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20 December 2021

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Dear Joe

RE: Response to the peer review of the Economic Impact Assessment of the Glendell Continued Operations Project

I refer to your letter dated 1 December 2021 requesting a response to the *Review of Economic Impact Assessment Supporting the Glendell Continued Operations Project* (CIE Review) prepared by The Centre for International Economics (The CIE).

The Review Report is a peer review of the Economic Impact Assessment (EY Report) for the Glendell Continued Operations Project (The Project) prepared by Ernst & Young (EY).

This response has been prepared by Umwelt with input from EY and is aimed at addressing the salient comments on the EY Report made in the CIE Review. This report is consistent with Umwelt's and EY's role in this process of providing an independent assessment of the costs and benefits of the Project consistent with the *Guidelines for the economic assessment of mining and coal seam gas proposals (NSW Government 2015)*, as published by the NSW government in December 2015 (the Guidelines) based on data and assumptions outlined in the EY Report.

The issues covered in detail below relate to the treatment of:

- Worker benefits
- Supplier benefits
- Uncertainties relating to coal markets
- Carbon emissions

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1.0 Background

EY was engaged to undertake an independent economic impact assessment of the proposed Glendell Continued Operations Project (“the EY Report”) in accordance with *the Guidelines* and the *Technical Notes supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* (the Technical Notes) published in April 2018 (NSW Government 2018).

The EY Report was completed on 29 October 2019 and subsequent annexures have been prepared concerning updates to coal prices, assessing the economic benefits of various mine plan options and detailing the methodology behind estimating worker and supplier benefits. The NSW Department of Planning, Industry and Environment (DPIE) engaged The CIE to undertake a peer review of the EY Report (The CIE Review).

2.0 Worker benefits

The Guidelines are clear in their allowance for the use of worker benefits as part of the CBA. As stated in the EY Report, it is assumed that the additional wages paid at the mine, which is significantly higher than the average wage in the region, is an appropriate measure of worker benefits. In seeking to have these benefits excluded from the analysis, a few justifications are commonly used, and have equally been levered by The CIE include:

- the average wage benchmark is inappropriate because the mine in question will simply employ workers from another mine;
- are significantly more skilled than other workers; or
- the wage premium paid simply covers the ‘disutility’ of working in a mine.

The first argument is unjustifiable in the context of the assumptions underpinning the CBA that are consistent with the Guidelines. Specifically, the Project Case in the CBA is additional to the Base Case. The ‘with project’ case is predicated on no underlying changes to economic activity except for the development of the Project which implies that all existing approved mining activity also continues. Logically then, if an additional worker is required for the Project and taken from an existing mine, given activity in that existing mine must continue then an additional worker is required in that mine. Eventually the additional mine worker is required from somewhere and EYs assessment is based on taking that worker from the pool of existing workers at the average wage rate. The same applies in measuring the impact on economic activity for extending the life of an existing mine.¹

Furthermore, over the operational period of the Glendell mine (extending out to 2044), multiple sources (including forecasts from NSW Treasury (Wood et al, 2021)) indicate a decline in the expected mining employment in NSW (the geographic area of assessment under these guidelines). This supports the position that the workers that would have been employed in Glendell would be required to seek work outside of the sector (or the State) should the Project not be approved. The EY Report further demonstrates that this has largely been the case in the past, where workers have moved between mining, manufacturing, construction, and the professional services sectors. While The CIE Review includes a projection for an increase in employment in the coal industry to 2025 of 7.5%, this is a national projection

¹ Note that a less conservative assumption would be that the person employed is drawn from the ranks of the unemployed (this kind of assumption would not be inconsistent with the line of logic underpinning our methodology).

and is for a limited time period only. In this regard, the NSW Treasury projections referred to in the EY Report are a better indication of likely employment opportunities in the coal sector in NSW. Furthermore, even if there are alternate jobs for workers displaced from Glendell in other States, this would reflect a 100% reduction in the wage benefits of these employees to NSW relative to the Project Case.

Secondly, the argument put forward by The CIE that the wage premium can be justified on the basis of higher skills is misplaced. The EY Report (Appendix F) puts forward evidence to demonstrate that while mining hourly wages across various mining related professions are higher (factoring in the longer working hours for mine workers), there is evidence to demonstrate significant movement between other sectors, while average years of schooling are similar across most occupations (which serves as a proxy for skill levels).

