Submission on NSW Government Guideline for the use of Cost Benefit Analysis in mining and coal seam gas proposals

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Introduction

Economists at Large is a network of economists who regularly donate time and expertise to economics-related issues in the public interest. Over the past two years we have regularly been asked by community groups in NSW to contribute to submissions on economic assessments of coal and coal seam gas developments. Our major submissions and contributions have been to:

- Boggabri Coal Project
- Maules Creek Mine Proposal
- Tarrawonga Coal Project
- Warkworth Coal Project
- Tasman Coal Project
- Cobbora Coal Project
- Ashton Coal Project
- Stratford extension project

We are happy to provide copies of our submissions and comments on all of these projects to interested parties. Most are currently on our website, www.ecolarge.com .

Having reviewed all these economic assessments, we believe there is considerable room for improvement in the way cost benefit analysis has been used to assess these projects.

Cost benefit analysis in project assessment

Economists at Large, and we are confident that economists everywhere, welcome the proposed change to shift project cost benefit analysis (CBA) from its current position as an obscure appendix of environmental assessment, to an earlier stage of the project assessment process. Debate about the economic merits of a project, its effects on the welfare of society, are far better suited to a development application stage, than a part of the process where project approval has largely been assumed.

Thorough CBA early in the planning process will allow for projects that clearly demonstrate a benefit to society to proceed more rapidly into the detailed approvals process, while projects with minimal or dubious benefits can be eliminated without lengthy delays and legal appeals. This could ease pressure on other parts of the planning process and ultimately lead to a more efficient planning process.

CBA – should it be "optional"?

The Guidelines suggest that CBA will be optional for project proponents. Why this assessment will not be compulsory is unclear. If a project is unable to clearly demonstrate the benefits it will bring to society, it should not proceed further. A thorough CBA need not be an expensive exercise and there seems to be no reason why project proponents would not be required to perform this analysis. Proponents of projects with dubious public benefits are exactly those which will have an incentive not to conduct CBA. We recommend that thorough CBA be a compulsory part of a development application.

Peer review

We are particularly pleased that the guidelines call for independent peer review of CBA commissioned by proponents. Several sources of advice to decision makers is important for good governance. A review process is essential for CBA to ensure that the assessments will reflect the effects of the project as they impact on the community, rather than the way that proponents and their consultants may predict. Several of our submissions have resulted in major revisions of CBA results and further reviews commissioned by proponents (see Bennett, 2011) or local councils (see Deloitte Access Economics, 2012). In each of these cases net present value (NPV) estimates were heavily revised downward by proponents and we believe even these revised figures overestimate NPV of these projects:

- Maules Creek Coal Project NPV revised down $3.2 billion (from $8.7 billion to $5.5 billion).
- Warkworth Coal Project NPV to NSW community revised from $1.9 billion to $0.6 billion.

The Department of Planning and Infrastructure does not seem to have the resources to thoroughly review economic assessments. We feel that the only real scrutiny many project assessments have received has been independent, from Economists at Large and groups within the community. We hope the peer review process will lead to more realistic project assessments from proponents and greater confidence in the planning process for the public. Peer reviews must be made public to allow for debate about the merits of projects.

It is worth noting that, to our knowledge, all recent assessments of coal projects in NSW have been conducted by the same consultants, Gillespie Economics. Why Gillespie Economics has such a dominant role in the market for project economic assessment is unclear, given the consistent flaws in their analysis that we have observed. We urge the Department of Planning and Infrastructure to encourage some diversity in the pool of consultants used by project proponents, which feel will be assisted by peer review.

Limitations of CBA

Other approaches

While we applaud the push for earlier, peer-reviewed CBA, the guidelines should acknowledge and cover the limitations of CBA more comprehensively. CBA is not good at incorporating uncertainty, and the guidelines do not distinguish between uncertainty and risk. Risks involve outcomes which are not known but their probabilities are understood or can be estimated. Uncertainty involves outcomes where probabilities are not known with any certainty. See the work of Knight (1921).

Considerable doubt has been raised as to the appropriateness of CBA in relation to projects with uncertainty, especially in relation to environmental assessment where irreversible impacts are a possibility, such as species extinction, climate change or damage to poorly understood aquifers. All these impacts are involved in coal and CSG projects. This debate goes back to authors such as Krutilla (1967) Bishop (1978) and continues to this day. Consideration should be given to alternative approaches in such cases, for example safe minimum standards or threshold analysis.

