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# Introduction

The coal industry is an important branch of the fuel and energy complex of the Republic of Uzbekistan. Its contribution to the socio-economic development of the country is significant and is under constant control of the government. This control is due to the following factors and difficulties caused mainly by a combination of natural and political factors, among which the following can be emphasized:

- the specifics of the geographical location of the state lack of access to the seas and wide trade routes,
- complex configuration of the territory, the presence of hard-to-reach and remote from the center regions extended deep into the territory of other countries,
- incomplete demarcation of the state border with almost all neighboring countries,
- complex terrain the presence of mountain ranges and desert zones,
- difficult mining and geological conditions of mineral deposits depth of deposits, parameters of strata, etc.,
- climatic peculiarities high ambient temperature, low precipitation, etc.,
- Conflict potential with neighboring states former Soviet republics due to historical and socio-cultural reasons.

The mentioned factors restrain the replenishment of the resource base, development of transport infrastructure, modernization and replacement of fixed assets, expansion of trade, and economic cooperation with foreign partners.

This year marks the 76th anniversary of the establishment of JSC "Uzbekcoal", the leading enterprise for coal production and supply in the country. It is part of the organizational structure of the Uzbekenergo joint stock company.

Annually, JSC "Uzbekugol" produces more than 5 million tons of coal.

There are fluctuations in the total volume of coal production: it reached a peak of 4.397 million tons/year in 2014, decreased in 2015 to 3.488 million tons/year, and has almost doubled since then. In recent years, lignite production has increased to about 5 million t/year and became 5.073 million t/year in 2022 and 5.829 million t/year in 2023 as a result of the Angren mine and power plant modernization program.



The main consumer of coal fuel is the power sector, which accounts for over 85 percent of total coal consumption. The demand for solid fuel is also formed by industrial, social, and communal enterprises and the population.

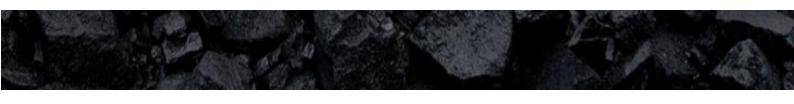
The main priority of coal industry development at present is the expediency of substitution in the domestic market of such energy resources as natural gas and oil products used in electricity generation, increasing the share of coal in the structure of the energy balance of Uzbekistan.



Uzbekistan's coal industry has a 76-year history. Coal reserves in the country amount to 1,900 million tons, including lignite - 1,853 million tons, and hard coal - 47 million tons. Forecast resources are over 5.7 billion tons of coal. Large reserves of hard coal are concentrated in the southern regions - Surkhandarya and Kashkadarya oblasts.



There are 3 coal deposits in Uzbekistan: Angren lignite coal deposit (97% of proven coal reserves in Uzbekistan), Shargun and Basun coal deposits.



## 2. Coal production and consumption

Two types of coal are mined and used in Uzbekistan - hard coal and brown coal. Annual production reaches 5 million tons.

#### Mining

In 2022, Uzbekistan produced 5.36 million tons of coal (+6.1% to 2021). Lignite accounts for 97-99% of the production structure (Table 1).

Table 1.

