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Industrial potential of the Murmansk oblast in the hydrocarbon resources development of the Arctic shelf

The article deals with the spectrum of the economic questions which concern the effective utilization of the Murmansk Oblast's industrial potential in the development of the shelf deposits. The article shows a comprehensive analysis of the industrial complex and an objective appraisal of the conditions for the oil and gas industry development in the Murmansk Oblast. The authors have pointed out the formation of organizational and economic mechanisms for utilization of the regional enterprises' industrial potential in the development of the oil and gas projects as well as other large industrial projects in the Murmansk Oblast.

Oil and gas industry, industrial potential, the Arctic shelf, hydrocarbon resources, oil and gas cluster.

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Relevance of research

Under present-day conditions the development of the global economic system is largely determined by the use of hydrocarbon resources as the efficient energy carriers and chemical raw materials.

Worldwide hydrocarbon resources are consumed in volume terms and firm oil and gas demand determines priorities in the expanding of production and placing in operation of new fields.

The oil and gas industry occupies a special place in the Russian economy. This sector provides the functioning of national economy in our country. In modern conditions hydrocarbon export revenues form a significant share of currency earnings and the consolidated state budget.

One of the modern trends of the global oil and gas production is the increasing of oil and gas share from the offshore fields. Russia begins to form a new phase in the development of the oil and gas industry and implements large-scale shelf projects for oil and gas production.

This trend leads to the formation of oil and gas provinces. They are new producing regions involved in the development of deposits.

Producing regions is a complex subject of prediction and control. An effective industrial policy in the producing region largely determines the social and economic development and influences over the dynamics of budget revenues, the development of the territorial infrastructure, the rate of employment and population's incomes.

Today the important and urgent task is to form the scientific approaches and tools for effective industrial policy in the new producing region, which is aimed at full and effective implementation of the producing region's industrial potential.

Resource potential of the Arctic shelf in Russia and prospective oil and gas projects

Currently the Murmansk Oblast has achieved a status of the capital of the new oil and gas province in the north of Russia. It is one of the most industrialized and attractive regions for the investors.

The Murmansk Oblast had organized the effective geological operations before it became a new center of oil and gas production. The largest fields in the Barents sea, the Pechora sea and the Kara sea *(fig. 1)*, some of which were unique in their reserves, had been prospected over the past 25 – 30 years. Thus, according to experts, the Western Arctic shelf contains nearly 75% of Russia's shelf hydrocarbon reserves. It is a strategic region for the development of the oil and gas industry.

Figure 1. Scheme of prospective structures and works based on the use of hydrocarbon raw materials (according to Federal State Unitary Enterprise "AMNGR")

