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Integration of Small and Middle-sized Enterprises into Large Energy Corporations as a Factor of Business Sustainability

Ivan A. Kapitonov[1], Gaukhar A. Taspenova[2], Vladimir R. Meshkov[3], Aleksei A. Shulus[4]*

[1]Institute of Economy of the Russian Academy of Sciences, 117218, Nakhimovsky Ave. 32, Moscow, Russian Federation, [2]Narxoz University, 050035, Zhandosov Street 55, Almaty, Republic of Kazakhstan, [3]Plekhanov Russian University of Economics, 115093, Stremyanny Lane 36, Moscow, Russian Federation, [4]State University of Management, 109542, Ryazansky Ave. 99, Moscow, Russian Federation. *Email: shulus@bk.ru

ABSTRACT

Small businesses are traditionally the driver of the economic growth in the conditions of market economy, so in the modern circumstances this thesis is seen as an axiom not requiring additional argumentation. Moreover, the role of small and middle-sized businesses in the acceleration in the rates of economic grows currently increases. The economic recession triggered by the sanctions as well as by the international collapse in oil prices, to an even greater degree actualized the task of searching the ways and methods of the Russian economy potential activation including more active and rational use of the most important nonmaterial resource of market economy that is business initiative.

Keywords: Enterprises, Small and Middle-sized Business, Energy Complex
JEL Classifications: L53, M14, O13

1. ROLE OF SMALL AND MIDDLE-SIZED BUSINESS IN ACCELERATION IN THE DEVELOPMENT RATES OF FUEL AND ENERGY COMPLEX OF THE RUSSIAN FEDERATION

It is to a significant extent actual for the energy sector of the Russian economy, the development of which is extremely adversely affected both by the international sanctions (many of which are directed to the industrial, financial and scientific and technological activities of the largest Russian energy corporations), and by the downturn in energy export prices.

However, small and middle-sized business traditionally takes extremely insignificant position in the energy business. In the modern Russia as well as in the majority of the foreign countries small and middle-sized businesses are included into the market value chain, though their percentage in the surplus value created by the fuel and energy complex is rather limited. In the 1st quarter of 2016, according to the data of the Russian Federal State Statistics Service (Rosstat, 2016), the turnover of the forward error correction (FEC) small enterprises was equal to about 1.5% to the general turnover of the national small enterprises. In 2015 the number of the FEC small enterprises, including fossil fuels production was equal to 3724 units (1.4% of the general number of the small enterprises registered in the Russian Federation), these enterprises employ 129 thousand people, and their turnover was equal to 147.7 million RUR. Considering that the annual turnover of the FEC enterprises in 2014 (the last actual data of the Russian Federal State Statistics Service does not consider the turnover of the small enterprises) amounted to as much as 16.56 trillion RUR., then about 0.63% of the FEC gross branch product falls to the share of the FEC small and middle-sized business.

It is quite obvious that the most important instrument for wider employment of small and middle-sized enterprises into the process of acceleration in the economic growth rates of the energy sector is further development of integration and cooperation of small (middle-sized) and large business. Therewith integration of small and middle-sized enterprises into large energy corporations as a

driver of intensification of economic growth in the energy business is of a special research interest.

2. FORMS OF INTEGRATION OF SMALL AND MIDDLE-SIZED ENTERPRISES INTO LARGE ENERGY CORPORATIONS

In the frameworks of the current publication it seems reasonable to share the opinion of L.A. Alexandrova, who states that "the integration implies formation of such relationship between the economic entities which ensure long-term convergence of the main goals of both the integrating and the integrated parties. Pure competition is replaced at integration by one of the cooperation variants, the range of which is spread from slight interaction to direct control, when market relations are replaced by interoperate supplies. It causes diversity of integration forms corresponding to various market situations and forming additional competitive edge of the uniting economic entities" (Alexandrova, 2014).

Therewith over the last years "new forms of integration of economic entities are being approved, such as: (a) Integration by means of incorporation of businesses into vertical structures (corporate groups), reorganized from branch structures or new created; (b) integration on the basis of horizontal structures formation. Both in the first and in the second cases necessary coordination and organizational and financial cooperation are ensured, efficient systems of technological development are created as well as sustainable market strategy and resource support of the corporate financial institutions" (Chernopyatov and Popova, 2015).

Despite diversity of the integration forms for economic entities, integration of small and middle-sized businesses into large corporations is a rather unusual occurrence, especially in the Russian practice.

