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EVALUATION OF SPECIFICITIES AND MAIN DIRECTIONS OF BUSINESS PROCESSES'S DEVELOPMENT OF THE INDUSTRIAL ENTERPRISE (RESEARCH EXAMPLE RER)

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Scientific and technical progress is inseparably linked with use energy of different forms and potentials, which significantly changed their volumes and types. In modern conditions of development the level of the energy considerably increases consumed by the person, and, therefore, there is a question of environment protection against harmful emissions. Many industrial enterprises are oriented to studying of renewable power which technologies can be used in development of the business processes. Real research is given a characteristic of the present stage of development of the market of the renewable energy resources. The article describes the entity and features of business processes of the enterprise of the industrial sector of economy. The research is carried out an analysis of business processes of the industrial enterprise Électricité de France. In addition, the article describes the main directions of development of the industrial enterprise in the conditions of commercialization of renewable energy resources. Rapid development of technologies of renewable energy resources and the current situation in the world led to consider development of the industrial enterprises in the conditions of commercialization of renewable energy resources as new approach to development of business processes of the enterprises of the industrial sector of economy. Modern conditions appear because of commercialization of renewable energy resources. It becomes necessary for the industrial enterprises adapting flexibly to modify and develop their business processes.

Keywords: commercialization, renewable energy, business process, industrial economy, industrial enterprise, power

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ОЦЕНКА ОСОБЕННОСТЕЙ И ОСНОВНЫХ НАПРАВЛЕНИЙ РАЗВИТИЯ БИЗНЕС-ПРОЦЕССОВ ПРОМЫШЛЕННЫХ ПРЕДПРИЯТИЙ (НА ПРИМЕРЕ ИССЛЕДОВАНИЯ ВИЭ)

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Научно-технический прогресс неразрывно связан с использованием энергии различных форм и потенциалов, которая с течением времени существенно меняла свои объемы и виды. В современных условиях развития уровень потребляемой человеком энергии зна-

чительно повышается, и следовательно, остро встает вопрос защиты окружающей среды от вредоносных выбросов. Многие промышленные предприятия ориентированы на изучение возобновляемой энергетики, технологии которой в дальнейшем можно использовать в развитии своих бизнес-процессов. Дана характеристика современного этапа развития рынка возобновляемых источников энергии (ВИЭ). Раскрыта сущность и особенности бизнес-процессов предприятия промышленного сектора экономики. Проведен анализ бизнес-процессов промышленного предприятия Électricité de France. Выявлены основные направления развития промышленного предприятия в условиях коммерциализации возобновляемых источников энергии. Стремительное развитие технологий возобновляемых источников энергии и текущая ситуация в мире привели к возможности рассматривать развитие промышленных предприятий в условиях коммерциализации возобновляемых источников энергии, как новый подход к развитию бизнес-процессов предприятий промышленного сектора экономики. Государства оказывают поддержку промышленным производствам сектора энергетики и проводят активную политику развития данного сектора экономики за счет применения современных технологий, активного совершенствования бизнес-процессов внутри предприятий и частичного участия в управлении производством. В результате коммерциализации возобновляемых источников энергии создаются новые условия, в которых промышленные предприятия вынуждены существовать, поскольку становится необходимым гибко подстраивать, видоизменять и развивать свои бизнес-процессы. Открывая для себя все большие возможности инвестирования, большинство стран мира нацелены на сотрудничество, взаимный обмен новыми технологиями, ресурсами, финансами. В новых условиях развития сектора энергетики промышленные предприятия вынуждены отвечать новым вызовам, развивать внутренние бизнес-процессы, ориентируясь на новые факторы, влияющие на функционирование и совершенствование производства.

Ключевые слова: коммерциализация, возобновляемые источники энергии, бизнс-процесс, экономика промышленности, промышленное предприятие, электроэнергетика

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Introduction. Development of humanity is inseparably linked with use of energy of different forms and potentials. Throughout the known history of development of a civilization not only sources of the energy changed, but also its volumes, types and potentials. The present stage of development of the world is characterized by the increased consumption of all types of energy, which caused, first of all, an environmental pollution. Fossil types of fuel are characterized by limited resources. This fact is a real problem for the majority of productions of different industries.

