCUS	Carbon capture, use and storage
CER	Clean Energy Regulator
CFI Act	*Carbon Credits (Carbon Farming) Act 2011*
CIE	Centre for International Economics
CHPP	Coal handling and preparation plant
COP	Conference of the Parties
CO_2-e	Carbon dioxide equivalent
CTSCo	Carbon Transport Storage Company
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP&A Act	*Environmental Planning and Assessment Act 1979*
EOR	Enhanced oil recovery
ERF	Emissions Reduction Fund
ESD	Ecologically sustainable development
ETS	China's National Emissions Trading Scheme
Export Countries	The most likely countries to which the Project's coal will be exported, being: Japan, China, South Korea, Taiwan, India, Malaysia, the Philippines and Vietnam
FoE	Friends of the Earth

GHG	Greenhouse gas
HEL	Hunter Environment Lobby
HELE	High-efficiency, low-emissions
IEA	International Energy Agency
INDC	Intended Nationally Determined Contribution
IPC	Independent Planning Commission
LE	Life Extension
JCM	Japan's Joint Crediting Mechanism
LULUCF	Land Use, Land-Use Change and Forestry
MIIT	China's Ministry of Industry and Information Technology
Mt	Million tonnes
Mtce	Megatonnes of coal equivalent
MW	Mega watts
NAPCC	India's National Action Plan on Climate Change
NCCAP	Philippines' National Climate Change Action Plan
NCOS	National Carbon Offset Scheme
NDC	Nationally Determined Contribution
NEP	India's National Electricity Plan
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NSW	New South Wales
PAC	Planning Assessment Commission
Project	United Wambo Open Cut Coal Mine
R&M	Renovation and Modernisation
RAPs	Registered Aboriginal parties
Roadmap	South Korea's revised roadmap for achieving the 2030 National Greenhouse Gas Reduction Goal in July 2018
Rocky Hill case	*Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7
ROM	Run-of-mine
SC	Supercritical

SEARs	Secretary's Environmental Assessment Requirements
Steffen Report	Expert report produced by Professor Steffen dated 11 December 2018
t	Tonnes
Transparency Framework	Transparency Framework adopted under the Katowice Climate Package
UNFCCC	*United Nations Framework Convention on Climate Change*
USC	Ultra-supercritical
Wallarah 2 case	*Australian Coal Alliance Inc v Wyong Coal Pty Ltd* [2019] NSWLEC 31
WEO	World Energy Outlook
WEO 2018	World Energy Outlook 2018
Xstrata case	*Xstrata Coal Queensland Pty Ltd v Friends of the Earth, Brisbane Co-op Ltd & Ors* [2012] QLC 13

SUBMISSION TO THE INDEPENDENT PLANNING COMMISSION

1. INTRODUCTION AND PURPOSE OF THIS SUBMISSION

1.1 United Collieries Pty Ltd (the **Applicant**), a subsidiary of Glencore, on behalf of its joint venture with Wambo Coal Pty Ltd, a subsidiary of Peabody, is seeking approval to expand open cut mining operations at the existing Wambo Coal Mine and United Collieries Mine, to allow for the extraction of an additional 150 million tonnes (**Mt**) of run-of-mine (**ROM**) coal over a period of 23 years. The project in respect of which approval is sought, under the State significant development provisions of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**), is known as the United Wambo Open Cut Coal Mine (the **Project**).

1.2 The Project comprises two open cut mining components. The first component involves minor extensions to Wambo Coal Mine's existing open cut mining area, including a material increase in the depth of mining to allow for the extraction of deeper coal seams that underlie the approved Montrose Pit. The second component involves the development of a new open cut mining area on the site of the former United Collieries Mine, an underground mine operating up until 2010.

1.3 A public meeting was held by the Independent Planning Commission (**IPC**) into the Project on 7 February 2019.

1.4 On 8 February 2019, Chief Judge Preston of the NSW Land and Environment Court delivered judgment in the case of *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7 (***Rocky Hill* case**).

1.5 In that case, the Court found that the development application for the Rocky Hill Coal Project should be refused on numerous grounds. In particular, the Court found that the "significant and unacceptable planning, visual and social impacts" of that project warranted refusal on those grounds alone (at [556]). Whilst it was unnecessary for the Court to do so, and did not affect the outcome which the Court had already arrived at, the greenhouse gas (**GHG**) emissions of the Rocky Hill Project and their contribution to climate change was said by the Court to be "a further reason for refusal" (at [556]).

1.6 A little over 1 month later, on 22 March 2019, Justice Moore of the NSW Land and Environment Court delivered judgment in the case of *Australian Coal Alliance Inc v Wyong Coal Pty Ltd* [2019] NSWLEC 31 (***Wallarah 2* case**).

1.7 In that case, the Court rejected a judicial review challenge brought by the Australian Coal Alliance Inc (**ACA**) to the Planning Assessment Commission's (**PAC's**) decision to grant development consent, as the Minister for Planning's delegate, to the Wallarah 2 Coal Project. In rejecting the challenge, Justice Moore rejected three grounds of challenge by ACA concerning the PAC's consideration of climate change and GHG emissions.

1.8 Ashurst has been instructed by the Applicant and its joint venture partner, Wambo Coal Pty Ltd, to make this submission on their behalf. The purpose of this submission is for the Applicant to:

(a) provide the IPC with its position in relation to the findings made in the *Rocky Hill* and *Wallarah 2* cases on climate change and GHG emissions;

(b) detail the reasons why the Applicant considers that:

(i) the findings made in the *Rocky Hill* case on climate change and GHG emissions do not constrain or restrict the IPC from determining the Applicant's development application for the Project by way of granting development consent; and

(ii) the findings made in the *Wallarah 2* case support the approach put forward by the Applicant in this submission as to how the IPC should address the issues of climate change and GHG emissions in determining the development application for the Project;

(c) respond to submissions made in respect of climate change and GHG emissions at, and following, the public meeting into the Project; and

(d) provide the IPC with, or otherwise refer the IPC to, additional information concerning the GHG emissions of the Project and their potential impact on climate change in order to ensure that the IPC has the information it requires for the purpose of making its determination in respect of the Project.

2. STRUCTURE OF THIS SUBMISSION

2.1 This submission is structured into the following substantive parts:

(a) **Part A:** Commentary on the findings made in the *Rocky Hill* and *Wallarah 2* cases on climate change and GHG emissions, including discussion of the relevance of that decision to the IPC's assessment and determination of the development application for the Project

(b) **Part B:** Summary of the impact assessment carried out for the Project

(c) **Part C:** Overview of the climate change law and policy frameworks informing consideration of climate change matters in assessing and determining development applications under the EP&A Act

(d) **Part D:** Demand for coal (thermal and coking), market substitution and carbon leakage

(e) **Part E:** Response to submissions made in respect of climate change and GHG emissions at, and following, the public meeting into the Project

3. EXECUTIVE SUMMARY

3.1 The following key points are raised in this submission:

(a) in **Part A** of the submission:

(i) the Court's decision in the *Rocky Hill* case was the determination of a "merit appeal" whereby the Court "stands in the shoes" of the consent authority for a development application under the EP&A Act, the Court's decision is, therefore, not a legal "precedent";

(ii) the Court's decision in the *Wallarah 2* case was the determination of judicial review proceedings, with the consequence that this case is a legal "precedent" and is, in the Applicant's submission, both binding on and instructive to the IPC as to how the issue of climate change and GHG emissions may be addressed by the IPC in determining the development application for the Project;

(iii) climate change impacts and GHG emissions were not key reasons for the refusal of the Rocky Hill Coal Project, as the Court made clear in [556] of the judgment that the significant and unacceptable planning, visual and social impacts of the proposed project were sufficient reasons alone for refusing the development application for the Rocky Hill Coal Project;

(iv) the *Rocky Hill* case was concerned with the specific facts and circumstances of that proposed mining project;

(v) the IPC, in determining the development application for the Applicant's Project, is not obliged to adopt, consider or follow any particular aspect of the Court's decision in the *Rocky Hill* case, as the Court's decision in the *Wallarah 2* case (which is a binding legal precedent) confirms;

(vi) the IPC is obliged to consider and determine the development application for the Applicant's Project on its own, individual merits, having regard to the environmental assessment material and information that is before it;

(vii) the discharge of such an obligation by the IPC requires it to assess all of the impacts of the Project (both positive and negative), which involves an "intuitive synthesis of the relevant factors" (as recognised at [687] in the *Rocky Hill* case);

(viii) as is evident from the result in the *Wallarah 2* case, the fact that a Project generates GHG emissions does not mean that the starting position for consideration of a development application is that the Project should be refused, and that fact is also not singularly determinative for the purposes of considering a development application made under the EP&A Act for any type of development, coal mining being only one of many types of development which generate GHG emissions;

(ix) there is no government policy or legal principle that dictates the extent to which GHG emissions generated by either the Project or the combustion of the Project's coal by other developments, are to be considered and weighted in determining a development application under the EP&A Act, and there is no prescribed quantitative criteria against which the Project's GHG emissions are to be assessed;

(x) in the absence of any government policy or legal principle that dictates the extent to which GHG emissions generated by either the Project or the combustion of the Project's coal by other developments, must be considered and weighted in the determination of a development application under the EP&A Act, it is for the IPC to determine how much weight it is to accord to the climate change impacts and GHG emissions generated by the Project or the combustion of the Project's coal by other developments, as the Court's decision in the *Wallarah 2* case confirms;

(xi) for the reasons given in Parts C and D of this submission, the Applicant considers that the climate change impacts and GHG emissions generated by the Project or the combustion of the Project's coal by other developments should not outweigh the significant social and economic benefits that the Project will deliver at a local, regional and State level (which are summarised in Part B of this submission and are addressed in other materials already before the IPC, such as the Environmental Impact Statement); and

(xii) based on the information provided by the Applicant to the IPC, including the information contained in its Environmental Impact Statement, Response to Submissions document, its responses to requests for further information and/or reports, this submission and its submission in response to issues raised at the IPC's public meeting on 7 February 2019, the Applicant considers that there is more than sufficient information before the IPC to comfortably reach a conclusion that the benefits of the Project outweigh its impacts.

(b) in **Part B** of the submission:

(i) the Project is to be undertaken on an existing mine site and is bordered by numerous neighbouring mining operations. Mining is thus, for the purposes of clause 12 of the Mining SEPP, an already existing and approved use in the area where the Project is proposed to be carried out, and is likely to continue to be a preferred land use in that area in the coming decades;

(ii) the Project will maximise recovery of the valuable coal resource by combining the existing United and Wambo mines and removing operational constraints, enabling extraction of an additional amount of approximately 150 million tonnes of ROM coal over 23 years;

(iii) as a result of the Project utilising already existing mining infrastructure, the extraction of the valuable coal resource will be conducted in an efficient manner involving low disturbance;

(iv) the Applicant has committed to minimising the extent of additional disturbance required for the carrying out of the Project and, to the extent that additional disturbance associated with the Project could not be minimised, the Applicant has put forward a biodiversity offset package to compensate for the impacts occasioned to native vegetation;

(v) the Project has been designed, and will be implemented, in a manner that makes use of mitigation measures to limit the impacts associated with the Project, including climate change impacts and Scope 1 and Scope 2 GHG emissions that are generated by the Project (noting that Scope 3 GHG emissions are not within the Applicant's control);

(vi) Glencore and Peabody, the parent companies of the Project's joint venture, continue to pursue steps to reduce their carbon footprint and promote the development and deployment of low-carbon technologies by conserving energy and reducing GHG emissions at its operations and advocating for research and key initiatives in low-emissions projects and partnerships;

(vii) the Project's environmental impacts in the surrounding locality will be minimal as a result of the Project being a brownfields expansion of two already well-established mining projects, which have been designed to utilise existing mining infrastructure to the greatest extent practicable;

(viii) the Project will not increase the total number of final voids and, in the process, will avoid environmental costs associated with alternative approaches to treatment of final voids; and

(ix) the Project will generate significant social and economic benefits at a local, regional and State level.

(c) in **Part C** of the submission:

(i) the *Paris Agreement* is one of the key instruments in the international climate change legal framework;

(ii) one of the key features of the *Paris Agreement* is the use of Nationally Determined Contributions (**NDCs**), which are high-level policy plans setting out what approach each country will take to reduce emissions and contribute to the "well below 2°C" goal;

(iii) the importance of avoiding "double counting" of GHG emissions generally, including in the context of calculating a country's GHG emissions for the

purpose of tracking progress towards achievement of its NDC, is well-recognised under international and Australian frameworks addressing climate change and GHG emissions;

(iv) the "carbon budget" approach suffers from numerous deficiencies, including in relation to its inherent uncertainties, its failure to account for technological advancements in management of CO_2 and the absence of any endorsement of the approach under the *Paris Agreement* as a method by which allocation or sharing of global mitigation efforts amongst countries can occur;

(v) the Australian Government has not – in any climate change law or policy – indicated that the development of new coal mines, or expansion of existing coal mines, is to be prohibited or restricted in any way for the purpose of achieving Australia's NDC;

(vi) of the most likely countries that the coal from the Project will be exported to,[1] all are parties to the *Paris Agreement* and either have or are in the process of adopting domestic laws, policies and measures to implement and achieve their NDC targets. In particular:

(A) the countries where the Project's coal is ultimately likely to be burned or combusted (i.e. the source of the Project's Scope 3 emissions) have numerous laws and policies in place for how each respective country intends to achieve its NDC;

(B) it is both appropriate, and consistent with the overarching international climate change framework, for the Project's Scope 3 emissions to be accounted for, regulated and reported by the respective countries that are ultimately responsible for the combustion or use of the Project's coal once it is exported from Australia; and

(C) because of this, the Scope 3 emissions generated by the combustion of the Project's coal should not outweigh the significant social and economic benefits that the Project will deliver at a local, regional and State level.

(vii) there are legal and policy reasons as to why the IPC should not seek to impose any conditions of development consent requiring offset of the Project's GHG emissions.

(d) in **Part D** of the submission:

(i) under all three policy scenarios presented by the International Energy Agency (**IEA**) in its *World Energy Outlook 2018* (**WEO 2018**)[2] (including the Sustainable Development Scenario), there will continue to be a global demand for coal that will need to be serviced by brownfield expansions of existing coal mines (such as the Project that is being considered by the IPC) or the development of new coal mines;

(ii) from the independent modelling undertaken by a coal markets expert engaged by the Applicant (which aligns generally with IEA's New Policies Scenario (the

---

[1] It should be noted, of course, that there may well be other countries to which the Project's coal is exported from time-to-time during the Project's life of mine.

[2] Please refer to the general disclosures concerning the IEA's three policy scenarios in the WEO 2018, in **Appendix 4** of this submission.

IEA's central scenario) and the Current Policies Scenario, but not the Sustainable Development Scenario), it is evident that:

(A) coal will, in 2040, remain an important pillar of electricity generation in many of the world's regions, including in Southeast Asia, as well as in China and India;

(B) high quality coal from Australia (such as that produced by the Project) is, and will continue to be, in demand to meet the electricity generation demands in these regions in particular, as well as global demand more generally;

(C) as the ability of existing mines to service global demand for coal declines (e.g. as a result of exhausting their economically recoverable reserves), it will be necessary for the shortfall in coal demand to be met by brownfield expansions of existing coal mines or the development of new coal mines;

(D) it is logical and preferable for the global coal demand to be met by the supply of higher quality coal resources (such as the Project's coal) than lower quality coal resources, in that the GHG emissions generated by the combustion of lower quality coal will generally be higher due to the fact that more lower quality coal will need to be combusted to achieve an equivalent energy output than what would be produced from the combustion of a higher quality of coal.

(iii) many of the export countries to which the Project's coal is likely to be transported have adopted initiatives directed toward implementation of low emission coal technologies;

(iv) coal investment and supply conditions in Australia have a limited impact on global market conditions;

(v) the Project is a low-cost project when compared with other projects and existing production worldwide, as well as when compared with average country business costs of running coal mines;

(vi) the Project's coal is of a relatively high quality;

(vii) the environmental impacts of switching to alternative supply sources for coal other than the Project would be adverse, because Australian coal (including the Project's thermal coal) is relatively high quality in calorific terms and low in negative attributes such as ash and sulphur;

(viii) this means that substitution by other coal supply sources is likely to result in more physical coal being mined and combusted to meet the same power needs, resulting in higher Scope 3 emissions and concentrations of ash and sulphur;

(ix) moreover, the direct emissions (Scope 1 and 2 emissions) of these alternative supply sources are also likely to be higher, largely due to favourable geology and highly efficient production processes and technologies commonly employed in the Australian mining industry;

(x) two coal supply substitution scenarios are addressed in this submission:

(A) the hypothetical scenario where the Project does not go ahead; and

(B) the hypothetical scenario where the Project and all other known Australian thermal coal projects do not enter the production phase (i.e. new investments are prevented nation-wide).

(xi) in the first hypothetical scenario, the absence of coal supply from the Project is expected to result in the release of an increased quantity of between approximately 1-44 million tonnes of CO_2-e in the atmosphere over the 2019-30 period, whereas in the second hypothetical scenario, the non-Australian alternative supply is expected to release an increased quantity of approximately 154-281 million tonnes of CO_2-e in the atmosphere over the 2019-30 period; and

(xii) therefore, the failure to approve the Project would likely result in a net increase in GHG emissions (particularly indirect Scope 3 emissions) globally due to market substitution of the Project's high quality coal with inferior quality coal.

(e) in **Part E** of the submission:

(i) the Applicant considers that comments about the effects of anthropogenic climate change generally, which are not tied to or made referrable to the determination of the development application for the Project, are of little to no assistance to the IPC's decision-making task;

(ii) the development of new coal mines, or the continuation of existing coal mines, is not prohibited by the operation of international, Australian or NSW laws;

(iii) the prohibition of coal mines is not one of the many measures or mechanisms that Australia has adopted for the specific purpose of meeting its NDC under the *Paris Agreement*; and

(iv) many of the submissions raised in opposition to the Project sit at odds with the existing climate change law and policy framework in Australia and NSW, involve misconceptions of the global demand for coal or ignore important positive features of the Project.

4. PART A: COMMENTARY ON THE FINDINGS MADE IN THE *ROCKY HILL* AND *WALLARAH 2* CASES ON CLIMATE CHANGE AND GHG EMISSIONS, INCLUDING DISCUSSION OF THE RELEVANCE OF THAT DECISION TO THE IPC'S ASSESSMENT AND DETERMINATION OF THE DEVELOPMENT APPLICATION FOR THE PROJECT

Preliminary observations by way of context

4.1 The Applicant considers that it is important to make some preliminary observations in order to situate both the *Rocky Hill* case and the *Wallarah 2* case into their proper context.

4.2 As the IPC would be aware, there has been much commentary in the media about the decision of the Court in the *Rocky Hill* case. A significant proportion of that commentary has been misleading in reporting the findings of the Court in the case, or exaggerating the implications of the findings made on climate change and GHG emissions in that case for future coal mining projects in NSW and, to a lesser extent, other jurisdictions in Australia.

4.3 Generally speaking, a significant proportion of the media commentary has reflected the following observations about the *Rocky Hill* case:

(a) the decision sets a new precedent;

(b) the decision is the first time a court in Australia has considered the climate impacts of coal mining and is a landmark case that will set a very high hurdle for any future coal mine to obtain development consent;

(c) the decision will generally be applicable to any new coal mine in Australia; and

(d) a key reason given by the Court for refusing the Rocky Hill Coal Project was the climate change impacts and GHG emissions generated by the Project.

4.4 Each of these observations is misleading or overstated.

4.5 First, in relation to the suggestion that the decision sets a new precedent and is a landmark case, it should be recognised that the Court's decision in the *Rocky Hill* case was in respect of a merit appeal heard in Class 1 of the Court's jurisdiction.

4.6 When the Court determines merit appeals in Class 1, it is exercising a form of administrative decision-making power,[3] rather than judicial power.[4] The role of the Court in a merit appeal is to "stand in the shoes" of the consent authority for a development application under the EP&A Act, which may be, for example, the IPC, and exercise the functions of the consent authority to reach a determination, on the merits, about whether a particular project should be allowed to proceed or not.

4.7 "Precedent", in law, means "[a] judgment that is authority for later cases with similar facts; a case that is authority for the legal principle contained in its decision".[5] Because the decision-making task performed by the Court in the *Rocky Hill* case involved the exercise of administrative rather than judicial power, the *Rocky Hill* case does not set any "new precedent". As far back as 1960, the courts in NSW have recognised that, in the context of applications made for development consent or planning permission, "each application must be considered on its individual merits and … there is no such thing as binding precedent in these matters".[6]

4.8 In short, the *Rocky Hill* case is not a "new precedent" because, at law, it is not a "precedent" at all.

4.9 As a matter of law, the IPC is not obliged to follow any finding made by the Court in the *Rocky Hill* case on the matter of climate change and GHG emissions in determining the development application that is before it for the Project. The IPC is entitled to take a different approach and view to the issues of climate change and GHG emissions than the Court did in the *Rocky Hill* case, as the decision in the *Wallarah 2* case confirms.

4.10 The IPC is, in accordance with law, obliged to consider the development application for the Project on its own individual merits.

4.11 The status of the *Rocky Hill* case can be contrasted with the *Wallarah 2* case. In that case, Justice Moore was hearing and determining a judicial review challenge brought in Class 4 of the Court's jurisdiction. Justice Moore's role in the case was to review the PAC's decision to approve the Wallarah 2 Coal Project for the purpose of determining whether any legal error was made by the PAC in approving that project. In this respect, unlike the Rocky Hill case, Justice Moore was exercising judicial power in determining the judicial review proceedings before him and, as a result, the *Wallarah 2* case is, at law, a "precedent".

---

[3] See, eg, Linda Pearson and Peter Williams, 'The New South Wales planning reforms: Undermining external merits review of land-use decision-making?' (2009) 26 EPLJ 19 at 27.

[4] *Ku-ring-gai Council v Bunnings Properties Pty Ltd* [2019] NSWCA 28 at [182] per Preston CJ of LEC (Beazley P agreeing).

[5] *LexisNexis Concise Australian Legal Dictionary* (LexisNexis Butterworths, 5th ed, 2015) p 485.

[6] *Shellcove Gardens Pty Ltd v North Sydney Municipal Council* (1960) 6 LGRA 93 at 104 per Sugerman J.

4.12 Therefore, in the Applicant's submission, the *Wallarah 2* case constitutes binding judicial precedent (established after the judgment in the *Rocky Hill* case was handed down) in which the Court found that there was no legal error in a consent authority approving a coal mining project that has Scope 3 emissions, even where:

(i) the combustion of its coal was predicted to generate Scope 3 emissions are significantly greater (by a factor of 7) than those of the Rocky Hill Coal Project; and

(ii) there was no proposal to offset those emissions by way of afforestation of land or otherwise.

4.13 Further, the consent authority, in determining the development application for the Wallarah 2 Coal Project, considered and applied the concept of market substitution in arriving at its decision to grant development consent, and acknowledged that Scope 3 emissions from the combustion of coal (including any potential to abate those emissions) should be dealt with at the location where those emissions are generated or at higher policy levels.

4.14 For completeness, even if it was accepted that the *Rocky Hill* case can be treated as a legal "precedent" (which the Applicant does not accept), the findings made by the Court in that case on climate change and GHG emissions cannot be considered, on any fair reading of the judgment, to form the essential reason for refusing development consent.

4.15 The Court's judgment makes very clear (at [556]) that the "significant and unacceptable planning, visual and social impacts" were the essential reasons why the Court reached the decision it did. The remarks on climate change and GHG emissions were observations that did not form part of the essential reasons for decision. Because of this, even if the *Rocky Hill* case had "precedent" value (which it did not), this would only be true of the parts of the judgment which constituted the essential reasons for decision.

4.16 Secondly, in relation to the claim that the decision is the first time a court in Australia has considered the climate impacts of coal mining and is a landmark case that will set a very high hurdle for any future coal mine to obtain development consent, this overstates the position.

4.17 The *Rocky Hill* case is not the first case to consider climate change issues associated with a new coal mine. Objections to new coal mines on climate change grounds have been relatively common over the past 10 years, and a number of courts throughout Australia have considered these issues previously, including both in the context of merit appeals (like the *Rocky Hill* case) and judicial review proceedings.

4.18 A non-exhaustive list of examples of Australian cases where climate change impacts have been considered in the context of coal mining projects is produced below:

(a) *Wildlife Preservation Society of Queensland Proserpine/Whitsunday Branch Inc v Minister for the Environment & Heritage* [2006] FCA 736;

(b) *Gray v Minister for Planning and Ors* [2006] NSWLEC 720;

(c) *Anvill Hill Project Watch Association Inc v Minister for the Environment and Water Resources* [2007] FCA 1480;

(d) *Hunter Environment Lobby Inc v Minister for Planning* [2011] NSWLEC 221;

(e) *Hunter Environment Lobby Inc v Minister for Planning (No 2)* [2012] NSWLEC 40;

(f) *Xstrata Coal Queensland Pty Ltd v Friends of the Earth, Brisbane Co-op Ltd & Ors* [2012] QLC 13 (***Xstrata* case**);

(g) *Hancock Coal Pty Ltd v Kelly & Ors and Department of Environment and Heritage Protection (No 4)* [2014] QLC 12;

(h) *Adani Mining Pty Ltd v Land Services of Coast and Country Inc & Ors* [2015] QLC 48;

(i) *Coast and Country Association of Queensland Inc v Smith* [2016] QCA 242;

(j) *Australian Conservation Foundation Incorporated v Minister for the Environment* [2016] FCA 1042;

(k) *Australian Conservation Foundation Incorporated v Minister for the Environment and Energy* [2017] FCAFC 134;

(l) *New Acland Coal Pty Ltd v Ashman & Ors and Chief Executive, Department of Environment and Heritage Protection (No 4)* [2017] QLC 24;

(m) *Wollar Progress Association Incorporated v Wilpinjong Coal Pty Ltd* [2018] NSWLEC 92; and

(n) *Australian Coal Alliance Incorporated v Wyong Coal Pty Ltd* [2019] NSWLEC 31.

4.19 Some of these cases were referred to by the Court in the *Rocky Hill* case, and others were not. On the whole, the climate change objections raised by persons in respect of new greenfield coal mines, or expansion of existing coal mines, were unsuccessful, generally because either:

(a) the Court, exercising administrative power in a merit appeal type context, was satisfied, on the evidence before it, that the mine should be approved on the merits and did not consider the climate change impacts or GHG emissions generated by the mine, or the combustion of the mine's coal by other developments, to outweigh the benefits of allowing the mine to proceed; or

(b) the Court, exercising judicial power in a judicial review context, was not satisfied that contentions that an approval authority committed an error of law by failing to consider the climate change impacts or GHG emissions generated by the mine, or the combustion of the mine's coal by other developments, when determining to grant approval to the mine, were made out. In this regard, the *Wallarah 2* case is a recent example where a court has rejected a challenge to a decision to grant planning approval to a coal mining project on grounds which, in part, related to an alleged failure of the decision-maker to consider the climate change impacts or GHG emissions generated by a proposed coal mining project, or the combustion of the coal produced by the proposed coal mining project.

4.20 Thirdly, for the reasons already given in relation to the issue of "precedent", it is incorrect to assert that the decision and reasoning in *Rocky Hill* case will be applicable to any new coal mine in Australia. The *Rocky Hill* case has no legal "precedent" value in NSW, much less so in the context of other Australian jurisdictions.

4.21 For example, the decision in the *Rocky Hill* case sits uncomfortably with a series of decisions of the Queensland Land Court (as to which, see paragraph 4.18 above) where climate change impacts and GHG emissions were considered but ultimately not found to outweigh the benefits associated with the particular mining project before the Queensland Land Court.

4.22 It would be useful, at this point, to provide a summary of the relevant decisions from the Queensland Land Court that have involved consideration of climate change issues in the context of coal mining proposals.

4.23 The most useful starting point for consideration of the Queensland cases is the decision of President MacDonald in the *Xstrata* case.

4.24 In that matter, Xstrata Coal (along with two other applicants) had applied for three mining leases and an associated environmental authority in respect of a proposed open cut coal mine near the Wandoan township in the Surat Basin. The role of the Land Court was to conduct a hearing into the applications for the grant of the mining leases and environmental authority and objections made to the grant of those statutory approvals, so as to then make recommendations to the relevant Minister about whether those statutory approvals should be granted and, if so, what conditions should be imposed on the grant of those approvals (at [18]). Thus, the Land Court's task was very much in the nature of a merits hearing, involving the exercise of administrative rather than judicial decision-making power.

4.25 As noted by the President (at [52]), there were two broad categories of objectors: landowners (who generally had private property concerns) and Friends of the Earth (**FoE**) (who raised concerns about the environmental impacts of the proposed project, including on climate change).

4.26 In relation to climate change, Xstrata (and the other applicants) submitted that (amongst other matters):

(a) a company is not responsible for Scope 3 emissions under either Commonwealth or international law. Rather, Scope 3 emissions are the legal responsibility of others who will account for them as Scope 1 or Scope 2 emissions (at [491]);

(b) emissions from coal sold to a power station for electricity generation will be reported by the power station as part of their Scope 1 emissions (at [497]);

(c) approximately 99% of the project's GHG emissions will be attributable to end-use of the coal for electricity production which will occur predominantly, if not totally, overseas (at [503]); and

(d) the demand for coal for electricity production would exist regardless of the location of the source – i.e. "stopping the project will not affect the amount of coal actually burned globally" (at [503]).

4.27 FoE's submissions in response included the following:

(a) the Court ought to recommend refusal of the project because GHG emissions will result from the project and will contribute to climate change (at [511]); and

(b) while the supply of coal from elsewhere in the world is a relevant consideration, the Court is primarily concerned with assessing the impact of this individual mine, not other mines that are not subject of this application and are not subject to the jurisdiction of the Court (at [512]).

4.28 President MacDonald made numerous findings in relation to climate change factors. Several of those findings were concerned with matters of the correct statutory construction of provisions contained in the relevant Queensland statutes (e.g. finding that Scope 3 emissions are not a relevant consideration under s 269(4)(j) of the *Mineral Resources Act 1989* (Qld) in determining whether to recommend the grant or refusal of a mining lease). Other findings were of a more general nature.

4.29 One of the findings that was of a more general nature concerned the issue of "carbon leakage". As the Court explained in the *Rocky Hill* case (at [535]):

> [carbon leakage can occur] where, as a result of more stringent climate policies or more stringent application of climate policies in a country, businesses move their production from that country to other countries with less ambitious climate policies or less ambitious application of climate policies, which can lead to a rise in global GHG emissions.

4.30 In the *Xstrata* case, President MacDonald stated (at [558]) that she was "not persuaded that the GHG impacts justify refusal of the proposal". The President then went on to say the following (underlining added):

> [559] In the first place, it is difficult to see from the evidence that this project will cause any relevant impact on the environment. In the *Wildlife Preservation Society* case, Dowsett J said that "[t]he relevant impact must be the difference between the position if the action occurs and the position if it does not". In this case, the applicants say that stopping the project will have a negligible impact on climate change because other coal will be mined elsewhere which will in turn produce the same or higher amounts of emissions when burned. They rely on the evidence of Mr Simes and Mr Stanford, who are experts on the economics of coal markets. In general terms, their opinion was that if the project does not proceed, there will be no impact on global demand for coal because that demand will be satisfied from another source. In other words, stopping the project will have no impact on climate change because it will have no impact on the global demand for coal and therefore no impact on global GHG emissions.
>
> …
>
> [570] … [E]ven on the most favourable interpretation of the FoE's submissions, that is, if it is assumed that it is sufficient to establish a general adverse environmental impact, such as a contribution to increased global warming, the evidence indicates a comparatively minor impact on the environment in terms of its GHG emissions. I do not consider therefore that the extent of the impact of the scope 1 and 2 emissions of the operations has been proved to be such as to warrant refusal of the proposed MLs.
>
> …
>
> [581] The evidence has established that the project will make significant economic contributions on a local, State and Commonwealth level. Although it is not disputed that the project will generate GHG emissions that will contribute to climate change, the evidence was that stopping the project will not result in any, or any substantial difference, in the levels of GHGs in the atmosphere. As previously mentioned, if the project proceeds, the evidence indicated that it will have a comparatively minor impact on the environment in terms of its GHG emissions. Balancing all these factors, I am not persuaded that the FoE's climate change objections justify a refusal of the proposed mining leases on public interest grounds.
>
> …
>
> [603] Most of the evidence led by the FoE centred on GHG emissions from the use of the coal in power stations, ie. scope 3 emissions. In my view, this evidence is irrelevant to the Court's task under the EPA.
>
> [604] The evidence establishes that the project's scope 1 and 2 emissions will contribute to climate change. The FoE contend that this issue should outweigh all other factors to be taken into account in the assessment of the project and that this should lead to a recommendation that the environmental authority be refused. I do not accept that submission. It also follows from what I have said above that I do not consider that the project is unsustainable within the meaning of s.3 of the EPA.
>
> [605] As discussed above in the context of the MRA, the project will make significant economic contributions on a local, State and Commonwealth level which is relevant to a consideration of the public interest … Stopping the project will not result in any, or any substantial, difference in the levels of GHGs in the atmosphere. If the project proceeds, the evidence indicates that it will have a comparatively minor adverse impact on the environment in terms of its GHG emissions. In the circumstances, I do not consider that the climate change issue outweighs all other issues so as to justify a recommendation under the EPA that the EA be refused.

4.31 Thus, in this case, President MacDonald found that Scope 3 emissions were not relevant to the decision-making task before her concerning the mining leases but, if she was wrong in that finding, she accepted the "carbon leakage" argument that the project would not result in any, or any substantial, difference in the levels of GHGs in the atmosphere and that, if she was to refuse the project, it will have no impact on climate change because it will have no impact on the global demand for coal. She ultimately rejected FoE's submission that the Court ought to recommend that the statutory approvals for the project be refused on the basis of its GHG emissions and contributions to climate change.

4.32 The subsequent decision of a different member of the Queensland Land Court in *Hancock Coal Pty Ltd v Kelly & Ors and Department of Environment and Heritage Protection (No 4)* [2014] QLC 12 generally adopted the same approach as President MacDonald in the *Xstrata* case. In particular, at [221]-[232], Member Smith made the following observations of relevance:

> [221] There is no dispute on the evidence that Hancock will mine thermal coal. Thermal coal is used for burning in power stations to cause the generation of electricity. It is also not in contention in this case that the burning of the thermal coal (or, in other words, the Scope 3 emissions) will occur overseas, in Asia, most probably in India or China.
>
> [222] As Hancock put it in its submissions:
>
> > The world has abundant coal resources. The amount of coal combusted in the world, including for the purposes of generating electricity, is driven by demand. That is to say, global supplies exceed demand such that preventing a particular mine from proceeding will not lead to demand not being met. Rather, the demand would be met from another source. To take a simple example, India's coal requirements for electricity generation will not abate merely because it is unable to source that coal from one mine in Australia. That is because, rather than leave its citizens without electricity, India would simply obtain the coal from another source. There was a substantial body of evidence to this effect.
>
> …
>
> [228] Hancock provides forceful submissions on this aspect in their reply submissions filed 23 October 2013 where they say:
>
> > But whatever figure is taken, this evidence which CCAQ itself refers to and therefore accepts as reliable, demonstrates the proposition that there are more than enough globally proven (in the sense of economically recoverable) reserves to supply demand in the event the Alpha mine does not proceed.
> >
> > Rather than address this matter as a relevant fact, CCAQ attempts to dismiss it in other parts of its submissions as "the hypothetical possibility of an alternative mine in a foreign country". CCAQ makes no attempt to meet the proposition. In consequence the evidence is all one way [in favour of Hancock] …
>
> [229] I agree with Hancock's reply submissions. This has the result that, even if both myself and President MacDonald are wrong in our assessment of the proper methods for dealing with climate change under the MRA and the EPA, the evidence [before the Court] would necessarily lead to the conclusion that global Scope 3 emissions will not fall if Alpha does not proceed as the coal will simply be sourced from somewhere else.
>
> [230] Put another way, it is the demand for electricity to the extent that it is met by coal-fired generators that causes the Scope 3 emissions, and the facts as set out in this case clearly show that Alpha is but one of a myriad of suppliers, both local and around the world, who will seek to meet this existing demand.
>
> [231] I can sympathise with the position of the objectors who see GHG emissions rising, and the likely adverse climate change consequences that will flow should nothing be done to alter the course that the world is heading down. I have no reason to doubt the eminent expert evidence that was presented in this case to that effect. However, I must on the evidence of this case determine that it is the demand for coal-fired electricity, and not the supply of coal from coal mines, which is at the heart of the problem.
>
> [232] Clearly, the possibility of dire consequences from climate change is a matter which falls to be addressed by the international community and the Federal Government. Even if it were within the jurisdiction of this Court (which apart from "Public Interest" principles I have found it not to be) then the clear and unambiguous facts of this case show that there will be no reduction of GHGs if the Alpha mine is refused and, indeed, depending on the source of replacement coal, such replacement coal may well, on the evidence, result in an increase in GHG emissions.

