

## **Estimating the Efficiency of Sustainable Development by South African Mining Companies**

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**ABSTRACT** The purpose of the study was to develop a model, using data envelopment analysis (DEA), in order to estimate the relative efficiency of nine South African listed mining companies in their efforts to convert environmental impact into economic and social gains for shareholders and other stakeholders. The environmental impact factors were used as input variables, that is, greenhouse gas emissions, water usage and energy usage, and the gains for shareholders and other stakeholders were used as output variables, that is, number of employees, taxes, donations, dividends and reinvestments. The study found substantial differences between the relative efficiency of gold-mining companies and the efficiency of all the other mining companies, where gold-mining companies were the most inefficient to convert their environmental impact into economic and social gains. The practical implication is that gold-mining companies should use the coal- and platinum-mining companies indicated in this study as a benchmark for best practice in sustainable development. Further research is recommended, that is, since more companies are willing to report on their environmental impact, a similar study should be conducted to include more mining companies from different sectors. This will allow a greater discrimination between the companies due to the larger quantity of data and a better comparison can be made between mining companies in the different mining sectors.