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Abstract: This paper reports the results of analysis of technical and economic parameters on the specific cost of electricity production. The use of a particular technology determines the value of the investment needed for the construction of a power plant, its energy efficiency, internal electrical load of the power plant and its annual operating time. Besides, this cost is considerably dependent on the interest rate on the capital, fuel prices and environmental charges as well as, equally importantly, their variability in time. The variability in the prices of energy carriers and their mutual relations are inevitable for a number of reasons. As shown in the paper the change of the technical parameters in the range of the possible boundaries in a particular technology cannot considerably reduce the specific cost of electricity production. The reduction of the current price relation between gas and three-times cheaper coal (calculated per specific unit of energy) can considerably improve the profitability of the use of the gas-steam technology. When the ratio of the cost of fuel in the specific cost of electricity production is small, the impact of the fuel price on its value is also insignificant.

Key words: power plant; energy efficiency; electricity production cost; power technologies; exergy analysis; technical and economic methodology.

1. Introduction

The value of the specific cost of electricity production depends on the technology in which it is generated. The use of a particular technology determines the value of the investment needed for the construction of a power plant, its energy efficiency, internal electrical load of the power plant and its annual operating time. Besides, this cost is considerably dependent on the interest rate on the capital, fuel prices and environmental charges as well as, equally importantly, their variability in time. The variability in the prices of energy carriers and their mutual relations are inevitable for a number of reasons. One of them is relative to inflation, other ones are relative to economic fluctuations, including the detrimental effect of political instability.

The technical and economic parameters discussed above determine the value of the specific cost of electricity production to a various degree [1]. What is more, the range of the variability of these parameters is limited in a given technology, except for such economic parameters as fuel prices, fees and charges in environmental policy. Hence, it is necessary to perform an analysis involving the find an answer to two questions, first of which regards the impact of the above parameters on the value of the specific cost of electricity production, whereas the other concerns the fact how the variability of these values in a given technology can lead to the reduction of the specific cost of electricity production.
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