Below are widespread forms of integration of small and middle-sized businesses into large energy corporations:

- Takeover of small and middle-sized enterprises and their integration into a corporate group (holding company) in the sphere of energetics;
- Formation of research, development and production platforms including technological clusters, innovation houses, technological centers and technological platforms;
- Building of clusters.

The simplest form of integration of small and middle-sized businesses into large energy corporations in the world practice is vertical integration by means of business takeover. The mechanism of this integration form is rather simple, a large corporation getting interested in a successful small or middle-sized business entity, buys out the technology (product) – usually having an innovative character, or integrates the small enterprise into the corporation, implementing a deal of takeover of the small business.

Such "result" of the small business development is often the initial goal of the founders, and the majority of the start-ups are oriented on this practice. Meanwhile, after the acquisition of the idea, technology, product or small business in general, integration of small enterprise into a large corporation is completed, so there is usually no long-term sustainable cooperation. The illustrated mechanism has rare exceptions, when small innovation enterprises which had sold their technology (product) to the corporation, but having not being wholly integrated, produced several interesting innovative solutions in succession after it. In this case the corporation either eventually takes over the innovation enterprise or activates the process of the small enterprise horizontal integration.

Another widespread form of small and middle-sized businesses integration into large energy corporations is formation of technical clusters, innovation houses, technological centers and technological platforms. Applicably to the Russian conditions, development of this form of integration became the consequence of insufficient development of such forms of small and large business cooperation as outsourcing as well as the circumstance caused the situation when the number of successful small and middle-sized businesses is concentrated in the innovation sector.

So, Russian energy corporations use outsourcing rather actively, including its direct economic purpose – increase in flexibility of the production processes. Here it is important to note that for a long time alongside with the above mentioned goal, using outsourcing for performance of works also often pursued a goal of so called "tax-sheltering," but the amendments in the RF tax legislation toughened taxation and tax control in the settlements between the interconnected persons, led to removal of fake outsourcing practices in the activities of the energy companies. Anyway, the overwhelming majority of works is still being outsourced by energy companies to their affiliated companies. The cause of this situation is rather typical for all the Russian business – the collapse of confidence to contractors, lack of sustainable philosophy of business diversification, high level of bureaucracy in decision-making in the corporations combined with lack of awareness of the persons making the decisions on the outsourcing supply. As a result, large corporations even if they outsource their works and services to the third parties (not affiliated companies), strive to conclude agreements with large companies with many years' work experience and a good reputation on the market. Middle-sized and especially small enterprises are on the sidelines of the outsourcing system. It requires significant efforts of the business support infrastructure entities for assistance to integration of small and middle-sized businesses into large energy corporations in the terms of outsourcing. Therewith according to the available estimates, the overwhelming majority of technological operations (not <90%), are performed by energy corporations using their own resources (Knysh and Verlup, 2016).

It is possible to stimulate development of the relationship based on outsourcing and cooperation by means of creation of technological clusters, innovation houses, technological centers and technological platforms.

Here it should be noted that integration of small and middle-sized businesses into energy corporations in the frameworks of

formation of research, development and production complexes is to a large extent connected with the highest innovation potential of small-business.

All over the world small enterprises are the drivers of innovative development. These processes are noted in all the branches of economy. Small business has all the necessary conditions for successful generation of innovative ideas, – it is about high degree in implementation of business initiative, creativity of small business, organizational flexibility and a series of other factors determining general success of small innovation enterprises. In the formation of the middle class distinguished by high business activity, the most important condition is small business. The enterprises of this economy sector significantly define the economic equilibrium; provide a significant number of jobs, ensuring their creation not only in large cities, but also in all the localities having even low population density.

Speaking about the kinds of the integration innovative and technological platforms it seems reasonable to note that technological clusters have got the most widespread use in the world practice.

As known, "technological cluster is a property complex including the objects of innovation, engineering and technological infrastructure ensuring rendering the full range of services on creation, placement and development of high-technological companies and ruled by the single operator – a specialized management company" (Chernikova, 2016).

Infrastructure of technological cluster includes office, technical, industrial and other facilities, objects of innovation, engineering, technological and transport infrastructure.

The coordination of the technological cluster activities is the obligation of the management company which exercises control as a proprietor (or otherwise) over the property complex, directs the activities of the residents as well as renders a complex of services with the purpose of commercialization of the innovation developments. Therewith the management company should cooperate with federal and regional executive authorities as well as the other organizations taking part in the development of small and middle-sized business.

