



## MS EXCEL MODEL FOR ECONOMICAL ANALYSIS OF HEAT SUPPLY AND ITS ENERGY EFFICIENCY INCREASING

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### ABSTRACT

Within the framework of the research there has been completed the analysis of the fuel cost ratio in the costs of heat generation depending on the type and the capacity of a heating boiler house (BH) and the type of fuel.

The effect of the fuel prices growth on the fuel cost ratio in heat costs, which is being solved by a mathematical model based on the application of MS Excel software program, was analysed in the paper. The mentioned model can be also applied in analysing the environmental factor effect on heat costs in BH depending on the natural resource tax and national environmental policy.

Perspectives of decentralized heat supply system, bearing in mind several indefinite conditions, were analysed in the paper. In the nearest future the fuel prices can change, thus considerably affecting the economic efficiency of the BH and the environmental system. Therefore, while applying the model, there are analyzed the costs of the heat power generated by the BH depending on changes of the fuel prices. Another essential factor that can possibly affect the heat costs is the intensification of environmental restrictions. Thus, the effect of how environmental taxes affect the heat costs in the BH is set as the basis of the ecological factor effect analysis method. The developed model provides the possibility to analyse the ecological factor effect on the efficiency of the BH.

Important part of the work is dedicated to the analysis of the heating boiler house IRR project depending on the planned boiler's energy efficiency. In the case IRR reaches the lowest permitted value at the assumed boiler's efficiency, it would be necessary to improve boiler's efficiency or to choose another boiler house project by applying the developed method and model.

In the completed research there are exploited such methods as mathematical statistics, system analysis, energy balance, etc. The main stress in the research is granted to the selection of the decentralized heat supply system energy sources (BH). It is assumed that the energy resource supply and the parameters of the consumer are optimal, and they are in compliance with the modern technologies.