The last argument assigns the wage premium paid to mine workers as compensation for an unpleasant job. The EY Report discounts this argument, rather focussing on the fact that fatalities and accident rates in the mining sector are substantially lower than other sectors (where workers would be coming from or going to) such as construction or manufacturing from Safework Australia statistics on hours worked per claim, by sector. There is little direct evidence to demonstrate that working in a mine is considerably more unpleasant than working in any comparable profession. The CIE Review identifies a range of factors they assert counter the EY arguments including the working week and associated rostering and long distance commuting as well as noise and pollutant impacts. In relation to shift times and durations, it is noted that mining is not alone in having shift work, abnormal/socially inconvenient hours or long shifts (see for example occupations such as nursing and the hospitality industry). Both of these sectors have significantly lower wages than the mining sector despite being subject to the same disutility factors. Accordingly, there is little evidence to support these factors as being a key reason for the increased wage in the mining sector. Long distance commuting is also raised as an issue by The CIE however the bulk (>81%) of the Glendell employees reside locally in the Hunter Valley within 1 hour of the operation (refer to Table 4.3 in the Social Impact Assessment for the Project). The health and welfare argument for disutility put forward by The CIE is similarly unsupported by any economic modelling and similar noise and air quality impacts are experienced in many other construction and airport jobs which do not attract the same wage premium. The reliance on the Cottle Report is similarly misplaced as it is not only coal mining employees who choose to reside in the Hunter Valley.

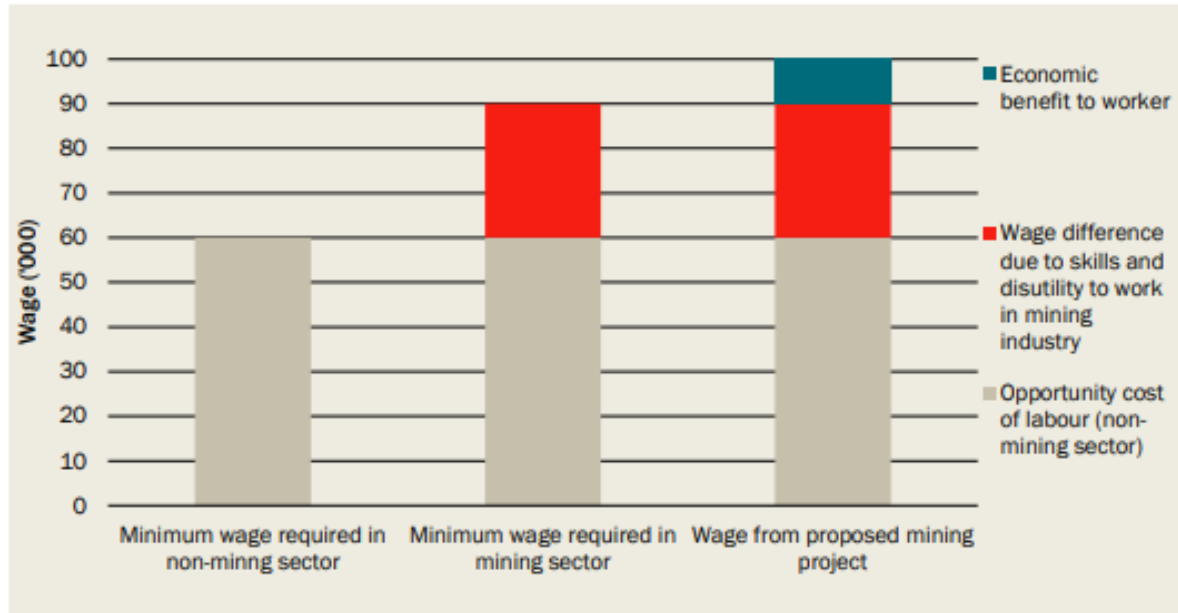
2.1 General comments on employee benefits and the CIE arguments

One of the key benefits of private sector investment is the employment it creates. The Project is expected to employ a significant number of workers, over 400 full time equivalent (FTE) positions, for the bulk of the operating phase. The EY Report shows the net present value of total wages paid to be around \$756 million over the life of the Project with worker benefits calculated at around \$468 million (around 61% of total wages paid).