The purpose of technological cluster is ensuring favorable conditions for creation and development of innovation enterprises, primarily small and middle-sized as well as creation of the best conditions for implementation of science-driven projects of large companies. The result of the technological cluster activities should be efficient incorporation of the research and development (R&D) into the economy, creation of competitive, import-substituting technologies and their implementation in the form of goods and services.

As a part of genesis, technological clusters modify into diversified innovation houses (e.g. Skolkovo Foundation, 2016).

Technological centers similar in their concept to technological clusters are usually formed on the basis of private initiative, so they may be created by an energy corporation and will be in its 100% ownership.

Another direction of research, development and production integration of small and middle-sized enterprises – the activities in terms of the technological platforms which represent "a communication tool designed for activation of the efforts for creation of perspective commercial technologies, new products (services), attraction of additional resources for conduction of researches and developments on the basis of participation of all the concerned parties (business, science, government, and civil society), improvement of regulatory and legal framework in the sphere of science and technology innovation-driven growth" (Portal "Innovations in Russia," 2016). Attractive and perspective spheres for creation of technological platforms may be particularly called energetics itself as well as oil and gas processing and oil and gas servicing.

Function of regional clusters may be called a specific peak of horizontal integration of small, middle-sized and large business.

Formation and development of the clusters is based on the sustainability of ties, presence of the mutual support system, cooperative learning and constant striving for something new.

Role of large business at formation of the "clusters," a kind of an economic symbiosis consists in involving small and middle-sized companies for production setting on the basis of tight cooperation and sub-contracting connections at active cooperation of business and information character. It predetermines development of all the "cluster" participants and allows ensuring competitive edges for them regarding the other standalone companies which are characterized by such strong interconnections.

The clusters are divided into three main types:

- Clusters having regionally limited form of economic activities within close spheres usually tied to universities and other scientific institutions;
- Clusters characterized by presence of vertical manufacturing ties, in narrow branches which are formed around mother companies or a network of the head companies embracing the processes connected with production, supply and sale;
- Branch clusters in various kinds of production with high index of clustering (in particular, "chemical cluster") or at a higher level of clustering (e.g., "aerospace cluster").

New relations inside of a "cluster" contribute to development of innovation activities, stimulate development of progressive technologies and improve all the stages of joint economic activities. Free information exchange and quick distribution of the novelty go along the channels of the consumers who have contacts with a number of competitors. The result of the interconnections taking place inside of a "cluster" is the development of new ways in acquisition of competitive edges and generation of brand new opportunities. Many enterprises of the "cluster" at development of cooperation and convergence of interests are characterized by gradual overcoming of disunity, inactivity and focus on internal problems which contributes to growth of their competitiveness and technical level.

L.A. Alexandrova justly underlines a priority character of clustering in the frameworks of integrative relations in any sector of economy, pointing at the fact that "unlike traditional integration in the form of a holding company, any cluster is a network structure with the ideology of competitive cooperation (or co-competition) at which the incentives for development generated by the competition between the network participants complement with the intensification of cooperation in mutually beneficial directions. It is exactly the co-competition that replaces direct economic and managerial control peculiar to holding structures" (Alexandrova, 2014).

Besides, according to A.B. Bubnov "a special attention is paid to the category of interconnection of branches in a clustere, the tool of which is cluster scheming. Many researchers see the only way of reserving small businesses in the conditions of economic globalization and grooving international competition in their uniting into the clusters. Thus, the main strategic goal of economic development is being implemented which is support and increase in the level of the enterprises performance" (Bubnov, 2016).

3. ACTUAL PRACTICE OF INTEGRATION OF SMALL AND MIDDLE-SIZED BUSINESSES INTO LARGE ENERGY CORPORATIONS

Considering the practice of integration of small, middle-sized and large business in the Russian energetics we should note that energy companies traditionally show high degree of concern in direct takeover of small innovation enterprises. At the same time in some cases small and middle-sized enterprises alongside with research institutions integrate into the value chain of an energy corporation creation without real takeover.

All the large energy companies strive to organize and control dependable research and development centers (RDC).

