



Review of the economic assessment of the Vickery
Extension Project

NSW Department of Planning

A Marsden Jacob Report

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Key points

AnalytEcon has undertaken a robust economic assessment of the Vickery Extension Project. The methodology aligns with the required guidelines and the indicative estimates broadly align with our expectations. However, some aspects of the assessment would benefit from further clarification and we identify some areas where the assessment could be further refined.

AnalytEcon has prepared a well written and on the whole clear report on the economic assessment of the Vickery Extension project. The assessment concludes that the project will deliver net benefits to the New South Wales economy in the order of \$499 million in today's dollars.

Method

The report applies standard benefit cost methods and frameworks to estimate the outcomes of the proposed investment.

The benefits and costs identified on the whole appear identified and categorised appropriately.

Assumptions

The key assumptions appear to be plausible although in a number of areas the assumptions could be better evidenced and justified.

Calculation procedures

The report uses input output analysis to provide insights to the local area effects. We have greater reservations than AnalytEcon regarding the appropriateness of this approach. Our view is a well-constructed and applied regional CGE model would be a preferred approach.

1. Introduction

This report presents the findings of an independent review by Marsden Jacob Associates (Marsden Jacob) of the Vickery Extension Project.

The proposed Vickery Extension Project is located 25 km north of Gunnedah in northern New South Wales (NSW). The project is currently undergoing a review of the environmental impact statement. As part of that review AnalytEcon was commissioned by the mine proponents to undertake an economic assessment of the proposed development. The report draws heavily on Gillespie Economics assessment of 2012 but critically makes a number of important refinements and addresses some key methodological concerns we have with that report.

1.1 Motivations for this report

Marsden Jacob Associates was engaged to undertake an independent review of the socio-economic assessment of the Vickery Coal Project by the NSW Department of Planning and Environment as part of the review process for the Environmental Impact Statement.

The socio-economic assessment undertakes a benefit cost assessment of the mine from a global, national, state and local perspective. The assessment is undertaken within a 30 year life of investment window. The purpose of this report is to undertake a critical review of the assessment and provide independent feedback to parties as to the Environmental Impact progresses. The authors of the assessment will be provided with this report and be given an opportunity to address any matters raised in through their final assessment.

1.2 Terms of reference

As part of a broader terms of reference to assist during the Environmental Impact Statement process, Marsden Jacob was asked to undertake a comprehensive review of the economic assessment completed for the Vickery Extension Project EIS including:

- whether the assumptions used are reasonable, appropriate and suitably justified;
- whether the Cost Benefit Analysis aligns with current best practice;
- the adequacy of the methodology, analysis and assessment presented in evaluating the economic costs and benefits of the proposed development;
- the identification of any areas of deficiency (including inconsistencies, overlaps or "double counting") and recommendations to improve or resolve these issues in the assessment;
- consistency of the assessment with relevant NSW Government guidelines including NSW *Guidelines for the economic assessment of mining and coal seam gas proposals*, December 2012;
- any recommendations (if required) for additional information to inform the assessment of the project.

1.3 Structure of this report

The remainder of this report is divided into three sections:

- A review of the general methodology
- A review of the critical assumptions
- A review of the calculation and assessment procedures

2. Critical review of methodology

Overall the AnalytEcon report robustly applies the guidelines for the assessment of economic costs and benefits and applies standard benefit cost methods to assess the economic outcomes of the mine.

Where we have not raised matters below we have no substantive issues with the method employed in the benefit cost assessment (BCA).

2.1 Overarching assessment of benefit cost methodology

The AnalytEcon report over all provides a robust application of standard benefit cost methods.

The method sets out an appropriate counterfactual and identifies the classes of benefits and costs of the proposed mine extension. The report draws on the analysis and approach of the Gillespie Report of 2012 for the mine proper but makes a number of important refinements that improves the robustness of the approach taken.

In line with the Guidelines, the population with standing for the assessment is New South Wales and in our view the report correctly identifies the classes of benefits and costs relevant to New South Wales as set out in the Guidelines.

The AnalytEcon economic assessment of the Mine Extension Project deviates from the Gillespie Report of 2012 with respect to the assessment of the benefits of employment. In the Gillespie report employment benefits included an assumed value society places on the mine reducing unemployment by 193 people for 30 years. We had a number of reservations with this assumption and support the exclusion of the valuation in the AnalytEcon analysis.

Discounting methods and values appear to have been applied in the manner consistent with the guidelines.

2.2 Some method issues that would benefit from further clarification

There are small number of methodological issues that could benefit from further clarification in the report.

Opportunity costs

The guidelines specify that the CBA should include first round impacts both direct and indirect but not secondary impacts – ‘Direct impacts reflect the revenues of the project less the opportunity cost of resources (such as land labour and capital) used for the project’

We note the assessment is a benefit cost of the Mine Extension to NSW. As such the assessment is not a benefit cost of the mine per se and only includes benefits and costs accruing to NSW – and appropriately does not include the total value of production nor the direct capital cost of mine establishment and variable costs of mine production.