### Coal production, mln tons

2015	2016	2017	2018	2019	2020	2021	2022
3,49	3,87	4,04	4,17	4,05	4,13	5,05	5,36

According to the State Statistics Committee of the Republic of Uzbekistan

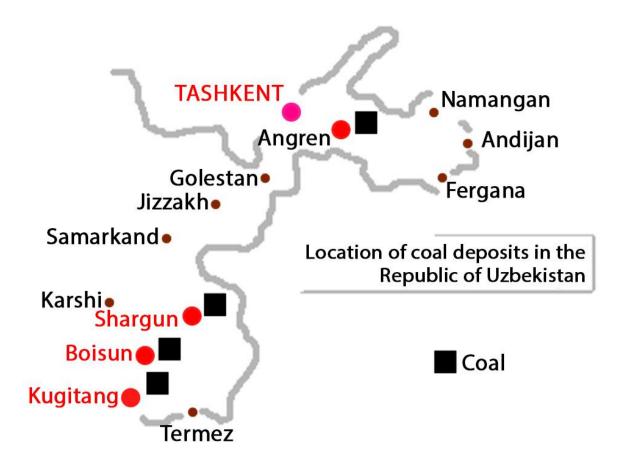
The basic resource base of the coal industry of the republic is the Angren lignite coal deposit located in the Tashkent region in the Angren coal basin and two smaller coal deposits - Shargunskoye and Baisunskoye, located in the Surkhandarya region in the Shargunskoye coal deposit.





Uzbekistan's demand for coal is about 4 million tons per year. The main consumer is Uzbekenergo TPPs. The share of the electric power industry in the structure of coal consumption reaches 72%, and industry - 12%.

## 3. Coal mining enterprises



Coal mining on the territory of the Republic of Uzbekistan is carried out by:

Joint Stock Company "Uzbekcoal" (JSC "Uzbekcoal") develops Angren lignite coal deposit.

**Shargunkumir Joint Stock Company (Shargunkumir JSC)** develops Shargun and Baysun hard coal deposits by underground method with partial processing of extracted coal into coal briquettes.



**Yerostigaz Joint Stock Company (Yerostigaz JSC)** develops Angren lignite deposits by underground gasification method.

But it is Uzbekugol JSC, operating in Angren City in the Tashkent region and providing up to 90% of coal production in the country, that makes a colossal contribution to the development of the industry.

Shargun hard coal is more suitable for brick and cement factories and greenhouses because it produces high temperatures. Lignite from the Angren coal basin is characterized by ease of use for domestic purposes.



# 4. Coal deposits

# 4.1. Angrenskoye coal deposit

The Angrensky open-pit coal mine has been commercially producing coal since January 1948, when the construction of the mine was completed. The deposit itself was discovered by geologists back in the thirties of the 20th century - on the border of plain and mountains, on the right bank of the Angren River. Industrial development of the coal deposit of Central and Central Asia began in the 19th century: private companies from Belgium, France, and England showed interest in it.



The development of coal mines here began in 1882. The first poods of coal were extracted by Belgians in the Fergana Valley. The need for coal became especially acute with the growth of industry. Lack of its fuel hindered the development of productive forces, while a hundred kilometers from Tashkent was the valley of the Ahangaran River, in the bowels of which, as it was later found out, lay the richest deposits of minerals, including lignite and kaolins.



In November 1940 it was decided to lay the first mine of the Angren brown coal deposit with a capacity of 100 thousand tons of coal. During the war years, Angren became the main and constant supplier of solid fuel in the republic. The deposit was developed at first by the underground method. From 1940 to 1943 six mines were laid: 1, 2, 3, 8, 9, 2-bis, in the construction of which miners of Ukraine, evacuated from Donbas, who taught Angren miners the wisdom of their profession, took part.

During the war years, 130 km long railroad and automobile-railroad Tashkent - Angren were built.

Uzbekcoal JSC "The leading producer and supplier of this coal is Uzbekcoal JSC, which is part of the organizational structure of the Uzbekenergo joint stock company.





85% of the coal mined in Uzbekistan comes from the Angren coal mine. Angren coal is extracted by open-pit mining. Coal is also mined here at the Spartak open-pit mine and by underground method.

The local brown coal is not similar to raw materials from other mines. Another important advantage of the open-pit mine is the by-product kaolin. Kaolin is a clay from the mineral kaolinite. It also contains mineral impurities. Its rich composition and physical and chemical properties have led to the use of kaolin in many spheres: from porcelain production and paper industry to cosmetology and pharmaceuticals.

The kaolin deposit is located before the coal deposit. Thus, in addition to coal, specialists extract 1 million tons of kaolin per year, and this covers the country's demand for this sedimentary mineral:

Angrensky cut is a deposit that represents coal deposits with a thickness of up to 60 meters and a depth of 130 to 150 meters.