The CIE Review places reliance on Chart 3.8 from the Guidelines (reproduced as **Figure 1**) with commentary asserting that the 'teal' area is only attributable to the wage premium due to additional demand for labour (The CIE Review pg. 18). This very limited interpretation of the reserve wage is not prescribed by the Guidelines. The CIE approach reflects only a very narrow set of circumstances where the growing employment demands in the mining industry outstrip supply. This approach does not hold true in the circumstances relevant to the Project where NSW Treasury projects a declining demand for employment in the Coal sector. In the current circumstances of projected declines in mining employment in NSW, the reserve wage reflected by the teal area is much broader and reflects reasonable alternative employment

options outside the mining sector (less any disutility or skills allowances). This is the approach that has been applied by EY in its calculations of employee benefits and reflects the fact that the reasonable alternative wages available to displaced workers (subject to the flow through effects discussed in the first point above) would be the average NSW wage.

Chart 3.8: Identifying the economic benefit to workers



It is noted that the circumstances relied upon by The CIE apply more generally to NSW Public Sector projects which typically draw employees from the construction sector. In these circumstances, the wages paid to employees in public sector projects are similar to the wages they would receive in private sector construction jobs. Only during periods of high employment when public projects are progressed to increase employment and provide an economic stimulus would these circumstances be a significant input to public sector projects. In this regard, the NSW Treasury CBA Guidelines place more focus on public projects and have limited application to private investment projects with higher wage premiums. The NSW Treasury CBA Guidelines have also been developed to account for the inherent conservatism that is required when assessing the use of public funds to construct new infrastructure, rather than the use of private capital.

Notwithstanding the arguments above in support of the employee benefits estimated in the EY Report, the analysis also contains systematic sensitivity analysis on worker benefits to recognise the prospect of disutility of labour (a 25% reduction in wage premium, and further extended in the annexures). These sensitivity analysis scenarios reflect a reasonable range of employee benefits which are more reasonable than the nil benefits argued by The CIE.

2.2 Contractor considerations

The CIE Review includes discussion regarding the number of contractors and lower wages for contractors. The CIE have misunderstood the contractor numbers provided to them and, as a result, have applied a high early phase contractor rate to mine workers. This is incorrect. The high number of contractors expected during the early phase of the Project are almost all associated with the short-term construction workforce required to build the Project-related infrastructure, rather than the mining operation. Mine workers at the Glendell Mine have historically comprised only a low percentage of contractors (approximately 10% in

2020) and this would be expected to continue under the owner-operator operational scenario proposed for the Project. Additionally, this construction workforce has been excluded from the worker benefits calculations considered in the EY Report however profits associated with contractors engaged in the construction activities is considered in the assessment of supplier benefits.

3.0 Supplier benefits

One of the key benefits of private sector investment is through the establishment of supply chain networks that act to disperse the economic benefits of projects to a myriad of businesses. The Guidelines are clear in their allowance for the use of supplier benefits as part of the CBA for private investment projects. Consistent with the Guidelines, the EY Report estimates the producer surplus associated with the additional demand for inputs into production. In other projects, such as Tahmoor Coal, the peer review, undertaken by Oxford Economics, accepted the inclusion of supplier benefits.

The CIE has taken a very narrow interpretation of supplier benefits as only being those ‘producer benefits’ which flow from being able to charge higher prices. That is, the CIE’s interpretation of producer surpluses which can be included in the CBA are only those associated with the increased prices but do not include any other profits associated with increased sales associated with increased demand. However, the Guidelines do not limit the assessment of producer surpluses in this manner. At pg. 14, the Guidelines provide:

Similar to the economic benefit gained by existing landholders and workers, local suppliers may also receive an economic benefit by achieving higher surpluses through supplying the mining/coal seam gas project.

The guidelines are not limited by surpluses associated with higher prices (as is argued by The CIE) but rather, applies to all surpluses (i.e. profits) associated with supplying the project under consideration. As is detailed in Appendix F to the EY Report, the producer surpluses associated with the project are the additional profits flowing to NSW suppliers associated with the increased demand due to the project. In other words, prices (and profit margin per unit) may remain the same as existing sales under the base case however the overall volume of sales will increase meaning higher producer surpluses.