Many countries of the world are oriented to development of renewable power which allows not only to reduce the number of harmful emissions in the atmosphere, but also implements an energy saving priority that is especially relevant in a century of «new technologies». A landmark, occurred for the last few years, promoted fixing to renewable energy resources (further – RER) the status of the dominating power source around the world. The energy sector underwent a number of changes which had an impact on changes in development of RER in total and separately. Growth of competitiveness of technological capacities using RER, state programs on questions green economy, conferences on questions of environmental and energy security and low-carbon economy, need of creation of more available energy for the consumer – all this led to creation of the new markets of production capacities and the distributed generation of RER, namely their commercialization.

Research objective. With this in mind, a research objective is a determination of features and the main directions of development of business processes of the industrial enterprise in the conditions of RES commercialization. Due to the research objective it is necessary to solve the following problems:

• give characteristic to the present stage of development of the market of RER;

• reveal an entity and features of business processes of the enterprise of the industrial sector of economy;

• carry out the analysis of business processes of the industrial enterprise Électricité de France (further – EDF) using RER;

• determine the main directions of development of the industrial enterprise in the conditions of RER commercialization.

Research methods. It consists in the analysis of domestic and foreign sources on the studied problems, identifying the specific features of the concept.

The energy sector underwent cardinal changes recently, but 2015 became for development of RER more important. It occurred thanks to the new agreements between countries devoted to problems of need of availability of RER and increases energy efficiency.

The United Nations General Assembly accepted the document «Steady Power for Everyone» that confirmed intention of the majority of the countries about distribution and development of policy on implementation of RER. Many governments agreed to undertake obligations for review of use of hydrocarbon fuel as replacement by «clear» energy. RER provided 19.2 % of the general final consumption of energy in 2014, growth of capacities and development continued also in 2015 [10, 12].

Global investments in RER also reached record level, despite falling of the prices of traditional fuel, the proceeding instability of economy of the countries of Europe and also continuous recession of the prices for unit of rated capacity of the equipment for solar and wind farms. Level of the private investments, enclosed in development of the RER projects, considerably increased for the last 5 years. In addition, the number of banks that are involved in financing of the RER projects increased too.

Along with active development and using of RER technologies on industrial productions, there was a question of effective management of a production, which is understood as the process based on use of modern technologies of management and more perfect forms of its organization. Foreign and Russian scientists are convinced that the solution is in deep connection between adapted management systems at the industrial enterprise and development of its business processes.

In foreign and domestic scientific literature are lots of definitions for the term «business process». According to authors, the most precisely this term described in the work «Reengineering of corporations: revolution in business» by M. Hammer and J. Champi who defined «business process» as «the set of different types of activity within which «on an input» are used one or more types of resources and as a result of this activity at «exit» is created the product which is a value for the consumer» [15]. At the present stage of development of economy restructuring of business on the basis of business processes is adopted by almost all leading companies of the world. It is considered that even partial improvement of business processes of the organization brings effect in the form of increase in production for 10–20 % [17].

Administrative activity at the level of management of the industrial enterprise on the basis of process approach represents continuous execution of a complex of the certain types of activity interconnected among themselves and the general functions of management. However, it should be noted that execution of separate works and functions of management is also considered in the form of process, i.e. the general process is set of the interconnected continuously performed operations transforming some inputs of resources, information, etc. to the corresponding results [11, 16]. In general, management – is the establishing value and an entity of process approach. The description of business processes at the enterprise can be different, but its basis is tracing of accurate structure of all interrelations of participants of processes of production activity. At

the same time, each business process should have the beginning – an input, consistently carried out flows of works, the end – an exit.