To improve the quality of coal and reduce its ash content, the management of Uzbekugol JSC was installed and put into operation at the open-pit mine five manual rock picks, with the help of which workers manually separated coal from the rock. By using them, the ash content of coal was reduced from 60% to 35%.

To keep the coal coarse (brown coal crumbles from impacts during transportation), it was also decided to extend the railway line to the open pit mine to load the coal into railcars directly from the face. Every day the company ships from 15 to 20 thousand tons of coal of two fractions for CHPPs and consumers - the finer coal is supplied to heat and power plants, and the best quality - large - to the population.

All coal mined here is used exclusively for the needs of Uzbekistan. So far, the enterprise is on its way to covering the country's needs in solid fuel. It is



estimated that the republic needs 6 million tons of coal annually. This year, the Angren mine will receive 3 million 700 thousand tons. But the thing is that the increase in the volume of production always entails an increase in the volume of stripping works - and this is a huge amount of time and resources. Therefore, by next year, the management of Uzbekugol JSC plans to produce 4 million 500 thousand tons of coal. From year to year, the indicators will grow, according to plans, it will take three years to reach the desired indicator of 6 million tons of coal.

Uzbekugol also plans to further develop the Apartak open-pit mine. The coal mined here is superior in quality to solid fuel from the Angrensky open-pit mine.





"Apartak" is an open-pit coal mine in Ahangaran, Tashkent region of Uzbekistan.



The Apartak coal mine is owned and operated by the state-owned Uzbekkomir JSC (Uzbekcoal). The Apartak mine is adjacent to the larger Angren coal mine.

The mine once produced a paltry 50,000 tons, but in 2020 produced 400,000 tons with plans to increase production to 1 million tons.

A statement issued by Uzbekugl in October 2022 stated that production would reach 0.5 million tons in 2022 and remain at that level in 2023-2026.

In February 2023, the company issued a press release stating that in 2022 production together with the Angren coal mine reached 5.07 million tons, up 4% from 2021.





#### **Consumers**

Uzbekistancoal JSC produces more than 5 million tons of coal annually. The main consumer of coal fuel is the power sector, which accounts for over 85 percent of total coal consumption, namely Angren TPP and "Novo-Angren" TPP. The demand for solid fuel is also formed by enterprises of industry, social and communal spheres, and population. Solid fuel is sold to the population and budgetary organizations through regional warehouses of Kumar Ta'minot LLC.



The coal of JSC "Uzbekugol" is sold to the population and budgetary organizations through coal depots of the department.



#### **Price for consumers of Uzbekcoal JSC**

Coal 300300300 soum/t Briquette 412500 soum/t

#### Contacts

Uzbekcoal JSC (+998) 78 150 39 80 info@coal.uz https://www.uzbekcoal.uz/



## 4.3. Shargun coal deposit

Construction of this coal mine began in 1943. At the Sariosie railway station, a 12-kilometer-long Tokjiyon (now Shargun) railway station and an 18-kilometer cableway for transporting coal, personnel, and cargo were built. A 20-kilometer highway was built.





The Shargun coal deposit with a design capacity of 400 thousand tons per year was put into operation in 1958.

In the early sixties, because 95% of Shargun's coal was fine-grained (13 mm), the sale of coal products was difficult.

In 1965, a briquette plant was built and sales of briquette (packaged) coal began.

The largest coal production in the mine's history to date was achieved in 1990 when it amounted to 220 thousand tons.



JSC "Shargunkumir" produces coal from underground in two mines located in the Surkhandarya region.

Today, the balance reserves of coal at the Shargun deposit alone amount to 33 million tons.

99.857940% of shares of Shargunkomir JSC belong to Uzbek Railways JSC.



Coal mined from the quarries is loaded onto trolleys using scraper conveyors and transported by electric locomotives to an external coal depot. From the coal warehouse, coal is loaded into bunkers, from which it is loaded into trolleys by cable car, delivered 18 km to the briquette plant, loaded into wagons, and sent to consumers.

