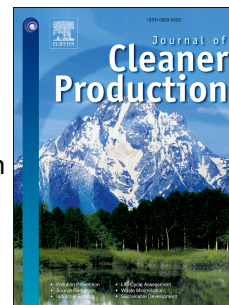


Accepted Manuscript

Integration of the environmental management aspect in the optimization of the design and planning of energy systems

Giorgos Theodosiou, Nikolaos Stylos, Christopher Koroneos



PII: S0959-6526(14)00575-7

DOI: [10.1016/j.jclepro.2014.05.096](https://doi.org/10.1016/j.jclepro.2014.05.096)

Reference: JCLP 4390

To appear in: *Journal of Cleaner Production*

Received Date: 23 October 2013

Revised Date: 20 May 2014

Accepted Date: 30 May 2014

Please cite this article as: Theodosiou G, Stylos N, Koroneos C, Integration of the environmental management aspect in the optimization of the design and planning of energy systems, *Journal of Cleaner Production* (2014), doi: 10.1016/j.jclepro.2014.05.096.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Integration of the environmental management aspect in the optimization of the design and planning of energy systems

ABSTRACT

The increasing concerns regarding the environmental pollution derived from anthropogenic activities, such as the use of fossil fuels for power generation, has driven many interested parties to seek different alternatives, e.g. use of renewable energy sources, use of “cleaner” fuels and use of more effective technologies, in order to minimize and control the quantity of emissions that are produced during the life cycle of conventional energy sources. The work presented in this paper focuses on the examination of the possibilities of integrating the environmental aspects in the preliminary phase of the conventional design and planning of energy systems in conjunction with other parameters, such as financial cost, availability, capacity, location, etc. The integration of the environmental parameter to the design is carried out within a context where Eco-design concepts are applied. Due to the multi-parameter nature of the design procedure, the tools that are used are Life Cycle Analysis and Multi-criteria Analysis. The proposed optimization model examines and identifies optimum available options of the use of different energy sources and technologies for the production of electricity and/or heat by minimizing both the financial cost and the environmental impacts, with regard to a multiple objective optimization subject to a set of specific constraints. Implementation of the proposed model in the form of a case study for the island of Rhodes in Greece revealed that an optimized solution both cost and environmental-wise, would be an almost balanced participation of renewables and non-renewable energy sources in the energy mix.

Download English Version:

<https://daneshyari.com/en/article/8103285>

Download Persian Version:

<https://daneshyari.com/article/8103285>

[Daneshyari.com](https://daneshyari.com)