BIS OXFORD ECONOMICS

PEER REVIEW OF ECONOMIC IMPACT ASSESSEMENT

TAHMOOR SOUTH COAL PROJECT

APRIL 2020

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April 2020

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An Environmental Impact Statement (EIS) for the project was released in January 2019. Subsequent to this, and taking into account feedback on the EIS, an Economic Impact Assessment Report ("the EIA") was prepared by EY.[1] The EIA was finalised on 4 December 2019. It contains a Cost Benefit Analysis (CBA) of the project using a NSW State-wide level of analysis as well as a Local Effects Analysis (LEA) using the Wollondilly SA3 area as the basis of the analysis.

The NSW Department of Planning, Industry & Environment ("the Department") has requested that BIS Oxford Economics undertake an independent assessment of the EIA and its component parts (the CBA and LEA).

This review finds that much of the CBA is well-researched and (with some exceptions) well presented. Much of the approach is reasonable. Attention has been paid, in many (though not all) cases, to the stipulations laid down in the NSW Government (2015) *Guidelines for the economic assessment of mining and coal seam gas proposals* ("the Guidelines").

That said, there remain a number of areas of concern with the CBA. These include the following:

- *Production volumes and pricing assumptions* – The EIA provides detail on both production volumes and pricing assumptions. It is difficult to offer commentary on these, as both would be the product of commercial and/or technical considerations and we do not have access to the data underlying these. In terms of production volumes, one issue may be the prospect of unexpected geological or technical issues which could push up project costs and affect project viability while the outcome of the COVID-19 pandemic may have an effect on coal demand and thereby production volumes. Another risk is growing opposition to the use of coal as an energy source. In terms of pricing, the results appear reasonable but could also be affected by short to medium term risks such as the impact of COVID-19 on global coal markets. We suggest that the Department seek clarification on both of these factors.

- *Producer surplus and treatment of costs* – While the producer surplus accruing to NSW is nil there are some issues relating to the its calculation. Moreover, there is no indication that contingencies have been allowed for in the calculation of project costs. This could affect estimated profitability and thereby company tax revenues.

[1] EY (2019), *Economic impact assessment of amended Tahmoor South Coal Project*.

- *Sensitivity tests* – While a range of sensitivity tests are presented there are a number of questions around their application including relatively small tests for capital and operating cost blow outs, apparently perverse effects of increasing operating costs (which increase benefits to NSW), a lack of discussion about remedial environmental measures not being successful, no testing for materially higher greenhouse gas costs and the omission of a test excluding worker benefits.

- *Benefits to workers* – The discussion and calculations in this section are not consistent with key elements of the Guidelines which call for strong evidence to be presented in support of wage premiums and consequent worker benefits. We suggest that benefits to workers be omitted from the CBA. As such benefits amount to $264.3 million in NPV terms, this would have material impacts on the assessed benefits to NSW (reducing benefits by approximately one third). This would not in itself make the project unviable but if combined with higher externalities, contingencies and/or other costs could make it more marginal.

- *Benefits to suppliers*– These are presented however more transparency on the cited figure of $1,226.3 million (NPV terms) in spending on inputs could be provided.

- *Distributional impacts* – These are omitted from the analysis in contrast to the requirements of the Guidelines.

- *Environmental and social externalities* – While considerable detail is provided, there are some questions about the quantums estimated in the assessment. The allocation of Scope 1 and 2 greenhouse gas damage to NSW (only) with an assessed cost of just $0.1 million (NPV terms) during the project lifetime seems dubious. This has a material effect as the global cost of such externalities is calculated as $102.3 million in NPV terms. Moreover there is a case that the assessed price of carbon could rise during the project lifetime. The relatively small groundwater and surface water costs could be called into question, while the subsidence, ambient noise, biodiversity and net public infrastructure assessments might also require further scrutiny. We suggest the Department seek clarification on some of the claims made in this section.

The project remains viable ($519.5 million net benefits, NPV terms) even with the omission of material items such as benefits to workers. If greenhouse gas emissions were also assessed at the global level then net benefits fall to $417.2 million in NPV terms. Nonetheless, viability may be reduced if other issues arise (e.g. contingencies, other/higher environmental costs). The EIA should be revised with benefits to workers omitted (at the very least). The Department may also wish to undertake further investigations into the highlighted issues.

The LEA is likewise well-presented in some places and the inclusion of CGE modelling adds to the credibility and sophistication of the results.

However, some elements of the LEA also appear open to question, namely:

- *Employment benefits* – The discussion here lacks the transparency suggested in the Guidelines. The presentation of CGE modelling combining direct and indirect figures rather than separating out direct Full Time Equivalent (FTE) numbers runs the risk of exaggerating net local employment effects for those who are not familiar with the distinction between the two. Moreover employment benefits would appear to be calculated on a gross rather than net wages basis.

- *Non-labour project expenditure* – This is quantified, however more detail on its derivation should be provided.

- *Local flow-on effects and effects on other sectors* – The use of CGE modelling adds sophistication to the results. However there is no discussion of impacts on other sectors in the local economy or potential displacement of activity in those sectors as required in the Guidelines.

- *Externalities* – These are presented but no mention is made of potential social externalities.

- *Presentation of results* – A summary table is provided but no timeline, supporting information or discussion of impacts on industries and residents is included in contrast to the stipulations of the Guidelines.

It is recommended that these issues be reviewed with an aim of adjusting the LEA findings, if feasible.

1. INTRODUCTION

Tahmoor Coal Pty Ltd (Tahmoor Coal) is currently seeking approval for an extension of its existing mining activities at Tahmoor. The extension of these activities is known as the Tahmoor South Coal Project ("TSCP" or "the project").

An Environmental Impact Statement (EIS) for the project was released in January 2019. Subsequent to this, and taking into account feedback on the EIS, an Economic Impact Assessment Report (the EIA) was prepared by EY.[2] The EIA was finalised on 4 December 2019. It contains a Cost Benefit Analysis (CBA) of the project using a NSW State-wide level of analysis as well as a Local Effects Analysis (LEA) using the Wollondilly SA3 area as the basis of the analysis.

The NSW Department of Planning, Industry & Environment ("the Department") has requested that BIS Oxford Economics undertake an independent review of the EIA and its component parts (the CBA and LEA).

The Statement of Requirements indicates that the review is to consider:

- consistency of the assessment with relevant NSW Government guidelines including *NSW Guidelines for the economic assessment of mining and coal seam gas proposals, December 2015* ("the Guidelines");
- consistency of the assessment with the *Technical Notes supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* ("the Technical Notes"), April 2018;
- whether the critical assumptions used are reasonable, appropriate and justifiable;
- whether the Cost Benefit Analysis (CBA) and the Local Effects Analyses (LEA) align with current best practice, the Guidelines and the Technical Notes;
- the adequacy of the methodology, analysis and assessment presented in evaluating the economic costs and benefits of the proposed development;
- the adequacy of the sensitivity analyses undertaken for the project, both for CBA and LEA;
- the identification of any areas of deficiency (including inconsistencies, overlaps or "double counting") and recommendations to improve or resolve these issues in the assessment;
- any recommendations (if required) for additional information to inform the assessment of the project.