Table 3-9 identifies production related benefits in the form of disposable income, taxes and share gross operating profit at \$1208 million. There are no estimated direct or indirect costs associated with those benefits. In section 3.3.7 AnalytEcon states ‘Foregone profits from agriculture represent an opportunity cost to Whitehaven....For the purpose of accounting for opportunity costs of agricultural production we have therefore deducted the estimated NPV of lost agricultural production, as measured by enterprise gross margin, as a cost from Whitehaven’s revenues in the Project Scenario and Approved Mine Scenario respectively.’ The report could usefully clarify the rationale why opportunity costs associated with production be treated within Whitehaven’s mine revenues and therefore assumed to be zero.

It would be also be useful to identify how Whitehaven's opportunity cost of capital has been treated in the analysis.

Incremental cash profits

It would be helpful for the report to provide disaggregated estimates of the incremental costs of the mine. in table 3-3. The aggregation of capital expenditures and operating expenditures in this table mean that there is no detail provided on these items with the BCA itself in table 3-9. As a result, while costs and benefits have been appropriately accounted for the presentation of the BCA does not fully align with the recommended in table 3.5 of the Guidelines.

Value of agricultural production

AnalytEcon states it uses the analysis of Gillespie Report of 2012 to estimate the impacts of the mine on lost agricultural production. Gillespie utilises land values as a proxy for lost production – in line with the Guidelines - but further provides a gross margin analysis as lower bound reference point. AnalytEcon focusses on the gross margin analysis and does not appear to reference the land value approach and it is unclear how of if they are considered. The report should clarify the treatment of land values in the benefit cost methodology.

Further a gross margin approach only considers short-run enterprise profit and does not account for the cost of capital and this limitation of gross margins should be acknowledged as a limitation in assessing the lost value of agricultural land. Arguably the valuation of lost production from 3643 hectares lost in perpetuity could acknowledge the likely risk climate change may have on the variability of agricultural production other things equal.

Valuation of externalities

AnalytEcon sets out a generally robust approach to the treatment of externalities. At a NSW level, the externalities are unlikely to be significantly relative to the overall benefits of the mine.

The report correctly implicitly incorporates the treatment of some externalities within the mine project net benefits and costs – a number of externalities such noise and dust, for example, are addressed through the adjustment of mine operation assumptions so that the net effect is minimised. The benefit cost assessment could helpfully point this gross versus net outcome in the specification of the benefit cost approach.

Nonetheless, some externalities may be more relevant at local economy level. The EIS documents points to noise and air-blast issues being more significant for a small number of neighbouring properties. For example:

With the above controls in place, exceedances of the Project noise trigger levels are predicted for privately-owned receivers 127b, 127c, 131a, 131b and 132 for periods of time during the life of the Project. Notwithstanding the conservatism associated with the meteorological conditions modelled, exceedances predicted at receivers 131a, 131b and 132 are considered to be "negligible" (between 1-2 dB according to the VLAMP) and would not be discernible (when compared to compliance with the Project noise trigger levels) by the average listener, in accordance with the VLAMP . Whitehaven has been in dialogue with the owner of receivers 127b and 127c regarding entering into a potential noise agreement. Additionally, the owner of receivers 127b and 127c has the right to acquisition upon request in Development Consent (SSD-5000) for the Approved Mine.

Other spillovers not acknowledged sufficiently are those relating to blasting, including the closure of roads.

These spillovers should be acknowledged in the BCA. We do not suggest this requires major analysis and could be assessed simply using indicative upper bound cost transfer estimates from other studies.

3. Critical review of assumptions

Overall AnalytEcon applies reasonable assumptions in the calculation of benefits and costs. There are number of areas where the assumptions could be further refined or better evidenced

Where we have not raised matters below we have no substantive issues with the assumptions employed in the BCA.

3.1 Overarching comments

Overall most assumptions are clearly set out and align with the general requirements of guidelines.

In several areas, more detailed assumptions appear to be embedded or implied.

Also, in several places, assumptions are asserted without supporting evidence.

Below we provide guidance on areas where the assumptions could be made more transparent.

3.2 Assumptions requiring further clarification

Run of mine

AnalytEcon assumes the annual coal production will be average 6.4 (Mtpa) to a maximum of 8.9 (Mtpa) – compared to the Gillespie report, AnalytEcon helpfully provides detail on the profile of mine production over the life of the mine for each coal type.

The report would benefit from providing further evidence to support the run of mine assumptions and clarify what risks or contingencies have been incorporated to account for unforeseen production delays or halts. In the absence of further evidence there is a risk the Rough Order of Magnitude (ROM) assumptions may be overly optimistic. In particular the report should clarify the assumptions regarding the pathway of ROM and any expected within year variability or variability over the life of the mine due to maintenance risk etc.

Value of coal

The report has assumed long term trend estimates for thermal coal of US\$85 per tonne and SSC/PCI of US\$100 per tonne and a US\$/AUS\$ exchange rate of \$0.77.

