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NATIONAL AGENCY OF NATURAL RESOURCES

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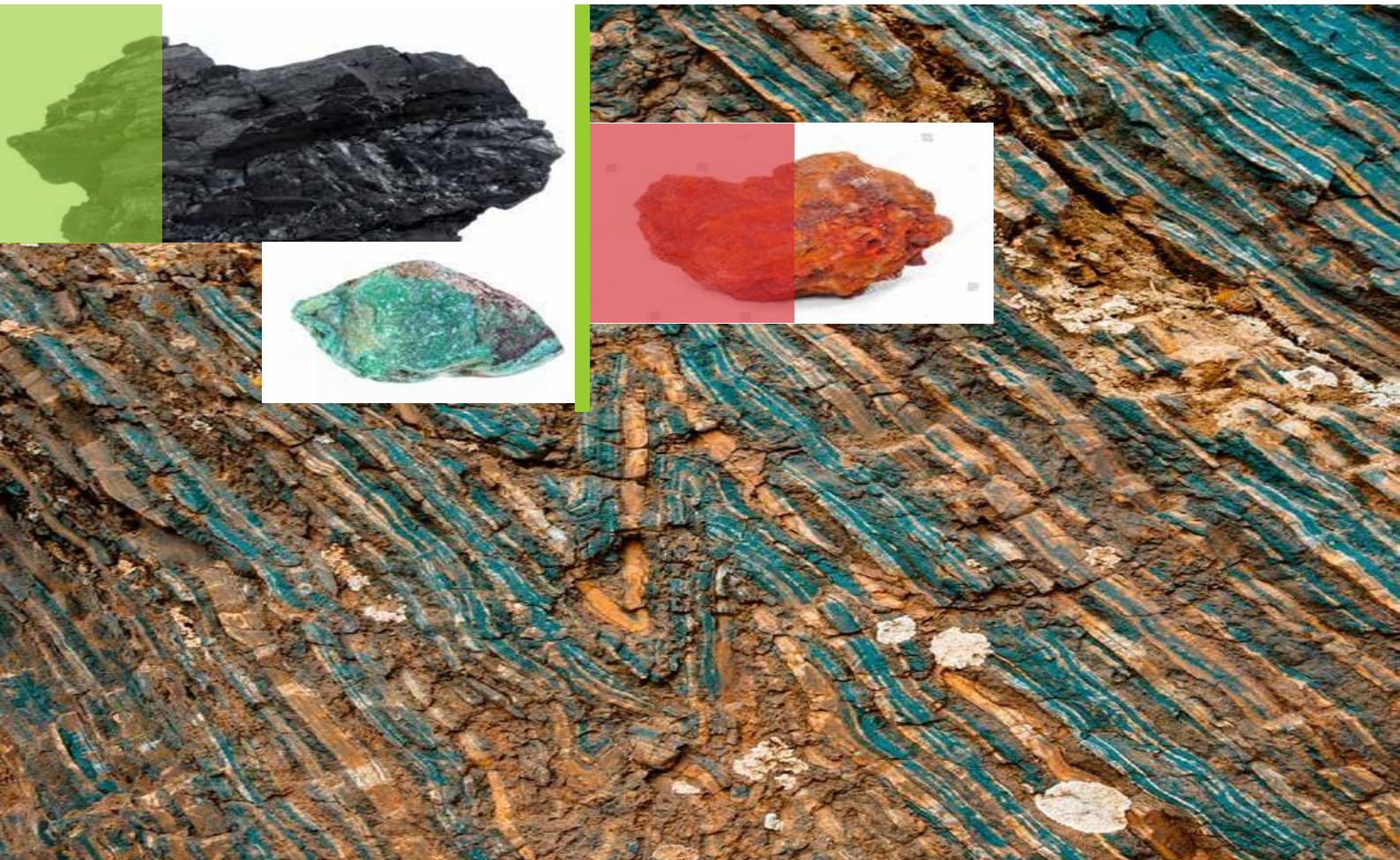






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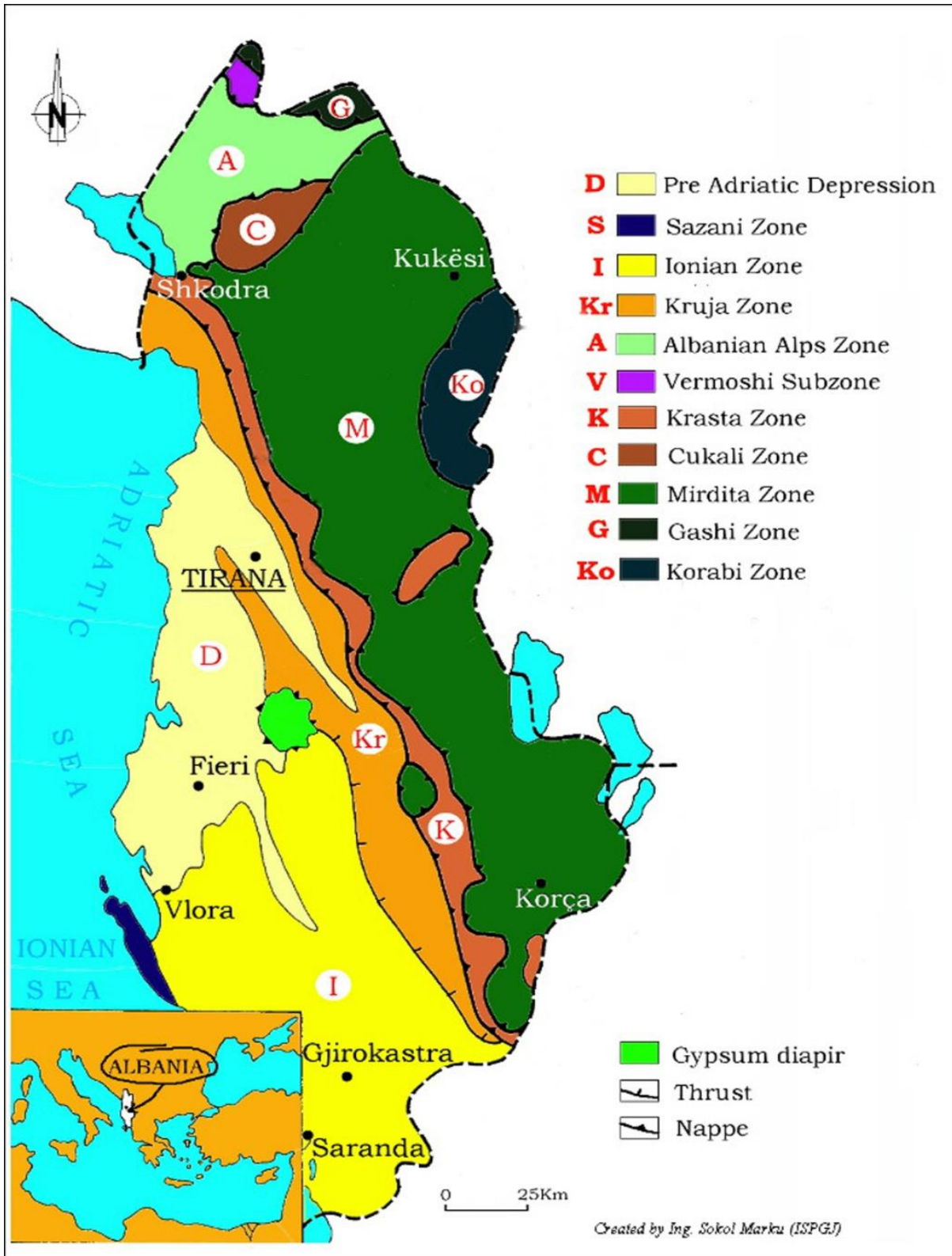


Fig No.1 Albania Tectonic Map

ALBANIA OVERVIEW

MINERAL RESOURCES IN ALBANIA

Albania is located in southeastern Europe, in the western part of the Balkan Peninsula. In the north-west it is bordered by Montenegro (172 km) north-east of Kosovo (115 km) east of Macedonia (151 km) to the south and south-east from Greece (282 km). Washed by the Adriatic and Ionian Sea.

