



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

Application of the Concept of Industrial Ecology to the Integrated Management System: Advantages and Associated Environmental Improvements

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Abstract

The need for making human systems part of the natural ecosystems and similar to natural environment is clearly stated. This approach, which is the basis of Industrial Ecology, aims to enhance industrial symbiosis that might contribute to mitigate process or material loss. However, it is not very common to amend Industrial Ecology principles to management systems and furthermore, to Integrated Management Systems. Therefore, the main objective of this work was to evaluate the sustainability impact of integrating the Industrial Ecology approach to the existing Integrated Management System at an electro electronic company in Brazil.

The defined methodology followed the most important premises of Industrial Ecology aligned to the Integrated Management Systems requirements in the electro electronic sector. The case study was based on a worldwide company that presented all the segments within the sector, that is, microelectronics, surface mounting technology, printed circuit board, mounting and logistics. Moreover, the study considered material flow and performance analysis in order to define potential industrial metabolism and sustainability degrees, besides implementing an Industrial Ecology computer program that enabled better information communication and control.

It was possible to conclude that the Industrial Ecology concept tools used in the company did benefit its industrial sustainability because it allowed more efficient processes through the use of metrics, involved most of the employees and operations, favored better process standardization, enhanced the systemic approach making the decision process easier once it was based on real time facts. It was observed that it also contributed to the adoption of methods, systems and procedures that enabled deep strategic change and improved cultural change, which is one of the essential aspects of sound sustainable development.

Finally, it is suggested that Industrial Ecology be used as a fruitful metaphor for facilitating the improvement of sustainability. The tools developed in this study might be easily applied to any enterprise, independently of its size, level or production processes.

Keywords: Sustainability. Industrial Ecology. Industrial Metabolism. Balanced Scorecard. Key Performance Indicators.