The report does not provide information on the derivation of these assumptions.

The report would benefit from providing evidence to support the forecast of coal prices in US dollars over medium and longer term and the source of the exchange rate assumptions provided by Whitehaven. The Gillespie Report of 2012 observed the benefit cost is more marginal when there is a sustained 30 per cent reduction in the price of coal assumed. The report does not provide guidance on the prices estimates and the recent large falls in medium term coal prices in the order of 25 per cent. We recommend further evidence be provided in the report to justify the coal price assumptions.

The report should provide information to support underlying assumptions of the proportion of run of mine that will thermal and SSC/PCI to justify the application of the prices to mine production.

Value of gravel

The Gillespie report assumed one of the benefits of the mine was the sale of gravel from the mine overburden. The report assumed the 90,000 cubic metres of gravel would be produced annually for direct collection and the gravel will be sold for \$4 cubic metre. The AnalytEcon report does not reference gravel production for the mine extension with the exception of table 3-3 and it would be useful to confirm this output has been excluded from the mine extension analysis.

Green House Gases (GHG)

The report assumes the green-house gas impacts arising from production activities of the mine to NSW will be \$0.28 million estimated from a global impact of the approved mine of \$48 million and the project of \$44 million. This results in net incremental *reduction* in GHG to NSW from the incremental impacts of the extension by \$4 million. This difference should be explained further based on the Figure 3-1.

The report calibrates the NSW impact estimate using a share weighted global to NSW GDP as assumption. There is no factor adjustment applied either for (i) the Australian population, relative to the global population, or (ii) the NSW population, relative to the Australian population. This assumption and procedure should be further articulated, and the rationale further justified.

Value of land

The value of the land on which the mine is to be sited was estimated by the Gillespie Report of 2012 at \$9 million. AnalytEcon does not provide evidence to support this estimate. The report should provide evidence of the value of land.

Shares of profit and margins to NSW

The report at a number of points makes a series of assumptions regarding the distribution of Whitehaven's profits and margins from production expenditures to NSW residents.

It would be helpful for these to be summarised in a table and further justified. For example, it is not clear if the 32 percent NSW ownership assumption is drawn from the share registry data or estimated based on whole of Australia data. Similarly, it is not clear the source and treatment of 10 percent of production costs to NSW supplier margins.

4. Critical review of calculation and assessment procedures

The report robustly applies the Guidelines to calculation and assessment procedures. There are no substantive issues with the application of techniques used as set out in the Guidelines. Nonetheless we are less sanguine regarding the use of input output assessment techniques to demonstrate the effects of the mine for the local area – our preference would be for a regional CGE model to be applied.

4.1 Overarching comments

Overall the calculation and assessment procedures align with standard benefit cost techniques.

They also align with the Guidelines.

The report could be improved by providing further clarity on the discounting treatment of flows of benefits and costs over the life of the project.

The report would also benefit from a more robust approach to assessing local economy effects.

4.2 Calculation procedures requiring further clarification

Discounted benefits and costs

It is not clear how a number of costs and benefits that occur over a period of time are treated from a discounting perspective. The report does not provide an annual discounted cashflow of the gross benefits and costs and it would be helpful to do so.

4.3 Local economy impacts

The report uses input output analysis techniques to demonstrate the effect of the mine on the local economy.

A gap in the AnalytEcon report is a summary table that aligns with the recommended structure in table 4.5 of the Guidelines. The tables provided (4-1 and 4-2) do not fully align and refining them in the would help draw together the assumptions and analysis provided.

At present it is difficult to clearly understand and interpret all the components of the local employment benefits presented in the report. Tables 4-1 and 4-2 provide estimates of the employment benefits and the table should include a disaggregation of the composition of these employment benefits and a summary table of their underlying assumptions.

The report acknowledges limitations with the input output approach — noting that the technique over values the local economy effect for a variety of reasons. We would support this being further developed to identify the limitations of input output analysis with respect to accounting for the opportunity costs of resources in the economy. The report goes some ways towards this by highlighting issues relating to asset and labour fixity.

We also support the observation of AnalytEcon that estimating value added at a granular regional level is not meaningful where there is not sound knowledge of the basis of ownership of capital and how value added may or may not 'stick' in the region.

Nonetheless we are more optimistic than AnalytEcon that a CGE approach would provide some valuable insight over and above the input output analysis.

The CGE approach would also provide some insight into the underlying counterfactual that there would be no development in the absence of the mine. Under the non-development scenario current activities continue and the CGE approach could estimate the net effect of the any change. The CGE approach also addresses the underlying problem with a no change counterfactual which can imply there is no opportunity cost with proceeding with investments and capital and labour in the economy would be used elsewhere in NSW or the local economy. The CGE approach can also provide more insight into the temporal dimensions of flow on effects through different stages of mine development. In the short run the flow on effects to the local economy of construction may be significant relative to the longer-term steady state mine production.