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## A REVIEW LIFE CYCLE ASSESSMENT OF A SOLAR THERMAL COLLECTOR SENSITIVITY ANALYSIS, ENERGY AND ENVIRONMENTAL BALANCES

**Abstract:** All goods and services have an impact on the environment throughout its life cycle. European countries have focused their attention on this concept, given that improving eco-performance products / services focal point of the European Environment Programme. In other words, global environmental problems can only be solved if the use of energy and raw materials per unit of output decreases, or if you increase the eco-efficiency. The renewable energy sources are often presented as 'clean' sources, not considering the environmental impacts related to their manufacture. The production of the renewable plants, like every production process, entails a consumption of energy and raw materials as well as the release of pollutants. Furthermore, the impacts related to some life cycle phases (as maintenance or installation) are sometimes neglected or not adequately investigated. The energy and the environmental performances of one of the most common renewable technologies have been studied: the solar thermal collector for sanitary warm water. The aim is to trace the main energy and environmental impacts related to the whole product's life cycle. The following phases have been investigated: production and delivery of energy and raw materials, production process, installation, maintenance, disposal and transports occurring during each step.

**Keywords:** Life cycle assessment (LCA); Renewable energy; Solar thermal collector

## 1. INTRODUCTION

All goods and services have an environmental impact along their life cycle. On this concept the European countries have focused their attention, considering the improvement of the eco-performances of products/services as a key point of the *European environmental programme*. In other words, global environmental problems can be met only if

the use of the energy and the raw materials per product unit will be reduced, i.e. eco-efficiency increased.

The need to strengthen the 'green market' has been successively confirmed in another official document named 'the green paper on Integrated Product Policy (IPP)'. Once a product is put on the market, there is relatively little that can be done to improve its environmental characteristics. The IPP approach seeks to

















