

**SUSTAINABLE PROJECT LIFE CYCLE
MANAGEMENT: CRITERIA FOR THE SOUTH AFRICAN
PROCESS INDUSTRY**

by

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Dissertation Summary

Sustainable project life cycle management: Criteria for the South African process industry

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DEGREE: *"Nature is neutral."* MSc. Industrial Engineering

KEYWORDS: *Man has wrested from nature*

the power to make the world a desert

or to make deserts bloom.

There is no evil in the atom; only in men's souls."

- Adlai Ewing Stevenson, 1952.

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Sustainable development aims to meet present needs without compromising the ability of future generations to meet their own needs. The concept has three definite objectives namely social equity, economic efficiency and environmental efficiency. Sustainability criteria are becoming factors within international trade agreements and governments worldwide are introducing more stringent legislation with regards to environmental issues in order to address sustainability. Business sustainability is thus becoming a prerequisite for global competitiveness and companies worldwide are adapting core competencies, policies, culture, business processes and decision-making processes to incorporate the objectives of sustainable development. Project management, as a core competency, must therefore incorporate planning, execution and implementation procedures within the broader sustainability framework.

The strategic importance of project management drives the integration of environmental and social objectives into a life-cycle project management framework, since economic aspects of sustainability are effectively considered in current project appraisal procedures. The aim of this dissertation is to develop a decision-making framework for projects in the South African process industry that incorporates **environmental sustainability**. Social aspects are not

considered at first because the incorporation of sustainability into businesses traditionally start by focussing on environmental aspects only.

The necessary environmental management tools and approaches to address environmental sustainability do exist, although all of the tools are not utilized in the current project life cycle management framework. The dissertation therefore proposes the promotion of other environmental management tools within this framework. An Environmental Evaluation Matrix (EEM) tool has been developed as part of the dissertation. The EEM tool is proposed as a strategic tool that can bridge the gap between decision-makers and designers, while simultaneously providing key environmental information for decision-making purposes and prompting designers to consider environmental aspects often ignored. A case study identified strengths and weaknesses of the tool. It is evident that the concept can be effective but the scoring guidelines of the tool will have to be adapted to be company specific.

Environmental information can be incorporated into the decision-making process by either expressing it in financial terms or by expressing it separately and using multi criteria decision analysis techniques to weigh environmental and economic aspects against each other. At each evaluation point within the project life cycle one of the techniques, or a combination thereof, can be used.

The implementation of the proposals to incorporate environmental sustainability criteria into a project life cycle management framework requires a paradigm shift at all levels within the company. However, due support from top management is a necessity to ensure that environmental aspects are adequately supported by management practices.

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Evaluation Tool

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Chapter 1: Introduction **List of Abbreviations**

AIChE:	The American Institute of Chemical Engineers
BSC:	Balanced Scorecard
CORE:	Coalition for Environmentally Responsible Economics
CWRT:	Centre for Waste Reduction Technologies
EEM:	Environmental Evaluation Matrix
EIA:	Environmental Impact Assessment
EIO:	Economic Input-Output
EMS:	Environmental Management System
EPA:	Environmental Protection Agency (United States)
ERA:	Environmental Risk Assessment
IEED:	International Institute for Environment and Development
IEF:	Industrial Environmental Forum
IEM:	Integrated Environmental Management
IISD:	International Institute for Sustainable Development
ISIC:	International Standard Industrial Classification of all Economic Activities
ISO:	International Organization for Standardization
IUCN:	International Union for the Conservation of Nature/ World Conservation Union
GDP:	Gross Domestic Product
GRI:	Global Reporting Initiative
LCA:	Life Cycle Assessment
LCC:	Life Cycle Cost
LCCA:	Life Cycle Cost Analysis
LCE:	Life Cycle Engineering
NEPA:	National Environmental Policy Act
OECD:	Organisation for Economic Co-Operation and Development
SANF:	Southern African Nature Foundation
SEA:	Strategic Environmental Assessment
SIA:	Social Impact Assessment
SIC:	Standard Industrial Classification of all Economic Activities
TCAM:	Total Cost Assessment Methodology
UNDP:	United Nations Development Program
UNEP:	United Nations Environmental Program
WBCSD:	World Business Council for Sustainable Development
WCED:	World Commission on Environment and Development
WRI:	World Resource Institute
WSSD:	World Summit on Sustainable Development
WWF:	World Wildlife Fund/ Worldwide Fund for Nature