The total area is 28,748 square kilometers and its' capital is Tirana.

Albania is connected to the roads with all the border countries and with the UTEC international network also to enable the import and export of electricity. Albania is connected to Montenegro with the rail system. Export and import of goods to the sea is done by the three ports of Durrës, Shengjin and Vlorë.



Albania is known for its mineral resources. Most of them have been discovered and mined from ancient times up to date. There are also other deposits for which a careful study and evaluation of geological reserves should be conducted.

The mining activity is mainly focused on the extraction of minerals of chromium, copper, iron-nickel, and nickel-silicate. Mineral processing in the country is low. Private companies and private investments enable the enrichment of chrome and copper ore and ferrochrome production.

The current state of the geological and exploitable reserves of different minerals, their degree of processing and the profit realized make it necessary to undertake further geological mining and technological studies, as well as carrying out different research works to enable the addition of the amount of different ore reserves, the use of minerals with low grade and their rational processing.

A General Overview in Mining Industry

Albania is a country relatively rich in mineral resources. Mineral exploration, exploitation and processing constitute an important component of the Albanian economy, due to a traditional mining industry, that has been a solid foundation to the country economic sector, generating substantial revenues. Chrome, copper, iron-nickel and coal, are some of the minerals mined and treated in Albania for a long period.

Mining industry development in Albania has passed through three main stages:

The first stage includes the period up to the end of World War II, marked by two important events. In 1922, has been compiled the first Geological Map of Albania, which was even the first of its kind in the Balkans. In 1929 has been approved the first Mining Law of the Albanian Kingdom, which paved the way to the exploration and/ or exploitation of mineral resources in Albania;

The second stage (1944-1994), marks the period when the mining activity has been organized in state-owned enterprises and the concept of mining privatization did not exist.

The third stage includes the period 1994 up to date. It began the mining's privatization, after the approval of Albanian Mining Law.

Legislation

The mining sector in Albania operates, Law no. 10304, "On Mining Sector in the Republic of Albania" dated 15 July 2010, which abrogated the previous Mining Law no. 7796 of 17 February 1994. MIE and AKBN present a summary of laws and regulations in force for the mining sector on their websites, www.akbn.gov.al and www.energjia.gov.al.

1. LAW No. 10 304, dated 15.7.2010 "On Mining Sector in the Republic of Albania", updated
2. 12 Government Decisions
3. 19 Orders of the Minister
4. Law, Decisions of the Council of Ministers and Orders for Environmental protection
5. Law no. 9975, dated 28.07.2008 "On National Fees".
6. Laws on Occupational Safety, Health Care of Workers.

Licensing

The licensing process initiated in 1994, upon approval of the Albanian Mining Law. Up to December 31th 2023, are 552 exploitation permits, mostly in Bulqiza, Kruja, Berati, Tirana and Librazhdi ect. districts. The table No 1 below the number of active exploitation permits at the end of 2023 by type of minerals are presented.

No.	Minerals	No.
1	Chrome ore	236
2	Copper	17
3	Iron-Nickel & Nickel-Silicate	31
4	Clay	11
5	Basalts	4
6	Bitumen & Bituminous Sand	12
7	Marble Limestone	34
8	Sandstone	16
9	Limestone	137
10	Slate Limestone	8
11	Olivine, Tractolites, Travertine	6
12	Gypsum	8
13	Conglomerate	9
14	Quartz	6
15	Coal	2
TOTAL		552

Table No.1 Number of active exploitation mining permits by type of minerals

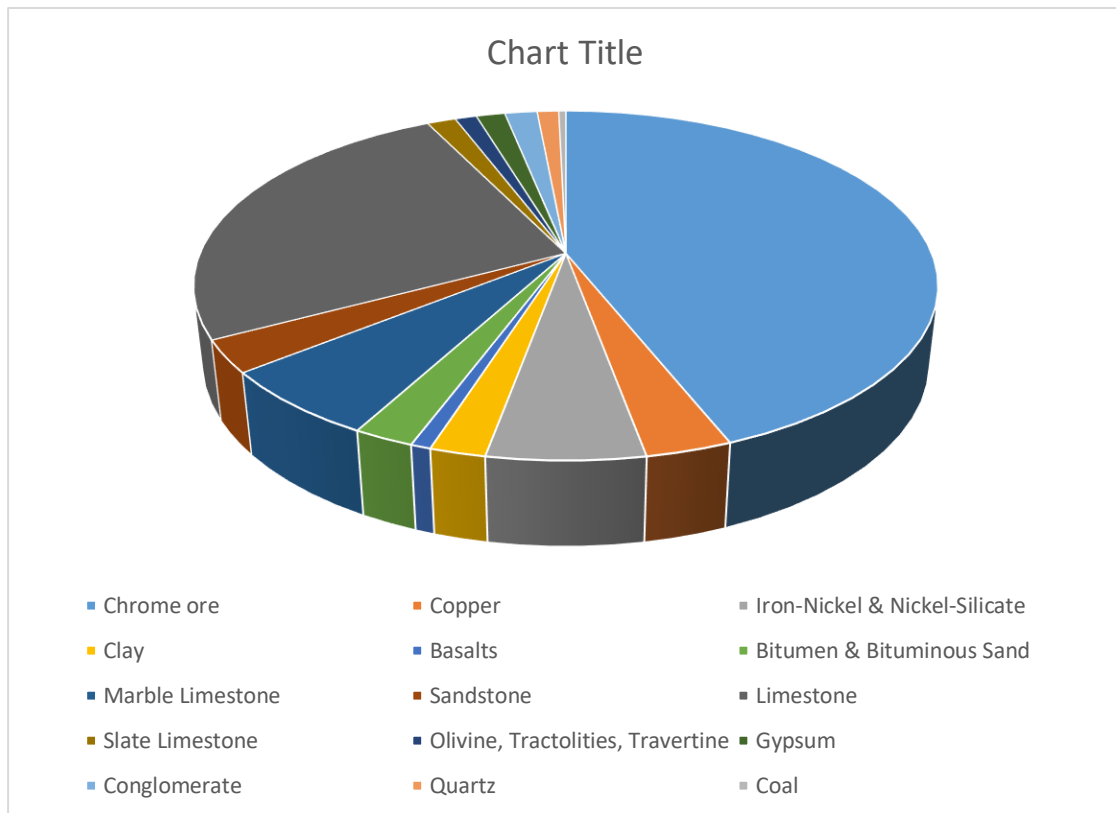


Chart No.1 The rest of exploitation licenses belongs to over 27 different kinds of minerals and rocks