### Products manufactured by the company

JSC "Shargunkumir" mainly produces USSS coal of 13 mm fraction with a calorific value of 8100 kcal/kg. Annual capacity - 100,000 tons, proven coal reserves - 35.6 million tons./ JSC "Shargunkumir" mainly produces SSSSH coal of 13 mm fraction with a calorific value of 8100 kcal / kg. Annual capacity - 100,000 tons, proven coal reserves - 35.6 million tons.







#### Coal products produced by JSC "Sharguncoal":

1. SSSS 0-13 mm. branded coal product

**Brand-SS** 

The fraction is 0-13 mm.

Ash content-up to 30%

Humidity-up to 10%

Lower calorific value – 5200 kcal / kg (21.7 MJ / kg)

coal storage-Shargun YEYU.

Delivery - railway and auto.

2. SSKOM 13-100 mm. branded coal product

**Brand-SS** 

Fraction - 13-100 mm.

Ash content up to 25%

Humidity-up to 10%

Lower calorific value - 6200 kcal / kg (25.9 MJ / kg)

Coal warehouse-Shargun YEYU.

Delivery – railway and auto.

3. SSSSHMO 0-50 mm. branded coal product

**Brand-SS** 

Fraction - 0-50 mm.

Ash content up to 42%

Humidity up to -15%

Low calorific value -5200 kcal/kg (21.7 MJ / kg)

Coal warehouse-Shargun YEYU.

Delivery – railway and auto.

Technical characteristics of coal products of the SS brand:

TS 00162369-03: 2018

Certificate of conformity:

no. 2056630 Uz. SMT. 01. 341. 2056670

4. TR 0-200 mm. branded coal product of LLC "Baisuncoal"

Brand - T

Fraction - 0-200 mm.

Ash content up to 24.5%.

Humidity-up to 10%

Lower calorific value - 5500 kcal / kg (23.0 MJ / kg)

Coal storage – ELS, the village "Tuda" of the Baisun district.

Delivery – only by car.

Technical specifications for coal products of the TR brand:

TS 00162369-04: 2018

Certificate of conformity:

No. 2245862 Uzsmt.01.325.2445511



5. A new coal field, is planned to produce coal in the Sherabad district of the Surkhandarya region of the Republic of Uzbekistan.

The fraction is 0-150 mm.

Ash content up to 4%

Humidity-up to 10%

Lower calorific value - 6500 kcal / kg (27.3 MJ / kg)

work is underway on the specification, certificate of conformity, price, and delivery time.

#### The price of goods and terms of sale

Prices for coal mined by Shargunkumir JSC from November 15, 2023, are set as follows

Coal grade SSSSH (fraction 0 + 13 mm) 460 000 sum.

Coal grade SSSSHMO brand (fraction 0 + 50 mm) 312 000 sum.

Coal grade SSKOM (fraction 13-100 mm) 549 000 sum.

Prices are calculated with VAT per ton of coal.

- 1. By the resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated March 31, 2015 No. 75, a special surcharge for 1 ton of coal products in the amount of 54,000 Soums is established.
- 2. The sale of coal products is carried out through trade-in" commodity exchange raw materials" in the Republic of Uzbekistan.

Brokerage Office: 11856 (10-826). Tel: (+998) 90-644-24-72

Contact phone: (+998) 99 377-22-10; (+998) 99-377-22-48

#### **Contacts**

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Surkhandarya region, Sariosi district

Shargun, st. A.Ikramova 50

Tel: (+998) 94-511-85-58; (+998) 99-041-40-88

e-mail: <a href="mailto:shargunkomir@railway.uz">shargunkomir@railway.uz</a>

https://sharguncoal.uz/





## 5. Export and import of coal products from Uzbekistan

According to the State Statistics Committee, Uzbekistan exports significantly less coal products than it imports from abroad.