The results of the review are detailed in the following chapters. Chapter 2 considers the CBA while Chapter 3 reviews the LEA.

[2] EY (2019), *Economic impact assessment of amended Tahmoor South Coal Project*.

2. REVIEW OF COST BENEFIT ANALYSIS

2.1 BACKGROUND

This Chapter is concerned with a review of the EIA's approach to Cost-Benefit Analysis (CBA) as applied to the TSCP. The analysis was specified at the State-wide (NSW) level undertaken by EY on behalf of Tahmoor Coal Pty Ltd (Tahmoor Coal).

Relevant points on the issues identified in the Statement of Requirements are presented below.

Generally speaking, the EIA presents a reasonable case for the TSCP. The EIA appears to be, on the whole, well-researched and presented and recognises many of the stipulations of the Guidelines. However there are areas of concern, and these have also been detailed below.

2.2 ADHERENCE TO GUIDELINES

The EIA (p.9) refers to the various guidelines of relevance to cost-benefit analyses (CBAs) of this nature, including:

- the NSW Government's (2015) *Guidelines for the economic assessment of mining and coal seam gas proposals ("the Guidelines");*and
- the NSW Government's (2018) *Technical Notes supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* ("the Technical Notes").

The Statement of Requirements for this review also refers to the need to ensure "consistency of the assessment with the relevant NSW Government guidelines" and to ensure that the "Cost Benefit Analysis (CBA) and Local Effects Analysis (LEA) align with current best practice".

It is worth noting that NSW Treasury (2017) also issues its own Guidelines informing the approach to be taken to CBA by public sector agencies (the "Treasury Guidelines").[3] While the Treasury Guidelines refer to government initiatives and indicate that these initiatives are not intended to replace agency-specific advice, they also note that they are intended to encourage a common analytical approach to CBA across NSW Government (p. 6). In this context, the Treasury Guidelines (p. 6) also refer to the NSW Government (2015), *Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* as publicly available sector specific guidelines.

These stipulations should be noted when analysing the EIA.

[3] NSW Treasury (2017), *NSW Government Guide to Cost-Benefit Analysis*, Policy and Guidelines Paper TPP 17-03.

2.3 PRODUCTION AND PRICING ASSUMPTIONS

Production and pricing assumptions obviously underpin the project financials and thereby the ultimate net benefits to NSW of the TSCP. While we do not possess detailed information on the project financials – and these considerations are also governed by engineering and geotechnical issues – some commentary is offered below.

2.3.1 Production volumes

The question of the mine's production volumes is ultimately linked to project viability. The project involves a longwall mine in the Tahmoor area, extending current operations. Pre-mining activities are expected to commence in 2020, with mining itself expected to commence in 2023 and continue until 2035. The EIA indicates that the TSCP will produce 42.4Mt of Run of Mine (ROM) coal over its lifetime, with 30.3Mt of saleable output being hard coking coal (HCC) and 1.9 Mt being thermal coal (EIA p.13). In addition, the EIA (p.15) refers to the operating costs of the TSCP. These could be expected to be tied to the nature of the mining operations, production volumes and by extension the viability of the project as a whole.

We do not possess detailed data on the nature of the mining operations in question in order to independently test the reasonableness of these assumptions or the related issue of project costings. It is noted that the sensitivity tests (EIA p.22-23 and Appendix B) include separate allowances for an increase in operating and capital costs of 10% as well as a "worst case scenario", through there appears to be no allowance for production volume risk Nonetheless, as discussed below, it is not clear if any contingencies have been allowed for in the base project costings – and these might be relevant if mining operations prove more complex than originally anticipated. If there are concerns about project operating cost blowouts this may be an issue worth investigating in more detail.

Though it is noted that while most of the TSCP output is coking coal, another production-related risk is the growing environmental concern about the mining of coal under any circumstances (see sensitivity tests discussion below).

Apart from this, of course, there is the short to medium term impact of the COVID-19 pandemic on coal demand and production, though this could not have been foreseen at the time of writing of the EIA.

Given our previous experience with discussions over the viability of production volumes and associated operating costs for coal mining operations, we suggest that the Department seek further clarification on the production assumptions and the associated operating cost assumptions.

2.3.2 Price assumptions

The price of coking coal and thermal coal are obviously of key importance to the TSCP financials. They underpin the assessment of the net benefits to NSW – and subsequent assessment of royalties and company tax – and are central to the benefits assessed for the project. Given this, it is important to understand the basis for the assumptions made about these prices during the lifetime of the project.

The EIA (p.14) presents calculations indicating that the price of hard coking coal will average A$ 187.1 per tonne over the lifetime of the project (from 2020-2035) while thermal coal averages A$ 93.8 dollars per tonne. These figures are presented in real 2019 Australian dollars.

BIS Oxford Economics provides its own forecasts for coking coal and thermal coal for the period 2020-2035 though these are priced in USD. These were last updated on 19th March 2020. These figures were converted to Australian dollars using BIS Oxford Economics' own average estimated AUD/USD exchange rate over the period 2020-3035 (0.77). Based on these forecasts, the average coking coal price over the period was equivalent to A$193.9 per tonne while, thermal coal was estimated at A$112.7 per tonne.

In themselves, these figures suggest that the EIA's estimates about the price of coal over the project's operational lifetime are reasonable (and indeed potentially conservative). However, it is likely that the impact of COVID-19 will continue to be felt on world demand for coal for years to come and neither the BIS Oxford Economics nor the EIA price forecasts would take this into account.

We note that sensitivity analysis is undertaken to examine variations in the price of coal by +/- 25% along with other key project inputs (EIA, p.22-23 and Appendix B). Even under the low price scenario, the project records a positive NPV of $664.9 million. However It should also be noted that this figure includes the assessed $264.3 million (NPV) in benefits to workers which are questionable (as discussed below). Moreover, the sizable impact of COVID-19 may produce even larger impacts on demand for coal and therefore coal prices in the short to medium term which could be lower than anticipated. Another risk is falling demand (and prices) for coal exports due to environmental concerns.

Given that BIS Oxford Economics is also the author of the present review, the Department might find it useful seek further clarification from other sources on the EIA's estimates about the price of coal over the project's lifetime.