For example, on the basis of Gazprom Neft there is the RDC working on improvement of oil production and its efficiency due to incorporation of new technologies and project solutions at the deposits of Gazprom Neft, being an independent community. The RDC ensures analytical, methodical as well as R&D support of the oil surveying and production processes. The focus of the center work is the development of new technologies, engineering and expertise of the raw hydrocarbon deposits surveying and production, projecting, analysis and monitoring of development of oil deposits and geological prospecting works, geological and hydrodynamic modeling, technological support and operational supervision of drilling. The Gazprom Neft RDC develops the Gazprom Neft Technological Strategy and implements its projects. The main scope of activities of the center is the following: Planning and maintenance of geological prospecting works; technical and economic assessment of the assets; creation of integrated concepts of development and field facilities construction; R&D support of the drilling process and down-hole treatment; technique and technology of oil and gas production; development of engineering methods and standards; IT-solutions for engineering activities; organization of research works as well as R&D; collection, actualization and distribution of knowledge and best practices ("Gazprom Neft," 2016).

Such centers integrate small and middle-sized innovation enterprises both through joint participation in the R&D projects, and by means of outsourcing, the implementation of which in the framework of the RDC is not accompanied with bureaucratic obstacles peculiar to the management of large corporations.

Technological clusters are also actively involved into the integration processes on the Russian energy market. The plan of the first Russian energy technological cluster was represented as early as in 2008. Therewith, though there are currently no branch energy clusters in the Russian Federation in pure form, a series of technological clusters include the segments and clusters, focused on the energy market.

The Energotech organizational cluster being a part of the structure of the Skolkovo Innovation Foundation is also widely known. According to the results of 2015 the technology cluster already unites over 310 companies. The number of the applications for 2014 to participate in it grew twice. Over the period of its existence more than fifteen new grant proposals have been approved not considering micro-grants which are becoming very popular participants of the cluster.

23 large industrial companies – the partners of the cluster decided to found their R&D centers in Skolkovo. Cooperation agreements have been concluded with Transneft, Gazprom Neft, FGC UES and the others. Among the commercial accomplishments of the star-ups there are entry into the markets of China and the USA, transactions with the international technological leaders, and the first contracts with the Russian FEC companies.

Energotech cooperates with the leading international centers of start-up acceleration (Houston Technology Center is among them) and joint research programs (including a joint project with the Boreskov Institute of Catalysis of the Siberian Branch of the Russian Academy of Sciences, Imperial College and BP).

Energotech also has more than 60 partners among venture funds, 20 of which have already invested into the start-ups of our cluster; over 300 leading international and Russian experts specialized in the EE technologies cooperate with the cluster (Energotech).

Since 2015 smart grid technologies have been actively developed in the cluster. Since 2013 Energotech in cooperation with the Rosseti, PAO (OJSC) has invited a tender among the projects in the sphere of smart grid "Energetic Breakthrough." One may observe an active interest towards the projects connected with electric energy accumulation which was shown by the 2-day conference on the energy accumulators and hydrogenous technologies held in Skolkovo in October, 2015. There real business-cases were discussed on incorporation of the accumulators in the vehicles, RES integration and self-contained power supply sources. Emergence on the Russian market of the mass energy accumulators (the cost of which over the last 3 years decreased to 200 USD/kWh) was marked as the main condition of the RES distribution by the

participants of the round table on distributive energetics. The beginner's luck on the international markets is shown by the Russian developers of the energy accumulators. In 2015 Ensol Tekhnologii Company entered the USA market (Energotech).

In terms of Energotech the oil and gas direction is being currently developed. In 2015 the oil and gas center was separated as the clustera subdivision. Extension of the team allowed paying more attention to the issues of support of the participants in solution of their prioritized tasks – from attraction of the investments to the entry on the foreign markets. For 2015 the number of the companies of the oil and gas center increased more than by 30% and almost reached 100 participants. Notably, among the new participants there are several companies created by the teams of the projects already implemented in the frameworks of Skolkovo – these teams not only successfully develop their current projects, but also keep on moving forward bringing brand new technologies on the market. As it is noted by the management of the center, "the participants keep cheering us with large commercial achievements," among which the first position is undoubtedly taken by creation of strategic alliance between "RRT" OOO (LLC) and KBR, a leading international company in the sphere of commercialization of technologies for production of PRIS petroleum components, developed by "RRT" OOO under Skolkovo grant support (Energotech).

Operation experience of the Cosmos-Oil-Gaz technological cluster (the Voronezh Region), founded as early as 2008, presents some features of interest. The following scope of activity of the technological cluster is currently being developed: Innovative products for oil and gas branch; nanotechnologies and nanomaterial; IT; biomedical technologies (Innovation and Development of Economic and Social Projects Agency, 2016).