No.	County	No. of permits
1	Dibër	163
2	Fier	10
3	Berat	50
4	Durrës	24
5	Elbasan	46
6	Gjirokastrë	19
7	Korçë	42
8	Kukës	42
9	Lezhë	36
10	Shkodër	25
11	Tiranë	22
12	Vlorë	34

Table No.2 Distribution of mining permits by Counties

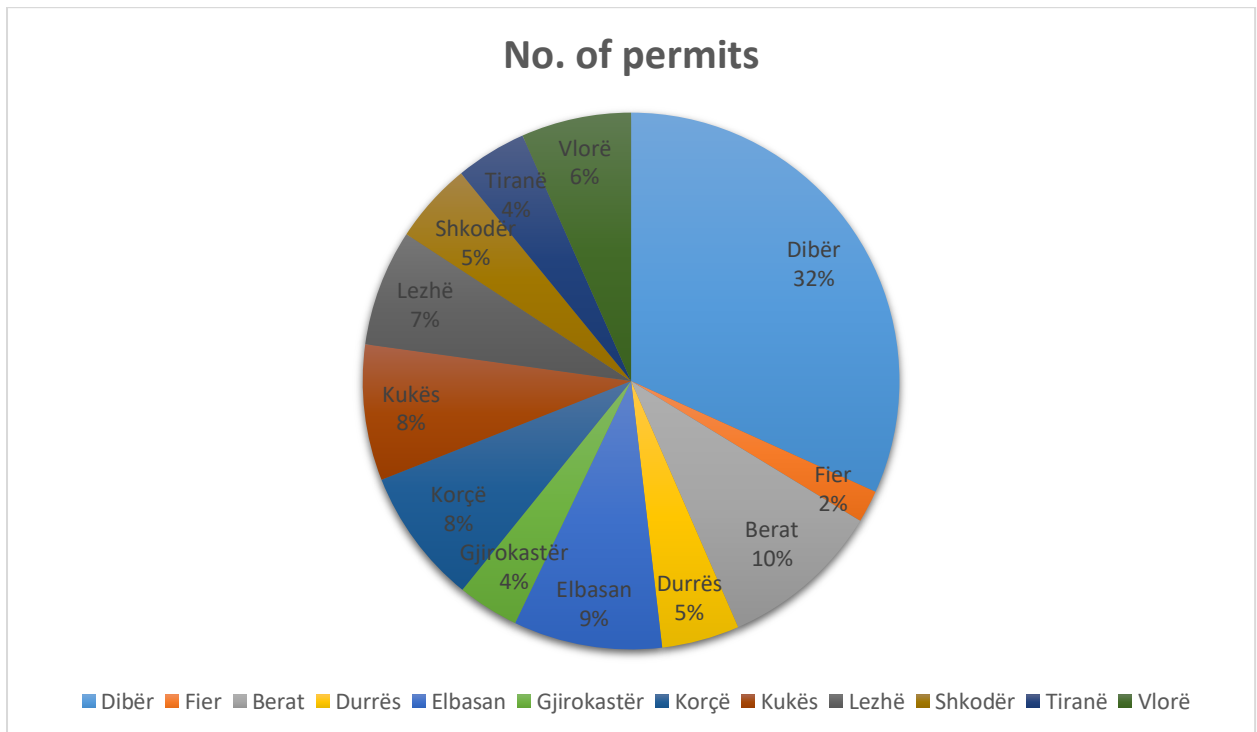


Chart No.2 Distribution of mining permits by Counties

Concessions

The privatization process continued with the approval of the Law "On Concessions", and giving by concession of certain parts of mining industry (of this branch).

The mining objects given in concession so far, are as below:

- Bulqiza chromium mine and ferrochrome smelters of Burrel and Elbasan Cities;
- Chromium Mines in Kalimash, Kukes district and Kalimashi dressing plant;
- Munella, Lak Rosh Karma 2 copper mines and also the copper dressing plant in Fush Arrez town;
- Selenica Bitumen mine, Vlora district and its bitumen smelter.

Albanian Mining Potential

Through many studies and exploration - prospecting geological works carried out, from 1945-1995, are concretized a lot of useful metallic and non-metallic mining deposits, industrial and for construction use and as decorative stone.

No.	Minerals	Composition (%)
1	Chromite	Cr ₂ O ₃ (15-48); FeO(10-12,5); SiO ₂ (11-18); MgO(23-27); Al ₂ O ₃ (7-9)
2	Iron-Nickel (laterite)	Fe(38.5-47,2); Ni(0.9-1,1); Co(0.06-0,08); SiO ₂ (7,1-17); Cr ₂ O ₃ (3,1-4,6)
3	Nickel-Silicate (saprolite)	Ni(1,07-1,32); Fe(14-18); Co (0,045); SiO ₂ (37-39,7); Cr ₂ O ₃ (3,3-8,5)
4	Copper	Cu(1.35-1,85) average 1.6
5	Coal	Calorific power 12958-21318KJ/Kg; S(2,9-3,2); Ash(21,6-65)
6	Bitumen	The softening point 120°C; S(3,5-7,5)
7	Tar sands	Bitumen concentrate (8-10)
8	Limestone	CaO (50-55,3); MgO (0,25-0,76); SiO ₂ (0,2-1,6); Fe ₂ O ₃ (0,04-0,7)
9	Dolomites	CaO (29-35); Fe ₂ O ₃ (0,14-0,5); MgO(17,6-21); SiO ₂ (0,04-1,25)
10	Trepele	CaO (0,03-0,35); Fe ₂ O ₃ (0,41-1,5); MgO (18-28); SiO ₂ (1,5-4,9)
11	Travertines	CaO(30-56); MgO(0,6-3,6); SiO ₂ (0,43-8,9); Fe ₂ O ₃ (0,4-1,59)