Another issue relates to exchange rate risk. The EIA indicates that the exchange rate over the project lifetime is constant and that the 25% sensitivity tests could equally be seen as exchange rate risk. However the precise exchange rate is used not specified .BIS Oxford Economics above also uses a fixed exchange rate, however the rate used (0.77) is specified. The Department may once again want to investigate whether it wishes to explore different exchange rate scenarios.

2.4 DIRECT BENEFITS

The EIA divides the assessed benefits into direct and indirect benefits. These are estimated on a net basis (i.e. inclusive of costs).

A discussion of the treatment of direct benefits is included below, while indirect benefits are discussed in Section 2.5

2.4.1 PRODUCER SURPLUS AND TREATMENT OF COSTS

The EIA allows for the assessment of a Net Producer Surplus. With some caveats, discussed below, the approach seems broadly consistent with that recommended by the Guidelines in that it allows for the assessment of Net Producer Surplus after deducting costs and tax and attributing a portion of the

Net Producer Surplus to NSW. As Tahmoor Coal is a wholly owned entity within the SIMEC Mining division of the GFC Alliance group, the Net Producer Surplus attributable to NSW is deemed to be zero (EIA p.16).

However, it is worth recalling the Guidelines stipulation on the assessment of Net Producer Surplus. On the benefits side the Guidelines state that producer surplus is to include:

- Gross mining revenue
- Residual value of land at the end of the evaluation period
- Residual value of capital at end of the evaluation period

On the costs side, the Guidelines state these include:

- Operating costs
- Capital costs
- Decommissioning costs
- Environmental mitigation costs
- Transport management costs
- Purchase costs for land
- Local contributions
- All taxes (Federal, State and local)

While it may be deemed an academic point (as the assessed Net Producer Surplus is zero from a NSW point of view) there remain some questions about the transparency and treatment of the calculations. In addition, the assessment of profits (and thereby company tax) is contingent upon the estimation of costs and revenues.

Some of the items on the above list are indeed included in the EIA's presentation of project financials and Net Producer Surplus in Table 4 and Table 5 on pp.15-16 (e.g. operational revenue and operating costs). Some items such as decommissioning costs and environmental mitigation costs could be assumed to be incorporated into the Rehabilitation, Subsidence Mitigation and Biodiversity Offsets items described in Table 4 and in Appendix 1 of the EIA, though we cannot comment on the accuracy or otherwise of these estimates. We also note that Table 4 and Appendix 1 contains some discussion of Transport/Traffic impacts.

We also note that while sensitivity tests are undertaken (discussed below) it is not clear that there is any allowance for project contingencies. "Optimism bias" (i.e. underestimating costs in particular) may be a generic issue with major projects. The Treasury Guidelines (p.49) indicate that a contingency allowance should be built into the project budget. (Sensitivity tests are then generally applied to this cost base inclusive of contingencies.) While this may have been the case, it is not clear from the EIA that this has been done. This could affect project profits and thereby estimated company tax benefits attributed to NSW.

In general, however, as indicated, it is not possible to offer detailed commentary on the accuracy or otherwise of the cited costs and revenues as these were obtained from the commercial estimates made by Tahmoor Coal. The Department may wish to explore this issue further with the proponent.

2.5 INDIRECT BENEFITS

2.5.1 Benefits to workers

A major issue with the assessed benefits in the EIA relates to the treatment of benefits to workers.

There are several grounds for concern with the approach taken towards such claimed benefits in the EIA, as indicated below. As is the case with our past assessments of such projects, it is worth noting that, on first principles grounds, a standard CBA considers labour to be an (opportunity) cost, not a benefit. The Treasury Guidelines (Appendix 7, p. 56) make this clear. The reason for this is that it is assumed that labour is fully employed and must be drawn away from elsewhere in order to develop and run projects such as the TSCP. This constitutes an opportunity cost.

There may be some instances where this is relaxed – such as cases where there is a high rate of industry or general unemployment. Indeed it might now be argued that in the wake of the COVID-19 crisis, regional and national unemployment will soar, though of course no such argument was made in the EIA given its time of publication.

The EIA does allow for some concept of opportunity cost. It cites mining wages at the TSCP as a net benefit (totalling some $264.3m in NPV terms) by deducting the value of such wages from the average wage across NSW during the lifetime of the project (pp.17-19).

However the key issue here is whether this is consistent with the approach recommended in the Guidelines. The EIA's approach effectively assumes that mining wages are higher than a counterfactual non-mining alternative. In effect, this represents a wage premium arising from the difference between mining sector and non-mining sector wages.[4]

However, the Guidelines (pp. 13-14 and Chart 3.8, p. 14) are very clear that the starting assumption is that wage premium is zero - whether workers are drawn from the mining sector or from other sectors. As was the case in our previous assessments for other mining projects, it is again worth citing the text provided on pp.13-14 of the Guidelines at some length on this:

An appropriate starting assumption should be that workers do not receive a wage premium, even if they will earn more working in the mining sector.

- *If workers are already working in the mining sector, it is not generally the case that one mine will pay significantly more than other mines for workers doing a similar job in similar conditions.*

[4] This may be because the EIA (p.18) suggests that should the project not go ahead, those who would have been employed on the project would have to find alternative employment elsewhere. It is not clear if this refers to the existing Tahmoor mining workforce or to the workforce in general. However, where employment *per se* is concerned, the focus of the Guidelines appears to be on existing unemployment (and areas of persistently high unemployment) rather than speculating about future potential changes to employment status. This issue is discussed in more detail below.

- *If a mine will employ workers that are currently working locally, but not in the mining sector, a mine may need to offer higher wages to compensate for more physically demanding work, tougher conditions etc. In this case, the benefit to the worker from higher pay will be offset by the costs associated with greater hardship etc.*

- *If a mine needs to attract workers from other parts of NSW, it may need to pay them more than they are earning in their existing or previous jobs so that they will relocate. For example, a mine that employs truck drivers in a remote area may need to offer a higher wage than is paid to drivers of similar trucks in the city or large towns. If so, the difference between the minimum wage necessary to get a truck driver to relocate and the standard wage in the city or town is not a valid wage premium.*

Although a zero wage premium is a useful starting assumption, the appropriateness of this assumption must be assessed on a case by case basis. This is because benefits to workers can be one of the major economic benefits from a project. If a proponent considers that a project will generate positive benefits for workers, the economic assessment should clearly explain the reasons for this conclusion and present evidence in support of the valuation that has been adopted.

A broad range of factors may be relevant to the question of whether a project will generate net benefits for workers. In general, the net benefit to workers is more likely to exist if workers will be drawn from a population with persistently high unemployment or experiencing other forms of social and economic disadvantage. Workers are also more likely to realise net economic benefits if they will develop new skills by working on a project, such that they become more employable in the long term, especially if the skills are relevant to jobs in other industries or locations. Workers may also receive a net economic benefit if a proponent intends to pay its workers more than necessary to attract the necessary skills or number of workers. If this is the case, they should clearly explain why this intention is credible and how compliance with this intention might be verified and enforced.

