

## Abstract Sheet (Bibliographical Entries)

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**Ntziachristos, I.,**

**Samaras, Z., Pattas, K.** (A.U.Th., Fac of Technology, Dept. of Mechanical Eng.),

*Δυνατότητα Χρήσης Ανανεώσιμων Πηγών Ενέργειας ως Αποκλειστικών Παροχών Ηλεκτρικής Ισχύος στο μη Διασυνδεδεμένο Ελληνικό Δίκτυο (Potential for the Use of Renewable Energy Sources as Exclusive Electrical Power Providers in the Non-Interconnected Greek Grid)*

**Tech. Chron. Sci J.T.C.G., IV**, Jan.- Dec. 2005, vol. 25, no 1-2, pp., tab. 1, ref. 9

*The current paper presents a study of coupling a wind turbine with a fuel cell to improve the utilization of wind power in the non-interconnected Greek archipelago grid. This hybrid system makes possible the storage of energy produced by the wind turbine and its supply for consumption under constant power, which can be absorbed by the grid of each island. The study presents the technology of the system and simulates its operation over a year using specially developed software and true wind speed input data. In this way, the energy availability to the grid can be estimated. Additionally, simplified methods for an initial investment evaluation are proposed which may be used to evaluate the substitution or even total replacement of conventional power generation stations with hybrid wind turbine and fuel cell systems. Finally the feasibility and economic viability of such an investment are analyzed.*

(Authors)

K-W: R.E.S., W/G, Fuel Cells, Power Systems, Storage, Wind Energy

**Gousgouriotis, I.I., Katsigiannis, Y.A.,**

**Georgilakis, P.S.** (Univ. of Patras, Fac of Technology, Dept. of Production Eng. & Management.)

*Οικονομική Αξιολόγηση Παραγωγής Θερμικής Ενέργειας από Βιομάζα (Economic Evaluation of Heating Energy Production from Biomass)*

**Tech. Chron. Sci J.T.C.G., IV**, Jan.- Dec. 2005, vol. 25, no 1-2, pp., tab. 10, ref. 24

*This paper proposes a methodology for the evaluation of the economic viability of investment plans for biomass heating systems. The factors participating in the development and application of biomass heating systems as well as the financial criteria used for the evaluation of the investment are analytically presented. The methodology is applied to the economic evaluation of two greenhouse-heating projects in the area of Chalkidiki, northern Greece.*

(Authors)

K-W: Biomass, Economical Evaluation, Thermal Energy, Energetic Biomass Utilisation, Technical – Economical Assessment, Biomass Heating

**Stergiou, K.** (T.E.I. Piraeus)

*Ένταξη Ανάλυσης Κατασκευών με τη Μέθοδο των Οριακών Στοιχείων σε Σύστημα Σχεδιασμού (Integration of the Boundary Element Method for the analysis of constructions in a CAD system)*

**Tech. Chron. Sci J.T.C.G., IV**, Jan.- Dec. 2005, vol. 25, no 1-2, pp., tab. 0, ref. 18

*When designing a construction using a CAD/CAE system, it is useful for the engineer to be able to perform stress calculations inside the integrated design environment of the CAD system they already use, without there being need for recourse to additional computing tools. Along with the widely used Finite Element Method (FEM), the Boundary Element Method (BEM) is also used to analyze constructions. The latter, besides the increased accuracy it offers, also provides the advantage of compatibility for the description of the required computational geometry by geometrically representing the object being designed in CAD. This paper presents an original method for automatically connecting the computational model to the “real” 3D geometry inside a CAD design system, using the NURBS-BREP representation of modern solid modelers.*

(Author)

K-W: BEM, CAD, NURBS-BREP, Machine Design

**Papakostas, K.,**

**Tsilingiridis, G., Kyriakis, N.** (A.U.Th., Dep. of Mech. Eng.)

*Βαθμομέρες Θέρμανσης 50 Ελληνικών Πόλεων (Heating Degree-days for 50 Greek Cities)*

**Tech. Chron. Sci J.T.C.G., IV**, Jan.- Dec. 2005, vol. 25, no 1-2, pp., tab. 1, ref. 14

*The purpose of this study was to determine and present heating degree-day data, for various base temperatures and for 50 Greek cities. The degree-day data for Athens and Thessaloniki were calculated based on hourly dry bulb temperature records from the meteorological stations of the National Observatory of Athens and the Aristotle University of Thessaloniki. Since hourly or daily temperature data were lacking for the other 48 cities, a reliable model was adopted for the estimation of their heating degree-days. The degree-day data were calculated for every month of the heating period and for base temperatures from 10°C to 20°C in 2°C steps. The results are presented in tabular form and can be used for the estimation of the required heating energy of buildings, according to the variable base degree-day method.*

(Authors)

K-W: Degree-Days, Building, Heating, Energy Prediction, Energy Consumption

**Pyrovolakis, A.,**

**Georgakellos, D.** (Univ. of Piraeus)

*Εκτίμηση Κύκλου Ζωής Ηλεκτρικής Ενέργειας από Τυπικό Ελληνι-*

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*κό Πετρελαϊκό Σταθμό (Life Cycle Assessment of Electric Power coming from a Typical Greek Petroleum Power Station)*

**Tech. Chron. Sci J.T.C.G., IV**, Jan.- Dec. 2005, vol. 25, no 1-2, pp., tab. 10, ref. 22

*The present Life Cycle Assessment (L.C.A.), includes all the life cycle's stages of 1Kwh of electric power, coming from the power station of Chania, which uses as fuel petroleum diesel. Moreover, it analyses the results of the life cycle inventory and conducts environmental impact assessment, using the Eco-Indicator '99 methodology. The crude oil is extracted in Iran and it is transported in the refinery of Eleusina, but also then under the form of Diesel in*

*Chania, with oil-bearing tanker ship. In the results' presentation, emphasis is laid on the air pollutants that contribute in the deterioration of human health and in the downgrading of the ecosystem quality. Furthermore, stress is put on the consumption of energy resources, like petroleum, electric power and thermal energy. For the completion of this assessment, apart from primary data, information has been sought in the internet, the existing bibliography, research programs and in the computer software G.E.M.I.S. (Global Emission Model of Integrated Systems).*

*(Authors)*

K-W: Life Cycle of Electric Power, Petroleum Power Plant, Life Cycle Assessment, Environmental Impact Assessment, Electrical Energy Production, Petroleum Thermal Powerstation