Improvement of business processes at the industrial enterprises allows to create the whole complex of strategic advantages and to provide higher level of a competitive stability. Often the industrial enterprises apply the innovation technologies to increase in efficiency of business processes of the complex hierarchical structure of production. The present stage of development of economy differs in the increased level of robotization of many industries and use of «smart»-technologies for increase in overall performance of the industrial enterprise in general.

Commercialization of RER has a positive impact on functioning of the industrial enterprise, thanks to development of its internal business processes. In total technologies of RER and «smart»-developments give the chance to increase growth rates of production capacities, to increase efficiency of functioning of the enterprise, to improve quality of products and to take care of the environment [4, 6].

The French energy company Électricité de France (further – EDF), which is in the lead in the market of the generating enterprises, is the most striking example of how to make use of the accumulated experience and knowledge together with RER technologies for development of all the business processes to construct stable and competitive production of the generating sector as much productive as it is possible [8]. The company began the development in post-war years, and now thanks to the accumulated knowledge and experience is the first company in using of RER on the productions.

EDF is concerned about green economy of our planet and «green» future of humanity. Its research department is oriented to maintenance of the «green» future of our planet and application of RER for reduction of emissions of toxic substances in the atmosphere and receiving «clean» energy, which is the most energy efficient resource for providing «green» life of consumers.

In 2008 EDF Énergies Nouvelles constructed (one of the first) a solar farm with the biggest rated capacity in Europe. EDF already has a large number of low-carbon power plants which use hydraulic power, nuclear energy, and wind energy and also new types of RER. A huge number of investments invest in development of new technologies of the next generation which do not release CO_2 into the atmosphere.

EDF uses different types of RER for creation of productions of new generation:

1) nuclear energy: in France the EDF company builds the first nuclear reactor of new generation of EPR in Flamanville (Manche). His first produced kW · h was sold by the EDF company in 2016. Nuclear projects of the EDF company made significant progress in three countries: China, the USA and Great Britain which made a decision to restart production of nuclear energy;

2) wind energy: around the world EDF Energies Nouvelles started more than 3.500 MW of rated capacity, and power is received more than from hundred wind farms;

3) solar energy: EDF Energies Nouvelles had 494.1 MW of pure ability in the course of construction. By the end 2017 this indicator grew to 500 MW;

4) biomass: the representative office of EDF manufactured 1.5 billion kW· h in Poland in 2016. More than 1 million tons of biomass was used by production [7].

The power plants of EDF using coal make only 9.8 % of all company enterprises. EDF upgrades the old power plants for increasing an efficiency of their work and reduction of emissions of CO_2. EDF used supercritical power plants and gas turbines with the combined cycle for increase the power of the productions. In France, the oldest power plants burning coal were closed in 2015.

They were replaced with gas turbines with the combined cycle, which are more effective in power generation and emit less CO_2 [9]. EDF also continues to work on collecting and storage of carbon. The Havre power plant burning coal uses this special technology in an attraction mode. In Great Britain EDF began construction of 3 gas turbines with the combined cycle on the Western Burton with the rated volume of 1.311 MW [5].

The ecological directions in the innovation activity of the EDF, directed to power generation of the future and to development of access to energy, require special attention. Martiga Gas with the combined cycle is the first experience of using new technology on productions in the Europe countries. Thanks to a double turbine system, with the same fuel quantity, the gas works with the combined cycle produce twice more electricity, than traditional thermal power plant, and throw out less CO_2 [3]. The first turbine of combustion burns down fuel, and gases selected with this combustion, turn the turbine to fill the first transformer. At the same time, water is transformed to steam in contact with hot gas blowouts. This steam turns the second turbine, which fills the second transformer with electricity. Gas works with the combined cycle are adapted to the increasing fluctuations in energy consumption better, and they are more energy saving and are harmless to the environment. They make smaller number of harmful emissions in the atmosphere, than stations of standard power because of using the unique technology of gas.