(Guidelines pp. 13-14)

It is worth considering the first dot point above in the context of the calculations undertaken by the EIA. Comparing the average mining wage to that across all sectors of the NSW economy could appear to imply that the project's labour is drawn from non-mining sectors of the economy or that, absent the project, such labour would work in non-mining sectors. However, this is not likely to be the case. It would be expected that the project workers would chiefly be drawn from the mining sector rather than from a workforce unfamiliar with such sectors.

This is a point BIS Oxford Economics has made in previous project reviews. As any jobseeker can attest, employers tend to prefer skilled and experienced staff members to fill roles. This would certainly be true in the case of the TSCP which will require large inputs of labour with skills and experience in the mining sector. However, if the project's workforce is indeed drawn from the mining sector – or would work in those sectors if the project did not occur - then dot point one (Guidelines p.13), cited above, applies and there is likewise no wage premium for such employees.

The EIA (pp.17-19) appears to ignore this key point. Instead the comparison is made to the average wage across all sectors, implying that if the mine did not exist, the workers would otherwise be employed in occupations other than mining. As indicated, this is unlikely to be the case.[5]

What if the mine did employ some (or all) of its workers from outside the mining sector and/or they had to be attracted from elsewhere in NSW ?

The second and third dot points here are relevant here. If it is assumed that the project's labour is drawn from non-mining sectors then any higher wages would be offset by the extra costs of the more demanding work. So the net wage premium is zero. Likewise if labour is travelling from other areas of the State then the higher wages are offset by relocation costs and there is no wage premium.

The same issue is clearly illustrated in Chart 3.8 on p. 14 of the Guidelines, where economic benefit to workers is identified as net of simple wage differentials.

The EIA (pp.18-19) appears to grapple with such issues by asserting that:

- There is little allowance for disutility in mining wages as "hardship allowances" are relatively minor (p.18-19).
- Differences in mining wages are therefore likely reflective of the skills and productivity of the workforce.

The work done to quantify these hardship allowances is notable. However there is no reason why they should represent the totality of the wage allowance for working in a physically demanding and tougher environment. As indicated in the EIA itself, the allowances are relatively small. It is more likely that the base mining wages themselves already reflect much of the disutility of working in the industry. If this is the case then higher wages in the mining industry are indeed partly attributable to the more demanding conditions of the job.

As indicated, a linked assertion is that mining wages reflect the skills and productivity in the industry. However, as indicated above, it's unlikely that this is the sole factor in explaining higher mining wages. Even if it were workers already drawn from the mining industry would already have such higher productivity effects incorporated into their wages – i.e. the project's wage premium is again zero.

However, as indicated above, the Guidelines *do* allow for the project's assessment of a wage premium (and hence labour market benefits) under certain conditions, namely:

- If the local area is experiencing persistently high unemployment.
- If workers on the project develop new skills and/or if the employer pays its workers more than is necessary to attract the necessary skills or number of workers.

[5] As indicated, the comparison to average wages might also be made because of an assumption that the existing Tahmoor workforce would be forced to seek alternative employment if the TSCP does not proceed. This is not clear in the EIA however and is examined in more detail below.

As indicated above, the Guidelines require this on a case by case basis and that proponents provide credible evidence of this and how compliance with this is to be enforced.

No case that the area suffers from high unemployment is made. Indeed, the Original EIA produced by Cadence Economics (p.46) remarks on the low unemployment in the region (2.3%) compared to the NSW average (4.6%)[6].

Of course, the advent of COVID-19 may change this picture drastically, at least in the short to medium term. Unemployment is likely to be an important issue, despite government initiatives to shore up companies as the economy enters "hibernation". However, even in such cases, projects such as the TSCP will not simply sponge up the unemployed. As indicated, employers will first seek skilled labour in such circumstances. This point has been made by CBA studies in the past.[7]

A related point is what might happen if the TSCP does not proceed. If, for example, the existing Tahmoor mine would close in the absence of the TSCP and its workforce became unemployed could the existence of the TSCP therefore be said to provide worker benefits ? While it is possible to map out such a scenario, we note that no such case relating to the existing workforce is explicitly made in the EIA. As indicated, the EIA (p.18) simply indicates that it compares mining wages to average NSW wages, based on the assumption that those who would have been employed on the project find alternative work at the average NSW wage, without specifying that this comparison is motivated by such a closure.

Moreover, the future employment of the existing workforce under such a scenario is a speculative issue. For example, given their skills, some or all of the workforce would be expected to find employment in other mining operations across the State or interstate. It should also be noted that the Guidelines appear to avoid speculating on possible future scenarios in discussing worker benefits connected to unemployment. They refer instead to a case being made for worker benefits related to unemployment when workers are drawn from a population suffering "persistently high unemployment" (Guidelines p.14). The implication is that such unemployment is already in being and has been for some time, rather than speculating on future unemployment.

What of a wage premium associated with the development of new skills associated with the TSCP itself ? This is allowed for in the Guidelines but no such case is made in the EIA. In order for a wage premium to be applied, as indicated, compelling, project specific, evidence would need to be presented relating to how the project is developing such skills and how this is reflected in wages. No such evidence is presented in the EIA.

Based on the above, we suggest that there is no strong justification for the inclusion of benefits to workers in the EIA and they should be excluded. As such benefits amount to $264.3 million in Net Present Value (NPV) terms, this would have material impacts on the assessed benefits to NSW (reducing

[6] Cadence Economics *Economic Impact Assessment of the Tahmoor South Project*, 18 December 2018

[7] Austrian Bureau of Transport Economics (1999) *Facts and Furphies in Benefit-Cost Analysis: Transport*

benefits by approximately one third). This would not in itself make the project unviable but if combined with higher externalities, contingencies and/or other costs could make it more marginal.

2.5.2 Treatment of company tax, royalties, payroll tax and local Council taxes

The Guidelines (p. 15) call for inclusion of the NSW royalties and company income tax in the assessment of benefits. The EIA does this and the approach is described in the EIA (p.16-17) with estimates provided in Tables 6 and 7.

The EIA also includes council rates and land taxes. The Guidelines appear to be silent on such inclusions and it should be recalled that technically, in cost-benefit terms, taxes are a transfer. However, the approach taken in the EIA appears reasonable. Such taxes are incorporated within a Gross Producer Surplus. The Gross Producer Surplus is pre-tax and approximates the value of profits, some of which is then appropriated by government. It therefore seems reasonable to incorporate these as a benefit which will flow through to the NSW community.

That said, the basis of the company tax and royalties assessments, in particular, are dependent on the accuracy of the cost, revenue and other estimates set out in Table 5 (p.11) and the production assumptions set out in Figure 5 (p.14). As indicated, further transparency on the derivation of these figures would boost confidence in the accuracy of these figures.

