

Complex Problems of Power Systems Based on Renewable Energy Sources

DOBROVOLSKYI V., YERSHOVA O., SOLO-NIN Yu., KOVAL A. (Kyiv). **Thermal stability and kinetics of hydrogen desorption from MgH₂ hydride phase of mechanical alloy Mg + 10% weight Al + 10% weight Ti.**

With the aim of lowering the temperature, improving the kinetics of stoichiometric hydride MgH₂ decomposition there were investigated the possibilities of its complex doping Al and Ti by mechanochemical synthesis. It has been stated that adding 10% by weight. Al + 10% mas. Ti to magnesium reduces the thermal stability of the resulting RMS hydride MgH₂ mechanical alloy phase and, consequently, decreases hydrogen desorption start temperature starting from 315°C (undoped phase MgH₂) to 288°C. Reducing the temperature of hydrogen desorption start point that could indicate a decrease of thermodynamic stability MgH₂ by mechanical Al and Ti alloying, has not been established. Adding aluminum with titanium to magnesium significantly improves the kinetics of hydrogen desorption from the hydride phase MgH₂ mechanical alloy produced by RMS.

BURKOVA E., BURKOV D. (Sevastopol). **Environmental assessment of safety level for heat supply systems in municipal facilities (on the example of Balaklava district).**

The article considers boiler-houses operation influence on the environment in Sevastopol, Balaklava district. There has been offered a method to assess the level of environmental safety in heat supply systems for households and municipal utilities.

Solar Energy

BONDARENKO D. (Kyiv). **Using solar panels for autonomous environmental monitoring systems.**

The paper presents an autonomous system of environmental monitoring; it suggests the equipment and shows solar photocells feasibility. The calculations have been made too.

USHKALENKO O. (Kyiv). **Online resource for PV power plant sizing.**

In the current article you can read about online resource launch containing pages for PV plants sizing, e.g. PV field and batteries capacity evaluation. The computation is performed on power balance base. The power was generated by PV power plant and consumed by the load during specific operation period.

Wind Energy

KUZNETSOV M. (Kyiv). **The impact of wind power on the energy system static stability.**

Variables and uncontrollable wind energy could have a negative impact on the stability of the power system with a significant amount of wind farms capacity. The nature of the impact depends on the characteristics such as the pace and scale of power random fluctuations. Identification of possible parameters of the wind farms allows us to estimate safe levels of wind energy penetration, and measures to

improve the sustainability of the energy system.

GOLOVKO V., KOKHANEVYCH V., SHYKHAILOV M., MARCHENKO N. (Kyiv). **The effect of rotor orientation system parameters with a spring-loaded tail constructive scheme over static characteristics of the wind turbine.**

There has been suggested a mathematical model of rotor orientation system with the help of feather planes and a spring-loaded tail constructive circuit. Based on this model there have been gained static characteristics and power curves allowing on design stage to choose system parameters which provide minimum energy losses.

KAYAN V., LEBED A. (Kyiv). **Darrieus wind turbine with direct controllable blades: experience creation, testing, performance optimization.**

There has been suggested a brief description of several WT designs with vertical rotation axis and direct controlled blades. There have been also presented research results performed in wind tunnels. The research work was aimed at determining the influence of periodic variation of blade angle setting during one revolution of a WT with vertical rotation axis over the capacity and torque characteristics. The ability to self-start of a rotor with controlled blades at a very low speed wind flow has been depicted. Also there have been shown the possibility of a significant utilization rate increase of energy flow and the torque on the WT shaft compared to the same rotor equipped with rigidly fixed blades.

SANDOVAL Z. (Kyiv). **Wind energy flow analysis in Ecuador Republic.**

The article presents the results of wind energy flow analysis in Ecuador. The data will be further used to assess the possibilities for autonomous wind power plants siting mainly in rural areas.

Hydroenergy

VASKO P., VASKO V., IBRAGIMOVA M. (Kyiv). **Small hydropower as a part of electricity sector in Ukraine.**

The analysis of the country's electricity sector and in particular small hydropower sector has been carried out. There have been considered legal mechanisms to encourage further small hydropower development.

PAZYCH S. (Kyiv). **Analysis of structural analogs of marine pumped storage HPP.**

There have been considered promising inventions, ideas and projects based on renewables to set up marine pumped storage hydro power plants.

Geothermal Energy

BARYLO A., KHIMENKO O., VASYLCHENKO M. (Kyiv). **Studying hydrodynamic and thermal characteristics of wastewater drainage facilities at the M.M. Gryshko National Botanical Garden.**

On the basis of experimental studies there have been

defined waste water capacities coming from the drainage and landslide systems the M.M. Gryshko National Botanical Garden is equipped with. The stability of hydrodynamic and thermal characteristics has been evaluated and the scheme of their rational use has been suggested.

LYSAK O., KULINKO Ye. (Kyiv). Prospects of using surface water for heat pump heating systems.

This article estimates the prospects of using surface water as a source of thermal energy in heat pump heating systems. The analysis was made to show the features of surface water as a source of thermal energy, the types of surface water heat pumps, the examples of introduction of surface water heat pumps both abroad and in Ukraine. To demonstrate the advantages of surface water as a

source of thermal energy in heat pump heating systems in comparison with air, the calculations of COP for heat pumps that use air and water were made.

BIOENERGY

KLIUS S. (Kyiv). Experimental study of processes for biomass energy technology converting in fixed bed reactors.

The article presents the results of experimental studies of energy technology conversion of solid biomass into combustible gas and biochar in fixed bed reactors. There have been determined restrictions and calculated parameters of the gasification process.



МІЖНАРОДНИЙ ІНВЕСТИЦІЙНИЙ БІЗНЕС-ФОРУМ З ПИТАНЬ ЕНЕРГОЕФЕКТИВНОСТІ ТА ВІДНОВЛЮВАНОЇ ЕНЕРГЕТИКИ
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МІЖНАРОДНИЙ ВИСТАВКОВИЙ ЦЕНТР
Україна, Київ, Броварський пр-т, 15
М "Лівобережна"
☎ +38 044 201-11-66, 206-87-86
e-mail: energo@iec-expo.com.ua
www.iec-expo.com.ua, www.tech-expo.com.ua

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