

Report on Classification of Energy
and Mineral Resources and its Management
in the Republic of Tajikistan

Mr. Rahmonbek Bakhtdavlatov

April, 2019

Contents

- Executive Summary 2
- Introduction..... 3
- Role of energy and minerals production in national economy 4
- Government policies and programmes in energy and mineral resources 5
 - Policy and legal framework 5
 - Sector organization and regulatory institutions..... 5
 - Fiscal design and administration 6
 - Revenue management and implementation 8
- Classification and management framework for energy and mineral reserves/resources..... 9
 - Description and details of the classification and management systems 9
 - Relationship with other international systems 14
 - Relationship with UNFC..... 14
- Energy and mineral resources endowments..... 15
 - Overview of Major Energy and Mineral Resources..... 15
- Annual production, trade, review of the current state and prospects 16
 - Oil and gas 16
 - Coal..... 17
 - Uranium..... 18
 - Mineral Resources..... 18
 - Renewable energy 18
- Social and environmental aspects of energy and minerals production 19
- Technological efficiency and innovations 21
- Data and knowledge management 22
- Conclusions on the status of energy and mineral resource management in the Republic of Tajikistan 22
- References..... 24
- Annex..... 25

Executive Summary

Intensively changing geopolitical, geo-economic and technological picture of the modern world sets the task for our country of preventive and sustainable economic development and measures to ensure national security.

In prospect, foreign policy objectives should be aimed at creating favorable external conditions for development, strengthening the foundations of statehood, protecting the rights and freedoms, interests and dignity of citizens abroad, strengthening the position of the state in the international arena.

In turn, internal policies should be aimed at reducing the vulnerability of the country's economy to potential external threats, finding and developing effective mechanisms and domestic sources of sustainable economic development, ensuring stable economic growth, productive employment, sustainable access to energy resources and a favorable business environment. The economic potential of the country should be considered as the material basis of national security. In this regard, the rational use of human and natural capital, as well as strengthening the institutional development potential in the direction of increasing efficiency, diversification and competitiveness of the national economy, will determine the industrial development of the future development and ensure the transition from the agrarian-industrial to the industrial-agrarian economy.

The basis of the preventive, industrial and innovative development of the country will be natural capital. Huge hydropower potential, clean water, favorable land and climate, flora, considerable labor resources, rich mineral resources and mining resources, create opportunities for the development of export-oriented and import-substituting industries, creating modern sectors of the mining and manufacturing industries, non-ferrous and ferrous metallurgy, environmentally clean agro-industrial complex. The rich historical and cultural heritage of Tajikistan, its unique nature with unique lakes, rare animals and plants, as well as high mountains are important conditions for the development of tourism and increasing the contribution of this industry to the country's GDP.

Introduction

Republic of Tajikistan, a state located in Central Asia. It borders with China, Afghanistan, Uzbekistan and Kyrgyzstan. The area is 142.6 km. sq. The population is 9 mln people (Figure 1).

Figure 1 – Map of Tajikistan



The territory of the republic is 93% mountains and it is rich in mineral resources. However, the country's enormous natural resources did not fully serve the economy of the Republic but were involved in the general development scheme of the Soviet Union planned economy. Hence, the raw material orientation of the mining sector of Tajikistan was predetermined.

Mineral resources are the basis for the development of the economy of any country; they determine the economic potential, the development and location of productive forces, and the use of labor resources. Explored mineral reserves are part of national wealth.

During the years of the geological service in Tajikistan, significant amounts of geological exploration have been performed. On the basis of proven mineral reserves, various sectors of the national economy have been created and are operating - mining, fuel and energy, construction, stone processing and others.

Analyzing the documents, which provide data on mineral deposits in the countries of Central Asia, it is necessary to ascertain the fact that a more detailed study of these materials in the territory of Tajikistan has the possibility of opening large objects for involvement in the mining industry.

At the current transition stage of the economy of our countries, the issues of strengthening cooperation of states in geological exploration and use of mineral resources, restoration of research and production links between geological departments of neighboring countries are especially important.

All geological exploration in the Republic of Tajikistan today is carried out at the expense of the budget, bilateral agreements and foreign investment.

The Geological Survey of Tajikistan is ready to cooperate with local and foreign companies for the maximum harmonization of legal regulations on subsoil use, exchange of information, as well as on other issues.

Role of energy and minerals production in national economy

To provide reliable energy supply to the economy of the country, a program of diversification of generating sources is being implemented based on the development of small hydropower, the construction of thermal power station (TPS), and the coal industry has been developed. The construction and reconstruction of thermal power station, combined heat and power plants, power lines and substations, as well as the implementation of reforms in the energy sector, have significantly improved the supply of electricity to the population, ensured sustainable energy infrastructure and exported electricity to neighboring countries in the summer time. In particular, the construction of the Sangtuda-1 and Sangtuda-2 hydropower stations, the first stage of the Dushanbe HPP, the South-North, Lolazor-Khatlon and Khujand-Aini transmission lines were completed and commissioned.

A positive experience of public-private partnership in the energy sector has been acquired in the form of a concession agreement, the construction of autonomous energy sources. Implemented projects to create a unified energy system of the country based on the unification of the energy systems of the south and north of the country. Measures have been taken to intensify exploration to identify new deposits of energy resources. Public and international recognition of the safety impact of the project of Rogun hydro power plan (HPP) on downstream countries has been achieved, its economic efficiency, environmental safety and financial viability have been substantiated and the first unit of this station has been commissioned.

Energy production in the national economy is very high, because without energy production, industry, mining and geological industry, in general, national economy does not develop. With abundant energy resources and energy production, the pace and growth of industry is developing rapidly. With abundant reserves of coal, oil and gas, it will be possible to build large hydro power stations. With an abundance of electricity, the production of aluminum and other minerals is developing.

Tajikistan has very rich hydropower resources, the total potential of which is 527 bln kWh, ranking 8th in the world in this indicator and one of the first places in the world per capita. The Government of Tajikistan, relying on rich hydropower resources, regards the construction of large hydropower plants as a priority area for the development of the country's economy.

Tajikistan currently has reserves of coking coal and anthracite, drilling and hard coal, the total proven reserves of which in total amount to 4.6 bln tons, including 900 mln tons of commercially valuable coking coal reserves, low-grade brown coal in the amount of 2.29 bln tons, anthracite - 250 mln tons.

In addition, there are relatively rich mineral resources. Tajikistan has a wide range of mineral resources; whose reserves are quite rich. Currently, deposits of more than 70 names of mineral resources have been discovered and reserves have been confirmed in more than 400 deposits containing precious metals, non-ferrous and rare-earth metals, ferrous metals, non-metallic minerals and coal.

The deposits of precious metals are represented by deposits of gold and silver, with silver reserves in Tajikistan taking the first place in Central Asia, and the amount of proven reserves is 53 thousand tons.