2.5.3 Benefits to suppliers

The EIA (p.19) determines the benefits to suppliers through providing an estimate of the intermediate inputs sourced from NSW ($1,226.3 million in NPV terms) adjusted by the Gross Operating Surplus (GOS) ratio to determine benefits to suppliers of $247.5 million.

In principle, this approach appears to be broadly consistent with the specifications in the Guidelines. Moreover, the use of GOS to estimate Producer Surplus, while not quite equivalent to a strict definition of Producer Surplus *per se,* is a reasonable approach, given data limitations.

However, the basis for the cited figure of $1,226.3 million (NPV) in intermediate inputs is not transparent. As is the case with the issues raised about cost transparency above, the reader is required to take this number “on faith”. It would be useful to have further transparency on the derivation of this figure, given how central it is to the assessment of project benefits.

It is also worth noting that the Guidelines depart somewhat from the Treasury Guidelines and other standard CBA practices in assessing benefits to suppliers.[8] These would not generally support the inclusion of benefits to suppliers as they would be deemed as benefits occurring in secondary markets, whereas only primary market benefits should be counted (see Treasury Guidelines p.12).

[8] See for Example Boardman et. al (2005) who indicate that benefits to producers outside of the “primary market (in this case the mine itself) should be excluded

Nonetheless, it is acknowledged that the Guidelines do indeed make such an allowance. However, we would recommend that further transparency about the derivation of the intermediate inputs figure be provided and that clarification of the correct intermediate inputs figure be provided.

2.6 SENSITIVITY TESTS

The Guidelines (pp.18-19) refer to "risk identification and sensitivity issues" and a related issue to those discussed above is the EIA's treatment of sensitivity tests.

A range of sensitivity tests is included on pp. 22-23 of the EIA as well as Appendix B (p.41) and the effort taken to perform these is noted. In addition, the EIA considers worst case and best case scenarios. However there are some discrepancies from list of tests outlined on pp.18-19 of the Guidelines.

- *Royalties and company tax* - The Guidelines call for a variation of the royalties by +/- 25% and of company tax by +/- 50%. The EIA's sensitivity tests explore alterations in the price of coal and operational and capital expenditures but do not explicitly model changes in the royalty and company tax takes. That said, some of the variation in outcomes detailed in Appendix B (particularly under the coal price assumptions) is higher than that to be found under those individual tests, so this would not appear to be a substantive issue in terms of testing project viability.

  Scale of operating and capital cost impacts – We note however that the operating and capital cost impacts were sensitivity tested at +/- 10%. These impacts have little effect on the assessed net benefits to NSW. The incorporation of higher costs into producer surplus which, in turn, is assessed as $0 for NSW under all scenarios may explain some of this. Indeed an interesting – and potentially perverse - effect of the higher operating costs scenario, as modelled, is that net benefits to NSW *increase* by nearly $20m over the base case as the benefits to local suppliers are higher (EIA p.41).

  There may be some argument that cost blowouts could be larger than such quantums. Combined with the lack of clarity on whether contingencies have been allowed for, this may be an issue requiring further investigation. However, a related issue is that, as modelled, inclusion of benefits to local suppliers would appear to more than compensate for higher operating costs. So ever higher operating costs might yield ever higher net benefits to NSW .Obviously there would be a point at which the project would not be financially sustainable but this counterintuitive issue should be noted when considering these tests.

- *Environmental costs* – The EIA does undertake +/- 10% sensitivity tests of environmental costs. It also makes the point that even under the worst case scenario, such costs would need to total $620.1 million in NPV terms (EIA p. 23) before the project did not provide a net benefit to NSW. However, this presupposes that other benefits (such as benefits to workers totalling $264.3 million (NPV) and/or global

greenhouse gas costs of $102.3 million (NPV)) are still included in the analysis. As indicated, the case for these is questionable. Moreover, the Guidelines call for a discussion of the fact that environmental mitigation measures may not be fully effective (p.19) and some consideration of the probability and potential magnitude of such risks. This discussion does not appear to be provided in the EIA. Another issue is growing opposition to the mining of coal in general and the export of coal in particular given global warming concerns. Though most of the TSCP's output is coking coal and not thermal coal, this may have impacts on project viability but is not discussed here or elsewhere in the CBA.

In terms of materiality, it is noted that project net benefits are barely affected by the higher environmental costs scenario presented in Appendix B ($783.4 million vs $783.8 million in the base case). The reason for this again appears to be that the variations in environmental costs appear to be internalised into changes in producer surplus, which in turn is effectively $0 from a NSW perspective.

The treatment of greenhouse gas emissions also deserves further scrutiny. As indicated below, these are assessed at only $0.1 million over the life of the project, although on a global basis the EIA estimates costs at $102.3 million (NPV). The sensitivity test appears to be undertaken assuming a cost of $0.1 million – i.e. a 10% variation is not material. Absent from the testing is a scenario where greenhouse gas emissions are $102.3 million in NPV terms or indeed any allowance for this amount to rise if the cost of carbon rises into the future as discussed below. Inclusion of global costs and a higher price of carbon would make a material difference to the sensitivity tests.

- *Benefits to workers*– The Guidelines (p.19) indicate that if a project is likely to provide economic benefits to workers they should present the project NPV without taking those benefits into account .The EIA indicates that a higher reservation wage (+25%) is modelled. However the sensitivity test figures provided in p.41 of the EIA do not indicate any variation from the assessed $264.3 million (NPV) in worker benefits in the higher reservation wage scenario. Moreover, a 25% wage reduction does not address the stipulation in the Guidelines that benefits to workers are to be excluded as a part of the sensitivity testing. Doing so would reduce the net benefits to NSW by $264.3 million (i.e. $519.5 million rather than $783.8 million in NPV terms).

As indicated, and although not mentioned in the Guidelines, an additional risk is obviously the question of global demand for coal (and justification for the export of Australian coal) given increasing concerns about global warming impacts. These concerns have been rising in recent years and may well sharpen during the lifetime of the project (2020-2035). Obviously this would affect the financial viability of the TSCP itself, however to the extent that this would also impact on NSW this is also a relevant issue. In short, there is arguably a risk that costs of mine development impact the State but the full benefits (e.g. taxation benefits) are never realised. This may be an issue the Department could further examine.

2.7 DISTRIBUTIONAL IMPACTS

The Guidelines (p.19) refer to the need to need to consider whether projects will have significant distributional impacts. In particular, whether the project will have significant 'winners" or "losers" along with some qualitative discussion of the likely magnitude of such effects.

However the EIA does not appear to address the issue of distributional impacts. This seems to be a departure from best practice.