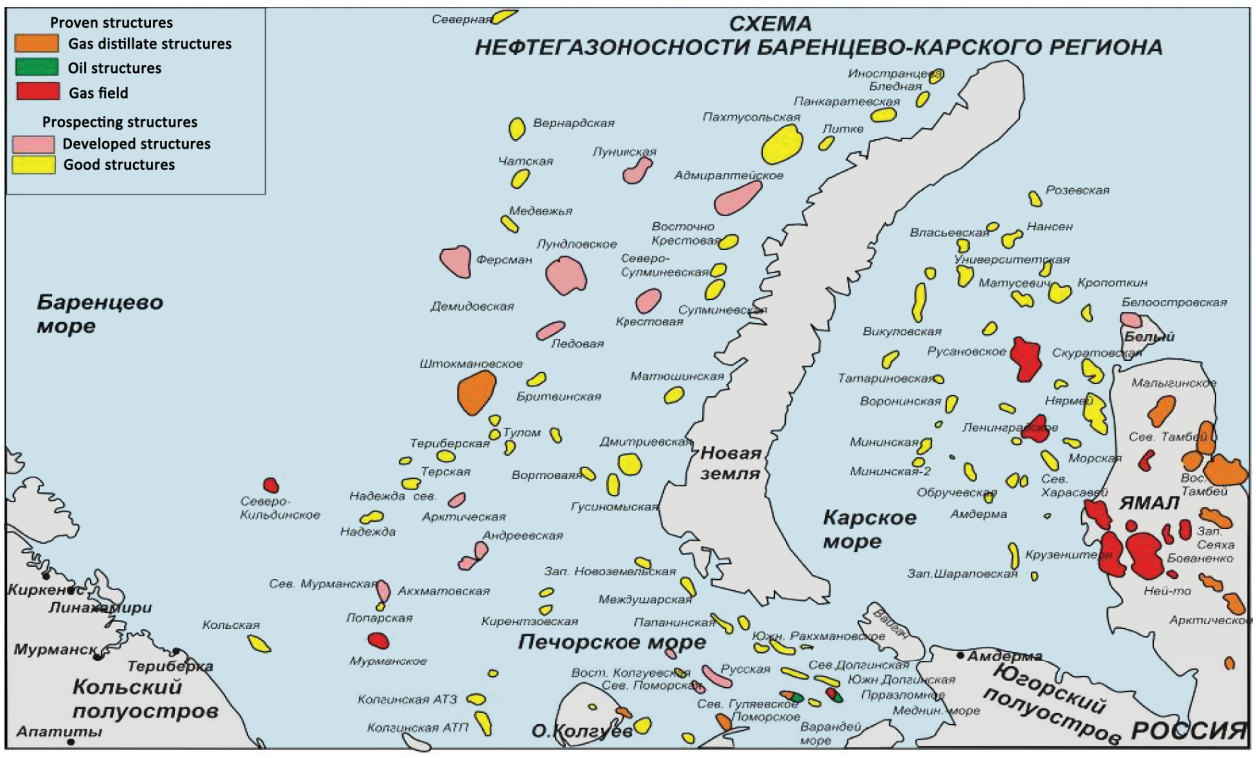


Table 1. Characteristics of the resource base of the Arctic water areas in Russia [1]

Indicator	Value
Initial total producing resources (ITR) of hydrocarbons	Near 80 billion TOE
In addition, in the contestable jurisdiction area of Russia and Norway	6,5 billion TOE
Producing reserves of oil	More than 400 million tons
Reserves of gas	More than 8 trillion cubic meters
Extent of of ITR of hydrocarbons	6.3%
Hydrocarbon deposits	25
Local objects (revealed and prepared)	524
Efficiency of deep drilling	27 thousand TOE / running meter

Table 2. Characteristics of the exploration work in the Arctic water areas [1]

Sea	Deep drilling		Prospecting seismology 2D		Prospecting seismology 3D
	Volume, running km	Number of wells	Volume, thousand running km	Density, running km/km^2	Volume, km^2
The Pechora Sea	70.83	21	83.7	0.8	2191.5
The Barents Sea	93.63	34	275	0.27	2404
The Kara Sea (including inlets and bays)	52.29	28	126.5	0.13	3159.5
The Laptev Sea	-	-	30.2	0.04	-
The East Siberian Sea	-	-	8.8	0.01	-
The Chukchi Sea	-	-	13.3	0.03	-
TOTAL:	216.75	83	537.5	0.13	7755

The revealed unique resources of hydrocarbon raw materials on the Arctic shelf *(tables 1, 2)* have fundamentally changed the prospects and development of the fuel and energy complex and incident industries not only in the Murmansk Oblast but in Russia in whole.

One of the most promising and top priority developing object is the Shtokman gas-condensate field. It was discovered in 1988. The field is located in the central part of the Barents Sea, 600 kilometers north-east of Murmansk. The deep of the sea ranges from 320 to 340 m in this area. The explored reserves of the Shtokman gas-condensate field are estimated at 3.7 trillion cubic meters of natural gas and more than 31million tons of gas condensate [6].

The developing project of the Shtokman gas-condensate field has the strategic importance. It is planned that the field will become a resource base for the shipping of Russian natural gas both pipeline and liquefied gas (LNG) to the Atlantic basin markets. According to the developing project of the Shtokman gas-condensate field, the annual production volume is planned to be 70 billion m^3 of natural gas. It is compared to an annual gas production of Norway which is one of the largest suppliers in Europe.

Produced raw materials will be transported by the sea pipelines to the shore of Teriberskaya bay. A LNG plant, a port transport and technology complex, a gas complex preparing plant and other industrial facilities will be situated here. It is planned to build a gas pipeline "Murmansk – Volkhov" to transport gas to the Unified Gas Supply System of Russia [6].

Another field which is planned to be developed soon is the Prirazlomnoe oil field. The field was discovered in 1989. It is located on the Pechora Sea shelf, 60 km out from shore (township of Varandei). The deep of the sea in the field area is 19 – 20 m. The recoverable oil reserves of the Prirazlomnoe field account for 46.4 million tons. It allows to achieve an annual production level of about 6 million tons [9].

Gazprom is considering the opportunity of refinery building in the Murmansk Oblast to process oil from the Prirazlomnoye field and then from the Dolginskoye field. The refinery's capacity in the township of Teriberka in the Murmansk Oblast in the event of its building could reach about 5 million tons per year. It is expected that oil production in the Prirazlomnoye field will begin in 2011.The peak production in the amount of 6.6 million tons per year will be reached in 6 or 7 years [7]. It is planned that oil production in the Dolginskoye field will begin in 2016. The oil production will be brought up to 6 – 7 million tons per year. Initially the oil from the Prirazlomnoye field will be exported. But the largest part of oil will be processed after the construction of the refinery and the possibility of exports will be reserved.