Simply, the EY analysis takes the amount of local spending on goods and services that will take place under the Project, some \$1.418 billion in net present value terms, and applies a metric of gross operating surplus from EYs in-house regional input output model (approximately 20%) to this figure to derive the change in producer surplus. This yields a benefit of around \$286 million in net present value terms. This represents the profits associated with the increase in economic activity levied to local suppliers with the project. Again, this figure is subject to sensitivity analysis in the EY Report, which is further extended in Appendix F.

The approach adopted by The CIE is highly sensitive to the Computable General Equilibrium (CGE) inputs and the outputs from The CIE CGE modelling would appear to grossly underestimate the change in producer surpluses associated with the additional spend in the region associated with the Project. Based on the figures provided on pg. 12 of The CIE Review, the only incremental profits flowing to suppliers is 0.007 per cent of total expenditure. Put another way, this figure suggests that, for every \$100 million in additional expenditure associated with The Project (relative to base case) there is only an additional \$7,000 in profit for NSW suppliers, which flows back into the NSW economy. Without seeing the input assumptions to The CIE’s CGE modelling, it isn’t possible to identify how this number is determined. However, it is clearly a significant underestimate of the profits associated with sales to mining operations, doesn’t take into

account the fact that many suppliers rely heavily on the Project to continue operating, and reflects an effective zero profit margin by all suppliers.

The approach adopted in the EY Report is robust and consistent with both the guidelines and peer reviews of other recent and comparable projects. An additional \$1.418 billion in additional expenditure (from overseas revenue sources) will clearly have significant flow through benefits to the NSW economy and sustains a plethora of businesses in the region.

The sensitivity analysis of the predicted supplier benefits contained in Appendix F of the EY Report provides a reasonable range for the supplier benefits which would flow to NSW as is a more reasonable estimate than the nil benefits argued by The CIE.

4.0 Coal price and demand assumptions

The EY Report includes the (then) latest consensus price forecasts from KPMG as a basis for the forecast. While coal prices fell in 2020, the substantive coal production for The Project does not start until 2022. While there may be a renewed focus on reducing emissions globally, over the timespan of the Project, to 2044, coal is still expected to remain a large contributor to demand in key markets. Relatedly, coal prices have recovered, and the base case assumptions outlined in EY's Report are in line with today's market and assumptions.

To account for this potential volatility, the analysis includes a sensitivity, by reducing the coal price assumption by 25 per cent over the lifetime of the Project. The sensitivity demonstrates that the Project remains viable under this lower coal price assumption. The risk to the Project has been tested through this sensitivity, which indicates strong overall benefits to NSW under lower coal prices. The impact of lower prices will primarily impact on shareholder returns, and a change in the quantum of taxes and royalties paid. Their ultimate decision to invest in the Project by shareholders will include a detailed consideration of the risks facing The Project today².

5.0 Carbon emissions

5.1 Attribution of impacts to NSW

Both the Guidelines and Technical Notes make it clear that estimates of economic impacts of all externalities are to be calculated in reference to their impact on NSW Only. The Guidelines make this explicitly clear under Task 7 on pg. 15 (emphasis added).

*In general the total net environmental, social and transport costs will be attributable to NSW. The proponent should include the total net environmental, social and transport costs in the NSW CBA, **unless there are cases where these costs are not entirely attributable to the NSW community.***

In all but a few cases, all externalities will be fully attributable to NSW. However, climate change impacts associated with GHG emissions have a global impact and the environmental and social costs associated with incremental Scope 1 and Scope 2 emissions associated with the Project will therefore be shared across the globe with different areas having different impacts.

² See for example the Glencore Climate Report 2021 Pathway to Net Zero 2021 progress report (Glencore 2021): <https://www.glencore.com/dam/jcr:ad341247-c81e-45b4-899d-a7f32a9d69a0/2021-Climate-Change-Report-.pdf> which includes specific consideration of a range of project risks including product demand and carbon pricing.

The specific requirement to separate out the costs of climate change impacts associated with incremental GHG emissions is made explicit in the Technical Notes (Technical Note 9 | Greenhouse Gas Emissions) at pages 48-49 with the word 'only' underlined to emphasize the requirement for attribution³.

