Mine Free Mallee Farms

Witness: Chris Lightfoot, Economic Expert Witness

Goschen Mineral Sand Mining Planning Panel Hearing, Swan Hill
April 17, 2024

Witness Evidence

Professor Bill Malcolm and I were instructed by Craige Kennedy, representing the Mine Free Mallee Farms (MFMF) group, to review and comment on the economic assessment present by VHM as part of their environmental effects statement (EES). It is our understanding that this EES was prepared to comply with the Victorian State Government's planning approval requirements.

The basis for my evidence is:

a) The Victorian Government's published requirements for economic analysis
b) The adequacy of the economic EES presented in the VHM submission

Basis a): Published requirements

Two documents will be tendered as evidence of the Victorian Government's requirements for an adequate economic EES.

i) Department of Treasury and Finance: Economic Evaluation for Business Cases Technical guidelines

In section 2.1.1 on page 3 of the Technical guidelines Treasury and Finance state that Cost Benefit Analysis (CBA) is the preferred approach to economic evaluation: *"….cost-benefit analysis provides a robust method for evaluating the costs and benefits (including both market and non-market impacts) of a project or policy change in today's dollars to society as a whole. The estimated net benefits (total benefits minus total costs), and any significant impacts that cannot be valued, are used to help decision-makers rank and assess options, and decide whether to implement them".*

In Section 2.1.3 on page 3 Treasury and Finance state that Computable General Equilibrium (CGE) models: *"….estimate the 'economy-wide' impacts of a proposed project or a policy change. However, CGE models only include market-based goods and services, not non-market goods (e.g. the environment). Due to their complexity and limitations, such models should only be used to complement a cost-benefit analysis, and only for significantly large investment projects that are likely to have economy-wide impacts."*

In our opinion the Treasury and Finance Technical guidelines accurately describe the strengths and weaknesses of both the CBA and CGE approaches to economic analysis. The Treasury and Finance preference for CBA accords with the standard precepts of economic theory.

In our opinion the CGE analysis presented in the VHM report does NOT meet the requirements of the Treasury and Finance Technical Economic Evaluation for Business Cases Technical guidelines.

ii) Department of Jobs, Skills, Industry and Regions: Guidance on Using CBA versus CGE to Estimate Net Social Benefit

On page 2 of the Guidance on using CBA versus CGE the Department states that:

- *"The CBA measure of welfare (or the net social benefit) associated with a proposal is the extent to which a community is better off with an investment or a policy."*
- *"The CGE measure of the economic impact of a proposal is the change in the macroeconomic (economy-wide) variables of interest."*

Also on page 2, the Guidance states that:

- *"A CBA will include all private and social costs and benefits of a proposal, including non-market effects such as environmental effects. A CGE model will not typically calculate any externalities"* [my highlight].
- *A CGE model is a general equilibrium approach to modelling, which means that the model examines economy-wide impacts. In contrast, a CBA is usually undertaken using a partial equilibrium approach. In partial equilibrium analysis, analysis is undertaken on a single market (and closely related markets where relevant) and secondary (or indirect) effects are ignored.*
- *Changes in GDP/GSP, as measured by a CGE, do not necessarily reflect changes in welfare. One reason is that GDP includes income accruing to foreign investors (which would not be considered in a CBA)."*

While, as acknowledged in the Government guidelines to project evaluation, it may be possible to structure a comprehensive CGE model that is sufficiently inclusive of benefits and costs of a project to estimate net social benefit and change in social welfare, the economic EES presented by VHM does not measure the potential net change in social welfare (economic surplus). For instance, market externalities, negative or positive, have not been included in the VHM CGE analysis.

Basis b): Adequacy of the economic EES

i) Treatment of Externalities

In Section 5.1 on page 27 the VHM report, it is stated that: *"…there are a range of qualitative costs and benefits that cannot be quantified through this method* [the CGE approach used by the analysts]. Also on page 27 the report explicitly states that potential transport and carbon emission externalities have not been addressed in the economic EES. This is normal for a CGE which are based on market prices rather than social benefits and costs.

In a CBA all relevant benefits and costs are identified regardless of whether they have a market value. Where possible, these benefits and costs are explicitly valued. Where valuation is not possible they are identified.

- **Transport infrastructure impacts:**

  In Sub-Section 5.1.1 Road Upgrades, also on page 27, the economic EES discusses the road upgrades that may be under-taken by VHM. The potential impact on road traffic and implications for transport infra-structure are examples of externalities that should be included in an economic EES. While the VHM report states that *"A traffic impact assessment has been prepared as part of the EES with input from the Department of Transport, the local shire and local residents…"*. The text in Section 5.1 of the VHM report suggests that transport infra-structure has been treated as a *"qualitative cost"*. The implication being that the potential transport externalities have not been included in the CGE analysis the resulting estimate of economic impact is therefore inadequate.