The product group in statistics includes hard coal (HS code 2701) and brown coal (lignite, HS code 2702).

#### Hard coal (HS code 2701)

Export of goods of group 2701 "Coal; briquettes, pellets and similar types of solid fuels obtained from coal" from Uzbekistan in 2022 amounted to \$2.64 million.

In value terms, the increase in supplies of goods of group 2701 from Uzbekistan compared to 2021 amounted to 7.06 thousand%: Exports of goods of group 2701 increased by \$2.6 million (in 2021 goods worth \$36 thousand were supplied from Uzbekistan).

Goods of group 2701 amounted to 0.017% of total exports of goods from Uzbekistan in 2022 (in total, exports from Uzbekistan in 2022 amounted to \$15.2 billion). Compared to 2021, the share of goods of group 2701 in total exports from Uzbekistan increased by 0.017% (in 2021 it was 0 percent, and total exports from Uzbekistan - \$14 billion).

Goods of group 2701 accounted for 0.217% of the group's goods exported from Uzbekistan in 2022 (in total, \$1.21 billion worth of group goods were exported from Uzbekistan in 2022). Compared to 2021, the share of group 2701 in the export of goods from Uzbekistan increased by 0.213% (in 2021 it was 0.004%, and the export of goods of the group from Uzbekistan was \$904 million).

### **Export direction of hard coal**

The main directions of export of goods of group 2701 "Coal; briquettes, pellets and similar types of solid fuels obtained from coal" from Uzbekistan in 2022 steel

- Pakistan with a share of 47% (US\$ 1.26 million)
- Tajikistan with a share of 21% (568 thousand US\$)
- Lithuania with a share of 18.2% (480 thousand US\$)
- Poland with a share of 10.2% (270 thousand US\$)
- Afghanistan with a share of 1.43% (37 thousand US\$)
- Cyprus 11.7 thousand US\$
- Iran 6.59 thousand US\$
- Latvia 2.39 thousand US\$
- China 3 US\$



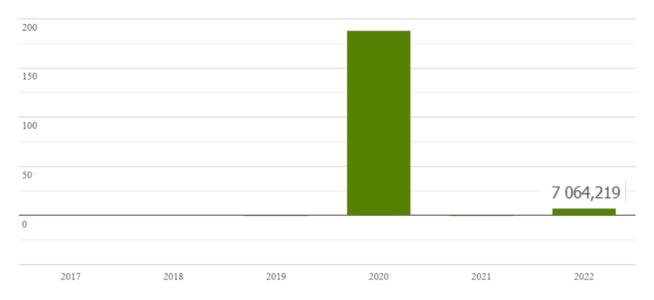


Directions of export of goods of group 2701 "Coal; briquettes, pellets and similar types of solid fuels obtained from coal" from Uzbekistan in 2022

Structure of exports from Uzbekistan of goods of group 2701 - Coal; briquettes, pellets, and similar types of solid fuels obtained from coal - in 2022 was represented by the following main product groups:

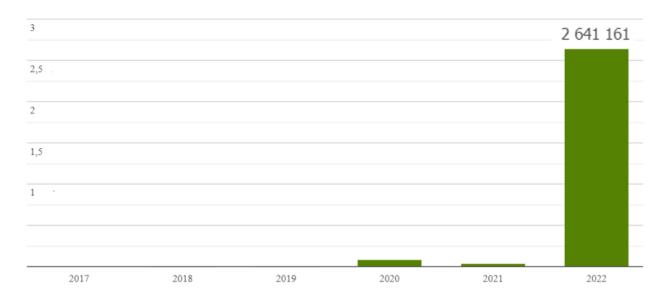
- 99% (2.63 million USD): 270119 Other coal, including pulverized or non-pulverized, but not agglomerated
- 0.132% (3.51 thousand USD): 270111 Anthracite

Change in export value (thousand%) | in 2017 – 2022 presented below:





#### Change in export value (millions of US dollars) | 2017 – 2022 presented below:



Import of goods of group 2701 "Coal; briquettes, pellets and similar types of solid fuels obtained from coal" to Uzbekistan in 2022 amounted to \$37 million. In value terms, the increase in supplies of goods of group 2701 to Uzbekistan compared to 2021 amounted to 19.5%: Imports of goods of group 2701 increased by \$6.12 million (in 2021 goods worth \$31 million were imported to Uzbekistan).