4.33 These findings of Member Smith were not disturbed on appeal to either the Supreme Court of Queensland or the Queensland Court of Appeal: see *Coast and Country Association Inc v Smith & Ors* [2016] QCA 242. In particular, Justice Fraser of the Court of Appeal (with whom Justice Morrison agreed) found that Member Smith was entitled, on the evidence before him, to find that, if the proposed mine did not proceed the power stations that would have burned coal from the mine would instead burn the same quantity of coal from other mines and there would be no difference in Scope 3 emissions. Further, the Member was entitled to have regard to that finding in making his decision.

4.34 Member Smith adopted the same approach in his decision in *New Acland Coal Pty Ltd v Ashman & Ors and Chief Executive, Department of Environment and Heritage Protection (No 4)* [2017] QLC 24. At [1091] to [1094], Member Smith relevantly said:

> [1091] Some points in this case are not contentious, just as they were not contentious in *Hancock*. For instance it is not contentious in this case that the burning of thermal coal (or in other words, Scope 3 emissions) will occur predominantly overseas, in Asia. Also, just like in *Hancock*, the science of climate change is not of itself an issue in this matter, although some of the objectors who object on the basis of climate change led evidence as to the global impact of climate change. It is therefore unnecessary for me to consider in any detail the exhibits tendered relating to climate change as a science.

> [1092] I accept the joint evidence of Mr Campbell and Mr Williams set out above, as well as the individual evidence of Mr Williams on climate change also set out above. In many respects, the evidence of Mr Williams that, in effect, if the Revised Expansion Project does not proceed New Hope's customers will obtain their coal from another source and that source will likely be of a lower quality than the NAC coal and so potentially greenhouse gas emissions may increase depending upon the country involved and the quality of the coal used for Stage 3 purposes, is telling.
>
> [1093] Having made the above findings of fact, it must follow as a logical consequence that I must accept the submissions of NAC regarding climate change. The law with respect to the considerations to be taken into account by this Court in hearing MRA and EPA climate change objections has clearly been settled by *Hancock* and the various appeals in that case. The facts as found in this case are in effect identical to the facts as I found at first instance in *Hancock*, so it follows that I must reach the same conclusion in this case as I did in *Hancock*.
>
> [1094] The objections in so far as they relate to climate change with respect to both the MRA and the EPA have not been made out.

4.35 Whilst Member Smith's decision in the *New Acland* case was set aside by the Supreme Court of Queensland (see *New Acland Coal Pty Ltd v Smith & Ors* [2018] QSC 88), it is relevant to note that the paragraphs extracted above from the Member's decision were not challenged or doubted by the Supreme Court. Member Smith's decision was set aside on other grounds.

4.36 Thus, the approach taken by the Queensland Land Court to considering the issue of climate change and GHG emissions has been endorsed by both the Supreme Court of Queensland and the Queensland Court of Appeal. One disappointing aspect of the *Rocky Hill* judgment was the absence of any detailed engagement with the Queensland case law, noting that an incomplete and selective reference was made to it at [502] in the Court's decision.

4.37 Even in NSW, it must be acknowledged that the most recent legal precedent on the requirement to consider climate change impacts and GHG emissions is the *Wallarah 2* case. In the Applicant's submission, that case is instructive to the IPC as to how the issue of climate change and GHG emissions may be addressed by the IPC in determining the development application for the Project.

4.38 In that case, the ACA raised 10 grounds of challenge in the proceedings. Three of these 10 grounds were related to climate change and GHG emissions (i.e. Grounds 1 to 3). Those grounds of challenge, in short, were:

(a) **Ground 1:** the PAC failed to consider the downstream GHG emissions (including Scope 3 emissions) generated by the combustion of the project's coal by other developments when determining to grant development consent for the project or determining whether or not to impose conditions on the development consent for the project to regulate GHG emissions;

(b) **Ground 2:** the PAC failed to consider clause 14(2) of the Mining SEPP (in effect or substance, this was the same allegation that formed Ground 1). Clause 14 of the Mining SEPP relevantly states:

> **14 Natural resource management and environmental management**
>
> (1) Before granting consent for development for the purposes of mining … the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:
>
> (a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,
>
> (b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,
>
> (c) that greenhouse gas emissions are minimised to the greatest extent practicable.

> (2) Without limiting subclause (1), in determining a development application for development for the purposes of mining … the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.

(c) **Ground 3:** the PAC failed to consider principles of ecologically sustainable development, including the precautionary principle and principle of intergenerational equity, by failing to consider the downstream GHG emissions (including Scope 3 emissions) generated by the combustion of the project's coal by other developments.

4.39 Justice Moore rejected all of Grounds 1 to 3.

4.40 In short, the key observations made by Moore J in addressing, and ultimately rejecting, Grounds 1 to 3 are as follows:

(a) it was common ground that the PAC was required to discharge, as the consent authority, the obligations imposed on it by clause 14(2) of the Mining SEPP (at [31]);

(b) that obligation required the PAC to consider an assessment of GHG emissions including Scope 3 emissions (at [32]);

(c) the proceedings before Chief Judge Preston in the Rocky Hill case were "entirely different in nature" from the proceedings brought before the Court concerning the Wallarah 2 Coal Project (at [36]);

(d) there was much material before the PAC that addressed climate change and GHG emissions, including Scope 3 emissions (see generally [49]-[66]). In particular, the Court identified and discussed the following material of relevance:

> [52] Critical to my consideration of Grounds 1 to 3 pressed by the Applicant, this portion of the PAC's Determination Report then continued saying:
>
> > The Commission also acknowledges the greenhouse gas emissions that would be produced from any future burning of the coal extracted, whether it is consumed locally or internationally. It is noted that presently there are alternative coal sources available to the market in the event that this mine does not proceed. Consequently, the downstream use of the coal (and any emissions abatement or capture technologies deployed) will need to be considered at that location.
>
> …
>
> [61] The next relevant document was the Department's Preliminary Assessment Report. The relevant section is reproduced below (Evidence Book, folios 1701 and 1702):
>
> > 5.7.3 Greenhouse Gas Emissions
> >
> > The EIS includes an assessment of greenhouse gas (GHG) emissions and potential impacts, undertaken by PAEHolmes.
> >
> > The Department acknowledges the potential climate change impacts caused by the burning of coal and other fossil fuels to provide the energy needs of various human societies, but does not consider that these in themselves should necessarily preclude the approval of the project. Rather, consideration of potential GHG impacts needs to be balanced, with due consideration given to:
> >
> > - the project's particular contribution to global warming/climate change
> > - whether refusing the development application would reduce global GHG emissions;
> > - the benefits of the project, including job creation and its contribution to the NSW economy;
> > - the objects of the EP&A Act, including the encouragement of ESD; and
> > - available GHG impact mitigation measures.
> >
> > The GHG assessment calculates direct and indirect GHG emissions associated with the project, including 'Scope 1' emissions (ie direct GHG emissions from sources controlled by WACJV), 'Scope 2' emissions (ie indirect emissions associated with the import of electricity for use in the project) and 'Scope 3'

> emissions (ie other indirect emissions, such as those associated with the downstream combustion of the product coal). The calculated GHG emissions associated with the project are shown in Table 9.
>
> The assessment indicates that the vast majority (97.76%) of the total GHG emissions generated as a consequence of the project are those associated with the downstream burning of the product coal for energy production purposes – ie Scope 3 indirect emissions. The Department is satisfied that the project's contribution to annual global GHG emissions, even when assessed on a full life-cycle basis (ie including downstream GHG emissions) would be very small.

[62] The Preliminary Assessment Report then reproduced a table which was, in effect, a summary of what had been set out in the greenhouse gas scope calculations in the EIS. It then continued:

> It must be noted that if the project was not allowed to proceed, the resultant gap in the thermal coal supply would be almost certainly filled by another coal resource, sourced either from elsewhere in NSW, Australia or overseas. In other words, preventing GHG emissions from the project would not result in any decrease in global CO_2 emissions. This point illustrates the reality that the key response to the issue of climate change needs to be made at a national and international policy or strategic planning level, outside and above the project assessment process in NSW.

(e) the ACA was seeking to employ an impermissible "fine-tooth comb" approach to contending that the PAC's reasons for decision (as reflected, non-exhaustively, in its Determination Report) revealed legal error on the basis of a failure to consider climate change and GHG emissions as required by clause 14(2) of the Mining SEPP (at [79]);

(f) there was material before the PAC that addressed Scope 3 emissions either expressly or by necessary implication and, in particular, there were passages from the PAC's Determination Report which were "sufficient to establish that the PAC has had regard [to], as it was obliged to by cl 14(1) and (2) of the Mining SEPP, the question of downstream emissions that will arise from the burning of the coal proposed to be produced from this mine, and that it has considered what conditions were appropriate to consider imposing and then actually impose concerning greenhouse gas emissions" (at [84]);

(g) the existence of this material was considered to be "a complete answer to Grounds 1 and 2" (at [85]);

(h) it did not matter whether or not the text of clause 14(2) of the Mining SEPP was referred to frequently or infrequently. The absence of (repeated) references to clause 14(2) of the Mining SEPP would not invalidate the development consent granted by the PAC if the PAC's Determination Report "has adequately addressed the substance of what would be required to satisfy the terms of the provision despite the fact that it was not expressly referenced. I am satisfied that that is here the case" (at [86]-[87]);

(i) in relation to the ACA's contention that the downstream emissions should have been dealt with in the context of the coal mining development before the PAC, rather than being deferred for consideration in the context of GHG emissions at the location of the burning of the coal proposed to be extracted from the mining development, the Court observed that the material before the PAC supported the finding that the PAC:

> ... did consider the issue of whether or not it was appropriate or possible to apply conditions to this consent dealing with Scope 3 emissions but that the PAC concluded that the appropriate place to deal with such emissions was at the location where they were caused to be emitted by the burning of the coal proposed to be produced by this mine or at the higher policy levels discussed in the earlier extract at [62].

(j) there was, again, material before the PAC (and statements in its reports) which supported the conclusion being reached that principles of ecologically sustainable development (**ESD**) were considered as required by law (at [99]-[105]). In particular, the Court noted the following relevant observations made in the PAC's Determination Report under the heading "intergenerational equity" (extracted at [99] in the judgment):

> The Department acknowledges that coal and other fossil fuel combustion is a known contributor to climate change, which has the potential to impact future generations. However, it also recognises that there remains for the foreseeable future a clear need to continue to mine coal deposits to meet society's basic energy needs. The Department also notes that climate change is a global phenomenon, the project's contribution to climate change would be very small and that WACJV has considered greenhouse gas mitigation measures. The Department also acknowledges that the downstream energy and other socio-economic benefits generated by the amended project would benefit future generations, particularly through the provision of international energy needs.

4.41 Fourthly, commentators' statements that the key reason given by the Court for refusing the Rocky Hill Coal Project was the climate change impacts and GHG emissions associated with the Project, is wrong. As already noted, the Court (at [556]) indicated that the "significant and unacceptable planning, visual and social impacts" of the Rocky Hill Coal Project warranted refusal of that project in and of themselves. It was these impacts that were the key reasons for refusing the Rocky Hill Coal Project. Climate change impacts and GHG emissions were cited as a "further reason for refusal", but were certainly not the key reasons why the Rocky Hill Coal Project was refused.

Relevance of the Rocky Hill case and the Wallarah 2 case to the IPC's assessment and determination of the development application for the Project

4.42 In concluding Part A of this submission, the Applicant considers it would be useful for it to outline its position on the relevance of the *Rocky Hill* case and the *Wallarah 2* case to the IPC's assessment and determination of the development application for the Project. To this end, the key points the Applicant would make are as follows:

(a) the Court's decision in the *Rocky Hill* case was the determination of a "merit appeal" whereby the Court "stands in the shoes" of the consent authority for a development application under the EP&A Act, the Court's decision is, therefore, not a legal "precedent";

(b) the Court's decision in the *Wallarah 2* case was the determination of judicial review proceedings, with the consequence that this case is a legal "precedent" and is, in the Applicant's submission, both binding on and instructive to the IPC as to how the issue of climate change and GHG emissions may be addressed by the IPC in determining the development application for the Project;

(c) climate change impacts and GHG emissions were not key reasons for the refusal of the Rocky Hill Coal Project, as the Court made clear in [556] of the judgment that the significant and unacceptable planning, visual and social impacts of the proposed project were sufficient reasons alone for refusing the development application for the Rocky Hill Coal Project;

(d) the *Rocky Hill* case was concerned with the specific facts and circumstances of that proposed mining project, particularly its location;

(e) the IPC, in determining the development application for the Applicant's Project, is not obliged to adopt, consider or follow any particular aspect of the Court's decision in the *Rocky Hill* case, as the Court's decision in the *Wallarah 2* case (which is a binding legal precedent) confirms;

(f) the IPC is obliged to consider and determine the development application for the Applicant's Project on its own, individual merits, having regard to the environmental assessment material and information that is before it;

(g) the discharge of such an obligation by the IPC requires it to assess all of the impacts of the Project (both positive and negative), which involves an "intuitive synthesis of the relevant factors" (as recognised at [687] in the *Rocky Hill* case);

(h) as is evident from the judgment in the *Wallarah 2* case, the fact that a Project generates GHG emissions does not mean that the starting position for consideration of a development application is that the Project should be refused, and that fact is also not singularly determinative for the purposes of considering a development application made under the EP&A Act for any type of development, coal mining being only one of many types of development which generate GHG emissions;

(i) there is no government policy or legal principle that dictates the extent to which GHG emissions generated by the Project, or the combustion of the Project's coal by other developments, are to be considered and weighted in determining a development application under the EP&A Act, and there is no prescribed quantitative criteria against which the Project's GHG emissions are to be assessed;

(j) in the absence of any government policy or legal principle that dictates the extent to which GHG emissions generated by the Project, or the combustion of the Project's coal by other developments, must be considered and weighted in the determination of a development application under the EP&A Act, it is for the IPC to determine how much weight it is to accord to the climate change impacts and GHG emissions generated by the Project or the combustion of the Project's coal by other developments, as the Court's decision in the *Wallarah 2* case confirms;

(k) for the reasons given in Parts C and D of this submission, the Applicant considers that the climate change impacts and GHG emissions generated by the Project or the combustion of the Project's coal by other developments should not outweigh the significant social and economic benefits that the Project will deliver at a local, regional and State level (which are summarised in Part B of this submission and are addressed in other materials already before the IPC, such as the Environmental Impact Statement); and

(l) based on the information provided by the Applicant to the IPC, including the information contained in its Environmental Impact Statement, Response to Submissions document, this submission and its submission in response to issues raised at the IPC's public meeting on 7 February 2019, the Applicant considers that there is more than sufficient information before the IPC to comfortably reach a conclusion that the benefits of the Project outweigh its negative impacts.

5. PART B: SUMMARY OF THE IMPACT ASSESSMENT CARRIED OUT FOR THE PROJECT

Overview

5.1 The Project has been subject to extensive environmental impact assessment that has been carried out over the course of the last four years or so, since the Preliminary Environmental Assessment for the Project was prepared and finalised in June 2015. The key features of the Project have already been described and assessed elsewhere in material before the IPC, particularly the Applicant's Environmental Impact Statement, its Response to Submissions document, its Response to the Independent Planning Commission Recommendations (dated July 2018) and the submission the Applicant has provided to the IPC in response to the issues raised at the public meeting held on 7 February 2019.

5.2 It is not intended, in this submission, to repeat *ad nauseam* the impact assessment material that is before the IPC and which has, no doubt, been carefully considered by the IPC already. Rather, in this Part B of the submission, the Applicant wishes to provide a brief summary of the impact assessment evidence that is already before the IPC in relation to the Project, so as to refresh the IPC's understanding of the material before it about the Project and to assure the IPC that there is more than sufficient material before it to determine the development application before it by way of granting development consent to the Project.

5.3 This Part B of the submission will consider 10 particular features of the Project and provide reasons as to why the IPC can be satisfied, on the material that is before it, that the development application for the Project can be approved.

Feature 1: The location of the Project

5.4 In section 1.6 of the EIS for the Project, the following observations are made about the context of the Project site:

> **1.6 Site Context**
>
> **1.6.1 Environmental Setting**
>
> The Project Area is dominated by existing mining including open cut mining areas, underground mining infrastructure associated with United and the existing Wambo Open Cut along with areas of rehabilitated land and native vegetation (refer to Figure 1.2). The majority of the remainder of the Project Area has been historically cleared, with an analysis of historical aerial photography indicating that most of the area had been cleared by the 1960s (refer to Section 6.3). As discussed in Section 1.2, United and Wambo have a number of existing mining tenements which cover the entirety of the Project Area with the exception of the Golden Highway (refer to Figure 1.3).
>
> The Project Area exists within a locality dominated by mining (refer to Figure 1.6) and is surrounded by other mining operations, including Wambo's underground operations and Coal and Allied's Hunter Valley Operations (HVO) and their associated mine owned land. Several other mines are located further south including Mount Thorley Warkworth and Bulga Mine (refer to Figure 1.2). Outside of mine owned land, the local area is dominated by agricultural land uses, predominantly grazing, and the Wollemi National Park to the west.

5.5 As can be appreciated from this passage from the EIS, the Project is located in a part of the Hunter Valley that has been subject to extensive coal mining operations for approximately 50 years. The Project is to be undertaken on an existing mine site (for which the mining tenements are already held by the proponents) and is bordered by numerous neighbouring mining operations. Mining is thus, for the purposes of clause 12 of the *Mining SEPP*, an already existing and approved use in the area where the Project is proposed to be carried out, and is likely to continue to be a preferred land use in that area in the coming decades.

5.6 The proposed Project is located in an established mining domain where there are very few privately-owned properties within close proximity to the Project's mining area. Further, given the fact that the dominant land use in the vicinity of the Project is mining, the potential for land use conflict is relatively insignificant.

Feature 2: Brownfields operation with high output and low disturbance

5.7 The Project may be accurately described as a brownfields expansion with high output and low disturbance.

5.8 As noted in the EIS, the Project involves open cut mining in two areas:

(a) the proposed United Open Cut; and

(b) the ongoing mining of the approved Wambo Open Cut with a proposed minor surface boundary extension in addition to a depth increase to maximise coal recovery.

5.9 The Project will maximise recovery by combining these two mines and removing operational constraints, enabling extraction of an additional amount of approximately 150 million tonnes of ROM coal over 23 years.

5.10 The Project is anticipated to deliver up to 10 million tonnes per annum of ROM coal from the combined operations of the United and Wambo Open Cuts. The Project will deliver ROM coal to the Wambo coal handling and preparation plant (**CHPP**) along with coal deliveries from the Wambo underground. Total production deliveries to the Wambo CHPP will be

limited to the currently approved production rate of 14.7 million tonnes per annum of ROM coal.

5.11 As a result of the Project utilising already existing mining infrastructure, the extraction of the valuable coal resource will be conducted in an efficient manner involving low disturbance.

Feature 3: Disturbance Footprint

5.12 Section 3.11 of the EIS relevantly described the disturbance footprint for the Project as follows:

> **3.11 Project Disturbance Area**
>
> Most activities associated with the construction or carrying out of the Project involve some degree of surface disturbance although much of the affected land has been previously disturbed by existing or historical activities, or is currently approved for disturbance …
>
> Where possible, as part of the implementation of the Project, activities will be undertaken in a manner that limits the amount of physical ground disturbance. However, this is not always possible, nor is it possible to accurately identify every area within the Project Area that will remain intact or will be disturbed. **Figure 3.25** identifies the areas within the Project Area that have been identified as potentially being disturbed as a result of the Project. Due to the difficulty in accurately defining the precise location of access tracks, infrastructure alignments and water management infrastructure and impact areas associated with the development of the Project components over the life of the Project, buffers around areas that are known to be, or are likely to be, disturbed as a result of the Project, have been applied so that the maximum potential footprint of the Project has been identified and assessed.
>
> Components of the Project Area have been disturbed by previous United and Wambo mining operations or, as discussed above, are approved to be disturbed by Wambo's mining operations. The total conceptual additional disturbance area (hereafter referred to as the additional disturbance area) is shown on **Figure 3.25**.

5.13 The EIS indicated that the carrying out of the Project would involve an additional disturbance area of approximately 714 hectares, within which area exists one critically endangered ecological community listed under the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) and four threatened ecological communities listed under NSW legislation (now the *Biodiversity Conservation Act 2016*).

5.14 As a result of further environmental impact assessment work carried out by the Applicant after the EIS was completed, the total extent of the additional disturbance area has been reduced from 714 hectares to 673 ha, which includes:

(a) disturbance of 527 ha of vegetation (approximately 17% of the total Project Area, which is 3,032 ha) and includes 247 ha of Central Hunter Valley Eucalypt Forest and Woodland CEEC; and

(b) re-disturbance of 146 ha of cleared land that has been previously cleared for mining purposes (including disturbed land, mixed species revegetation plantation and water bodies).

5.15 The Applicant has committed to minimising the extent of additional disturbance required for the carrying out of the Project and, to the extent that additional disturbance associated with the Project could not be minimised, the Applicant has put forward a biodiversity offset package to compensate for the impacts occasioned to native vegetation.

Feature 4: Biodiversity offset package

5.16 As noted in the IPC's Review Report of 2018, the Applicant's biodiversity offset package comprises the following elements:

(a) upfront land-based biobanking sites, each comprising a mix of native vegetation communities and derived native grassland areas, including:

(i) Highfields Offset site (428 ha);

(ii) Mangrove Offset site (259 ha);

(iii) Wambo Offset site (334 ha);

(iv) Jerrys Plains Offset site (275 ha);

(v) Brosi Offset site (215 ha); and

(vi) South Wambo Offset site (265 ha).

(b) mine site rehabilitation of threatened vegetation communities across the final landform contributing 16 per cent of the overall biodiversity offset requirement (878 ha); and

(c) contributing funding to established biodiversity offset funds.

5.17 The Applicant will progressively retire biodiversity credits generated for the Project in three stages, accepted by the Department of Planning and Environment (**DP&E**) and the Office of Environment and Heritage (**OEH**) with disturbance stages of approximately 7 years. The staged approach would allow the Applicant to benefit from any further reductions in the Project's disturbance area through a reduction in biodiversity credits that need to be retired, thus providing the Applicant with the incentive to minimise disturbance throughout the life of the Project.

5.18 In relation to each of the three stages for retirement of biodiversity credits, the Applicant would note that:

(a) all credits generated for Stage 1 will be retired within 12 months of commencement of Phase 1A of the Project (100% of the required offsets for Stage 1 have been secured using land based offsets and the biodiversity fund); and

(b) all credits for Stages 2 and 3 will be retired before commencing disturbance within those areas, with the Applicant continuing to make efficient progress in identifying and acquiring offset properties (e.g. the recent inclusion of the South Wambo Offset property).

5.19 In relation to the biodiversity offset required for the purpose of approval of the Project under the EPBC Act, it is noted that:

(a) all of the offset credits required for Stage 1 have been secured using land-based offsets and the biodiversity fund; and

(b) Stage 2 and 3 offsets will be based on the approved mechanisms at the time of retirement.

Feature 5: Mitigation measures to be deployed

5.20 The Project has been designed, and will be implemented, in a manner that makes use of mitigation measures to limit the impacts associated with the Project, including climate change impacts and GHG emissions. The mitigation measures proposed in this regard have been described in numerous documents that are already before the IPC, including the EIS and Response to Submissions document.

5.21 A summary of some of the primary measures that will be deployed to mitigate the impacts of the Project is provided below:

Impact	Mitigation measure	References and further comments
Social	• United will develop and implement a Stakeholder Engagement Plan to guide the implementation and evaluation of the social aspects of the Project. • United will implement an ongoing community engagement program for the Project, including periodic community BBQs/information days as well as community newsletters. • United will update and implement the existing United complaint response and management program as part of the Project. • United will continue to operate the United Community Consultative Committee following relevant DPE guidelines. • United will enter into a Voluntary Planning Agreement with Singleton Council for the Project to contribute funds to meet local community needs. • Development of a Social Management Plan to provide a framework to monitor the Project's impact over time. • Implementation of visual mitigation works early in the Project. • Incorporation of productive agricultural land through rehabilitation and planning.	EIS section 6.14.5 (pages 386 to 387), section 8.0 (page 452-453)
Land Use and Agriculture	• In response to community feedback, United will reinstate agricultural land uses within part of the Project Area post mining; • Land management for the Project will also include ongoing sustainable land management measures including: o control of noxious weeds and feral animals, o bushfire management, o implementation of land management strategies in consultation with relevant stakeholders o implementation of measures to minimise offsite impacts on other land uses, e.g. noise, dust, blasting controls, etc.	EIS section 6.3.5 (page 163)
Air Quality	• The proposed dust management measures for the Project will be prepared in consideration of the NSW Coal Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining (Katestone 2011). Strategies will include: o minimising the area of disturbed land o minimising the length of Project haul roads o utilising water sprays o maintaining existing covered conveyors, o using temporary rehabilitation and stabilisation measures o progressively rehabilitation all overburdened emplacement areas and	EIS table 1 (page iii), section 6.4.6 (pages 182 to 184), section 8.0 (pages 454 to 455). Response to Submissions Part A, section 3.12 (page 142), section 4.2 (pages 155 to 156).

Impact	Mitigation measure	References and further comments
	disturbed land associated with the Project. • United will develop and implement an Air Quality Management Plan for the open cut operations. The Plan will outline the range of proactive and reactive dust control strategies to be implemented as part of the Project. • Proactive air quality control strategies to minimise dust emissions include: o review of daily forecasts and consideration at daily pre-shift meetings o modifying the planned mining activities to minimise dust impacts. • Reactive air quality management measures including modification or suspension of activities in response to identified triggers including: o visual conditions, such as visible dust from trucks above wheel height. Visual conditions will be established from both observations by site personnel and from a camera network to be established on site to cover the main dust sources of the operation o meteorological conditions, such as dry, windy conditions, with winds blowing towards sensitive receptors o ambient air quality conditions (that is, elevated short-term PM10 concentrations). • United will implement blasting procedures relating to fume management as part of the Project. A site specific Blast Management Plan will also be developed and implemented during operations. • United will develop and implement a Spontaneous Combustion Management Plan for the Project which will provide guidelines for eliminating or minimising the risk of incidents as a result of spontaneous combustion.	
Blasting	• Implementation of a blast management plan including: o implementing a pre-blast assessment protocol o designing each blast to meet criteria o assessing pre-blast meteorological conditions o only blasting when conditions are acceptable o developing road closure management plans o implementing appropriate exclusion zones o liaising with operators of nearby mines and with HVO. • Undertaking property inspections of nearby properties prior to blasting associated with the Project, at United's cost.	EIS section 6.7.6 (pages 225 to 226) Response to IPC Recommendations section 4.0 (page 111)
Noise Impacts	• Reasonable and feasible noise controls have been	EIS table 1 (page iii), section

Impact	Mitigation measure	References and further comments

	identified as part of the Project design process and incorporated into detailed noise modelling.
	• A combination of proactive and reactive/adaptive controls will be implemented over the life of the Project. Proactive control measures to be implemented over the life of the Project include:
	  ○ incorporation of reasonable and feasible noise attenuation on key items of plant and equipment
	  ○ using 'silent horns' to communicate with trucks and smart broadband 'Quacker' reversing alarms
	  ○ inclusion of bunds in strategic locations along haul roads, where practicable
	  ○ use of topographical features to maximise shielding to surrounding receiver areas, where practicable
	  ○ managing the drop height of the first load into truck bodies to minimise impact noise.
	• Implementation of a performance based adaptive management approach, including:
	  ○ strategic relocation or shut down of acoustically significant equipment during adverse meteorological conditions that could result in noise propagation towards sensitive receivers
	  ○ limiting the activities of ancillary equipment in exposed locations
	  ○ progressive shut down of production machines in elevated locations.
	• United will develop and implement a Noise Management Plan for the open cut operations.
	• Implementation of a monitoring program including predictive forecasting of adverse weather conditions, operation of four continuous noise monitors and associated data monitors, implementing an attended noise monitoring program, data assessment and review procedures, a notice incident investigation and response plan and change management processes.
	• Central to the management of noise impacts is the implementation of an appropriate continuous noise monitoring system that will enable the proactive and real time management of operations during adverse noise propagating conditions. United has committed to implement such a system and proposes to utilise four directional real-time noise monitors to enable the assessment of ongoing compliance with relevant noise impact assessment criteria and to guide implementation of actions to maintain compliance.
		6.6.11 (pages 215 to 217), section 8.0 (page 456)
		Response to Submissions Part A, section 3.1.3(a) (page 37-39), section 3.1.3(f) (page 40 to 41), section 3.12 (pages 144 to 145)

Water Resources	• United will prepare and implement a Water Management Plan for the Project in consultation with DPI Water and DPE. The WMP will include:
	  ○ a water balance
	  ○ an Erosion and Sediment Control Plan
	  ○ a Surface Water Management Plan
	  ○ a Groundwater Management Plan
		EIS section 6.8.2.4 (page 270)
		Response to Submissions Part A, section 3.1.4(b) (page 42 to 43), section 3.1.4(d) (Page 44), section 3.1.4(f), section 3.1.4(i) (pages 49 to 50), section 3.1.5(a) (page 52)
		Response to Submissions Part B, sections 2.1 (page 84),

Impact	Mitigation measure	References and further comments
	• The Water Management Plan prepared for the Project will include a Trigger Action Response Plan for both surface water and groundwater. The TARPs will identify when rehabilitation measures may be required. • Implementation of a water management system to separate clean and dirty water. • United will construct a flood levee to protect the United Open Cut from flood inundation along Redbank Creek from Wollombi Brook. • Minimisation of works within the flood prone areas of Wollombi Brook. • Maximised water recycling and sharing across the integrated water management system to minimise import of water to the mining complex and to minimise discharges of excess water from the mining complex. • Water quality monitoring for EC, pH and key AMD indicators, including metals/metalloids, within the water management system and the downstream receiving environment. • Ongoing monitoring of the leachate generated from the emplacements will also be undertaken, in addition to follow up elemental testing if any low pH conditions are detected.	section 2.3 (page 103-116) section 4.0 (page 195) Request for Additional Information section 3.0 (page 54)

Biodiversity	• The Project will avoid direct impacts on the 0.1 hectare stand of Hunter Valley Weeping Myall Woodland of the Sydney Basin Bioregion within the Project Area.
	• United will prepare and implement a Biodiversity Management Plan for the Project including a detailed impact mitigation strategy.
	• The Biodiversity Management Plan will include a biodiversity monitoring program for the Project. The monitoring program will be used to assess and inform the ongoing improvement of management actions.
	• United will implement a comprehensive Biodiversity Offset Strategy for the Project, including:
	  ○ establishment of proponent-managed offset sites including the Highfields Offset Site, Mangrove Offset Site, Wambo Offset Site, Brosi Offset Site and Jerrys Plains Offset Site
	  ○ mine site ecological rehabilitation
	  ○ payments into the Offsets Scheme fund and/or establishment of further offset sites for the residual credits that need to be retired.
	• United proposes to retire biodiversity credits progressively based on the staging of disturbance. Credits will be secured for each stage prior to commencement of the next stage.
	• The development of a monitoring program for GDEs.
	• Specific control measures, including implementing clearing procedures, landform establishment, pre-clearance and tree-felling, feral animal and noxious weed control, fencing and access control, domestic stock management bushfire management and ensuring appropriate environmental management
		EIS section 6.9.3 (pages 278 to 279), section 6.9.6 (pages 286 to 290), and sections 7.2.2 to 7.2.3 (pages 439), sections 8.0 (pages 458 to 459)
		BDAR section 4.2.2 (page 87)
		BDAR section 4.2.10 (page 91-92)

Impact	Mitigation measure	References and further comments
	measures are in place, and training key employees.	
Cultural Heritage	• Implementation of an Aboriginal Cultural Heritage Management Plan in consultation with registered Aboriginal parties (**RAPs**). • Salvage of the 128 sites to be impacted by the Project. • United will make available funds for potential programs identified by the RAPs as part of the Aboriginal Cultural Heritage management of the Project. Funding for programs would be available for applications from the Wonnarua community for a period of 2 years from the commencement of the Project. As part of the ACHMP development, a process and criteria for the application for this support would be developed. A further budget of $350,000 has been allocated to these programs.	EIS table 1 (page v), table 6.36 (pages 302 to 306)
European Heritage	• The Dog-leg fence will be subject to a detailed survey and photographic/archival recording and an interpretation strategy will be developed. • Archaeological investigation of the former House Site will be undertaken to relevant professional standards prior to the commencement of works that impact the site, including ground preparation/clearing works. • Further investigations of the potential for relics at the shearing shed and creamery site prior to any disturbance of the site. • Undertake a structural assessment of the Montrose Property prior to any blasting associated with the Project.	EIS section 6.11.5 (page 324) Request for Additional Information section 3.0 (page 54)
Visual	• To assist in minimising the visual impacts of the Project, United will implement the following controls: ○ progressive rehabilitation of disturbed areas with a particular focus on overburden emplacement areas, including the use of temporary rehabilitation as appropriate ○ additional roadside tree planting will be undertaken along the existing Golden Highway to screen views of the Project ○ incorporation of roadside tree planting into the detailed design for the realigned section of the Golden Highway to assist in screening views of the Project from the road ○ consultation will be undertaken with potentially affected landholders in the Moses Crossing and South Wambo areas regarding the potential for additional tree screening/landscaping to minimise the visibility of the Project ○ upon receipt of a written request from any other land owner, United will undertake a review of visual impacts on the property and where adverse visual impacts are identified, will implement reasonable and feasible mitigation measures (such as tree screening or other landscape works) in consultation with the land owner ○ ongoing management of mobile lighting to reduce the impacts of lighting at night, positioning lights so they are not pointing off site, and are shielded by walls, overburden	EIS section 5.7 (page 143), section 6.12.6 (page 353) Response to IPC section 4.0 (pages 113 to 114)

Impact	Mitigation measure	References and further comments
	emplacement areas and/or vegetation where practicable o all fixed lighting associated with the Project will be installed and maintained in accordance with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting.	
Rehabilitation and Final Landform	• United will implement an approach to the design and development of the final landform for the Project to achieve a more natural landform. The final landform will be designed to: o be safe, stable and non-polluting o incorporate micro relief o incorporate drainage lines consistent with topography and natural drainage where reasonable and feasible o sustain the intended land use for the post-mining domains o minimise the visual impacts of the development o be in keeping with the natural terrain features of the area o be integrated with the rehabilitated landforms of surrounding mines where practicable. • The revegetation strategy for the Project will involve the revegetation of the site to achieve three broad types of rehabilitation vegetation, being ecological rehabilitation, native woodland and agricultural pasture land. • A Rehabilitation Management Plan will be prepared for the Project. • United will undertake a rehabilitation monitoring program as part of the Project. The objectives of the program will be to: o assess the long term stability and functioning of re-established ecosystems on mine affected land o assess rehabilitation performance against the closure criteria o facilitate continuous improvement in rehabilitation practices. • United will develop and implement a management approach to address any areas of potential acid forming materials that may be identified as part of the Project. • A detailed mine closure plan will be developed at least two years prior to the anticipated mine closure date (i.e. cessation of mining). It will include a Final Void Management Plan. • United commits to further investigating supplementary post mining land uses, including potential uses for the final voids, as part of developing the detailed closure plan for the mine. • United commits to no net loss of high capability land (Class 1 to 3) as a result of the Project. Approximately 12.4 hectares of Class 3 land will be included in the rehabilitation strategy. • United commits to including features to allow for	EIS section 8.0 (pages 453 to 454) Request for Additional Information section 3.0 (page 55)

Impact	Mitigation measure	References and further comments
	active recreational uses such as hiking / bike trails and picnic areas within the land landform and to investigate the potential to stock the United final void with fish for recreational fishing purposes. • United commits to working with Singleton Council and the Upper Hunter Mining Dialogue in the development of a strategic plan that will provide a sustainable future for the local community. • United will prepare a Final Land Use Strategy for the Project in consultation with Singleton Council. The outcomes of the Final Land Use Strategy will consider any local strategic planning statement prepared by Singleton Council.	
Hazardous Materials	• Implementation of hazard management strategies, including: ○ storage of hazardous materials with a buffer distance required by the hazard analysis ○ design of diesel tanks and refuelling systems in accordance with relevant standards and codes ○ design of hazardous materials storage area surface drainage systems to prevent spills or runoff from storage areas entering surrounding land/waterways ○ selection of approved carriers of dangerous goods to transport hazardous materials.	EIS section 6.16 (page 397 to 398)
Tailings Management	Development of a tailings management plan which will include monitoring and management of tailings slurry.	Response to Submissions Part B, section 2.1 (page 84) and section 4.0 (page 195)

5.22 In relation to climate change impacts and GHG emissions specifically, the Applicant proposes to implement the following mitigation measures in respect of the Project's Scope 1 and Scope 2 GHG emissions (noting that Scope 3 GHG emissions are not within the Applicant's control):

(a) limiting the length of material haulage routes;

(b) optimising ramp gradients;

(c) improving fuel efficiency of haulage trucks and mine equipment;

(d) payload management;

(e) increasing haul truck payload;

(f) improving rolling resistance of haul roads;

(g) scheduling activities to optimise equipment operation;

(h) blasting strategies to improve extraction;

(i) maximising resource recovery efficiency;

(j) working machines to their upper design performance;

(k) preventing unnecessary water ingress;

(l) in-pit servicing;

(m) high efficiency workshop lighting; and

(n) high efficiency heating, ventilation and cooling.

