ABSTRACT

Energy saving

The paper gives a review of main scientific works of the Chair of Industrial and Biomedical Electronics of the NTU "KhPI" in the field of electromagnetic compatibility of conversion systems and energy saving: compensated controlled rectifier, theory of instantaneous active and reactive powers, transformation of coordinates of voltage and current space vectors, calculation of energy losses and efficiency factor in a power supply system and practical application of results of scientific research. This paper presents the first part of the review of scientific works of the chair. Bibl. 35, Fig. 6, Tabl. 2.

Key words: *power supply system, efficiency factor, compensated rectifier, power theory, active power filter, active rectifier, compensated asynchronous machine, distributed production of electric power*

The paper is dedicated to research into some aspects of improvement of efficiency of building fronts design using analysis of their main problems, trends and directions for development at the recent stage.

Average values of electric power losses and the loss coefficient for trial areas were determined using simulation modeling. Regression equations that allow determining loss coefficients were received for the areas of direct and alternating current.

The paper presents the results of theoretical research of a number of design measures for heat insulation implemented in the process of redesigning of a large-panel five-storeyed residential building.

Power engineering

The paper develops a method for thermodynamic testing and evaluation of environmental markers of modern heat pump equipment. Due to the use of this method an environmental and energy analysis of chillers and heat pumps was made for the first time ever.

The paper develops a hypothesis of three-component energy potential of wood stipulated by the discrete character of its charge into the pyrolysis heat generator, when all stages of thermal destruction of this type of fuel occur simultaneously.

ABSTRACT

The work on the formation of the proposals for the second reading of the draft law "On the Principles of Functioning of Electricity Market of Ukraine" (Registration No. 0916 dd. 12.12.12) was completed. The drafters note that even after the adoption of the law the work to improve its certain provisions will continue throughout the transitional period until the formation of a full-scale electricity market.

However, the stance of the law regarding balancing and responsibility for imbalances even now requires studying the practices of producers of electricity from renewable energy sources (RES) in market conditions. Particularly important in this regard is the practice of manufacturers of electricity from interruptible RES (using solar and wind energy), because the accuracy of forecasting of the capacity, production volumes and schedules of such electricity affects the efficiency of operation of the electricity market and power system as a whole.

This paper presents a comparative review of operating conditions of producers using RES in the electricity markets of developed countries. Collection and analysis of such information is an important step in the process of determining the nature of the relations among market actors.

Ekonomy

The paper deals with the problems of improvement of regional level investment infrastructure in conditions of market economy, which should facilitate effective development of the social and economic sphere and the real sector of economy.

Scitntific and technical progress and efficiency of production

The paper considers mathematical models of electromagnetic and temperature fields in the area of end-face bus packages of alternating current graphitization furnaces. It identifies active, reactive and complete electrical impedances of end-face buses, current leads and side bus packages, investigates distribution of currents and electric losses in parallel end-face buses and current leads. It offers a method for selection of effective cross-section of end-face buses based on the criteria of equal load, which ensures reduction of weight and electric losses in the end-face electric buses.

The paper presents the results of the study of the specifics of degradation of structure of welded seams in steam pipelines of heat resistant perlitic steels in continuous operation in conditions of creep flow and low-cycle fatigue.