Active cooperation of small enterprises with energy corporations (mostly in the sphere of oil and gas servicing) takes place on the site of the Tyumen technological cluster (West Siberian Innovation Center). Particularly, one of the residents of the technological cluster is Avtonom Neftegaz Engineering, OOO (LLC) implementing an innovative project on creation of technological submergible complex for replacement of the underground facilities without killing of the well.

As it is noted in the innovation memorandum, "the proposed complex allows implementing reliable, long-term and hermetic isolation of the capital string hole for protection of productive formation from the effect of the killing liquid in the process of conduction in the well of technological operations" (West Siberian Innovation Centre, 2016).

Among the possible advantages of the developed complex there are prevention of show of oil, gas and water during the performance of the works in the well; exclusion of the works on recovery of the formation peculiarities after change of equipment (acid and thermal treatments); reduction of losses of unextracted oil due to well-downtime; reduction of time for putting of well on production; reduction of terms for replacement of the down-hole equipment; performance of works by the well production maintenance team.

Considering the promising character of the technological platforms creation in the sphere of energetics there is no wonder in the presence of a rather great number of actively operating platforms of various specialization. Among the technological platforms one may mention, in particular, those widely supported by the government such as "bioenergetics," "deep processing of hydrocarbon resources," "closed nuclear fuel cycle with the fast-neuron reactors," "intellectual energy system of Russia," "complex safety of industry and energetics," "low distributed energetics," "promising renewable energy technologies," "hydrocarbon extraction and usage technologies," "controlled thermonuclear fusion," "environmentally safe thermal power of high efficiency."

Energy companies are actively involved into participation in the technological platforms.

Particularly, "technological platform 'closed nuclear fuel cycle with the fast-neuron reactors' is a form of public-private partnership in the sphere of R&D and technological innovations, uniting academic and engineering institutions, engineering companies, private corporations and the Rosatom State Atomic Energy Corporation."

Technological platform "promising renewable energy technologies" in its turn develops under control of "Rusgidro." The purpose of the technological platform is defined as "uniting the efforts of the government, business, financial institutions and the institutions of development, scientific and project communities, and educational institutions in creation of the conditions for development of the renewable energetics, incorporation of efficient technologies of generation based of RES, increase in the competitive ability of the services and products of renewable energetics on the Russian and international markets" (Technology Platform "Promising Renewable Energy Technologies," 2016).

Speaking about clusters we should note that according to the data of the Russian cluster observatory, there are currently 8 clusters functioning in the energy sector of the Russian Federation, among them the majority specializes in the sphere of nuclear and radiation technologies (6 clusters), in the sphere of generation of electric power and production of electrical equipment, as well as the last two cluster specialize in the sphere of production of crude oil and natural gas each (Russian Cluster Observatory, 2015). Therewith, 7 out of the 8 clusters, belonging to the energy sector, refer to the initial level of organizational development and only one is characterized by a high level of development. A half of the above mentioned clusters belong to the category of pilot innovative clusters. Two clusters out of the eight are supervised by the Center of Cluster Development (CCD), which refers them to the category of the key cluster formations, the most significant for the Russian economy.

Meanwhile, more detailed analysis of the clusters specialization shows that the interests of the energy sector are directly met by only 4 clusters. So, among the developments of the Nuclear Innovation Cluster of Dimitrovgrad, the Ulyanovsk Region of the Russian

Federation there are industrial biotechnologies (manufacturing of products on the basis of enzymes and microorganisms for further application in chemical industry, healthcare, production of food and fodder, household chemicals, paper and cellulose, textile, and bioenergetics), only insignificant percentage of which may be used in the energy sector.

Among the clusters, directly focused on the energy sector, the largest one is Volgodonsk Industrial Cluster of Atomic Engineering (VICAE), – the only energy cluster, supported by the CCD in the frameworks of the program of the Ministry of Economic Development of the Russian Federation on support of small and middle-sized businesses. The cluster currently consists of 17 participants, employing 7755 workers (Russian Cluster Observatory, 2015). Therewith the list of participants of the cluster currently includes only one small manufacturing company (Agat Volgodonsk Factory, AO), and two middle-sized manufacturing companies as well as regional institution of development, three higher educational institutions, local state authority and six large manufacturing companies.

