

BCA AND ASSESSMENT OF EXTERNALITIES

Consideration of Externalities in Economic Assessment

- The “perfect” BCA is an ideal. Different situations call for different styles and depths of analysis.
- Valuation of all environmental impacts is neither practical nor necessary.
- In attempting to value impacts, there is the practical principle of materiality. Only those impacts which are likely to have a material bearing on the decision need to be considered in BCA (NSW Government 2012). The guideline gives an example of impacts of less than \$1M being immaterial for a project with an estimated net present value of \$20M. The estimated NPV of the Project to Australia pre consideration of environmental impacts is \$592M.
- The BCA of a project can take a number of approaches to the consideration of environmental costs:
 - Threshold value analysis;
 - Qualitative consideration of impacts and valuation of the main impacts based on market data and benefit transfer; and
 - Additional threshold value analysis to recognise that some impacts may not have been fully valued and incorporated into the analysis.

Threshold Value Analysis

- The first approach used to consider the environmental impacts of a project is the threshold value method.
- Threshold value analysis is a recognised approach to BCA where it is not possible or pragmatic to attempt to value potential external impacts.
- Threshold value analysis was developed by Krutilla and Fisher (1975)¹. It is specifically referred to as an appropriate approach in the DP&I's (2002) *Draft Guideline for Economic Effects and Evaluation in EIA*, and is a widely recognised approach.
- Threshold value analysis avoids the sometimes contentious matter of physically quantifying environmental impacts and then placing dollar values on them.
- Threshold value analysis leaves the trade-off between quantified economic benefits and unquantified environmental costs for the decision-maker.
- In an Economic Assessment of a project, the estimated net production benefits provides a threshold value or reference value against which the relative value of the residual environmental, social and cultural impacts of the Project, after mitigation, offset and compensation, may be assessed. The threshold value indicates the price that the community must value any residual environmental impacts of the Project (be willing to pay) to justify in economic efficiency terms the ‘no development’ option.

¹ Krutilla, J.V. and A.C. Fisher (1975) *The Economics of Natural Environments*, Johns Hopkins University Press, Baltimore.

Qualitative consideration of impacts and valuation of the main impacts based on market data and benefit transfer

- The second approach that can be used is to qualitatively consider, and where possible value, the main environmental, cultural and social impacts of a project for the well-being of people.
- Qualitative consideration of potential impacts and any subsequent valuation of impacts relies on the assessment of biophysical impacts provided in a project EIS.
- The approach to valuing environmental impacts in the Economic Assessment of a mining project is summarised in Table 1.

Table 1 – Method for Valuing Environmental Impacts in the Economic Assessment of a Mining Project

Impact	Potential Valuation Method	Comment
Greenhouse gas emissions	Damage cost method	Estimate of global social damage cost of carbon from literature and govt policy, adjusted to Australian damage cost.
Agricultural impacts	Property valuation method	Foregone agricultural production is reflected in land values. So acquisition costs of land reflect, among other things, foregone agriculture.
Noise impacts		
<i>Significant</i>	Property valuation method	Cost of acquiring properties identified as being significantly impacted will overstate impacts.
<i>Moderate and low</i>	Defensive expenditure or property valuation method	Noise mitigation costs which are generally included in capital costs of a project. Residual impacts may be estimated using property valuation method.
Blasting	Defensive expenditure or property valuation method	If vibration and air blast limits for human comfort and structural damage are met, minimal impact is likely to occur to humans or structures. Residual impacts could be estimated using costs of mitigation measures e.g. braces for buildings etc or the property value method.
Significant air quality impacts	Property valuation method	Cost of acquiring properties identified as being significantly impacted will overstate impacts.
Use of surface water	Market value of water	Cost of Water Access Licences
Use of groundwater	Market value of water	Cost of Water Access Licences
Groundwater drawdown	Defensive expenditure	Cost of mitigation measures for private bores e.g. deepening of bores and extra pumping costs.
Flora and fauna	Replacement cost	Capital and operating costs of offsets. This approach assumes that offsets levels are sufficient to compensate the community for values lost. This is a requirement of Govt. Policy.
Road transport impacts	Defensive expenditure	Cost of actions to ameliorate impacts e.g. new intersections etc. Also potentially cost of accidents, vehicle operating costs and time from changes in travel distances.
Aboriginal heritage	Defensive expenditure/Benefit transfer of CM data	Cost of preparation and implementation of an Aboriginal Cultural Heritage Management Plan. For other impacted items benefit transfer from nonmarket valuations studies.
Historic heritage	Defensive expenditure/Benefit transfer of CM data	Cost of relocating heritage items and fortifying them from impact. For other impacted item benefit transfer from nonmarket valuations studies
Visual	Defensive expenditure/property valuation method	Costs of mitigation measures. Residual impacts may be estimated using the property valuation method.

Additional Threshold Value Analysis

- To the extent that there may be some disagreement about the estimated economic values of the environmental impacts of a project, the estimated net benefits of a project provides another threshold

value that the residual environmental impacts of a project after mitigation, compensation and offset would need to exceed to make a project questionable from an economic efficiency perspective. This again allows the decision-maker to consider any material impacts that it identifies in the course of its consideration that were not valued in the Economic Assessment.