



"Gheorghe Asachi" Technical University of Iasi, Romania



LIFE CYCLE ASSESSMENT OF WINE: FOCUS ON WATER USE IMPACT ASSESSMENT

**Iulia Maria Comandaru¹, George Bârjoveanu^{1*}, Nicolae Peiu²,
Simona-Andreea Ene¹, Carmen Teodosiu¹**

¹"Gheorghe Asachi" Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection,
Department of Environmental Engineering and Management, 73 Prof.Dr.Docent D. Mangeron Street, 700050 Iasi, Romania

²Environmental Protection Agency, 10bis Theodor Văscăuțeanu, 700464 Iasi, Romania

Abstract

This paper presents and discusses the possibility of using the life cycle assessment (LCA) methodology as a support instrument in water resources management. Traditionally, water is considered in LCA studies as a transport media for other impact generators and not as an impact category itself (i.e. damaged environmental component).

In this context, this study introduces and discusses the possibility of implementing two new impact categories in the life cycle impact assessment phase (LCIA) of LCA to account for the impacts of water consumption and discharge of wastewater flows to subsequent or downstream water uses. These two new indicators, named *consumptive water use* and *degradative water use* are implemented into the widely used Eco-Indicator 99 (EI99) LCIA methodology in the resources impact class and are tested in a LCA case study from a wine making industry. This research approaches the wine life cycle, since its production contributes to a variety of environmental impacts due to the high demand of water and energy.

The LCIA was performed using the classic Eco-Indicator 99 methodology and the updated methodology using the two new impact categories. The results have shown that the production phase in the wine life cycle generated the highest impacts, although the impact profiles are different for the two methodologies. Also, by using the classic EI99 methodology it is difficult to identify, quantify and analyze the water related impacts, while the proposed new methodology allows for an in-depth analysis of water related impacts, in terms of water consumption and wastewater discharges.

Key words: consumptive water use, degradative water use, life cycle assessment, water resources management, wine life cycle

Received: September, 2011; Revised final: February, 2012; Accepted: March, 2012

* Author to whom all correspondence should be addressed: e-mail: gb@ch.tuiasi.ro; Phone/Fax: +40 232 237594