Goods of group 2701 amounted to 0.132% of total imports of goods into Uzbekistan in 2022 (in total, imports into Uzbekistan amounted to \$28 billion in 2022). Compared to 2021, the share of goods of group 2701 in total imports to Uzbekistan increased by 0.001 percentage points. (in 2021 it was 0.13 percent, and total imports to Uzbekistan were \$23 billion).

Goods of group 2701 accounted for 2.08% of imports into Uzbekistan in 2022 (in total, goods from the group were imported into Uzbekistan for \$1.79 billion in 2022). Compared to 2021, the share of group 2701 in imports of goods to Uzbekistan increased by 0.056% (in 2021 it was 2.02%, and imports of goods from the group to Uzbekistan amounted to \$1.54 billion).

#### Directions for import of hard coal

The main importers of goods of group 2701 "Coal; briquettes, pellets and similar types of solid fuels obtained from coal" to Uzbekistan in 2022 were

- Kazakhstan with a share of 47% (US\$ 17.9 million)
- Kyrgyzstan with a share of 40% (US\$ 15 million)
- Russia with a share of 11.2% (4.19 million US\$)
- Tajikistan 199 thousand US\$
- Türkiye 2 thousand US\$

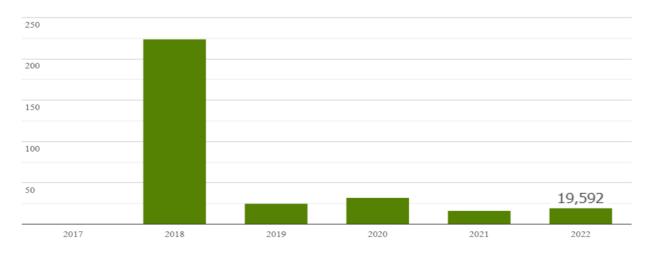


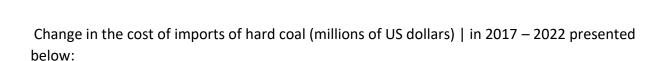
Suppliers of goods of group 2701 "Coal; briquettes, pellets and similar types of solid fuels obtained from coal" to Uzbekistan in 2022

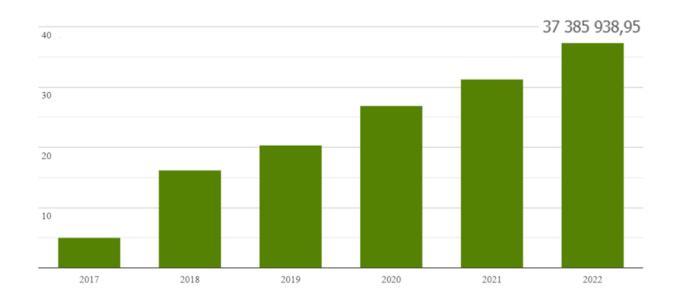
Structure of imports into Uzbekistan of goods of group 2701 - Coal; briquettes, pellets, and similar types of solid fuels obtained from coal - in 2022 was represented by the following main product groups:

- 59% (22 million USD): 270119 Other coal, including pulverized or non-pulverized, but not agglomerated
- 34% (13 million USD): 270112 Bituminous coal
- 6.03% (2.25 million USD): 270111 Anthracite

Change in the cost of import of hard coal (%) | in 2017 – 2022 presented below:







#### Brown coal (lignite, HS code 2702).

Exports of goods of group 2702 "Lignite, or brown coal, agglomerated or non-agglomerated, except jet" from Uzbekistan in 2022 amounted to \$740 thousand. In value terms, the increase in supplies of goods of group 2702 from Uzbekistan compared to 2021 amounted to 582 thousand%: Exports of goods of group 2702 increased by 739 thousand dollars (in 2021 goods of group 2702 were supplied from Uzbekistan for \$127).

