

Valuing the Environmental, Social and Cultural Impacts of Coal Mining Projects in NSW Australia

Abstract

The abundant and cost effective nature of coal as an energy source is reflected in forecasts of strong growth in global demand for coal, particularly from the non-OECD countries of China and India. New South Wales (NSW), with its abundant coal resources, is well placed to provide coal resources to meet this growth in demand through expansion of existing coal mines and the development of new mines. However, this would have a range of potential environmental, social and cultural impacts and would require Environmental Impact Assessment (EIA) under the NSW Environmental Planning and Assessment Act, 1979.

Standard EIA encompasses a range of technical studies to assess the biophysical impacts of projects but provides no theoretical or practical framework for weighing up positive and negative impacts to determine if a project should proceed or not. The application of neoclassical welfare economics through benefit cost analysis (BCA) can remedy the deficiencies of standard EIA and aid in more efficient decision-making. This is particularly the case where nonmarket valuation methods are used to estimate the welfare effects of environmental, social and cultural impacts. Nevertheless, historically BCA and nonmarket valuation have rarely been undertaken as part of the NSW EIA process.

This thesis addresses the significant gap that exists in converting the conceptually developed techniques of BCA and nonmarket valuation to practical application in the policy realm. It does this through the application of BCA, including nonmarket valuation, to a sequence of coal mining case studies over an 18 month time frame in a real policy setting. It finds choice modelling (CM) to be the preferred approach for the valuation of multiple impacts and mutually exclusive policy options.

The thesis demonstrates that the community hold significant positive values for reducing the impacts of coal mining on streams, Aboriginal heritage, upland swamps, native vegetation and rural villages. The CM case studies also show that community welfare would be significantly reduced by any proposals that decrease the length of time that the mines provide employment. Social and cultural attributes are therefore relevant attributes for inclusion in CM studies of coal mining proposals. The thesis also provides evidence that the community holds positive economic values for the provision of biodiversity offsets, through planting and protection of vegetation in the landscape. Integration of the CM results into BCA demonstrates how nonmarket valuation can enhance the role of BCA as a tool for decision-making.

While CM has a number of strengths over other nonmarket valuation methods, its application can also be associated with a number of methodological issues, particularly around the framing of the questionnaire. A number of attribute framing issues in the application of CM are examined. Split sample analysis in the CM applications is used to examine the impact of including additional policy relevant attributes in choice set design, providing cumulative impact information instead of project specific impact information and using different temporal payment vehicles. The nonlinearity of the attribute representing employment provided by the case study mines, is also investigated.