

Maules Creek Coal Project Economic Impact Assessment

A review

by

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This review is prefaced by noting that the EIA of the Maules Creek Mine performed by Gillespie Economics (the EIA) was designed as an input to a planning approval process and was based on information available at the time. It was not able to conduct any primary data collection. The review is therefore focused on the conceptual validity of the assessment carried out, the appropriateness of the analysis and the strength of the conclusions drawn. Conclusions are set out regarding the merits of the policy advice delivered by the EIA.

Scope of the analysis.

Any benefit cost analysis (BCA) must be delineated in terms of the relevant jurisdiction of the decision making process that is being informed, the time frame over which impacts are to be considered and the decision options that are to be considered.

The EIA defines the jurisdiction as Australia. It therefore extends the analysis beyond that which is strictly relevant to a NSW government planning authority. Given the interconnected nature of the Australian economy and society, this is a sound approach. Spillovers between states (including those associated with the tax system and the movement of resources over state boundaries) necessitate this approach both from conceptual and practical perspectives. Extending the analysis internationally would however not be appropriate. Public policy decisions are normally in terms of national interests given that those making the decisions (politicians) are elected by their constituents to further their well-being, not those of overseas interests.

The time frame of relevance should encompass the period over which most impacts are to be experienced. For the case of mine developments, the period of the proposed mine's operation is the default period unless impacts such as environmental harms are likely to extend beyond the life of the mine. Even then, the long term costs associated with such impacts can be incorporated into an analysis extending only to the mine's life by adding in the present value of an on-going cost annuity. The EIA has used a 21 year time frame – that of the mine's life-span. It makes no explicit consideration of costs extending beyond that time frame. While costs associated with mine operation (including noise, dust etc.) will not be experienced beyond 21 years, damage to the landscape and ecosystems may. The approach taken by the EIA is to consider costs associated with mine site reclamation and the purchase of environmental offsets that are incurred during the mine's life, are sufficient to account for any after mine closure costs. This is not necessarily the case, as will be discussed later in this review when environmental costs are considered in more detail.

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The definition of the proposal is central to any BCA. First, a 'counter factual' or base case of the 'without project' is established. Then, 'with project' options are defined. It is the comparison of social well-being between the counter factual and the 'with project' options that is the basis of a BCA. BCA has the flexibility to investigate a single proposed project or a number of options for change. Where a single proposal is analysed, the BCA allows a conclusion to be drawn as to whether or not the proposed project will improve social well-being above that provided by the counter factual. If a number of options are considered, the option that delivers the most improvement in social well-being over the counterfactual (if any do) can be determined. In the EIA, only one option is analysed. This is appropriate to the policy circumstances as it involves the NSW Department of Planning using the BCA as an input to deciding if the mine proposal should go ahead. If the planning process comes to a conclusion that the proposal advanced is somehow problematic, it may be that the project proponent is required to alter their proposal. If a range of alternatives are then advanced, a BCA could be conducted across those alternatives to identify the one that is preferred from a social well-being perspective. In all cases however, the basis of the BCA is a comparison of the 'with and without project' situations.

Relevance of producer surplus

The primary driver of mine benefits in the EIA is the producer surplus generated by the proposed coal mining. The inclusion of this element of the BCA is appropriate. BCA involves the comparison of the 'with and without' project circumstances. The use of resources with and without the mine must therefore be considered. Without the mine, the resources to be allocated to the mining operation would be engaged in other uses in the economy. These are the opportunity costs of the proposed mine. Given that markets for these resources (land, machinery, labour etc.) in the Australian economy are relatively competitive and not highly distorted by subsidies and regulations, market prices reflect these resources opportunity costs. With the project, the value of those resources is reflected by the price that world markets determine to be the marginal value of the coal that is produced. Hence, the net benefit created by the mine project is the difference between the market costs of the resources used and the market determined output price. This is known as producer surplus. It is the 'return' on the use of resources in the project above that achieved in their next best uses². The EIA has used the project proponent's estimates of these costs and prices in estimating the producer surplus generated by the mine. This is appropriate so long as the markets involved are relatively free from distortions.