Threshold analysis and safe minimum standards do not have the same limitations as CBA – the statement to the contrary in this section should be removed from the guidelines. There are clearly situations where approaches such as safe minimum standards may be preferable to CBA and this should be allowed for in the guidelines.

Basic sensitivity testing is not sufficient to account for uncertainty. At present sensitivity analysis merely tests adjustments to single variables at different discount rates. Even where CBA is an appropriate methodology, we feel this is insufficient. Cumulative effects of several variables on NPV should be assessed and a best case/worst case scenario prepared. Monte Carlo style analysis would also be useful.

Equity

CBA makes no considerations of equity, or of what is “fair” or “right”. This is a major shortcoming of CBA which is not mentioned in the guidelines and should be considered by decision makers. CBA makes the assumption that through transfers between parties a pareto efficient outcome will occur. In reality, this is clearly not the case. Some stakeholders become “winners” while others are “losers”.

Communities have preference for a high degree of equity and decision makers need to be aware of this preference and CBA’s inability to incorporate it. The obvious example here is that of multinational energy companies making large profits while local people experienced reduced welfare in relation to land values, environmental amenity and health impacts.

A related point is materiality. We are concerned about the guidelines suggestion that impacts below a certain value may be immaterial, perhaps $1m in a $20m NPV project. Consideration needs to be given here to the equity implications of the project. For local residents to bear several million dollars

in health and amenity costs in a project which has benefits accruing mainly to overseas capital or governments should be of concern to decision makers. Dismissing such concerns as immaterial is unlikely to increase community acceptance of the planning process.

Scope

We agree that defining the scope of CBA is an important first step. We would like to point out that the assessments we have reviewed have all adopted a confused approach to the scope of assessment. See for example Gillespie Economics (2009) in which the CBA inconsistently included costs and benefits – some accruing at a global level, others at a national level and others at a strictly state level.

We endorse the call in the guidelines to "assess all major costs and benefits to whoever they accrue and then adjust to estimate the proportion of these attributable to residents of the State." Analysts have commonly defined coal projects and their impacts as ending at some arbitrary point, commonly to free on board in Newcastle. This has no basis in economic analysis and impacts should be estimated to whoever they accrue and then adjusted. Estimating state-level flows can be difficult, but is important for state-based decision making (see (Bennett & Gillespie, 2012)and (Campbell, 2012) for more on this topic.

Some points related to scope that analysts regularly fail to assess include:

- Profits accruing overseas or interstate need to be excluded from national or state level analysis
- Global level analysis needs to consider the marginal impacts of the project on greenhouse gas emissions
- Environmental and social costs can accrue outside of state borders and so should be incorporated into assessments at a national or global level.

Estimating costs and benefits

We are pleased that the guidelines call for details regarding capital and operating costs, rehabilitation costs and costs relating to local infrastructure and management that may accrue to local councils. At present it is unclear if many costs are included in calculations of capital expenditure. For example, in the assessment of the Cobbora Coal project (Gillespie Economics, 2012), do not make it clear if any allowance for the ongoing maintenance costs of ecological offsets have been included in capital costs, prompting submissions from the Office of Heritage and Environment.

We are pleased that the guidelines call for information on the expected quality and specifications of coal and more detailed forecasts of the implications of this on price and project value. At present valuations of projects are based on a crude point estimate of the current market value of the coal,

with no discussion of market outlook of the various ranks of product coal. Exhaustive market analysis is not required, but these considerations are important so interested readers with some understanding of coal markets can review the assumptions underlying the CBA.

We agree that consideration must be given to impacts such as air pollution, noise levels, dust, amenity, etc. Analysts must be aware, however, that proponents' forecasts of compliance with a pollution or noise guideline does not mean there is no economic impact. An effort needs to be made to evaluate such impacts through revealed or stated preference techniques, benefits transfer or at least through qualitative discussion.

We disagree that "increase in mine worker wages" should be considered a surplus of a particular project. This ignores the likelihood that a worker able to work on one mining project could work on another mining project should the mine in question not proceed. Indeed, in the words of (Bennett, 2011):

> *"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."*

Including "increase in mine worker wages" as a benefit of the project would suggest that opportunity cost of labour is low, which would only be appropriate if a mine employed local workers whose only other employment opportunities were in different, lower-paying industries and could they could not travel to another mine. Given the predominance of fly-in-fly-out or drive-in-drive-out workers in Australian mining, this is clearly not the case.

