

**ABSTRACT**

**Energy saving**

**G. B. VARLAMOV, K. O. PRYIMAK, H. SCHWARCZOV. GENERAL APPROACHES TO SHAPING METHODOLOGICAL FOUNDATIONS OF ENERGY AND ENVIRONMENTAL ANALYSIS OF FEC FACILITIES.....2**

*The paper deals with the preconditions and the need for methodological foundations for energy and environmental analysis and management of operation of fuel and energy complex (FEC) facilities. It analyses the negative impacts of FEC energy facilities on the environment. The contributors proposed principal approaches to implementing a complex of environment protection measures and addressing air pollution using complex system energy and environmental analysis and management energy facilities operation.*

**A. V. BELOUSOV, S. N. GLAGOLEV, YU. A. KOSHLICH, A. B. BYSTROV. ENERGY SAVING DEMONSTRATION AREA AT BSTU NAMED AFTER V. G. SHUKHOV - A BASE FOR DEVELOPMENT OF ENERGY EFFICIENT PROJECTS IN THE REGION.....10**

*The paper outlines the interuniversity distributed energy saving demonstration area at Belgorod State Technological University (BSTU) named after V.G. Shukhov comprised of process facilities of universities, residential areas and production enterprises. It presents the area's structure and main elements. Special attention in the demonstration area is given to the use of renewable energy sources and the use of web-based access to process information.*

*Key words: energy saving, demonstration area, automated dispatch control system (ADCS), energy efficiency, renewable energy sources, web-based access.*

**D. A. KOVALEV, A. A. BOBUH. IMPROVEMENT OF ENERGY EFFICIENCY IN PRODUCTION AND USE OF GEOTHERMAL ENERGY DUE TO AUTOAMTION OF TECHNOLOGICAL PROCESSES.....18**

*The paper considers issues of energy efficiency of engineering systems of housing and utility sector in production and use of geothermal energy due technological processes automation. The studies resulted in development of a functional diagram of automation of technological processes in office areas when producing and using geothermal energy during the heating season for the four cycles of heat transfer.*

**V. G. KUZNETZOV. CONTACT WIRE WEAR PATTERN FOR ELECTRIC ENERGY LOSS CONTROL IN TRACTION NETWORKS.....24**

*The paper builds a pattern of average wear of contact wires for indirect methods of electric energy loss control in traction networks of trunk railway lines.*

**A. B. BIRUKOV. ANALYSIS OF MEASURES TO IMPROVE FUEL EFFICIENCY VALUES IN HEATING OF METAL IN FURNACES.....31**

*The paper gives functional dependencies developed to allow determining control magnitude depending on required level of relative fuel saving for measures aimed at reduction of fuel consumption in heat treatment of work pieces in furnaces by increasing fuel efficiency value. This theoretical and practical tools allow goal-oriented reconstruction of furnace units and assess the feasibility of proposals by third-party organizations.*

**Power engineering**

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*The paper substantiates three-level segmentation of retail electricity market, defines reasonable criteria for segmentation considering specifics of electricity consumers due to the regulation of power consumption conditions. Based on three criteria it offers flexible systems of price differentiation that encourage consumers to form an energy-efficient schedule for electric loads.*

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*The paper describes the main features of the division of labor in automation of production processes and creation of flexible manufacturing systems.*

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*The paper considers the most developed system of industrial energy management created on the basis of the international standard ISO 50001.*

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**V. A. KYTOVOY, APPROXIMATING ANALYSIS OF EXPERIMENTAL DATA FOR HETEROGENEOUS ENVIRONMENTS DRYING PROCESS.....**

*The paper offers approximating analysis of experimental data of the heterogeneous environments drying process and develops a general approach to obtaining mass transfer coefficients inside the material to be dried.*

**B. V. SITNIKOV, EFFECT OF PARAMETERS OF CONDITIONS OF TUNGSTEN ELECTRODE WELDING IN ARGON ON FORCE ACTION OF THE ARC AND SEAM FORMATION.....70**

*The paper gives data on the effect of parameters of conditions of automatic tungsten electrode welding in argon on force action of the arc and seam formation that can be used to improve the quality of joints in high-speed welding.*