Among the reserves of non-ferrous and rare-earth metals, Tajikistan ranks first among the Central Asian states in terms of reserves of lead and zinc, second in terms of reserves of antimony, with a large deposit of antimony located in Tajikistan.

There are deposits of non-ferrous and rare-earth metals, which mainly include lead, zinc, nickel, copper, antimony, tungsten, tin, molybdenum, beryllium, strontium and aluminum.

The deposits of ferrous metals are represented by deposits of iron ore and manganese.

The deposits of non-metallic minerals mainly contain rock salt, barium sulfate, boron, fluorspar, phosphates, asbestos, clay for making bricks, limestone, quartz sand, gravel, semi-precious and semi-precious stones.

Among the various types of mineral resources, ores of non-ferrous metals and precious metals are relatively priority mineral resources. However, in most cases they are either not mined, and if mined, in a primitive way. In the future there is a great potential for the development of this direction.

Government policies and programmes in energy and mineral resources

Policy and legal framework

The laws of the Republic of Tajikistan governing the activities of the mining and geological industry are as follows:

- On subsoil
- On investments, on concessions,
- Production Sharing Agreement,
- About licensing of certain types of activities,
- About precious metals and gems,
- About oil and gas,
- About coal
- Tax and Customs Codes.

As a result of improving the legislative framework for attracting investment in the Republic of Tajikistan, at present, the number of applicants has increased several times to participate in the competition for licenses for geological study and mining operations.

Worth to note that the number of foreign investments in the mining industry increases every year.

The state guarantees equal rights between foreign and domestic investors.

Favorable investment climate contributed to attracting investment in the oil and gas industry of the republic.

The Government of the Republic of Tajikistan pays special attention to improving the existing legislation, making changes and additions to them, aimed at improving the investment climate in the exploration and mining industries.

The right to use land and mineral resources (Law of the Republic of Tajikistan "On Subsoil"). The objectives of legislation on subsoil use is to regulate the work on subsoil use in order to protect the interests of the Republic of Tajikistan and its natural resources, rational use and protection of the subsoil of the Republic of Tajikistan, protect the interests of subsoil users, create and ensure conditions for the development of all forms of economic activity, strengthen the rule of law in subsoil use.

The Government pays great attention to the development and implementation of economic development plans. The "Development Program for the Economy of Tajikistan" defines development plans in the areas of export, energy, transportation, food security and others, and at the same time receive a package of relevant documents.

Sector organization and regulatory institutions

The state institutions involved in the administration and management of subsoil use (including geological research, licensing of mineral resources and license management, management of cadaster and mineral resources and inspection of mines, etc.) in the Republic of Tajikistan are:

- Ministry of Industry and New Technologies (MINT),
- Ministry of Energy and Water Resources (MEWR)

- Agency for State control for the Safe Conducting Works in Industry and Mining under the Government of the Republic of Tajikistan,
- Main Department of Geology (MDG),
- State Commission of the Republic of Tajikistan on Mineral Reserves.

As a key result of the functional analysis and the subsequent strategic review, information was received that MDG currently performs most of the powers and functions with respect to the management of subsoil use, and therefore is the main goal and beneficiary of the proposed reorganization. In addition, there are several government agencies that perform similar or equivalent administrative functions, in accordance with their respective operational and administrative powers to control certain types of natural resources. Accordingly, MEWR is central to the management of hydrocarbon resources, such as oil and natural gas. Similarly, MINT administers activities related to the extraction of metal and non-metallic resources, coal and building materials. With regard to the inspection and control of exploration and operational activities, the appropriate distribution of functions among several government organizations was determined.

Fiscal design and administration

In the field of development of public financial management in the republic are held:

- development of program budgeting and introduction of the practice of “budgeting capacity” for executive bodies;
- linking the budget process with strategic planning;
- improvement of tax administration in order to increase collection, reduce the administrative burden on responsible taxpayers, increase transparency and predictability of the tax system;
- development of fiscal decentralization;
- Increasing transparency and accountability, through ensuring the general availability of information, including through the inclusion of quasi-fiscal operations in financial reporting, improvement of parliamentary control and the participation of civil society in the budget process.

Customs Code:

Article 345, paragraph 4. The import of production and technological equipment and components to it is exempt from payment of customs duty, to form or replenish the authorized capital of the enterprise or retool existing production, provided that this property is used directly for the production of goods. Exempt from the payment of customs duties and personal property imported into the Republic of Tajikistan by foreign employees of enterprises with investments directly for their own needs.

Tax code:

Articles 144, 145

- Reduced income tax from 25% to 15%;
- Enterprises are exempt from income tax in the year of state registration and starting from the year following the year of initial state registration when they are made by the founders, taking into account the minimum investments established by legislation, to the statutory fund of such enterprises in the following investments, for a period of:
 - o 2 years, if the volume of investments is up to US\$ 500,000;
 - o 3 years, if the volume of investment is between US\$ 0.5-2 mln;
 - o 4 years, if the volume of investments is between US\$ 2-5 mln;
 - o 5 years, if investment exceeds US\$ 5 mln

Article 156. Expenses for geological exploration and preparation work for the extraction of natural resources are considered as financing for fixed assets and are deductible from gross income in the form of depreciation deductions.

Article 211, paragraph 4. The import of industrial and technological equipment and its components for the formation or replenishment of the authorized capital of the enterprise is exempt from value added tax.

Article 224. The rate of value added tax is reduced from 20% to 18%.

Taxes on natural resources are paid in the case of the use of natural resources, including subsoil use under subsoil use contracts and (or) the use of water to generate electrical energy.

When using natural resources, their users in the manner determined by the legislation of the Republic of Tajikistan, also pay other taxes and other obligatory payments to the budget established by the Tax Code and other regulatory legal acts of the Republic of Tajikistan.

Taxes on natural resources include:

- taxes on subsoil users (subscription bonus, commercial discovery bonus, royalties for mining);
- royalty for water.

The subscription bonus is a one-time fixed tax of the subsoil user for the acquisition of a subsoil use right in the territory specified by the license (permit). The subscription bonus is paid by the person who won the tender for the right to use the subsoil or obtained the right to use the subsoil on the basis of direct negotiations in accordance with the legislation of the Republic of Tajikistan and also received one of the following licenses (permits) in the prescribed manner: - a license (permission) for geological study; - license (permission) for the extraction of minerals.

The commercial discovery bonus is a one-time fixed tax from the subsoil user for the discovery and registration of economically feasible mineral deposits for mining, as well as for obtaining mining rights in the territory specified by the license (permit).

The royalty for mining is a tax paid by the subsoil user separately for each type of minerals mined in the Republic of Tajikistan, regardless of whether they were delivered (shipped) to buyers (recipients) or used for their own needs.

