

Technical-economical assessment of cogeneration project in the Brazilian sugar cane mills

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The present work is a technical and economical evaluation of cogeneration systems using high-steam parameters in the sugar mills, in order to obtain surplus electricity to be sold to the grid.

The assessment was based on the employment of condensing-extraction steam turbines with steam parameter of 4,2 MPa, 6,0 MPa and 8,0 MPa. During the off-season period, alternative fuels such as the cane trash, eucalyptus and natural gas were assumed to be used. According to the price of the different thermal equipment (boiler, steam turbine), the cogeneration systems implementation cost was considered. Furthermore, other two tools for the economic analysis were applied: the internal tax of return (TIR) and the liquid present value (VPL), so that feasibility of these systems could be determined. The analyses are accomplished by considering that part of the total investment is financed by BNDES (National Bank of Social Development) and the other one with own resources.

The sensibility analysis shows that the parameter that mostly influences on the cogeneration system design is the price of electricity. In addition, it was established which is the best investment variant depending on the sugar cane mill capacity.

Another result is the viable minimum sale price of electricity to the grid by using different complementary fuels.