Accordingly, project proponents should provide an analysis of:

- *their business-as-usual (BAU) GHG emission output (central estimate) and the expected emissions profile of this central estimate (Scope 1 and 2);*
- ***Estimate the economic impact of GHG emission output to NSW only***
- *Undertake a sensitivity analysis on anticipated project GHG emissions output (Scope 1 and 2) at carbon prices below and above the central estimate price.*

The value of the externality is limited to the impact on NSW, consistent with the Guidelines and how all other costs/benefits are measured within the CBA. As noted in the Guidelines, the focus is on the costs and benefits of the project as they relate to the community of NSW (emphasis added).

Applying 100% of Greenhouse Gas (GHG) emission costs to NSW in a CBA, as proposed by The CIE, is not a stated Government Policy, and the attribution of GHG impacts is inconsistent with how other costs and benefits are attributed in the CBA. While the CIE referenced a comment from Gillespie Economics on an earlier draft of the Guidelines to justify the adjustment to the methodology, this comment was referenced out of context, and only partially. When assessing the full context of Gillespie's comments, the approach recommended by Gillespie aligns with that undertaken in the EY Report. The full extract from the Gillespie Economics submission is presented below:

A considerable portion of the draft guidelines is dedicated to attributing benefits and costs on different geographical scales e.g., NSW residents share of company tax, NSW residents share of the net producer surplus, local areas share of employment benefits. However, when it comes to GHG a different and inconsistent approach is used. The prices of carbon in the draft guidelines represent proxies for the global social damage cost of carbon i.e., the cost of carbon emissions to the population of the whole world. Yet the draft guideline attributes all the social damage costs of GHG emissions to NSW despite most of the social damage costs of carbon occurring overseas. This was raised by a reviewer of the draft guideline and dismissed by NSW DP&E as follows:

" The draft guidelines focus on calculating the relative cost or benefit to NSW. For the most part this requires proponents to calculate the environmental and social costs that will be attributable to NSW. The fact that GHG impacts will not be localised to NSW is noted, however it is considered appropriate to value these based on the amount of emissions that are produced in NSW".

No explanation is given why a different approach is "considered appropriate" for GHG compared to all other costs and benefits. It makes no sense and is inconsistent with economic principles and the views of leading CBA and environmental valuation experts such as Dr Jeff Bennett from the Australian National University. Overseas this has also become a matter for the attention of academics and is discussed in Gayer, T. and Viscusi, W.K. (2014) Determining the Proper Scope of

³ It is noted that the emphasis on the words 'only' is not provided for any other externalities considered in the Technical Notes; likely due to the relatively unique nature of the global nature of impacts associated with climate change.

Climate Change Benefits, Working Paper of The George Washington University Regulatory Studies Centre, The George Washington University, Washington DC. GHG impacts have no special claim in welfare economics and CBA and when undertaking a CBA from a NSW or Australian perspective should be apportioned in a consistent way with all other costs and benefits.

A similar argument against attributing the cost of 100% of emissions to NSW was presented in the NSWMC submission on the Draft Guidelines (NSWMC, 2015).

Further, in The Australia Institute Submission on Draft Guidelines (Campbell, 2015), the requirement to attribute climate change impacts to NSW only was directly raised with the clear and obvious conclusion from this submission being that the CBA is to be directly focussed on the impacts to NSW.

Of particular concern in relation to project scope is the issue of greenhouse gas emissions. Under a NSW-focused cost benefit analysis, the cost to NSW of each tonne of carbon emitted is a small fraction of the cost of emissions at a global scale. We recommend keeping the scope of the assessment consistent, but requiring discussion of scope 1, 2 and 3 emissions in the text of the assessment.