The main port in the region is the Murmansk Commercial Seaport (MCS). It is a kind of the Arctic gateway of Russia. The port specializes in the transshipment of ore and chemical products. The advantage of the port is its convenient location to the major importing countries. Recently its main objective is to increase bandwidth because of the growth of freight turnover and hydrocarbon exports.

The important events to improve the efficiency and competitiveness of the Murmansk traffic center were being carried in 2001 – 2005. Reconstruction of the Murmansk commercial seaport and dredging in the Kola Bay allowed to take the ships with a displacement of 350 tons and more. It is important to note that any port in the European part of Russia doesn't have the similar opportunities. The new transshipment complexes and oil terminals were put into service. It allowed to increase the volume of freight turnover in the regional ports and the volume of oil transshipment and exporting oil.

The reconstruction of the port's terminals and construction of offshore oil- loading complexes create prerequisites for development of the Murmansk traffic center. Murmansk is becoming a major oil transshipment port of Russia and northern Europe including transshipment of the oil produced in the Arctic offshore fields.

In autumn 2005 the close corporation Arcticshelfneftgas began to build a oil-loading complex "Lavna" on the western shore of Kola Bay which will be joined the system of the Murmansk traffic center. The Ministry of Transport of Russia has approved the general scheme of its development. It is expected that the capital investment in the development of Murmansk port will have amounted to about $ 2.5 billion by 2015. According to forecasts, freight turnover of the port will have amounted to 78 million tons by 2015 (38 million tons of dry cargo and 40 million tons of bulked cargo).

One of the problems of hydrocarbon exports from the port of Murmansk is the fact that any pipeline isn't laid to Murmansk nowadays. Export commodities are delivered by freight trains but railway traffic capacity is limited. It should be noted that the idea to build an oil pipeline that would link the Kola Peninsula and Western Siberia is promising.

It will be recalled that the oil companies Yukos, Lukoil, Sibneft, TNK and Surgutneftegaz signed a Memorandum of Mutual Understanding to create a pipeline system for transport of oil through a bulk oil terminal in the Murmansk region in 2002. In accordance with the memorandum, the Interdepartmental Commission on the placement of production forces of the Murmansk Oblast considered and supported in 2003 the Declaration of intent to invest into construction of a pipeline system in Murmansk which had been furnished by oil-producers.

According to preliminary estimates, the creation of the Murmansk pipeline system would bring $ 1.4 billion to the federal budget, $ 2.6 billion to the regional budgets including about $ 700 million to the budget of the Murmansk Oblast. It would also create from 2 to 6 thousand vacancies. However, the investigation of the case of Mikhail Khodorkovsky has put the project into cold storage.

Transport capacity and promising projects of transport development in the Murmansk Oblast are shown *in table 3.*

Table 3. Development prospect of the transport capacity in the Murmansk Oblast

Project's Name	Planned Activities
Development of marine transport	Reconstruction of the coal terminal MMTP of 9.6 million tons; Building of a coal terminal of 20 million tons on the western shore of Kola Bay; Building of a container terminal of 1 million TEU in the East coast of Kola Bay; Building of an oil terminal of 35 million tons on the western shore of Kola Bay; Development of water area for ships DW = 350 thousand tons; Development of the port fleet; Building of an environmental bin complex
Development of logistic and warehouse infrastructure	Building of a distributional and logistic complex Building of a logistic center
Development of railway transport	Building of a new branch railway "Byhodnoy – Lavna" (28 km); Building of 10 new railway stations and parks; Reconstruction of the gridirons of 4 stations; Reconstruction of the approaches (from the station. Volkhovstroy)
Development of motor transport	Development of the network of streets in Murmansk; Reconstruction of the road "Kola"
Development of air transport	Reconstruction of the airport "Murmansk"

The development of hydrocarbon deposits on the Arctic shelf of Russia is hampered by harsh climatic conditions. The extraction will be produced in the areas characterized by low temperatures, hurricane winds and quick icing. Ice drifts more than 200 days per year in some areas of the shelf, where they will plan to produce gas. These circumstances raise the price of the hydrocarbon deposits projects on the Arctic shelf.

The development of the natural gas fields on the northern seas shelf which are situated far from the shore and in the unique conditions would requires enormous resources and new technological solutions: building of extractive complexes, laying of natural gas pipelines along the seabed, establishment of coastal infrastructure, construction of the liquefaction facilities. It is very important to fulfil the strict environmental requirements during the development of the shelf fields. In this context, the industrial potential of Murmansk has a particular importance.

The industrial potential of the Murmansk Oblast

The importance of the industrial potential of the Murmansk Oblast in the development of oil and gas projects on the Arctic shelf can scarcely be overestimated. The advantage of the Murmansk region is its geographical proximity to the proven hydrocarbons fields.

There are the biggest industrial companies, ship-repairing enterprises, research and educational organizations here.