The Law of the Republic of Tajikistan "On Environmental Protection", adopted by Decree of the Government of the Republic of Tajikistan on August 2, 2011 No. 760, defines the legal basis of state policy in the field of environmental protection and is aimed at ensuring sustainable socio-economic development, guaranteeing the human right to a healthy and favorable environment, strengthening the rule of law, preventing the negative impact of economic and other activities on the environment, organizing the rational use of natural resources and environmental security.

The law regulates relations connected with the interaction of society and the environment, arising from the implementation of economic and other activities related to the impact on the environment in the territory of the Republic of Tajikistan.

The protection and use of land, subsoil, water, air, flora and fauna, including forests, as well as environmental objects of particular ecological, scientific and cultural value, especially protected natural areas, are governed by relevant laws and other adopted on its basis and in accordance with it by the normative legal acts of the Republic of Tajikistan.

Relations arising in the field of environmental protection, in the part necessary to ensure the sanitary and epidemiological safety of the population, are regulated by the legislation of the Republic of Tajikistan on the sanitary and epidemiological safety of the population and the protection of public health, as well as other legislative acts of the Republic of Tajikistan aimed at ensuring favorable for human environment.

To implement the state policy in the field of environmental protection, a system of environmental protection has been created in the Republic of Tajikistan and its activities are aimed at ensuring the rights of citizens to a healthy and prosperous environment.

The organizational basis of the state policy in the field of environmental protection are programs, strategies and plans for environmental protection, developed by the authorized state body of the Republic of Tajikistan in the field of environmental protection, approved by the Government of the Republic of Tajikistan.

Protection from pollution, damage, exhaustion, destruction and other negative impact of economic and other activities of individuals and legal entities are subject to: the land, its subsoil, the soil; surface and groundwater; atmospheric air, the ozone layer of the Earth; the animal and plant world, including forests in all their species diversity, as well as their genetic stock. State nature reserves, groundwater formation zones, rare geological discoveries and mineralogical formations, paleontological objects and other subsurface areas of particular scientific, cultural and other value and other zones are subject to special protection in the manner specified by the legislation of the Republic of Tajikistan.

Revenue management and implementation

Industry is a leader in material production. In this industry a significant part of the gross domestic product is created in almost every country in the world.

The state budget, which today has a socially-oriented focus, is not a budget for industrial development, the government focuses on the social sphere, which, on the one hand, is positive, as the quality of medical, educational and other social services improves and thus improves social security of citizens of the country. On the other hand, with such a distribution of the budget expenditures, the financial needs of the real economy and, in particular, industry, remain practically unmet. For example, the share of expenditure on mining and processing of minerals, mining and construction decreased from 1.52% of the total expenditure part of the country's budget in 2000 to 0.85% in 2010.

The only industry of the republic to which a sufficiently large amount of budget funds is directed is the fuel and energy complex. The trend shows that the state, since 2000, is gradually increasing funding for this industry. If this trend continues in the future, it will lead to almost complete de-industrialization of the country, a critical lag behind the neighboring countries.

Thus, the state needs in the future to revise the structure of budget expenditures in the direction of a gradual increase in financing of industrial sectors of the economy. This can be achieved, either by increasing the revenue side of the budget, or by reducing the costs of other items.

The state should not only increase revenues in order to increase the expenditure side of the budget for industry, but also optimize the structure of other budget expenditures. For example, in the field of medicine, cost optimization can be achieved through fair, open competitions and tenders, where medical equipment and drugs are supplied not by an affiliated company at inflated prices, but by a company that is ready to offer the most optimal equipment for price and quality. Conducting such a balanced, transparent policy in all sectors of the economy, the state is able to solve the existing problems both in the sphere of material production and in other sectors of the economy.

In connection with the above mentions, the state industrial policy should be multidirectional, and for its solution a variety of tools and mechanisms should be used, starting with fiscal measures and ending with the attraction of foreign investment.

Specific priorities in this direction are:

1. In the field of energy:

- a. ensuring reliable energy supply of the country's economy with efficient use of energy resources;
 - b. ensuring the transition of the country's hydropower industry to the budget-forming sector of the country, its decisive role in reducing poverty, promoting not only its own development, but also other sectors of the economy;
 - c. further development of small hydropower, both to reduce poverty and ensure access of the population, especially rural, to social benefits, and for the general development of the economy, first of all, small business;
 - d. ensuring the transition of Tajikistan from the regional and world leader in potential reserves of hydropower to the leaders in the efficiency of development and use of the country's energy potential and, on this basis, promoting the interests of national energy on foreign markets both through appropriate energy diplomacy and through the use of market mechanisms.
2. In the field of mineral resources:
- a. growth in production and sales of industrial products competitive in domestic and foreign markets;
 - b. the organization of an effective system for the reproduction of personnel capable of creating and developing industrial technologies and producing innovative products;
 - c. creation of institutional bases for sustainable and preventive development of industries, the creation of innovative high-performance clusters;
 - d. development of a national system of selective import substitution based on the processing of local resources.

Classification and management framework for energy and mineral reserves/resources

Description and details of the classification and management systems

The classification of deposits and forecast mineral resources is developed in accordance with Article 5 of the Law of the Republic of Tajikistan "On Subsoil Law" and clause 8 of the "Regulations on the State Commission of the Republic of Tajikistan on Mineral Reserves", approved by the Government of the Republic of Tajikistan and establishes uniform principles for the Republic of Tajikistan reserves classification and projected solid mineral resources. The classification of mineral reserves and forecast resources establishes uniform principles for the Republic of Tajikistan on the classification of deposits, reserves and forecast resources of solid minerals and does not apply to deposits of groundwater, oil and gas.

The object of calculating mineral reserves is a deposit (part of the deposit) of minerals. The object of the assessment of the estimated mineral resource are metallogenic (mineragenic) zones, basins, ore areas, fields, ore occurrences, sides and deep horizons of deposits.

Mineral reserves are calculated based on the results of geological exploration and operational work carried out in the process of studying and industrial development of deposits. Predicted mineral resources are estimated on the basis of favorable geological prerequisites, a reasonable analogy with known deposits, based on the results of geological survey, geophysical, geochemical, assessment and prospecting works.

Calculation and accounting of reserves for a field (or its part), assessment and accounting of forecast resources of mineral resources of a subsoil ground is made in units of mass or volume as a whole, in

accordance with economically justified parameters of conditions, confirmed by state expertise, without taking into account losses and dilution during mining, enrichment and processing of minerals.

In determining the reserves of mineral deposits, compulsory separate calculation and accounting shall be made for the reserves of the main and together with them occurring mineral resources, as well as the main and associated components contained in them (metals, minerals, chemical elements and their compounds). economic rationales for inventory calculation.

The quality of minerals is studied taking into account the need for their integrated use, processing technology, quality requirements for minerals and technical conditions. At the same time, the contents of the main and associated, toxic and harmful components, the form of their location and the distribution features in the products of enrichment and processing are determined.