5.23 Further information about these mitigation measures can be found in the EIS for the Project and other documents that are before the IPC: see, in particular, EIS table 1 (page vi), section 6.5.5 (pages 190 to 192), and Response to Submissions Part B, section 3.4 (page 103) of the EIS and the Applicant's Response to the Independent Planning Commission Recommendations (dated July 2018) (pages 111 to 114).

5.24 Glencore and Peabody continue to pursue steps to reduce their carbon footprint and promote the development and deployment of low-carbon technologies by conserving energy and reducing GHG emissions at their operations and advocating for research and key initiatives in low-emissions projects and partnerships.

5.25 Glencore continues to integrate climate change considerations across its business, understanding potential risks, managing its operational energy and emissions footprint, supporting a suite of low emission technologies and playing a proactive role in public policy and regulatory developments.

5.26 For nearly 20 years, Peabody has advocated the use of technology to lower GHG emissions from power generation and other industrial uses and has invested approximately $300 million in global partnerships and projects in the United States, Australia and China over that time to deploy high-efficiency, low-emissions (**HELE**) technologies and advance carbon capture, use and storage (**CCUS**) technologies. Peabody believes these technologies can drive dramatic reductions in emissions and work towards the ultimate goal of near-zero emissions from coal consumption.

5.27 Peabody's approach to technology is aligned with many countries, including major coal consumers China, India and Japan. These countries are among those numerous nations that have identified HELE coal-fuelled power plants in their NDCs to the *Paris Agreement*, designating coal as part of their lower-carbon future.

5.28 Further details on Glencore's and Peabody's corporate initiatives concerning GHG emissions, including their support of HELE and CCUS may be found in **Appendix 1** to this submission.

Feature 6: Minimal local environmental impacts

5.29 The Project's environmental impacts in the surrounding locality will be minimal as a result of the Project being a brownfields expansion of two already well-established mining projects, which have been designed to utilise existing mining infrastructure to the greatest extent practicable.

5.30 Further, as noted in section 3.3 of the EIS (page 50):

> The Project has been designed to maximise resource recovery and operational efficiencies between the proposed United Open Cut and the existing Wambo Open Cut whilst aiming to minimise environmental and social impacts. In terms of minimising environmental and social impacts, changes to the Project through the design and assessment phase have significantly reduced the number of noise impacted residences (through design changes such as bunding and noise controls), reduced dust generation (e.g. through commitments to temporary rehabilitation areas and a high level of active dust control) and reduced visual, landform and water impacts through development of a more natural final landform. The Project design also includes a range of environmental and social management and mitigation measures, including measures relating to cultural heritage values and community sustainability, which have been included as part of the Project to minimise impacts (refer to Section 8.0).
>
> The stratified lease arrangement across the United and Wambo mining titles is complex and places significant constrains on both operations. Several standalone mine plan options have been considered by both United and Wambo in order to realise resource recovery across the two operations. This has included consideration of both open cut and underground mining methods separately operated by both parties. The Joint Venture

> arrangement provides an opportunity for the adjoining mining operations to integrate operations to efficiently extract the mineable resources as a single mining operation.
>
> The Project will allow for significant operational efficiencies and improved resource utilisation. The Project Area, in particular the United Open Cut in CCL775 (refer to Figure 1.3), is constrained due to the proximity of neighbouring mining operations, natural features (e.g. Wollombi Brook) and public infrastructure. As a standalone mine, the United Open Cut would have been heavily constrained, limiting mining methods, resource recovery and the ability of the mine to generate a suitable final landform.
>
> The Project proposes to utilise spare capacity within the existing Wambo CHPP and train loading facilities. Due to the constrained nature of the United Open Cut area, the modification or construction of new infrastructure facilities would have sterilised coal resources under a standalone option, or if constructed on adjoining land, would have resulted in significantly increased environmental impacts through increased land disturbance and cumulative amenity impacts. By entering into the Joint Venture, a number of the constraints have been removed, resulting in a more efficient and economic development with improved environmental outcomes. In addition, the full utilisation of the approved capacity within the existing Wambo CHPP and train loading facilities provides an improved environmental and community outcome by avoiding duplication of such facilities.

Feature 7: Meeting global demands for coal

5.31 In a letter dated 29 June 2015, the Division of Resources and Energy confirmed that the resource to be mined by the Project is considered to be a significant resource:

> The Division considered the coal deposit a significant coal resource which will continue to bring economic benefits to the State and the region. The Division supports the proposed Project as a responsible utilisation of the State's valuable coal resources and supports the project proceeding through the State's comprehensive development assessment and approval process.

5.32 The EIS also noted the following in respect of global coal demand (p 41):

> World energy demand is predicted to increase significantly over the next 20-30 years ...
>
> The Project is well positioned to contribute to meeting this expected demand in the short to medium term and will maximise coal recovery from within existing mining areas, whilst optimising the use of existing infrastructure and minimising the environmental impact associated with meeting this demand.

5.33 In light of the commentary in the *Rocky Hill* case regarding world demand for coal, market substitution and carbon leakage, as well as the fact that the EIS was produced in August 2016, the Applicant has produced, in Part D of this submission, some further commentary on the issue of meeting global demand for coal.

Feature 8: No increase in voids and avoidance of environmental costs

5.34 The final landform for the land subject to the Project will be a contiguous undulating final landform that seeks to blend with the natural topography of the surrounding land, with the Project not increasing on the number of already approved voids (two).

5.35 In designing the Project, the Applicant has explored the option of eliminating final voids completely. As a result of undertaking this exercise, the Applicant determined that there were both unacceptable environmental and economic costs associated with filling the voids.

5.36 First, in relation to the environmental costs, the Applicant has determined that there would be significant water impacts associated with the elimination of final voids from the Project's final landform design. More specifically, groundwater studies indicate that when voids remain within the final landform, this creates a sink within the water table that captures salt that would otherwise export to the surrounding environment. Such significant water impacts can be avoided by implementing the already approved approach of having two final voids.

5.37 Secondly, detailed mine planning was undertaken to understand the cost of filling the voids, including costs associated with material movement, rehandling, drainage infrastructure, maintenance and production staff and overheads. As a result of undertaking this exercise, it was determined that the cost of eliminating final voids was $777 million. It is, therefore,

not economically feasible for the Applicant to eliminate final voids from the Project's final landform design.

Feature 9: Employment

5.38 The Project will result in significant social and economic benefits at a local, regional and State level. One of the key benefits of the Projects is the economic benefit to the State and region associated with job creation, capital expenditure, ongoing operational expenditure and employee expenditure.

5.39 Employment and economic benefits were the most common responses from local landholders when they were asked to identify the benefits of the Project during the consultation process as described in section 5 of the EIS titled "Stakeholder Consultation and Identification of Environmental and Community Issues".

5.40 As noted in the EIS, the Project will provide for the continued employment of the existing Wambo Open Cut workforce (approximately 250 full time equivalent positions) in addition to creating additional employment from the Project's development (up to approximately 250 additional full time equivalent positions at peak production). This means that the Project will provide approximately 500 total full time equivalent positions at peak production with resultant flow on effects to the local and regional economy.

5.41 Peak operational employee numbers are anticipated for the first 6 to 7 years of the Project's life, before decreasing slightly to a total of 450 full time equivalent workers. The Project will also employ approximately an additional 120 full time equivalent employees during the peak construction phase.

5.42 The option of not proceeding with the Project would result in a failure to realise these significant benefits for the local, regional and State economy.

Feature 10: Royalties, taxes and other economic benefits

5.43 The Project will provide significant ongoing benefits for local and wider communities through local and regional expenditure and payment of royalties and taxes.

5.44 It is estimated that the Project will generate approximately $369 million (in net present value terms) (or $817 million in undiscounted terms) in additional royalties for the NSW Government (relative to the base case).

5.45 Other economic benefits include:

(a) net producer surplus attributable to NSW of $2.1 million; and

(b) company income tax attributable to NSW of $66.6 million.

5.46 The Project will contribute an estimated total net economic benefit for the NSW community of approximately $414 million (in net present value terms). Importantly, this means that the benefits for NSW in present value terms are estimated to exceed the costs of the Project borne by NSW. In addition, the Project is anticipated to increase the Gross Regional Product by an estimated $2 billion (in net present value terms), and increase the NSW Gross State Product (including the Hunter region) by an estimated $3 billion (in net present value terms).

5.47 Direct financial benefits will be conferred on the local community as a result of agreement reached between the Applicant and the Singleton Council in respect of the key terms of a proposed Voluntary Planning Agreement. These terms comprise the payment of:

(a) $1,325,000 to the Singleton Community and Economic Development Fund, or similar, to be used across the local government area; and

(b) $1,325,000 for funding of community infrastructure and services for local affected communities, including Jerrys Plains and Warkworth.

5.48 DP&E retained the Centre for International Economics (**CIE**) to carry out a peer review of the economic assessment contained in the EIS. In the Final Assessment Report, DP&E at page 2 stated that the key aspects of the Project include:

(a) involving $381 million (undiscounted) of capital investment; and

(b) providing $414 million (net present value) of economic benefits to NSW, including royalties of $369 million (net present value) over the life of the Project.

Conclusion

5.49 As noted in Part A of this submission, it is for the IPC to engage in an "intuitive synthesis" of considering, assessing and weighting all of the various positive and negative impacts associated with the Project. Climate change impacts and GHG emissions are just one of many different factors and impacts that are relevant for the IPC to take into account in determining the development application for the Project. Certainly, climate change impacts and GHG emissions should not be the single determinative consideration for the IPC in making a decision in respect of the development application for the Project.

5.50 The Applicant considers that, in light of the features of the Project summarised above and as detailed elsewhere in the material before the IPC, the positive aspects associated with the Project clearly outweigh the negative aspects associated with the Project, and that the Project should be approved.

5.51 The Applicant's view is shared by the DP&E which states in its Final Assessment Report at page 65:

> The Department is satisfied that the benefits of the Project outweigh its residual costs and considers that the Project is in the public interest and is approvable, subject to strict conditions of consent.

6. PART C: OVERVIEW OF THE CLIMATE CHANGE LAW AND POLICY FRAMEWORKS INFORMING CONSIDERATION OF CLIMATE CHANGE MATTERS IN ASSESSING AND DETERMINING DEVELOPMENT APPLICATIONS UNDER THE EP&A ACT

Overview

6.1 There are a range of climate change laws and policies that may inform the IPC's consideration of the specific factor of climate change and GHG emissions as one of the many factors of relevance to take into account when determining the development application for the Project under the EP&A Act.

6.2 Some of these laws and policies are mandatory relevant considerations (e.g. clause 14(2) of the Mining SEPP), whereas others are permissible relevant considerations (i.e. considerations that the IPC may, but is not obliged to, take into account). Regardless of whether consideration of a specific climate change law and/or policy is mandatory or permissible for the IPC to take into account in making a decision about the Project, it will be a matter for the IPC to determine what amount of weight should be accorded to the climate change impacts and GHG emissions of the Project.

6.3 As already stated earlier in this submission, the Applicant considers that the climate change impacts and GHG emissions generated by the Project should not outweigh the significant social and economic benefits that the Project will deliver at a local, regional and State level.

6.4 In this Part C of the submission, the Applicant provides commentary on the following matters:

(a) the international climate change framework, focussing particularly on the *Paris Agreement*;

(b) classification of GHG emissions into Scope 1, 2 and 3 emissions;

(c) the issue of double counting of GHG emissions and how that is generally addressed in the international and Australian climate change frameworks;

(d) the carbon budget approach and its uptake in the international and Australian climate change frameworks;

(e) Australia's NDC under the framework of the *Paris Agreement*, and the laws and policies that Australia has adopted for the purposes of facilitating the achievement of its NDC;

(f) the domestic climate change laws, policies, NDCs and objectives of the countries that are most likely to be the export destinations for the Project's coal; and

(g) the climate change law and policy framework in NSW, including the NSW Climate Change Framework and the manner in which climate change and GHG emissions (particularly Scope 3 emissions) can be considered and addressed in the application of the EP&A Act and environmental planning instruments made under that Act, to determining a development application.

6.5 Each of these will be addressed in turn below.

The international climate change framework, focussing particularly on the Paris Agreement

6.6 The international framework that addresses GHG emissions, and more broadly the global response to climate change, is comprised of:

(a) the *United Nations Framework Convention on Climate Change* (**UNFCCC**);

(b) the *Kyoto Protocol*;

(c) the *Paris Agreement*; and

(d) associated decisions by the Conference of the Parties serving each of the above instruments.

6.7 The UNFCCC was adopted in 1992 and represented the first step by countries to address the issue of climate change. It set out a number of commitments, but these did not translate into quantifiable targets or outcomes. This led to the adoption of the *Kyoto Protocol*, which imposed firm targets and timeframes for GHG emission reductions by developed countries, both individually and collectively. The second commitment period runs from 1 January 2013 to 31 December 2020, but is not binding under international law.

6.8 For present purposes, the most important aspect of the international climate change framework is the *Paris Agreement*.

6.9 The *Paris Agreement* builds upon the UNFCCC and for the first time requires all nations to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. The *Paris Agreement* includes a global goal to hold global warming to "well below 2°C" and to pursue efforts to limit the temperature increase to 1.5°C above preindustrial levels. Countries are to peak and then reduce emissions "as soon as possible" to "achieve a balance between anthropogenic emissions by sources and removals by sinks" in the second half of the century. Put differently, from as soon as possible after 2050, countries are to have net-zero emissions, using carbon sinks such as forests to offset any emissions they then produce.

6.10 One of the key features of the *Paris Agreement* is the use of NDCs, which are high-level policy plans setting out what approach each country will take to reduce emissions and contribute to the global "well below 2°C" goal. 182 parties to the *Paris Agreement* have submitted their first NDC, including Australia and the countries that are most likely to be the export destinations for the vast majority of the Project's coal, being Japan, China, South Korea, Taiwan, India, Malaysia, the Philippines and Vietnam (**Export Countries**).[7] The NDCs of Australia and the Export Countries are addressed under separate sub-headings below in this Part C of the submission.

6.11 At the Conference of the Parties (**COP**) 24 in Katowice in December 2018, the Katowice Climate Change Package was adopted. That package contains, amongst other things, guidance on the features of NDCs, the information each country should provide to facilitate clarity, transparency and understanding of NDCs and accounting for NDCs. In general terms, they establish a common set of elements that each Party will apply, as appropriate, based on the type of its NDC. Importantly, the guidance ensures the avoidance of "double counting" of emissions. The issue of "double counting" is addressed under a separate sub-heading below in this Part C of the submission.

Classification of GHG emissions into Scope 1, 2 and 3 emissions

6.12 Whilst the IPC is no doubt aware of the difference between Scope 1, 2 and 3 GHG emissions, the Applicant considered that, for the purposes of the commentary which follows in this Part C of the submission, it would be useful to provide a high level overview of the three scopes of GHG emissions.

6.13 As noted in the Greenhouse Gas and Energy Assessment for the Project (May 2016), the three scopes of GHG emissions may be defined or described as follows:

(a) **Scope 1:** direct emissions occurring from sources that are owned or controlled by the proponent of the Project (e.g. fuel use, fugitive emissions). These emissions are emissions over which the Project has a high level of control.

(b) **Scope 2**: emissions from the generation of purchased electricity consumed by the Project.

(c) **Scope 3**: indirect emissions that are a consequence of the activities of the Project, but occur at sources owned or controlled by other entities (e.g. outsourced services). Scope 3 emissions can include emissions generated upstream of the Project by providers of energy, materials and transport. Scope 3 emissions can also include emissions generated downstream of the Project by transport providers and product use (e.g. burning product coal).

6.14 A useful figure that highlights the degree of control the proponent of a mining project has over GHG emissions is produced at **Appendix 5** of this submission.

The issue of double counting of GHG emissions and how that is generally addressed in the international and Australian climate change frameworks

6.15 For present purposes, double counting of GHG emissions can generally be described as occurring where the Scope 3 emissions generated by the burning of a mine's coal by other developments are counted twice in the context of calculating a country's GHG emissions for the purpose of tracking progress towards achievement of its NDC. This can occur in two main circumstances:

---

[7] It should be noted, of course, that there may well be other countries to which the Project's coal is exported from time-to-time during the Project's life of mine.

(a) the Scope 3 emissions of a particular development or activity carried out in Country A, are actually generated in Country B as Scope 1 emissions associated with development or activities conducted in Country B, and both Countries A and B count the same GHG emissions towards their NDC; or

(b) the Scope 3 emissions of a particular development or activity carried out in Country A, are actually generated by another development or activity in Country A as Scope 1 emissions generated by that other development or activity, and Country A counts the same GHG emissions towards its NDC.

6.16 The issue of double counting, as arising in the context of the first main circumstance described in paragraph 6.15(a) above, can be illustrated by use of the example of the Project that is currently before the IPC.

6.17 Almost all of the Project's Scope 3 emissions are generated by the burning or combustion of coal by the end-user of the coal. As the coal from the Project is planned to be exported, the generation of all Scope 3 emissions will occur outside of Australia. In this regard, the Scope 3 emissions of the Project would count as Scope 1 emissions in each of the countries to which the coal is exported and, if Australia were to count the Scope 3 emissions from the Project in calculating its GHG emissions, this would result in an unacceptable double counting of GHG emissions.

6.18 In relation to the second main circumstance described in paragraph 6.15(b) above, another example can be used to illustrate how double counting can occur in this context. If there was a coal mine proposed to be constructed somewhere in Australia, and it was to supply coal to a power station which was also located in Australia and the coal was combusted by that power station, it would be the case that:

(a) the Scope 1 emissions of the coal mine would need to be accounted for and reported; and

(b) the Scope 1 emissions of the power station would need to be accounted for and reported.

6.19 However, it would be double counting if the Scope 3 emissions of the coal mine were also accounted for and reported, on the basis that those emissions are the same as the Scope 1 emissions of the power station.

6.20 The importance of avoiding double counting of GHG emissions generally, including in the context of calculating a country's GHG emissions for the purpose of tracking progress towards achievement of its NDC, is well-recognised under international and Australian frameworks addressing climate change and GHG emissions.

6.21 On an international level:

(a) in respect of overarching obligations, article 4(13) of the *Paris Agreement* requires parties to ensure the avoidance of double counting consistent with the guidance adopted by the COP;

(b) in respect of the use of internationally transferred mitigation outcomes towards nationally determined contributions:

(i) article 6(2) of the *Paris Agreement* requires Parties to apply robust accounting to avoid double counting consistent with the guidance adopted by the Conference of the Parties;

(ii) the modalities, procedures and guidelines for the Transparency Framework adopted under the Katowice Climate Package (**Transparency Framework**), requires that each participating Party provide information on how their

cooperative approach applies robust accounting to ensure the avoidance of double counting;

(c) in respect of accounting for Parties' NDCs, the guidance adopted by the Parties under the Katowice Climate Package requires that Parties avoid double counting when accounting for anthropogenic emissions and removals corresponding to their NDCs; and

(d) the guiding principles of the Transparency Framework also provides that double counting be avoided.

6.22 The Applicant would readily acknowledge that the measures contained in the Katowice Climate Package are generally focussed on the avoidance of double counting of GHG emission reductions. However, the clear intent of the *Paris Agreement* is to ensure a robust approach is taken to accounting of GHG emissions and it would undermine the integrity of that agreement for an approach to be taken to accounting of emissions which involved double counting.

6.23 For example, if the Scope 3 emissions generated by the Project were to be included in Australia's national inventory report as well as the respective national inventory report of the countries to which the coal from the Project is exported, this would represent an over allocation of the total GHG emissions from the Project. Furthermore, there are challenges in the accuracy of the way in which the Scope 3 emissions are accounted for ex ante, particularly when matters such as technology and end uses are taken into account. For example, if the coal was exported and used in a supercritical coal-fired power station or in conjunction with carbon capture and storage, then the actual GHG emissions would likely be quite different than if used in a less-efficient, unabated power station.

6.24 At the domestic level, the NGER Act in Australia also dissuades double counting by imposing reporting obligations upon companies only in respect of Scope 1 and Scope 2 emissions. There is no requirement or obligation imposed on companies under Australian law to report on Scope 3 emissions. The exclusion of Scope 3 emissions from the reporting requirements under Australian law effectively avoids double counting of Scope 3 emissions since the end-user who is responsible for a project's Scope 3 emissions will ultimately account for them as Scope 1 emissions.

The carbon budget approach and its uptake in international and domestic climate change frameworks

6.25 The "carbon budget" approach has been used by some members of the scientific community to describe the maximum amount of CO_2 (i.e. the budget of CO_2) that can be released from human sources globally into the atmosphere to limit global warming to a desired level above pre-industrialised levels. Once the CO_2 concentration in the atmosphere reaches the set maximum amount (i.e. the budget is spent), global emissions of CO_2 must be "net zero" (i.e. the magnitude of emissions to the atmosphere is matched by the magnitude of removals of emissions from the atmosphere).

6.26 Whilst the "carbon budget" approach is sometimes used by scientists, it is not an approach that is required to be followed under the *Paris Agreement*, or Australian domestic laws (i.e. federal and NSW legislation) in the context of implementing, or measuring progress towards, achievement of Australia's NDC. Australian and NSW climate change laws and policies are dealt with below in this Part C of the submission.

6.27 In the absence of a requirement in these laws to apply the "carbon budget" approach, the Applicant would submit that it would be inappropriate for the IPC to either have regard to or apply the "carbon budget" approach in determining the development application for the Project. The Applicant makes this submission for the following reasons:

(a) the "carbon budget" approach does not provide the IPC with any practical assistance in discharging the function it has been asked to perform (i.e. to determine the development application for the Project), and is a matter that is best left to higher policy circles and the international community;

(b) the approach is inconsistent with the approach that has been adopted by the *Paris Agreement* for achieving the goal set under that agreement, in that:

(i) each country has made a commitment (in the form of a NDC) as to how it will contribute to achieving the goal set by the *Paris Agreement*;

(ii) the *Paris Agreement* does not prescribe the measures or mechanisms by which a particular country is to implement actions to facilitate the achievement of its NDC; and

(iii) the application of the carbon budget approach results in double counting of GHG emissions, which is an outcome that the *Paris Agreement* seeks to avoid.

(c) the approach suffers from numerous deficiencies, including:

(i) **Uncertainty:** the approach suffers from uncertainties, such as the desired probability of meeting the goal of the *Paris Agreement* (i.e. the higher one sets the probability for achieving the goal, the more stringent the budget needs to be), accounting for non-CO_2 gases (i.e. if non-CO_2 gases are not reduced or reduced more slowly than CO_2, the budget is reduced accordingly), and the failure to account for carbon cycle feedback (i.e. including estimates of these would reduce the carbon budget further).

(ii) **Technology:** the approach can be susceptible to ignoring the role that technological advancements can play in reducing CO_2 levels globally (e.g. low emission coal technologies including carbon capture and storage, and HELE projects). Any failure of the carbon budget approach to account for such technological advancements would result in the CO_2 levels being recorded at levels higher than what they actually are.

(iii) **Allocation:** the approach has not been accepted by the international community as a means of sharing global mitigation efforts amongst countries. Rather, as explained above, the approach to allocation adopted under the *Paris Agreement* has been for each country to adopt a NDC and determine, for itself, the measures or mechanisms that will be implemented to achieve that NDC.

Australia's NDC, and climate change laws and policies

Australia's NDC

6.28 Australia signed the *Paris Agreement* on 22 April 2016, and ratified it on 6 November 2016.

6.29 It is not bound under international law to achieve the emission reduction target in its NDC, although it is to be observed that countries are likely to face international pressure if they fail to meet NDC targets.

6.30 Australia has obligations under the *Paris Agreement* to:

(a) prepare, communicate and maintain an NDC that it intends to achieve (Article 4(2));

(b) pursue domestic mitigation measures, with the aim of achieving the objectives of its NDC (Article 4(2));

(c) communicate an NDC every 5 years (Article 4(3), (9)); and

(d) account for its NDC and, in the process, ensure the avoidance of double counting in accordance with the methodologies and common metrics assessed by the IPCC and adopted by the Katowice Climate Package (Article 4(13)).

6.31 With respect to the specifics of Australia's NDC, it is to be noted that Australia's NDC communicates an unconditional economy-wide target to reduce GHG emissions by 26-28% below 2005 levels by 2030. Australia's emissions reduction target represents a 50-52% reduction in emissions per capita and a 64-65% reduction in the emissions intensity of the economy between 2005 and 2030.

6.32 Australia's NDC is summarised in the table below:

Emissions reduction target	Economy-wide target to reduce greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030
Coverage	Economy-wide
Scope	- Energy - Industrial processes and product use - Agriculture - Land-use, land-use change and forestry - Waste
Gases	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3

Mechanisms by which Australia's NDC is to be achieved

6.33 The policy document supporting Australia's NDC communicates that Australia will achieve its 2030 target through the Direct Action policy suite. The key component of the Direct Action policy suite is the Emissions Reduction Fund (**ERF**), which is complemented by the Safeguard Mechanism, the Renewable Energy Target (which requires 33,000Gwh of electricity generation (or approximately 23.5% of total generation) to be produced from renewable resources by 2020), improvements in energy efficiency under the National Energy Productivity Plan, phasing out of synthetic GHGs and direct support for investment in low emissions technologies and practices.

6.34 Importantly, the Australian Government has not – in any climate change policy or law – indicated that the development of new coal mines, or expansions of existing coal mines, is to be prohibited or restricted in any way for the purpose of achieving Australia's NDC. As a corollary, it must follow that the Australian Government considers that Australia's NDC can still be achieved in circumstances where new coal mines, or expansions of existing coal mines, are approved.

6.35 It is also to be noted that the Federal ALP climate change policy does not contain any measures that could constitute a prohibition on new coal mines or coal mining.

6.36 For present purposes, the most relevant mechanisms in the suite of policy measures are:

(a) the ERF; and

(b) the Safeguard Mechanism.

6.37 First, the ERF is a $2.55bn fund which purchases least cost emission reductions and abatement through a Commonwealth government procurement process, which includes

reverse auctions. It is underpinned by the *Carbon Credits (Carbon Farming) Act 2011* (**CFI Act**) which creates a legislative framework for the development of offset projects and the creation of Australian carbon credit units (**ACCUs**). The CFI Act was initially enacted to support activities in the land sector but has been amended to now support a wider range of projects related to energy, transport and industry.

6.38 Separate from, but related to the ERF, it should be acknowledged that the Australian Government recently announced the Climate Solutions Package, which is a $3.5 billion plan to deliver Australia's 2030 emissions reduction target. As part of the package, a Climate Solutions Fund has been established to continue the work of the ERF with an additional $2 billion investment over 10 years. Approximately $200 million per year over ten years is expected to be allocated to abatement purchases through the ERF. The Climate Solutions Fund is also designed to be a fund that will partner with businesses, local communities and farmers in emissions reduction programs. How this will affect the current auction approach preferred by the fund is unclear. The Package, and the fund specifically, has been promoted as a key policy to contribute to meeting the national 26% emissions reduction target by 2030.

6.39 Secondly, the Safeguard Mechanism, established under Part 3H of the *National Greenhouse and Energy Reporting Act 2007* (**NGER Act**), aims to ensure that emission reductions purchased by the Government under the ERF are not offset by increases in emissions in other areas of the economy.

6.40 The Safeguard Mechanism sets a baseline on emissions for facilities that emit over 100,000 tonnes CO_2-e per year. When the Safeguard Mechanism was implemented, baselines were set for existing facilities using data reported under the NGER Act. For most facilities, baselines were the highest level of report emissions for a facility over the historical period 2009-10 to 2013-4. These baselines can be adjusted to accommodate economic growth, natural resource variability and other circumstances where historical baselines will not represent future business-as-usual emissions. Up to 2020, baselines for new facilities will be based on an audited emissions forecast provided by the facility operator, with a reconciliation of the estimate against the actual performance of the facility at the end of the forecast period. For new facilities completed after 1 July 2020 (or existing facilities with new investments), baselines will be set to encourage facilities to achieve and maintain best practice.

6.41 If a facility exceeds its baseline, it is nominally required to surrender a number of ACCUs equivalent to the exceedance to the Clean Energy Regulator (**CER**). It is also noted that there are other mechanisms by which a facility can manage baseline exceedance, including applying for multi-year monitoring periods and exemption for exceptional circumstances (i.e. natural disasters or criminal activity unrelated to the liable entity).

6.42 For example, if a facility has a FY2016/17 baseline of 1,000,000 tonnes CO_2-e and reported emissions of 1,500,000, the company with operational control of that facility would have to surrender 500,000 ACCUs to comply with its baseline, or be liable to the penalty under section 22XF of the NGER Act.

6.43 In its first year of operation (FY2016/17), 203 facilities were covered by the Safeguard Mechanism with combined emissions of 131.3 million tonnes of CO_2-e. Sixteen facilities exceeded their emissions limits and purchased and retired a total of 448,097 ACCUs to clear their liabilities.

6.44 The Safeguard Mechanism was reviewed in 2017 and 2018. In March 2019, the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment Rule (No 1) 2019*

commenced. On its website, the Department of Environment and Energy has indicated that the amendments:[8]

(a) bring baselines up-to-date by transitioning all facilities to calculated baselines over 2018-19 and 2019-20;

(b) simplify calculated baseline applications by giving businesses the option to use Government-determined prescribed production variables and default emissions intensity values for calculating baselines; and

(c) update baselines annually for actual production where facilities use eligible production variables, so they continually reflect facility circumstances.

6.45 Both the United mine and the Wambo mine have been allocated reported baselines which correspond to their highest levels of emissions during the period 2009-10 to 2013-14. The United baseline is set at 731,007 tonnes of CO_2-e and the Wambo baseline is set at 1,132,078 tonnes of CO_2-e. Notwithstanding that the United mine has been on care and maintenance, these baselines remain current.

6.46 Assuming the Project is approved, a re-assessment of the facility boundaries and operational control of the Project will need to be undertaken which will result in new baselines being allocated. Those baselines are likely to be determined on a calculated emissions baseline approach, under which baselines are set using an audited forecast of emissions over the three-year period that the baseline is to apply. Under this approach, the baseline is calculated by multiplying the high-point of estimated annual production over the period by the estimated emissions-intensity of that production (tCO_2-e per unit of production).

NGER Act

6.47 The NGER Act is a national system for reporting GHG emissions, energy production and consumption by corporations. The data gathered under the NGER Act assists with compiling Australia's national GHG inventory in order to meet Australia's reporting obligations under the UNFCCC.

6.48 Corporations that have operational control of facilities that emit more than a specified amount must report on the type of the source of their emissions, the methods used to estimate emissions and the amount of GHG emitted (in CO_2-e). The reporting requirements under the NGER Act apply to:

(a) an individual facility that emits 25kt or more of CO_2-e or produces or consumes 100tJ or more of energy; or

(b) an individual facility and other facilities under the operational control of the same corporate group that together emit 50kt or more of CO_2-e or produce or consume 200tJ or more of energy.

6.49 Failure to comply with these reporting obligations is a breach of the legislation and can result in the imposition of civil penalties on companies and executive officers.

6.50 The NGER Act covers each of the six classes of Kyoto Protocol gases:

- CO_2;
- CH_4;

---

[8] http://www.environment.gov.au/climate-change/government/emissions-reduction-fund/consultation/safeguard-mechanism-legislative-amendments-2018.

- N_2O;
- SF_6;
- certain specified HFCs; and
- certain specified PFCs.

6.51 Reporting requirements cover both Scope 1 and Scope 2 emissions. The NGER Act does not cover Scope 3 emissions.

6.52 The parent companies of the joint venture participants for the Project, Glencore and Peabody, both submit annual NGERs reports for the facilities over which they or a member of their corporate group has operational control. These facilities respectively include both the United and Wambo mines. Typically these reports will include Scope 1 emissions related to fugitive emissions of CO_2 and CH_4, emissions from the combustion of diesel, LPG and other gaseous fuels for stationary and transport uses, and Scope 2 emissions related to electricity consumption.

Consideration of Scope 3 emissions under climate change laws and policies at the Commonwealth level in Australia

6.53 Australia's GHG Inventory is prepared centrally by the Department of the Environment using the Australian Greenhouse Emissions Information System (**AGEIS**). Australia's National Greenhouse Accounts conform to the UNFCCC Reporting Guidelines on Annual Inventories and the supplementary reporting requirements under the Kyoto Protocol to prepare its national inventories. These guidelines establish standardised reporting formats and require detailed information on all aspects of each party's national inventory system, including measurement systems, data collection systems, estimation methodologies, reporting and data management.

6.54 Currently, emission estimates are compiled in accordance with the IPCC 2006 Guidelines for National Greenhouse Gas Inventories (**2006 IPCC Guidelines**) and the 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol. Parties may also use country-specific methodologies where these are consistent with the IPCC guidelines and improve the accuracy of emissions estimates. Australia predominantly uses country-specific methodologies and emissions factors, described in detail in its National Inventory Report.

6.55 The National Greenhouse Gas Inventory is reviewed annually by a team of international experts through the UNFCCC review process.

6.56 Notably, neither the 2006 IPCC Guidelines nor the Revised Supplementary Methods require emissions data to be collected and reported or estimates to be made for Scope 3 emissions.

6.57 The NGER Act also does not provide any methodology for accounting for and reporting on Scope 3 emissions.

6.58 The only guidance provided by the Commonwealth Government in relation to accounting for Scope 3 emissions arises in the context of the National Carbon Offset Scheme (**NCOS**) which operates as a voluntary standard for making claims related to the carbon neutrality of organisations, products and services, buildings and precincts. The guidance that is provided in this context is relatively limited and linked to items such as international air travel, water and waste rather than supply chain emissions.

The NDCs, and climate change laws and policies of the Export Countries

6.59 It is to be noted that of the most likely countries that the coal from the Project will be exported to, all are parties to the *Paris Agreement* and either have or are in the process of

adopting domestic laws, policies, and measures to implement and achieve their NDC targets. Each Export Country's domestic efforts to achieve their NDC targets are summarised in the table below. Further, specific details as to the uptake of HELE, CCUS and other low emission coal technologies is addressed in Part D of this submission.