The fact that the final economics guidelines did not reproduce the GHG workbooks is not evidence that the position that it is 'appropriate to value these based on the amount of emissions that are produced in NSW' remains sound policy. The very specific and well-argued submissions from the NSWMC and Gillespie Economics against the full attribution of GHG costs to NSW, together with The Australia Institute submission extracted above, is a strong argument against making such an assumption (i.e., the omission of the GHG workbooks was deliberate because it was not a sound economic approach). Further, the comments by The Australia Institute on the Draft Guidelines are reflected in the Technical Notes discussion that specifically requires full identification of greenhouse gas impacts. The full quantification of GHG emissions and potential policy implications are specifically considered in the *Glendell Continued Operations Project Greenhouse Gas and Energy Assessment* (Umwelt 2019) and *Revised Greenhouse Gas and Energy Assessment* (Umwelt 2020) and this broader greenhouse gas assessment enables the consent authority to consider the potential greenhouse gas impacts of the Project beyond NSW.

The approach of attributing costs associated with greenhouse gas emissions to NSW based on a population basis has been adopted by numerous economic assessments and was supported by the BIS Oxford Economics Review of the BAE Economics Assessment of the Hume Project. The peer review of the Cadence economic assessment of the Mangoola Project undertaken by Emeritus Professor Jeff Bennett also clearly supported the attribution approach taken for that assessment which is the same as has been adopted in the Glendell EIA.

The CIE Review also references TPP17-03 NSW Government Guide to Cost-Benefit Analysis (NSW Treasury, 2017) in support of applying all of the estimated GHG costs to the costing of externalities. On this point, TPP17-03 provides:

Externalities can be estimated drawing on market data, where it is available. For example, the valuation of externalities like greenhouse gas emissions is normally examined as part of an Environmental Impact Assessment which follows broadly similar steps:

- 1. Determine the scope of the impact (e.g., categories of externality **and/or geographic coverage**).*

2. *Measure the physical change (i.e., the volume of greenhouse gas emissions relative to the base case).*
3. *Derive from market data or reasonable proxies a market price or cost in dollars per unit of volume/impact (e.g., market prices of emissions trading certificates).*
4. *Undertake sensitivity analysis of key parameters.*

Externalities can also be estimated using non-market valuation techniques such as stated preference surveys to estimate the value placed by respondents on externalities of health or environmental programs or various revealed preference valuation methods (emphasis added).

As with the Guidelines discussion on Task 7 extracted above, these requirements are not specific to GHG but apply to all externalities. In relying on the TPP17-03 to support the approach of 100% attribution, The CIE has overlooked the key aspect of the first step which is defining the *geographical coverage* of the impact. In this regard, the TPP17-03 requirements are entirely consistent with the approach adopted in the EY Report of attributing GHG costs to NSW based on the geographical scope of the impacts associated with these emissions.

The approach to carbon cost assumptions is discussed further in **Sections 5.2, 5.3** and **5.4** below.

5.2 Inappropriate to use International Trading Rules in attributing costs

The adoption of the international rules regarding emission limits and attribution to the jurisdiction where emissions occurred is very specific to the policy objective of reducing emissions. It has no bearing at all to the relative global costs associated with these emissions and is based on the general principle of common but differentiated responsibilities (Principal 1 UNFCCC). Further, it is noted that these rules apply to Australia as a whole and do not have any specific application to NSW as a separate jurisdiction. There is no economic justification for ascribing 100% of GHG emission credit trading prices to NSW in a CBA focused on costs and benefits to NSW simply because the emissions are sourced in NSW. As discussed above, the Guidelines (appropriately) do not require 100% attribution of GHG emissions costs to NSW.

This is not to say that the costs of emissions under domestic policies have no role to play in a CBA focussed on NSW. Under current domestic policies, the Project will be required to report its greenhouse gas emissions and energy production annually against an approved baseline as part of its obligations under the *National Greenhouse and Energy Reporting Act 2007 (Cwth)*. If emissions exceed the approved baseline then Australian carbon credit units would need to be purchased in order to acquit this liability with the cost of these units borne by the Project.

The use of market-based pricing and estimates of the social cost of carbon and their appropriateness for use in estimating are discussed further in **Sections 5.3** and **5.4** below.

5.3 Comments on Carbon Price assumptions and use of Market Pricing as a Proxy

The Technical Notes include specific commentary around the use of market prices as a proxy for the costs of climate change impacts associated with greenhouse gas emissions. The Technical Notes initiate discussion on this issue as follows:

While at present there is no identified carbon price in Australia, it is suggested for NSW project appraisal purposes that proponents refer to the NSW Government Guide to Cost-Benefit Analysis (TPP17-03) which states that: Market prices should be used as a basis for valuing the costs of carbon emissions, where reliable evidence can demonstrate that those market prices are not significantly biased as a direct consequence of scheme design.