Goods of group 2702 amounted to 0.004% of the total exports of goods from Uzbekistan in 2022 (in total, exports from Uzbekistan in 2022 amounted to \$15.2 billion). Compared to 2021, the share of goods of group 2702 in total exports from Uzbekistan increased by 0.004 percentage points. (in 2021 it was 0 percent, and total exports from Uzbekistan were \$14 billion).

Goods of group 2702 accounted for 0.06% of exports from Uzbekistan of goods of the group "in 2022 (in total, goods of the group were exported from Uzbekistan for \$1.21 billion in 2022). Compared to 2021, the share of group 2702 in goods exported from Uzbekistan increased by 0.06 percentage points. (in 2021 it was 0%, and exports of group goods from Uzbekistan were \$904 million).



The main export destinations for goods of group 2702 "Lignite, or brown coal, agglomerated or non-agglomerated, except jet" from Uzbekistan in 2022 were

- Pakistan with a share of 77% (574 thousand US\$)
- Tajikistan with a share of 19.6% (145 thousand US\$)
- Poland with a share of 1.85% (13.7 thousand US\$)
- Kazakhstan 2.97 thousand US\$
- Afghanistan 2.92 thousand US\$



The structure of exports from Uzbekistan of goods of group 2702 in 2022 was represented by the following main product groups:

• 100% (740 thousand USD): 270210 - Lignite, or brown coal, pulverized or non-pulverized, but not agglomerated

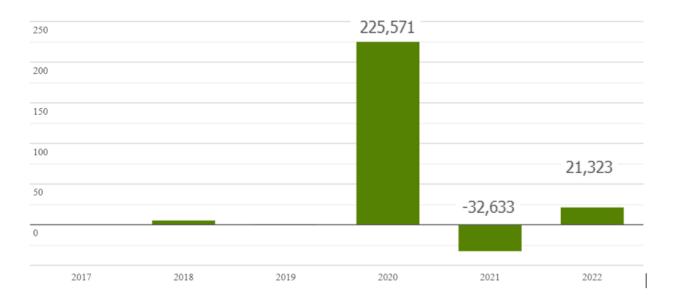
Imports of goods of group 2702 to Uzbekistan in 2022 amounted to \$62 million. In value terms, the increase in supplies of goods of group 2702 to Uzbekistan compared to 2021 amounted to 21%: Imports of goods of group 2702 increased by \$11 million (in 2021, goods of group 2702 worth \$51 million were imported to Uzbekistan).



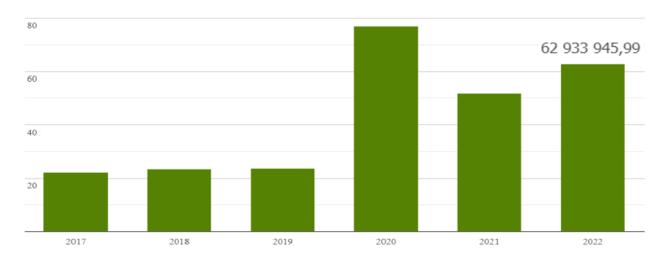
Goods of group 2702 amounted to 0.222% of total imports of goods into Uzbekistan in 2022 (in total, imports into Uzbekistan amounted to \$28 billion in 2022). Compared to 2021, the share of goods of group 2702 in total imports to Uzbekistan increased by 0.005% (in 2021 it was 0.217 percent, and total imports to Uzbekistan - \$23 billion).

In 2022, goods of group 2702 accounted for 3.5% of imports into Uzbekistan of goods of the group (in total, in 2022, goods of the group were imported to Uzbekistan for \$1.79 billion). Compared to 2021, the share of group 2702 in imports of goods to Uzbekistan increased by 0.143 percentage points. (in 2021 it was 3.36%, and imports of group goods to Uzbekistan amounted to \$1.54 billion).

