IDEA GROUP PUBLISHING
701 E. Chocolate Avenue, Suite 200, Hershey PA 17033-1240, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com
ITB10454

Chapter XIV

From "Industrial Symbiosis" to "Sustainability Networks"

Alfred Posch, Karl-Franzens-University Graz, Austria

Abstract

Industrial recycling networks are very effective in minimizing impact on the environment by building up closed loops of material and energy use within the industrial system. These interorganizational recycling activities among various industries can be a starting point for "sustainability networks," that is, systems of voluntary, but organized cooperation among different stakeholders with the common target of the sustainable development of society within a certain region. To work well, an overall vision of the sustainability network needs to be clearly defined and then translated into strategies and strategic objectives. These in turn need to be transformed into operational targets that can be measured by a comprehensive set of environmental, social and economic indicators. This procedure is quite similar to the balanced scorecard approach of Kaplan/Norton, which is

considered as an appropriate management information system not only for industry but also for sustainability networks. As part of inter- and transdisciplinary research and educational projects at the University of Graz the concept of sustainability networks is being implemented for the first time in the Eisenerz region, an abandoned iron-ore mining area in Austria.

Introduction

In the last few decades many industrial organizations have implemented an environmental management system (EMS) to comply with international standards, such as ISO 14000 and EMAS regulations. In addition to these intraorganizational activities the concept of "industrial symbiosis," emphasizing similarities between natural and industrial ecosystems, has emerged. The fact that a natural ecosystem tends to recycle all materials biologically, using only energy from the sun to "drive" the system, is used as a metaphor for industrial systems (Ayres & Ayres, 1996). The main idea of this attractive concept is to design industrial systems in a way that the by-products ("waste") produced by one company are used as a raw material by another company. The aim is to minimize industries' impact on the environment by building closed loops of material and energy use within the industrial system. The best-documented example here is Kalundborg in Denmark, but the industrial recycling network in Styria, Austria, has also become a well-known case in the field of industrial symbiosis (Strebel, 2002). While in Europe the main focus lies on the waste exchange relationships among existing companies within a certain area (Schwarz, 1994; Strebel, 2000; Wallner, 1999), overseas the construction of so-called eco-industrial parks is considered the most effective way to implement the concept (Chertow, 1998). Whatever the case, the protection of the environment as the ultimate goal is achieved through collaboration and inter-company partnering. The totality of the firms involved and the recycling-oriented collaborative relationships between them is often represented in diagrams with vectors for each waste flow.

Characteristic for recycling networks is the participation of several different industries, since this makes a higher variety of processes available for potential recycling activities. Except for those industries where highly organized markets for recycling residuals are already used, such as in waste paper or scrap iron, recycling within a single industry is not usually inter- but intraorganizational.