All identified and economically estimated mineral reserves, quantity and quality, economic importance, mining, hydrogeological, ecological and other mining conditions, which have undergone state expertise and approved by the State Commission of the Republic of Tajikistan on mineral reserves, are subject to state accounting.

The necessary and sufficient degree of exploration of solid mineral reserves is determined depending on the complexity of the geological structure of the deposits (subsoil areas), which are divided according to this attribute into the following groups:

- a) deposits of the 1st group. Deposits of simple geological structure. These features of the fields provide an opportunity in the process of geological exploration of reserves calculation for categories A, B and C1.
- b) deposits of the 2nd group. Deposits of complex geological structure. These features of the fields provide an opportunity in the process of geological exploration of reserves calculation for categories B, C1 and C2.
- c) deposits of the 3rd group. Deposits of very complex geological structure. These features of the fields provide an opportunity in the process of geological exploration of reserves calculation for categories C1 and C2.
- d) deposits of the 4th group. Fields with small, rarely medium-sized bodies with extremely disturbed occurrence. These features of the field structure provide an opportunity in the process of geological exploration of reserves calculation by categories C2.

Mineral reserves according to the degree of exploration are divided into categories A, B, C1, C2. Predictable resources are subdivided into categories P1, P2, and P3 according to their degree of reasonableness.

Stages of exploration for solid minerals in the Republic of Tajikistan are presented in Table 1.

Table 1 – Stages of exploration for solid minerals in the Republic of Tajikistan

Stage	Assignment of work	Results	Note
<p>Regional geological study of the territory:</p> <p>a) geological and geophysical studies at a scale of 1:1,000,000-1,500,000</p> <p>b) geophysical, geological survey, hydrogeological and engineering-geological work on a scale of 1:200,000 (1:100,000)</p>	<p>The study of the geological structure of large regions of the country and the patterns of distribution of minerals within them. Creation of a geological and geophysical basis for determining the main features of the geological region and general patterns of mineral resources. Study of the geological structure of the region and justification of the search criteria and signs of minerals to identify promising geological structures</p>	<p>The state geological map, on the basis of which the prospective structures with respect to minerals are established, their search criteria and characteristics. Geological, geophysical and forecast maps, supporting deep sections of geological regions. A geological map of the sheets of the adopted graphic, a map of minerals with the selection of geological structures that are promising for minerals. Gravity, magnetic, radiometric maps. Predicted mineral resources by category P3 with the determination of their possible geological and economic value</p>	<p>Upon detection of sign of minerals on a large area, it is possible to stage prospecting work until the completion of the geological survey of the region.</p>
<p>Geological survey work on a scale of 1:50,000 (1:25,000) with a general survey</p>	<p>Systematic large-scale study of the geological structure of the territory, identification of geological conditions favorable for the localization of mineral resources, predictive assessment of promising areas</p>	<p>The state geological map of the studied areas with the allocation of projected basins, ore fields for prospecting and prospecting and assessment work; assessment of the estimated mineral resources by category P2 and the determination of their possible geological and economic value</p>	<p>If the occurrence of minerals is detected over a considerable area, it is possible to stage the exploration of subsequent stages until the completion of the geological survey of the region.</p>
<p>Exploratory Work</p>	<p>Identification of deposits and signs of minerals and determining the feasibility of their further study</p>	<p>Identification of individual deposits or groups of mineral deposits with an assessment of the estimated resources of category P2 and the determination of their possible geological and economic value</p>	<p>On some types of minerals and well-studied areas, the concentration of mineral manifestations may be determined by the estimated resources of category P1</p>

Stage	Assignment of work	Results	Note
Exploratory and Evaluation Studies	Preliminary assessment of identified mineral deposits and the choice of the object for preliminary exploration	Establishment of the possible industrial value of the identified mineral deposit with an estimate of reserves in category C2, and in less studied areas in category P1 and preparation of technical and economic considerations for TPPs to decide whether to conduct preliminary exploration	Exploratory and evaluation studies can be carried out after any previous stage of geological surveys or searches in areas where promising mineral deposits have been identified.
Preliminary exploration	Industrial field (deposit) assessment	Industrial field assessment; mineral reserves are calculated according to categories C1 and C2 based on temporary conditions; a Technical-economical report (TER) will be compiled to substantiate the expediency of detailed exploration of the field	Very large objects – basin or ore zones extending to large depths, can be explored in parts, within boundaries.
Detail exploration	Preparation of the deposit or its part for industrial development	Obtaining baseline data necessary for designing a field development in compliance with the requirements of the classification of reserves according to field readiness for industrial development; design and approval in the prescribed manner Technical and economic justification (TEJ) for the permanent condition; calculation of reserves and approval of them in State Commission for Mineral Reserves	For fields of major economic importance, which are subject to priority development, the detailed exploration of which is associated with significant costs for the excavation of underground workings, it is possible to combine the stage of detailed exploration with the opening and preparation of the object for development

Stage	Assignment of work	Results	Note
Pre- exploration of the deposit: a) not industrialized	Preparation for industrial development of previously explored deposits Sequential study of insufficiently studied parts of the field and exploration of the areas being cut (plots) in order to replenish the spent mineral reserves or expand the raw material base of the operating enterprise	Generalization of materials on the additional work carried out; if necessary, recalculation of previously approved mineral reserves, reassessment of the Technical- Economic justification of conditions and reserves in the State Committee for Reserves Generalization of materials on the additional work carried out; if necessary, recalculation of previously approved mineral reserves, reassessment of the TEJ of conditions and reserves in the State Committee for Reserves	-
Operational exploration	Refinement of the data obtained during detailed exploration on the number, quality and conditions of occurrence of mineral bodies prepared for development in order to operationalize production planning and monitor the completeness and quality of reserves mining	Operational reserve estimates prepared and ready for excavation blocks; materials specifying the parameters of cross and clearing workings; baseline data to control the completeness of the deposit, determine the loss of mineralization	-

Relationship with other international systems

In today's difficult economic conditions, the owners of deposits in the country still conduct geological exploration, investing significant funds. Usually this process is led by "active managers" who do not have a geological education, but who count money well. Geologists, submitting to "active managers," conduct exploration according to their experience and the requirements of state bodies. Often, geologists are forced to act within the framework of tight budget constraints, tacking between the demands of owners and government agencies (although there are exceptions). Owners need to obtain information on where the reserves are located and to put them on balance as quickly as possible in order to speed up the start of field development.

Everything would be fine, but at a certain stage, when subsoil users want to get a loan or attract foreign investments, there is such a problem as a mismatch of the exploration work carried out in terms of documenting the requirements of international reports (for example, Australian-Asian JORC-2012 or 101 [1, 2]).

And here comes the later insight that the available materials have almost no value for attracting funding.

And why not make the least effort in advance - for example, develop standards for drilling enterprises, documentation of ditches and core samples, sample preparation, apply standard samples in analytics and do analyzes in certified laboratories?