Country	Summary of the domestic climate change framework in the relevant export customer countries for the Project
China	• has introduced several policies to limit emissions (including policies to shut down coal-fired power plants, increase the efficiency of its coal generation fleet and place caps on the annual production capacity of coal), and to promote the development of commercially-viable CCUS technology in order to achieve its NDC of lowering carbon intensity by 60% to 65% from 2005 levels; and • has introduced carbon pricing policies and has committed to extend their scope and value
India	• has imposed a coal tax on all domestic and imported coal since 2010 (which has been increased three times since its inception), though its NDC indicates that coal (from both domestic and imported sources) will continue to dominate power generation into the future and India has included constructing coal-fuelled power plants with higher efficiency.
Japan	• has highlighted carbon pricing and the use of CCUS technologies as key to achieving its emissions reductions NDC of 25% below 2013 levels by 2030; • made significant progress with several CCUS projects; • has imposed import taxes for coal and LNG; and • aims to pursue high efficiency in thermal power generation using high-efficiency technologies such as ultra-supercritical and advanced ultra-supercritical.
Malaysia	• has set a renewable energy target of 20% by 2025 (an 18% increase from current levels) as a key mechanism for achieving its NDC of reducing emissions by 40% by 2030 relative to 2005 levels; and • may present an ideal site for CCUS opportunities in the future (though currently lacks the legal and regulatory frameworks to support such projects).
Philippines	• has resolved to increase the share of renewable energy in its generation mix and is considering the introduction of a carbon tax as some of the strategies for meeting its NDC of reducing emissions to approximately 70% below BAU levels by 2030, though has acknowledged that coal will continue to play a key role in the country; and • plans to continue constructing new coal-fired power plants into the future.
South Korea	• is looking to increase the share of renewable energy and natural gas while decreasing the share of coal as a key measure for achieving its NDC of 37% below business-as-usual (**BAU**) levels by 2030; and • has imposed import taxes for coal and LNG which act as a carbon tax and seeks to encourage a transition away from coal to renewables and LNG
Taiwan	• has legislated toward reducing reliance on both domestic and imported sources of coal, with plans to increase reliance on renewable energy and impose tax mechanisms on imported fossil fuels as a part of its plan to achieving emissions reductions of 50% below BAU levels by 2030 per its NDC.
Vietnam	• Targeted an increase in reliance on renewable energy, while not discounting the continued use of coal, in its plans to reach its NDC of emissions reductions of 8% below BAU by 2030.

6.60 **Appendix 2** to this submission provides a comprehensive description of each Export Country's domestic efforts to achieve their NDC targets.

6.61 For the purposes of the Project, the Applicant would suggest that the key points for the IPC to appreciate in relation to the material produced in this submission on climate change laws and policies in the Export Countries are:

(a) the countries where the Project's coal will ultimately be burned or combusted (i.e. source of the Project's Scope 3 emissions) have numerous domestic laws and policies in place for how each respective country intends to achieve its NDC;

(b) it is both appropriate, and consistent with the overarching international climate change framework, for the Project's Scope 3 emissions to be accounted for, regulated and reported by the respective Export Countries as Scope 1 emissions generated in those countries; and

(c) because of this, the Scope 3 emissions of the Project should not outweigh the significant social and economic benefits that the Project will deliver at a local, regional and State level.

The climate change law and policy framework in NSW, including in the context of determining development applications under the EP&A Act

6.62 The main climate change policy the NSW Government has implemented is the NSW Climate Change Policy Framework.

6.63 The NSW Climate Change Policy Framework seeks to provide aspirational goals and broad policy directions to achieve NSW's objective of achieving net-zero emissions by 2050 and ensuring that NSW is more resilient and responsive to climate change. Its other aspirational objectives include the implementation of policies consistent with the Commonwealth's plan for long-term emissions savings, to reduce emissions in government operations, and to advocate for Commonwealth, COAG and international action consistent with the *Paris Agreement*.

6.64 Under the NSW Climate Change Policy Framework, NSW has committed to both follow the *Paris Agreement* and to work to complement national action. The key policy directions under the NSW Climate Change Policy Framework and their rationales are summarised in the table below:

Policy Direction	**Rationale/Goals**
Creating an investment environment that manages the emissions reduction transition	Energy will be transformed and investment/job opportunities will be created in emerging industries of advanced energy, transport and carbon farming and environmental services
Boost energy productivity and put downward pressure on energy bills	Boosting energy and resource productivity will help reduce prices and the cost of transitions to net-zero emissions
Grow new industries and capitalise on competitive advantages	Capitalising on the competitive advantage and growth of industries in professional services, advanced energy technology, property management and financial services
Reduce risks and damage to public and private assets arising from climate change	Embed climate change considerations into asset and risk management as well as support the private sector by providing information and supportive regulatory frameworks for adaptation
Reduce climate change impacts on health and wellbeing	Recognise the increased demand for health and emergency services due to climate change and identify ways to better support more vulnerable communities to health impacts
Manage impacts on natural resources and communities	Coordinate efforts to increase resilience of primary industries and rural communities as climate change impacts water availability, water quality, habitats, weeds and air pollution

6.65 The policy framework is being delivered through:

(a) the Climate Change Fund;

(b) the development of a value for emissions savings that will be applied consistently in government economic appraisals;

(c) embedding climate change mitigation and adaptation across government operations including service delivery, infrastructure, purchasing decisions and regulatory frameworks;

(d) building on NSW's expansion of renewable energy; and

(e) developing action plans and strategies, including on advanced energy, energy efficiency, climate change adaptation, energy productivity, fugitive emissions, primary industry emissions and adaptation and health and wellbeing.

6.66 The Applicant considers that the NSW Climate Change Policy Framework provides little, if any, assistance to the IPC in determining the development application for the Project. The Applicant's view in this regard is consistent with the decision of the Land and Environment Court in the matter of *Wollar Progress Association Inc v Wilpinjong Coal Pty Ltd* [2018] NSWLEC 92.

6.67 In that case, the Wollar Progress Association contended that the Minister's delegate, in approving the Wilpinjong Extension Project, had, among other things, failed to take into account, as relevant policies for the purposes of clause 14(2) of the Mining SEPP:

(a) the Paris Agreement, in respect of which Australia adopted 2005 emissions as a baseline and a target reduction of 26-28% by 2030; and

(b) the NSW Climate Change Policy Framework, particularly its "long term aspirational objective of net zero emissions by 2050".

6.68 Wilpinjong Coal Pty Ltd, in response, submitted that there was no such failure to comply with the requirements of clause 14(2) of the Mining SEPP for two main reasons:

(a) the Paris Agreement and the NSW Climate Change Policy Framework were not applicable policies within the meaning of that clause, in that those policies could not meaningfully guide the task of the consent authority to determine the development application before it; and

(b) even if the Paris Agreement and the NSW Climate Change Policy Framework were applicable policies for the purposes of clause 14(2) of the Mining SEPP, there was ample evidence that the consent authority had regard to each of those policies.

6.69 The Court accepted Wilpinjong's submissions in this regard and generally found in its favour on this ground of challenge for the two main reasons advanced by Wilpinjong Coal: see, in particular, [180]-[183].

6.70 However, the Applicant notes that whilst it is not required to do so as a result of the *Wilpinjong* case, it would be permissible for the IPC to have regard to the NSW Climate Change Policy Framework, and it is for this reason that the Applicant has referred to the framework above.

6.71 Leaving the NSW Climate Change Policy Framework to one side, it is apparent that the consideration of climate change impacts and GHG emissions (including Scope 3 emissions) may be required, or is permitted, in determining a development application as a result of the following sources:

(a) the Secretary's Environmental Assessment Requirements (**SEARs**) for the Project;

(b) consideration of the relevant matters set out in s 4.15 of the EP&A Act, including the "public interest" and principles of ESD;

(c) the NSW case law, which had already recognised the relevance of considering Scope 3 emissions prior to the *Rocky Hill* case being decided (and noting that, as observed in Part A of this submission, the *Rocky Hill* case does not have "precedent" value); and

(d) the provisions of any relevant environmental planning instrument, such as clause 14(2) of the Mining SEPP.

6.72 Each of these four sources is considered in turn below.

6.73 First, in relation to the SEARs for the Project, the Applicant was, in relation to GHG emissions, required to carry out:

> an assessment of the likely greenhouse gas impacts of the development, having regard to the EPA's requirements (see Attachment 2)

6.74 The Applicant produced a GHG emissions assessment as a technical appendix to the EIS to comply with this requirement of the SEARs. That technical appendix assesses the GHG emissions generated by the Project in detail.

6.75 Secondly, in relation to s 4.15 of the EP&A Act, the Applicant would acknowledge that the "public interest" is a relevant consideration that must be taken into account in determining the development application for the Project and that the NSW courts have held that principles of ecologically sustainable development are a part of the "public interest" and thus must also be considered.

6.76 However, the following things should be noted about s 4.15 of the EP&A Act:

(a) the consent authority is required to consider the likely social, economic and environmental impacts of the Project (both positive and negative), "in the locality";[9]

(b) this means that Scope 3 emissions and their impacts cannot and should not feature heavily in the consent authority's consideration and determination of the development application for the Project;

(c) the expression "public interest", when used in a statute like the EP&A Act, imports a discretionary value judgment to be made by reference to undefined factual matters and is unconfined except by the scope and subject matter of the EP&A Act;[10]

(d) the "public interest" is, as a result, broad and captures not only environmental considerations associated with the Project, but also the social and economic benefits associated with the Project for the wider community and locality;

(e) whilst climate change and GHG emissions (including Scope 3 emissions) are permitted to be considered as part of the "public interest", these matters are not the only considerations that inform the "public interest" and, certainly, are not to be solely determinative of the Project;[11]

(f) if Scope 3 emissions and their impacts are to be given a relatively high level of weight (which the Applicant says they should not), it should follow that the broader

---

[9] In the *Guidelines for the economic assessment of mining and coal seam gas proposals* (dated December 2015), it appears to be suggested that the assessment of the economic aspects of a given project are to be considered at local, regional and State scale, but not at a higher scale.

[10] *The Pilbara Infrastructure Pty Ltd v Australian Competition Tribunal* [2012] HCA 36 at [42] per French CJ, Gummow, Hayne, Crennan, Kiefel and Bell JJ.

[11] This proposition also gains support generally from Justice Moore's recent decision in *Australian Coal Alliance Incorporated v Wyong Coal Pty Ltd* [2019] NSWLEC 31 at [96] to [105].

benefit to the public in having reliable and affordable energy supplies should also be considered and attributed a relatively high level of weight, even in circumstances where that benefit arises in countries to which the Project's coal is to be exported. As the DP&E noted in its Addendum Report in respect of the Wallarah 2 Coal Project:

> The Department also acknowledges that the downstream energy and other socio-economic benefits generated by the amended project would benefit future generations, particularly through the provision of international energy needs.

(g) the Applicant considers that, based on the information that is before the IPC (including the submissions made by the Applicant), the benefits of the Project outweigh the adverse impacts associated with the Project and that it is in the "public interest" for the Project to be approved.

6.77 Thirdly, as noted above, the NSW case law has recognised that Scope 3 emissions of a Project may be considered in the context of determining development applications: see, e.g., *Gray v Minister for Planning and Ors* [2006] NSWLEC 720. The *Rocky Hill* judgment also referred to case law from other jurisdictions, including the United States, in analysing the extent to which Scope 3 emissions of a project are to be considered in determining whether or not a project should be approved or refused.

6.78 The Applicant does not dispute the proposition that Scope 3 emissions may be considered by the IPC in determining the development application for the Project but would submit that:

(a) in light of the issue of double counting of GHG emissions as described earlier in this Part C, and the fact that both the *Paris Agreement* and domestic legislation (in the form of the NGER Act) clearly intend for such double counting to be avoided, the IPC should accord little weight to the Scope 3 emissions of the Project;

(b) it is for the IPC (and the IPC alone) to determine how much weight is to be attributed to the relevant social, economic and environmental factors associated with the Project (including the climate change impacts and GHG emissions of the Project). The IPC's approach to considering and weighting relevant factors is not prescribed, dictated or restricted by the *Rocky Hill* judgment or the case law that is cited by that judgment from other jurisdictions, such as the United States; and

(c) there are legal and policy reasons why the IPC should not, as a result of its consideration of Scope 3 emissions, seek to impose conditions of development consent on the Project which require any offset of GHG emissions.

6.79 The latter point just made can be well illustrated by the decision of Justice Pain in the case of *Hunter Environment Lobby Inc v Minister for Planning* [2011] NSWLEC 221. Whilst that decision was also in a merit appeal like the *Rocky Hill* case (and thus, has no "precedent" value), the Applicant considers that certain aspects of that decision are worth bringing to the IPC's attention.

6.80 That case was concerned with a merit appeal brought in respect of the consolidation and expansion of the Ulan coal mine. At [32] in the judgment, Justice Pain noted that "some of the conditions that [Hunter Environment Lobby] seek to impose are novel, particularly in relation to measures to offset GHG emissions".

6.81 In particular, one of the contentions put by Hunter Environment Lobby (**HEL**) in the case (as recorded in [33] in the judgment) was:

> Ulan has not addressed measures that would be implemented to avoid, minimise, mitigate and/or offset the Scope 3 impacts of the Project.

6.82 HEL later changed its position to seek conditions requiring an offset for Scope 1 and 2 emissions, but not for Scope 3 emissions.

6.83 Mr Kitto of the DP&E gave evidence in the proceedings. His evidence was that the imposition of conditions on a planning approval requiring offset of GHG emissions would be "inconsistent with the government's policy of not using the development assessment process in the EP&A Act to impose obligations on proponents to offset the GHG emissions of their projects and contrary to the DP&E's practice of at least 5 years of applying this policy to the assessment and regulation of all major projects in NSW" (at [59]).

6.84 Mr Kitto summarised the DP&E's position as being that development approval conditions are unsuitable for implementing a regulatory regime to require proponents to offset some or all of the GHG emissions of their projects. Key reasons given for this position were (at [60]):

(a) such a regime would be inefficient, ineffective and inequitable because conditions could only be imposed on new projects, not existing ones;

(b) no existing mines in NSW are required to offset their GHG emissions (we believe that statement remains true today);

(c) imposing a regulatory regime through conditions would make the coal supply from a few mines more expensive and would not drive change across the industry;

(d) in the absence of a national or international scheme for offsetting GHG emissions, the regulatory regime imposed by the conditions would need to rely on a collection of largely voluntary schemes to achieve offsets;

(e) the regime would be inflexible as consents could only be modified at the request of the proponent; and

(f) the regime would be complex to administer as it would not be uniform for all proponents.

6.85 Justice Pain held that it was within power to impose a condition on a planning approval requiring the offset of Scope 1 emissions generated by a project, finding that the fact that "the impact is felt within and also beyond NSW does not suggest that legally a condition should not be imposed under state legislation which seeks to ameliorate one contributor to that impact" (at [93]).

6.86 At [94], her Honour declined to determine whether it would be lawful to impose conditions requiring the offset of Scope 2 emissions, but clearly expressed doubts on the validity of such a condition:

> Scope 2 emissions are different to scope 1 emissions. By contrast scope 2 emissions result from diesel and electricity use at the project and are not emissions which Ulan can control entirely … [W]hile Ulan can minimise electricity and diesel use at the mine it cannot influence how an electricity generator and supplier chooses to generate the electricity Ulan uses … A condition framed to require offsetting of scope 2 emissions would be open to criticism that to the extent that those emissions are under the control of others, the requirement would not fairly relate to the development [one of the three criteria to be satisfied under the *Newbury* test for a valid condition of development consent]. It was not clear from the evidence how identifiable those parts of the scope 2 emissions are which Ulan has the ability to minimise or of any other form of control. The incentive for the electricity generator to reduce the production of GHG will also be removed if Ulan has to offset these, a poor policy outcome as identified in the Respondent's submissions.

6.87 It stands to reason that, if Justice Pain's logic in [94] is accepted (which the Applicant considers it should be), it would be invalid to impose conditions of development consent on the SSD consent for the Project which requires offset of Scope 2 or Scope 3 GHG emissions.

6.88 At [100] et seq, her Honour resolved to impose a condition requiring offset of Scope 1 GHG emissions.

6.89 However, in a later judgment – *Hunter Environment Lobby Inc v Minister for Planning (No 2)* [2012] NSWLEC 40 – Justice Pain departed from the position of imposing a condition requiring offset of Scope 1 GHG emissions generated by the project following the passage of

the *Clean Energy Act 2011* (Cth) (see here for the judgment). It appears that the main reason why her Honour departed from her original position was that she was satisfied that the Commonwealth scheme as represented by the *Clean Energy Act 2011* (Cth) and related legislation, met "at a practical level the purpose of imposing a condition requiring the offset of Scope 1 GHG emissions".

6.90 In light of Justice Pain's observations in these cases, as well as the information contained in this submission, the Applicant submits that:

(a) it would be unlawful for a condition of consent to be imposed on the SSD consent for the Project requiring offset of Scope 2 and Scope 3 GHG emissions, because it would breach the *Newbury* tests for a valid condition of development consent;

(b) even if it was lawful, there are strong policy reasons why it would be inappropriate for such a condition of development consent to be imposed; and

(c) there are also strong policy reasons why it would be inappropriate for a condition of development consent to be imposed requiring offset of Scope 1 emissions, in that there are existing Commonwealth laws regulating GHG emissions (as set out earlier in this Part C of the submission).

6.91 In particular, it is observed that:

(a) under the existing climate change law framework established at the federal level in Australia, in particular the safeguard mechanism provided under the NGER Act, if a facility exceeds its baseline levels set under the NGER Act for emission of Scope 1 GHG emissions, it is nominally required to surrender a number of ACCUs equivalent to the exceedance to the CER; and

(b) as the DP&E noted in its Preliminary Assessment Report in respect of the Wallarah 2 Coal Project:

> … the key response to the issue of climate change needs to be made at a national and international policy or strategic planning level, outside and above the project assessment process in NSW.

6.92 Finally, in relation to the provisions of any environmental planning instrument, clause 14(2) of the Mining SEPP does require consideration of an assessment of the GHG emissions (including downstream emissions) of the Project having regard to any applicable State or national policies, programs or guidelines concerning GHG emissions.

6.93 Clause 14(2) of the Mining SEPP has already been addressed earlier in this submission in the context of discussing the *Wilpinjong* and *Wallarah 2* cases, and is not considered in any further detail here.

6.94 It is further noted, for completeness, that the application of provisions of other environmental planning instruments more generally to the Project has been addressed in detail in the EIS: see section 4.2.2 of the EIS.

7. PART D: DEMAND FOR COAL (COKING AND THERMAL), MARKET SUBSTITUTION AND CARBON LEAKAGE

Overview

7.1 It is important to recognise that there is, and will remain for the foreseeable future, a demand for coal (both coking and thermal coal) as a reliable, affordable and efficient source of energy to meet the basic needs of human populations throughout the world. That demand for coal will remain irrespective of whether the IPC approves the Project or not and, if the Project is not approved, the demand will simply be met by product coal sourced from

elsewhere. In this regard, there is a real likelihood that the coal sourced from elsewhere will:

(a) be of an inferior quality (in terms of calorific value, and ash and sulphur content) than the quality of coal that would be produced by the Project; and

(b) result in a higher level of GHG emissions than if the Project is approved.

7.2 In this Part D of the submission, the Applicant will illustrate the points made in the paragraph immediately above and will:

(a) demonstrate that under all three policy scenarios presented by the IEA in WEO 2018 (including the Sustainable Development Scenario), there will continue to be a global demand for coal that will need to be serviced by brownfield expansions of existing coal mines (such as the Project that is being considered by the IPC) or the development of new coal mines;

(b) provide commentary on the:

(i) evaluation of the Project's coal and cost of operations, having regard to the Project's coal qualities, tonnage profile and expected duration;

(ii) relative importance of Australian coal exports in terms of meeting projected demand for thermal and coking coal;

(iii) likelihood of market substitution occurring in the event that:

(A) the Project is not approved and does not go ahead; or

(B) the Project and all other known Australian thermal coal projects do not enter the production phase,

including observations as to the where the alternative supply of coal would likely be sourced from in either of these hypothetical scenarios;

(iv) consequences that would likely follow from substitution of the Project's coal with product coal from alternative sources, particularly in respect of GHG emissions;

(v) policy and energy transition policies, plans and initiatives of countries to which the Project's coal is likely to be exported, including discussion of the uptake of HELE, CCUS and other low emission coal technologies in Asia and the impact that such technology is likely to have on global GHG emissions.

7.3 Before turning to the substantive content in this Part D of the submission, it should be acknowledged that the Applicant retained CRU to undertake an independent study into the issue of coal market substitution and leakage over the medium and long-term period, in the context of the Project that is before the IPC. For reasons relating to confidentiality and intellectual property, the Applicant only has CRU's permission to publicly disclose a letter summarising the main findings of the CRU report.

7.4 A copy of that summary letter is produced at **Appendix 3** of this submission.[12]

[12] Please refer to the general disclosures concerning the IEA's three policy scenarios in WEO 2018 in **Appendix 4** of this submission.

Global demand for coal over the medium and long-term period

7.5 The global demand for coal over the medium and long-term period is addressed in detail by the IEA, an entity related to the Organisation for Economic Co-operation and Development, in its annually published reports known as the WEO. The IEA does analysis work for both the Intergovernmental Panel on Climate Change and under the UNFCCC.

7.6 At the time of preparing this submission, the most recent report published by the IEA is the WEO 2018, which was published in late 2018.

7.7 As stated at page 29 of the WEO 2018, the purpose of the publication is as follows:

> The [WEO 2018] provides a framework for thinking about the future of global energy. It does not make predictions about the future. Instead, it sets out what the future could look like on the basis of different scenarios or pathways, with the aim of providing insights to inform decision making by governments, companies and others concerned with energy.

7.8 The WEO 2018 presents three policy scenarios for assessing global energy demand and energy source, for the period ending 2040. Those three policy scenarios are defined in the WEO-2018 (at p 29) as follows:

> - The **New Policies Scenario** provides a measured assessment of where today's policy frameworks and ambitions, together with the continued evolution of known technologies, might take the energy sector in the coming decades. The policy ambitions include those that have been announced as of August 2018 and incorporates the commitments made in the Nationally Determined Contributions under the Paris Agreement, but does not speculate as to further evolution of these positions. Where commitments are aspirational, this scenario makes a judgement as to the likelihood of those commitments being met in full. It does not focus on achieving any particular outcome: it simply looks forward on the basis of announced policy ambitions.
>
> …
>
> - The **Current Policies Scenario** is based solely on existing laws and regulations as of mid-2018, and therefore excludes the ambitions and targets that have been declared by governments around the world. It provides a baseline for the *WEO* analysis.
>
> - The **Sustainable Development Scenario**, introduced for the first time in the WEO-2017, starts from selected key outcomes and then works back to the present to see how they might be achieved. The outcomes in question are the main energy-related components of the Sustainable Development Goals, agreed by 193 countries in 2015:
>
>   - Delivering on the Paris Agreement. The Sustainable Development Scenario is fully aligned with the Paris Agreement's goal of holding the increase in the global average temperature to "well below 2°C".
>
>   - Achieving universal access to modern energy by 2030
>
>   - Reducing dramatically the premature deaths due to energy-related air pollution

7.9 In relation to each of these three policy scenarios, it must be recognised that:

(a) the IEA does not endorse any particular scenario in WEO 2018;

(b) the New Policies Scenario is the central scenario in WEO 2018;

(c) the New Policies Scenario incorporates policies and measures affecting energy markets which have already been adopted, as well as other relevant commitments that have been announced by governments of the world but where the precise implementation measures have yet to be fully defined;

(d) the Current Policies Scenario is the most favourable IEA scenario for coal, incorporating only those policies and measures affecting energy markets that were formally enacted. It assumes that governments do not implement any recent

commitments that have yet to be backed-up by legislation and will not introduce other new policies bearing on the energy sector in the future; and

(e) while the Current Policies Scenario presents the most favourable case for coal, IEA's Sustainable Development Scenario presents the most unfavourable scenario for coal. The Sustainable Development Scenario incorporates a variety of government policies compatible with limiting the long-term increase in the average global temperature to well below 2 degrees Celsius, the limit recognised by the *Paris Agreement*.

7.10 In Part A, Chapter 1 of the WEO 2018, the IEA projects the global energy demand to 2040 by fuel and the three policy scenarios.

7.11 Table 1.1 of the WEO 2018 (p 38) sets out the world primary demand by fuel and scenario:

Table 1.1 ▷ World primary energy demand by fuel and scenario (Mtoe)

			New Policies		Current Policies		Sustainable Development	
	2000	2017	2025	2040	2025	2040	2025	2040
Coal	2 308	3 750	3 768	3 809	3 998	4 769	3 045	1 597
Oil	3 665	4 435	4 754	4 894	4 902	5 570	4 334	3 156
Gas	2 071	3 107	3 539	4 436	3 616	4 804	3 454	3 433
Nuclear	675	688	805	971	803	951	861	1 293
Renewables	662	1 334	1 855	3 014	1 798	2 642	2 056	4 159
Hydro	225	353	415	531	413	514	431	601
Modern bioenergy	377	727	924	1 260	906	1 181	976	1 427
Other	60	254	516	1 223	479	948	648	2 132
Solid biomass	646	658	666	591	666	591	396	77
Total	10 027	13 972	15 388	17 715	15 782	19 328	14 146	13 715
Fossil fuel share	*80%*	*81%*	*78%*	*74%*	*79%*	*78%*	*77%*	*60%*
CO_2 emissions (Gt)	23.1	32.6	33.9	35.9	35.5	42.5	29.5	17.6

Notes: Mtoe = million tonnes of oil equivalent; Gt = gigatonnes. Solid biomass includes its traditional use in three-stone fires and in improved cookstoves.

7.12 The relevant commentary on the data for the three policy scenarios, as outlined in Table 1.1 of the WEO 2018, is produced at pp 38-39 of the WEO 2018. The following relevant observations from that commentary are extracted below:

> In the **New Policies Scenario**, global primary energy demand grows by over a quarter between today and 2040. The overarching structural trends that shape demand are population growth, urbanisation and economic growth. Energy policies also play a critical role, notably those relating to energy efficiency, renewable resources, measures to curb air pollution and the phasing-out of fossil fuel subsidies. In the Sustainable Development Scenario, demand is almost flat out to 2040, reflecting in part the continuing potential of energy efficiency to reduce demand. Our scenario-based projections show where policy choices lead the energy sector.
>
> In the **Current Policies Scenario**, continued strong growth among the incumbent fuels leaves only a small amount of headroom for renewables to step in and meet incremental demand. Coal use rises on the back of strong consumption in the developing world. In the absence of significant commitments to improve vehicle efficiency, oil demand climbs by 25% to 2040.
>
> In the New Policies Scenario, coal, and oil to a degree, have to make room for others, not least because of rapid rise in the share of renewables in electricity generation. Strong policy headwinds, including commitments to phase out coal use in some countries, mean that global coal consumption levels off. Oil use in cars also peaks in the 2020s due to advances in fuel efficiency and an increased use of biofuels and electricity. However, trucks, aviation, shipping and petrochemicals continue to push up overall oil use.
>
> In the **Sustainable Development Scenario**, coal moves to the back of the pack: demand of 1 600 million tonnes of oil equivalent (Mtoe) of coal in 2040 is in line with the level of 1975, when the global economy was barely a quarter of the size of today. Oil demand reaches a peak and begins to decline.

Natural gas consumption grows in every scenario, underpinned by its versatility and environmental advantages relative to other combustible fuels. Its growth prospects are, however, curtailed in the Sustainable Development Scenario by higher efficiency and the push towards full decarbonisation of the energy system.

7.13 In relation to the outlook for coal specifically under each of the three scenarios, Chapter 5 in Part A of the WEO 2018 analyses the outlook for coal, examining how coal fares in a rapidly changing power sector and the prospects for exporters in a demand-constrained world.

7.14 Table 5.1 of the WEO 2018 (p 218) sets out the global coal demand, production and trade by scenario:

Table 5.1 ▷ Global coal demand, production and trade by scenario (Mtce)

			New Policies		Current Policies		Sustainable Development	
	2000	2017	2025	2040	2025	2040	2025	2040
Power	2 235	3 415	3 341	3 361	3 593	4 485	2 448	732
Industry	857	1 716	1 867	2 005	1 906	2 178	1 744	1 530
Other sectors	205	227	175	74	212	150	159	19
World coal demand	**3 298**	**5 357**	**5 383**	**5 441**	**5 711**	**6 813**	**4 350**	**2 282**
Share of Asia Pacific	*47%*	*74%*	*78%*	*82%*	*77%*	*81%*	*81%*	*83%*
Steam coal	2 504	4 134	4 201	4 412	4 486	5 655	3 313	1 609
Coking coal	449	960	918	806	937	869	837	579
Lignite	302	265	264	224	288	289	201	93
World coal production	**3 255**	**5 360**	**5 383**	**5 441**	**5 711**	**6 813**	**4 350**	**2 282**
Share of Asia Pacific	*48%*	*72%*	*75%*	*78%*	*75%*	*77%*	*76%*	*79%*
Steam coal	310	805	736	760	803	1 066	538	281
Coking coal	175	302	320	346	340	378	287	250
World coal trade	**471**	**1 102**	**1 044**	**1 089**	**1 121**	**1 422**	**815**	**518**
Share of production that is traded	*14%*	*21%*	*19%*	*20%*	*20%*	*21%*	*19%*	*23%*
Coastal China steam coal price ($2017/tonne adjusted to 6 000 kcal/kg)	**35**	**102**	**91**	**94**	**95**	**106**	**81**	**79**

Notes: kcal/kg = kilocalories per kilogramme. Unless otherwise stated, use of coal in industry in this chapter reflects volumes also consumed in own use and transformation in blast furnaces and coke ovens, petrochemical feedstocks, coal-to-liquids and coal-to-gas plants. Historical data for world demand differ from world production due to stock changes. Lignite production includes peat. Unless otherwise stated, trade figures in this chapter reflect volumes of coking and steam coal traded between regions modelled in the *WEO* and therefore do not include intra-regional trade. World coal trade is the sum of net exports for all *WEO* regions and may not match the sum of steam and coking coal trade as a region could be a net exporter of one coal type but a net importer of another.

7.15 The relevant commentary on the data for the three policy scenarios, as outlined in Table 5.1 of the WEO 2018, is produced at pp 218-219 of the WEO 2018. The following relevant observations from that commentary are extracted below:

> Coal demand in 2040 in the **New Policies Scenario** has been revised down by some 3% (170 Mtce) compared with WEO-2017. Downward revisions have been made for industrial coal use, as the shift from coal to alternative fuels in industry speeds up, and in the buildings sector where coal use almost disappears.
>
> Overall coal demand for power generation declines slightly in the New Policies Scenario as moderate growth in coal-fired generation is offset by improvements in plant efficiencies. Modest growth in industrial coal consumption is due in part to rising use of coal as a feedstock for a range of conversion processes, notably coal-to-gas and coal-to-liquids projects in China. Overall coal consumption flattens around 5 400 Mtce and does not regain the peak seen in 2014 (Table 5.1).
>
> …
>
> In the New Policies Scenario, the share of coal in global primary energy demand declines from 27% today to 22% in 2040, falling behind gas in the late 2020s. The growth picture looks very different in the other two scenarios, reflecting the extent to which the prospects for coal are dependent on the way that policies evolve. In the **Current Policies Scenario**, coal demand increases at 1% per year over the outlook period, but coal still falls behind gas by 2040. In the **Sustainable Development Scenario**, coal consumption decreases steeply (-3.6% per year) and coal's share in primary energy falls below 12% by 2040.

Coal prices increase slightly in the New Policies and Current Policies scenarios from 2025 onward, reflecting upward cost pressure caused by the need to tap more remote coal deposits, increasingly challenging geological conditions and rising costs for consumables such as fuel. Coal prices decrease in the Sustainable Development Scenario as lower demand forces the closures of high cost mines in a market where only the most productive, least-cost mines can survive.

CCUS provides a technology option to reduce emissions of the existing coal-fired power plant fleet through retrofits in the Sustainable Development Scenario. Some 210 gigawatts (GW) of coal plants are fitted with carbon removal technology by 2040, of which 170 GW are retrofits to existing plants. However, progress in CCUS deployment and investment remains limited in practice and lags well behind the pace that would be needed in this scenario.

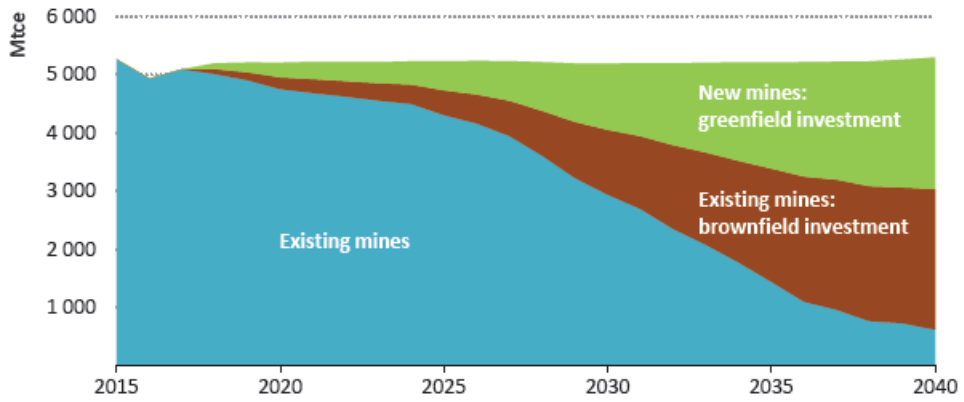
7.16 Given that the New Policies Scenario in the WEO 2018 is considered to be the central scenario in respect of the global outlook for coal, the following observations contained in WEO 2018 in respect of the New Policies Scenario should be made (noting that, unless otherwise stated, there are no equivalent observations or comparative statistics offered in WEO 2018 with respect to the Current Policies Scenario or the Sustainable Development Scenario):

(a) the 2017 increase in coal-fired electricity generation in China has continued in 2018, but coal demand comes under pressure in IEA's projections from the policy priority to improve urban air quality, supported by coal-to-gas switching in the industrial and residential sectors, a push for renewables in power generation and ongoing restructuring of the economy (WEO 2018, p 215);

(b) India is the single largest source of global demand growth in the New Policies Scenario. Whilst India is pushing strongly to expand the role of renewables in its power mix, robust growth in electricity demand means a near-doubling in coal-fired power output to 2040. Imports of coal to India will rise, especially for coking coal as India's domestic resources are insufficient to meet growing demand from the iron and steel industries (WEO 2018, p 215). This is projected by the IEA, notwithstanding that India is looking to limit the growth of coal in the near and long-term to support multiple environmental goals, and is taking other steps as well to support cleaner air (WEO 2018, p 341);

(c) the New Policies Scenario implies $1 trillion of investment to offset decreasing production of coal from existing mines (as to which, see Figure 5.2 from WEO 2018 below) and to build new coal infrastructure, the majority of which is in China and India (WEO 2018, p 216):

Figure 5.2 ▷ Global coal production by type in the New Policies Scenario



Global coal production from existing mines drops markedly by 2030. More than 40% of coal production in 2040 is from new mines.

(d) to meet projected coal demand in the New Policies Scenario by 2040:

(i) capital expenditure to support operations at existing mines comes to roughly $370 billion over the period to 2040, a sum almost equal to greenfield and brownfield mining expenditures (WEO 2018, p 225); and

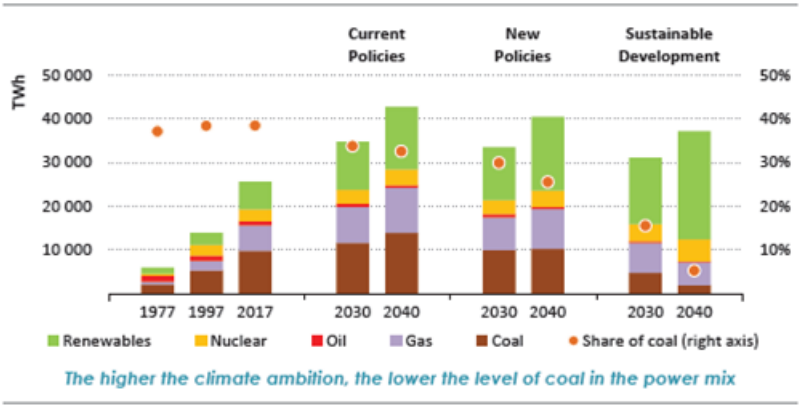
(ii) the outlook for coal trade is uncertain, but Australia is the only export-oriented country projected to significantly ramp up coal production over the period to 2040, particularly due to its strong resource base and its proximity to growing markets in Asia (WEO 2018, p 223);

(e) even in the Sustainable Development Scenario, it is projected that, beyond 2028, there will need to be investment in expanding existing brownfield operations in order to meet the Sustainable Development Scenario coal demand projection (WEO 2018, Figure 5.2 and Table 5.1, as extracted above);

(f) over the outlook period, some new coal importers are projected to emerge in Asia, even as import needs decline elsewhere. Australia continues to be well positioned to serve demand in Asia in a growing international coking coal market (WEO 2018, p 216);

(g) in relation to the picture for coal on a regional level, the New Policies Scenario projects that coal remains an important pillar of electricity generation in many regions. In India, coal remains the main fuel in power generation in 2040 with a share of around 50%. In China and Southeast Asia, coal accounts for around 40% of power generation in 2040. In Southeast Asia, it becomes the primary fuel for power generation over the period, as the share of gas decreases. This can be contrasted with the Current Policies Scenario and the Sustainable Development Scenario, as depicted in Figure 5.7 from WEO 2018 extracted below. In the Sustainable Development Scenario, coal is projected to be almost squeezed out of the power mix, with renewables accounting for two-thirds of power generation by 2040 in this scenario and the share of coal falls to around 5%. Unabated coal plants operate far less often, providing power primarily when low-carbon sources (e.g. wind and solar PV) are not available. High load factors of 60-70% are confined to plants equipped with CCUS: by 2040, roughly 20% of coal capacity is equipped with carbon capture technology. Further, coal generation is projected to be in retreat in many advanced economies such as Japan, Korea and the United States, and almost vanishes from power generation in the European Union over the period (WEO 2018, pp 228-229);

Figure 5.7 ▷ Global electricity generation by source and scenario



Note: TWh = terawatt-hours.