In addition the Murmansk traffic center has the obvious competitive advantages. They allow the Murmansk Oblast to be not only a promising base of the Arctic shelf development but also an important traffic center in the Russian Federation.

The above facts turn the port of Murmansk into a promising traffic center for the delivery of hydrocarbonic raw materials to the world marketing outlets *(fig. 2)*.

Kola Bay and adjacent bays are the deployment place of mercantile, fishing icebreaker and navy fleets. Murmansk is an initial point of the Northern Sea Route and the base of the Russian nuclear icebreaker fleet.

Murmansk will become an industrial base for future oil and gas extraction projects in the region owing to the development of the Arctic shelf and increasing of the oil shipping volume. It will jump-start the development of the industrial enterprises in the North-West District. Nowadays Murmansk has such strategic importance for the Russian economy in the development of hydrocarbon resources of the Arctic shelf as the Norwegian port of Stavanger and the Scottish port of Aberdeen had in the early oil production from the North Sea shelf more than 30 years ago.

Figure 2. The port of Murmansk as a traffic center for the delivery of hydrocarbons to the marketing outlets

Currently, the Murmansk Oblast has a significant amount of production assets which are under the authority of the military-industrial complex (MIC). By virtue of objective reasons emerged during the period of reforms, a lot of MIC-enterprises are on the verge of bankruptcy or they are unprofitable.

So, the enterprises for repairing and modernization of combat ships and submarines of the Northern Fleet were established on the Kola Peninsula in the Soviet period. They had the unique fixed assets. Today they stand idle without the government order. Part of the production capacities of these organizations can be refocused on the issue of oil and gas equipment. The military-industrial complex has highly qualified stuff and it is especially important to involve the military-industrial complex in welding and metal processing.

Currently the Government of the Russian Federation has signed a decree establishing a special economic port zone in the Murmansk Oblast. Moreover, the Murmansk Oblast takes part in the tenders for the creation of special economic zones of industrial production and technical innovation types which are announced by the Ministry of Economic Development. It is a proposal to establish the industrial and production zone on the western shore of Kola Bay which will focus on manufacturing, repairing and maintenance of the boring machinery and other technologies and platforms for offshore operations. According to preliminary estimates, the volume of attracted investments will exceed 138 billion rubles and 1500 new jobs will be created. Also they are considering a proposal to confer the status of special economic zones to the sea ports.

Along with this the Government of the Murmansk Oblast is developing a mechanism of the regional guarantees to attract investment to the regional economy. The priority spheres for investment are still the objects which are associated with the development prospects of hydrocarbon reserves of the Arctic shelf. Currently there is a long-term targeted program "The development of the investment activity in the Murmansk Oblast in 2007 – 2010" (Decree of the Government of the Murmansk Oblast from 28.09.2006, № 375-PP/9). There is also a targeted investment program for 2010 – 2012 (Decree of the Government of the Murmansk Oblast from 09.10.2009, № 474-PP/18). In addition a draft regional law "About tax concessions in the exercise of investment activities in the territory of the Murmansk Oblast" is developing now.

The international rating agency "Fitch Ratings Ltd" assigned National Long-term rating of "A+(rus)" to the Murmansk Oblast in 2009. The agency also assigned long-term foreign and local currency ratings of "BB-" (BB minus) a short-term foreign currency rating 'B' [8].

The Murmansk Oblast has an advantageous geographical position, natural resources, developed infrastructure and powerful energy system; that's why it is a region which is the center of business interests of Russia and the foreign oil companies realizing the large international projects.

Now the region has two major airports: Murmansk Airport (village Murmashi) and Hibiny Airport (Apatity). Murmansk Airport has two international airlines: Murmansk – Kirkenes and Murmansk – Tromso (Norway), Murmansk – Rovaniemi (Finland) – Lulea (Sweden). It is planned to create the international air junction on the base of Murmansk airline.

The regional institutions of basic and applied science create the necessary prerequisites for the exaggerated economic growth of the real sector of the economy and for the transition to technological development and manufacturing of innovative products.

Development prospects of the proven hydrocarbon fields of the Arctic shelf and creation of oil and gas infrastructure in the Murmansk Oblast open the additional possibilities of attracting such businesses as products, goods and services providers for service companies.

Table 4 shows the SWOT-analysis of the industrial complex allowing to estimate the development conditions for oil and gas industry in the Murmansk Oblast.

Despite the existing weaknesses and threats, almost all variants of hydrocarbon deposits of the Arctic shelf of Kola Peninsula is the base region to accommodate logistics bases and to perform a wide range of works.