There has been some debate in the economics literature regarding the existence of producer surplus in the long run. Specifically the argument is made that in the long run, there is an infinite supply response to changes in price. That is under conditions of perfect competition, the supply curve is perfectly elastic and hence no 'gap' exists between opportunity costs and market price. This is clearly not true in the current case as there is evidence that the long term supply curve is not perfectly elastic. Indeed, as evidence from recent world price rises has indicated, more coal mines are being scheduled for development as the price has risen. Given the long time frame for the development of mines, in short to medium term, the supply curve for coal is highly inelastic (with little increase in supply forthcoming in the short to medium term as prices rise in response to

² Note that the opportunity cost of capital (interest on loans and dividends on equity) is included as part of the discounting process and is not explicitly included in the calculation of producer surplus. All other resource costs (labour, land, machinery etc.) are.

increasing demand). So in some markets where competition is fierce and supply responses are fast, producer surpluses may be relatively small. That is not the case in mining. Nor is it the case in agriculture where extensive benefit cost analyses of investments are based primarily on changes in producer surplus³.

Distribution of benefits

The producer surplus generated by the project is enjoyed by the shareholders of the company proposing the mine and the citizens of the nation, via taxes collected by state and national governments. Where the shareholders are not citizens, their mine benefits are expatriated and should not be included in the BCA. Careful attention should therefore be given to the register of shareholders and adjustments made to the producer surplus benefit calculation. While the EIA reports that the producer surplus benefit of the project are distributed amongst a range of stakeholders including Aston Resources and its shareholders, no adjustment to the producer surplus has been made to reflect the level of foreign ownership. The producer surplus estimates for the project assumes 100% Australian ownership and so may overstate the benefits to Australia if Aston Resource is not 100% Australian owned.

Benefits are also to be enjoyed by the local community. These will arise because some of the producer surplus will be distributed to the state and federal governments and they will commit expenditure in the local region. The proponent may also commit part of the producer surplus directly to the local community – a type of voluntary taxation. All of these compulsory and voluntary ‘tax’ payments are distributions of the producer surplus.

Where the mine proponent commits costs to the provision of services for the local community, those costs are not measures of the benefits those services provide. Rather they are costs associated with the proposal. Because the mine is producing those services for locals, the relevant concept for inclusion as a benefit is the consumer surplus associated with the services. Because these are largely public goods for which prices are not charged, non-market valuation studies of this consumer surplus would be required. The preferable approach to conducting the BCA is for the proponent to commit funds to the local community rather than costs. It is then up to the local community to conduct their own BCA on which local investments provide the greatest net benefit. This would be separate from the mine BCA.

The benefits of consuming the coal produced by the mine have also not been included in the analysis. Because the jurisdiction of the analysis is national, this is appropriate. A BCA of a power station that is proposed to use the coal in another country would need to do that.

Employment impacts

Part of the opportunity costs of the mine relate to labour. The mine will use labour that would be otherwise employed elsewhere. In a fully employed economy (as is the case in Australia in the midst of a mineral boom) these costs are relevant and reflected by market wage rates (despite some distortions created by employment regulations and union power). They have been appropriately included in the EIA. More contentious is the EIA’s inclusion of benefits associated with employment. The argument advanced is that people outside of the mine workforce enjoy benefits associated with people having jobs in the mine. The values of this ‘existence benefit’ of work estimated for the case

³ For example, a technical discussion of these matters is provided in Alston, J.M., Norton, G.W. and Pardey, P.G. (1995). *Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting*, Cornell University Press, Ithaca.

of a mine in the southern coal field are 'transferred' to the current case. A number of points argue against this approach. First, there is a conceptual issue. In a fully employed economy, it is doubtful that people employed in the new mine would be drawn from the ranks of the unemployed. So people outside the mine are unlikely to hold any existence benefits for the jobs provided by the mine in that case. Second, there is an estimation issue concerning the use of a benefit estimate transferred from another context. The conditions in the southern coalfield – the context of the source of the benefit estimate - are very different from the proposed mine context. For one, the southern coal field mine was a continuation of an existing mine (if it didn't go ahead, miners who were currently employed would need to relocate to find work) whereas miners will need to be attracted to the new proposed mine. Because of these two issues, the inclusion of the employment benefit as a component of the EIA is not recommended. Their inclusion would overstate the extent of proposal benefits. It is noted that the sensitivity analysis conducted as an integral part of the EIA includes one scenario in which the jobs benefit is not included

Environmental impacts

The operation of a large open cut coal mine involves numerous environmental costs. The approach taken to incorporate these costs is to include the costs of dust suppression operations. Where dust suppression is not complete the approach moves to using the costs of affected property acquisition. This assumes that the dust problem is completely averted through suppression and removing affected people the costs of purchasing neighbouring farms as a measure of the environmental costs of the mine. The assumption is that the property owner is (more than) fully compensated for the environmental damages done by the mine because these costs would only represent a fraction of the property's purchase price. The problem with this logic is that the choice offered the land owner is between staying on the property and enduring the consequences of mining or taking the offered price. The comparison is not between owning the land with and without the effects of the mine. Because the land price may not reflect the consumer surplus provided by the land to its owner (the price is determined by the second highest bidder in the auction) the land price is only an approximate estimator of the values involved.

