Assessing the Environmental Value of Water Treatment Solutions in the Mining Industry

Summary of Master's Thesis
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Research objective

The aim of this thesis is to develop a tool to assess the environmental value of water treatment solutions in mining industry. This study examines what kinds of methods to assess environmental impacts exist currently in the literature and practice, and aims to develop a specific tool for assessing the environmental value of water treatment solutions. Accordingly, the present study addresses the following research questions:

1. What kinds of methods to assess environmental impacts exist?
   a. What kinds of methods are present in the current literature?
   b. What kinds of methods are currently used by industrial companies?

2. What kind of tool could be used to assess the environmental value of water treatment solutions for the customers in mining industry?

Methodology

The present study was conducted by using a qualitative case study research method. The empirical data was collected through a total of 13 in-depth interviews, including respondents from the water treatment solutions supplier, one customer company from the mining industry, and external experts, such as environmental authorities and consultants. Most of the interviews were conducted face-to-face and later transcribed for further analysis with Nvivo9 program. Interview data was complemented with secondary data from the literature and from the case company's websites and annual reports.

Main Findings

Several methods for assessing environmental impacts were found in the literature, including life cycle assessment (LCA), eco-efficiency calculations, material flow analysis (MFA), footprint calculations and process simulation. Methods related to life cycle costing (LCC) and neoclassical valuation may be used to assess the financial value of environmental impacts. Also, based on the analysis of five industrial companies' websites, eco-efficiency and carbon footprint assessments are typical methods used in practice. Companies typically illustrate the results of their assessments by using informative charts or conversion formulas which present the environmental benefits as physical and/or financial units.

Based on the literature review and empirical research, the present study suggests an Excel based tool that utilizes reference data from previous customer cases and customer specific test results as a suitable method to assess the environmental value of water treatment solutions. The proposed tool can be used to demonstrate the functionality of selected water treatment solutions, including their impacts to both environmental and financial parameters in customers' processes.

Managerial Implications

The proposed tool can be used by the sales and application personnel in sales processes as a check list, reference list and in presenting test results. It also functions as a guide in comparing different water treatment solutions based on selected parameters, and it may also serve as a guide for gathering reference data from ongoing and future customer cases.
Given the increasing need for water treatment solutions, especially in the mining industry and the emphasis on improving environmental performance, there is a growing need for environmental assessments that consider activities in the mining industry. In this regard, the proposed tool may enhance the supplier’s images as it communicates the improved environmental aspects both to the customers and broader stakeholders, such as society. After all, transparency is a key in the success of industrial operations concerning the environment, such as mining industry. For example for mining companies, managing and understanding the environmental impacts of suppliers’ solutions is one factor that affects the so called social license to operate, which is received from the local society. The license enables continuing the business operations and affects the profitability of the business.