INDUSTRY OF THE REPUBLIC OFUZBEKISTAN

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Annotation: this article discusses the industry of the Republic of Uzbekistan and its significant contribution to the country's economic development. It explains how various sectors of industry have undergone important modernization, technological renewal, and structural reforms to strengthen the national economy, increase production capacity, and improve the quality of life. The article highlights the achievements in key industrial branches such as energy, mining, metallurgy, oil and gas, and textile production, which serve as the backbone of Uzbekistan's industrial growth and economic stability. It also emphasizes the extensive reforms carried out in recent years to attract foreign investment, expand international cooperation, and introduce modern technologies into industrial processes.The article additionally outlines progress in important areas such as manufacturing, construction materials, chemical production, and the automotive industry. It describes efforts to develop industrial infrastructure, establish free economic zones, support entrepreneurship, and promote innovation and digital technologies. These measures have helped diversify the economy, increase export potential, and enhance the competitiveness of national products in global markets. Overall, the article shows how Uzbekistan's rapidly developing industry—through modernization, investment, and innovation—has contributed to building a strong and sustainable economy that successfully combines traditional sectors with modern industrial growth.

Key words: Industrial development; Manufacturing; Heavy industry; Light industry; Energy sector;Oil and gas industry; Mining (gold, copper, uranium); Metallurgy; Automotive industry (UzAuto); Chemical industry;Textile industry; Agriculture processing; Construction materials;Electronics production; Industrial zones; Free economic zones (FEZ); Modern technologies Export potential; Industrial

modernization; Digital industry; Renewable energy; Transport infrastructure; Logistics; Investment climate; Foreign direct investment (FDI); Innovation and engineering; Industrial diversification;

Introduction

The industry of the Republic of Uzbekistan plays a vital role in the country's economic growth and modernization. Over the past decades, Uzbekistan has carried out large-scale reforms to transform its industrial sector, strengthen production capacity, and attract new technologies. Today, the nation is developing a diverse industrial base that includes energy, mining, metallurgy, chemicals, textiles, automotive manufacturing, and construction materials. These sectors contribute not only to economic stability but also to improving the quality of life, expanding employment opportunities, and increasing the country's export potential. As Uzbekistan integrates more closely with global markets, its industrial sector continues to evolve, combining traditional strengths with innovation, digitalization, and international cooperation. This ongoing transformation reflects the country's long-term vision for building a competitive, modern, and sustainable economy.

Industry

Industry is one of the most important sectors of every country's economy, as it is the field where material goods are produced, technologies are created, and the development of all other sectors is ensured. The growth of industry leads to the establishment of new settlements, the construction of transport routes, and the development of agriculture, construction, trade, and other spheres. Therefore, the role of industry in the national economy is invaluable.During the years of independence, Uzbekistan's industry has undergone significant changes: many state-owned enterprises were privatized, and a production system based on market economy principles was formed. Today, gas extraction, non-ferrous metallurgy, mechanical engineering, light industry, and the food industry are among the leading sectors of the country's economy.The geographical placement of industry, agriculture, and transport depends on several factors, especially scientific and technological progress. New technologies, energy sources, and modern transport systems allow enterprises to be located more efficiently. As a result, specialization, cooperation, and intersectoral industrial complexes are expanding, contributing to higher labor productivity.Today, ensuring the development of Uzbekistan's industry requires not only large industrial complexes but also the establishment of numerous small and medium-sized enterprises across different regions. This helps increase employment in rural areas, enhance economic efficiency, and create new production sectors.