Health

We feel the guidelines should place a greater emphasis on the health impacts of coal and coal seam gas projects. Ample evidence suggests that coal projects have considerable health impacts on local populations and studies from the USA have found that health impacts of some coal projects outweigh their financial benefits (see (Hendryx & Ahern, 2009; Palmer et al., 2010)(Muller, Mendelsohn, & Nordhaus, 2011). Despite this, to our knowledge, no analysis of a NSW coal mine has included any estimate of health costs.

Greenhouse gas emissions

Cost benefit analysis should include all significant marginal impacts of a project. This includes greenhouse gas emissions. At present only direct emissions are considered. Projects of significant size will, however, have a marginal impact on the amount of coal consumed in the world and the greenhouse gas emissions associated with this marginal increase should be included in CBA.

This is not the same as arguing, as some environmental groups have, that a project should be responsible for all its downstream emissions. While the size of downstream emissions may be an interesting factor from an environmental management perspective, the CBA of the project should consider emissions related only to the marginal increase in coal consumption caused by the project.

Some coal industry proponents argue that no downstream emissions are relevant as project coal would be replaced by coal of some other project and are thus not a marginal impact of the project. This is also misguided and suggests that coal supplies are perfectly elastic, which would in turn imply that coal prices should never change, which is clearly not the case.

Discount Rates

Setting an appropriate social discount rate is a detailed and subjective process. CBA text books dedicate considerable on how to determine an appropriate social discount rate. For example, Boardman et al (2006) devotes nearly fifty pages to the issue. We feel that requiring a particular discount rate, recommended in the guidelines as 7%, does not reflect this complexity and importance.

Section 10 of NSW Treasury (2007) outlines the recommended approach to the selection of discount rates. While the points discussed there are generally applicable, there are a few caveats which we feel should be considered when putting the recommendations into practise for coal and coal seam gas projects. In particular, we wish to highlight the following:

- **That 7% real discount rate might be too low for the financial aspects of these projects.**
  Frontier Economics (2009) assesses the pre-tax nominal WACC for a mining business at 11.05% (c.f. Deloitte 2012). Allowing for inflation of 2%, this implies a real discount rate of around 9% as compared to the recommended 7% baseline. Other studies such as Productivity Commission (2010) provide further discussion and quote 9% real rates as the average return to capital.

  The market price of risk as outlined above does reflect to a degree people's willingness to bear risk and their attitude to tradeoffs and hence should be reflected in the social discount rate.

- **A simplistic approach may understate/overstate the impacts of projects where the impacts are only observed far in the future.**
  Where impacts are uncertain (see above) and their timing also uncertain, a basic 7% discount rate applied to future impacts may not be appropriate. Alternatives including declining discount rates or hyperbolic discounting may be required, or a different approach altogether such as safe minimum standards or threshold analysis.

NSW Treasury (2007) suggests that "interpretation of appraisal results will be impossible if different agencies use different discount rates". We would suggest that the use of a standardised set of discount rates for all projects might in itself affect comparability – where a coal or coal seam gas project with relatively high social risks is assessed in the same context as a comparatively lower social risk project such as a water supply infrastructure or hospitals.

Conclusion

Given our recent experience in reviewing cost benefit analysis of coal projects in NSW, we welcome the push to move CBA to an earlier stage in the planning process. We are concerned that leaving CBA as an "option" for proponents will lead to proponents ignoring this option completely, particularly proponents with projects with dubious social benefit. CBA should be compulsory for Development Applications.

Peer review will be important for ensuring the public can have confidence in commissioned CBA. Diversity in analysts and reviewers will also be important; at present only one consultant, Gillespie Economics, conducts all CBA of coal projects, with consistent weaknesses in approach.

CBA has shortcomings in regard to uncertainty and equity that need to be widely understood. Projects with considerable environmental, social or financial uncertainty may need to adopt another approach such as safe minimum standards. CBA also provides no guidance on what is equitable, or fair, which needs to be understood by decision makers.

We generally agree with the guidelines' approach to scope, it is most useful to first assess all impacts of a project and then consider these costs and benefits at a state level if required. More detail on calculations of costs and benefits than is currently provided will also be useful. We believe the guidelines could be improved by strengthening the approaches taken to greenhouse gas emissions and health. Greater consideration should be given to discount rates.

We hope these guidelines and our suggestions will improve the standard of cost benefit analysis of coal and coal seam gas projects not only in NSW, but in other states and internationally.

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