The originality of the technology applied at the plant in Martige consists in conversion of one unit using oil in 2 combined cycles, everyone with the rated volume of 465 MW, functioning with natural gas [2]. This hi-tech process, which is originally developed for use in the industry of aeronautics, consists in use of some installations (especially steam turbine and the pump station) in connection with new elements of new unit (the combustion turbine, a recovery boiler, reuse of the generator of a turbo transformer, a cold source of the current sections using oil). By estimation, this project will become the most large-scale in the field of power industry across the Europe. Construction of 2 plants with the combined cycle in Martige would require €500 million investments [7].

The plant in Rosière-en-Haye is one of the largest plants of solar energy in Europe. The plant consists of 1.5 million solar panels with the rated volume of 115 MW. The area on which there is a plant is 367 hectares from whom 120 hectares occupy solar panels. Every year the plant makes an equivalent of annual consumption of electricity approximately on 55,000 inhabitants [9].

Photovoltaic solar batteries at the Rosières-en-Haye plant were developed, using the technology of the next generation known as «thin membrane». This technology alternative to the traditional units made of silicon allows adapting to variable conditions of the sun of Lorraine easily.

Research result:

1. The characteristic of the modern stage of development of the market of renewable energy sources is given.

2. The essence and features of business processes of the enterprise of industrial sector of economy are revealed.

3. The analysis of business processes of the industrial enterprise Électricité de France with the use of renewable energy sources is carried out.

4. The main directions of development of the industrial enterprise in the conditions of commercialization of renewable energy sources are revealed.

EDF only a few years ago began to conduct policy of «green» production as most the large international companies are anxious with the corporate and social image, state of environment and profit markup and increase in efficiency of the made products. However, the company can admit what success it achieved in development of the production capacities thanks to RER technologies.

Summing it up, RER is profitable business, especially for those productions having rather developed production capacities, which can qualitatively and quickly make processing and receiving clean energy now. To my way of thinking, new technologies arising thanks to new researches of the market of RER are the most competitive instrument of development of business processes of the industrial enterprises.

Summary. In the final analysis, the executed research allows to draw the following conclusions. Active development of RER technologies and the current situation in the world led to the fact that development of the industrial enterprises in new

conditions, namely commercialization of RER; it is possible to consider new approach to development of business processes of the enterprises of the industrial sector of economy.

Attention of the environment and creation of new technologies gave an impulse to deeper studying of opportunities of RER which were appreciated only a few years ago. The largest industrial enterprises are aimed at use of RER technologies for the purpose of creation of the stable, effective production making not only high profit, but also the «clean» product harmless to consumers and our planet.

The majority of the countries of the world are aimed at cooperation, mutual exchange of new technologies, resources, finance. Even more often, the states began to give support to industrial productions of the energy sector and to pursue active policy of development of this sector of economy, due to use of modern technologies, active improvement of business processes in the enterprise and partial participation in production management [1].

The French energy company EDF, leading in the market of the generating enterprises, is the most striking example of how it is productive to make use of the accumulated experience and knowledge in management together with RER technologies for development of all the business processes to construct stable and competitive production of the generating sector. This enterprise underwent a set of instructural changes, which rendered both positive and negative effect on development of administrative communications of production.

In new conditions of development of the energy sector, the industrial enterprises are forced to answer new calls, to develop internal business processes, being guided by the new factors influencing functioning and improvement of production. At this stage, it is possible thanks to use of RER technologies and active development of the new products of the industrial sector of economy possessing new functions.

In relation to EDF it was shown in the form of implementation of pilot projects which allowed reducing the number of emissions of CO_2 in the atmosphere by 61 % [13, 14].

Directions for further research. Finally, commercialization of RER gives an impulse and continues to stimulate productions of the industrial sector of economy not only to a solution of important problems of consumers, the environment, but also issues of effective management of the enterprises in general, because new conditions, in which they are forced to exist, differ in need flexibly to arrange, alter and develop the business processes. Experience of development and deployment of RER technologies in business structure of the industrial enterprises creates premises for creation of new strategy of management of the enterprises in modern conditions.

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