12	Carbonatic Decorative Stones	CaO(47,5-56,1); MgO(0,26-2,7); SiO ₂ (0,43-0,95); Fe ₂ O ₃ (0,6-0,94)
13	Siliceous-Sandstone, Decorative Stones	SiO ₂ (46,8-53,6); Fe ₂ O ₃ (1,6-2,1); Al ₂ O ₃ (4-13); CaO(11,7-21); MgO(1,8-7,8)
14	Phosphorite	P ₂ O ₅ (10-12); CaO (48-50); SiO ₂ (5-8.5); U ₃ O ₈ (0.005-0,03)
15	Clays	SiO ₂ (43-64); Al ₂ O ₃ (9,6-16,4)Fe ₂ O ₃ (0,4-7,8); CaO (0,3-13,2); MgO(2-7,2)
16	Kaolin	Al ₂ O ₃ (29-35); Fe ₂ O ₃ (1,1-5); CaO(1,4-1,9); MgO(2,8-3,8); SiO ₂ (43-47)
17	Volcanic tuff	Al ₂ O ₃ (13,21); Fe ₂ O ₃ (3-4,16); CaO(3,6); MgO(2,2-3,14)SiO ₂ (60-62)
18	Silica Sand	SiO ₂ (75-85); Al ₂ O ₃ (5-13); Fe ₂ O ₃ (0,8-2,6); CaO(0,1-1,15); Mg(0,4-0,6)
19	Gypsum	CaO(30-33,4); SO ₂ (36,9-44); H ₂ O(13-20,4); CaSO ₄ 2H ₂ O> 86%
20	Rock Salt	NaCl (80-82); CaSO ₄ (4,9); CaO(1,1); SO ₃ 2%
21	Olivinites	MgO(44,6-50); SiO ₂ (36-39); Al ₂ O ₃ (0,18-0,82);Fe ₂ O ₃ (5,2 -10,2)
22	Volcanic Glass	SiO ₂ (63-66); Fe Total (3,3-6,5); Al ₂ O ₃ (9,9-10,7); MgO (0.4-0.9); CaO (4,6-5,04)
23	Magnesites	MgO(39,6); SiO ₂ (11,34); Fe ₂ O ₃ (1,9); CaO(3,67)
24	Feldspat	SiO ₂ (71,21); Na ₂ O(3,47); K ₂ O(4,42); Al ₂ O ₃ (17,74)
25	Albitophyre	SiO ₂ (77,05); Na ₂ O(5,79); K ₂ O(2.58); Al ₂ O ₃ (12,48)
26	Pyrophyllite	SiO ₂ (68,4); Al ₂ O ₃ (18,58); CaO(0,37); MgO(1,09)
27	Fluorite	CaF ₂ (39,82); SiO ₂ (39,43)
28	Troctolite	SiO ₂ (40-44); MgO(8,9-20,5); Fe ₂ O ₃ (0,83-4); CaO(2,2-13,3)
29	Basalt	SiO ₂ >40; Al ₂ O ₃ (12-17); MgO(4-9); CaO(9-17)
30	Harcburgite	SiO ₂ (40,42); MgO (7,6); Fe ₂ O ₃ (3,06); CaO(2,73)
31	Plagiogranite	SiO ₂ (67,5); MgO(3,3); Fe ₂ O ₃ (3); CaO(4,3)

Table No.3 Some main different ores and their comical composition

Raw mining production

For the period 2005-2021, the production of some main metallic minerals and raw materials used for construction, construction aggregate and cement and decorative stones of sedimentary rocks type, in the table below is given:



	Minerals	Production in Years								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
1	Chrome	170697	201416	203321	229899	268718	322597	349873	360349	521080
2	FeNi e Ni Si		78000	369559	353320	68840	269300	363723	75017	215086
3	Lignite		3800	4000	1500	2000	2500	1200	0	
4	Copper	68312	35071	98000	105000	114286	139926	305284	479720	507105
5	Limestone	1337373	4339440	1716122	3837161	3271617	2363445	2445680	2727451	3232937
6	Marbled Lime- stone		11420	3250	4454	5953	7801	7859	10914	1530
7	Gypsum	14770	25279	53629	87261	71276	77400	93248	91021	126349
8	Sandstone		3200	7100	25237	45415	22902	23989	29249	22316
9	Clay	315085	552769	783764	695469	819341	803326	973256	961052	1181242
10	Bituminous Sand				23968	13186	32600	34632	80728	169800
11	Quartz		12978	2900	2000	3150	2000	950	3598	6000

	Production in Years										Composition (%)
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
1	683874	646139	726671	808016	1142719	1288315	626627	650200	932686	920769.98	Cr ₂ O ₃ (15-48); FeO (10-12,5); SiO ₂ (11-18); MgO(23-27); A I ₂ O ₃ (7-9)
2	493867	742180	439082	548762	385710	325243	432673	427650	174918	63131	Fe(38,5-47,2); Ni(0,9-1,1); CO(0,06-0,08); SiO ₂ (7,1-17); Cr ₂ O ₃ (3,1-4,6)
											Ni(1,07-1,32); Fe(14-1); Co (0,045); SiO ₂ (37-39,7); Cr ₂ O ₃ (3,3-8,5)
3	0	100	2000	0	150	0	0	0	0	0	Calorific power 12958-21318KJ/Kg; S(2,9-3,2); Ash (21,6-65)
4	259137	140386	0	0	236459	394530	333715	618518	641245	460628	Cu(1,35-1,85) average 1.6□
5	2976041	4147642	4776275	5578623	5567524	6272905	4976731	4746674	4560156	2319469.3 6 T	CaO(47,5-56,1); MgO(0,26-2,7); SiO ₂ (0,43-0,95); Fe ₂ O ₃ (0,6-0,94)
										3973495 m ³	
6	1445	15737	21414	18077	14923	30161	35103	21852	36439	53096.21 m ³	CaO(50-55,3); MgO (0,25-0,76); SiO ₂ (0,2-1,6); Fe ₂ O ₃ (0,04-0,7)
7	108733	86163.3	131924	104120	102016	106070	111880	116295	78239	95262.35	CaO(30-56); MgO(0,6-3,6); SiO ₂ (0,43-8,9); Fe ₂ O ₃ (0,4-1,59)
8	13438	14825	11089	9999	11243	12975	13292	11355	22748	41824.13	CaO(29-35); Fe ₂ O ₃ (0,14-0,5); MgO(17,6-21); SiO ₂ (0,04-1,25)
9	1050471	1140708	827086	954765	708311	754080	924950	879435	503747	639929.76 T	The softening point 1200C; S (3,5-7,5)
										11585 m3	
10	121626	140516	25396	125568	341911	95679	182525	251334	176877	10617.5	Bitumen concentrate (8- 10)□
11	10731	12708	30637	10450	24299	14486	20500	29217	18600	19900	CaO (0,03-0,35); Fe ₂ O ₃ (0,41-1,5); MgO (18-28); SiO ₂ (1,5-4,9)

Table No 4. Main ore production in year

Chromium ore

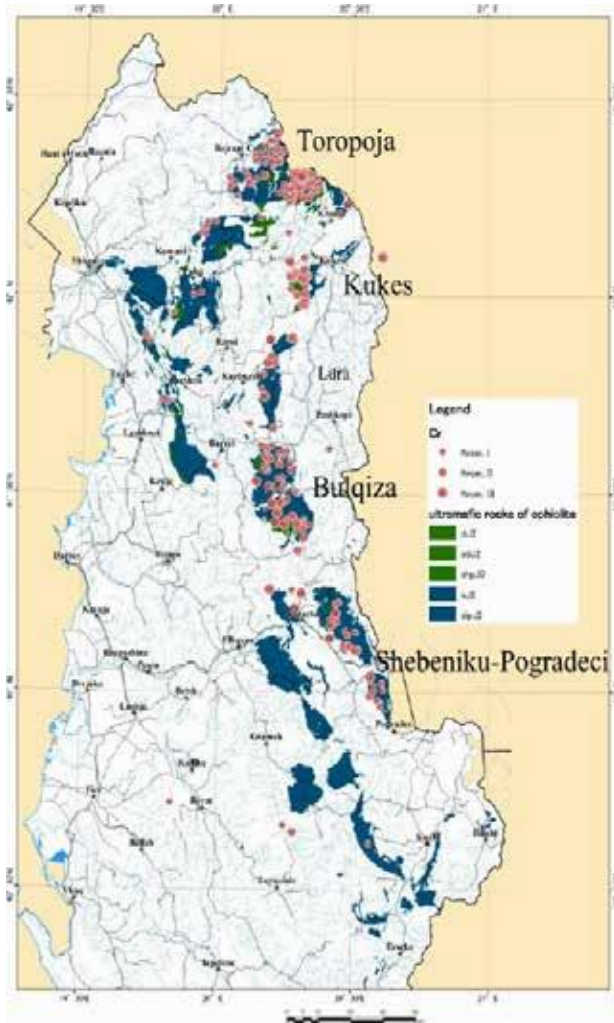


Fig No.2 Chromium ore deposits

Albania is well known for its important potential in chromium ore, comparing to the other Mediterranean and Balkans countries.

