

**ANALYTICAL ANALYSIS OF VOLUMES OF ENERGY FROM KSEP**

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Taking into account the methodological aspects of the development of energy balances of the unified energy supply system (USEP), its structural and parametric scheme [1, 2] has been improved, according to which the volumes of different types of energy will be presented in the form of functions  $Y_i = f(x_1, x_2, x_3 \dots x_n)$  from variable parameters  $x_i$ .

$$A_{\Sigma} = \begin{bmatrix} Y_1 = Y_1'' + Y_1' + Y_1^{\circ} - Y_1^* - Y_3^* - Y_4^* - Y_5^* - Y_6^* \\ Y_2 = Y_2'' + Y_2' - Y_2^* \\ Y_3 = Y_3'' + Y_3' \\ Y_4 = Y_2^* + Y_3^* + \Delta Y_3^* - \Delta Y_2^* \\ Y_5 = Y_3^* - \Delta Y_3^* \\ Y_6 = Y_4'' + \Delta Y_4' + \Delta Y_{42}' + \Delta Y_{44}' + Y_4^* + Y_5^* + Y_6^* \end{bmatrix} = [\sum_1^6 Y_i] \quad (1)$$

The study of the dependence of the change in the volume of different types of energy  $Y_i$  on the value of the variable parameters ( $x_i$ ) determines the conditions for making a decision on the selection (improvement, etc.) of the technical parameters of the devices of the local power supply system using AES (LSAES), for example:

a) electrical energy:  $Y_1 = f(k_1, U, I, R, \cos\varphi, \tau_1), \quad (2)$

b) thermal energy:  $Y_2 = f(k_2, m, c, \Delta Q, \tau_2), \quad (3)$

c) fuel energy for ICE:  $Y_3 = f(k_3, \theta_e, P_e, \tau_3), \quad (4)$

d) thermal energy of hot heat supply:  $Y_4 = f(k_4, m, c, \Delta Q, \tau_4), \quad (5)$

The functional dependencies of the volumes of various types of energy produced by CESS allow in the design process to make a decision regarding the selection or improvement of energy installations and devices of LSAES.

## List of references

1. Dudnikov S, Miroshnyk O, Kovalyshyn S, Ptashnyk V, Mudryk K, Methodological aspects of evaluating the effectiveness of using local energy systems with renewable sources, E3S Web of Conferences 154, 07013

2. Serhii Dudnikov, Oleksandr Miroshnyk, Oleksandr Moroz, Oleksandr Savchenko, Iryna Trunova and Volodymyr Pazy, Substantiation of Algorithms of Functioning of the Combined Power Supply System with Renewable Sources, Easy Chair Preprint № 6745