It is precisely this requirement that is not in the requirements of state bodies, and the experts of these bodies "take for granted" what is written in the geological exploration reports, without questioning these data.

Visiting the fields, we see how good deposits are ruined because of the greed of their owners, saving on the quality of drilling, sample preparation and analytics.

It is the quality of geological exploration and analytics, when evaluated according to international standards, that is the main requirement for the assessment of mineral resources.

Geologists own the software DATAMINE, MICROMINE and others at least at the level of basic. Problems arise further. Assessment of deposits, as is known, is an art, and having attended courses, for example, MICROMINE, within 5 days, you will not become a master of this art. Of course, in large mining companies there are entire departments, dozens of experienced specialists in the field of block modeling, who are constantly improving and improving their skills. But how to be small and medium-sized companies, where the software is often "broken", and self-study work on it, who have not completed even the initial courses on "block modeling"?

Here again, you need to seek help from an independent auditing company, whose experienced specialists will help you to make the right model, check its quality, and most importantly, objectively assess (or check the estimate) resources / reserves.

Relationship with UNFC

Currently, the UN resource classification is not applied in the Republic of Tajikistan. But the organizations responsible for subsoil use in the republic are interested in involving this classification and this will probably happen in the coming years.

Energy and mineral resources endowments

Overview of Major Energy and Mineral Resources

Tajikistan has rich hydropower resources. Due to the availability of abundant hydropower resources, measures on the large-scale development in Tajikistan of sources of thermal power have not yet been resolved. Outcomes from an integrated approach to coal reserves in Tajikistan and the allocation of energy resources, Tajikistan, while developing in the future, while maintaining the priority development of hydropower, will have to make serious efforts to develop thermal power as an important addition to hydropower, eliminate the bottleneck in Tajikistan's energy sector, maintain normal functioning the country's economy and the life of the population.

It is necessary to comprehensively consider the state of energy resources, the level of economic development, the location of industry in the future, the electricity demand, the acceptable level of electricity prices, the placement of electricity sources, the scale of construction, the construction schedule and the project to create a power grid. Preferential policies in the field of modernization of the energy sector, increasing the ability of the energy sector to attract foreign investment, maximize the use of foreign investment and foreign assistance to expand the construction of power grids inside the country. Acceleration of preliminary work on small hydropower facilities, restoration of small hydropower facilities unable to function normally, the earliest manifestation by small-scale power engineering of its role for the earliest resolution of energy supply issues in vast rural areas.

Mineral resources require a long development cycle and for a short time can't become a significant production power. The development of mineral resources, however, is an area in which the country has advantages, and in the future could be the main basis for the accumulation of wealth in Tajikistan and the qualitative improvement of the industrial structure.

It is necessary to increase the number of equipment employed in geological exploration, increase the degree of exploration work and the potential of mining, expand the area of geological exploration, as much as possible to acquire information about mineral reserves in the country and their location. At the same time, it is necessary to stimulate the construction and improvement of the class of the accompanying basic infrastructure facilities, strive to synchronize the introduction of infrastructure facilities and the development of mineral resources.

It is necessary to develop development plans and policies in the field of the mining industry and related fields, clearly define the sequence of development of mineral resources, and also create a rational guide mechanism for the transfer of rights to the development of mineral resources.

Conditions for investment in the development of mineral resources should be improved, foreign capital should be attracted for geological exploration, mining and processing of minerals, to expand benefits in the field of taxes and fees, land lease, export of profits and guaranteeing the rights of investors at the same time.

Improve legislation in the field of natural resource extraction, develop processing and deep processing of natural resources in combination with the extraction of natural resources, lengthen the chain of industries engaged in this area, and at the same time work out and develop legislative provisions regulating the export of natural resources, limiting direct export of raw materials, stimulating development processing of natural resources. At the same time increasing the number of people employed in the mining industry, there will be an increase in value added.

Annual production, trade, review of the current state and prospects

Oil and gas

In Tajikistan, 25 oil, condensate and gas fields have been discovered, most of which are under development. To date, the state balance of oil reserves includes 20 fields, of which 12 are located within the Fergana Basin, and 8 are located within the Afghan-Tajik Basin.

All open deposits of Tajikistan multi-layer deposits are confined mainly to the Paleogene deposits, and to a lesser extent to the Cretaceous and to a small extent to the Jurassic deposits. Collectors, which are the reservoirs of hydrocarbon accumulations, are sandstones, siltstones and limestones.

In general, Tajikistan has significant hydrocarbon resources, of which about 1% are converted into industrial categories.

The maximum volume of production falls on 1973 and 1979, when 520 mln m³ of gas and 418 thousand tons of oil were produced.

Most of the developed fields are at a late stage of development and are accordingly developed by 80-85%. High water cut (80-90%), lack of discovery of new deposits led to a drop-in production. So, if in 1986 oil and condensate production reached 450 thousand tons, gas - 250 mln m³, then in 2017 oil - 23.482 thousand tons, gas - 1492 thousand m³.

Worth to note that, today subsalt deposits, deep wells, which were drilled on the areas of South-Western Tajikistan, are considered to be more promising objects, most of them have not reached the design depth, and the subsalt deposits studied have not yet produced a positive result.

With a view to sustainable, dynamic and balanced development of the oil industry, the Government of the Republic of Tajikistan on March 18, 2015 No. 1190 adopted the Law of the Republic of Tajikistan "On Oil and Gas".

The law establishes the legal, economic, organizational framework and state policy in the field of oil and gas and aims to develop this industry in the Republic of Tajikistan.

The discovery of one gas field in the Cretaceous and Upper Jurassic sediments would solve many problems of the fuel and energy complex, and the economy of the republic as a whole.

There is no doubt that for any state in the development of the economy the most important place is occupied by the energy sector, which is particularly relevant to the Republic of Tajikistan.

The annual capacity (2018) of hydrocarbon feedstock in the country amounted to 23,780 tons of oil and 1,600 thousand m³ of gas.

The volume of production of petroleum products in Tajikistan is insignificant against the background of imports of petroleum products from abroad.

According to the "Avesta" in the Ministry of Energy and Water Resources, in the two months of 2019, the country produced about 3.7 thousand tons of oil, which is 1.8% less than in 2018.

According to the source, during this period 43.4 tons of gasoline and 835.4 tons of diesel fuel were produced in the country.

Meanwhile, only in February 2019, Tajikistan imported more than 27.4 thousand tons of petroleum products worth over US\$ 18 mln.

Indicators of imports of petroleum products in 2018 exceeded those of 2017 by 20.7 thousand tons, and in value by US\$ 44.9 mln.

