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ENVIRONMENTALLY FRIENDLY POWER DISPATCH AT SUGAR PLANT WITH OPTIMUM BAGASSE UTILIZATION

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Abstract

Availability of alternate fuels for cogeneration helps to limit the amount of bagasse as fuel at sugar plants and make them available for other uses such as paper manufacture or ethanol production. Due to the increased awareness on the adverse effects of carbon dioxide emission on the environment, power plant operators are compelled to reduce emissions of pollutants during cogeneration. Selection of low pollutant fuels, tapping of renewable energy and use of efficient operating policies can help to reduce the emissions at sugar plants to some extent. This paper reports on an optimization study where a combination of bagasse, coal, other biomass and solar energy are used. Dried bagasse is more efficient and a less pollutant fuel. The bagasse at different levels of moisture content (MC) is also analyzed here. Minimization of the emissions and bagasse utilization are taken as the objectives with the combined use of coal and biomass along with the bagasse. The problem is formulated as environmental friendly power dispatch with optimum bagasse (EFDOP) and the optimization is performed for this multi-objective problem using sequential quadratic programming (SQP) algorithm in MATLAB. The results discuss the strategy for an economical and environmental friendly utilization of bagasse and other biomasses for sugar plants.

Key words: bagasse, biomass, cogeneration, carbon footprint, power dispatch, solar energy

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