### Change in the cost of lignite imports (%) | in 2017 – 2022 is presented below:



#### Change in the value of lignite imports (millions of US dollars) | in 2017 – 2022 presented below:





#### Where does Uzbekistan buy brown coal?



The main importers of goods of group 2702 "Lignite, or brown coal, agglomerated or non-agglomerated, except jet" to Uzbekistan in 2022 were

- Kazakhstan with a share of 66% (41 million US\$)
- Kyrgyzstan with a share of 33% (21 million US\$)

## 6. Problems and prospects for the development of the coal industry

As in the rest of the world, the coal industry in Uzbekistan is unprofitable and requires sufficient financial injections from the state for its stable existence. In addition, coal is significantly inferior to natural gas and oil in terms of cost and environmental indicators of its use (Table 2).

Table 2

## Comparative table of calorific value of energy carriers

Energy resources	The heat of combustion of 1 kg of fuel (thousand Kcal)	Heat coefficient		
Oil	10,5	1,5		
Natural gas	10,4	1,5		
Hard coal	7,0	1,0		
Lignite	3,0	0,4		



In 2009, "Uzbekugol" developed a program of modernization, technical, and technological reequipment of the coal industry, within the framework of which passports of 8 investment proposals with a total estimated cost of more than \$1.1 billion were prepared.

In January 2010, the Chinese company China Coal Energy Company won a tender worth \$154 million to modernize the Angren coal mine. It is planned that after the implementation of the project, coal production capacity at the mine will increase from 3.2 to 6.4 million tons per year.

The capacity of Angren mine is limited, and the mining equipment is outdated. It is necessary to equip the mines with modern mining equipment. And this issue is already being solved. Thanks to the government, Uzbekugol JSC is allocated a soft loan of 77.1 million dollars, and mining equipment is being purchased. And some equipment has already been delivered.

In September 2017, a consortium of Chinese companies comprising China Railway Tunnel Group and China Coal Technology & Engineering Group Corp. started the main preparatory works within the framework of the Shargunkumir modernization project.

The project envisages the modernization of the Shargun field with an increase of hard coal production from the "Shargunkumir" side up to 900 thousand tons per year in the Saryasiyskiy district of the Surkhandarya region, which is currently carried out.





To increase the level of lignite production and the need for significant modernization of Apartak, it is envisaged to build a plant for the synthesis of diesel fuel from alternative lignite at the Apartak mine using innovative technology with a design capacity of 2.2 million tons of lignite per year or 700,000 tons of diesel fuel, and a project is being developed to create alumina-cement production from secondary kaolin's.

The country's government has set a task to increase coal production in Uzbekistan by 1.5 times to 6.5 million tons. The increase in demand for coal is due to the decision to switch greenhouses, cement and brick factories, kindergartens, schools, and hospitals - 5,407 social facilities, 1,147 greenhouses, and 250 factories - to coal fuel this year. To meet the growing demand for coal, 14 promising coal fields, including five in Surkhandarya province, have been transferred to the private sector. This was also done to accelerate geological exploration, improve the quality of coal mined, and introduce selection technologies.

#### Renewable energy sources

Renewable energy sources are undoubtedly an alternative to coal for electricity generation and home heating. Uzbekistan is carrying out systematic work on the transition to "green" energy. Coal can be replaced by natural gas and fuel oil. But there are no analogs of coal among mineral resources. Uzbekistan has very large coal reserves, and coal is a much cheaper fuel than gas and oil. However, all three types of fossils are not the solution to the problem. The only salvation is renewable energy.

The country is currently working on 28 projects based on public-private partnerships to build solar, wind, and hybrid power plants with a total capacity of 6.3 gigawatts. Of these, the first capacities of 7 projects for 2.6 gigawatts were commissioned in 2023.