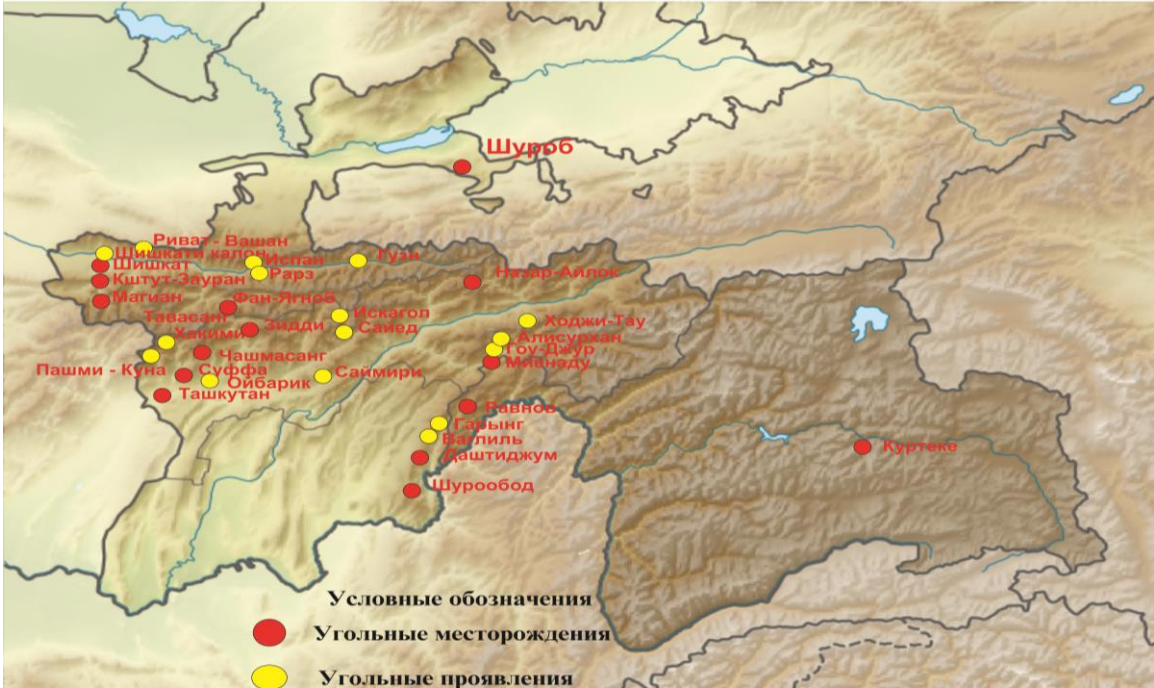
Russia remains the main supplier of petroleum products. Also, oil products in Tajikistan were supplied from Turkmenistan, Kazakhstan and other countries.

At present, the republic’s demand for fuel and lubricants is almost completely satisfied by importing these products from abroad, which leads to regular price increases for fuel, especially during the planting season. To stabilize the situation in the country's oil market, the government of the republic called on investors to invest in the construction of oil refineries in order to somehow reduce their greater dependence on foreign suppliers.

Coal

The subsoil of the Republic of Tajikistan are rich in coal. According to the latest geological data, there are 40 deposits and manifestations of coal in Tajikistan, which represent all the varieties of this type of solid fossil fuel: from brown coal to hard coal, including coking coal and anthracite. The total reserves of these deposits and occurrences exceed 4.3 bln tons (Figure 2).

Figure 2 – Tajikistan coal deposit map



The largest, most extensive coal-bearing area, which is represented by the maximum number of coal seams, is Zarafshano-Gissarsky. The coal-bearing stratum extends in a continuous strip from Penjikent to the headwaters of the Zarafshan River.

According to the Ministry of Industry and New Technologies, coal reserves are sufficient not only to provide the fuel and energy complex for decades, but also to create a chemical industry.

Today, more than 200 industrial and energy enterprises use coal as an alternative process fuel, replacing natural gas. Productive use of coal, and on this basis the development of the chemical industry and non-ferrous metallurgy, can become the main source of achieving the goals of the country's economic development.

It should be noted that the main consumers of coal are:

- energy sector (thermal power plants, boiler houses 45%);
- industrial enterprises (41%);
- population (11%);
- budget organizations (3%).

Annual production (2018) of coal in the republic amounted to more than 1,907 thousand tons.

Uranium

The geological study of radioactive materials in the Republic of Tajikistan is carried out by a specialized organization under the Main Department of Geology, the State Unitary Enterprise “Geological Prospecting Expedition of Radioactive and Raw Materials”. At present, the expedition is conducting a geological study of uranium deposits on the southern slopes of the Gissar Range.

Mineral Resources

The Republic of Tajikistan has enormous reserves of antimony ore. Zeravshan-Gissar mercury-antimony belt, having a width of up to 35 km and a length of up to 200 km. Mining operations are carried out only on one field.

In the north of the country explored and partially involved in the development of deposits of lead-zinc ores. Tajikistan is one of the leading places in the world in terms of reserves of lead-zinc ores.

Of the 20 deposits and signs of lead and zinc studied in the territory of the republic, 19 lead-zinc and polymetallic deposits are located within the Karamazar mining region, only the Mirkhant deposit is located in Central Tajikistan. The deposits of the Karamazar mining region are concentrated mainly in the Zarnissor and Adrasman ore areas.

On the territory of Tajikistan there are 3 gold provinces - Karamazarskaya, South-Tien-Shan (Central Tajikistan) and Pamir.

Tajikistan is the largest province of silver ore deposits in Central Asia. The main part of silver deposits is located within the Sughd region. The explored reserves of silver are mainly concentrated in the Karamazar mining region, where the silver polymetallic deposits themselves are located - Bolshoi Konimansur, Konimansurskoe, Kanjol. The unique silver field of Konimansuri Kalon is fully prepared for industrial development. At Karamazar there are also prerequisites for identifying new objects at deeper horizons.

Tajikistan is rich in precious and semiprecious stones. Features of the geological structure, mineragenic specialization, the presence of a large number of diverse deposits of jewelry and ornamental stones push the territory of the Republic of Tajikistan into the category of highly promising regions of gemstone in the world.

More than 1,000 sites and deposits of lapis lazuli, ruby, sapphire, amethyst, scapolite, polychrome tourmalines, cordierite, agate, carnelian, topaz, rhodonite, marble onyx, spinel, clinohumite, garnet, goethite, serpentine, ornamental marble, facing stones: marble, conglomerate – breccia, gabbro, granite, etc. (Annex I).

Renewable energy

Tajikistan systematically began to engage in research in the field of renewable energy since the 80s of the last century. In the period from 1980 to 2005 employees of the Physicotechnical Institute S.U. Umarov of the Academy of Sciences of the Republic of Tajikistan, together with specialists from the Special Design and Technological Bureau of the Academy of Sciences, developed and implemented more than 20 solar power plants.

