

# **Advantages of managing environmental impacts of products using PLM**

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Ann Arbor, MI, USA

March 2004

Environmental preservation has emerged as an important and urgent issue at the beginning of the 21<sup>st</sup> century. Traditionally, environmental concerns of a company were limited to “end-of-pipe” treatment in order to comply with regulations. However, the demand for environmentally friendlier and sustainable products is being increasingly observed in the market. Recognising this potential many corporations around the world have started taking proactive steps towards improving the environmental performance of their products. The governments of individual countries and international organisations have also raised the bar by implementing stricter regulations and evolving better environmental standards. Apart from compliance and philanthropy, the present environment oriented efforts of companies can be categorised into the following two broad areas:-

1. **Goal oriented design:** These include efforts towards increasing the energy efficiency, recyclability, reliability, serviceability, etc. of the product. Programs such as Design for Environment (DFE), Design for Assembly (DFA), Design for Disassembly (DFD), Design for Recycling (DFR), etc. are examples of these efforts.
2. **Environmental accounting methods :** These methods are employed to characterise and quantify the environmental impact of the product (and production). Examples of these methods include “ecological footprinting” and “life cycle assessment”. These methods are useful in identifying the key areas and goals to be pursued to reduce the environmental impact of the product.

In this project, we consider environmental management tasks within a Product Lifecycle Management (PLM) framework. In particular, we focus on life cycle assessment (LCA) of products and argue that significant benefits can be realized when the task is performed in a PLM environment. We present a conceptual model for LCA conducted within the PLM framework and illustrate its advantages when compared with the procedures followed today. PLM aims to create a framework that will allow efficient sharing of product data across the extended enterprise and throughout the product lifecycle. It is being looked upon as a tool that will allow dynamic collaboration within the organisation, thereby enabling more innovative products to be developed and introduced faster into the market. We propose that the PLM framework has the right components to overcome the problems commonly cited in using the LCA technique.

In the report, we explain the LCA activity and its implementation in industry. We discuss the benefits of LCA, its present limitations and the difficulties in carrying out a successful LCA study. We discuss the present notions of PLM and its suitability for supporting the LCA activity. Thereafter, we analyse a published LCA study conducted on automotive fuel tank systems to demonstrate the benefits of the PLM framework. We also discuss the role that PLM can play in facilitating design validation processes. We conclude by identifying areas for future research in order to enable incorporation of LCA studies under PLM.