Fuel Industry in Uzbekistan

The fuel industry of Uzbekistan is one of the most important and strategic sectors of the national economy. It plays a key role in ensuring the country's energy security, supplying industrial enterprises with stable fuel resources, and increasing export potential. The foundation of this sector consists of the extraction and processing of natural gas, oil, gas condensate, and coal.Uzbekistan is one of the leading countries in Central Asia in terms of natural gas reserves. Major companies such as *Uzbekneftgaz* and *UzGasOil* are actively involved in gas and oil production. Large deposits of natural gas and oil are located in the regions of Kashkadarya, Bukhara, Khorezm, Navoi, and Karakalpakstan, where modern technologies and advanced equipment are being introduced.The fuel processing segment is also developing rapidly. Large refineries such as the Bukhara Oil Refinery and the Fergana Oil Refinery produce high-quality gasoline, diesel fuel, aviation kerosene, and various petrochemical products. In recent years, Uzbekistan has carried out wide-ranging reforms aimed at improving energy efficiency, transitioning to environmentally friendly fuels, and attracting foreign investments.The coal industry also holds an important place in the country's energy balance. Coal extraction in the Angren and Shargun mines is increasing, supporting both industrial needs and electricity generation. Along with traditional fuel sources, Uzbekistan is also working to modernize the fuel sector while expanding the use of renewable energy resources, which strengthens the overall stability of the national energy system.Overall, the fuel industry of Uzbekistan serves as a foundation for economic growth. Its development contributes to strengthening the country's industrial potential, increasing exports, and ensuring a reliable energy supply for the population and enterprises.

Oil and Gas industry

The gas industry, the youngest branch of the fuel industry, has been rapidly developing in recent years. Gas is one of the cheapest types of fuel. It is used both in industry and in everyday household life. Gas is also a valuable chemical raw material. Compared to other types of fuel, gas pollutes the air the least.In our country, natural gas reserves are much larger than coal and oil. Gas fields are located next to oil fields. A small portion of gas (associated gas) is extracted together with oil, but the main part is obtained from pure gas fields. In the mid-20th century, in the Ferghana Valley, associated gas from oil fields began to be used in industry and for household needs for the first time. Back then, Uzbekistan produced an average of 9 million cubic meters of natural gas per year, while today almost 60 billion cubic meters are extracted annually. Thanks to the use of natural gas, major changes have taken place in the country's fuel balance.According to official data from OPEC (Organization of the Petroleum Exporting Countries), Uzbekistan ranks 14th in natural gas production in the world. In addition to the Ferghana Valley, rich natural gas fields have been discovered in Bukhara, Surkhandarya, Kashkadarya regions and in the Republic of Karakalpakstan,

enabling Uzbekistan to begin exporting gas.Transporting gas through pipelines is cheaper than transporting any other type of fuel. The length of gas pipelines is rapidly increasing. The first natural gas pipelines were built in the Ferghana Valley. Because Uzbekistan has long hot summers, gas is mostly needed in winter. In large cities such as Tashkent, Ferghana, and Andijan—where gas consumption is high—gas saved during the summer is stored in underground reservoirs and then used in winter. Gas is not only a high-quality fuel, but also an important raw material for the chemical industry. The demand for gas in the chemical sector, thermal power stations, and households is increasing. Therefore, new methods of extracting additional gas are being explored and the capacity of existing pipelines is being expanded.The modern economy cannot function without oil. Oil is not used in its crude form. During processing, various fuels and chemical products are obtained from it. The cost of extracting oil is, on average, four times cheaper than coal mining. The wide use of oil in the national economy helps save a large amount of money.All expenses expressed in the money needed to produce a unit of product (for example, extracting 1 ton of oil) are called production cost. The production cost of oil depends not on how deep it lies underground, but on how rich the oil field is. The cheapest method of extracting oil is the fountain (gusher) method, where oil flows to the surface due to natural pressure inside the reservoir. When the pressure decreases, it is maintained by special techniques. Extraction using pumps is also widely used.Like gas, oil is also transported through pipelines, which is four times cheaper and safer than railway transport. Pipeline transport ensures regular and reliable delivery of oil to consumers and prevents the inevitable losses that occur during loading and unloading in other transport types.In the past, oil was refined where it was extracted. Today, oil is delivered to locations where petroleum products are most in demand and refined there. If oil were refined only near extraction sites, each type of petroleum product would require a separate pipeline, which would greatly increase transport costs.Many oil and gas fields have been discovered in Uzbekistan as a result of geological exploration (e.g., Mingbulok oil field discovered in Namangan in 1992). Taking into account the increasing demand for oil, a refinery capable of processing 5 million tons of oil per year was built in Bukhara. It began operating in 1997.Currently, Uzbekistan produces more than 50 types of petroleum products.Since domestic production is not enough to meet demand, Uzbekistan imports some oil from abroad. Today, the country’s refineries have a capacity to process 11 million tons of oil per year.Compared to developed countries, the share of petroleum products in Uzbekistan’s energy consumption structure is quite high. In the future, it is necessary to reduce the share of oil in the fuel-energy balance. For this, existing vehicles and machinery need to be equipped with fuel-efficient technologies—a process that is complex and expensive.