(h) the extent to which existing coal plants can provide flexibility in a cost-effective way to the system is context dependent. Coal-fired capacity does play a part in meeting

the increasing demand for flexibility in the New Policies Scenario. The existing fleet is valuable in some countries where electricity storage is not available at cost and scale, grid interconnection between regions is not yet well developed, and demand response is not fully utilised. In these cases, coal plant flexibility retrofits are among the least-cost ways to bring additional flexibility to the system.[13] The possibility of flexible operation can also be taken into account in the design of coal-fired power plants under construction or in planning stages, thereby reducing additional costs in the future (WEO 2018, p 233); and

(i) Australia, the world's largest coal exporter, benefits from a large high-quality resource base (in particular low cost/high quality coking coal) and from a formidable mining industry which has successfully cut costs in recent years. IEA's projections in the New Policies Scenario see Australia increasing its exports to around 430 Mtce by 2040, roughly half of which is coking coal (WEO 2018, p 240).

7.17 In light of the information contained in the WEO 2018 as described above, it is evident that under all three policy scenarios presented by the IEA (including the Sustainable Development Scenario), there will continue to be a global demand for coal that will need to be serviced by brownfield expansions of existing coal mines (such as the Project that is being considered by the IPC) or the development of new coal mines (see Figure 5.2 from WEO 2018, and Table 5.1 from WEO 2018, extracted above).

7.18 Further, from the independent modelling undertaken by a coal markets expert engaged by the Applicant (which aligns generally with IEA's New Policies Scenario and Current Policies Scenario, but not the Sustainable Development Scenario), it is evident that:

(a) coal will, in 2040, remain an important pillar of electricity generation in many of the world's regions, including in Southeast Asia, as well as in China and India;

(b) high quality coal from Australia (such as that produced by the Project) is, and will continue to be, in demand to meet the electricity generation demands in these regions in particular (as many of these countries do not have any domestic coal resources), as well as global demand more generally;

(c) as the ability of existing mines to service global demand for coal declines (e.g. as a result of exhausting their environmentally recoverable reserves), it will be necessary for the shortfall in coal demand to be met by brownfield expansions of existing coal mines or the development of new coal mines (see Figure 5.2 from WEO 2018, as extracted above); and

(d) for the reasons that are later explained in this Part D of the submission, it is logical and preferable for the global coal demand to be met by the supply of higher quality coal resources (such as the Project's coal) than lower quality coal resources, in that the GHG emissions generated by the combustion of lower quality coal will generally be higher due to the fact that more lower quality coal will need to be combusted to achieve an equivalent energy output than what would be produced from the combustion of a higher quality of coal.

Evaluating the Project's coal and cost of operations: coal qualities, tonnage profile and expected duration of the Project

7.19 The Project will involve the extraction of an additional 150 million tonnes of ROM coal over 23 years, with all coal produced by the Project being exported to countries other than Australia.

---

[13] The Applicant would also point out that retrofitting control systems in coal-fired power plants, through use of low emission coal technologies, will not only provide flexibility to the system, but will also result in the reduction of GHG emissions from coal-fired power plants that are so retrofitted.

7.20 Coal produced by the Project will be one of three coal categories:

(a) low ash thermal;

(b) medium ash thermal; and

(c) semi-soft coking (metallurgical coal).

7.21 The qualities of the Project's coal products are presented in the table below:

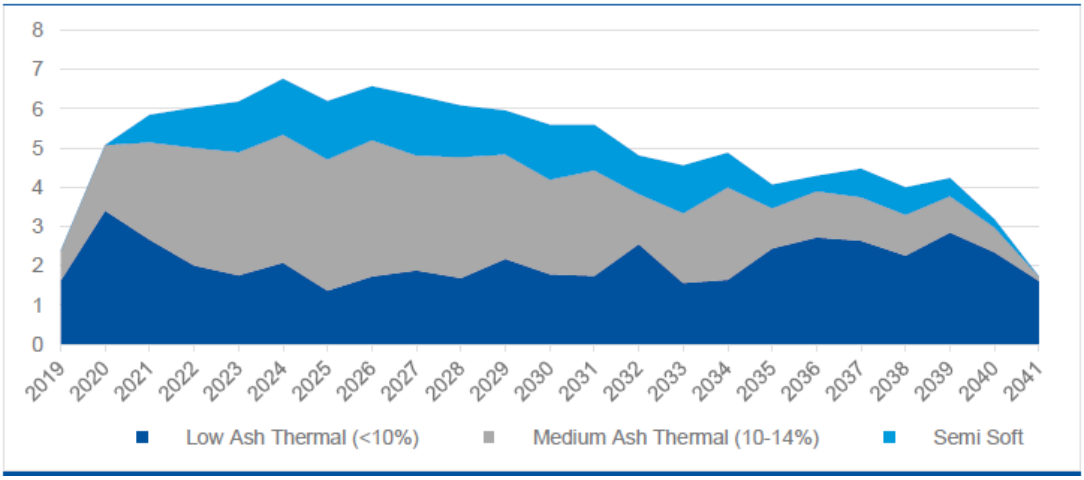
	Unit	Life of Mine Weighted Average
Low Ash Thermal (<10%)		
Calorific Value	kcal/kg	6,767
Ash	%	7.8%
Sulphur	%	0.37%
Medium Ash Thermal (10-14%)		
Calorific Value	kcal/kg	6,410
Ash	%	12.2%
Sulphur	%	0.40%
Semi Soft		
Calorific Value	kcal/kg	6,751
Ash	%	8.1%
Sulphur	%	0.35%
Crucible Swell	-	6.2
Fluidity	ddpm[1]	123.6
Phosphorus	%	6.6%

7.22 As coal is not a standardised homogeneous commodity, the quality parameters of the ore produced by different coal mining projects will vary considerably. This is a critically important factor to recognise when comparing both the costs of production of different mines as well as the environmental consequences of its production and use.

7.23 The Applicant has evaluated the production costs associated with the Project by taking into account the differences in coal quality and their impacts on producers (and, indirectly, consumers of coal) when analysing the business performance and competitive position of individual production facilities in the extractive industries.

7.24 This evaluation required the establishment of a "benchmark" price, against which the costs of all production facilities are compared. This exercise was only performed in respect of thermal coal, and not semi-soft coking (metallurgical) coal. Thermal coal is the Project's primary product, representing over 80% of the total life of mine saleable coal output. This is illustrated by **Figure 1** below showing United Wambo's saleable production profile for the period from 2019 to 2041.

Figure 1: Project's saleable production profile, 2019-2041



7.25 The key benchmark for thermal coal is the 6,000kcal/kg calorific value benchmark. Once the valuation methodology was applied and after necessary adjustments were made to the Project's business costs so as to allow for a "like to like" value comparison with the business cost curve that was adopted, the initial business costs for the Project were reduced from US$53.2/t to US$40.5/t as the Project's thermal coal products are of higher quality than the benchmark.

7.26 The costs of the Project's coal were compared against the business cost curves that were adopted for 2025 for two situations: one including Chinese operations and the other excluding Chinese operations (being **Figures 2** and **3** respectively below). The costs excluding Chinese operations are shown because Chinese coal is not part of the seaborne market. Australian coal therefore only competes with the other seaborne coal miners. The business cost curves that were adopted represent the costs of running coal mines globally that produce both thermal and metallurgical material on a quality equivalent basis.

7.27 As a result of carrying out this exercise, it was found that the Project's business costs sit within the 10th percentile of both curves as shown in Figures 2 and 3, meaning that the Project is a low-cost project when compared to other projects and existing production worldwide, as well as when compared with average country business costs of running coal mines (as to which, see **Figure 4** below).

Figure 2: All coal products seaborne business cost curve including China, 2025

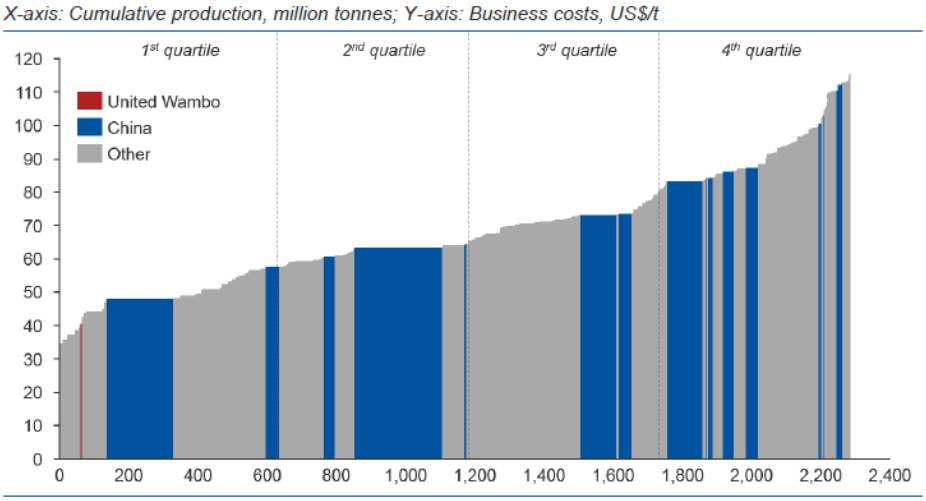


Figure 3: All coal products seaborne business cost curve excluding China, 2025

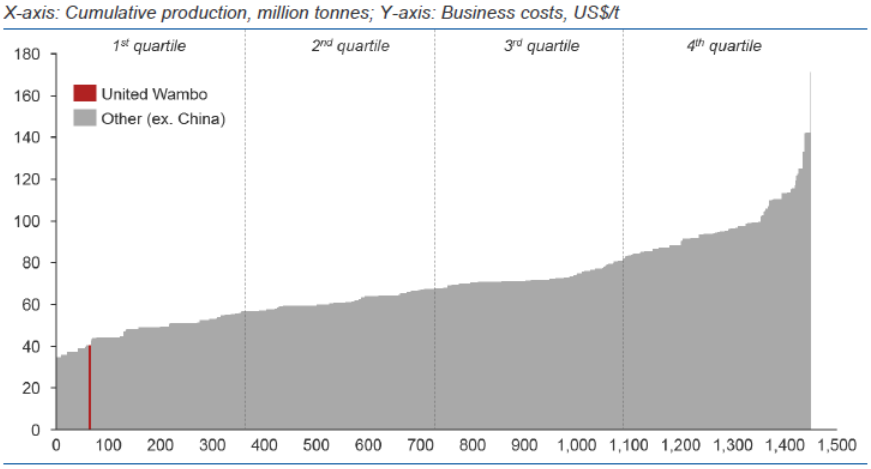
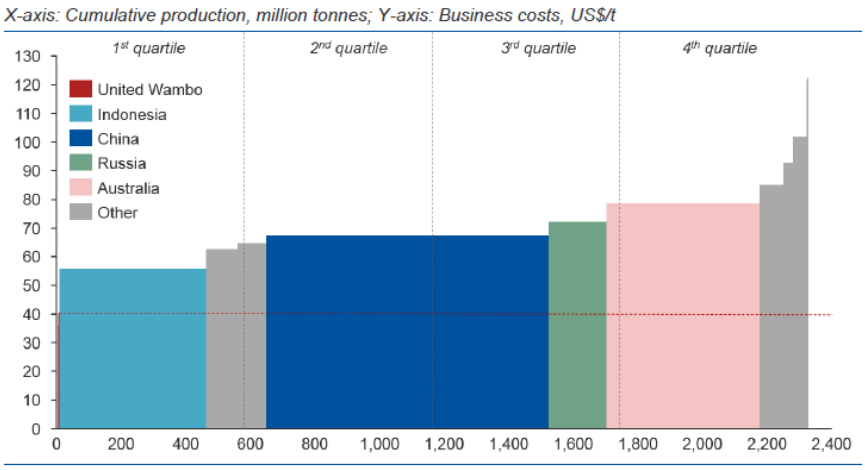


Figure 4: All coal products seaborne business cost curve on a country basis, 2025



The relative importance of Australian coal exports in terms of meeting projected demand for thermal and coking coal

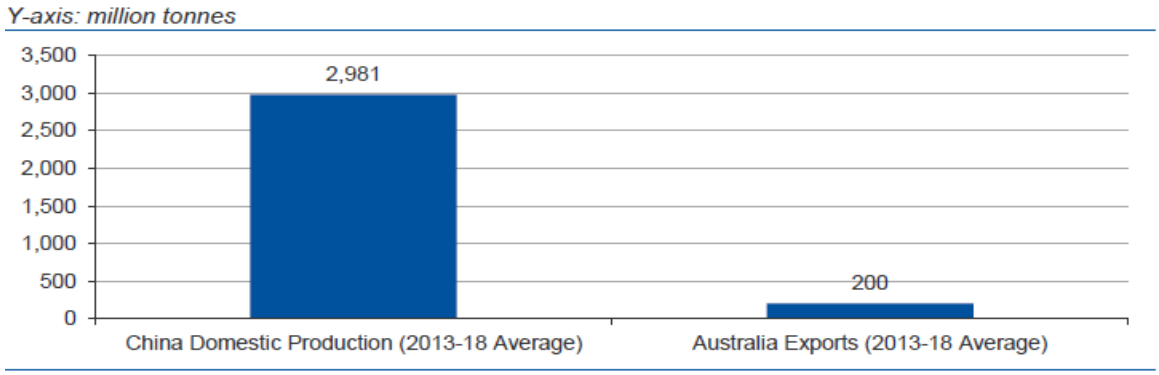
7.28 Whilst it is the case that Australia is the world's largest exporter of coal, it should be acknowledged that coal investment and supply conditions in Australia have a limited impact on the global demand for coal generally for several reasons:

(a) as a low-cost producer, it does not affect the price of coal (which is determined by the marginal – typically Chinese coal producer);

(b) Australian coal supplies are small relative to domestic industries in the major importing countries: Chinese domestic coal production alone is around 15 times larger than total Australian exports (see **Figure 5** below); and

(c) a high degree of flexibility is observed in the coal industries of major Asian demand centres, rendering it likely that any change in Australian exports would be offset by expansion in these domestic supplies. In 2017 alone, for example, China closed around 200 million tonnes of coal production capacity (roughly equivalent to the entire Australian export market). Such former producing assets can be readily restarted in response to any supply shortages.

Figure 5: Size comparison between China domestic market and Australian exports for thermal coal



Likelihood of market substitution

7.29 The likelihood of market substitution of the Project's coal can be considered in two different hypothetical scenarios:

(a) the Project is not approved and does not go ahead; or

(b) the Project and all other known Australian thermal coal projects do not enter the production phase.

7.30 Both of the two hypothetical market substitution scenarios considered below cover a forecast period of 2019-2030 only (c. 50% of the Project's life of mine). The analysis does not cover the 2031-2040 period, as it is not possible to forecast the substitution scenarios with any level of accuracy, beyond 2030 due to the dynamic nature of supply and demand and the vast number of variables that cannot be predicted with certainty more than a decade in advance. Further, it should be noted that the analysis of the impacts of the two hypothetical market substitution scenarios considered below has been informed by various technical factors, including:

(a) the requisite coal volumes evaluated on an energy-equivalent basis

(b) the relative average regional boiler efficiencies

(c) the average diesel and power consumption from mined coal production by region; and

(d) the average carbon intensity of grid power by region.

7.31 This analysis is reliant on the specific data that is available to the Applicant. It should be acknowledged that, like all market substitution analyses of this nature, the estimate of GHG emissions that is given can vary depending upon the data and parameters that are set for the particular analysis.

7.32 In relation to the first of these hypothetical scenarios, there will remain a global demand for high quality Australian coal irrespective of whether or not the Project is approved, as is evident from discussion of the three policy scenarios posited in the IEA's WEO 2018. The most credible replacement projects to substitute for the Project's coal in the event that the Project is not approved are in Indonesia and other Australian coal projects. Alternative substitution sources for the Project's coal could be sourced from elsewhere within the Pacific Basin, including China, India, Russia or Vietnam.

7.33 In relation to the second of these hypothetical scenarios, there will, again, remain a global demand for high quality Australian coal irrespective of whether or not the Project is approved, as is evident from discussion of the three policy scenarios posited in the IEA's WEO 2018. Based on the Applicant's modelling for the forecast period (i.e. 2019-2030), it is estimated that export thermal coal production in Australia will be 248 million tonnes in 2020 and 244 million tonnes in 2030, from:

(a) operational mines which are expected to progressively deplete from 239 million tonnes in 2020 to 170 million tonnes in 2030; and

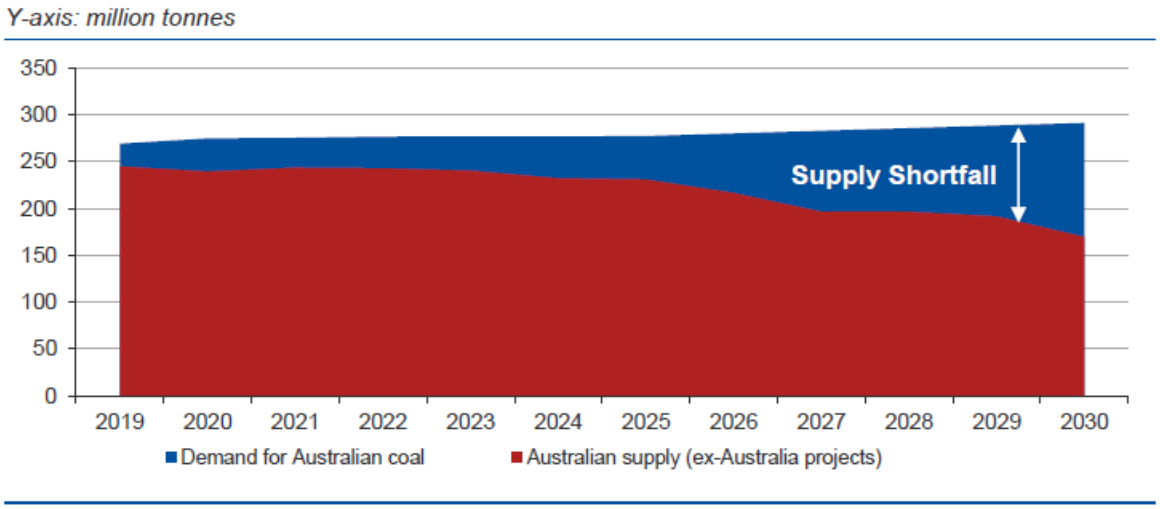
(b) thermal coal committed projects that are viewed as the most likely to be brought into production, including the Project, Adani's Carmichael Mine, MACH Energy's Mt Pleasant Coal Mine, and Whitehaven Coal's Vickery Mine (noting that the combined output of those projects will increase from 9 million tonnes in 2020 to 74 million tonnes in 2030).

7.34 The demand for Australian export coal during the forecast period is estimated to be 275 million tonnes in 2020 and 291 million tonnes in 2030. Therefore, it is forecast that there

will be a supply gap between export production and demand of 27 million tonnes in 2020 to 47 million tonnes in 2030.

7.35 The supply gap and of the exclusion of future production from committed Australian projects creates an increased production shortfall of 36 million tonnes in 2020 and 121 million tonnes in 2030 (as shown in **Figure 6** below) to meet demand. The shortfall represents respectively 13.1% and 41.6% of Australian supply, or 0.6% and 2.0% of global supply.

Figure 6: Visualisation of the supply shortfall if no Australian projects are approved in the future



7.36 This supply shortage will be bridged by alternative coal supplies from outside Australia. The most credible alternative supply countries are China, Russia, Indonesia, South Africa and Vietnam. Because those countries are also major coal producing countries, it is considered that those countries will be capable of absorbing the supply shortage, as well as providing replacement coal volumes to non-producing countries in the Pacific Basin that normally are net importers of Australian thermal coal.

7.37 The substituting volumes to fill the gap left by the Australian shortfall are allocated using the following assumptions:

(a) producing countries substitute import volumes by domestic production going forward; and

(b) non-producing countries keep sourcing coal from Australia for a few years until the volumes are not enough to feed demand, resulting in those non-producing countries turning to producing countries other than Australia to feed the demand.

7.38 In **Figure 7** below, the replacement supply curve is plotted and, in **Figure 8** below, the breakdown per country is displayed.

7.39 As is evident in Figures 7 and 8, early substitution will mainly come from China as it is able to respond quickly to the shortfall with large scale domestic production. As the shortfall grows, non-producing countries will start diversifying their imports away from Australia and the share of other exporters like Indonesia and Russia are set to increase. Nonetheless, the Applicant considers that Chinese coal is likely to remain the largest substitute to Australian coal.

Figure 7: Production profile from Pacific Basin producers replace Australian supply

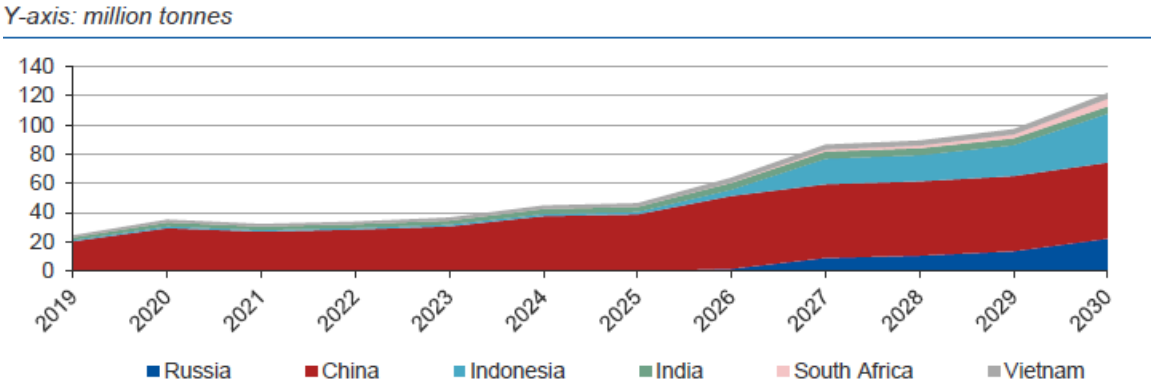
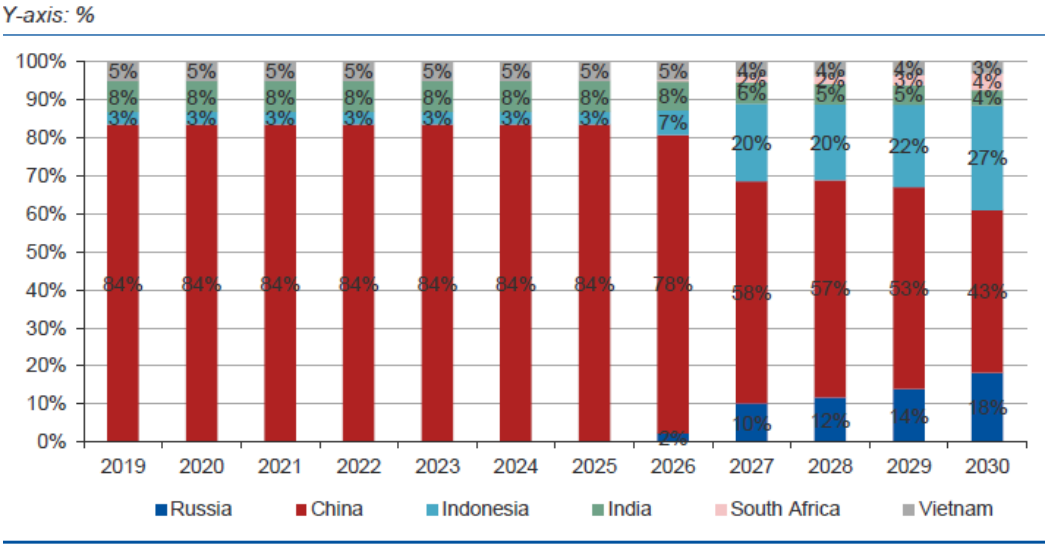


Figure 8: Country breakdown of the substitution production



Consequences that would likely follow from substitution of the Project's coal with product coal from alternative sources, particularly in respect of GHG emissions

7.40 In order to appreciate the consequences that would likely follow from substitution of the Project's coal with product coal from alternative sources, it is essential to first appreciate the quality of the Project's coal. This is because the quality of the Project's coal, relative to alternative markets and projects, is key for assessing the potential environmental impacts of any supply substitution that may arise.

7.41 There are three particular measures by which the Project's coal can be evaluated. They are:

(a) calorific values (unit: kcal/kg);[14]

(b) ash content (unit: %);[15] and

(c) sulphur content (unit: %).[16]

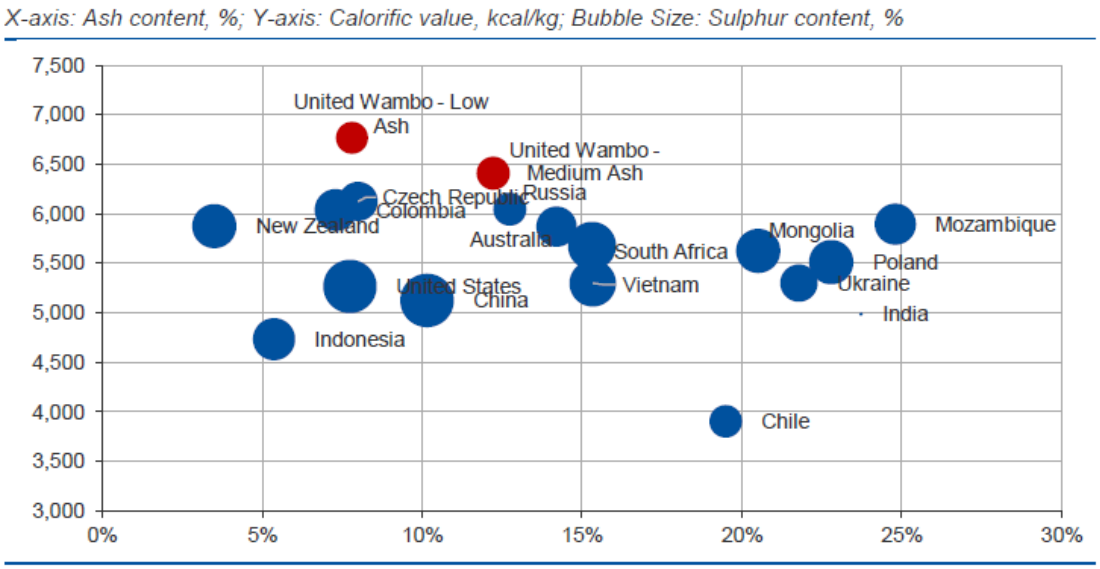
---

[14] The energy density of different coal sub product is a key driver of the volume of coal that is needed to be burned to attain a given level of power demand.

[15] This refers to the non-combustible residue left after the coal is burnt; it is a key driver of costs as it impacts power plant maintenance costs via equipment wear and ash-handling requirements.

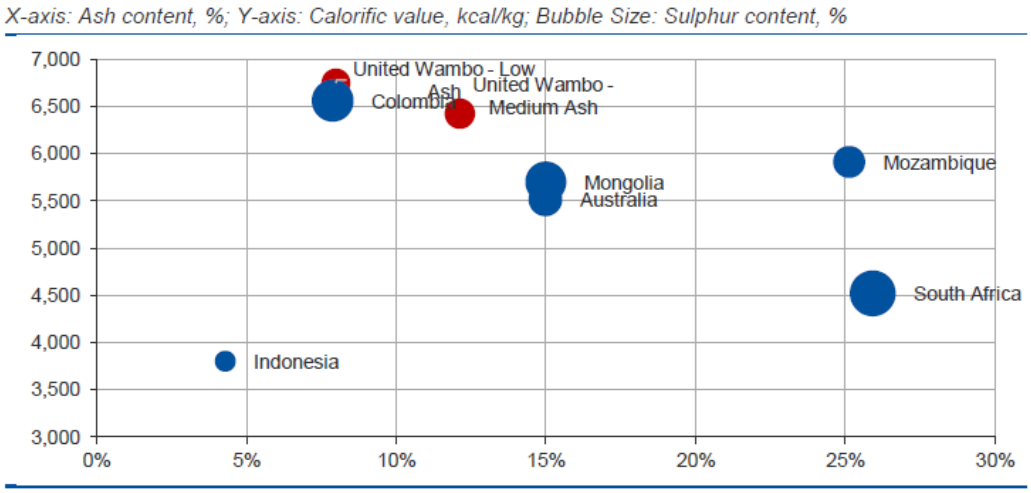
7.42 In **Figure 9** below, a scatter chart ranking of the Project's low and medium thermal coal products against country average quality of operational mines is provided.

Figure 9: Thermal coal quality comparison between the Project and country weighted average of operational mines



7.43 **Figure 10** below does the same exercise as Figure 9, but with all known thermal coal projects that are expected to commence operations at any time between 2019 and 2030.

Figure 10: Thermal coal quality comparison between the Project and country weighted average of projects



7.44 The Project's low and medium ash products' calorific values are respectively 12.8% and 6.8% above the 6,000kcal/kg benchmark. The calorific values of the Project's low ash and medium ash thermal coal products are also higher than the country averages of Australia and other major thermal coal producers such as China, India, Indonesia, Russia, South Africa and the United States.

---

[16] This contaminant impacts the level of atmospheric oxides which are emitted (a key local air pollutant and contributor to acid rain).

7.45 The Project's low ash and medium ash thermal coal products have low (<10%) and medium (between 10-14%) ash content.

7.46 The sulphur contents of the Project's thermal coal products (0.36%) are at the bottom end of the range globally,[17] similar to products from Russia and Chile, with only India having significantly lower sulphur levels.

7.47 The high quality of the Project's thermal coal, when compared with alternative supply sources, has important consequences for the purpose of calculating the GHG emissions that would occur if the Project was to proceed vs the two hypothetical scenarios posited above (i.e. where the Project did not proceed, or the Project and all other known Australian thermal coal projects do not enter the production phase).

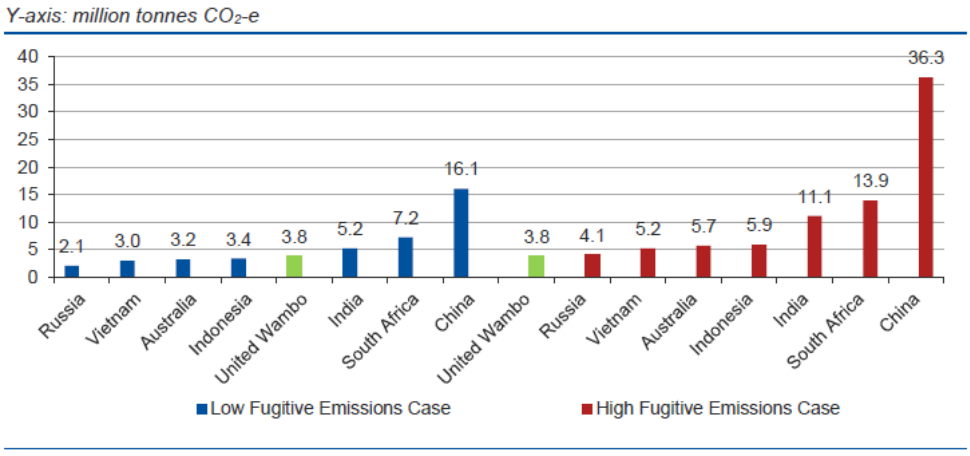
7.48 In relation to the first hypothetical scenario (i.e. where the Project did not proceed), the Scope 1 and 2 GHG emissions (from fuel, fugitive emissions and power consumption) of the Project and the alternative sources of coal over the period from 2019 to 2030 are compared in **Figure 11** below.

7.49 As a result of the absence of detailed estimates of fugitive emissions from a defined alternative supply source, a Low and High case needed to be adopted. The selection of the Low and High cases was informed by the IPCC's estimates of fugitive methane emissions from coal mining, which are said to range from 0.164 to 0.410 t CO_2-e / coal tonne (in the case of underground mining) and 0.005 to 0.033 t CO_2-e / coal tonne (in the case of surface mining).

7.50 In the Low case for fugitive emissions, only if the Project's output is fully replaced with either Russian, Vietnamese, Indonesian or other Australian coal will the emissions be lower, saving the release of 0.4 to 1.7 million tonnes CO_2-e in the atmosphere. Replacement coal from the other alternative countries would produce an additional 1.4 to 12.3 million tonnes CO_2-e. In the High case though, the Project is expected to emit the lowest amount of GHG among the alternative universe of supply sources; coal substitution would produce an additional 3.3 to 26.5 million tonnes CO_2-e.

7.51 Scope 1 and 2 emissions also account for just 2.3% of all direct and indirect GHG emissions calculated for the Project. Therefore, direct mining activity is responsible for only a small fraction of emissions from the coal value chain.

Figure 11: Scope 1 and 2 emissions from the Project and alternative supply sources for both fugitive emission cases, 2019-2030

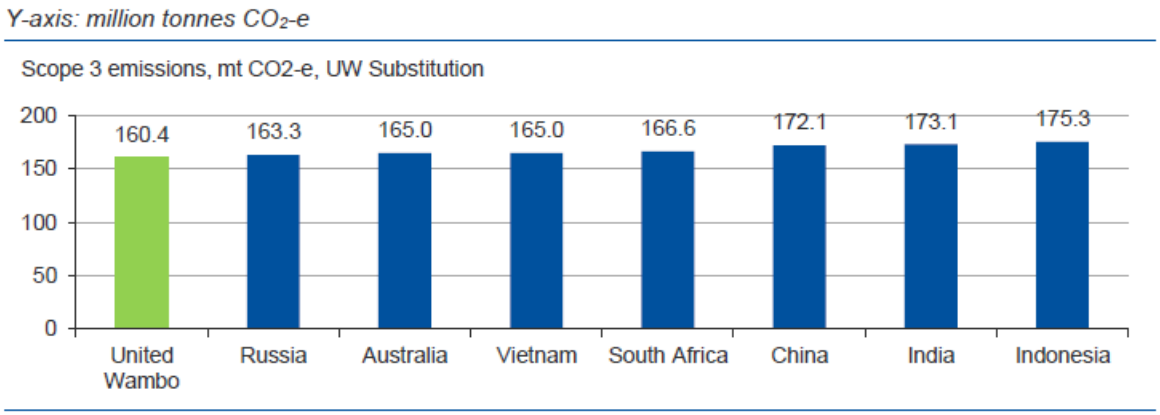


[17] Noting, in practical terms, that the lower the level of sulphur in the coal product, the higher the quality of that coal product.

7.52 In relation to Scope 3 emissions in the first hypothetical scenario, substituting the Project's output by coal from the alternate countries will increase Scope 3 emissions by 2.9 to 14.9 million tonnes of CO_2-e between 2019 and 2030 (**Figure 12** below).

