

# ESTABLISHING ABATEMENT ALTERNATIVES IN CONSTRUCTION

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Construction operations consume energy and due to the associated emission of greenhouse gases (GHG), leave negative environmental impacts. Many construction contractors look on emission mitigation efforts as being counter to profit and of secondary priority. However, due to increased social pressure, contractors are being obliged to reduce energy consumption and mitigate emissions. This paper focuses on emissions during construction. The aim of this research is to provide construction contractors with an understanding of the effectiveness and cost of available abatement alternatives and aid them in making profitable decisions while minimizing project emissions. Based on data from a road construction project, required material quantities, available suppliers, delivery vehicles and the NONROAD model, the cost and emissions of each possible procurement alternative are compared. The abatement curves are used to present the results. It is shown that by simply considering emissions in decision making, changing material supplier can help mitigate emissions. It demonstrates that for contractors who intend to make environmental friendly decisions, there exist affordable alternatives.

**Keywords:** construction operations, abatement curves, greenhouse gases, emissions, energy consumption.

## INTRODUCTION

The push to examine carbon emissions is driven by obligatory and voluntarily regulations aimed at reducing greenhouse gases (GHG) set in response to global concerns over climate change issues. Minimizing carbon footprint is seen as a global priority and an important step towards sustainability (Piratla *et al.*, 2012).

Construction industry not only consumes energy, but also emits GHG which lead to climate change and global warming (Guggemos and Hovarth, 2005; Dixit *et al.*, 2010). Although compared with other industries, each individual construction project may not contribute to a large quantity of GHGs but the aggregate GHG product of the large number of construction projects is significant. For example, the construction industry is responsible for 40% of the primary energy use, and 36% of the energy related CO<sub>2</sub> emissions in industrialized countries (Blengini and Di Carlo 2010). In addition, in the United States, the construction industry ranks third after cement and steel production industries which supply construction projects with required material for its CO<sub>2</sub> emissions per unit of energy used as input (Avaetisyan *et al.* 2012).

However, when it comes to mitigation efforts, construction contractors, look at environmental issues generally as being counter to profit and secondary priority

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# Environmental Policy A Sociological Assessment Of Abatement Alternatives

**Eliot R. Hammer**



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**Environmental Policy** Eliot R. Hammer, 1977 Estudio de las directrices principales de las políticas seguidas en defensa del medio ambiente Se acentúa sobre todo el problema de la asignación de recursos en relación con las directrices económicas Housing and Planning References, 1977 **Housing and Planning References** United States. Department of Housing and Urban Development. Library, 1977 Directory of Environmental Sociologists Riley E. Dunlap, 1975 Social Science, 1978 **Social Sciences**, 1977 Selected Library Acquisitions United States. Department of Transportation, International Social Science Review, 1978 **Inventory of Federal Energy-related Environment and Safety Research for ...**, 1978 *Inventory of Federal Energy-related Environment and Safety Research for FY 1977* United States Department of Energy. Environmental Impacts Division, 1978 ERDA Authorization United States. Congress. House. Committee on Science and Technology. Subcommittee on Energy Research, Development, and Demonstration, 1975

**Multicriteria Evaluation in Physical Planning** P. Nijkamp, P. Rietveld, H. Voogd, 2013-10-22 The aim of this book on the use of multiple criteria analysis in physical planning is to synthesize most of the relevant work in this field Its first objective is to provide a concise and systematic overview of the state of the art in the area of multiple criteria analysis with a strong emphasis on practical use and planning Secondly this book attempts to show the wealth of potential applications of multiple criteria analysis by providing a presentation and discussion of various real world uses of multiple criteria decision making in the practice of physical planning The book is mainly intended as a textbook for practitioners in the field and for students in the areas of physical planning regional and urban economics geography transportation science and environmental management **Inventory of Federal Energy-related Environment and Safety Research for FY 1978**, 1979

**Greenhouse Gases** Guoxiang Liu, 2012-03-09 Understanding greenhouse gas capture utilization reduction and storage is essential for solving issues such as global warming and climate change that result from greenhouse gas Taking advantage of the authors experience in greenhouse gases this book discusses an overview of recently developed techniques methods and strategies Novel techniques and methods on greenhouse gas capture by physical adsorption and separation chemical structural reconstruction and biological utilization Systemic discussions on greenhouse gas reduction by policy conduction mitigation strategies and alternative energy sources A comprehensive review of geological storage monitoring technologies *SME Mining Engineering Handbook, Third Edition* Peter Darling, Society for Mining, Metallurgy, and Exploration (U.S.), 2011 This third edition of the SME Mining Engineering Handbook reaffirms its international reputation as the handbook of choice for today's practicing mining engineer It distills the body of knowledge that characterizes mining engineering as a disciplinary field and has subsequently helped to inspire and inform generations of mining professionals Virtually all of the information is original content representing the latest information from more than 250 internationally recognized mining industry experts Within the handbook's 115 thought provoking chapters are current topics relevant to

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