CHOICE OF PARAMETERS FOR COMBINED RENEWABLE ENERGY INSTALLATIONS

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ANNOTATION: the calculation of the economic characteristics of RES installations with known TE characteristics can be carried out in the usual ways. However, the variability of RES and, in connection with this, the variability of energy characteristics requires that these features of RES be taken into account in the calculations

Key words: RES power plants, "compositional" method, power supply of the station,the main parameters of the CPP (helio+wind), the main parameters of the MED

Introduction. One of the main tasks in the field of using RES power plants is to ensure their economic feasibility. To solve this problem, it is necessary to know the relationship between the technical and economic parameters and indicators of renewable energy installations, which is significantly more complicated given the variability of renewable energy sources over time and, in connection with this, the difficulties of coordinating the modes of energy generation and consumption, as well as, as a rule, the need for renewable energy installations to store energy (AB). To determine the economic characteristics.

In general, the calculation of the economic characteristics of RES installations with known TE characteristics can be carried out in the usual ways. However, the variability of RES and, in connection with this, the variability of energy characteristics requires that these features of RES be taken into account in the calculations.

Methods. In /12/ a mathematical model for calculating and optimizing the main parameters of the CPP (helio+wind) was proposed. The basic equation of the

model is the total reduced costs for the construction and operation of the power plant, taking into account the profit and damage from the production of products. The main conclusion obtained in the work is that, depending on the potential of renewable energy sources in a particular area, it may be beneficial not for CPPs, but for individual wind turbines or power plants.

Results. The comments on the work include the following:

- The model is quite generalized, so the model has technical and economic characteristics (empirical dependencies of cost on power are presented), but the dependencies of power change and efficiency are not taken into account. power plants from RES parameters. Those. in the KEU model, it is necessary to separately identify and set the technical and economic characteristics of the KEU and, in general, the relationship between them.

- the initial data are not selected in the model - what load should the power plant provide.

- it is important to note that in the work, their long-term average values were used as initial data for wind and solar energy, i.e. in the estimates, these indicators were seasonal variables, and for shorter periods of a day, a week, a month, their actual constant values were used.

In /13/ the cost of wind-solar power plants was estimated for the case of a constant load relative to the average solar radiation during the day and a constant wind speed.

In /14/ on the basis of the model developed in /13/, the energy cost of such a CPP was estimated. It was found that the share of the solar part at constant load and constant power generation by the wind part is significantly small and does not exceed 5%. It was also concluded that the cost of CPP as a whole is higher than individual installations of wind turbines and SFEU, which is not consistent with the conclusions of Makhkamdzhanov B.M.

In /25/ estimates of the cost of electricity are given for the estimated generation of wind power plants with a capacity of 60, 250 and 500 kW, mass-produced by Taske (Germany) in the region of 88 meteorological stations in Uzbekistan. Based on the analysis, areas were identified where the expected cost of generated energy is at the level of world achievements; the most suitable types of wind turbines for wind conditions in these areas and effective ways of their application are determined. However, the cost of wind turbine power for the consumer is not given for the available wind speed ranges, which differ significantly from the nominal nameplate wind speeds for wind turbines.

In /28/, it was proposed to identify and evaluate the possibilities of using the energy of the sun, wind and small rivers to provide heat supply and improve the power supply of non-gasified SNPs in the above zone. The predicted consumption of electrical and thermal energy of residential buildings in rural settlements in the mountainous Chimgan-Charvak zone, including those not subject to gasification until 2010, was determined. The possibilities of covering these loads with the help of solar photovoltaic installations were considered; wind power plants of small and medium capacity in areas for which the observational data at the MS Charvak reservoir are representative; small hydroelectric power stations on the river. Pskem, Ugam and Chimgansay. The paper considers the possible potentials of renewable energy sources, however, an economic assessment of the use of these renewable energy sources has not been carried out.

In /29/ the main principles of the combined use of RES were presented, as well as ways to increase the efficiency of the energy complex based on solar, wind and hydraulic energy by accumulating their generation. Based on the selected methods and accumulated information, as well as the results of calculations, the most effective option for building an energy complex is selected. The model does not consider such points as the criteria for optimizing the CPP, the relationship of the output characteristics of the CPP depending on the supply of RES.

In /30/ the issues of designing an autonomous source of electricity with renewable energy converters were considered. The structural-technological scheme of the combined power source, mathematical models for calculating the capacity of the storage device and the energy balance are given. On the basis of mathematical modeling of the output energy parameters of the power source, a block diagram of the algorithmization of designing a combined power source with solar-wind energy converters together with a low-power hydraulic unit has been developed. It can be noted that, as in /30/, it is precisely the features of RES that are not considered - the variability of the supply and, accordingly, the variability of the output power, as well as the criteria for optimizing the parameters of the CPP.

In /31/ indicators of the cost of power and mass of microhydroelectric power plants were considered by analogy with the density of solar radiation, depending on the density of the energy flow of water. The dependences of the change in these indicators with a change in the energy of the water flow are determined.

In /32/ options for using a microhydropower plant were considered, generalized models of its technological process were built, and a method for determining the main parameters of this plant was also described. It is said that on the basis of the proposed methodology, the main parameters of the MED and the required amount of accumulated energy at the design stages can be determined.

In /33/ the questions of combined use of micropower installations with hydrostorage and without it were considered, as well as the characteristics of the economic efficiency of their work, depending on the load schedule of consumers.

Discussion. The following conclusions are obtained:

1. With sufficient wind energy potential, it is recommended to use MPP based on wind turbines and power plants with accumulation of excess wind energy in the upper basin.

2. In conditions of insufficient return of wind energy, in order to improve the reliability of power supply, it is advisable to use controlled MPPs based on wind turbines, SPPs and GPPs with a hydraulic accumulator.

3. The use of a hydraulic accumulator in combined systems for the use of renewable energy sources leads to a reduction in annual costs and the cost of energy compared to the option without a hydraulic accumulator.

However, all these conclusions were obtained for the case of constant load and constant power of RES, i.e. variability of RES and output characteristics of CPP was not taken into account.

REFERENCE

1. Клычев Ш.И., Мухаммадиев М.М., Авезов Р.Р., Потаенко К.Д. Нетрадиционные и возобновляемые источники энергии.Учебник –Т.: Изд-во “Fan va texnologiya”, 2010, 192 стр.
2. Клычев Ш.И., Исманжанов А.И Солнечные сушильные установки и комплексы: расчет и проектирование/Ин-т природных ресурсов НАН КР. – Бишкек: Илим. 2011. -132 с.
3. Мухаммадиев М.М. и Потаенко К.Д. Возобновляемые источники энергии. Учеб.пособ., ТашГТУ, 2005.
4. Джуманов А. Н. и др. Измерительные трансформаторы тока //World science: problems and innovations. – 2021. – С. 76-78.
5. Mamasaliev O. Theoretical Foundations of Energy Saving //International Journal of Engineering and Information Systems (IJEAIS) ISSN. – 2021. – С. 293-296.
6. Suyarov A. O. et al. Use of solar and wind energy sources in autonomous networks //Web of Scientist: International Scientific Research Journal. – 2022. – Т. 3. – №. 5. – С. 219-225.