TO THE QUESTION OF EFFICIENT OF ENERGY SYSTEMS

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As a result of the excessive, ever-increasing energy consumption in the near future can be drawn the traditional energy resources. In this regard, to the fore the problem of determining the value of the energy used by mankind, which requires the development of indicators, not only in energy consumption, but also its quality.

The purpose of research - to develop a method for evaluating the effectiveness of the total flux density of different types of energy.

Materials and methods of research. To assess the quality of energy are introduced to clarify the concepts of energy value (any man) systems or processes that are created for specific needs that must be gauges of quality performance of its functions. A method of quantifying the degree of the quality of man-made objects (including the energy system as a process or set of processes) for entities that use it. These are primarily consumers of energy produced, the creators of this object (equipment manufacturers) and in complex systems - operators of its functioning.

The first quantitative comparison of the quality of different types of energy offered in the late nineteenth century, NY Minds administration based on the second law of thermodynamics "Umov - Poynting", which determines the total flux density of different types of energy (thermal, mechanical, chemical, electrical, and later as refined as the flow of energy and radiation) as W / m2:

$$S_j = \sum_j \alpha_j e_j \,, \qquad (1)$$

where e_j - the energy flux density of species j; α_j - the potential of forming a flow of the respective type of energy. Other key parameters of any energy process (system) are: reliability, as measured by the probability of failure; implementation of the required operating mode with the output parameters of the process; energy efficiency (COP) process.

The integral value of the energy value of the process (the system) is found from the following considerations. The actual values of all key parameters of energy processes

are probabilistic characteristics. The effective functioning of the process involves the simultaneous realization of all its key dimensions. By analogy with the calculation of probability integral quality process suggested expect as the product measures the quality of all of its parameters, and the value of the value as the sum of the logarithms of these values, that is, the sum of the partial values of the parameters

$$Q_{jt} = \sum_{n} Q_{jnt} \cdot \qquad (2)$$

Great value has not thermonuclear bomb, and elements of microelectronics: the so-called low-current power is sufficiently high local energy flux density with high reliability and compliance with the required operating conditions. Thus, the value of quantitative indicator confirms the idea that micro-electronics and information systems are now the highest material achievement of human knowledge. Indeed, the scientific and technological leap towards industrial mastery of energy, such as nuclear fusion, will provide mankind virtually inexhaustible source of energy at all times. The fact that such a breakthrough in the development of science and technology has not yet occurred, it does not follow the basic impossibility.

The results of research. Let us for the long term solution of the energy problem.

Renewable energy sources (RES) are used in small-scale power and energy of large energy systems based on developed in recent years, fusion plants operating under the provisions of the hydrogen bomb.

Basics such power systems are designed and specialists in France, England, Germany, Russia and Japan are built like power plants. In Ukraine there are experts in their academic qualifications are not inferior to those skilled in these countries, but our country does not have adequate means to participate in this project. Similar power plants being built in the United States that China.

According to preliminary estimates by the International Thermonuclear Reactor (ITER) that can reach the regime in 2037.

In recent decades, it found a fundamentally new type of energy, which is of considerable interest. In 2011, an Italian engineer Andrea Rossi with Professor Sergio

Fakardi from the University of Bologna have shown a real working thermal generator developed on the basis of the process, known as catalyst (power).

In a first approximation, the fuel consists of a very fine powder containing isotopes of nickel and impurities associated with the lithium isotope of hydrogen and an electric heater. Test setup sated conducted in the US on the basis of a more effective system name - NTE-Sat.V result of these experiments the ratio of lithium-6 and lithium-7 has changed in the 124 times the isotope nickel-58 from 39 to 98.7%.

The second result is a complete absence of radioactivity in products of nuclear transformations.

In October 2014 it was reported that the corporation Lockheed Marth started in the development and production of compact fusion generator capacity 100 MW, which may be that serves, for example, on an airplane or in a car body.

The licenses for the manufacture of such nuclear generators Purchase Japan, China, India.

The consequence of these developments is the sharp decline in oil prices.

Research on the topic in Ukraine held in KNU. Taras Shevchenko and the National Scientific Center "Kharkiv Institute of Physics and Technology" (Kharkov).

Conclusions

In addition to the energy indicators should also be used to determine the value of energy resources.

Currently, the most promising in the energy and environmental relations are energy generators such as E-Cat.