2.8 ENVIRONMENTAL AND SOCIAL EXTERNALITIES

The EIA (pp. 19-20 and Appendix A) refers to a variety of environmental and social externalities, including:

- Greenhouse Gas Emissions
- Biodiversity Impact
- Ambient noise impact
- Subsidence
- Air Quality
- Groundwater
- Loss of surplus to other industries
- Residual value of land
- Visual Amenity
- Traffic and Transport
- Aboriginal Heritage
- Historic heritage
- Surface water

We note that, apart from the first four items on the list above, all other items have either

- been assessed as "nil" in direct cost terms (but in many cases are assumed to been included in operating or capital costs); or
- are qualitatively assessed.

Many of these issues involved go beyond pure economic analysis and have been the product of specialist analysis in areas such as hydrology, geology, air quality and cultural issues. The Department may therefore wish to reach its own determination as to whether these analyses have been adequate. Nonetheless, we have made some commentary on selected externalities based on our own experience with previous assessments.

- *Greenhouse gas emissions* – The EIA (p.32) addresses the issue of Scope 1 and 2 greenhouse gas emissions. It notes that the project would generate almost 13.4 million tonnes of Scope 1 and 2 greenhouse gases during its lifetime. Based on an average carbon price of $14.17 tCO2-e using auction data from the Clean Energy Regulator it estimates that on a global scale, the cost of these emissions would amount to $102.3 million in NPV terms. However it states that to maintain consistency with CBA methodology, the figure needs to be attributed to NSW. Accordingly, it apportions the impacts of the TSCP to the NSW population, estimating a cost of $0.1 million

over the lifetime of the project. It states that this approach is consistent with the Guidelines.

However, the approach seems questionable. The Guidelines mention the importance of including greenhouse gas emissions but are silent on the specific apportionment of such an externality to NSW. Intuitively, the amount of $0.1 million in greenhouse costs across the lifetime of such a significant project (contributing 13.4 million tonnes of greenhouse gas emissions) seems small. Moreover, it is not clear if this apportionment approach is consistent with that taken to carbon emissions generally (e.g. in CBAs of transport projects) regardless of jurisdictional boundaries. It is worth noting that similar controversy has been generated in the United States where the Trump Administration has sought to lower the social cost of carbon through various means including only taking into account the damage carbon emissions will do to the United States rather than globally.[9]

Another issue relates to the price point used and its application across the lifetime of the project. The price of $14.17t CO2-e in question appears to relate to the auction results of July 2019.[10] This price is then applied across the lifetime of the project from 2020 to 2035. However, such prices could clearly move around in the long run. More example, there is a risk that as Australia seeks to meet the more challenging stipulations of the Paris Agreement, the cost of abatement could rise. It is worth noting that the price at the March 2020 auction had risen to $16.14 t CO2-e – an increase of 14%.[11]

It is also worth noting the Clean Energy regulator's own comments on the July 2019 auction price:

> *The ninth ERF auction ran over the election period, with the associated uncertainty appearing to contribute to constrained project development and auction registration. The Clean Energy Regulator has a statutory duty to purchase abatement at the lowest cost. In practice, this means the Regulator will buy up the long run supply curve and the price is likely to rise over time as it did at the July auction. However, it is not the role of the Regulator to buy up the short run supply curve, when it appears that abatement supply is temporarily suppressed.*[12]

[9] See New York Times August 23, 2018 "Trump put a low price on carbon emissions, Here's why it matters" https://www.nytimes.com/2018/08/23/climate/social-cost-carbon.html accessed 8 April 2020.
[10] Australian Government "Emissions Reduction Fund Auction July 2019" http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/july-2019 accessed 29 April 2020
[11] Australian Government "Emissions Reduction Fund Auction March 2020" http://www.cleanenergyregulator.gov.au/ERF/Auctions-results/march-2020 accessed 29 April 2020
[12] Australian Government "Australian Carbon Credit Units – Market Update" http://www.cleanenergyregulator.gov.au/Infohub/Markets/Pages/Buying%20ACCUs/ACCU%20market%20updates/Australian-Carbon-Credit-Units-Market-Update-%E2%80%93-October-2019.aspx accessed 29 April 2020

Price increases would obviously increase the cost of the project greenhouse gas emissions in the long term. The risk of this - and more particularly its interaction with the treatment of greenhouse gas damage at the global level - does not appear to be addressed in the assessment since, as indicated above, the sensitivity tests do not address these issues.

We note the EIAs assessment of the TSCPs Scope 1 and 2 greenhouse gas emissions (13.4 million tonnes) are separate from the emissions caused by burning any thermal coal extracted (Scope 3 emissions). However, as indicated, there have been growing concerns about Australia's contribution to global carbon emissions and calls for this to be taken into account in mine approval when mines produce coal for export. While most of the TSCPs output is coking coal, international moves away for the use of coal for power generation (at the very least) may be relevant, as indicated above.

In any event, the attribution of Scope 1 and 2 greenhouse gas emissions generated by the TSCP purely to NSW seems a questionable approach and has a material impact on the net benefits assessment.

- *Groundwater* – The EIA (p.20) indicates that any costs of mitigating groundwater impacts to bores. are included in the operating costs but are not individually identified. Appendix A (p.35) provides further details. It states that a detailed groundwater assessment has been carried out. It indicates that "make good" provisions for the bores have been included in operating costs but have not been separately identified. It also states that the TSCP will require an additional 1,058 megalitres (ML) to reach its total needs of 2,700 megalitres.

  We are aware that groundwater usage, including the adequacy of "make good" provisions, has been the source of dispute and controversy in other mining projects in the recent past. As there is no transparency regarding the amount or adequacy of the make good provisions, the Department may like to explore this issue further.

  In addition, it is unclear how the cost of acquiring additional 1,058 ML of groundwater is factored into the project costings. A concern raised with other projects is that future acquisition prices may rise if groundwater becomes scarce and indeed if the operation of the project itself could force up groundwater prices. If this is so, then, this could add to project costs. More clarity on the assumed cost per ML of water, particularly as regards the future purchases of groundwater would be useful.

  While these are technical issues they may have an impact on the costings developed for the project. The Department may wish to seek further clarification as to how the costings for this aspect of the report were arrived at, along with clarification as to how additional groundwater acquisition costs will be taken into account.

- *Surface water* – The EIA (pp.34-35) indicates that a Surface Water Assessment (SWA) has been undertaken and that local impacts are minimal. Accordingly no separate costing for surface water impacts is provided.

  As is the case with groundwater, we are aware that surface water issues are among the most controversial aspects of coal mining projects. The Department may wish to seek clarification as to whether there are further concerns about the SWA assessment in this case.