Table 4. SWOT-analysis of the industrial complex in the Murmansk Oblast

External environment	Internal environment
Opportunities 1. The Federal subject has an advantageous transport and geographical location 2. There is a variety of unique natural resources 3. There are new promising deposits (including oil and gas fields) 4. Labour force is highly educated 5. The territory has a substantial scientific potential; there are innovative proposals for some industries 6. There is a border with the countries of the European Union 7. The Federal subject takes part in various international programs and projects (including the projects under the BEAR) 8. The special economic areas can appear in the region	**Strengths** 1. The industrial complex is multifunctional 2. Competitive position in the domestic and foreign markets for some types of products is strong 3. Export potential is significant 4. Geography of marketing outlets is wide
Threats 1. The Federal subject is remote from the center of Russia 2. Climatic conditions are difficult 3. Ecological situation has become worse 4. Outflow of population is progressive (including its working-age) 5. There are swings in world prices for raw materials 6. Energy and transport tariffs as well as fuel raises are raised 7. Infrastructure and stock markets aren't developed enough 8. The Federal subject has a capital flight 9. The real exchange rate is growing	**Weaknesses** 1. Costs of production are heightened 2. Fixed assets are outdated and obsolescent 3. Cost price of natural raw materials is increasing 4. Diversification of production is low 5. There is a lack of strategic approaches to management 6. Long-term orientation to raw materials has no alternative 7. The percentage of the final output in the export structure is extremely low 8. High-tech industries are developed poorly 9. There are various kinds of production and technological base; competitive ratio of separate proceedings is essentially different 10. Self-financing potential is limited; there is a lack of investments 11. Social responsibility of some enterprises (especially enterprise forming a company town) is high 12. Personnel's level of proficiency is insufficient

Advantageous geographical location and developed infrastructure have returned the Kola Peninsula into an attractive place for logistics enterprises of drilling. It is a suitable place to work the deposits, transport oil, gas and gas condensate, assemble and repair platforms and equipment, service the fleet and develop the welfare using the existing production capacities and labor resources.

At the initial stage of oil and gas projects the regional companies are ready to carry out blast-hole drilling, crushing, rock movement, sand alluvium, building of access and inside motor roads, construction of berths, electric installation work for temporary power service during the construction period, networks and communications arrangement for the temporary and permanent buildings. Ship-repairing enterprises in the region are able to assemble fabricated metals, build the berths, repair the ships engaged in the fields' development.

In addition, during the first phase of the Shtokman gas condensate field the most parts of project such as gas-turbine installations, the producing of pipes, steel, nails, etc. may be submitted by Russian companies including the regional enterprises. The regional companies may be involved in explorations and borings conducting, providing of transport services including services for shipping companies. The use of icebreaker fleet is very promising for the project.

Promising work front emerges also for the service regional companies. It will be necessary to provide about 16,000 people with food, personal services, etc. during the first phase of the Shtokman gas condensate field project. In addition, the territories of some regional companies are promising to place the complex base of the Shtokman gas condensate field project.

At the same time, the beginning of the development of deposits in the Barents Sea and the laying of the pipeline to the coast of the Murmansk Oblast will significantly contribute to the social and economic development of the neighboring regions, including the Arkhangelsk Oblast which is one of the shipbuilding centers in Russia. Despite the product line diversification had occurred at the largest enterprises of the Arkhangelsk Oblast and they had reorientated to civilian purposes, organization managed to maintain highly skilled technical personnel and ability to work with high technologies. As the largest shipbuilding center in Russia transport enterprises of the Arkhangelsk Oblast will be able to supply the Murmansk Oblast with cargo which is necessary for the oil and gas projects.

Economic prospects of the regional industry's drawing into the oil and gas projects

When oil and gas are referred most people imagine large corporations. But few people know that small companies also work in the shelf's area. Many small businesses involved in the service and supply spheres play an important role on the shelf. Less than 10 employees work in seven out of ten companies [4].

Experience of the leading oil and gas powers, particularly practice the of Norway, shows that during the development of the coastal shelf oil and gas sector offers great opportunities for the development of regional industries, creating of new jobs and raising of living standards. Thus, one of the world leaders in the development of offshore fields is a Norwegian company "Statoil". It has been involving the local businesses in the implementing process of the large-scale projects aimed at development of oil and gas fields near the coast of Norway since its inception. It contributed to social and economic development of the areas where the company "Statoil" acted [3].

The world practice shows that about 80% of the works fall to the share of oil and gas industry suppliers during the implementation of major oil and gas projects. These suppliers are service companies, large metalworking, construction, transport and other suppliers of equipment and materials, as well as scientific and educational institutions which are representatives of various industries.

It is important that the bulk of gross domestic product is created by the industry which determines the technical level of the other branches of national economy and social sphere. Therefore, the positive dynamics of industry determines the entire state of social development in the region.

The struggle for the receipt of orders in the oil industry will accelerate the pace of development and modernization of the enterprises' technological base and increase quality and competitive ability of products. It will meet the requirement in resource opportunities for further technological development and economic growth of the regional businesses.