- **Carbon emissions**

  Sub-section 5.2.1 Project carbon emissions and other externalities, also on page 27, briefly discusses the implications of carbon emissions and other externalities. As with the transport infrastructure the text suggests that externalities have not been taken into account in the analysis provided which means the estimate of economic impact is inadequate.

The absence of the above and other externalities in the analysis is not surprising. As discussed earlier, usually the CGE method is answering questions about 'economic activity' and not comprehensively considering the wider benefits and costs to the welfare of the community, region, state and nation.

ii) Replicability of results

In section 3.2 on page 6 of their guidelines Treasury and Finance state that, amongst other points:

"To ensure objective, evidence-based analysis, agencies should:

- *be explicit about the evidence and data used, as well as the basis for all assumptions, so that results can be replicated and tested;"*

It is not possible to replicate the results of the CGE analysis from the evidence, data and assumptions in the VHM economic EES. The model used is a proprietary CGE that is owned by Deloitte/Access Economics and the detail remains 'in confidence'. While the information provided in Appendix A DAE-RGEM provides an overview of the structure and assumptions used in the CGE, that information is not sufficient to enable the *"results to be replicated and tested"*.

iii) Value to Victoria

In section 6.0 on page 28 the report states that: *" ….the project is estimated to increase GSP* [gross state product] *by $1.3 billion (present value, 7 percent discount rate)*". This statement raises two issues:

- The $1.3 billion is stated to be the present value estimated benefits discounted at a 7 percent (presumably per annum). There is no explanation of why 7 percent was chosen as the discount rate nor whether or not it is a real or nominal rate.

We note that, according to the Treasury and Finance Technical guidelines - Section 6.1 on page 25, when assessing present values for commercial projects [such as the Goschen project], it is appropriate to use a market discount rate. We suggest that the commercial discount rate for a mining venture is likely to be substantially higher than 7 percent.

- The Economic EES presents the value of the project, $126 million per annum, as the undiscounted annual average of the discounted net present value of the lump sum value, $1.3 billion.

  This is incorrect. The correct method is to calculate the annuity equivalent of the $1.3 billion over the expected life of the project. For example, the annuity value of $1.3 billion over 20 years at a discount rate of 7 percent is $123 million not the $126 million that is reported in the economic EES.

iv) Externalities, Sensitivity and Risk Analysis

Treasury and Finance, in section 8.2 on page 34 of the Technical guidelines state that *"Sensitivity analysis can be a useful tool in dealing with risk. It typically shows how sensitive the overall result (NPV) is to a change to a key variable (such as key costs and benefits that involve risk/uncertainty, and the discount rate)."*

In his Expert Witness Statement Noel Richards (Deloitte) explicitly states several times that the CGE model used to estimate the economic impact of the Goschen project did not address, amongst other issues:

- potential price volatility for the mined minerals
- impact of drought/floods
- sovereign risk from change in Australian and/or foreign government policies
- location of the beneficial ownership
- risk of VHM defaulting on the site rehabilitation requirements

The above omissions are not unusual for a CGE. CGE analysis is generally based on market prices and designed to estimate the distributional impacts and changes in economic activity. This is a more narrowly defined focus than that of CBA which specifically addresses change in net social welfare.

It is noted that VHM has included a sensitivity analysis in the report on page 10 of the Goschen Project DFS Refresh - Phases 1 and 1A: Sensitivity Analysis; this sensitivity analysis is not part of the economic EES. The analysis provided is rudimentary two-factor analysis of several costs and prices. Since it is not uncommon for several factors to change at the same time, a thorough analysis of sensitivity and risk would include a multi-factorial matrix with risk profiles and several plausible scenarios

Conclusion

Professor Malcolm and I do not dispute the results of the CGE prepared for VHM: it does what CGE models do, it calculates distributional effects and impacts on macro-variables.

What this CGE analysis does not do is provide the information necessary to determine whether the Goschen project will enhance or diminish the welfare of the community, region or state. As such it does not meet the Victoria's criteria for determining whether or not planning permission should be granted.

It is our opinion that a thorough economic analysis would comply with the Treasury and Finance Technical guidelines and be based on a CBA that estimated the potential net social welfare impacts of the Goschen project. A CGE model could then be used to estimate economy wide impact on prices and resource reallocations. Such a hybrid approach would provide comprehensive and sound indications of the economic impact of the Goschen project and be consistent with established economic theory and practice.