

су в суспільному розвитку наступного століття та виявляє перші прояви динамічності економіки: «куди жаба не долізе і за тисячу років, добрий кінь забіжить за один тиждень, а паровою машиною доїдеш за один день. Тепер настали швидкі дні: усе робиться парою...» [2, с. 29].

Список використаних джерел

1. Руденко М. Д. Сила і слабкість Адама Сміта. *Енергія прогресу. Вибрані праці з економії, філософії і космології* / М. Д. Руденко ; упоряд. Р. А. Руденко. Київ: КЛЮ, 2015. 680 с.
2. Подолинський С. Парова машина. *Вибрані твори* / С. Подолинський ; упоряд. Р. Сербин. Монреаль: Українське історичне товариство, 1990. 208 с.

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SERGIY PODOLYNSKY IDEAS ABOUT ENERGY BUDGET OF THE TERRITORY

Introduction. Today, in our opinion, given a number of energy problems, including and environmental, research related to the energy supply of the territory, the so-called energy budget, is important. After all, we do not have a well-established opinion of scientists about the energy strategy of Ukraine, in particular the feasibility of nuclear power plants, the development of alternative environmentally friendly energy sources, the state's attitude to land, including and prospects for the development of the agro-industrial complex. The study of scientific heritage S. A. Podolinsky allows us to consider his approaches in improving the concept of development of our state, in particular the energy budget of its territories.

Formulation of the problem. In conditions when the linear model of aggressive economic growth was considered in the coordinates "man — society", "man — ecology", we received a number of natural disasters, shortages of natural resources and the devaluation of the "financial unit" as a market regulator.

Scientific achievements of SA Podolinsky were carried out on the border of natural and social sciences. It was he who first combined physical processes with economic ones, methodologically proved the necessity of synthesis of natural and cost parameters of solar energy conservation in the process of economic activity. Therefore, today it is necessary to apply a macroeconomic approach, which would be focused on adequate end results of natural economic systems [1], for example, to consider the components of such a system: "Man" — "Society" — "Ecology" in interrelation. Only in such coordinates can we find the optimal solution, and for the further development of mankind - to ensure sustainable development (Fig. 1).

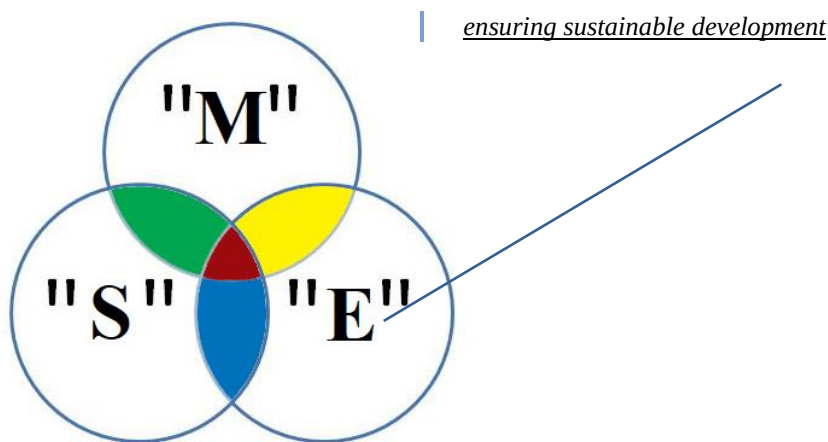


Fig. 1 — Conceptual model for the study of the problem

Such a model must meet the requirements of structural, dynamic and information completeness. Using elements of the deductive approach, the energy budget of any territory can be presented in the form of the scheme (fig. 2).

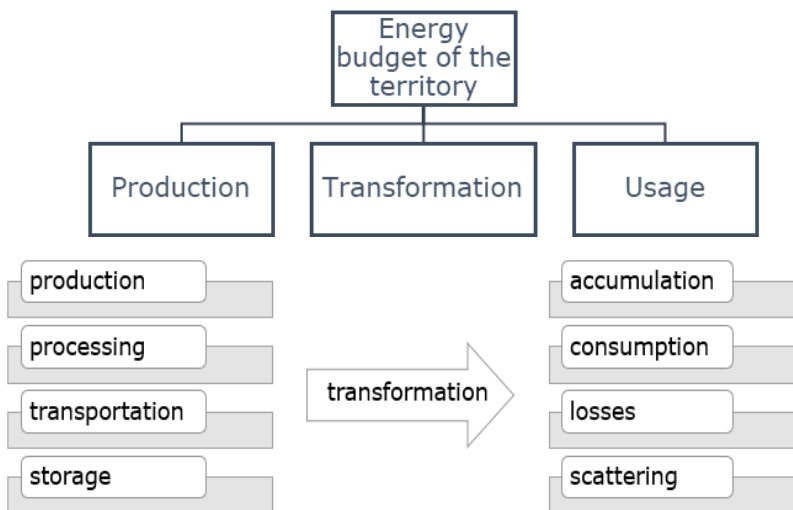


Fig. 2 — To the concept of "energy budget of the territory"

From the point of view of system analysis, such a structure can be classified as an open, non-homogeneous system and in which the features of the final product (quantity, quality, etc.) make it difficult to determine its value.