In chromium mining activity, till 31.12.2023, there are 236 active mining exploitation licenses. Production activities are concentrated in the Bulqiza region with about 120 active permits followed by the Kukës, Tropoja and Has regions.

By the end of 2023, 920769.98 tonnes of chrome ore were produced in this branch of the mining industry mainly for export.

The table below shows the qualitative parameters of the chrome ore according to the quality group.

The main chromium deposits are located in the Ophiolites of the Eastern Belt area, to Tropoja-Kukës-Bulqiza-Shebenik-Pogradec direction.

In the Ophiolites of the Western belt is identified less development in the chromium ore deposits.

From the geologic perspective, there are three main regions where chromium ore is located:

- North-eastern Region (Tropoja and Kukës Ultrabasic Massifs);
- Central Region (Bulqiza and Lura Ultrabasic Massif which is most important);
- South-eastern Region (Shebenik-Pogradec Ultrabasic Massif).

1. The most important geological sequence with which is connected chromium ore mineralization is that of Harzburgite-Dunite (H-D) fascia, which is located close to its floor.

2. The second level, from the point of view of importance of mineralization, is connected with Harzburgite-Dunite (H-D) fascia such as Thekna, Tërnova, Shkalla, Vlahna, Vanas, etc. level.

3. The third level is that, which is connected with Dunite (D) facia, with big dimensions such as Krasta, Maja Lugut, Qaf-Lame, Livadhi Dashit, Kalimashi, Përroi Batrës, etc. level. The chromium ore in this deposits is of low average content and it is destined to be treated in beneficiation plants for the concentrate production.

Bulqiza Ultramafic Massif is the biggest chrome-potential massif, where is located Bulqiza chromium ore mine. This is a unique one in its kind and has good quantitative and qualitative features and a challenge for the geologists and mining engineers.

Some perspective areas for chromium ore prospection exploration are:

1. The depth of North, Bulqiza deposit, Qaf Buall deposit, Bater-Lugu I gjate- Fushë Lope area, Liqeni Sopeve-Thekën-Ternova area, Depth of Thekën deposit;
2. The areas around Kalimash 1,2,3 and Përroi i Batrës deposits;
3. Mineralized occurrences in Shebenik-Pogradec massif and Katjel-Shesh Bush-Pojskë area;
4. Lura massif in Dibra region etc.

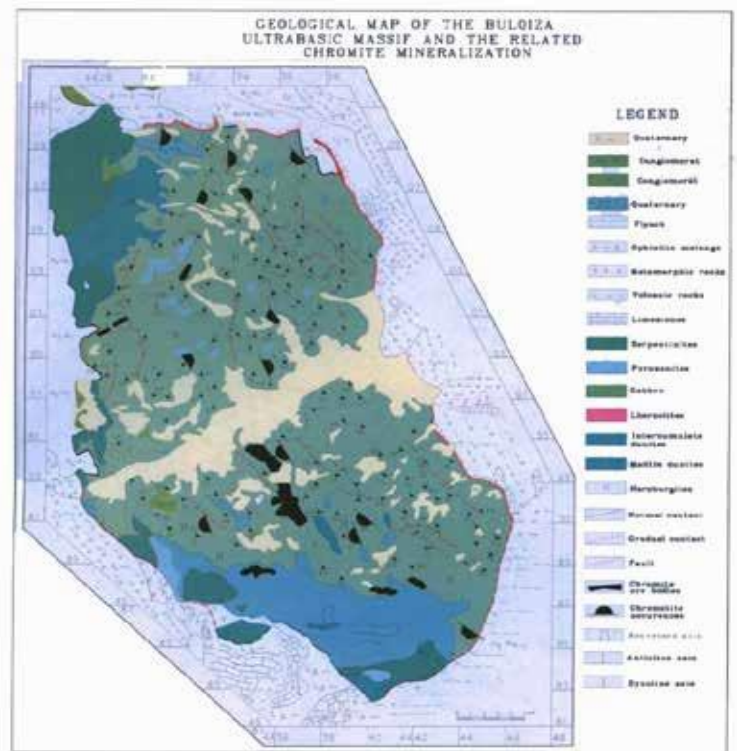


Fig No.3 Geological map of Bulqiza ultrabasic massif

After 2005, mineral exploitation activity in chromium ore has been and continues to be a sustainable development with an average annual growth of 27 %.



Fig.4 Bulqiza Deposits (Zona D)



Fig.5 General view of Bulqiza mine



Fig No.6 Shaft A1 Entrance Bulqiza North



Fig No.7 Main Level 41 Entrance Bulqiza North



Fig No.8 Main Drift +1200, Batër



Fig No.9 Thekna Mine view

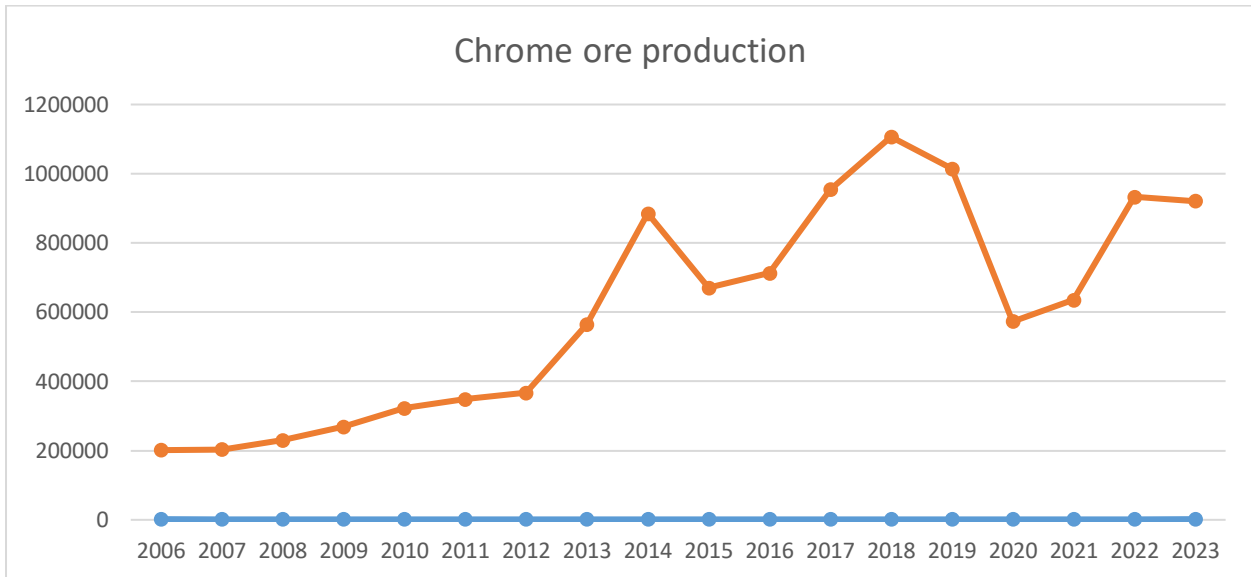


Chart No. 3 Chrome ore production in years

In the branch of the chrome mining industry are carried out and continue to undertake important investments both in mineral exploitation and in concentrate and ferrochrome production