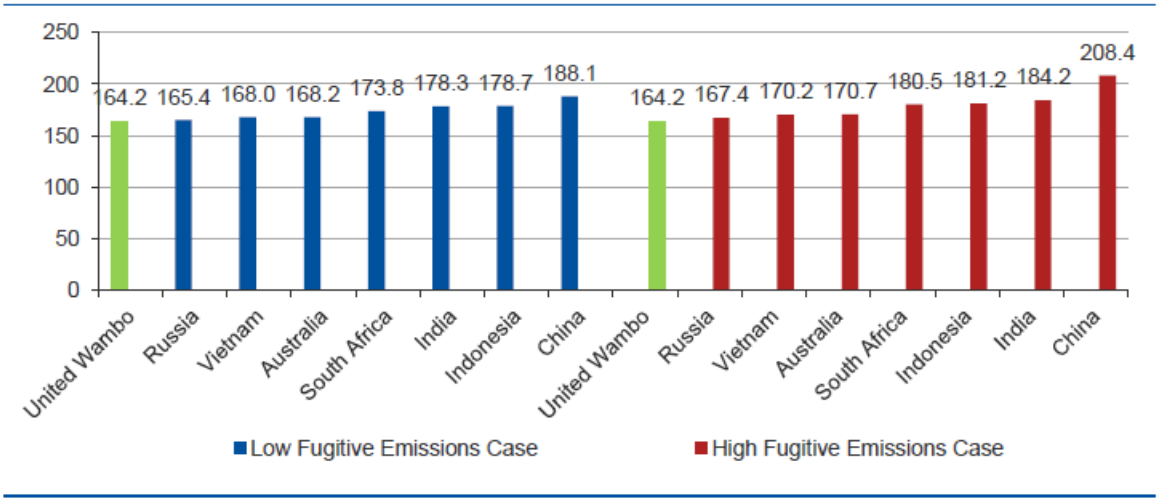
7.53 Scope 3 emissions account for 98.3% of all direct and indirect GHG emissions generated by the Project. Thus, Scope 3 emissions at the stage of power generation are a much larger share compared to Scope 1 and 2 emissions.

Figure 12: Scope 3 emissions from the Project and alternative supply sources, 2019-2030



7.54 When combining Scope 1, 2 and 3 GHG emissions, Scope 3 emissions are the main driver of GHG emissions and are much larger than Scope 1 and 2 emissions. Overall, we expect that substituting the Project's coal with non-Australian coal will release between 1.2 and 44.2 million tonnes CO_2-e in the atmosphere over the 2019-2030 period (depending on the fugitive emissions values) (see **Figure 13** below).

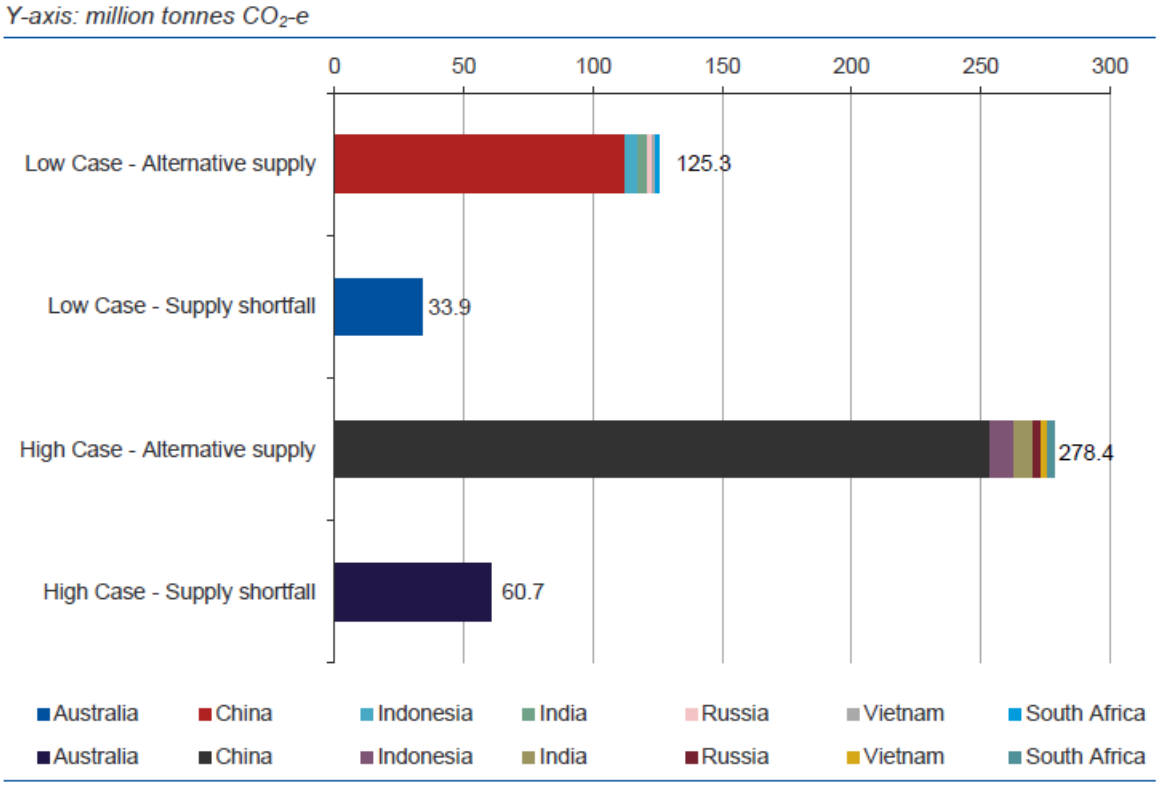
Figure 13: Scope 1, 2 and 3 emissions from the Project and alternative supply sources for both fugitive emission cases, 2019-2030



7.55 In relation to the second hypothetical scenario (i.e. where the Project and all other known Australian thermal coal projects do not enter the production phase), the Scope 1 and 2 emissions (from fuel, fugitive emissions and power consumption) of the Australian supply shortfall and the alternative sources of coal over the period from 2019 to 2030 are compared in **Figure 14** below. The coal substitution will increase Scope 1 and 2 emissions by 91 to 218 million tonnes CO_2-e depending on the fugitive emissions case.

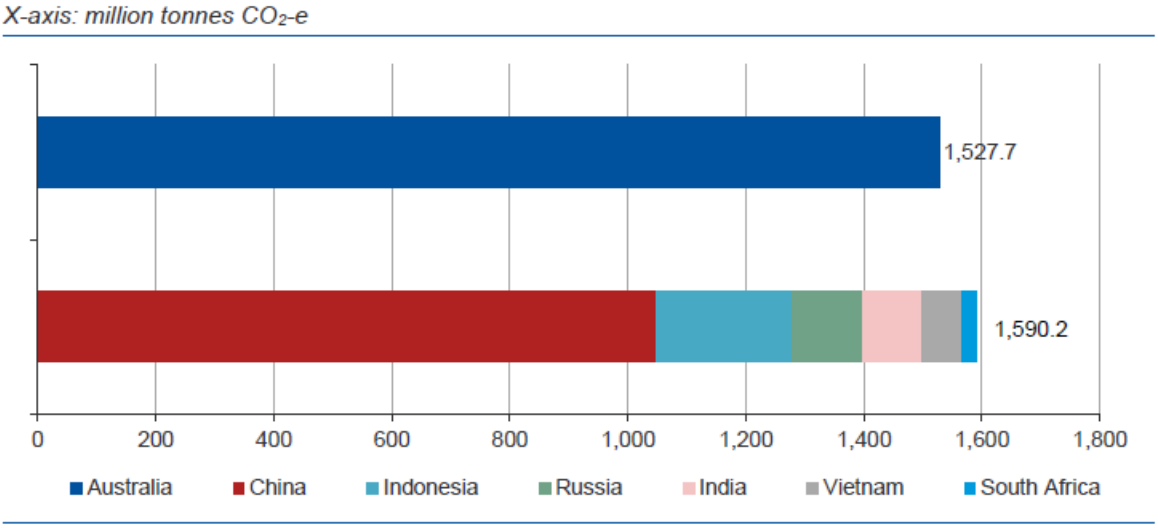
7.56 Overall, Scope 1 and 2 emissions from the Australian supply account for only 2 to 4% of total GHG emissions in the coal value chain in this scenario.

Figure 14: Scope 1 and 2 emissions from Australian supply shortfall and alternative supply sources for both fugitive emissions cases, 2019-2030



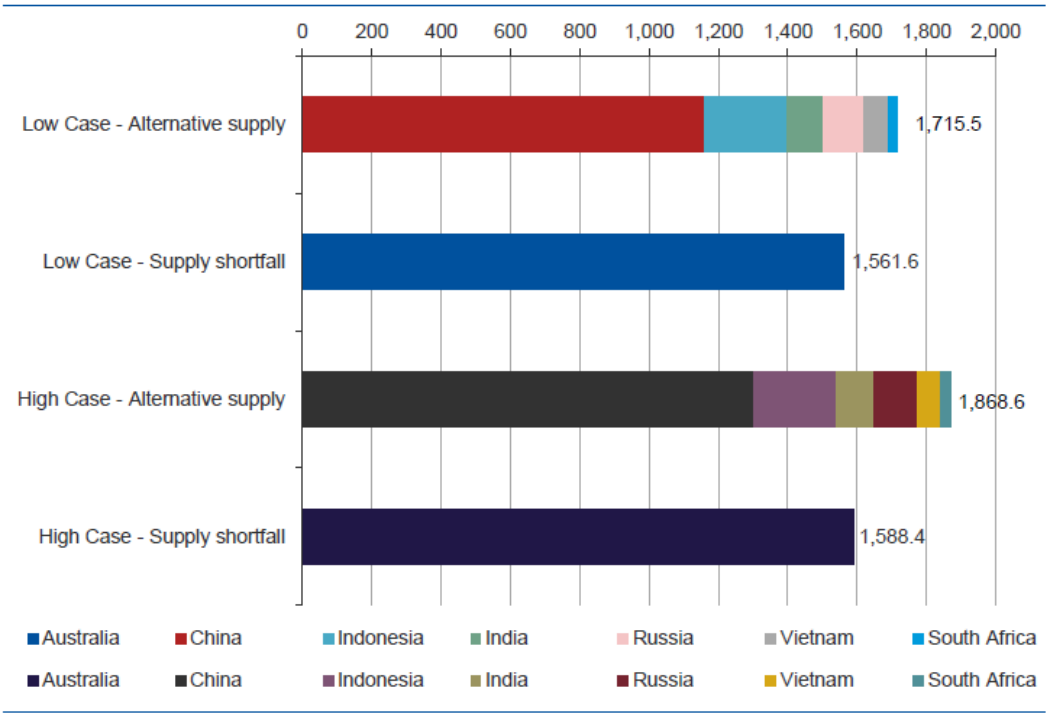
7.57 In relation to the Scope 3 emissions in the second hypothetical scenario, the alternative countries would release an additional 62.5 million tonnes of CO_2-e GHG emissions in the atmosphere compared to Australian supply (see **Figure 15** below). There is also a strong upside risk to the emissions if substitution increases from low quality coal markets like Indonesia and India. The Scope 3 emissions calculated here account for the majority share of all GHG emissions, being 96 to 98%.

Figure 15: Scope 3 GHG emissions from coal use, 2019-2030



7.58 When combining Scope 1, 2 and 3 GHG emissions, Scope 3 emissions are the main driver of GHG emissions and effectively overshadow Scope 1 and 2 GHG emissions which are an order of magnitude smaller. Overall, it is expected that substitution of the Australian supply shortfall by non-Australian coal will release between 153.9 and 280.2 million tonnes CO_2-e in the atmosphere over the 2019-2030 period (depending on the fugitive emissions values (see **Figure 16** below).

Figure 16: Scope 1, 2 and 3 GHG emissions from Australian supply shortfall and alternative supply sources for both fugitive emission cases, 2019-2030



Policy and energy transition policies, plans and initiatives of countries to which the Project's coal is likely to be exported, including the uptake of HELE, CCUS and other low emission coal technologies in Asia

7.59 In Part C of this submission, the Applicant provided an overview of the climate change laws and policies which have been adopted by the countries to which coal from the Project is likely to be exported to meet their respective NDCs under the *Paris Agreement*.

7.60 A detailed account of the domestic climate change laws and policies which have been adopted by these countries has been annexed to these submissions in **Appendix 2**.

7.61 Before providing a summary of the main initiatives that have been implemented by these countries in relation to low emission coal technologies, it is worth first briefly explaining two of the more important low emission coal technologies that are being deployed in these countries. They are:

(a) HELE; and

(b) CCUS.

7.62 First, in relation to HELE:

(a) HELE power plants have lower emissions of all types per unit of power produced, including CO_2. Subcritical coal-fuelled power plants are not considered HELE, while supercritical (**SC**) and ultra-supercritical (**USC**) coal-fuelled plants with advanced

emissions controls are considered to meet the HELE technology classification. Advanced ultra-supercritical (**A-USC**) coal-fuelled power plants are nearing commercial status and will be the most efficient plants once they are fully available.

(b) Many coal-importing countries are leaders in the deployment of higher efficiency coal-fuelled power plants simply because power plants with higher efficiency require less coal per unit of electricity and reduce the fuel costs associated with electricity production.

(c) Importantly, the higher efficiency plants result in lower CO_2 emissions per unit of electricity. According to the International Energy Agency Clean Coal Centre, "if a power producer decides to build a new SC or USC unit, it involves 13% and 19% fewer CO_2 emissions than a brand new subcritical unit respectively; and up to 40% fewer CO_2 emissions if the HELE unit is replacing an older plant."

(d) Increasing the efficiency of coal-fuelled power plants is a well-understood approach to reducing CO2 emissions. Under the Paris Agreement, it is the responsibility of each party to indicate how it will meet emissions reduction targets. Numerous countries that are major coal users (e.g. China, India and Japan) and customers of Australian coal have indicated a role for high-efficiency coal in their NDCs under the *Paris Agreement*.

7.63 Second, in relation to CCUS:

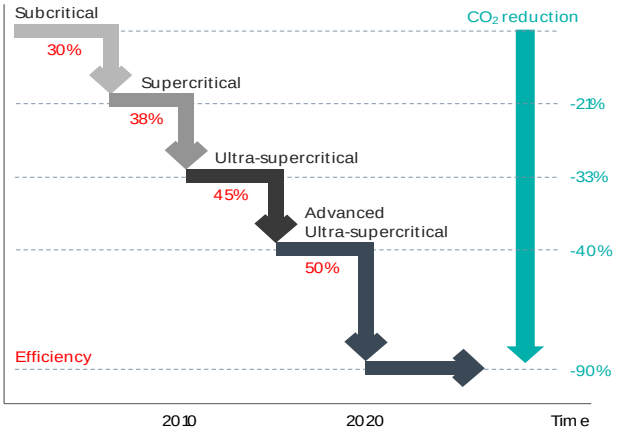
(a) CCUS refers to the technological ability to capture CO_2 emissions from large point sources such as power stations and to store them for long periods of time in underground geological formations where they will not enter the atmosphere. The CO_2 could also be prevented from entering the atmosphere through means of beneficial reuse. CCUS is recognised as a means of mitigating the contribution of fossil fuel emissions to climate change.

(b) CCUS applied to a contemporary power plant may prevent 90% or even more of CO_2 emissions from entering the atmosphere compared to power plants without CCUS. The two large-scale (i.e. at least 1 million tonnes per annum) CCUS projects operating at coal-fuelled power plants currently are designed to capture approximately 90% of the CO_2 from the treated flue gas.

7.64 In **Figure 17** below, a figure from the World Coal Association's Fact Sheet on Coal and Climate Change[18] has been reproduced which shows the efficiency gains that can be realised to substantially reduce CO_2 emissions when HELE and/or CCUS technology is deployed.

[18] https://www.worldcoal.org/file_validate.php?file=Coal%20and%20climate%20change.pdf.

Figure 17: Efficiency gains substantially reduce GHG emissions



7.65 The Applicant has summarised some of the main initiatives that have been implemented by these countries in relation to low emission coal technologies in the table below.[19]

Country	Implementation of HELE, CCUS and other similar technologies

China	• Included high-efficiency coal in its NDCs to the *Paris Agreement*.
	• China's Ministry of Industry and Information Technology (MIIT) and Finance Ministry released a 2015-2020 Action Plan on the Efficient Use of Coal.
	• China has set limits on consumption per kWh rate (another approach to measuring efficiency) of <310 grams/kWh by 2020 for large plants and has consistently improved emissions intensity.
	• Employing HELE coal-fuelled plants in increasing percentages, supporting research and development to develop new HELE technologies and transition its fleet to larger power plants
	• Implemented multiple measures to accelerate the deployment of CCUS. These include:
	  ○ widely promoting low-carbon technologies, with an emphasis on carbon capture utilisation and storage (CCUS);
	  ○ supporting CCUS pilots and Near Zero Carbon Emissions pilots;
	  ○ providing grant funding for CCUS research projects promoted by the Ministry of Science and Technology;
	  ○ amending the Environmental Impact Assessment Guidelines to better address CCUS projects; and
	  ○ establishing a CCUS capacity building project for government officials and researchers directly involved in CCUS.
	• A significant focus for China is the application of CCUS for enhanced oil recovery (**EOR**). China has over 20 CCUS for EOR projects at various stages of development. A number of these EOR projects have been, or will be, linked to CCUS plants and designed to capture the CO_2 generated by coal-fired power plants. For example, the Sinopec Shengli Power Plant, located near the Shengli oilfield in the Shangdong province (the second largest oil field in China), currently possesses an integrated CCUS pilot plant which captures 40,000 tons of CO_2 per annum, with a second phase of the CCUS plant currently under construction and intended to capture up to 1 million tons of CO_2 per annum. Once the second phase of the CCUS plant is complete, all captured CO_2 will be used for EOR to increase oil recovery by 10-15%.

India	• Included high-efficiency coal-fuelled power in its NDC under the *Paris Agreement*. • As of December 2018, 21% of India's coal-fuelled generation capacity was HELE, but at least 83% of planned and under construction capacity is HELE. In the 5 years to 2023, at least 53 GW of HELE generating capacity is expected to come online in India.

[19] The content referred to in the table immediately below has been informed by the following sources: S&P Global Platts World Electric Power Plants Database, December 2018; M Wiatros-Motyka, 'An overview of HELE technology deployment in the coal power plant fleets of China, EU, Japan and USA' (December 2016) and I Barnes, 'HELE Perspectives for Selected Asian Countries' (International Energy Agency Clean Coal Centre, May 2018).

	• Target coal burn for power generation in 2027 is 828 Mt, but this is highly dependent on significant renewables growth. Any renewables shortfall will contribute to increased coal demand.
	• According to India's NDC, coal will continue to dominate power generation in the future. The Government has introduced the following initiatives to improve the efficiency of coal-fired power plants:
	  ○ all new, large coal-based generating stations have been required to use highly efficient supercritical technology;
	  ○ Renovation and Modernisation (**R&M**) and Life Extension (**LE**) of existing old power stations is being undertaken in a phased manner; and
	  ○ approximately 144 old thermal stations have been assigned mandatory targets for improving energy efficiency.

Japan	• A global leader in the application of HELE coal-fueled power plants and built its first USC plant in 1993.
	• 95% of the country's plants are HELE plants.
	• Included high-efficiency coal as part of their contributions to the Paris Agreement.
	• Long-term Low-carbon Vision, published in March 2017, refers to CCUS as a means of achieving emission reductions in the energy sector, as well as centralised/distributed energy management.
	• According to the Global CCS Institute's Global Status Report 2018, Japan has achieved the following major milestones:
	  ○ commenced of CO_2 injections at the Tomakomai CCUS facility by Japan CCUS with the Ministry of Economy, Trade and Industry's full support – this is Asia's first full-cycle CCUS hydrogen plant, which will capture more than 300,000 tonnes of CO_2 by 2020;
	  ○ retrofitted the Toshiba Corporation 49MW Mikawa power plant in Omuta (Fukuoka Prefecture) to accept biomass (in addition to coal) with a carbon capture facility;
	  ○ launched JPOWER and Chugoku Electric Power Company's Osaki CoolGen facility, a 166 MW oxygen-blown IGCC (integrated gasification combined cycle) plant in Osakikamijima (Hiroshima Prefecture), which will separate and capture CO_2;
	  ○ completed construction of Toshiba's carbon capture and utilisation (CCU) system at the Saga City Waste Incineration Plant (on Japan's Kyushu Island), using captured CO_2 for algae culture; and
	  ○ announced (by Kawasaki Heavy Industries) of a Japanese Hydrogen Energy Supply Chain that plans to gasify Australian brown coal in Victoria's Latrobe Valley and transport it by ship to Japan for future decarbonised hydrogen developments.

Malaysia	• Malaysia's NDC has a target to reduce its GHG emissions intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. • Post-2015 planned or under construction capacity includes 600 MW subcritical and 4,160 MW of USC HELE. • Plans to achieve a 13% efficiency improvement in 2030. • Has set a renewable energy target of 20% (equivalent to 3,991MW) by 2025. Currently the country only sources 2% of its energy from renewable sources. However, it is intended for the target to be met through various policies and frameworks under the Energy Efficiency and Conservation Act, a first draft of which is to be presented to Parliament later this year. • Does not have an integrated CCUS legal framework. A scoping study on CCUS in Malaysia was released by the Global CCS Institute, the Clinton Climate Initiative and the Malaysian Ministry of Energy, Green Technology and Water in January 2011. The study found that CCUS technologies present an opportunity to significantly reduce CO_2 emissions in Malaysia. It also found that Malaysia lacks legal and regulatory frameworks that are capable of being applied to the stages of the CCUS project cycle. Despite this, two commercial-scale CCUS projects are currently underway in Malaysia – the K5 Strategic Technology Project (with a CO_2 processing platform due for installation by 2022) and the TNB Janamanjung Project.
South Korea	• As of December 2018, 83% of South Korea's coal-fuelled generation capacity was HELE and at least 90% of planned and under construction capacity is HELE. In the 5 years to 2023, at least 7 GW of HELE generating capacity is expected to come online in South Korea. • South Korea's NDC indicated that it would subsequently develop a detailed plan to implement its mitigation target. To this end, South Korea released a revised roadmap for achieving the 2030 National Greenhouse Gas Reduction Goal in July 2018 (the **Roadmap**). The Roadmap sets out sectoral targets, including emission reductions of 24 million tons in the energy conversion sector (power generation, group energy) through policies to reduce fine dust and promote the use of eco-friendly energy.

Taiwan	• Included HELE in its NDC under the *Paris Agreement*. • As of December 2018, 31% of Taiwan's coal-fuelled generation capacity was HELE and 2.4 GW of planned and under construction capacity is USC HELE. • Taiwan's EPA established a national CCUS strategic alliance in 2011. This alliance brings together domestic experts from government, academia and industry, for the purpose of developing the technology and regulatory framework required for the commercial use of CCUS technology, with the ultimate goal of achieving widespread use of CCUS technology by 2020. Through the alliance, the Taiwan Cement Corporation (in partnership with the Industrial Technology Research Institute) commissioned the world's first CCUS pilot project in the cement industry in 2013, with the two entities agreeing in 2016 to extend their cooperation on the project.
Philippines	• Included HELE in its INDC under the *Paris Agreement*. • The National Framework Strategy on Climate Change 2010-2022 has a long-term objective of facilitating "the transition towards low greenhouse gas emissions for sustainable development". The Strategy sets Key Result Areas to achieve this long-term objective which, relevantly, relate to energy efficiency and conservation and renewable energy. The Strategy sets a goal of doubling the renewable energy capacity in the country from 4,500MW to 9,000MW by 2030.
Vietnam	• Announced plans to continue the buildout of its HELE coal fleet; before 2010, all coal-fuelled power capacity was based on subcritical technology and the first units using HELE supercritical technology were brought online in the 2010-2014 timeframe with an additional approximately 4,200 MW SC and 1,800 MW USC HELE coal-fuelled power plant capacity projected into the future. • Vietnam does not have an integrated CCUS framework, though the government has previously acknowledged the role that CCUS technology could play in assisting Vietnam to achieve its emissions reduction goals.

8. PART E: RESPONSE TO SUBMISSIONS MADE IN RESPECT OF CLIMATE CHANGE, COAL DEMAND AND GHG EMISSIONS AT, AND FOLLOWING, THE PUBLIC MEETING INTO THE PROJECT

Overview

8.1 A public meeting was held by the IPC into the Project on 7 February 2019. Numerous submissions made by members of the public, NGOs and other stakeholders at, and following, the public meeting into the Project raised the issue of climate change impacts and GHG emissions.

8.2 Rather than address each specific submission concerning climate change impacts and GHG emissions that was raised at and following the public meeting, the Applicant proposes, in this Part E of this submission, to:

(a) identify the common themes or elements of the submissions made at and following the public meeting concerning climate change impacts, coal demand and GHG emissions (including the expert report produced by Professor Steffen, dated 11 December 2018 (**Steffen Report**), and the expert report produced by Mr Campbell dated February 2019 (**Campbell Report**)); and

(b) state, in response, the Applicant's position on those common themes or elements.

Identifying common themes or elements in the submissions addressing climate change impacts and GHG emissions at and following the public meeting

8.3 The Applicant considers that the following common themes or elements emerge from the submissions which opposed the Project and addressed climate change and GHG emissions at and following the public meeting:

(a) anthropogenic climate change is a real phenomenon that is occurring;

(b) there is a need for action to be taken to reduce GHG emissions globally in order for the "well below 2°C" goal of the Paris Agreement to be realised;

(c) coal is one of, if not the, major source of human-induced GHG emissions;

(d) no new fossil fuel developments should be approved, and those existing, already approved fossil fuel developments should be rapidly phased out;

(e) the approval of the Project would be inconsistent with existing climate change laws and policies, particularly Australia's NDC and the NSW Climate Change Policy Framework;

(f) the approval of the Project is against the interests of existing coal mines in NSW as it results in there being additional competition between existing coal mines in NSW and the Project for the sale of coal products;

(g) climate change has adverse health impacts for human populations; and

(h) the Scope 1 GHG emissions generated by the Project have not been adequately assessed or mitigated.

8.4 Each of these themes or elements will be addressed in turn below.

Theme 1: Anthropogenic climate change is a real phenomenon that is occurring

8.5 Many of the submissions put at and following the public meeting into the Project dedicated much time and length to describing, at a high level, the science of climate change and the impacts that can be caused to the world's and Australia's climate and environments as a result of anthropogenic climate change. This was particularly the case in the Steffen Report: see especially paragraphs [10] to [35].

8.6 The Applicant considers that comments about the effects of anthropogenic climate change generally, which are not tied or made referrable to the determination of the development application for the Project, are of little to no assistance to the IPC's decision-making task.

Theme 2: Need for steps to be taken globally (including the continued adoption of HELE and CCUS technologies) to meet the goal of the Paris Agreement

8.7 The Applicant does not dispute that action needs to be taken to reduce GHG emissions globally in order for the "well below 2°C" goal of the Paris Agreement to be realised.

8.8 However, in circumstances where:

(a) the existing climate change frameworks described in Part C of this submission make clear that:

(i) the development of new coal mines, or the continuation of existing coal mines, is not prohibited by the operation of international, Australian or NSW laws;

(ii) the prohibition of coal mines is not one of the many measures or mechanisms that Australia has adopted for the specific purpose of meeting its NDC under the *Paris Agreement*;

(iii) indeed, to the contrary, NSW planning laws recognise that the carrying out of coal mining projects (including the Project) is permitted with development consent under the Mining SEPP; and

(iv) the objects of the Mining SEPP include:

(A) to facilitate the orderly and economic use and development of land containing mineral resources (such as coal); and

(B) to promote the development of significant mineral resources.

(b) the material produced in Part D of this submission demonstrates that the failure to approve the Project would likely result in a net increase in GHG emissions (particularly indirect Scope 3 emissions) globally due to market substitution of the Project's high quality coal with inferior quality coal,

the Applicant considers that any suggestion put in submissions by others to the IPC that the refusal of the development application would demonstrate a commitment on the IPC's part to take action to achieve the goal of the *Paris Agreement* is both misconceived and places at risk the realisation of the significant social and economic benefits that the Project will deliver at a local, regional and State level.

8.9 In particular, the Applicant considers that the critique presented of the two arguments set out at [60]- [65] of the Steffen Report is, in light of the material addressed in Part D of this submission, untenable.

8.10 In relation to the first argument critiqued in those paragraphs of the Steffen Report, Professor Steffen suggests that the argument of "my emissions are too small to matter" is flawed because all GHG emissions "are important because cumulatively they constitute the global total of greenhouse gas emissions, which are destabilising the global climate system at a rapid rate". There are some important points to make in response to that point.

8.11 First, it is important to be clear as to what GHG emissions should be counted towards a given development's total of GHG emissions. Given that the intent of the climate change laws and policies set out in Part C of this submission is to avoid double counting of GHG emissions towards a country's NDC under the *Paris Agreement*, the GHG emissions that should be counted towards a development's total are the Scope 1 and 2 emissions, not Scope 3 emissions. In respect of the Project that is being considered by the IPC, the adoption of an approach which counts the Scope 1 and 2 emissions of the Project, but excludes the Scope 3 emissions, significantly reduces the amount of life of mine GHG emissions from 265,894,000 t CO_2-e to 6,599,000 t CO_2-e: see p ii of the Greenhouse Gas and Energy Assessment Technical Appendix to the EIS for the Project.

8.12 Secondly, it should be observed that only Scope 1 emissions are genuinely within the control of a proponent of a given coal mining project, and that the Scope 2 emissions that are associated with such a project will also be recorded as Scope 1 emissions by the electricity generator. In this regard, the adoption of an approach which counts the Scope 1 emissions of the Project only, and excludes the Scope 2 and 3 emissions, reduces the amount of life of mine GHG emissions from 265,894,000 t CO_2-e to 5,802,000 t CO_2-e: see p ii of the Greenhouse Gas and Energy Assessment Technical Appendix to the EIS for the Project.

8.13 Thirdly, when one considers and compares the Scope 1 and 2 emissions generated from different types of development, it is evident that some developments may produce more GHG emissions than others. Professor Steffen's position in this regard would suggest that it does not matter whether a given development that is reliant on fossil fuels for energy is large or small: no matter what size the development is, it will contribute GHG emissions and these emissions matter in the context of seeking to reduce GHG emissions worldwide. As a corollary to that point, Professor Steffen appears to take the position that <u>any</u> development that is reliant on fossil fuels for energy generation should be either refused (in the case of new development) or may be maintained (in the case of existing development) for a short period of time only, before being phased out completely.

8.14 Professor Steffen's position in this regard has legal and practical problems.

8.15 Legally, it is problematic because NSW planning laws do not prohibit or restrict (as distinct from regulate, pursuant to development consent conditions) the carrying out of fossil fuel

development, including coal mines (nor, for that matter, does any other climate change law or policy considered in Part C of this submission). More specifically, the carrying out of the Project here is permissible with development consent under the Mining SEPP. The objects of the Mining SEPP include:

(a) to facilitate the orderly and economic use and development of land containing mineral resources (such as coal); and

(b) to promote the development of significant mineral resources.

8.16 If Professor Steffen's approach of no new fossil fuel development is adopted by the IPC as a decision-making practice, it would mean that all development applications for fossil fuel developments would be rejected without being assessed on their own merits and such decisions would almost certainly be invalid in that:

(a) the EP&A Act, the Mining SEPP and the Mining Act all contemplate that fossil fuel developments may be carried out with lawful authority in NSW; and

(b) a failure to entertain a development application for such fossil fuel development on its merits would amount in numerous legal errors rendering the IPC's decision invalid, including:

(i) a failure to have regard to all relevant considerations set out in s 4.15 of the EP&A Act;

(ii) a failure to accord the proponent of the proposed project with procedural fairness;

(iii) a constructive failure to exercise its decision-making power or jurisdiction; and

(iv) rigid adoption and application of a decision-making practice or policy without due regard to the circumstances or merits of the development application before it.

8.17 Indeed, it was apparent that the Court in the *Rocky Hill* case did not go so far to accept Professor Steffen's evidence in that case (which, by and large, is the same as the material produced in the Steffen Report in respect of the Project). In the *Rocky Hill* case, the Court remarked on this aspect of Professor Steffen's evidence that:

> [552] … It gives priority to existing and approved fossil fuel developments, along the lines of "first in, best dressed". It also frames the decision as a policy decision that no fossil fuel development should ever be approved.
>
> [553] I consider the better approach is to evaluate the merits of the particular fossil fuel development that is the subject of the development application to be determined. Should this fossil fuel development be approved or refused? Answering this question involves consideration of the GHG emissions of the development and their likely contribution to climate change and its consequences, as well as the other impacts of the development …

8.18 Thus, the Applicant suggests that the Steffen Report's position fundamentally sits at odds with the decision-making framework set out by NSW planning laws.

8.19 Further, Professor Steffen's position also has practical problems. If the approach is to be adopted that any form of development – new or existing – that is to be, or is, reliant on fossil fuels for energy should be refused or halted, this could have crippling and devastating consequences for human populations that rely on fossil fuels as a reliable, affordable and efficient means for energy or electricity. It could result in many different forms of development, such as schools and hospitals, being without electricity, which would, in turn, have flow-on effects for human development globally. Such consequences would give rise to distributive injustice to different human populations and undermine the achievement of

intra-generational equity, which is one of the principles of ecologically sustainable development. Moreover, as the Department of Planning recognised in its Addendum Report on the Wallarah 2 Coal Project in considering the principle of inter-generational equity:

> [The Department] recognises that there remains for the foreseeable future a clear need to continue to mine coal deposits to meet society's basic energy needs … The Department also acknowledges that the downstream energy and other socio-economic benefits generated by the amended project would benefit future generations, particularly through the provision of international energy needs.

8.20 Thirdly, whilst the Applicant does make the point in its Greenhouse Gas and Energy Assessment Technical Appendix to the EIS that its GHG emissions constitute a "relatively small annual contribution to national emissions", the Applicant would not suggest that the GHG emissions that are generated by the Project "are too small to matter". The Applicant takes the GHG emissions generated by the Project seriously, which is why the Applicant has committed to implementation of the GHG emission mitigation measures that are summarised in Part B of this submission.

8.21 In relation to the second argument critiqued in [60] to [65] of the Steffen Report, it is argued by Professor Steffen that any suggestion that "some other coal resource will be developed if this one isn't" is flawed because "it assumes that there is now, and will continue to be, a demand for new coal resources beyond those that already exist".

8.22 The Applicant considers this critique to be unconvincing and, in light of the material produced in Part D of this submission, unsustainable. As is made clear in Part D of this submission, there is a demand for high quality coal product like that which would be generated by the Project that is before the IPC. In the absence of the Project's coal becoming available on the market for export, the Project's customers will simply source their coal from elsewhere and, as the material produced in Part D of this submission suggests, those customers would most likely need to rely upon, as a substitute, an inferior quality of coal which would, in relative terms, actually generate more GHG emissions than those that would be generated in the event of the Project being approved.

Theme 3: Coal is a major source of GHG emissions

8.23 The Applicant readily acknowledges that coal mining projects, like many forms of development, generate GHG emissions. However, it is considered that numerous submissions put to the IPC at and following the public meeting into the Project mis-characterise the nature in which coal may cause GHG emissions.

8.24 Many of the submissions characterise the generation of Scope 3 GHG emissions from the Project as being direct consequences of coal mining activity. This is not an accurate characterisation. Coal is currently, and will continue to be for several decades, vital to the provision of affordable, reliable energy worldwide. It is the world's demand for coal-fired electricity generation that is the main cause of Scope 3 GHG emissions that may be said to be generated by coal mining projects.

8.25 This point was recognised by Member Smith of the Queensland Land Court, in the context of considering the Alpha coal mine, in the decision of *Hancock Coal Pty Ltd v Kelly & Ors and Department of Environment and Heritage Protection (No 4)* [2014] QLC 12, where he relevantly observed:

> [230] … [I]t is the demand for electricity to the extent that it is met by coal-fired generators that causes the Scope 3 emissions, and the facts as set out in this case clearly show that Alpha is but one of a myriad of suppliers, both local and around the world, who will seek to meet this existing demand.
>
> [231] … I must on the evidence of this case determine that it is the demand for coal-fired electricity, and not the supply of coal from coal mines, which is at the heart of the problem.
>
> [232] … the clear and unambiguous facts of this case show that there will be no reduction of GHGs if the Alpha mine is refused, and, indeed, depending on the source of replacement coal, such replacement coal may well, on the evidence, result in an increase in GHG emissions.

8.26 The Applicant considers that the observations made by Member Smith are equally applicable to the Project the IPC is considering here, and would submit that it is both open to, and appropriate for, the IPC to adopt the same approach to consideration of Scope 3 emissions that Member Smith did in the *Hancock Coal* case.

Theme 4: No new fossil fuel developments should be approved and existing fossil fuel developments should be rapidly phased out

8.27 The idea that no new fossil fuel developments should be approved and existing fossil fuel developments should be rapidly phased out was a common theme running through the submissions made at and following the public meeting.

8.28 For the reasons set out in the discussion of Theme 2 above, this position sits at odds with the NSW planning law framework. It also seeks to invite the IPC to engage in policy debates that are inappropriate to engage with in the IPC's decision-making context: i.e. to determine whether or not, on the merits, the Project should be approved or refused, having regard to all relevant matters, of which GHG emissions is only one such matter.