The purpose of association of the Volgodonsk Industrial Cluster's participants is "consolidation based on the principles of public private partnership of manufacturing, innovation, organizational potential of enterprises and organizations participating in the cluster, intended to increase in the competitive ability of the regional economy in the sphere of atomic engineering, oil and gas industry" (Russian Cluster Observatory, 2016).

Despite the leader position among the other energy clusters by the number of participants, the Volgodonsk Industrial Cluster is a new formation as it was found in 2016 and actually active operation of the cluster is the issue of the future. Nevertheless, there are the following prioritized projects of the cluster, planned to be implemented in 2016-2020:

1. Expansion and modernization of the existing industry with the purpose of growing the production of innovative equipment for nuclear power stations.
2. Expansion and modernization of the existing industry for creating an opportunity of full import substitution of the axisymmetric fittings of gas-distributing pipeline systems on the existing market by 2020.
3. Development and modernization of the existing network engineering center of the cluster.
4. The project of development and creation of transport and electrical support equipment and the nuclear power stations equipment control systems.
5. The project of construction of destroying chisel test laboratory.
6. The project of construction of thermal environment chamber for timber antisepsis for export supplies (Russian Cluster Observatory, 2016).

The strategy of the industrial cluster development imposes achievement of the following practical results:

- Growth in the volumes of output and realization of the engineering products, components and control systems including of the innovation product;
- Increase of labor efficiency;
- Increase in the volume of the performed R&D works on creation of the new and modernization of the existing technologies and manufactures;
- Increase in the added value created in Russia on all the amendments of the value chain resulting in the cost of the final product;
- Increase in the performance of small and middle-sized business;
- Growth in the volume of real investments;
- Ensuring social stability and economic development in Volgodonsk and the Rostov Region, Russian Federation.

Undoubtedly, if the declared goals and tasks of the cluster development are achieved, it will become an efficient site in the sphere of integration of small and middle-sized businesses into large energy corporations.

In spite of the fact that there are no large industrial corporations among the direct participants of the Volgodonsk Industrial Cluster, the integration of small and middle-sized businesses into the value chain for the largest energy corporations is included into the potential mechanism of the cluster operation.

So, the marketing strategy of development of the VICAE defines that the markets for the products and services consumption of the VICAE participants are such clusters as Rosatom, Gazprom, PAO, Lukoil, and Novatek. The most stable financially capable and promising market segment of the cluster products consumption is large enterprises, being a part of the state corporations and the companies with the state participation of Rosatom State Atomic Energy Corporation and Gazprom, PAO. The orders volumes of these structures are connected with state and commercial projects including international, such as construction of Nuclear Power Stations in India, China, Belarus and other countries, as well as the projects of construction of oil and gas-distributive transport networks of Gazprom, PAO such as "The Power of Siberia," "Turkish Stream," "Nord Stream 2" and the others. In the long-term perspective (up to 2030) one may forecast sustainable increase in the demand for the production and the services of the cluster due to the plans of constructing Nuclear Power Stations abroad – in Turkey, Iran, Egypt, Vietnam, and Finland (Volgodonsk Nuclear Engineering Industrial Cluster).

Notably, only two clusters of the energy sector have a certain operation experience (not less than 3-5 years) – the Energy Cluster of the Tula Region (founded in 2012) and the Cluster of Innovation Technologies of Closed Administrative-Territorial Unit Zheleznogorsk (situated in Krasnoyarsk Region, founded in 2011). Despite an average period of existence of these clusters is 5 years, the both clusters have not yet achieve even middle level of organizational development.

So, among the participants of the Energy Cluster of the Tula Region there are only 10 entities, totally employing 6630 people, while the Cluster of Innovation Technologies of Closed Administrative-Territorial Unit Zheleznogorsk includes the same amount of entities though with a significantly more employees – 29048 people (Russian Cluster Observatory, 2015).

Despite slow rates of organizational development, the both above mentioned clusters support and develop extremely interesting start-ups.