The further continuation of a sustainable long-term development of this mining industry branch is closely conditioned with the discovery of new reserves of different minerals and for the realization of this goal are welcomed all foreign and domestic companies wishing to carry out studies and works to different geologic;

Chemical components, in% Classification according to % Cr ₂ O ₃			
	>40-42	36-40	30-36
SiO ₂	11.5	15	18
FeO	11.8	12.5	10
Al ₂ O ₃	8	7	7
MgO	23.5	23	27
TiO ₂	0.16	0.16	0.16
CaO	0.31	0.5	0.15
MnO	0.11	0.23	0.12
CoO	0.02	0.015	0.01
NiO	0.25	0.22	0.2
P ₂ O ₅	0.01	0.09	0.08
V ₂ O ₅	0.11	0.02	0.06
Loss in Calcination	2.9	3.1	3.3
Cr/Fe Ration	03-Jan	2.7/1	2.6/1

Table No.5 Characteristics of Albanian chromium ores according to the Cr₂O₃ content

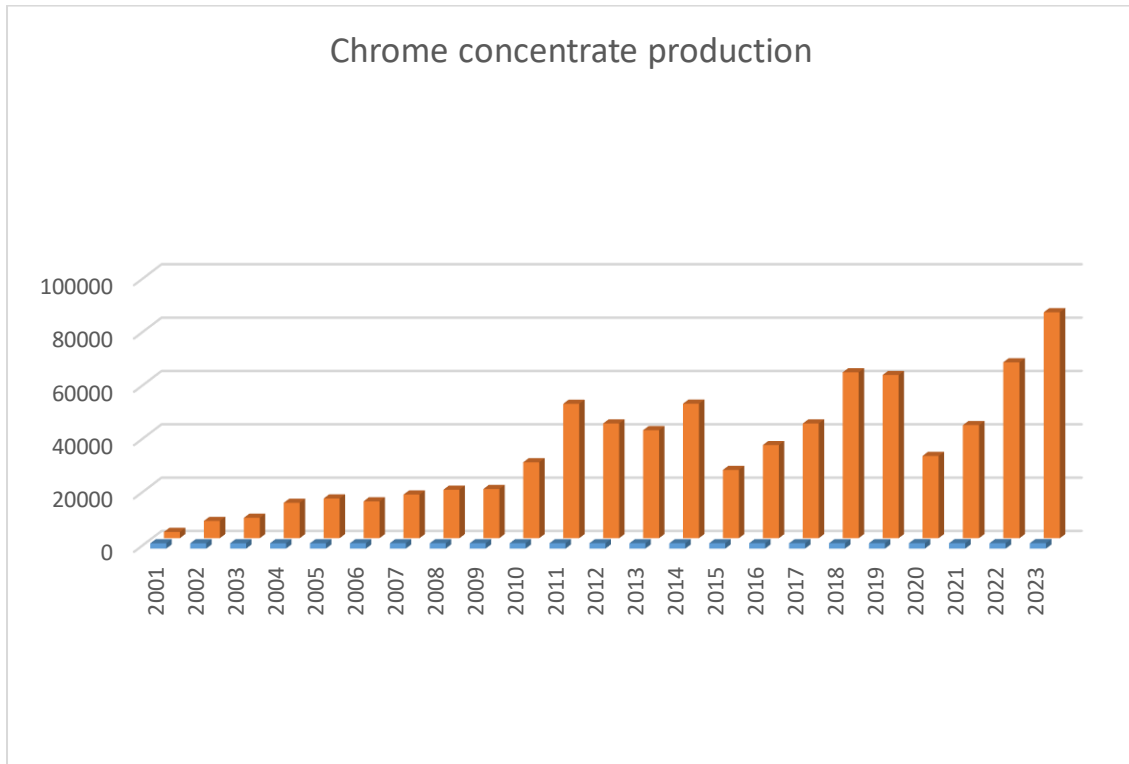


Chart No.4 Chrome Concentrate production in years

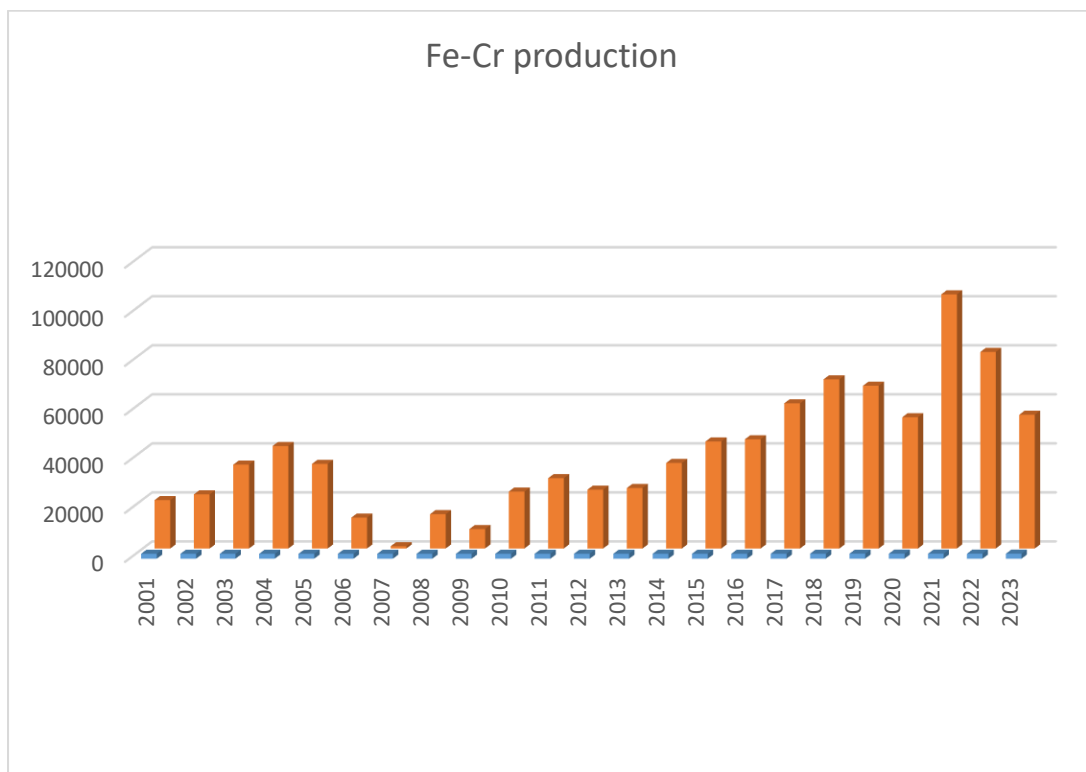


Chart No.5 Fe-Cr production in years



Copper

In copper, till 31.12.2023, there are 17 active mining exploitation licenses.