Theme 5: Approval of the Project would be inconsistent with existing climate change laws and policies

8.29 Again, this theme has already been addressed in the context of discussing Theme 2 above. As pointed out there, and in Part C of this submission:

(a) there is nothing in existing climate change laws and policies which prohibits the approval of new coal mining development; and

(b) the prohibition of new coal mines is not one of the specific mechanisms or measures that Australia has adopted for the specific purpose of meeting its NDC under the *Paris Agreement*;

(c) indeed, to the contrary, NSW planning laws recognise that the carrying out of coal mining projects (including the Project before the IPC) is permitted with development consent; and

(d) the objects of the Mining SEPP include:

(i) to facilitate the orderly and economic use and development of land containing mineral resources (such as coal); and

(ii) to promote the development of significant mineral resources.

Theme 6: The approval of the Project is against the interests of existing coal mines in NSW as it results in there being additional competition between existing coal mines in NSW and the Project for the sale of coal products

8.30 This theme generally originates from the expert report of Mr Campbell. The following arguments are put forward in that expert report:

(a) "it is likely that not all approved coal production in NSW will be extracted" (p 3);

(b) "NSW mines are now to a considerable degree competing against each other. Adding to this competition with new capacity such as this Project is in the interests of the new mine proponents and against the interests of workers and investors in existing mines" (p 3);

(c) "decision makers should seek more information on the capacity of operating and approved mines and the potential for new mines to simply displace production in other mines before approving new projects" (p 3); and

(d) "While the world will use a larger amount of coal than United Wambo will produce, it is clear this market is declining and will decline even faster under the Paris Agreement. The United Wambo Project is competing against other Hunter coal mines. Its expansion will to some extent come at the expense of existing Hunter mines" (p 10).

8.31 The Applicant submits that the arguments put forward by Mr Campbell are unpersuasive and, in many respects, plainly wrong.

8.32 First, the suggestion that it is "likely that not all approved coal production in NSW will be extracted" is speculation that is not supported by evidence. As Part D of this submission demonstrates, there is a clear global demand for high quality coal (including Australian coal) that will not be capable of being met by the existing NSW mines alone.

8.33 Secondly, the assertion that the Project is "in the interests of the new mine proponents and against the interests of workers and investors in existing mines" in the sense that it creates more competition between NSW mines is puzzling. Both United Collieries Mine and Wambo Mine are existing mines, and this project is an expansion of those existing mines. In particular, the Wambo mine currently employs a workforce of 250 people for the open cut project. Is Mr Campbell suggesting that it is "against the interests" of the 250 people currently employed at Wambo open cut mine (and the investors in that mine) for the Project to be approved? That surely cannot be correct, because it is clearly evident that the existing employees at the Wambo open cut mine would benefit significantly from the approval of the Project through the continued employment opportunities.

8.34 Further, if it was genuinely the case that approval of the Project was against the interests of workers and investors in other NSW mines, it could be expected that those persons would have made submissions opposing the Project. That did not happen. There is no evidence to support the assertions put by Mr Campbell on this point.

8.35 Thirdly, in relation to Mr Campbell's point about decision-makers (such as the IPC) not having information about the potential for new mines to displace production in other mines before producing new projects, this submission is ill-conceived in a number of respects. Part D of this submission provides the information on global demand for coal under the three scenarios posited by the IEA.

8.36 In any event, it is for the Applicant to make its own assessment of the economic viability of the Project and then decide whether it wishes to proceed to seek development consent for the Project. The Applicant has undertaken that course of action in lodging the development application for the Project.

Theme 7: Climate change has adverse health impacts for human populations

8.37 The Applicant rejects any suggestion that the Project, in and of itself, will cause unacceptable health impacts for people living in the local community.

8.38 The Applicant would point out that, in its Response to Submissions document, the Applicant addressed numerous comments raised by NSW Health (in its submission letter dated 22 September 2016) concerning the assessment in the EIS of air quality, noise, water and issues which may have an impact on public health.

8.39 NSW Health, by way of email to the DP&E dated 21 April 2017, indicated that it had reviewed the Response to Submissions document and had "no further comments" in respect of the Project.

8.40 Further, the Applicant would observe that, in relation to global health and climate change matters, the Project's overall GHG emissions constitute an infinitesimal contribution to global GHG emissions and, for the reasons given in Part D of this submission, are likely to result in less GHG emissions than in circumstances where the Project is refused.

Theme 8: Scope 1 GHG emissions generated by the Project have not been adequately assessed or mitigated

8.41 The Applicant considers that the Scope 1 emissions generated by the Project have been adequately assessed in the Greenhouse Gas and Energy Assessment Technical Appendix to the EIS. Further, as summarised in Part B of this submission, the Applicant proposes to implement numerous mitigation measures which are directed at minimising the Scope 1 GHG emissions that are generated by the Project.

8.42 For completeness, the Applicant would observe that one measure that might be suggested by different stakeholders for the mitigation of GHG emissions is to offset the Scope 1 GHG emissions. The Applicant would reiterate its observations in Part C of this submission as to why it would be inappropriate to impose any condition of development consent for the Project which requires the offset of Scope 1 emissions generated by the Project.

APPENDIX 1: GLENCORE'S AND PEABODY'S CORPORATE INITIATIVES CONCERNING GHG EMISSIONS (INCLUDING SUPPORT OF HELE AND CCUS)

GLENCORE

Overview

The deployment of a range of low emission technologies will be critical to achieving significant carbon emission reductions and the transition to a low carbon economy including the goals of the *Paris Agreement*.

Glencore participates in a number of organisations and a suite of projects that support the development and demonstration of low emission technologies.

They include the following:

Member of Australian Coal Association Research Program (ACARP)

ACARP is a mining research program that has been running in Australia since its establishment in 1992. It is 100% owned and funded by all Australian black coal producers through a five cents per tonne levy paid on saleable coal. Glencore contributes a levy to this research program that includes working groups on mine site greenhouse gas mitigation and low emission coal use. The ACARP program was also instrumental in designing regulation for insitu calculation of emissions for open cut coal mines as part of NGERs.

Further information: https://www.acarp.com.au/

Member of COAL21

The COAL21 Fund was established in 2006 by the Australian black coal industry for the demonstration of low-emissions coal technologies, such as carbon capture and storage. The Fund is supported by a voluntary levy on coal production and includes 26 investors from among Australia's black coal producers, including Glencore.

COAL21 primarily invests in the development of low-emissions technologies for the coal-fired power generation sector and in emissions reduction from coal mines.

Up to 30 June 2018, COAL21 has seen $374m committed to demonstrating low-emission technologies in the coal-fired power generation sector, and safe fugitive emissions abatement from coal-mining operations.

COAL21 is now preparing to commit a further $255m for the period to June 2027, to meet its objectives to:

- Build community confidence in CCUS technology for safe, long-term CO_2 storage
- Demonstrate safe abatement of fugitive emissions from coal mines
- Assist in making the case for coal to remain a key part of Australia's future energy supply.

Further information: https://coal21.com/

The Callide Oxyfuel project

Glencore partnered in this $245million large-scale demonstration project that proved the suitability of oxyfuel technology in capturing CO_2 for both new-build and existing coal-fired power stations.

It involved burning coal in a mixture of oxygen and recirculated exhaust gases, instead of air, and resulted in a concentrated stream of CO2 suitable for capture and storage.

The Project was highly successful, confirming that carbon capture technology could be applied to a coal-fired power station to generate electricity with almost no emissions.

By capturing CO2, the project demonstrated that deep cuts could be made to power station emissions to help slow the process of climate change while maintaining the use of fossil fuels as a major energy source.

As one of only a handful of coal-fired, low-emission projects in the world to move beyond concept to construction, the project represented several firsts for Australia and the world:

- World's first industrial-scale demonstration of oxyfuel combustion and carbon capture technology
- World's first power station to be retrofitted with oxyfuel carbon capture technology
- First injection underground of CO2 from an Australian power station
- World's first injection of CO2 from an oxyfuel power station.

Further information: https://callideoxyfuel.com/

CTSCo (Carbon Transport Storage Company)

Glencore is hosting a carbon capture and storage research project called CTSCo on our land holdings at Wandoan in Queensland's Surat Basin.

The project aims to determine the viability of industrial-scale carbon capture and storage in the Surat Basin. It is funded by both industry and Government and will monitor, evaluate and verify CO_2 storage capacity.

In 2012, CTSCo was awarded a permit by the Queensland Government under the *Greenhouse Gas Storage Act 2009* authorising carbon storage exploration activities under an Environmental Authority.

This gave CTSCo permission to find a suitable location to investigate storing CO_2.

Carbon capture and storage is a group of technologies which can capture up to 90% of the CO_2 emissions produced by using fossil fuels in electricity generation and industrial processes, and store this CO_2 underground.

This prevents the CO_2 from entering the atmosphere and adding to global emissions. Carbon capture and storage involves three major steps:

- Capture: the separation of CO_2 from other gases produced at large industrial process facilities such as coal and natural gas power plants, oil and gas plants, steel mills and cement plants.
- Transport: once separated and cleaned, the CO_2 is compressed and transported via pipelines, or in this case trucks, for geological storage.

- Storage: CO_2 is injected into deep underground geological formations, often at depths of one kilometre or more.

Further information: http://ctsco.com.au/

PEABODY

COAL21 Fund

Peabody is a founding member of Australia's $1 billion COAL21 Fund, an industry effort to pursue low-carbon technologies. This world-first, whole-of-industry funding approach is designed to support greenhouse gas abatement and is based on a voluntary levy on coal production. Peabody's Australian President, George Schuller, is chair of COAL21.

To date, Peabody has contributed more than $30 million to the COAL21 Fund, which has so far directed more than $300 million to demonstration projects in Queensland, New South Wales and nationally, covering CO_2 capture, geological storage and methane emissions abatement at operating underground coal mines.

Projects funded by COAL21 include the CTSCo Carbon Capture and Storage Project in the Surat Basin near Wandoan in Queensland. CCUS can capture and store carbon dioxide from coal and gas fired power stations, as well as a wide range of other industrial processes, such as steel making and chemical processes. The CTSCo project is trialling the injection and underground storage of approximately 60,000 tonnes of carbon dioxide over 3 years.

Australian Coal Association Research Program - Greenhouse Committee

Peabody funds the ACARP, a mining research program that is 100 percent owned and funded by all Australian black coal producers through a 5 cents per tonne levy paid on saleable coal. Research funding is directed by several focus-area committees including a Greenhouse Committee. Research work via the Greenhouse Committee of ACARP primarily focuses on estimating fugitive methane emissions from open cut operations and mitigating the methane in underground mine ventilation air.

Carbon Capture Coalition

Peabody is a participant in the Carbon Capture Coalition, which brings together coal, oil and gas, electric power, ethanol, chemical and energy technology companies, labour unions and national environmental and energy policy organisations in an effort to make CCUS a widely available, cost effective and rapidly scalable technology solution in the United States and has been widely successful at achieving bipartisan support for the necessary policy drivers.

Carbon Utilization Research Council

Peabody serves as co-chair of the Carbon Utilization Research Council, a coalition of fossil fuel producers, electric utilities, equipment manufacturers, technology innovators, and national associations working to identify ways for the United States to use low-cost fossil fuels while meeting societal energy needs and goals.

Consortium for Clean Coal Utilization

Peabody is a founding member and board member of the Consortium for Clean Coal Utilization, which is a cutting-edge research program focused on advanced coal utilization and carbon capture technologies at the prestigious Washington University in St. Louis. Peabody recently renewed its funding commitment to this program through 2021.

Global CCS Institute

Peabody is a founding member of the Global CCS Institute, which was launched in Australia and now serves as an internationally-recognized advocate for carbon capture and storage. The institute aims to provide relevant information on the status of CCUS and other practical policy advice regarding CCUS to government and other key stakeholders.

GreenGen

Peabody is on the board of the GreenGen project and is the only non-Chinese equity partner in the GreenGen power plant, one of the first integrated gasification combined cycle power plants in the world, and carbon research center in Tianjin, China.

National Carbon Capture Center

Peabody is a co-funding partner of the National Carbon Capture Center. Since its creation by the United States Department of Energy's Office of Fossil Energy in 2009, the center has established itself as a world-class, neutral research facility, focused on accelerating the development and commercialisation of next-generation carbon capture technologies by giving technology developers engineering support and a power plant host at which they can test their technologies.

Peabody Global Clean Coal Awards

Peabody believes in recognising the good work that is being done by others to advance coal technologies. The Peabody Global Clean Coal Leadership Awards highlight outstanding examples of leadership and innovation among coal-fueled generating plants and projects. The 2018 award recipients reinforced the major environmental benefits that can be achieved using today's advanced coal-fueled generation technologies as well as the tremendous possibilities for technology in the future:

- **Huaibei Shenergy Power Generation Co. Ltd** – The 1,350-megawatt ultra-supercritical coal-fueled generation unit is currently under construction in China and is expected to be among the most efficient coal-fueled generating plants in the world. Plant commissioning is targeted in 2020.

- **Nabha Power Limited, a subsidiary of Larsen & Toubro** – The 1,400-megawatt powerplant in Rajpura, Punjab, achieved the best heat rate and auxiliary power consumption in India's 660-megawatt class for FY 2017 – 2018 and has 100 percent dry fly ash utilisation and zero liquid discharge.

- **Wyoming Integrated Test Center** – The test center is one of the few research and testing facilities at an operating coal-fueled generating plant and offers space for researchers to test CCUS technologies using 20 megawatts of coal-based flue gas. Additional research looks at taking carbon emissions from flue gas and turning it into a marketable commodity.

APPENDIX 2: DOMESTIC LAWS, POLICIES AND MEASURES OF EXPORT COUNTRIES DIRECTED TOWARDS CLIMATE CHANGE IMPACTS, GHG EMISSIONS AND ACHIEVEMENT OF THE COUNTRY'S NDC

Country	Summary
China	**Paris Agreement and NDC** China signed the Paris Agreement on 22 April 2016, and ratified it on 3 September 2016. China's NDC has the following goals: • to peak carbon dioxide emissions around 2030 and make best efforts to peak early; • to lower carbon intensity (carbon dioxide emissions per unit of GDP) by 60% to 65% from the 2005 level; • to increase the share of non-fossil fuels in primary energy consumption to around 20%; and • to increase the forest stock volume by around 4.5 billion cubic meters compared to the 2005 level. Through achieving these goals, China aims to limit emissions to approximately 1.042 billion tCO_2e in 2030. China's NDC sets out policies and measures to implement enhanced action on climate change. Measures relating to energy include to: • control total coal consumption; • enhance the clean use of coal; • increase the share of concentrated and highly-efficient electricity generation from coal; • lower coal consumption of electricity generation from newly built coal-fired power plants to around 300 grams coal equivalent per kilowatt-hour; • expand the use of natural gas by 2020 by achieving more than 10% share of natural gas consumption in the primary energy consumption and making efforts to reach 30 billion cubic meters of coal-bed methane production; • proactively promote the development of hydro power, on the premise of ecological and environmental protection and inhabitant resettlement; • develop nuclear power in a safe and efficient manner; • scale up the development of wind power; • accelerate the development of solar power; • proactively develop geothermal energy, bio-energy and maritime energy; • achieve 200GW installed capacity of wind power, 100GW installed capacity of solar power and the utilization of thermal energy to 50 million tons coal equivalent by 2020; • enhance the recovery and utilization of vent gas and oilfield-associated gas; and • scale up distributed energy and strengthen the construction of smart grid. Measures relating to industry include to: • strictly control the total expansion of industries with extensive energy consumption and emissions, accelerate the elimination of outdated

	production capacity and promote the development of service industry and strategic emerging industries; • promote low-carbon development of industrial sectors, implement the Action Plan of Industries Addressing Climate Change (2012-2020) and formulating carbon emission control targets and action plans in key industries; • research and formulate greenhouse gas emission standards for key industries; • effectively control emissions from key sectors including power, iron and steel, nonferrous metal, building materials and chemical industries through energy conservation and efficiency improvement; • strengthen the management of carbon emissions for new projects and to actively control greenhouse gas emissions originating from the industrial production process; and • construct a recycling-based industrial system, promoting recycling restructu in industrial parks, increasing the recycling and utilization of renewable resources and improving the production rate of resource. Measures relating to enhancing support for science and technology include strengthening research and development and commercializing demonstration for low-carbon technologies, such as energy conservation, renewable energy, advanced nuclear power technologies and carbon capture, utilization and storage and promoting the technologies of utilizing carbon dioxide to enhance oil recovery and coal-bed methane recovery. Measures relating to emissions trading include to: • build on carbon emission trading pilots, steadily implement a nationwide carbon emission trading system and gradually establish the carbon emission trading mechanism so as to make the market play the decisive role in resource allocation; and • develop mechanisms for the reporting, verifying and certificating of carbon emissions and to improve rules and regulations for carbon emission trading to ensure openness, fairness and justice in the operation of the carbon emission trading market. **Current policies** <u>National emissions trading scheme</u> In December 2017, China launched its national emissions trading scheme (**ETS**). It is expected that the ETS will be fully operational in 2020. It will initially only cover companies in the power sector (including heat and power as well as captive power plants of other sectors) that emit more than 26,000 tons of GHG per year or consume more than 10,000 tons of standard coal equivalent (tce) per year - this will cover more than three billion tons of CO_2e, which accounts for approximately 30% of China's emissions. The National Carbon Emissions Trading Market Construction Plan (Power Generation Industry) set out the targets and roadmap for developing the ETS. While it has not yet been decided whether offsets will be available to be used in the ETS, it is expected that domestic offsets that have been used in China's existing regional ETS pilots will be able to be used. China also has eight multiple regional pilot ETSs. including the: • Beijing (Pilot) Emissions Trading System; • Chongqing (Pilot) Emissions Trading System;

	• Fujian (Pilot) Emissions Trading System; • Guangdong (Pilot) Emissions Trading System; • Hubei (Pilot) Emissions Trading System; • Shanghai (Pilot) Emissions Trading System; • Shenzhen (Pilot) Emissions Trading System; and • Tianjin (Pilot) Emissions Trading System. These pilots have adopted different approaches to sectoral coverage, allocation methods, use of offsets and other design elements to test various approaches. The pilot ETSs will be integrated into the national ETS when it is fully established. They currently have prices ranging from the equivalent of US\$9/tCO_2e (Beijing) to US\$1/tCO_2e (Tianjin). The exact date of the ETS' formal, national implementation in 2020 is still unknown. However, the Chinese Ministry of Ecology and Environment is currently preparing a number of framework rules for the ETS (such rules to potentially cover the inclusion of verified voluntary reduction credits), with draft allocation plans for the power, cement and electrolytic aluminium sectors (developed in 2016) anticipated to feed into this framework. <u>Five-year plan to save energy and cut emissions</u> China issued a **five-year plan to save energy and cut emissions** (2016-2020) on 5 January 2017. The Plan aims to cut energy consumption by 15% in 2020 based on 2015 levels. It also sets a target of a 58% maximum share of coal in national energy consumption by 2020. Coal consumption will be controlled in key areas that are suffering from heavy air pollution, and gas is encouraged as a replacement for coal. <u>Action Plan on the Efficient Use of Coal</u> In 2015, MIIT and Finance Ministry released a 2015-2020 **Action Plan on the Efficient Use of Coal**. The action plan sets out how fiscal and financial policies will support cuts in coal consumption. Through the Action Plan on the Efficient Use of Coal, China intends to decrease coal consumption by 160 million tonnes over the next five years. Policies under this action plan included the closure of multiple coal-fired power plants, a ban on the construction of new coal-fired power plants until 2018, and now include a cap on the annual production capacity of coal to 700Mtce (approximately 15% of total coal production capacity). China supports CCUS and has recently implemented multiple measures to accelerate the deployment of CCUS. These include: • widely promoting low-carbon technologies, with an emphasis on CCUS; • supporting CCUS pilots and Near Zero Carbon Emissions pilots; • providing grant funding for CCUS research projects promoted by the Ministry of Science and Technology; • amending the Environmental Impact Assessment Guidelines to better address CCUS projects; and • establishing a CCUS capacity building project for government officials and researchers directly involved in CCUS. A significant focus for China is the application of CCUS for EOR. China has over 20 CCUS for EOR projects at various stages of development. A number of these EOR projects have been, or will be, linked to facilities that capture the CO_2 generated by coal-fired power plants. For example, the Sinopec Shengli Power Plant, located near the Shengli oilfield in the Shangdong province (the second largest oil field in China), currently possesses an integrated CCUS pilot plant which captures 40,000 tons of CO_2 per annum, with a second phase of the CCUS plant

	currently under construction and intended to capture up to 1 million tons of CO_2 per annum. Once the second phase of the CCUS plant is complete, all captured CO_2 will be used for EOR to increase oil recovery by 10-15%.
India	**Paris Agreement and NDC** India signed the Paris Agreement on 22 April 2016, and ratified it on 2 October 2016. India's NDC includes the following targets: • to reduce the emissions intensity of its GDP by 33-35% percent by 2030 from 2005 levels (India has not provided the specific coverage and metrics of its emissions intensity target); • to achieve about 40% cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF); and • to create an additional carbon sink of 2.5 to 3 billion tonnes of CO_2-e through additional forest and tree cover by 2030. Priority areas for emission reductions include: • introducing new, more efficient and cleaner technologies in thermal power generation (noting that most thermal power generation in India is coal-fuelled); • promoting renewable energy generation and increasing the share of alternative fuels in the overall fuel mix; • reducing emissions from transportation sector; • promoting energy efficiency in the economy, notably in industry, transportation, buildings and appliances; • reducing emissions from waste; • developing climate resilient infrastructure; • fully implementing the Green India Mission and other programmes of afforestation; and • planning and implementing actions to enhance climate resilience and reduce vulnerability to climate change. **Current policies** <u>Perform, Achieve, Trade Scheme</u> India does not have a carbon market or carbon pricing policy. India has a **Perform, Achieve, Trade Scheme**, introduced in 2008, which reduces energy consumption in energy intensive industries. The scheme involves the trading of energy saving certificates and operates as a market based mechanism. <u>National Action Plan on Climate Change</u> India's National Action Plan on Climate Change (**NAPCC**), introduced in 2008, outlines priorities for mitigating and adapting to climate change. It established "missions" relating to solar energy and enhanced energy efficiency, among others. The NAPCC was revisited in 2015 and the government proposed to introduce new missions on wind energy, health, waste to energy, coastal areas and redesigning the National Water Mission & National Mission on Sustainable Agriculture.

<table>
<tr><td></td><td>
<u>Clean Environment Cess</u>

Since 2010, the Indian Government has imposed a coal cess (i.e. a coal tax), the Clean Environment Cess, on all domestic and imported coal (in all forms). The Clean Environment Cess has been increased three times since its establishment, now reaching 400 rupees per tonne of coal. The revenues from the coal tax feed into the National Clean Environment Fund, which provides finance to renewable energy projects.

<u>National Electricity Plan</u>

In April 2018, India released its National Electricity Plan (NEP), which is valid to financial year 2026/27. The NEP provides electricity demand forecasts for the period 2017-2026/27, calculates installed capacities from conventional and renewable energy sources needed to meet that demand and describes relevant policies. During the period 2017-22, no additional capacity of coal will be added (except for the coal power plants currently under construction). Demand growth will be met by additional installed capacities in gas, hydro, nuclear and renewables. A share of 56.5% of installed capacity is expected to come from non-fossil sources by 2027. In 2027 the country aims to have 275GW installed capacity of solar and wind, 72GW of hydro and 15GW of nuclear. The Central Electricity authority estimates that this means that no additional coal capacity is needed until at least 2027.

<u>Draft National Energy Policy</u>

According to India's Draft National Energy Policy, published in 2017, coal based power generation capacity is likely to go up to more than 330-441GW by 2040 (from 192GW in FY 2017). The Draft Policy indicates India's preference for demand to be met by domestic coal, however the percentage of coal that is imported is likely to remain high unless domestic production increases rapidly.

According to India's NDC, coal will continue to dominate power generation in the future. The Government has introduced the following initiatives to improve the efficiency of coal-fired power plants:
• all new, large coal-based generating stations have been required to use highly efficient supercritical technology;
• R&M and LE of existing old power stations is being undertaken in a phased manner; and
• approximately 144 old thermal stations have been assigned mandatory targets for improving energy efficiency.
</td></tr>
<tr><td>Japan</td><td>
Paris Agreement and NDC

Japan signed the Paris Agreement on 22 April 2016, and ratified it on 8 November 2016. The Paris Agreement entered into force for Japan on 8 December 2016. Japan's NDC includes an emissions reduction target of 26% below 2013 levels in 2030. This equates to emissions of approximately 1.042 billion tCO_2-e in 2030. The table below sets out further information relating to Japan's NDC:

<table>
<tr><td>Emissions reduction target</td><td>Emission reductions of 26% below 2013 levels in 2030.</td></tr>
<tr><td>Total emissions in 2030</td><td>Approximately 1.042 billion tCO_2e in 2030.</td></tr>
<tr><td>Coverage</td><td>100% (economy-wide)</td></tr>
<tr><td>Scope</td><td>All sectors, including:</td></tr>
</table>
</td></tr>
</table>

	▪ energy; ▪ industrial processes and product use; ▪ agriculture; ▪ Land Use, Land-Use Change and Forestry (**LULUCF**); and ▪ waste.
Gases	CO_2, CH4, N2O, HFCs, PFCs, SF6 and NF3.
Sectoral targets	Japan has sector-specific emissions reduction targets. Relevantly, Japan's target for: ▪ the industry sector is to reduce emissions from 429 $MtCO_2$ in 2013 to 401 $MtCO_2$ in 2030; and ▪ the energy conversion sector is to reduce emissions from 101 $MtCO_2$ in 2013 to 73 $MtCO_2$ in 2030. Japan also has a "removals target" for the LULUCF sector, of removing 37 $MtCO_2$ from the atmosphere by 2030. Japan did not provide a base year figure.

Japan's NDC sets out a variety of measures to achieve its 2030 emissions reduction target. Relevantly, measures in the energy conversion sector include:

- expanding renewable energy introduction to the maximum extent possible;
- utilizing nuclear power generation whose safety is confirmed; and
- pursuit of high efficiency in thermal power generation, including coal-fuelled technologies such as USC, A-USC, integrated gasification and combined cycle, etc.

Measures in the industry sector are classified as measures which relate to the iron and steel industry, the chemical industry, the ceramics, stone and clay products industry, factory energy management and cross-sectoral/other. Measures in the iron and steel industry include:

- efficiency improvement of electricity-consuming facilities;
- increased chemical recycling of waste plastic at steel plants;
- introduction of a next-generation coke making process (SCOPE21);
- improvement of power generation efficiency;
- enhanced energy efficiency and conservation facilities;
- introduction of an innovative ironmaking process (Ferro Coke); and
- introduction of an environmentally harmonized steelmaking process (COURSE50).

Current policies

Plan for Global Warming Countermeasures

The **Plan for Global Warming Countermeasures** was adopted by the Cabinet of Japan on 13 May 2016. The Plan incorporates the emissions reduction target in Japan's NDC of 26% below 2013 levels in 2030. The Plan also sets out strategic actions towards Japan's long-term goal of an 80% reduction by 2050. The base year of this long-term goal is not specified. The Plan incorporates the sectoral targets and measures set out in Japan's NDC (see above). The Plan also emphasises the key role of innovative technology, which the Government is promoting though its "Environmental and Energy Technology Innovation Plan" and

	its "National Energy and Environment Strategy for Technological Innovation towards 2050". The Plan will be revised every three years as necessary. Long-term Low-Carbon Vision Japan's **Long-term Low-carbon Vision**, published in March 2017, establishes that Japan's long-term goal of reducing emissions by 80% in 2050 will be met through energy efficiency, low-carbon energy supply and a switch to end-use low-carbon energies. This will be achieved through existing technologies and the development and deployment of new technologies. Carbon pricing is highlighted as a key policy direction. Relevantly, Japan's vision refers to CCUS as a means of achieving emission reductions in the energy sector, as well as centralised/distributed energy management. The Vision sets out that "now" is the time to act, and refers to concepts including: • the carbon budget, which is set in accordance with the total amount of cumulative emissions that can be emitted in order to allow Japan to achieve its 2^{o}c target; • the avoidance of "lock-in" through introducing city structures and large-scale facilities; and • key principles of environmental policy including prevention, the precautionary principle and the polluter pays principle. Tax for Climate Change Mitigation Japan implemented a **Tax for Climate Change Mitigation** (a carbon tax) on 1 October 2012. It currently has a value of JPY289/tCO_2e (US\$3/tCO_2e). The tax covers all fossil fuels, which comprise 68% of Japan's emissions. Revenues earned from the tax are applied to bolstering mitigation activities, such as encouraging energy savings and increasing utilisation of renewable energy. Tokyo also has a cap and trade scheme and Saitama has an emissions trading system - these schemes are bilaterally linked and cover an additional 2% of Japan's emissions. In 2015, Tokyo's cap and trade scheme had reduced emissions by 26% compared to emissions in 2000, and Saitama's ETS had achieved a 27% reduction in emissions below 2005 levels. Both Tokyo's cap and trade scheme and Saitama's ETS cover large-scale facilities in all commercial and industrial sectors which consume more than 1,500KL of crude oil equivalent in energy per year. Joint Crediting Mechanism Japan has introduced a Joint Crediting Mechanism (**JCM**), through which Japan will cooperate with developing countries to achieve a reduction in greenhouse gas emissions through the diffusion of low-carbon technologies. The JCM's partnership document has been signed by 17 developing countries. Credits generated from emission reductions under the JCM will be allocated according to agreed terms between the participating countries. Development of CCUS technologies Japan is actively engaged in the **development of CCUS technologies**. According to the Global CCS Institute's Global Status Report 2018, Japan has achieved the following major milestones: • commenced of CO_2 injections at the Tomakomai CCUS facility by Japan CCUS with the Ministry of Economy, Trade and Industry's full support – this is Asia's first full-cycle CCUS hydrogen plant, which will capture more than 300,000 tonnes of CO_2 by 2020; • retrofitted the Toshiba Corporation 49MW Mikawa power plant in Omuta (Fukuoka Prefecture) to accept biomass (in addition to coal) with a carbon capture facility;

<table>
<tr><td></td><td>

launched JPOWER and Chugoku Electric Power Company's Osaki CoolGen facility, a 166 MW oxygen-blown IGCC (integrated gasification combined cycle) plant in Osakikamijima (Hiroshima Prefecture), which will separate and capture CO_2;
completed construction of Toshiba's carbon capture and utilisation system at the Saga City Waste Incineration Plant (on Japan's Kyushu Island), using captured CO_2 for algae culture; and
announced (by Kawasaki Heavy Industries) of a Japanese Hydrogen Energy Supply Chain that plans to gasify Australian brown coal in Victoria's Latrobe Valley and transport it by ship to Japan for future decarbonised hydrogen developments.

</td></tr>
<tr><td>Malaysia</td><td>
Paris Agreement and NDC

Malaysia signed the Paris Agreement on 22 April 2016, and ratified it on 16 November 2016.

Malaysia's NDC has a target to reduce its GHG emissions intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. This comprises a 35% reduction on an unconditional basis and a further 10% conditional reduction based upon receipt of climate finance, technology transfer and capacity building from developed countries. The table below sets out key information relating to Malaysia's NDC:

<table>
<tr><td>Emissions reduction target</td><td>Reduce GHG emissions intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. Emissions intensity in 2005 was Emissions intensity of GDP in the base year: 0.531 tons CO_2e per thousand RM.</td></tr>
<tr><td>Coverage</td><td>Economy-wide</td></tr>
<tr><td>Scope</td><td>▪ Energy
▪ Industrial processes
▪ Waste
▪ Agriculture
▪ Land Use, Land-Use Change and Forestry (LULUCF)</td></tr>
<tr><td>Gases</td><td>CO_2, CH_4, N_2O</td></tr>
</table>

Malaysia's NDC is based on the Eleventh Malaysia Plan, as well as the following policies:

National Petroleum Policy (1975);
National Energy Policy (1979);
National Depletion Policy (1980);
Four-Fuel Diversification Policy (1981);
National Forestry Policy (1978, Revised 1992);
National Policy on Biological Diversity (1998);
Five-Fuel Policy (2001);
National Policy on the Environment (2002);
National Strategic Plan for Solid Waste Management (2005);
National Biofuel Policy (2006);
National Energy Policy (2008);
National Green Technology Policy (2009);

</td></tr>
</table>

	• National Policy on Climate Change (2009); • New Economic Model, Government Transformation Programme and Economic Transformation Programme (2010); • Renewable Energy Policy and Action Plan (2010); • Second National Physical Plan (2010); • Low Carbon Cities Framework (2011); • National Agro-food Policy (2011); • National Water Resources Policy (2012); and • National Automotive Policy (2014). **Current policies** Energy Efficiency and Conservation Act The Malaysian government has set a renewable energy target of 20% (equivalent to 3,991MW) by 2025. Currently the country only sources 2% of its energy from renewable sources. However, it is intended for the target to be met through various policies and frameworks under the **Energy Efficiency and Conservation Act**, a first draft of which is to be presented to Parliament later this year. Eleventh Malaysia Plan The government will continue to pursue the green growth goal under the **Eleventh Malaysia Plan** (2016-2020), and will further focus on pursuing green growth for sustainability and resilience. The Plan includes strategies to enable green growth, adopt sustainable consumption and production methods, conserve natural resources and strengthen resilience against climate change and natural disasters. These actions will further reduce Malaysia's carbon footprint. A Roadmap of Emissions Intensity Reduction in Malaysia in 2014 Malaysia developed **A Roadmap of Emissions Intensity Reduction in Malaysia in 2014**. The study indicated that Malaysia has opportunities across various sectors to meet the emissions intensity reduction target of 40% of GDP. However, while these opportunities exist, considerable efforts would be required to realise these emissions reductions in light of the challenges and barriers described below. Malaysia does not have an integrated CCUS legal framework. A scoping study on CCUS in Malaysia was released by the Global CCS Institute, the Clinton Climate Initiative and the Malaysian Ministry of Energy, Green Technology and Water in January 2011. The study found that CCUS technologies present an opportunity to significantly reduce CO_2 emissions in Malaysia. It also found that Malaysia lacks legal and regulatory frameworks that are capable of being applied to the stages of the CCUS project cycle. Despite this, two commercial-scale CCUS projects are currently underway in Malaysia – the K5 Strategic Technology Project (with a CO_2 processing platform due for installation by 2022) and the TNB Janamanjung Project.
Philippines	**Paris Agreement and NDC** The Philippines signed the Paris Agreement on 22 April 2016, and ratified it on 23 March 2017. The Philippines communicated an INDC in 2015, however it has not yet submitted its NDC. The Philippines' INDC has a target to reduce its GHG emissions by "about" 70% below BAU by 2030. This is conditional on the extent of financial resources, including technology development and transfer, and capacity building, that will be made available to the Philippines. The table below sets out key information relating to the Philippines' INDC:

Emissions reduction target	GHG (CO_2e) emissions reduction of about 70% by 2030 relative to its BAU scenario of 2000-2030. No BAU scenario is provided.
Scope	▪ Energy ▪ Industry ▪ Waste ▪ Transport ▪ Forestry
Conditional	Mitigation contribution is conditional on the extent of financial resources, including technology development and transfer, and capacity building, that will be made available to the Philippines.

The Philippines' Climate Change Commission is currently working on revising the Philippines' INDC. The current draft NDC revised the emission reductions target down to 67% below BAU by 2030.

Current policies

Climate Change Act of 2009

The Philippines enacted the **Climate Change Act of 2009** and amended in 2011. The Act established the Climate Change Commission (CCC) to lead policy development and coordinate, monitor and evaluate the programs and action plans of the government relating to climate change. The amended law established the People's Survival Fund which is to finance adaptation programs and projects based on the National Strategic Framework.

Philippine Development Plan 2017-2022

The **Philippine Development Plan 2017-2022** identifies the Philippines' priorities in the development of energy infrastructure, which include to:

- support the required investments and fast track the implementation of infrastructure projects to improve power generation;
- encourage competition to drive down electricity costs;
- pursue development of the natural gas industry, as well as the renewable energy such as wind and solar;
- ensure efficient transmission of electricity to various load centers and interconnect the entire grid;
- prioritize provision of electricity services to the remaining unelectrified off-grid, island, remote, and last-mile communities;
- continue the implementation of energy efficiency and conservation programs; and
- review mandated biofuels blending with due consideration to the impact on prices, farmer incomes, and environmental protection.