Similarly, the effects of the mine beyond the area which is being purchased by the mine operator cannot be dismissed because the studies conducted are not revealing any environmental impacts. Proximity to the mine may be a detrimental factor beyond what is indicated in property prices. Thus, even an hedonic pricing study of the impacts of the mine on the surrounding property prices will not reveal these changes in consumers surplus. Put simply, price is not equal to consumer surplus. Expert valuation studies would assist in securing a better understanding of the impacts of mining on surrounding property prices

The treatment in the EIA of environmental costs associated with vegetation clearing also requires some comment. The approach as outlined in the EIA includes the costs of offsets as estimates of the costs associated with the lost ecosystem benefits that result from the clearance of vegetation during the mining operation. The approach assumes that the provision of the offsets ensures that overall value associated with ecosystems in the region remain unchanged. This needs to be further explained and clarified as a methodological approach.

Offset schemes are designed to ensure 'no net loss' in ecosystem benefits. Hence, the EIA relies on the offset ensuring that social well-being associated with ecosystems is at least maintained, with the

project compared to without. Hence, the costs incurred in establishing and maintaining the offset are incurred so that there is no net loss in ecosystem value. That of course assumes that the offset negotiated between the mine proponent and the NSW Government does ensure 'no net loss'. This relies on the inputs of government scientists rather than the preferences of the community as is consistent with the principles of BCA. In the absence of a non-market study to investigate these community preferences, it is not possible to confirm whether the proposed offset strategy actually results in no net loss of community economic values.

A final environmental impact requiring consideration is the issue of greenhouse gas emissions (GHG). The EIA includes GHG from the mining and transportation operations as costs. The value is set at the market price of emissions trading certificates. This assumes that the highly 'artificial' market for these certificates reflects the opportunity cost of the damage caused by GHG. While that is an heroic assumption, it is practically the only one to be used. The GHG emitted during the burning of the coal are not included in the EIA. Because any costs caused by these GHG are borne outside the jurisdiction of the BCA (Australia), this is the appropriate approach. They should be included in a BCA of say the power station proposed to burn the coal.

Time

The EIA uses discounting to take into account the effects of time on the project analysis. This is accepted BCA practice. The EIA uses the discount rate recommended by the NSW Treasury. That is also appropriate and the use of sensitivity analysis around that 7% rate is also good practice. Taking a rate much higher implies that people place a much higher value on the present than the future (with the implication that future impacts don't matter so much to people). Taking a value much lower implies that the cost of capital is lower than the market rate suggests (and that many more investments are 'profitable' than is really the case).

Overall

In summary, the EIA is basically sound but falls short on a number of issues. Mostly, they involve the use of procedures that are 'short-cuts' needed to be taken when primary data collection exercises cannot be carried out. With more time and more money devoted to the EIA, improvements could be made. The question is whether or not taking more time and money would make any material difference to the policy outcome indicated by the analysis. Given the overwhelming extent of the producer surplus generated by the proposed mine, it is doubtful that it would⁴. The recommended omission of the benefits from employment element has a relatively small effect on the estimate of the net benefit. Similarly, the order of magnitude of the environmental impacts estimated, albeit imperfectly, in the EIA is also swamped by the producer surplus value. These relativities would only be changed if the consumer surplus lost from the ecosystem disturbance was found to be offset only by very expensive alternatives. For instance, this may be the case if the mine site was the last remaining habitat of a species. In that case the environmental costs could well be substantial and unable to be offset.

⁴ A caveat to this conclusion relates to the issue of mine ownership. If the mine was substantially owned by overseas interests, the jurisdictional boundary established for the EIA would imply that the producer surplus expatriated could not be included as a benefit of the mine as it would not improve the well-being of the Australian populace.

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