The oil and gas projects implemented in the Murmansk Oblast can revive general economic conjuncture of most sectors in the Murmansk Oblast and first of all industrial, construction and transport sector. The oil and gas projects can involve the key industries in work which are related in intersectorial production strings. The development of these strings is a driving force for allied industries and it will stimulate the development of their suppliers, etc. This circumstance will lead to the fact that multiplier effects will operate during the certain time period. It is a kind of self-excitation of economic growth. In effect, it is stimulating of the rising spiral of production, investment and consumer demand. According to the scientific studies' results, just domestic demand is the main and the most reliable domestic demand of economic and social progress.

The oil and gas industry can provide hundreds of businesses related branches with the loading. Now this industry has an exclusive economic and social importance; it predetermines employment and efficiency of economic relations, as well as it strengthens inter-regional relations and increases the tax base. Production build-up in the related branches will boost demand for the products of these industries through the strings of engineering communications and generate the additional resources.

Degree of related branches development is characterized by the so-called multiplication index. In the developed countries the multiplier is the following: Norway – 1.6 – 1.7; Australia – 1.8 – 2.4; USA – 2.1. Calculations show that "oil and gas" multiplier is 1.9 in Russia; it corresponds to the multipliers in the oil-producing developed countries [5].

According to some reports, Russian revenues from the machine-building line in the Shtokman gas field (by placement of orders with Russian contractors, transporters, etc.) can double its revenues from the "gas" line. Maximum capacities and augmented of volume of output will allow the bulk of the regional enterprises to fully restore the economic situation, regulate financial management, settle accounts with creditors and increase their own investment opportunities.

In general, the social and economic effects for the Murmansk Oblast of the development of hydrocarbon deposits are the following *(fig. 3)*:

There is a growing demand for science intensive and high technology products of process industry because of the movement of oil and gas resource base to the Arctic seas' shelf.

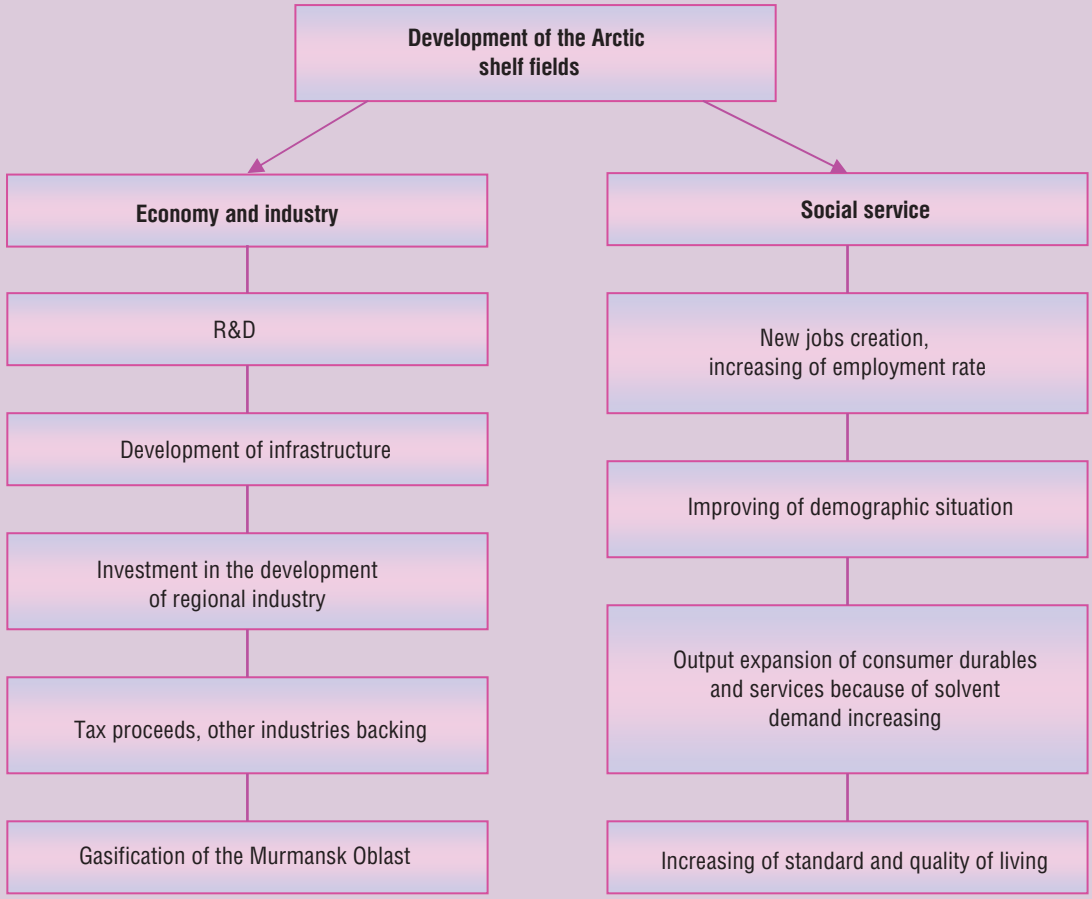
Development of the Arctic seas' deposits creates favorable conditions for the formation of oil and gas cluster in the Murmansk Oblast.