National Framework Strategy on Climate Change 2010-2022

The **National Framework Strategy on Climate Change 2010-2022** has a long-term objective of facilitating "the transition towards low greenhouse gas emissions for sustainable development". The Strategy sets Key Result Areas to achieve this long-term objective which, relevantly, relate to energy efficiency and conservation and renewable energy. The Strategy sets a goal of doubling the renewable energy capacity in the country from 4,500MW to 9,000MW by 2030.

	National Climate Change Action Plan 2011-2028 The National Climate Change Action Plan (2011-2028) (**NCCAP**) sets strategic priorities for the Government to implement in seven thematic areas of food security, water security, ecological and environmental stability, human security, climate smart industries and services, sustainable energy, and knowledge and capacity development. Relevantly, the NCCAP prioritizes the promotion and expansion of energy efficiency and conservation; the development of sustainable and renewable energy; environmentally sustainable transport; and climate-proofing and rehabilitation of energy systems infrastructures. Within these priority areas, the NCCAP identifies outputs, for example development and implementation of a national renewable energy program and technology roadmap based on RA 9513, and activities specific to each output, for example the development of a national renewable energy program, increasing generation capacities of RE systems and increasing research and development on renewable energy. The NCCAP recognises the potential to improve efficiency in the power sector by rehabilitating power plants, fuel switching from coal to gas, and reducing transmission and distribution losses. The Department of Energy released Circular No. DC2015-07-0014 in 2015, which sets a policy of achieving at least a 30% share of renewable energy in total power generation capacity. The Circular was made in accordance with the *Renewable Energy Act of 2008*, which aims to accelerate the development and increase the utilisation of renewable energy resources. The Climate Change Commission issued Commission Resolution No. 2016-001, Resolution on the Development of a Clear Policy on Coal-Fired Power Plants in Pursuit of a Low Carbon Development Pathway for the Philippines. The Resolution requires the Climate Change Commission and other National Government Agencies and stakeholders to facilitate a national policy review and develop a new framework on energy. Key messages from the policy review include: • security: renewable energy can provide a major share of the Philippine electricity mix in a stable and reliable manner and at the same time increase energy self-sufficiency and reduce supply related risks; • affordability: if initiated now, the large-scale application of renewables can lead to significant economic benefits for the Philippines. These benefits are due to four main aspects: decreasing renewable technology costs, reducing susceptibility to uncertain fossil fuel price developments, lowering electricity prices on the wholesale market, and reducing subsidies for off-grid electricity supply; and • sustainability: an energy system with increasing shares of renewable energy sources can provide the Philippines with clean air and a healthy environment. Additionally, it can insure the achievement of established GHG reduction goals and trigger economic growth through the creation of a renewable industry and energy access in remote areas. The policy review calls for a thorough assessment of whether coal-based generation is "least cost" electricity, and whether societal and environmental costs should be factored into the assessment of "least cost". Carbon taxes and emissions trading schemes are flagged as a possible approach to "transfer the cost burden from the Philippine society to the ones that actually cause it." The policy review also notes that conventional power plants "play a major role in today's energy sector and will not cease to exist in the foreseeable future" and additional coal-fired power plants will be required to meet electricity demand. To this end, the policy review recommends the introduction of "new standards and strict implementation of existing rules are necessary to integrate coal at least damage to Philippine consumers", including:

<table>
<tr><td></td><td>

EIA System: establishing specific should be implemented that prohibit the construction of coal plants which do not comply with international emission standards should be implemented. These standards should - as requested by the CCC - include rules on GHG emissions;
establishing limits for new coal-fired power plants in accordance with the commitments to reduce GHG emissions until 2030; and
improving the Philippine Clean Air Act of 1999 (Republic Act No. 8749) through (i) the effective implementation of existing rules, (ii) the stringency of existing rules compared to other international emission restrictions, (iii) the review process of the standards, and (iv) the rules on the Emission Charge System.

The government has made progress on some of the above recommendations. For example, the bill for the amendment of the Philippine Clean Air Act of 1999 was filed in Parliament in May 2018, and is currently under Committee review. However, it has not yet released details of any frameworks with regards to the EIA System or limits on the construction of new coal-fired power plants.
</td></tr>
<tr><td>South Korea</td><td>
Paris Agreement and NDC

South Korea signed the Paris Agreement on 22 April 2016, and ratified it on 3 November 2016. The Paris Agreement entered into force for South Korea on 3 December 2016. South Korea's NDC has proposes an economy-wide target to reduce GHG emissions by 37% below BAU emissions of 850.6 $MtCO_2e$/year in 2030. The table below sets out key information relating to South Korea's NDC:
<table>
<tr><td>Emissions reduction target</td><td>37% below BAU by 2030. BAU emissions in 2030 are projected at 850.6 MtCO2e.</td></tr>
<tr><td>Coverage</td><td>Economy-wide</td></tr>
<tr><td>Scope</td><td>100% (economy-wide)</td></tr>
<tr><td>Scope</td><td>Energy, industrial processes and product use, agriculture and waste (A decision on whether to include land use, land-use change and forestry (LULUCF) will be made at a later stage.)</td></tr>
<tr><td>Gases</td><td>CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6</td></tr>
</table>
South Korea's NDC indicated that it would subsequently develop a detailed plan to implement its mitigation target. To this end, South Korea released a revised roadmap for achieving the 2030 National Greenhouse Gas Reduction Goal in July 2018 (the Roadmap). The Roadmap sets out sectoral targets, including:

emission reductions of 24 million tons in the energy conversion sector (power generation, group energy) through policies to reduce fine dust and promote the use of eco-friendly energy. The sector will create a detailed plan to reduce another 34 million tons before submitting the revised NDC in 2020 by establishing a third basic energy plan, revising the energy tax framework, and enhancing the dispatch of environmental power; and
emission reductions of 99 million tons in the industry sector through the revision of industrial processes, energy use reduction, and sharing of emission reductions technologies.

The Roadmap indicates that South Korea intends to achieve a 32.5% reduction on BAU emissions domestically, and the remaining 4.5% through international market
</td></tr>
</table>

	mechanisms. **Current Policies** Act on the Allocation and Trading of Greenhouse Gas Emission Permits South Korea enacted the **Act on the Allocation and Trading of Greenhouse Gas Emission Permits** in 2012, and launched an ETS on 1 January 2015. It currently has a price of approximately US$20/tCO$_2$e. The ETS covers 68% of Korea's emissions, including emissions from the industry, power, aviation, building and waste sectors. Liable emitters comprise companies and factories in the relevant sectors which produce over 125,000 tons of CO_2 per year and 25,000 tons of CO_2 per year (respectively). This represents approximately 600 companies, including 5 domestic airlines. During the first phase of the scheme (2015-2017), only domestic offset credits could be used for compliance. CERs generated from domestic CDM projects and credits from domestically certified projects (Korean Offset Credits) were allowed. These credits had to be converted to Korean Credit Units (KCUs) before being used for compliance. Offsets could only be used for up to 10% of each entity's compliance obligation. During the second phase of the scheme (2018-2020), CERs generated from international CDM projects developed by domestic companies can be used for compliance (up to 5% of each entity's emission volume). During the third phase of the scheme (2021-2025), credits of up to 10% of each entity's compliance obligation with a maximum of 5% coming from international offsets will be allowed. Framework Act on Low Carbon Green Growth South Korea enacted a **Framework Act on Low Carbon Green Growth** on 6 June 2016. Article 25 of the Act incorporates the 2030 emissions reduction target in South Korea's NDC. Article 4 of the Act requires the Government to establish a five-year National Strategy for Low Carbon Green Growth every five years. Article 39 of the Act requires the Government to gradually reduce the use of fossil fuels such as petroleum and coal. Eighth Plan for Electricity Supply and Demand In December 2017, the government released its **Eighth Plan for Electricity Supply and Demand** which sets targets for increased electricity supply from renewables and natural gas, and decreases supply from coal and nuclear. The Plan sets an objective of 20% share of electricity production obtained from renewables by 2030, while natural gas would reach 18.8%, and both coal and nuclear decreasing to 36.1% and 23.9% respectively. These targets are intended to be achieved through the addition of 4.3GW in new LNG and pumped-storage hydroelectric generation facilities and an increase in the installed capacity of renewable energy (to be comprised mainly of wind and solar projects) from 11.3GW to 58.5GW, by 2030.
Taiwan	**Paris Agreement and NDC** Taiwan is not a party to the UNFCCC or the Paris Agreement. Nevertheless, Taiwan's Cabinet put forward an Intended Nationally Determined Contribution (**INDC**) on 17 September 2015. Taiwan's INDC has an emissions reduction target of 50% from the BAU level by 2030. The BAU level is 428 MtCO$_2$e and the 2030 target is 214 MtCO$_2$e by 2030. The table below sets out key information relating to Taiwan's INDC: Emissions reduction target — Emission reductions of 50% below BAU levels by 2030.

Total emissions in 2030	Approximately 214 $MtCO_2e$ in 2030.
Coverage	Economy-wide
Scope	All sectors, including: ▪ energy; ▪ industrial processes and product use; ▪ agriculture; ▪ Land Use, Land-Use Change and Forestry (LULUCF); and ▪ waste.
Gases	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3.

Taiwan's INDC sets out measures for achieving sectoral mitigation measures. Relevantly, in relation to energy, the government will:

- reduce energy demand by introducing energy conservation measures;
- raise the renewable energy development target to 17,250MW in 2030;
- continue to phase out nuclear power plants;
- increase the use of natural gas;
- replace old power plants with the "best feasible technology";
- promote the construction of smart grids; and
- use low-carbon fuel and energy-efficient technologies in the refining sector.

Emissions reductions will be achieved in the industrial sector through:

- industrial structure adjustment;
- technical advice service of energy conservation and carbon reduction;
- integrated utilization of energy and resources in industrial zones;
- regulation of energy efficiency standards;
- alternative fuels;
- heat recovery; and
- a renewal of facilities.

Current policies

Greenhouse Gas Reduction and Management Act 2015

Taiwan enacted its Greenhouse Gas Reduction and Management Act on 1 July 2015. Key features of the Act are:

- Article 4 of the Act sets a goal to reduce GHG emissions to no more than 50% of 2005 emissions by 2050;
- Article 5(1) requires the Government to draft mid- to long-term strategies for gradually reducing dependence on fossil fuels, with a mid-to long-term aim of improving renewable energy policies, and the gradual realization of a nuclear-free homeland;
- Article 5(3)-(4) recommends that the Government implement tax mechanisms on imported fossil fuels based on their CO_2-e emissions, and actively help traditional industries achieve energy conservation and carbon reduction or transition, develop green technology and green industry, create new employment opportunities and green economies, and promote

	a low-carbon, green growth plan for Taiwan's infrastructure; • Article 8 requires relevant government agencies to promote GHG reduction and climate change adaptation through, relevantly, development of renewable energy and energy technology, reduction in GHG emissions by industrial sectors, establishment of GHG cap-and-trade scheme and facilitation of international emission reduction cooperation mechanism, and research, development and implementation of GHG reduction technologies; and • Article 18 requires Taiwan's Environmental Protection Administration (EPA) to implement a domestic cap and trade scheme, and Article 20 outlines matters to be considered in the development of the scheme, including trade intensities of various sectors, avoiding carbon leakage and overall national competitiveness. <u>National Climate Change Action Guideline/GHG Reduction Action Plan</u> The Act also required the Government to develop the **National Climate Change Action Guideline** (which was approved on 23 February 2017) and a **GHG Reduction Action Plan**.[20] The National Climate Change Action Guideline is to include periodic regulatory goals, implementation timetables, implementation strategies and an evaluation mechanism.[21] Under the GHG Reduction Action Plan, the authorities responsible for the Taiwan's energy, manufacturing, transportation, residential, commercial, and agriculture sectors are required to formulate GHG Emission Control Action Programs. These Action Programs must include GHG emissions targets, timetables and economic incentive measures. These Action Programs are to be regularly reviewed and revised and are to propose improvement plans if sectors are failing to meet their emission targets. Multiple subsidiary regulations have been introduced, including the: • Regulations Governing Incentives for Landfill Sites to Reduce Greenhouse Gas Emissions (announced 25 December 2015). • Regulations Governing Greenhouse Gases Offset Program Management (announced 31 December 2015). • Management Regulations Governing Greenhouse Gas Emission Inventories and Registration (announce 5 January 2016). • Greenhouse Gas Reduction and Management Enforcement Rules (announced 6 January 2016). • First Batch of Emission Sources Required to Report Greenhouse Gas Emission Inventory and Registration (announced 7 January 2016). • Greenhouse Gas Management Fund Revenues and Expenditures, Safekeeping, and Utilization Regulations (announced 30 January 2016). <u>Annual Emission Reports</u> Since 1 January 2012, Taiwan's EPA has been, in batches, requesting major enterprises to submit annual emission reports. As of the end of 2015, the EPA had added 269 firms to the list, and the reporting rate has been 100%. These enterprises account for approximately 80% of CO_2 emissions from industry and fossil-fuel energy generation in Taiwan. <u>National CCUS Strategic Alliance</u> Taiwan's EPA established a national CCUS strategic alliance in 2011. This alliance

[20] Taiwan, *Greenhouse Gas Reduction and Management Act*, Article 9.

[21] Taiwan, *Greenhouse Gas Reduction and Management Act*, Article 9.

<table>
<tr><td></td><td>brings together domestic experts from government, academia and industry, for the purpose of developing the technology and regulatory framework required for the commercial use of CCUS technology, with the ultimate goal of achieving widespread use of CCUS technology by 2020. Through the alliance, the Taiwan Cement Corporation (in partnership with the Industrial Technology Research Institute) commissioned the world's first CCUS pilot project in the cement industry in 2013, with the two entities agreeing in 2016 to extend their cooperation on the project.

Renewable Energy Development Act

Taiwan introduced a Renewable Energy Development Act in 2009, which encourages renewable energy use and promotes energy diversification.</td></tr>
<tr><td>Vietnam</td><td>Paris Agreement and NDC

Vietnam signed the Paris Agreement on 22 April 2016, and "approved" it on 3 November 2016.

Vietnam has an unconditional emissions reduction target of reducing GHG emissions by 8% compared to BAU by 2030. This is to be achieved by reducing emissions intensity per unit of GDP by 20% compared to 2010 levels, and increasing forest cover to 45%. If sufficient international support is received, the target of reducing GHG emissions by 8% compared to BAU by 2030 could be increased to 25%.

<table>
<tr><td>Emissions reduction target</td><td>Unconditional target of reducing GHG emissions by 8% compared to BAU by 2030. BAU emissions were 246.8 million tCO2e in 2010, and are projected to be 474.1 million tCO_2e in 2020 and 787.4 million tCO_2e in 2030.

Conditional target of reducing GHG emissions by 25% compared to BAU by 2030.</td></tr>
<tr><td>Coverage</td><td>Economy-wide</td></tr>
<tr><td>Scope</td><td>▪ Energy
▪ Agriculture
▪ Land Use, Land-Use Change and Forestry (LULUCF)
▪ Waste</td></tr>
<tr><td>Gases</td><td>CO_2, CH_4, N_2O, HFCs, PFCs and SF_6.</td></tr>
</table>
Vietnam will exert efforts in implementing a range of measures to achieve its NDC. Measures relating to energy efficiency and reducing energy consumption include:

• innovating technologies and applying advanced management and operation procedures for efficient and effective use of energy in production, transmission and consumption, especially in large production facilities where energy consumption is high;
• applying energy savings and efficiency, and renewable energy applications in the residential sector, trade and services;
• developing public passenger transport, especially fast modes of transit in large urban centres, restructuring freight to reduce the share of road transport in exchange for an increase in the share of transportation via rail and inland waterways; and
• establishing standards on fuel consumption, and developing a roadmap to remove obsolete and energy-consuming technologies in energy production</td></tr>
</table>

	and consumption systems. Measures relating to changing the fuel structure in industry and transportation include: • assuring national energy security by developing and exploiting different energy sources, while simultaneously using energy sources effectively; • changing the energy structure towards a reduced share of fossil fuel, and encouraging the exploitation and use of renewable and low GHG emission energy sources; • encouraging buses and taxis to use compressed natural gas and liquefied petroleum gas (LPG); • implementing management solutions for fuel quality, emissions standards, and vehicle maintenance; • applying market instruments to promote structural change and improve energy efficiency; encourage the use of clean fuels; • supporting the development of renewable energy; • implementing the roadmap to phase out subsidies for fossil fuels; and • labelling energy-saving equipment and issue national standards for the quality of equipment. Measures relating to increasing the proportion of new and renewable energy sources in energy production and consumption include: • developing and implementing financial and technical mechanisms and policies to support research and the application of appropriate advanced technologies; • exploiting and optimizing the use of renewable energy sources, both on-grid as well as off grid; and • developing a renewable energy technology market, domestic industries and local service providers. **Current Policies** Legal documents and policies on climate change support to NDC implementation in Vietnam include: • Law on Environment (6/2014); • Law on Economical and Efficient use of Energy (6/2010); • Resolution No. 24-NQ/TW on "Pro-actively responding to climate change, enhancing natural resource management and environmental protection" (6/2013); • National Climate Change Strategy (2011); • National Green Growth Strategy (2012); and • Decision 1775/Q?-TTg on "Management of GHG emissions; management of carbon credit trading activities to the world market" (11/2012). <u>National Climate Change Strategy 2011-2020</u> The **National Climate Change Strategy (2011-2020)** has a strategic target "to turn low-carbon economy and green growth into main orientations for sustainable development; lower emission and higher absorption of greenhouse gases to become compulsory indicators of socio-economic development". The Strategy has multiple missions, including, relevantly, reducing greenhouse gas emissions through:

	• Developing new and recycled energies:
	  ○ to review, plan and develop hydroelectric projects properly for various purposes, so that the total output capacity of hydroelectric plants can reach 20,000-22,000 MW by 2020;
	  ○ to boost research and development of technologies which can produce recycled energies and new ones, including wind energy, solar energy, tidal energy, geothermal energy, biofuel, and universal energy;
	  ○ to design and implement policies on engaging socio-economic sectors in applying and popularizing recycled energies;
	  ○ to guarantee national energy security through synchronously developing different sources of energy; and
	  ○ to raise the percentage of new energies and recycled ones to 5% of the totality of primary commercial energies by 2020 and 11% by 2050,
	• Saving and effectively using energies:
	  ○ to restructure the economy through narrowing energy-intensive industries and developing energy-efficient ones;
	  ○ to design and implement policies which support and encourage the effective use of energies in economic fields, especially in transportation, urban development, industry, and agriculture;
	  ○ to check and reject ineffective technologies which largely consume energies and create greenhouse gases;
	  ○ to research, develop and apply technologies, equipment and consumer goods which use energies effectively, consume non-fossil energies and create low emission, especially in transportation, urban development, industry and agriculture;
	  ○ to set up a sound energy valuing system for effectively using and saving energies and for development of new and recycled;
	  ○ to introduce advanced technologies for increasing the output of electricity generation and reducing greenhouse gas emission at all newly-built thermoelectric plants;
	  ○ to apply small-scale electricity generating systems which use methane collected from dumping sites and other sources;
	  ○ to collect gases and make full use of redundant heat of industrial production factories for discovering and burning solid wastes for electricity generation;
	  ○ to improve the economical use and preservation of energies; to monitor and supervise the use of energy in energy-intensive industries; and
	  ○ to apply standards on energy efficiency to energy-saving products and systems,
	• Industrial production and construction:
	  ○ to research and apply new technologies for low greenhouse gas emissions in industrial production;
	  ○ to speed up the replacement of fossil fuels with low-carbon ones;
	  ○ to popularize cleaner production, so that by 2020, 90% of industrial production facilities must use cleaner technologies and save energies, fuels, and materials;

	○ to enhance research and development of high technologies in key industries by 2020, the added value of hi-tech industries must be raised to 42-45% of the total industrial production; ○ to boost technological renovation through adopting high technologies and renewing 20% of machinery and equipment by 2020. The production value of hi-tech industries must be raised to 80% by 2050; and ○ to put forth and apply technical standards and norms of effective energy use in the production of materials and to construction projects. <u>The National Green Growth Strategy 2011-2020</u> The **National Green Growth Strategy** (2011-2020) aims to reduce the intensity of greenhouse gas emissions by 8-10% as compared to the 2010 level and reduce energy consumption per unit of GDP by 1-1.5% per year over the period of 2011-2020. The Strategy also aims to reduce annual greenhouse gas emissions by at least 1.5-2% and reduce greenhouse gas emissions in energy activities by 20 - 30% compared to business as usual levels by 2030. Of this commitment, the voluntary reduction will be approximately 20%, and 10% will be dependent on additional international support. Relevantly, the Strategy identifies solutions including: • innovating technologies, applying advanced management and operation procedures for efficient and effective use of energy in production, transmission and consumption (in particular in large production facilities where energy consumption is high); • establishing and publically announcing standards on fuel consumption norms, developing roadmaps to remove obsolete and energy consuming technologies in energy production and consumption systems; • developing a legal basis to prepare for the application of technologies to capture, restore and trade various types of greenhouse gases; • assuring national energy security by simultaneously developing different energy sources, exploiting and using economically domestic energy sources, reducing reliance on petroleum products, gradually decreasing the volume of coal export and import an appropriate amount, while creating linkages with energy systems in neighbouring countries; • changing the energy structure so that the share of energy which originates from fossil fuel is gradually decreased, and encouraging the exploitation and use of new, renewable and low greenhouse gas emission energy sources; • applying market instruments to promote changes in the energy structure and increase energy efficiency, encouraging the use of clean energy, supporting the development of renewable energy, building a roadmap to phase out subsidies for fossil fuels, and assuring principles of competitiveness, transparency and efficiency; • establishing and implementing financial and technical policies to promote research and application of appropriate advanced technologies to exploit and optimize the potentials of renewable energy sources both on-grid as well as off grid; and • developing a renewable energy technology market which stimulates domestic industries to commence the production of renewable energy equipment and provide related services in the country. The government reported in 2017 that five government ministries, and nearly 30

	provinces and cities across Vietnam had implemented their Green Growth Action Plans. Vietnam does not have an integrated CCUS framework, though the government has previously acknowledged the role that CCUS technology could play in assisting Vietnam to achieve its emissions reduction goals.

APPENDIX 3: CRU'S SUMMARY LETTER

THE INDEPENDENT AUTHORITY
MINING | METALS | FERTILIZERS

Sydney Office

Suite 1002
99 Mount Street
North Sydney
NSW 2060
Australia

Tel +61 2 8412 2800
Fax+61 2 8412 2810

www.crugroup.com

12th April 2019

Mr Gary Wills
Operations Manager
United Wambo Joint Venture
gary.wills@glencore.com.au

UNITED WAMBO OPEN CUT COAL PROJECT – INDEPENDENT STUDY ON COAL MARKET SUBSTITUTION AND CARBON LEAKAGE

Dear Mr Wills

Background and purpose of this letter

United Collieries Pty Ltd ("United") and Wambo Coal Pty Ltd ("Wambo"), through the United Wambo Joint Venture ("UWJV"), propose to develop a project that will combine the existing open cut coal mining operations at the Wambo Mine with a new open cut at the United Mine ("Project"). The Project is currently subject to an assessment process under the *Environmental Planning and Assessment Act 1979* ("EP&A Act"). The NSW Independent Planning Commission ("IPC") held a public meeting into the Project on 7 February 2019.

CRU Consulting ("CRU") has prepared a report in response to a request from the UWJV parties to carry out an independent study on the issue of coal market substitution and carbon leakage over the long term ("CRU Report").

The purpose of this letter is to provide you with a summary of the main findings we have made in the CRU Report. This letter can be made available to the IPC and placed in the public domain.

We note that, for reasons relating to the commercially sensitive information contained in the CRU Report and our proprietary intellectual property which was used in producing the CRU Report, we are not prepared to provide the UWJV with permission for the CRU Report to be made available in the public domain.

However, we are prepared to grant the UWJV permission to disclose the CRU Report to the IPC if the IPC makes a direction under clause 5 of Schedule 2 to the EP&A Act that the CRU Report is to be treated as a confidential document that is not to be made publicly available.

Summary of findings

The study conducted by CRU comprised four main components:

1. An outline of CRU's views on the long-term thermal coal demand outlook to 2040, comparing these demand forecasts with those of the International Energy Agency ("IEA"), under the IEA's New Policies Scenario ("NPS"), Current Policies Scenario ("CPS") and the Sustainable Development Scenario ("SDS") ("First Component")
2. An overview of CRU's appraisal methodologies and evaluation of production costs from the Project and other competing supply sources ("Second Component")
3. Discussion of the key dimensions of coal quality, comparing coal quality value indicators across regions and projects, with specific reference to the Project, focusing on three measures:
    a. calorific value (unit: kcal/kg);[1]
    b. ash content (unit: %);[2] and
    c. sulphur content (unit: %)[3] ("Third Component")
4. An assessment of two coal supply substitution scenarios and their impact on greenhouse gas ("GHG") emissions, the two scenarios being:
    a. Scenario 1: the Project does not go ahead; and
    b. Scenario 2: the Project and all other known Australian thermal coal projects do not enter the production phase (i.e. new investments are prevented country-wide) ("Fourth Component").

In relation to the First Component, the main findings made by CRU were:

1. energy demand growth is projected to continue over the medium and longer term, as a result of rising incomes and improved access to supply infrastructure;
2. coal is a critical component of the global energy system, accounting for 35% of total power generation in 2018;

---

[1] The energy density of different coal sub product is a key driver of the volume of coal that is needed to be burned to attain a given level of power demand.
[2] This refers to the non-combustible residue left after the coal is burnt; it is a key driver of costs as it impacts power plant maintenance costs via equipment wear and ash-handling requirements.
[3] This contaminant impacts the level of atmospheric oxides which are emitted (a key local air pollutant and contributor to acid rain).

3. although subject to downside risks, CRU forecast that total thermal coal demand is expected to remain relatively flat between 2019 and 2040, with an average compounded annual growth rate of 0.7% over the period - a view that is largely consistent with that forecast under the IEA's NPS (its "central case");
4. coal investment and supply conditions in Australia have a limited impact on global market conditions for several reasons:
    a. as a low-cost producer, it does not affect the price of coal (which is determined by the marginal - typically Chinese - coal producer);
    b. Australian coal supplies are small relative to domestic industries in the major importing countries: Chinese domestic coal production alone is around 15 times larger than total Australian exports; and
    c. a high degree of flexibility is observed in the coal industries of major Asian demand centres, rendering it likely that any change in Australian exports would be offset by expansion in these domestic supplies. In 2017 alone, for example, China closed around 200 million tonnes of coal production capacity (roughly equivalent to the entire Australian export market). Such former producing assets can be readily restarted in response to any supply shortages.

In relation to the Second Component, the main findings made by CRU were:

1. coal is not a standardised homogeneous commodity, as the quality parameters of the ore produced by different mines vary considerably. This is a critically important factor to recognise when comparing both the costs of production of different mines as well as the environmental consequences of its production and use;
2. CRU's proprietary methodology - the Value Based Costing (VBC)™ system - takes differences in quality and their impacts on producers (and, indirectly, consumers of coal) into account in analysing the business performance and competitive position of individual production facilities in the extractive industries;
3. a core principle of the VBC is that each commodity market has a "benchmark" price and that the costs of all production facilities are compared against this benchmark. In the case of thermal coal, the key "benchmark" is the 6,000kcal/kg calorific value benchmark;
4. VBC, once applied and after necessary adjustments are made to the Project's business costs so as to allow for a "like with like" value comparison with CRU's business cost curve, results in the initial business costs being reduced from US$53.2/t to US$40.5/t as the Project's thermal coal products are of higher quality than the benchmark; and
5. the Project is a low-cost project when compared to other projects and existing production worldwide, as well as when compared with average country business costs of running coal mines.

In relation to the Third Component, the main findings made by CRU were:

1. understanding the quality of the Project's coal, relative to alternative markets and projects, is key for assessing the potential environmental impacts of any supply substitution arising from a given investment decision;
2. the Project's low and medium ash products' calorific values are respectively 12.8% and 6.8% above the 6,000kcal/kg benchmark;
3. the calorific values of the Project's low ash and medium ash thermal coal products are also higher than the country averages of Australia and other major thermal coal producers such as China, India, Indonesia, Russia, South Africa and the United States;
4. the Project's low ash and medium ash thermal coal products have low (<10%) and medium (between 10-14%) ash content and the sulphur contents of the Project's thermal coal products (0.36%) are at the bottom end of the range globally;
5. it is important to understand the calorific value of coal from both the Project and competing supply sources since this will determine how much coal will need to be mined and burned in different regions to replace a given weight of the Project's coal;
6. the Project's thermal coal, as a result of its high calorific values and moderate ash content, performs at a higher level of boiler efficiency when burned at power stations compared to competing coal supply sources;
7. in terms of measuring the GHG emissions associated with the coal value chain, it is apparent that:
   a. in relation to Scope 1 emissions, comparison with other coal sources requires to look into a low and high value case for emission rates. Fugitive methane emissions are highly variable and depend on the characteristics of each coal orebody and as such we have assumed the International Panel on Climate Change ("IPCC") estimates methane emissions in a range;
   b. in relation to Scope 2 emissions, Australian coal mining consumes lower power compared to many other regions;

      and

   c. in relation to Scope 3 emissions, substituting the Project's output by coal from the alternate countries will increase scope 3 emissions by 2.9 to 14.9 million tonnes CO2-e between 2019 and 2030.
8. the environmental impacts of switching to alternative supply sources would be adverse, because Australian coal (including the Project's thermal coal) is relatively high quality in calorific terms and low in negative attributes such as ash and sulphur. This means that substitution by other coal supply sources is likely to result in more physical coal being mined and combusted to meet the same power needs,

4

resulting in higher Scope 3 emissions and concentrations of ash and sulphur. Moreover, the direct emissions (Scope 1 and 2) of these alternative supply sources are also likely to be higher, largely due to favourable geology and highly efficient production processes and technologies commonly employed in the Australian mining industry.

In relation to the Fourth Component, the main findings made by CRU were:

1. In Scenario 1, non-Australian alternative supply is expected to release an increased quantity of between 1-44 million tonnes CO2-e in the atmosphere over the 2019-30 period.
2. In Scenario 2, non-Australian alternative supply is expected to release an increased quantity of approximately 154-281 million tonnes CO2-e in the atmosphere over the 2019-30 period.

The impacts of these scenarios on Scope 1, 2 and 3 as well as total emissions are detailed in Table 1. Overall, these results confirm the material increase in total GHG emissions that could arise from lower investments in the Australian coal industry.

Table 1: Summary of scenarios

Scenario 1:	**2019-30 GHG emissions, million tonnes CO_2-e**				
	Scope 1&2	Scope 1&2	Scope 3	Total emissions*	
Fugitive Emissions	*Low*	*High*	-	*Low*	*High*
United Wambo	4	4	160	164	164
Alternative suppliers	2-16	4-36	163-175	165-188	167-208
Increase in GHG emissions				1 to 24	3 to 44

Scenario 2	**2019-30 GHG emissions, million tonnes CO_2-e**				
	Scope 1&2	Scope 1&2	Scope 3	Total emissions	
Fugitive Emissions	*Low*	*High*	-	*Low*	*High*
Australia shortfall	34	61	1,528	1,562	1,588
Alternative suppliers	125	278	1,591	1,716	1,869
Increase in GHG emissions				154	281

CRU
* Rounded numbers; caution, totals may not align with total of emission ranges

If you wish to discuss any aspect of this letter, or require further information, please do not hesitate to contact me.

Yours sincerely

Alex Tonks
Head of CRU Australia & New Zealand

APPENDIX 4: GENERAL DISCLOSURES REGARDING WEO 2018

1. the IEA does not endorse any particular scenario in WEO 2018;

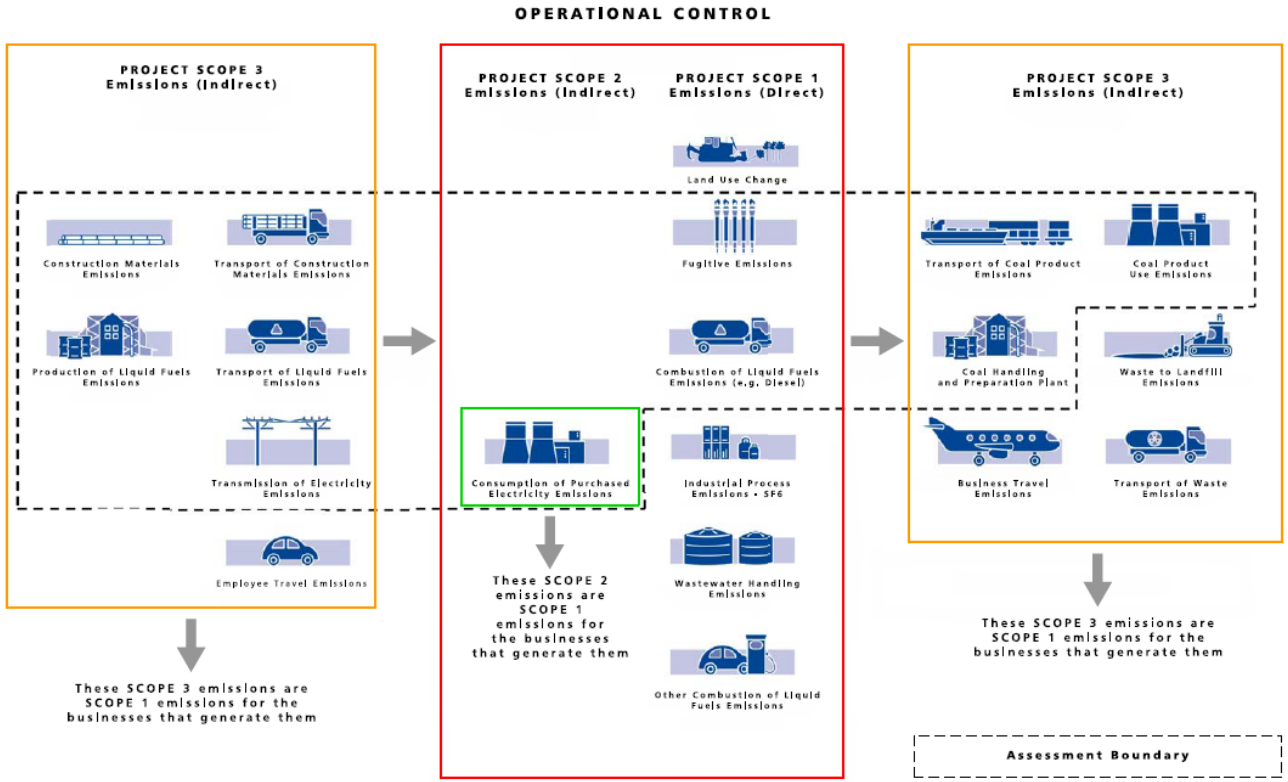
2. the New Policies Scenario is the central scenario in WEO 2018;

3. the New Policies Scenario incorporates policies and measures affecting energy markets which have already been adopted, as well as other relevant commitments that have been announced by governments of the world but where the precise implementation measures have yet to be fully defined;

4. the Current Policies Scenario is the most favourable IEA scenario for coal, incorporating only those policies and measures affecting energy markets that were formally enacted; it assumes that governments do not implement any recent commitments that have yet to be backed-up by legislation and will not introduce other new policies bearing on the energy sector in the future; and

5. while the Current Policies Scenario presents the most favourable scenario for coal, IEA's Sustainable Development Scenario presents the most unfavourable scenario for coal; the Sustainable Development Scenario incorporates a variety of government policies compatible with limiting the long-term increase in the average global temperature to well below 2 degrees Celsius, the limit recognized by the *Paris Agreement*.

APPENDIX 5: FIGURE SHOWING OPERATIONAL CONTROL THE PROPONENT OF A COAL MINING PROJECT HAS OVER GHG EMISSIONS



Scope 2 and 3 emissions associated with the Project are part of the scope 1 emissions from another facility. For example, a power station burns coal to power its generatorsand in turn creates electricity. Burning the coal causes greenhouse emissions to be emitted. These gases are attributed to the power station as scope 1 emissions. When the electricity is then transmitted to a mine and used there, the gases emitted as a result of generating the electricity are then attributed to the mine as scope 2 emissions.

Greenhouse Gas Assessment Boundary

File Name (A4): 3509_730.dgn
20190412 11:48