Copper deposits are located in six districts: Korça, Mirdita, Puka, Shkodra, Kukës and Has regions (Fig.10)

Mirdita and Puka regions have an important copper potential considering the annual production and number of the mining deposits.

Based on the geologic conditions, their morphology, genetic and mineralogical components, there are distinguished three main types of copper deposits:

- Plutonic type, quartz-sulphur- this type includes deposits located in Nikoliq 1, 2, Golaj, Krume, Gdheshtë, Thire, Shemri, Tuci Lindor, Kurbnesh, Kabash, Kcire, Turec regions and a lot of mineralized occurrences in plutonic, gabbro and plagiogranite intrusives rocks.
- Volcanogenic type, includes deposits such as Perlat, Munelle, Lak Roshi, Tug, Paluce, Qaf Bari, Gurth 1,2,3, Spac, Kaginar, Derven, Rehove, Bregu I Geshtenjes, Dushku I Trashe etc. and mineralized occurrences around these deposits
- Volcanogenic-sedimentary type includes deposits in Gjegjan, Porave, Palaj, Karma, Rubik and other mineralized occurrences around these deposits.

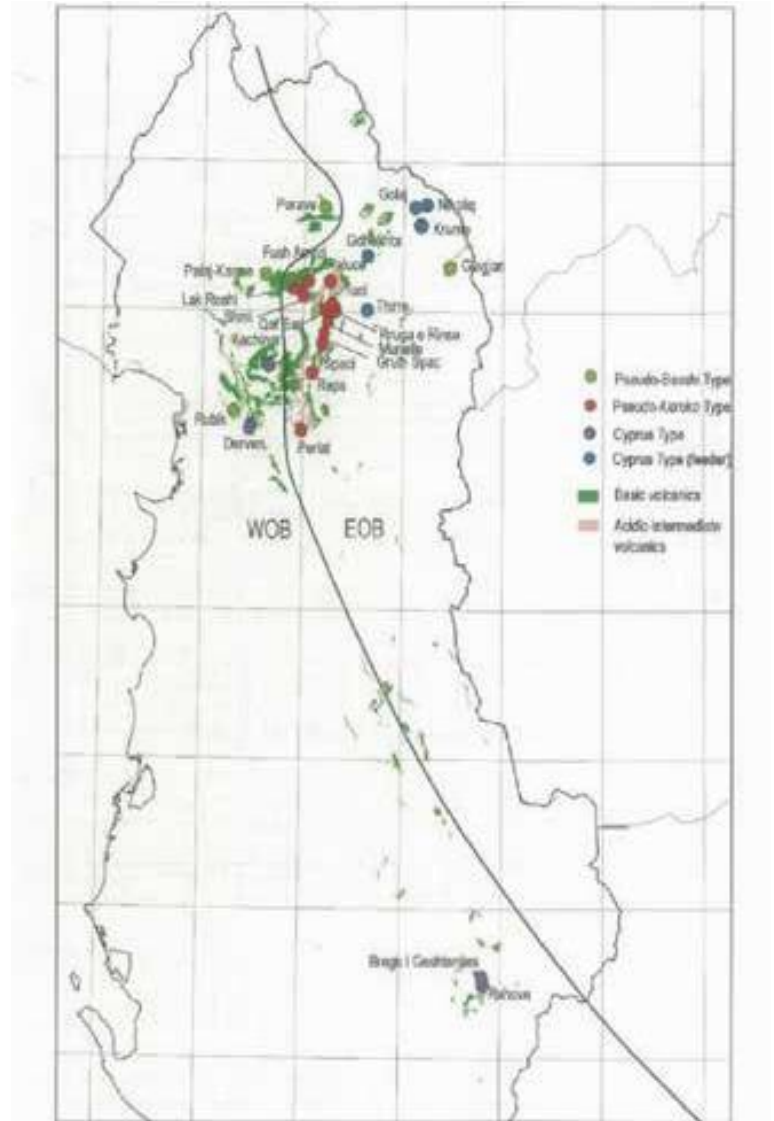
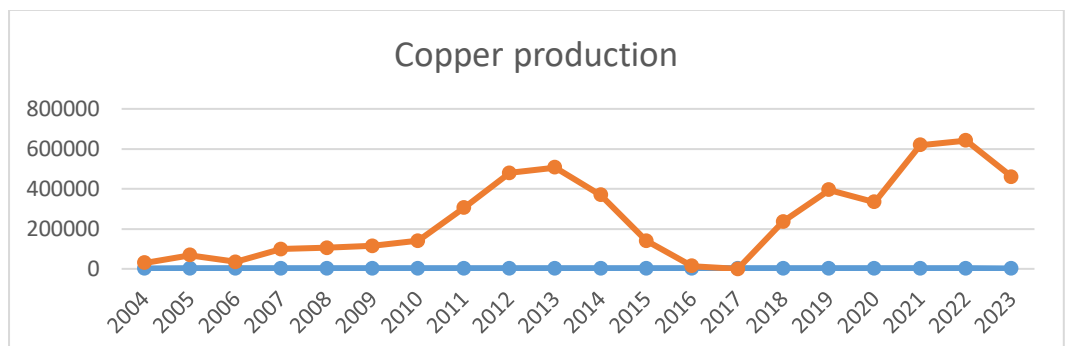


Fig No. 10 The main copper deposit

Chart No. 6 Copper ore production in years



Some perspective areas for copper exploration and/or exploitation may probably be alongside and in the depth of Munella, Gurth, Perlat, Karma and Rehovë deposits.



Fig No. 11 Main Ramp entrance Spaç Mine



Fig No.12 Main Ramp entrance Munella Mine

Iron-Nickel (laterite) and Nickel-Silicate (saprolite) minerals

Iron-nickel and nickel-silicate are located near the East border of our country, from the North-East to the South-East area. (Fig.13)

The deposits are located as below:

1. North-East region (Kukes); Trull Surroi, Mamëz, Nome deposits;
2. Përrenjas, Skroskë, Xixillas, Bushtricë, Gur i kuq, Çervenakë, Guri Përgjegjur, Hudënisht and Gradisht deposits.
3. West Central region includes deposits of the group of laterite-redeposited type. Liqeni I Kuq, Xhumagë, Debrovë that have lower qualitative properties than the other groups.
4. South-East region deposits, iron-nickel and nickel-silicate deposits of Devolli region: Bitinckë, Kapshticë, Stranë, Kokogllavë and a few less studied objects such as Vërniku, Shkoza etc.

