

Mathematical model of competitive equilibria on the electricity market of Mongolia

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As known, the modeling of economical conflicts via Game Theory is a natural tool for this purpose [1]. For example, a bimatrix game can be applied for analysis of the duopolies [1, 2, 5]. A greater number of competitors in the oligopolistic market requires the use of at least polymatrix games tool [1, 3].

A problem of competition between three countries (Mongolia, Russia, China) on the electricity market of Mongolia is investigated. Modeling of the conflict is carried out using the apparatus of three person polymatrix games (hexamatrix games). To find a Nash equilibrium in the constructed game we use an approach based on its reduction to a non-convex optimization problem with bilinear structure in the objective function [3]. To solve the latter problem we apply Global Search Theory due to A.S. Strekalovsky [4]. According to the theory, local and global search algorithms for formulated game are developed. Local search method is based on the idea of sequential solving of auxiliary linear programming problems followed from the formulation of the problem. Global search based on a specific Global Search Strategy in the d.c. maximization problems as the objective function of the reduced optimization problem can be represented as a difference of two convex functions [3]. The results of a computational simulation is presented and analyzed.

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