Therefore, in the coming decades, the share of oil in the fuel-energy balance will remain stable.

Electric Power Industry in Uzbekistan

The rapid development of a national economy requires a steady increase in the production of electric power. In Uzbekistan, almost 90 percent of all electricity is generated by thermal power plants (TPPs). The country has several large TPPs, such as the Sirdaryo, Tashkent, Angren, New Angren, Navoi, Takhiatash and Talimarjan power plants. Thermal power stations are relatively fast and inexpensive to build, and the cost of electricity largely depends on the expenses of extracting and transporting fuel. Therefore, when choosing a location for a new power plant, the cost of bringing fuel to the plant and transmitting electricity to consumers is carefully compared.The distance over which electricity can be transmitted is increasing every year due to scientific and technological progress. One of the main advantages of electricity is that it can be transmitted through wires over long distances. Another important advantage is that almost every sphere of the economy relies on electric power. A third advantage is the possibility of using local fuel resources, and the fourth is that electricity can be generated at large centralized power stations.The Angren and New Angren TPPs are located near coal deposits, which significantly reduces transportation costs. In areas where electricity consumption is very high, power plants can be built even if the fuel is transported from other regions. Large TPPs supply not only their own region but also neighboring provinces. For example, the Sirdaryo TPP alone produces about 13 billion kWh of electricity per year. During the years of independence, one of the major projects was the commissioning of the 800-MW first unit of the Talimarjan TPP in Kashkadarya region.Many thermal power plants also produce heat alongside electricity. These plants are known as combined heat and power plants (CHP). The heat they generate is used for heating buildings, greenhouses and for industrial processes. However, hot water cools down after 20 km, so CHP plants are built mainly near large cities and industrial enterprises. In Uzbekistan, major CHP plants are located in Fergana, Muborak and Tashkent.Electricity can also be produced at hydroelectric power stations (HPPs), which use the natural power of flowing water. The cost of electricity produced at HPPs is very low — up to four times cheaper than at thermal power plants of the same capacity. The first HPP in Uzbekistan was built on the Bozsuv Canal in 1926. Later, major HPPs such as Xishrav, Tuyamuyun, Farhod and Khojakent played an important role in the development of industry. Hydropower allows not only electricity generation but also irrigation, water supply and fish farming. On fast-flowing rivers, several HPPs can be built close to each other, forming a cascade, such as the Chirchik–Bozsuv Hydropower Cascade, which consists of 19 HPPs.Uzbekistan currently has 37 major thermal and hydroelectric power stations, producing around 60 billion kWh of electricity annually. Today, the country’s electricity demand is about 69 billion kWh,

and most of it is still produced at thermal power plants. To generate this, Uzbekistan consumes annually (2018 data): 16.5 billion m³ of natural gas, 86 thousand tons of mazut, and 2.3 million tons of coal. In the future, due to population growth and economic expansion, electricity demand is expected to increase even more.President Shavkat Mirziyoyev has emphasized that relying only on gas and coal is unsustainable, as their reserves may be depleted in the future. Therefore, Uzbekistan has begun taking steps to develop nuclear energy. In cooperation with Russia's "Rosatom," an agreement has been reached to build the country's first nuclear power plant (NPP). The project includes two power units, each with a capacity of 1,200 MW, planned to be commissioned by 2028. Nuclear fuel (uranium) is extremely efficient: just 1 kg of uranium produces as much heat as 2,500 tons of coal.