The most promising project of the Cluster of Innovation Technologies of the Closed Administrative-Territorial Unit Zheleznogorsk is the project on creation of production of beta-voltaic power supply sources on the basis of nickel-63 isotope. The project consists of three parts: Production of the necessary highly enriched isotope, where the competences of Rosatom are used, production of the necessary beta-voltaic transformer and production of the final consumable product with the set specification, in which the cluster approach and cluster cooperation are used in the most efficient way. The first part of the project foresees modification of certain parts of the isotope production technology, while the second part provides creation of highly effective semiconducting substrate (of the beta-voltaic transformer) for deposition of the isotope ensuring highest efficiency and specific electric power of the power supply. This scientific groundwork will allow transferring to the next stage of the project implementation that is creation of tiny nuclear batteries. Beta-voltaic batteries are currently developing in an especially significant group of supply sources due to such characteristics as small size and weight, durability and resistance to aggressive environment. Application of highly enriched nickel-63 isotope will allow increasing the efficiency of the batteries manifoldly. The result of the project implementation should become creation of the production of supply sources with overlong operating life (50 years) with the improved characteristics in comparison with the world analogues (Cluster Innovative Technologies of the Closed City of Zheleznogorsk, 2016).

For the national fuel and energy complex the other projects implemented by the participants of the Cluster of Innovation Technologies of the Closed Administrative-Territorial Unit Zheleznogorsk are of a great interest, including creation of a pilot demonstration facility for spent nuclear fuel reprocessing on the basis of innovation technologies, the project on industrial production of MOX-fuel for supply unit No. 4 of the Beloyarsk nuclear power station with BN-800 reactor. Creation of permanent co-working site in Zheleznogorsk is also meant for support of small and middle-sized business, where the participants remaining free and independent, use the common space for their activities.

In general, despite slow development rate, the Cluster of Innovation Technologies of the Closed Administrative-Territorial Unit Zheleznogorsk is characterized as a highly potential. In 2016 the cluster was one of the winners of a tender of the Ministry of Economic Development of the Russian Federation. Up to 2020 it is planned to involve into the cluster about 40 billion RUR of extra budgetary investments. By 2020 the following indicators are expected in the cluster: Increase in the number of jobs up to 7500, attracting extra budgetary investments up to 40 billion RUR. This tender will also help to achieve increase in the number of specialized schools. It is planned to provide 108 invention patents, as well as to invest into 120 start-ups (Cluster Innovative Technologies of the Closed City of Zheleznogorsk, 2016).

The Energy Cluster of the Tula Region is to a greater extent focused on solution of production tasks.

As envisioned by its founders, creation of the cluster will allow:

- Incorporating modern technologies of electric power production;
- Reducing specific costs of natural gas for electricity production;
- Reducing gross regional product energy output ratio;
- Boosting the efficiency of the energy generating facilities in the Tula Region (80-85% in comparison with 40-60%);
- Renewing the main production funds of the Tula Region energy generation (depreciation of the basic infrastructure is currently equal to 70%);
- Reducing the electrical energy production cost and increasing competitive ability on the wholesale power market;
- Stimulating development of industrial production and growth of the investment activity due to putting into operation the additional energy generating capacities (Russian Cluster Observatory, 2016).

In the framework of the cluster creation it is planned:

- To construct PGU-190 at Novomoskovskaya Regional Hydro-Electric Power Plant ("KVADRA – Generating Company," OJSC);
- To create 2 PGU-225 at Cherepetskaya Regional Hydro-Electric Power Plant ("OGK-3," OJSC);
- To construct a new electro station with the capacity of 800 MW on the basis of two combined-cycle plants PGU-400 in Sovetsk, Tula Region (at the site bordered with Schekinskaya Hydro-Electric Power Plant);
- To develop the electric power system of the Inter-Regional High-Voltage Grid Company of the Center and Privolzhye branch of Tulenergo OJSC.

One may also underline the following clusters, founded over the last couple of years, having a definite potential: Pharmaceutical and medical industry, radio technology (the Leningrad region, among the promising directions of specialization, – electricity production and manufacturing of electrical facilities, development of nuclear technologies for creation of nuclear energy of new generation), as well as West Siberian Oil Technology Cluster (West Siberian oil technology cluster) (the Tyumen Region, among the promising production – the whole range of geological and geophysical operations, necessary for successful solution of the tasks of geological surveying by the oil industry enterprises, engineering services in the sphere of well construction and increase in the reservoir recovery and hydrocarbon production stimulation, manufacturing of high quality servicing equipment, supervision of construction, reclamation, test and maintenance of the wells, field research of oil and gas wells, seismic surveying, investigation, field facilities construction, project works, laboratory researches, development and incorporation of innovative products in the sphere of oil industry waste disposal and recycling).

Thus, several regional clusters both of production and innovation type have been formed and operate in the Russian energy sector.

