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Comprehensive utilization of energy in sugar factory using renewable energy sources, maximizing the power cogeneration.

E. Gil, L.A. Bujedo, L. Gorostiaga
FUNDACIÓN CARTIF
Parque Tecnologico de Boecillo,parc. 205,
47151 Boecillo (Valladolid), SPAIN
Phone/Fax number:+0034 983 546504, email:enrgil@cartif.es, luibuj@cartif.es, lazgor@cartif.es

Abstract.

In this paper we evaluate the implementation of renewable energy to process sugar and alcohol production. This has been applied to dynamic simulation techniques that provide quantitative information production in a Caribbean climate.

Key words

Renewable energy, sugar production, dynamic simulation, dried bagasse.

1. Introduction

The solar energy applications are many and varied: water heating, refrigeration production, ovens, dryers, etc. However, its application in an industrial level faces certain barriers and reticence that makes difficult its implementation:

Most industries are subjected to continuous production processes, which can not depend upon the availability of solar radiation, which in fact is capricious and in a specific way random, even if it is in terms of mean energy.

The elements devoted to transforming solar energy have low energy density; therefore, large areas are required to have enough energy and thus have some impact in the whole process.

The renewable energy based systems are generally not straightforward integrated into industrial production systems.

The usual rates of return in the companies are 2-3 years, although solar facilities are distance runners that can give benefits over longer periods (10-20 years). This statement is supported by the durability of these facilities, and considering a promising scenario in which prices are increasing for thermal energy based on burning fossil fuels, and electricity based on centralized production, and further transport and distribution to consumption points.

On the other side, the production plants present some advantages:

As they are continuous processes, their energy consumption are quite regular. Therefore, there are always available options for the use of renewable energy.

The production plants are generally large area facilities, thus helping in the placement of large quantities of solar collectors.

They have a wide variety of energy demands and thus, there are several points within the processes that can be exploited.

Hence, it is necessary to develop new initiatives for industrial applications that can provide experience and demonstrate the feasibility of solar energy in production environments

The IEA (Inernational Energy Agency) has been sensitive to this issue, under its program of Solar Heating and Cooling during the years 2003-2007. They analysed the applicability of solar energy in industry throughout the [1] Task 33 - Solar Heat for Industrial Processes, establishing the potential application of solar energy as a function of its thermal level.

Previously, [2] Dufie and Beckman in 1991, proposed some industrial actions for heating of both water and air, these being the two most commonly used fluids. They also showed some examples of industrial facilities, especially in the food industry.