Chemical industry

The chemical industry in Uzbekistan began to take shape in 1932 with the opening of the Sho'rsuv sulfur mine. Its products are widely used in various sectors: machinery (plastics, glass), textile industry (fibers, dyes), agriculture (fertilizers, pesticides), transport (motor fuels, lubricants, synthetic rubber), and construction (adhesive films, glass, plastics).Within the chemical industry, the production of mineral fertilizers occupies a significant place. Additionally, defoliants for controlling agricultural pests are also produced. While supplying raw materials and products to many sectors, the chemical industry, in turn, relies on other industries for energy, equipment, and transport. The chemical industry also processes raw materials from the gas and cotton industries, as well as waste from non-ferrous metallurgy. Thus, the chemical industry is interconnected with multiple sectors, influencing their development and regional distribution.The chemical industry creates synthetic materials that are superior in quality to natural products. These materials save both human labor and agricultural raw materials. For example, producing nylon requires 20 times less labor than preparing natural silk. Moreover, the chemical industry has facilitated the combination of production processes. For instance, coal, oil, and gas are used both for energy generation and for producing chemical products (such as gasoline and paraffin), leading to the establishment of energy-chemical complexes.Combination (Kombinatlashtirish) refers to the integration of several production enterprises into a single entity, where the technological processes are interconnected, sometimes spanning multiple industries.The raw material base of the chemical industry is rich and diverse. It utilizes various minerals, industrial waste, wood, water, and even air. This vast range of raw materials allows chemical plants to be built almost anywhere. However, chemical enterprises consume large amounts of energy and water and can have a serious negative impact on the environment, which limits the locations suitable for their construction.A major chemical enterprise is the Chirchiq Electrochemical Plant, which started operating in 1940. Initially, it produced nitrogen fertilizers from

atmospheric nitrogen using electrical energy. After natural gas discovered in Bukhara was transported to Chirchiq via pipeline, the plant began using gas as a raw material. This led to a significant increase in production and a decrease in production costs. In addition to nitrogen fertilizers, the plant also produces magnesium chloride (used in cotton defoliation), plastics, and synthetic fibers from organic chemical products.Factories producing nitrogen fertilizers and chemical fibers were also established in Fergana and Navoiy. The Qo‘qon plant started in 1946, and the Samarqand superphosphate plant in 1957. In 1998, the Qizilqum Phosphate Complex began operation, producing 2.7 million tons of phosphate concentrate. During the years of independence, the Dehqonobod potash fertilizer plant in Qashqadaryo and the Qo‘ng‘irot soda plant in Karakalpakstan were established.Uzbekistan is also rich in rock salt. Mines such as Xo‘jaykon, Borsakelmas, Boybichakon, and Oqqal’a contain 90 billion tons of raw material. A high-quality ammophos plant was built in Olmaliq. Chemical enterprises producing rubber operate in Angren, and in Muborak, a plant extracts sulfur from natural gas. Waste from non-ferrous metallurgy is used to produce sulfuric acid. The Pop rubber plant manufactures cables, rubber pipes, and various parts for machinery, while the Jizzakh plant produces polyethylene films and plastic pipes.Minerals such as sulfur, kyanite, barium, talc, and limestone meet the needs of various branches of the chemical industry. Facilities for producing paints and dyes, synthetic fibers, artificial leather, and synthetic wool (in Fergana) have been expanded. In accordance with measures for rapid development of the chemical industry, production of chemical products is planned to increase 4.5 times by 2030.Hydrolysis plants were built in the 1950s. The Yangiyo‘l Biochemical and Andijan Hydrolysis Plants used cottonseed cake and rice husks to produce technical ethanol, furfural, and yeast for feed. Since the early 1990s, these plants began producing ethanol from grain, reducing the need to import alcohol for food, medicine, perfumes, and other industries.Using natural gas in Uzbekistan is efficient both as fuel and as raw material. Producing chemical fibers from gas costs 40–50% less than in Russia. Gas from fields such as Gazli, Muborak, Uchqir, Odamtosh, and Sho‘rtan is notable for its high condensate content. Gas condensate is the basis for organic synthesis, and from each ton, it is possible to produce 50 kg of synthetic rubber, 150 kg of plastic, 150 kg of synthetic fibers, 100 kg of solvents, and 400 kg of motor fuel.

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