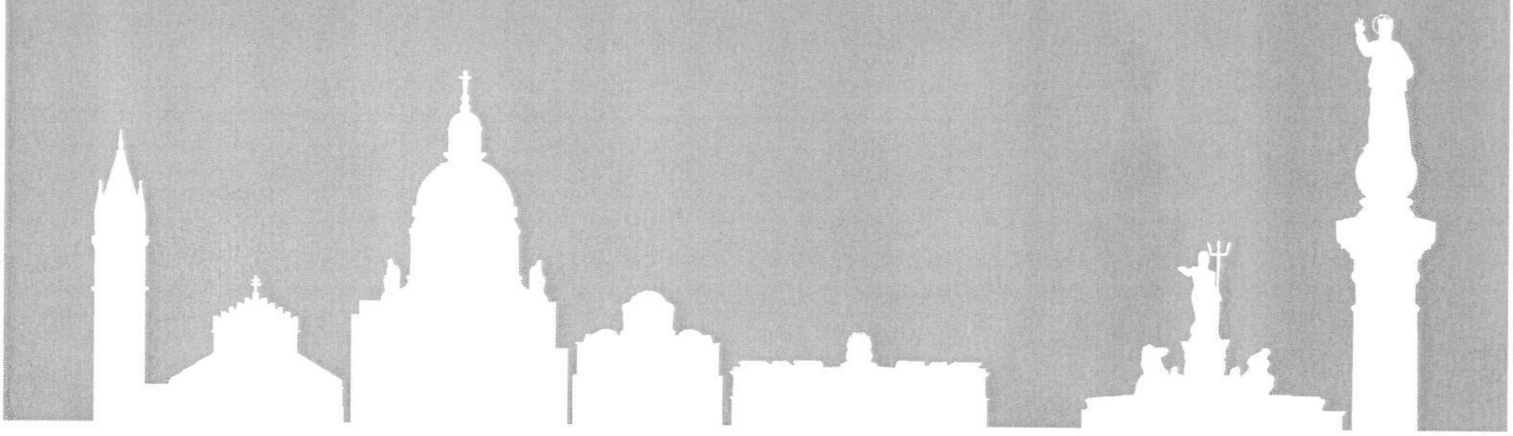
ACTIONS FOR A SUSTAINABLE WORLD

FROM THEORY TO PRACTICE



BOOK OF ABSTRACTS

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Department of Economics
Piazza Pugliatti, 1 – Messina (Italy)

Sustainable product design through Life Cycle Assessment: the S8-Vela environmental monitoring system

Prof. Riccardo Beltramo (University of Torino), Prof. Annalisa Romani (University of Firenze), Prof. Sergio Margarita (University of Torino), Prof. Stefano Duglio (University of Torino)

Eco-design is acquiring increasingly importance in Europe, especially after the publication of the Directive 2009/125/EC, providingrules for improving the environmental performance of products, such as household appliances, information and communication technologies or engineering.

In this general context, Life Cycle Assessment (LCA) methodology can play a fundamental role per greening products thanks to its core objective, the evaluation procedure to examine the energetic and environmental impact related to a product, process or activity. In fact, an LCA analysis is carried out by the identification and quantification of energy and materials used and the amount of waste released into the environment.

The paper aims at presenting the application of the LCA methodology to a specific kind of product, consisting of an environmental monitoring system made up of a sail-shaped monobloc structure, of solid chestnut, tinted with brown chestnut tannins, and a veneered MDF (Medium Density Fibreboard) base, for an approximately weight of about 11 kg. Moreover, the monitoring system is featured with three types of sensors for environmental control, related to the monitoring of the temperature, humidity and carbon monoxide parameter.

The methodology adopted is a complete LCA, from cradle to grave, carried out according to the International Standards ISO 14040 and ISO 14044 - not for third part verification –applied with reference to the monitoring system. For managing the LCA analysis, both primary data provided by Department of Agri-Food Production Sciences and of Environment (DISPAA) and secondary data by scientific publications have been used.

Furthermore, the impact assessment has been performed with the Ecoindicator 99 methodology, and Human Health (HH), Ecosystem Quality (EQ) and Resources (R) are the three conditions considered in the classification and characterization steps.

In accordance with the main results of the LCA application, it is possible to affirm that the subsystem of wood preparation has the largest impacts related to damage to HH and damage to R, as this subsystem is the most dependent on the use of electricity. Damage to EQ is mainly caused by the urea formaldehyde used as synthetic resin binder. Until now, the wireless sensors network (electronic components) has not been taken into consideration. This factor would be a severe limitation of the study, though this assessment can serve as a basis to evaluate the use of the product and its recycling. Therefore, we have identified a plan oriented to the LCA evaluation of electronics, which is rather complex due to the high number of small components, made of different materials, and to the difficulty of identifying the actors of the supply chain and their countries, from manufacturers to raw material providers.

Keywords: Life Cycle Assessment, sustainable product

UNIVERSITY OF MESSINA
Department of Economics
P.zza Pugliatti, 1 · 98122 Messina (Italy) ✆ +39 090.6767113
www.unime.it/it/dipartimenti/economia

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