MOTROL, 2008, 10, 122–125

GROUNDING OF THE MAIN TASKS THE PROJECT MANAGEMENT OF POWER SUPPLY FOR RURAL POWER CONSUMERS

O. Sydorchuk, L. Sydorchuk, A. Tatomyr

National Agrarian University in Lviv, Ukraine

Summary. In the article the organizational aspects of power supply to agricultural consumers are considered due to energy of wind. The general scheme of the conceptual model of power supply system is considered. The main tasks of project management of the power supply system are chose and methods of its solution are outlined.

Key words: rural power consumer, wind-driven powerplant, power supply, management.

INTRODUCTION

Program of Ukraine's energy development is proposed the considerable growth of wind energy segment in general energy balance [1, 2, 3]. Wind energy is extraordinarily actual for providing a rural power consumers, in particular for the autonomous supply of remote objects. Next to perfection of the wind-driven powerplant design the scientifically grounded power supply project management is especially important for successful development of this branch on the whole. In particular, there is the row of tasks of the operations management and effective exploitation of wind-driven powerplant (WDP) as the elementary objects of the power supply system of rural power consumers. The peculiarity of the system is that the separate WDP works not in a network but individually. For this reason the wind-driven powerplant efficiency is evaluated adequate only in concrete naturally-productions conditions.

A necessity in the solution of these tasks appeared comparatively recently in connection with the tendencies of prices rise of fossil power carriers. The general disadvantage of all previous researches is using different models for solution of tasks of unique project management that conflicts with principles of systems engineering approaches [4]. Thus the tasks of one class actually solved with application on principles of different theories. For example, the WDP using efficiency was determined by use of the graphs theory, and parametric rows grounding – by apparatus of mathematical statistics [5].

The research purpose is outlining of tasks circle of the project management of power supply rural to the power consumers.

SCIENTIFICALLY-METHODICAL PRINCIPLES OF RESEARCH

The analysis of the power supply system of rural individual power consumers shows the difficult system of tasks and correlation among them. That is why the effective management by the constituents of this power supply project is possible only with consideration of them in system unity. The tasks stratification in this system was fulfilled and a single meaning hierarchy was determined. On this stage of researches three dependent and five independent tasks is found out and solution of these task is possible only after successive decision of previous. The gradual "tacking" previous task solution to the general model allows to solve the tasks of the next level. Solution of the one sphere tasks with using of unique methodological approach is the basic idea of such approach.

The scheme of tasks correlation in the project of agricultural enterprises power supply by wind-driven power plant is resulted on figure. Rectangular blocks mark tasks, pointers show the directions of influencing (order of solution) of the model constituents.

The main tasks of management by project configuration of agricultural enterprises power supply by wind-driven power plant are following: grounding of optimum set of the wind-driven power plant complex for the conditions of concrete rural power consumer, determination of optimum WDP parametric row and management by the structure of parametric row in time (on figure the tasks are rounded by a chain line). The figure shows three main tasks on the top of hierarchy and to solve them the previous tasks decision is needed.

