RESEARCH COGENERATION UNITS BIOTEPLOGENERATORA SIMULATION TOOLS

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The main ways of solving the problem of energy independence of Ukraine is using the principles of co-generation based on alternative, renewable fuels, in particular - the conversion of solid waste into energy resources. A significant disadvantage of solid fuel heat generators is that during their work they dissipate large amounts of heat, which, moreover, is also a source of thermal pollution. Therefore, it is appropriate to use thermal emissions recovery systems as a source of electrical energy for power supply backup heat source. To realize this task can using thermoelectric energy converters. Therefore, the urgent task is to determine the feasibility of thermoelectric modules as part of a cogeneration system as a source of the accumulation of heat emission electric heating equipment.

Usually thermoelectric equipment used for waste heat recovery mode the heat generator temperature changes (thermoelectric generator is in contact with the heated surface, which gives off heat). In this case, it is appropriate placement thermoelectric modules chimney that will not only accumulate energy, but also reduce heat emission to the atmosphere.

To confirm the feasibility of implementing the thermoelectric modules chimney heat generator CHP developed its physical model.

Experimental studies on the basis of a physical model made in this way. With hot side heater heated to temperatures of 150 ° C, 140 ° C, 130 ° C, 120 ° C, 110 ° C, 100 ° C. According fixed value fed power. At this time the cold side cooled for ΔT = 100 ° C. Fixed rates generated voltage (current and voltage to determine power). So having the power generated was determined and announced efficiency module.

The results of the experiments are constructed curves that reproduce dependency efficiency of TEG load resistance (R) and the temperature on the hot side (Tg) at constant ΔT = 100 ° C. The results showed that the highest efficiency while ensuring nyschoyi module temperature on the hot side, subject to constant ΔT = 100 ° C.

To optimize a cogeneration system we have developed its simulation model that reproduces the system under different operating and environmental parameters.

Choose how simulation due to the fact that simulation, unlike the analytical method does not require the uniqueness of computational procedures. This allows you to play algorithm of the investigated object over time at various combinations of system parameters and environment

Using simulation and physical model allows to analyze the efficiency of thermoelectric elements as a source of independent power control systems based on cogeneration solid bioteploheneratora.

The proposed method of using thermoelectric modules in cogeneration plants based on solid fuel heat generators, to generate electricity from heat emission in an amount sufficient to implement independent backup power system process control. A comprehensive simulation model of the CHP and heat generator based thermoelectric module with integrated control modes that lets you check the adequacy of the system in normal and critical conditions.