The Academy of Sciences of the Republic of Tajikistan, together with other interested ministries and departments of the country, prepared and submitted to the Government of the Republic of Tajikistan a Targeted Comprehensive Program on the widespread use of renewable energy in Tajikistan for years, the goal of which is:

- creation, development and widespread use of promising technologies for the production of electrical and thermal energy based on renewable energy resources;

- contributing to the country's fuel and energy balance;
- assistance in raising the living standards of the population through the introduction of modern technologies for the use of renewable energy sources;
- -reduction of consumption of non-renewable energy resources of organic origin;
- -training of highly qualified personnel in the field of renewable energy;
- ensuring social well-being and economic growth through the development of remote areas;
- aiding in solving the problems of unemployment, education and preservation of the environment.

Hydropower is the main potential source of energy in Tajikistan. The geographical latitude and climatic conditions of Tajikistan make it possible to effectively use renewable energy sources: solar radiation, the energy of small rivers (micro and mini-hydropower plants), and biogas. For widespread use of renewable energy, government support from the Government of the Republic of Tajikistan and international organizations is needed. Some hope in this regard is the beginning of the creation of a regulatory framework.

This refers to the Targeted Comprehensive Program on the Use of Renewable Energy Sources in Tajikistan for Years, prepared by the Academy of Sciences of the Republic of Tajikistan together with the interested ministries and departments of the Republic of Tajikistan. Since most of the population in Tajikistan lives in rural and mountainous areas, energy decentralization and stable energy supply is the basis for sustainable development of rural and mountainous areas and can ensure the rational use of natural resources and, in the long run, contribute to solving the problem of sustainable energy supply and environmental conservation.

In addition, in the territory of the Republic of Tajikistan, are 437 deposits and signs of building materials have been identified and studied to varying level. These are deposits: agloporitovy raw materials, gypsum, facing stones, sawn stones, building stones, raw materials for air lime, expanded clay raw materials, brick raw materials, building sand, sand and gravel mixtures, perlite raw materials, glass raw materials, raw materials in cementless production, raw materials for pottery, raw materials for drainage pipes, raw materials for ceramic tiles, raw materials for mineral paints, raw materials for silicate bricks, raw materials for cellular concrete and cement raw materials.

Social and environmental aspects of energy and minerals production

Environmental challenges and vulnerabilities remain significant, especially in the context of mitigation and adaptation to climate change. These problems have gained great importance after 2015, which include the rational use of water resources, ensuring the resilience of human settlements, taking urgent measures to adapt to climate change, protecting terrestrial ecosystems, land degradation, preventing and eliminating the consequences of natural disasters, and expanding access to clean water and sanitation.

The rural population of Tajikistan is more vulnerable to environmental degradation.

Extraction of primary energy resources, their transportation, production of electric and thermal energy at power plants, in boiler houses has a very significant adverse impact on the environment, which consists in the release of harmful substances into the atmosphere and hydrosphere, thermal pollution of the environment, increased radioactive background, land alienation for power facilities.

Accumulation of carbon dioxide, methane and other gases in the atmosphere due to the burning of huge amounts of organic fuels (coal, natural gas, petroleum products - boiler fuel for power plants, boiler houses and process furnaces, gasoline, diesel and jet fuels for transport) in power generating and energy consuming installations - One of the main causes of the greenhouse effect. The layer of greenhouse gases does not allow heat back into space, and the average temperature of the surface layer of the atmosphere gradually rises.

Auto-transport is one of the main sources of atmospheric pollution with carbon dioxide.

As a rule, any energy saving measure entails positive environmental effects. Therefore, when deciding on the appropriateness of the costs of these activities and determining their priorities, it is necessary to make a quantitative assessment of environmental effects. The value of energy saving for the preservation of human health and habitat is as follows:

1. The first energy saving effect is associated with the possibility of not constructing new fuel bases, fuel supply infrastructures, energy-producing sources, transportation and energy distribution networks;
2. The second most important energy saving effect is the reduction of anthropogenic emissions of greenhouse and polluting gases by reducing the amount of fuel burning, that is, maintaining the atmosphere clean;
3. The third effect of energy saving is the conservation of the hydrosphere.

The modern period of human development is sometimes characterized by three "E": energy, economy, ecology. Energy in this series occupies a special place. It is decisive for the economy and for ecology. The economic potential of states and the well-being of people depend on it. It also has the strongest impact on the environment, ecological systems and the biosphere as a whole. The most acute environmental problems, such as climate change, acid precipitation, global pollution, rapid depletion of fossil fuels, are directly or indirectly related to the production or use of energy. Energy belongs to the primacy not only in chemical, but also other types of pollution: thermal, aerosol, electromagnetic, radioactive, vibration. Therefore, the ability to solve basic environmental problems depends on the solution of energy problems. Energy is a branch of production that is developing at an unprecedented pace. If the population size in the conditions of the modern population explosion doubles in 40-50 years, then in the production and consumption of energy this happens every 12-15 years.

The problems of finding alternative ways of obtaining energy have always interested humanity, but they have never been so exciting as they are today. World energy consumption has become commensurate with the reserves of combustible minerals - the basis of modern energy. The fact that nature has been created over geological eras (millions of years) has been consumed over several decades. If up to 1980, 150 bln tons of oil were produced in the world, then for the last 20 years of the twentieth century it is supposed to use almost 1.2 times more, which threatens not only the exhaustion of easily accessible, cheap deposits, but also serious environmental complications.

Around the world, fossil fuel, nuclear and hydropower are used to produce electricity and heat. Provided that energy resources will be consumed at an ever-increasing pace, the following approximate terms of their complete consumption are called: coal – at the end of the XXII century; oil and gas – at the end of the XXI century; Uranium – In the middle of the XXI century.

However, some futurologists believe that before humanity burns the last kilogram of fuel, it will use up the last kilogram of oxygen. According to available calculations, oxygen consumption is growing rapidly. So, if in 1960, it took 1.3 bln tons of oxygen to burn all types of fuel, then in 1980 it was 12 bln tons, and in 2000 energy consumed about 60 bln tons of atmospheric oxygen.

In addition to the problem of limited natural resources, there are a number of other negative consequences of the use of organic fuel on the environment. Thus, the extraction of oil and natural gas leads to subsidence of the soil. Oil and gas accumulated in porous rocks beneath the surface of the Earth serve as a kind of "cushion" supporting the rock lying on top. When this pillow is removed, the earth's surface in the area of oil and gas is lowered to a depth of 10 meters. In addition, the extraction of minerals from the earth's interior leads to a redistribution of gravitational stress in the earth's crust, which sometimes ends in earthquakes.

The environmental impact of energy depends heavily on the type of fuel used. The most “clean” fuel is natural gas, which gives the least amount of air pollutants when it is burned. This is followed by oil (fuel oil), coal, brown coal, shale, peat.

