

Complex Problems of Power Systems Based on Renewable Energy Sources

ROKHMAN B. (Kyiv). Investigating various schemes of steam-oxygen gasification of coal in a vertical in-line gasifier under a pressure of 3 MPa.

There has been obtained detailed information about the work process in in-line reactor at one-and two-stage steam-oxygen gasification schemes for coal and lignite under a pressure of 3 MPa.

The dependences of mass flow ratio (O_2 to coal and H_2O to coal) over the type of fuel source have been stated; their optimum values for gasification process by Shell technology have been found. Having got the set ratio for gas coal and lignite costs there have been found optimum particles' diameters that ensure minimal mechanical partial combustion of a binary coal mixture.

It was revealed that methane content of synthetic gas within two-stage gasification process is considerably higher than for a single stage. The advantage of using coke-and-ash residues scheme over recycling balance over single-pass two-step process has been shown.

MANILOV A. (Kyiv). Outlook for silicon raw material application in hydrogen power industry.

There have been considered promising ways of resource-saving process based on using cheap silicon raw materials and semiconductor industry wastes in hydrogen energy production. The possibilities of processing raw materials into hydrogen sources based on crystalline, nano-sized or porous silicon have been analyzed. Modern H_2 generation technologies have been discussed and the appropriate applicable schemes have been chosen. The energy efficiency of different composites as hydrogen storage source has been compared.

MATYAKH S. (Kyiv). Solving two-dimensional problem in modeling the distribution of charges in photovoltaic and electrochemical converters.

The article presents problem solution of two-dimensional charge distribution with non-linear parameters of their transfer to photovoltaic and electrochemical converters using adaptive numerical algorithm with a fully non-uniform grid and recursive subnets.

DONETS' A., KHIL'KO V. (Kyiv). Some issues of wind-diesel power plants production.

There have been defined principles that would ensure electricity quality for an autonomous wind-diesel power plant depending on changes in electricity consumption and variability of wind load at wind power plants.

There have been grounded optimization measures of an autonomous wind-diesel power plant according to the criteria of saving fossil fuels and achieving technically possible performance.

NAKASHYDZE I. (Dnipropetrovsk). Economic component of using power-supply network constructions in the systems utilizing alternative power sources.

There have been considered the approach to evaluate cost-effectiveness of power-supply network constructions that use alternative energy sources. There have been processed methods showing the advisability to carry out economic assessment of energy systems with power-supply network constructions.

Solar Energy

SHKLYAR V., DUBROVSKA V., KARPENKO D. (Kyiv). Utilizing solar energy in PV systems.

There has been considered practicability issue of solar energy utilization for electricity production by photo cells in Ukraine. The comparative analysis of the most applied photo cells has been carried out. The characteristic of various photovoltaic systems with single-crystal KV-255M panels and its additional equipment has been provided. The current state of production and the equipment costs for PV systems in Ukraine have been presented. Technical and economical analysis of these systems for three areas of Ukraine has been performed.

BEKIROV E., ALIEVA Z. (Simferopol). The method of calculating parameters of a wall water radiant panel heating system.

The article considers the method to calculate wall-radiant panel heating system. The method of calculation of heat transfer heating concrete structures. Hydraulic calculation of a wall heating system has been considered.

Wind Energy

KUDRYA S., PERMINOV Yu., BUDYONNYI I. (Kyiv). Some design features of synchronous high-power wind turbines with permanent magnet excitation.

The article describes calculation algorithm for synchronous high-power wind turbines. Design peculiarities have been indicated.

GOLOVKO V., KOKHANEVYCH V. SHYKHAILOV M. (Kyiv). Determining the impact of the blades' geometric parameters over rotor energy performance.

There have been presented studies' methods and results showing the influence of profile aerodynamic indexes on blade geometric parameters when determining power characteristics of wind turbine rotor.

KUZNETSOV M., KARMAZIN O. (Kyiv). Ukrainian power grid state-of-the-art and possible wind power plants impact.

Power consumption and the corresponding electricity generation have got random nature. Wind power integration into the grid introduces an additional random factor. Wind farms impact over the amount of spare capacity requirements depends on wind farms total capacity, their location, forecast accuracy and season of the year. Wind farms impact Result can be evaluated on the example of grid actual data as well as synchronous data on wind speed in different regions of Ukraine. The use of internationally accepted methods of analysis indicates a relatively minor nature of this impact.

KARMAZIN O. (Kyiv). The problems of blending wind farms into overall balance of Ukrainian integrated energy systems.

The analysis of generating sources' structure as well as actual condition of thermal power plants of integrated Ukrainian energy system has been made. The main problems of blending wind farms in the overall balance of Ukrainian integrated energy systems have been defined.

PER'KOVA I. (Kyiv). Evaluating wind energy potential for irrigation purposes in southern regions of Ukraine.

There have been presented studies' methods and results evaluating wind energy potential in southern regions of Ukraine for vegetable crops irrigation.

Hydroenergy

VAS'KO P., MOROZ A. (Kyiv). **Small hydropower of Ukraine. State-of-the-art and potential.**

The current state, potential and environmental requirements for further of small hydropower development in Ukraine within the framework of existing legislation have been determined.

Geothermal Energy

VELYCHKO V. (Kyiv). **Performing experimental studies of mountain massif temperature around vertically installed heat exchanger.**

There have been carried out experimental studies of mountain massif temperature field around vertical heat exchanger in cold medium circulation environment. The experiment

included studying temperature field recovery process when the cooling process is terminated.

BIOENERGY

LUDANOV K. (Kyiv). **Transpiration mechanism of capillary transportation in plants xylem.**

The article deals with the problem of capillary transportation of minerals' aqueous solution in a plant xylem due to transpiration process. Basing on analysis of driving forces balance (capillary forces, gravity and viscous friction) there have been gained and integrated differential equations of fluid flow in the xylem consisting of capillaries with variable cross section. The vertical profile of a capillary for maximum water flow has been obtained. Based on the obtained formula for minimum radius capillary as well as Thomson law for vapor pressure over a concave meniscus there has been obtained an expression of maximum capillary length influenced by the atmospheric humidity.

**XII МІЖНАРОДНА СПЕЦІАЛІЗОВАНА ВИСТАВКА
ЕНЕРГЕТИКА В ПРОМИСЛОВОСТІ-2014**

ЕЛЕКТРОТЕХНІЧНЕ, СВІЛОТЕХНІЧНЕ ОБЛАДНАННЯ, КАБЕЛІ ТА ПРОВІДИ, ЛІНІЇ ЕЛЕКТРОПЕРЕДАЧ, АВТОМАТИЗАЦІЯ, КВПІА, ЕЛЕКТРООБЛАДНАННЯ УСТАНОВОК, МАШИН І МЕХАНІЗМІВ, ЕНЕРГЕТИЧНЕ МАШИНОБУДУВАННЯ

СПЕЦІАЛЬНІ ТЕМИ:
СИСТЕМИ КОНТРОЛЮ І ОБЛІКУ ЕНЕРГОРЕСУРСІВ • УСТАТКУВАННЯ ЕЛЕКТРИЧНИХ ПІДСТАНЦІЙ

**XII МІЖНАРОДНИЙ ФОРУМ
ПАЛИВНО-ЕНЕРГЕТИЧНИЙ КОМПЛЕКС УКРАЇНИ:
СЬОГОДЕННЯ ТА МАЙБУТНЄ**



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**23-25
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