Approaches to the solution. A key element of the studied system is energy. On the one hand, it is one of the basic properties of matter, the general measure of all forms of its motion, and on the other — the ability to perform some work or the source of the force that will perform the work. At the same time, the transformation and conservation of energy is carried out by labor, which determines its accumulation at the disposal of mankind. The role of the law of conservation of energy in society and the impact of human activities on the conversion of energy on Earth showed S. A. Podolinsky [2]. He gave an in-depth analysis and classification of the types and sources of energy available to mankind at the time. These are solar energy (radiation, photosynthesis, wind, falling water), the energy of the Earth's rotation around the axis (tides), the solar energy (coal, oil) accumulated on the Earth.

The sun continues to provide us with a huge amount of unconverted energy and its stock is still very large. But it does not follow that the distribution of energy on the earth's surface is the most beneficial for human life [2, p. 211].

Quantitative characteristic in this case is energy efficiency — a property of the system to receive, process, absorb and transport exter-

nal energy, as well as give it outside the system. This property is closely related to productivity, as evidenced by the units of the latter — the mass or amount of energy concentrated in this mass. Moreover, in a unit mass of different substances concentrated different amounts of energy: internal, mechanical, thermal, electrical.

Exploring energy, S. A. Podolinsky proceeded from the fact that the sum of universal energy is a constant quantity. But in some parts of the universe it is unevenly distributed, which causes a tendency to its universal balance and gradual dispersion. Considering energy as a world constant, S. Podolinsky shows the ability of man to influence its movement and accumulation. He proved that an intelligent subject who consciously opposes entropic processes is able to prevent energy wastage.

Natural systems receive external energy from the Sun, which emits a complex range of spectra of rays in a wide range of wavelengths — from 0.1 to 3000 nm.

The law of conservation and conversion of energy is based on the equations of energy balance. Man is given the role of a biotransformer, to give the energy received from the Sun, by labor. Buildings built on Earth have a high cost due to labor, because they use a lot of solar energy. Podolinsky never downplayed the role of socially useful work; he was more interested in the accumulation on the planet of living matter — or, more simply, organic matter born of the Sun, because it is a prerequisite for any work and the greatest earthly wealth — absolute capital.

In addition, according to S. Podolinsky, the definition of "useful work" is "any consumption of mechanical and mental work of man and animals, which results in an increase in the budget of converted energy on the earth's surface" [2, p. 281]. From this there are two aspects of energy conservation: physical and social [3, p. 247]: physical — is to reduce the scattering of all types of energy through the rational use of energy stored on Earth and increase the absorption of solar energy. This aspect has a differential character in relation to all moments of time; social — is to preserve energy (benefits) between generations. In relation to the whole generation, it has an integral character.

Examining the system as a whole, Serhiy Podolynsky in his work "Human labor and its relation to energy distribution" [2, p. 281–282] summarizes the components of the energy budget of the territory, in particular:

- the total amount of energy received by the Earth's surface is gradually decreasing, but at the same time its accumulation at the disposal of mankind increases under the influence of human and domestic labor.
- the use of solar energy as a direct engine and the preparation of nutrients from inorganic materials is key to continuing the most profitable energy storage on Earth.

- actions that result in phenomena, opposite works, are the theft (scattering, waste) of human energy, in particular — war, arbitrary limitation of the population, the manufacture of luxury items and unproductive consumption. Instead, the improvement of human life quantitatively increases the energy budget of each person.

When considering several types of energy in one area, the possibility of replacing one type with another must be considered from exergetic positions [6], ie it is necessary to take into account the external fields and their impact on energy conversion processes and allow the possibility of achieving equilibrium system and environment. Thus, it is possible to build an energy model of our civilization in the form in which it exists in living reality. It should be remembered that "the main goal of humanity in work should be an absolute increase in energy budget." The only limit of "the most profitable accumulation of energy on Earth" is "only the absolute amount of energy received from the Sun and organic materials on Earth" [4, p. 178].

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ІДЕЇ СЕРГІЯ ПОДОЛИНСЬКОГО ПРО ЕНЕРГЕТИЧНИЙ БЮДЖЕТ ТЕРИТОРІЇ

Вступ. Сьогодні на наш погляд, з огляду на низку проблем енергетики, в т.ч. і екологічних, важливим є дослідження, пов'язані з енергетичним забезпеченням території, так званим енергетичним бюджетом. Адже ми не маємо усталеної думки вчених з приводу енергетичної стратегії України, зокрема доцільності функціонування АЕС, розвитку альтернативних екобезпечних дже-