As mentioned above, in the process of burning fuel a lot of side substances are formed. When coal is burned, a significant amount of ash and slag is formed. Most of the ash can be caught, but not all. All waste gases are potentially harmful, even water vapors and carbon dioxide CO₂. These gases absorb the infrared radiation of the earth’s surface and a part of it is reflected back to the Earth, creating the so-called “greenhouse effect”. If the level of CO₂ concentration in the Earth’s atmosphere will increase, global climate change may occur.

When burning fuel, heat is generated, part of which is released into the atmosphere, leading to thermal pollution of the atmosphere. This, ultimately, entails an increase in the temperature of the water and air basins, the melting of glaciers and the like. This whole process of accumulation of heat can lead to a noticeable increase in temperature on Earth, if the use of energy continues to grow at the same pace as it is now. In turn, an increase in temperature can cause profound climate changes throughout the Earth.

Technological efficiency and innovations

In this direction, the development should receive the mining industry, energy, transport, telecommunications, food and light industry, building materials industry, tourism, as well as the financial sector.

Special attention in sectoral and regional development programs should be given to products that already have comparative competitive advantages. Already at this stage it is necessary to consider potential points of growth adjacent to these industries.

Along with the existing enterprises of the industry (some of them will be reconstructed), new enterprises of the mining and manufacturing industries (non-ferrous and ferrous metallurgy, building materials industry, light and food industries, chemical industry and other industries) will be put into operation.

In general, the number of new jobs in industry will increase by 1.5 times. Taking into account modern needs and existing financial opportunities in the development of the national energy sector, at this stage it is necessary to continue the implementation of the construction program for small hydropower plants in the framework of diversifying energy sources and their forms of ownership, to ensure financial rehabilitation of the energy system based on improved payment discipline, restructuring of the energy sector, and an adequate tariff policy, implementation of energy saving and energy efficiency measures in all sectors of the national economy.

The issues of diversification of generating sources of energy based on the construction of thermal power plants and the development of the coal mining industry, as well as the implementation of projects to reduce energy losses and improve the efficiency of the use of existing energy capacities will be important.

This stage will be connected with actions in the field of improving the quality of work of existing types of transport, ensuring increased involvement of natural resources into economic circulation and the development of new lands, growth of transit traffic, reduction of transportation costs and increased security.

A characteristic feature of this stage of development will be the adjustment of new mechanisms for implementing state social policy in the direction of modernizing the management system of the sectors forming human capital, and institutionalizing the system of production and social entrepreneurship.

Social security and competition will be key growth objectives. During this period, work will be organized to carry out the necessary research and preparatory activities to create the basis for the accelerated development of the country's regions.

Data and knowledge management

In Tajikistan, in the mining and geological sector, since 2005, significant actions have been taking place, both from the Main Department of Geology under the Government of the Republic of Tajikistan, and cooperation with the international organizations in with the Geological Department of Tajikistan.

Under the Department of geology there is a State Geological Archive, which is the main base of geological information. Until very recently, most of the information, reports, maps, graphic applications, etc. were in paper format.

As part of the cooperation of the Geology Department with other geological services, such as Iran, Finland, Germany, China, Britain, etc., serious attention was paid to the management of geological data and the training of local specialists. For example, in 2009, within the framework of the project, cooperation with the Geological Service of Iran established the “Earth Science Information Center”, which continues working up to present. For more than three years, more than 30 local specialists have been trained in the field of geomatics. The main purpose of this center is to collect, study and use geological and geographical information, also digitizing old and new data.

Also, in 2011, within the framework of the project, a cooperation with the Finnish Geological Survey in the geological fund itself created an information center with powerful copying equipment and a server for storing digital data. As one of the key aspects of the project was to attract international investors to the country's mining industry, a web portal was created for the geo-portal of Central Asia: www.cac-geoportal.org; www.geoportal-tj.org.

Today, for various projects and a grant from the World Bank, the geological fund has been completely scanned and most of the graphic material has been digitized.

Within the framework of cooperation with the British Geological Survey, it is planned to develop a data management plan combine servers of different projects and create a single database. A plan for accessing information is being developed, as well as training of local specialists in the creation, management and dissemination of data.

The collaboration of the Main Department of Geology with the Aga Khan Agency for Habitat created the Open Center for Exogenous Geological Processes, where a database of exogenous geological processes was created and connected to the Agency of Emergency and Civil Defense of the Republic of Tajikistan with a Policom system and a joint online platform for sharing information (Web application – GeoNODE).

It is worth noting that the mining industry of Tajikistan in the near future may become one of the first in regard to providing and dissemination the data online.

Conclusions on the status of energy and mineral resource management in the Republic of Tajikistan

The solution of tasks related to the low energy efficiency of the economy of the republic is required; the need to ensure sustainable energy and fuel supply of the population and industry; reduction of anthropogenic impact and loads of the fuel and energy complex on the environment; ensuring reliable energy and economic security of Tajikistan.

To ensure the stability of energy and fuel supply in the republic, the following tasks must be solved:

- development of a long-term forecast of the energy needs of the Republic of Tajikistan and possible ways to ensure them;
- development of fuel and energy and water resources, creation of an appropriate infrastructure with the attraction of state and foreign investments;

- on the basis of a long-term forecast, the conclusion of long-term bilateral and multilateral interstate agreements between producer and consumer countries for the supply of energy resources with the mutual commitment of the parties to implement these agreements;
- restoration of the functioning of unified systems of gas, oil, coal, electricity;
- improving the regulatory framework for the free movement of capital, labor and technological equipment between the fuel and energy complexes of the partner countries;
- development and rational use of the mechanism of relations in the markets of foreign countries, taking into account the mutual interests of the partner countries;
- solving personnel problems of the fuel and energy complex;
- creating conditions for the growth of national and foreign investments in the fuel and energy industry.

The named measures are the first necessary steps in solving the problem of energy supply of the national economy of the republic and creating the basis for stable and sustainable economic growth.

References

- [1]. National Development Strategy of the Republic of Tajikistan for the period up to 2030. Approved by the resolution of the Majlisi Namoyandagon of the Majlisi Oli of the Republic of Tajikistan dated December 1, 2016, No. 636.
- [2]. Mineral resources of Tajikistan, the potential for further development of the country's economy. Main Department of Geology under the Government of the Republic of Tajikistan.
- [3]. Renewable energy sources in Tajikistan: the state and development prospects of Kh.M. Akhmedov, Kh.S. Karimov, K. Kabutov Physicotechnical Institute. S.U. Umarov Academy of Sciences of the Republic of Tajikistan.
- [4]. The current state of the republic's industry and the role of hydropower in the development of Tajikistan. S.A. Kurbonov, Graduate Student, Russian University of Economics. G.V. Plekhanov, Moscow.
- [5]. The current state and directions of development of the fuel and energy complex of the Republic of Tajikistan Z.Zh. Ziyaeva, Graduate Student, Department of Economics, Accounting and Auditing, Tajik National University.

Annex

Annex I – Geological and mineral resource map of Tajikistan