4. PROBLEMS AND PERSPECTIVES OF INTEGRATION OF SMALL AND MIDDLE-SIZED BUSINESSES INTO LARGE ENERGY CORPORATIONS

The conducted research showed that in the Russian energy complex all the mentioned forms and direction of integration of small and middle-sized businesses gained traction, among which a special attention, due to the theses described above, is reasonable to pay to such integration forms as creation of R&D platforms as well as operation of clusters.

Noteworthy, RDCs at the corporations are nevertheless related to the forms of vertical integration, because they do not imply organizational equality of small and middle-sized businesses, involved to cooperation: The latter is implemented either without tight integration of the partners or vice versa is accompanied by takeover of the research teams and laboratories.

More attractive in the context of stimulation of competition and innovation development of the energy sector in the Russian reality are such integration forms of small and middle-sized enterprises as technological clusters and technological platform.

Technological clusters contributing to development of the innovation business in general, bond it to large corporations. The latter often play the role of sponsors of the technological clusters and/or sign in to the venture capital of the technological clusters. The largest corporations also play the role of the investors for the most interesting projects implemented by the technological clusters not only contributing to development of the small innovation enterprises and use of their scientific potential for the benefit of the energy sector in general, but also stimulating and motivating research interest of the innovators who have not achieved any results on the current stage which can be used for monetization.

The same role is played by the technological platforms, among the additional advantages of which one may name narrow specialization that first implies tight connection with the supervising corporation (usually, state company), and secondly, attracts investments to promising star-ups seeking the corresponding developments of the entities.

The main problem of development of technological clusters and technological platforms as integration forms of small and middle-sized business in energetics is in the fact that many scientific and research platforms of this kind remain so called "things-in-themselves," drawing significant investments away to the projects with unclear economic and technological perspectives. Governmental "parenting" over such projects often decreases the efficiency of their functioning – unfortunately, in the modern Russia the problem of non-transparency and unreasonable allocation of the budget financing still remains actual.

Additionally, it should be noted that technological cluster and technological platforms though quite efficiently implement the task of integration of small businesses (first of all, the start-ups) and large corporations, actually pass by middle-sized business, the most prioritized direction of integration into the technological chain of which on the energy market is clusters.

The conducted research, undoubtedly, confirms that creation of clusters is the most promising direction of integration of small and middle-sized businesses into large energy corporations, particularly due to the following reasons:

- In the frameworks of a cluster mutually beneficial and generally equal economic exchange and interaction with the participants of the entities of all forms of ownership and sizes is implemented;
- Operation of the clusters does not imply large-scale state involvement, first of all financial, contributing to commercialization of the implemented projects and stimulating economic interest of the largest corporations to participation in the cluster.

Comparatively small experience of development of regional energy clusters in the Russian Federation do not allow providing a unique estimate to the practical efficiency to this integration form of small and middle-sized businesses into large energy corporations, and among the most obvious problems of development of the clusters specialized in energetics is slow organizational growth.

However, the latter may be connected with the stagnation of the branch that is being recently observed, and inability of the large corporation representatives to understand high importance of competition forms of integration with small and middle-sized business.

Total commitment of the Russian energy corporations to integration only through takeover of attractive business should not spread to the spheres of cooperation with small and middle-sized enterprises. Their active involvement into the processes of stimulation of the energy sector's growth should complement with the preservation of organizational independence as a key factor of development of innovation activity. If to take this argument as a base it is reasonable to implement the transformation of the cluster policy on the state and regional level. Among the prioritized measures aimed at improvement of the governmental cluster policy, it is deemed reasonable to inhibit state corporations (forming the basis of the corporate sector in energetics) from takeover of small and middle-sized innovation enterprises and to oblige them joining into horizontal integration unions with small and middle-sized businesses.

5. CONCLUSION

In the Russian Federation the following key forms of integration of small and middle-sized businesses into large energy corporations are being implemented with various degrees of success: Takeover of small and middle-sized businesses, their integration into a corporate group (a holding company) in the sphere of energetics; formation of research, development and production platforms including technological clusters, innovation houses, technological centers and technological platforms; building of clusters.

Regardless of the chosen form of integration the main purpose of the integration processes is ensuring sustainable business development.

In general, awareness of the priority character of the horizontal integration, first of all, through creation of clusters as a more perspective direction of cooperation between small, middle-sized and large businesses in energetics will allow maximizing the input of small and middle-sized business into the recovery and growth of the Russian energetics.

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