The Technical Notes indicate a preference for the European Union credit price as a proxy for carbon costs. While this may have been appropriate in 2018 when the Technical Notes were being finalised, the recent significant price jump in the EU credit price in Phase 4 (as discussed in The CIE Review) would indicate that the current EU market price falls foul of the last point identified in the Technical Notes extract above, namely that the prices are biased as a direct consequence of the scheme design. Indeed, it is likely that most domestic (Australia and overseas) carbon trading process will be significantly influenced by the particular characteristic of the scheme and emissions target set by countries and would limit their appropriateness as a proxy for externalities.

The commentary on carbon price escalation at pg. 27 of The CIE Review includes the following statement:

The Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals provide escalating carbon prices from 2015-2064, with price escalations ranging from 2-5 per cent per annum.

This statement is incorrect as the Guidelines do not contain any such requirement. While the Draft guidelines and associated workbooks did include such an approach, this is not stipulated in either the Guidelines or the Technical Notes.

The discussion in this section of The CIE Review includes Figure 5.2 which shows estimates of escalating carbon prices over time under different *policy* setting. However, as acknowledged by The CIE, these prices reflect the marginal cost of abatement of a trajectory to meet overall emissions reductions targets in each jurisdiction rather than the cost of climate change on the jurisdiction. Put another way, the increasing costs reflect the increased costs associated with reducing emissions as you approach a net zero emissions target; these increases do not reflect, nor are they necessarily reflective of, the actual costs of climate change impacts in NSW or Australia. Additionally, the more ambitious the trajectory for emissions reductions, the higher the market price is likely to be (as evidence by the recent spike in the EU price) but, paradoxically, the lower the long-term costs of climate change. In this regard, there is an almost inverse link between market prices in jurisdictions which set ambitious reduction tasks and the costs from climate change as the very purpose of ambitious targets (which drive higher market prices) is to reduce the long-term costs of climate change.

A further complication with the use of market-based instruments as a proxy for greenhouse gas costs where permits are auctioned by the Government or emissions are taxed (as is the case in the EU market), the revenue generated from these transactions can be recycled through the economy in ways which reduce the overall cost of the climate change policy on people within that jurisdiction and cost of climate change itself through mitigation efforts. These flow through effects are not reflected in the use of these market-based prices as a proxy for climate change costs.

If market prices are to be used as a proxy, these should reflect a market which is in a similar policy position to Australia. In this regard, the recent EU prices reflect significantly higher emission reduction targets than currently apply in Australia and the continued preference for the use of EU prices over available Australian

data is not justified in The CIE Review. The auction prices obtained by the Clean Energy Regulator (CER) under the Emissions Reduction Fund (ERF) represents a useful proxy to the marginal cost of abatement under Australia's current emission abatement policy represented by the ERF as these costs represent a reasonable market price for the provision of carbon offsets. At the time the EIA was prepared, the average June 2019 price (\$14.17 per tCO₂-e) was the most recent price available. The April 2021 price was \$15.99 per tCO₂-e. The average price for the October 2021 auction was \$16.94 per tCO₂-e. While marginally higher than the proxy price used in the EIA, these prices remain well below the recent EU prices and the price estimates in The CIE Review and reflect current policy positions in NSW.

5.4 Use of EPA Social Cost of Carbon pricing

Estimates of costs associated with greenhouse gas emissions are limited with the US EPA Social Cost of Carbon (SCC) estimates providing one of the more robust assessment of the costs of GHG emissions on a per-unit basis (albeit not without some criticisms⁴) and its use also supported by the Guidelines. It is not clear why the CIE Review has relied only on the Nordhouse 2017 estimates of these prices rather than the 2021 Technical Support Document⁵ costs provided in support of the Interim Estimates under Executive Order 1390 which are provided in 2020 USD. These SCC estimates are highly sensitive to the discount factors used and are currently under review by the Interagency Working Group that established them. These reviews will also have regard to updated climate impact projects based on COP26 targets.