- *Subsidence* – Subsidence is typically a key concern in the case of mining projects. The EIA (pp.39-40) notes that subsidence attributable to the project can affect other externalities such as Aboriginal and historical heritage, surface water and groundwater. It reports the results of work by Mine Subsidence Engineering Consultants (MSEC) and indicates the allocation of $13.6 million in NPV terms from 2024 onwards to mitigate such effects.

  As with some of the other costings in this report, we cannot directly comment on the adequacy or otherwise of this amount. However its derivation should be further detailed. In particular, as the EIA acknowledges subsidence can impact on other externalities. Its effects could be substantial in some cases. Indeed it is not clear if the costing allows for costs beyond the end date of the TSCP (2035) as subsidence can continue after the cessation of activities. Further clarification of the derivation of the subsidence costing should be provided.

- *Ambient noise impacts* – The EIA (pp.33-34) reports the results of an Noise Impact Assessment (NIA) and indicates an allocation of $11.5 million in NPV terms for noise mitigation works within its capital works budget over the period 2020-2023. However the basis for this figure is unclear. Further transparency on how this figure was derived and its adequacy would be welcome.

- *Biodiversity and ecological impacts* – The EIA (p.36) refers to a biodiversity assessment undertaken by Niche Environment and Heritage. This EIA states that the costs of meeting environmental offsets including a Biodiversity Stewardship Agreement, purchasing credits and/or payment to the NSW Biodiversity Conservation Fund have been estimated and total $20.3 million in NPV terms. However, once again, there is no clarity as to how this figure was derived. It would be useful to have more information on its estimation.

- *Net public infrastructure costs* – The Guidelines refer to the need to make an assessment of net public infrastructure costs imposed by the project. The EIA (p.40) acknowledges the potential for this in areas such as rail, roads, sewers, potable water telecommunications, power and gas but states that such incremental costs will effectively be nil, as they will be incorporated into subsidence costs. However, because the

derivation of the amount determined for subsidence costs is itself not detailed it is difficult to comment on the adequacy of this approach. In addition, the EIA elsewhere (p.36) mentions traffic and transport impacts including truck movements to and from the mine site. This would seem to imply the potential for increased maintenance costs on the part of the local council, which would be separate to any impacts assessed under the ambit of subsidence. However no allowance appears to have been made for this in the EIA. Alternatively this could be covered through the payment of council rates referred to elsewhere in the assessment ,but if so this does not appear to be mentioned. Further clarification on these issues should be provided.

2.9 CONCLUSION

As indicated, the EIA presents a reasonable case for the TSCP. It appears to be, on the whole, well-researched and presented and recognises many of the stipulations of the Guidelines. However there are areas of concern. Key issues include:

- *Production volumes and pricing assumptions* – The EIA provides detail on both production volumes and pricing assumptions. It is difficult to offer commentary on these as both would be the product of commercial and/or technical considerations and we do not have access to the data underlying these. In terms of production volumes, one issue may be the prospect of unexpected geological or technical issues which could push up project costs and affect project viability while the outcome of the COVID-19 pandemic may have an effect on coal demand and thereby production volumes. Another risk is growing opposition to the use of coal as an energy source. In terms of pricing, the results appear reasonable but could also be affected by short to medium term risks such as the impact of COVID-19 on global coal markets. We suggest that the Department may wish to seek clarification on both of these factors.

- *Producer surplus and treatment of costs* – While the producer surplus accruing to NSW is nil there are some issues relating to the its calculation. Moreover, there is no indication that contingencies have been allowed for in the calculation of project costs. This could affect estimated profitability and thereby company tax revenues.

- *Sensitivity tests* – While a range of sensitivity tests are presented there are a number of questions around their application including relatively small tests for capital and operating cost blow outs, apparently perverse effects of increasing operating costs (which increase benefits to NSW), a lack of discussion about remedial environmental measures not being successful, no testing for materially higher greenhouse gas costs and the omission of a test excluding worker benefits.

- *Benefits to workers* – The discussion and calculations in this section are not consistent with key elements of the Guidelines which call for strong evidence to be presented in support of wage premiums and consequent worker benefits. We suggest that benefits to workers be

omitted from the CBA. As such benefits amount to $264.3 million in NPV terms, this would have material impacts on the assessed benefits to NSW (reducing benefits by approximately one third). This would not in itself make the project unviable but if combined with higher externalities, contingencies and/or other costs could make it more marginal.

- *Benefits to suppliers*– These are presented however more transparency on the cited figure of $1,226.3 million (NPV terms) in spending on inputs could be provided.

- *Distributional impacts* – These are omitted from the analysis in contrast to the requirements of the Guidelines.

- *Environmental and social externalities* – While considerable detail is provided, there are some questions about the quantums estimated in the assessment. The allocation of Scope 1 and 2 greenhouse gas damage to NSW (only) with an assessed cost of just $0.1 million (NPV terms) during the project lifetime seems dubious. This has a material effect as the global cost of such externalities is calculated as $102.3 million in NPV terms. Moreover there is a case that the assessed price of carbon could rise during the project lifetime. The relatively small groundwater and surface water costs could be called into question, while the subsidence, ambient noise, biodiversity and net public infrastructure assessments might also require further scrutiny. We suggest the Department seek clarification to verify some of the claims made in this section.

The project remains viable ($519.5 million net benefits, NPV terms) even with the omission of material items such as benefits to workers. If greenhouse gas emissions were also assessed at the global level then net benefits fall to $417.2 million in NPV terms. Nonetheless, viability may be reduced if other issues arise (e.g. contingencies, other, higher environmental costs). The EIA should be revised with benefits to workers omitted (at the very least). The Department may also wish to undertake further investigations into the highlighted issues.

3. REVIEW OF LOCAL EFFECTS ANALYSIS

3.1 BACKGROUND

The Guidelines call for a discussion of a number of key elements affecting the local area as a part of a LEA. These include:

- Effects relating to local employment;
- Second round/flow-on effects;
- Effects related to non-labour project expenditure;
- Effects on other local industries; and
- Environmental and social impacts on the local community

As is the case with the CBA, much of the research and modelling behind the LEA is reasonable and much appears to conform to the Guidelines. However, there are some issues which require further clarification. These are detailed below.

3.2 CALCULATION OF LOCAL EMPLOYMENT BENEFITS

The Guidelines (pp.21-22) require that the net increase in local workers incomes is measured as well as the flow-on effects that such earnings generate.

In order to estimate incremental income benefits the EIA (p.25) makes estimates indicating how much of the workforce is local (45%). However, the basis for this estimate is not clear. This is relevant as the larger the proportion of workers assumed to be local, the larger the direct local employment benefits. Accordingly, the EIA should provide a better justification as to the basis for this estimate.