Organizational and economic mechanisms of the industrial potential of the Murmansk Oblast in matters of oil and gas projects

The local companies must meet a number of serious claims to use successfully the regional industrial capacity in the field of oil and gas projects in their territory.

In holding the tenders they will take into account technical resources, reputation, business process perspective, experience, performing of similar types of work earlier, the availability of resources for execution of works, technologies, financial standing, the possibility of receiving a policy in the insurance company, quality of work, environment, structure and organization, necessary equipment, costs and timing of orders, the creditworthiness of the company.

Figure 3. Possible effects of oil and gas projects for the region



It is important to note that work in the oil and gas sector is a new type of activity for the regional enterprises. Despite the high intellectual and industrial potential, local companies need to increase significantly their level of competence in the field of international demands for quality of products and services, system of labour protection, environmental protection and participation in the oil and gas projects as the suppliers, etc.

Today the suppliers of the oil and gas projects are determined by the results of tenders which involve the foreign companies that have already considerable experience in carrying out of similar types of work. This circumstance complicates the competitive activity of Russian suppliers and foreign firms without outside aid. At this moment it is important to overcome the informational closure of the foreign operators' projects, coordinate the development and production of import of industrial products.

There must be a protectionist governmental policy in point of all oil and gas companies to develop the fields efficiently and safety. It is also necessary the mutual integration of these companies to increase their own profits and ensure the state's energy security.

One of the most effective mechanisms for interaction between government and oil and gas companies can serve the creation of industrial clusters, industrial associations or other types of associations and alliances based on mutual economic integration of interests. In modern economic literature the cluster means a network of independent production and / or service firms (including suppliers), the authors of technologies and know-how (universities, research institutes, engineering companies), market-based institutions (brokers, consultants) and customers interacting with each other within a unified value chain [2].

The creation of such structures is one of the most effective tools to harmonize the relations between the government and private business. Such organizations are the forms of support to the companies of all levels. They help to improve work efficiency, living standards, production competitiveness, financial stability and they also promote domestic companies in the international markets and ensure that quality of products meet the world standards.

It is significant to note that it is much easier for the large integrated structures to defend their interests in the interaction with the government agencies. A separate small or medium entrepreneur cannot be a subject to lobbying at the federal level. First of all lobbying is a scope of unions and business associations, industrial enterprises, as well as large commercial structures. The world experience shows that most advanced industrial companies in the developed countries tend to consolidate the economic activity.

The creation of the special Association of suppliers of oil and gas industry "Petro Arctic" to realize the Norwegian project "Snowit" can be an example. Now the association of "Petro Arctic" includes more than 400 vendors covering a wide range of goods and services.

Association offers its services not only during the design and construction, but also during subsequent operation. A similar network of suppliers has been formed for the project "Ormen Lange".

Integration processes which occur during creation of a production cluster, enhance the competence of the enterprises participating in projects and diversification of production at the largest enterprises in the region.

The Association of suppliers of oil and gas industry "Murmanshelf" is one of the earliest examples of such structures in the Murmansk Oblast. It was registered in 2006. Today it unites more than 230 companies and organizations which are going to take part in the oil and gas projects on the Arctic shelf. It is noteworthy that one of the founders of the Association is the Government of the Murmansk Oblast, which actively promoted the creation of this organization.

Now the Association unites project operators, general contractors, oilfield services, construction, transportation, ship-repair, logistics, engineering companies, as well as educational, academic and research institutions of Russia.

At present the structure of the Association "Murmanshelf" by activities is the following *(fig. 4)*:

The main objective of the Association is training for the local industry, combinations of companies which are interested in the projects of integrated development of the Shtokman gas field and other fields on the shelf in the Arctic. The Association promotes the competence of member companies. It uses their productive capacity in the hydrocarbon deposits projects on the Arctic shelf as well as the construction of appropriate coastal infrastructure in the territory of the Murmansk Oblast. Particular attention is paid to training the personnel for the oil and gas industry.