The USEPA SCC estimates are global costs associated with each tonne of CO₂-e emitted. Accordingly, these costs would need to be attributed to NSW for the purposes of the CBA assessing benefits to NSW. Based on the updated Scope 1 and 2 emissions estimates for the Project of 6,515,000 tCO₂-e (Umwelt 2020) and AUD/USD conversion rates used in the EY Report (Appendix C of the EY Report) the estimated **global** cost of Scope 1 and 2 GHG emissions associated with the Project is \$229.73 million in NPV terms based on the (central) 3% Discount Rate USEPA SCC estimates. Applying the population-based attribution approach used in the EY Report, the costs attributable to **NSW** are \$0.25 million in NPV terms. Using the 5% and 2.5% Discount Rate USEPA SCC estimates, the predicted GHG costs associated with the Project are \$0.08 and \$0.36 million respectively.

The predicted range of costs associated with GHG emissions to NSW using the USEPA SCC estimates approach therefore ranges between \$0.08 million and \$0.36 million. While the 3% and 5% discount rate estimates are slightly higher than the estimates in the original EY Report (which used the ERF auction processes as a proxy), the results remain insignificant relative to the other predicted benefits of the Project. This approach is considered to be entirely consistent with the Guidelines for valuing the benefits of the Project to NSW.

⁴ See for example:

- National Academies of Sciences, Engineering, and Medicine (NASEM). 2017. Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide. Washington, DC: National Academies Press. <https://doi.org/10.17226/24651> and
- Rennert et al (2021) The Social Cost of Carbon: Advances in Long-Term Probabilistic Projections of Population, GDP, Emissions, and Discount Rates BPEA Conference Drafts, September 9 2021, https://www.brookings.edu/wp-content/uploads/2021/09/Social-Cost-of-Carbon_Conf-Draft.pdf

⁵ Interagency Working Group on Social Cost of Greenhouse Gases, United States Government (2021) Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990. https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

6.0 CGE modelling

A typical way for governments to assess the impacts of large projects is using Computable General Equilibrium (CGE) modelling. A CGE model is based on a more detailed representation of the economy, including the complex interactions between different sectors, such as labour market displacement associated with the increased demand associated with the Project, and takes into account international ownership (which results in the expropriation of profits). The analysis corroborates the results of the Glendell EIA completed by EY. In the Lower Hunter region, the Project is expected to increase Gross Regional Product (GRP) by \$2,522.4 million in Net Present Value terms and providing larger net benefits to NSW and Australia.

7.0 A final comment

The economic studies for mining projects attract a lot of debate. However, there are some key things to consider:

- The Project extends the employment opportunities of the Mount Owen Complex workforce and the progressive increase in employment to 2033 coincides with a reduction in workforce numbers and planned closure of mining operations across the Ravensworth area meaning overall employee numbers at the Mount Owen Complex are maintained for an extended period of time,
- The existing Glendell operations spent approximately \$160 million on wages, goods, and services in 2020 alone
- This spending is driven entirely by the export income derived from the coal mined at Glendell and represents direct injection of foreign money into the NSW economy.

The exclusion of indirect benefits, as asserted by The CIE Review, is inconsistent with the Guidelines and not sensible. Taken to the extreme, given the Project's foreign ownership, if the indirect benefits in the form of worker benefits and supplier benefits are not taken into consideration, the net remaining impact of the Project to NSW is effectively measured in taxes alone (corporate income taxes and royalties). By default, this approach to CBA modelling renders government the primary stakeholder in the Project.

This is contrary to the framework developed in the Guidelines which aims to consider the extent of the net increase in economic activity as a result from an investment, and through this, weigh up the economy-wide costs and benefits of the investment. In this manner, the estimates of the impacts of the Project should serve to support all stakeholders in assessing the relative merits of the Project.

The analysis presented in the EY Report follows a logical framework and, as detailed above, has been prepared in accordance with the Guidelines. The discussion above supports the proposition that the CBA undertaken in the EY Report remains sound and that the Project will deliver very significant net benefits to NSW, not just in the form of royalties and taxes but also through employee wages and supplier benefit. The existence of these benefits to the State and regional economies is further confirmed through the CGE modelling assessment undertaken in the EY Report.

Please do not hesitate to contact me on 1300 793 267 should you require clarification or further information.

Yours sincerely



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