A second issue relates to clarity around the local employment effects. The Guidelines (pp.21-22) refer to the need to clearly set out the number of local (i.e. ordinarily resident) and non-local workers. The EIA indicates that 45% of workers are local without specifying a precise (direct) employment figure. However p.17 of the EIA cites an average figure of 348.4 Full Time Equivalent (FTE) workers over the lifetime of the project. If this is so then this implies an average of 156.8 FTEs (i.e. 45% of the total) are sourced locally.

This figure is not separately cited, however. Instead the EIA (p.29) refers to 265.8 FTEs in discussing the total economic impacts of the project in Wollondilly. This would appear to include the employment multiplier effects calculated via CGE modelling. However, the Guidelines clearly indicate that direct employment effects – both local, non-local should first be separately presented. The EIA does not appear to do this. The presentation of CGE modelling rather than direct FTE numbers runs the risk of exaggerating net local employment effects for those who are not familiar with the distinction between the two. A transparent picture of direct employment should be presented, consistent with the Guidelines.

A third issue is the transparency of the calculation of employment benefits (cited as $122.3 million in NPV terms). This seems roughly equivalent to 45% of the estimated net worker benefit of $264.3 million in NPV terms on p.18 of the EIA. This might also seem roughly consistent with the approach set out in the Guidelines (Table 4.2, p.22). Nonetheless, the calculation is not laid out in the transparent manner suggested by the Guidelines. Further, the Guidelines refer to the difference between local wages in the mining and other industries (net of superannuation and tax). The wage calculations in Table 9 on p.18 of the EIA do not appear to refer to net wages and refer to an all NSW average wage figure rather than one for Wollondilly.

3.3 NON-LABOUR PROJECT EXPENDITURE

The EIA (p.25) provides details of non-labour project spending, noting that local suppliers will benefit by some $34.4 million in NPV terms. This is noted (and presumably this spending is used as an input to the CGE modelling). However, more detail on its derivation could be provided. The Guidelines (p.23) provide an outline of the level of detail expected and this should be reflected in the EIA.

3.4 LOCAL FLOW-ON EFFECTS AND EFFECTS ON OTHER SECTORS

The Guidelines (pp.23-24) note the importance of exploring local flow-on effects and effects on other local industries.

With respect to the latter they state that:

> *A qualitative discussion of these effects on other industries is required as part of an LEA. Where no or minimal impacts are claimed, evidence should be provided to support this assessment. Where possible, this discussion should specifically note who is being affected and what strategies might be possible to mitigate these impacts.*
>
> (Guidelines p.24)

The LEA uses CGE modelling to estimate the local flow-on effects .The use of CGE modelling is a positive aspect of the EIA and adds considerable sophistication to the results.

However, flow-on benefits are also calculated for NSW and presented in the EIA (p.24 and pp.17-18). NSW is not the local area and the Guidelines do not appear to allow for such benefits at the State level. The inclusion of flow-on effects in the LEA is there to provide local supplementary information only and should not be confused with the State-level effects modelled in the CBA.[13] The inclusion of State-level flow-on effects risks confusing (and exaggerating) the assessment of the project's net benefits to NSW which are appropriately modelled via the CBA. The presentation of State-level results could be particularly confusing (or potentially misleading) for those who are not well versed in the technical distinctions between CBA and CGE analysis.

[13] Moreover, as the Treasury Guidelines (Appendix 8 p.66) make clear, CGE is not a CBA and should not be used in its place.

Moreover, one of the advantages of CGE modelling is its ability to take into account displacement effects on other industries. The Guidelines note that mining projects can displace other local industries in areas such as land use but also that it can have effects (without specifying if these are positive or negative) on other industries such as tourism or business travel and can affect food and housing markets.

There is some discussion of the loss of surplus to other industries in the EIA (p.20, Appendix A p. 39), as this is relevant to the issues to be explored in the CBA. However, the text states that the project is not expected to reduce the output of other sectors of the economy operating in the area and therefore there is no loss of surplus to other industries.

This seems implausible. To the extent that the project will draw labour and capital away from other sectors of the local economy, there will be displacement effects on other industries. Moreover, one of the attractions of CGE modelling (as opposed to input-output analysis) is precisely that it models such effects.

No transparency is provided in the CGE modelling results (EIA p.29) on how resources are displaced from other sectors in the local economy. Likewise there is no qualitative discussion of how impacts on other industries are assessed.

The omission of even a qualitative description is at odds with the directions given in the Guidelines. Moreover there is no real discussion of why other industries will not be displaced. The comments in the EIA (p.39) suggest that only direct impacts on agricultural land or water rights are of relevance to displacement. However, this is at odds with the stipulations in the Guidelines and the mechanics of CGE modelling which, as indicated, typically allow for direct and indirect displacement effects.

3.5 ENVIRONMENTAL AND SOCIAL EXTERNALITIES

The EIA (p.25) includes an indication of environmental externalities as they impact on the local area (though no mention is made of other potential social externalities). The issues identified in the discussion of the externalities in the CBA above also apply here.

3.6 PRESENTATION OF THE RESULTS

The EIA (p.25) provides a summary table (Table 13) of the LEA's results. However it is worth citing the Guidelines (p. 24) requirements for the LEA's presentation of results:

> *the summary table should be accompanied by a detailed description of the results, an indicative timeline of when the costs and benefits are likely to occur, and the assumptions and methods used to arrive at them. As with the cost benefit analysis, it is important that sufficient supporting information is provided to allow the results to be replicated. This description should also include discussion of qualitative issues such as the effects on other local industries and residents*

This discussion is absent from the presentation of results. In addition, Table 3 refers to the results as ”benefits to NSW” in several places. This is incorrect as the benefits should be attributed to Wollondilly only.

3.7 CONCLUSION

The LEA is generally well presented. Some key facts are provided and the inclusion of CGE modelling is a definite bonus in terms of accuracy. However, several elements of the LEA also appear open to question, namely:

- *Employment benefits* – The discussion here lacks the transparency suggested in the Guidelines. The presentation of CGE modelling combining direct and indirect figures rather than separating out direct Full Time Equivalent (FTE) numbers runs the risk of exaggerating net local employment effects for those who are not familiar with the distinction between the two. Moreover employment benefits would appear to be calculated on a gross rather than net wages basis.

- *Non-labour project expenditure* – This is quantified, however more detail on its derivation should be provided.

- *Local flow-on effects and effects on other sectors* – The use of CGE modelling adds sophistication to the results. However, there is no discussion of impacts on other sectors in the local economy or potential displacement of activity in those sectors as required in the Guidelines.

- *Externalities* – These are presented but no mention is made of potential social externalities.

- *Presentation of results* – A summary table is provided but no timeline, supporting information or discussion of impacts on industries and residents is included, in contrast to the stipulations of the Guidelines.

If the opportunity presents itself we suggest that the LEA be revised to allow for the inclusion of the elements required by the Guidelines.

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