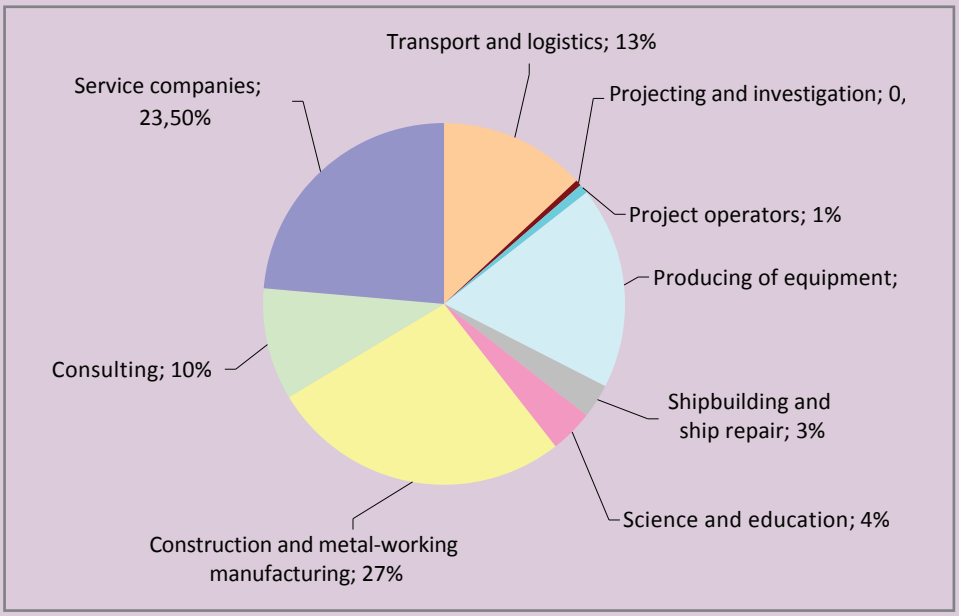
During the work the Association of suppliers "Murmanshelf" create a platform to transfer the advanced industrial technologies: monthly training seminars, experts from the leading Russian and foreign oil companies, a detailed database of the regional industry, and much more.

It has allowed many regional enterprises, especially small and medium businesses, to change their development strategy and head for modernization and training.

The vast majority of the members of the Association "Murmanshelf" representing other states as well as other regions of Russia, are registered in the Murmansk Oblast. They are the taxpayers of the regional budget. That's why we can rank them to the industrial potential of the region.

The Association "Murmanshelf" is an emerging oil and gas cluster, which includes the interaction between government, business and science. The Association provides its members with a variety of consulting services, providing them with the necessary scientific, technical, economic and legal information; it organizes the exchange of experience.

Figure 4. Structure of the Association "Murmanshelf" by activities



The consortium "Murmanshelf Construction" was established in 2008 to use efficiency the industrial and financial capacity of construction companies. The Consortium "Murmanshelf Construction" was created to bring together industrial, financial and intellectual resources. It should also coordinate actions of construction enterprises for joint participation in major projects implemented in the Murmansk Oblast.

The main objective of the Consortium is to involve in the construction of port and onshore complexes for production and shipping of liquefied natural gas and overland pipeline "Teriberka – Volkhov" with the appropriate infrastructure. Currently, the Consortium "Murmanshelf Construction" is concluding agreements to participate in the activities with the regional construction enterprises.

The Consortium "Murmanshelf Logistics" was established in the Murmansk Oblast in 2009. The Consortium's companies are ready to participate in solving of the problems of preparation, organization and implementation of transportation, customs clearance and storage of construction equipment and supplies for building of coastal and seaside infrastructure of the oil and gas projects.

Such integrated economic structures provide a unique opportunity to combine a wide range of partners, including customers, suppliers, competitors, government representatives. They allow to overcome the barriers between firms with different styles of doing business.

Creation of the economically integrated structures simplifies the access to other markets. It reduces the barriers in this way, increases a competition level and brings benefits to all partners of the economic union.

Conclusion

It is obvious that the Kola Peninsula is a promising basic region for location of logistics drilling enterprises, field development, transportation of oil, gas and gas condensate production, installation and maintenance of platforms and equipment, fleet and social security with the existing regional production facilities and manpower.

Economic integration of the companies and their further transformations into the Murmansk marine oil and gas cluster are necessary for full utilization of industrial capacity of the regional businesses.

The establishment of such structures (clusters) is also one of the most effective tools to harmonize the relationship between the government and business. Such organizations are a form of support to companies of all levels, greatly helping to improve work efficiency, living standards, competitiveness, achieve financial stability, promoting the international markets of domestic companies, as well as the relevance of quality products to world class standards. Such organizations are the forms of support to the companies of all levels. They help to improve work efficiency, living standards, production competitiveness, financial stability and they also promote domestic companies in the international markets and ensure that quality of products meet the world standards.

The Murmansk Oblast has a sufficiently high industrial, economic and scientific potential. It can provide an effective and safe development of the Arctic fields. It is obvious that we need active state participation to turn the Murmansk Oblast into a new world energy and transportation center.

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