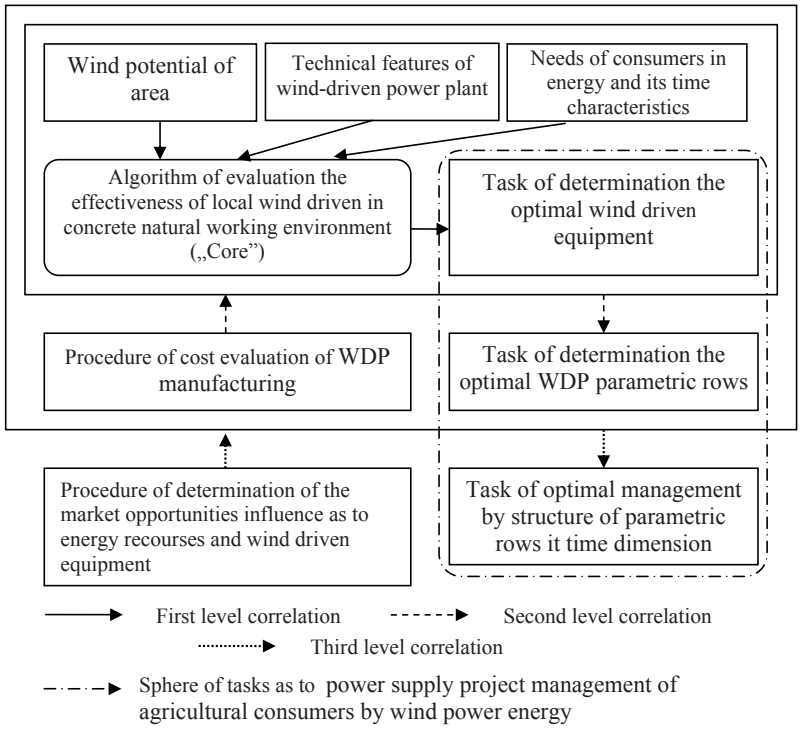

Fig. The tasks correlation scheme in project of agricultural enterprises power supply by wind-driven power plant

RESEARCH RESULTS

Among independent tasks (on the top of figure) the ones are selected which concern to the climatic group of factors, organizationally-production, group of technical, technological and economic and also market factors.

Task of wind potential research for the conditions of concrete consumer in general gives the complete picture of climatic factors for certain region where the system of wind power supply is designed for. This task could be solved by mean of working out and generalization of basic statistical data in relation to meteorological conditions. The mathematical statistics gives possibility to get descriptions of changeable stochastic processes of winds speed and direction for concrete locality. Using of descriptions in the "Core" of model will allow to design a virtual weather situation due to the wind loading.

Correlation research of WDP parameters in depending of a basic dimension-type parameter (for example, wind wheel diameter or circle area of rotor) will allow to take one parameter for description the unidimensional parametric row.

The task of determination a agricultural consumer need in electric power consists in research of the graph of energy consumption of the concrete agricultural enterprises on base of real statistical data. Thus, research of dynamics of the energy consumption during years and days (for the different periods of year) is an important moment as well as evaluations of probable fluctuations of the generalized graphs. As a result of analysis the energy consumption classification as to grouping after certain parameters (power, necessities in energy, type of the graph etc.) is planned to work out. This sub model is included in the "core" of algorithm and make possible to determine the effectiveness of power balance of concrete consumer (type of consumer).

The task of WDP prime price determination foresees the previous calculation of total cost of manufacturing, delivery, assembling and commissioning of equipment. This block can be used for determination of optimal parametric rows of WDP as the negative constituent of the efficiency criterion. Next task is the determination of the energy resource market affairs. Solution of this task as submodel of the third level system allows to manage by the structure of parametric rows in time.

The solution of dependent tasks is impossible without use of previous tasks as sub models, yet requires an addition model which substitutes for the real system.

The task of determination the optimum set of wind-driven equipment needs the grounding of WDP expedient powers and accumulation facilities on the base following factors as loading of consumers and conditions of concrete locality. By way of entries parameters choice the indexes of efficiency is determined by the certain method. This is the criterion of choice of WDP optimum set and accumulating devices.

Task about optimum parametric rows could be solved on the base of consideration of following associate systems: systems of WDP manufacturing and exploitation. Comparison of the local efficiency criteria of these subsystems make possible to determine the optimum structure of all system on the whole.

The peculiarity of the optimum parametric rows task is not use concrete results of calculations, got on a previous stage, but is the algorithm of task decision.

More detailed these submodels and its correlation is characterized in work [6].

In addition, there is the task of optimum management by the structure of parametric rows in time, and pre-condition of this task solution is the algorithms for previous tasks decision in sphere of the project management of energy supply, and also research of the energy resources market affairs. The chart of temporariness sequence of introduction in production of the new elements of the wind-driven power plant parametric row is the decision of this task.

CONCLUSIONS

1 Management by the project configuration of power supply to agricultural consumers by energy of wind is needed to solve the row of successive tasks on an unique methodological base;

2 A system model is the pre-condition of adequate management by project configuration of power supply to agricultural consumers by energy of wind; 3) The next subsequent step of this research is following: development of the methods of experimental and theoretical researches of efficiency evaluation of the considered system.

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