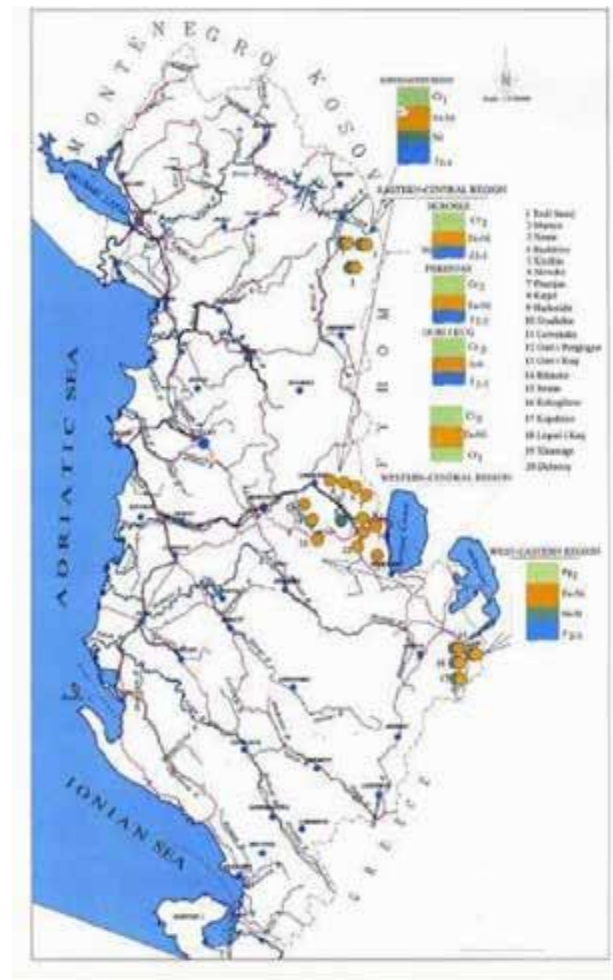


Fig. 13 Nickel's deposits

Perspective areas for iron-nickel and nickel-silicate exploration and prospecting can be:

- Kukës-Has-Cahan region;
- Trull-Surroi-Name-Lurë area;
- Skroskë-Bushtrica-the depth of Përrenjas deposit area;
- Bilisht-Kapshtica area in Devolli region:

No.	Region	Fe%	Ni%	SiO2%	Co%
1.	Devolli				
	Nickel-Silicate	16,60	1,20	35,12	0,0397
	Iron-Nickel	38,66	1,074	12,2	0,056
2.	Kukës				
	Nickel-Silicate	21,73	1,057	40,12	0,053
	Iron-Nickel	37,22	1,029	26,93	0,0547
3.	Librazhd-Pogradeci				
	<u>Iron-Nickel</u>	<u>44,72</u>	<u>0,97</u>	<u>17,22</u>	<u>0,074</u>

Table No. 6 Average content of nickel-silicate and iron-nickel according to the regions



Fig. 14 Fe-Ni, Librazhd



Fig. 15 Fe-Ni, Kukës

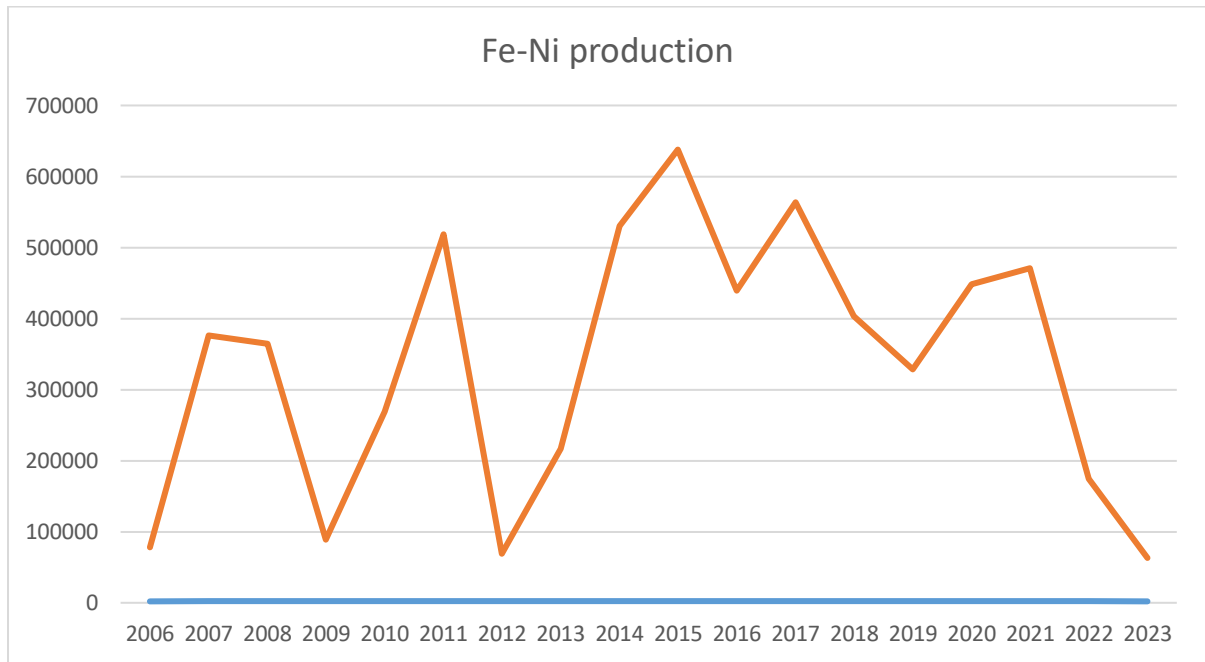


Chart No. 7 Fe-Ni+ Ni-Si Production in years

Coal and other energy minerals

The coal discovered and exploited in Albania are of the lignite type. The geologist through the mining works for exploration-prospecting, have fixed 16 (sixteen) coal-bearing deposits expanded all over the territory, from Tropoja to Saranda district.

In the coal-bearing deposits of Morava, Gore- Mokra, Tirana, Erzeni, Memaliaj, Bezhan and Alarupi are located 19 coal deposits, that are exploited up to 1995, (Fig.16).

In the coal-bearing deposits of Goliku, Galush, Burrel, Devoll, Fushe Korca, Tropoja and Xara, have mainly mineral occurrences with poor coals and limited size.

Coal occurrences are found in other places as well as: Lushnje, Kucove etc. These occurrences have not been evaluated for their quantitative and qualitative features. From the total geological reserves discovered, that are evaluated to be some hundreds million tonnes, approximately 85% of the reserves are located in Tirana coal-bearing deposit, approximately 9,2% in Morava and Gore-Moker deposits and approximately 4.4% of the reserves in Memaliaj deposit. A complete and comprehensive study is needed to define the possible fields of coal use.

In coal, till 31.12.2023, there are 2 active mining exploitation licenses.



Fig. 16 Coal deposits

Peats (turfs)

Some peats zones are found along the moors of Adriatic seaside, beginning from Shkodra to Vlora and in Korca fields and Vurgu as well.

The moors where peats are found, have generally small size but not to be underestimated. Peats occurrences are also found near Jon seaside, in Butrint region.

An important deposit is discovered in ex Maliqi moor, in Korca field. The peats discovered in this deposit are over 100 million m³, 1% of Sulphur content and 38,6 volatilizates content.

Bitumen

In this group are included concentrations that in world literature are known as "Selenica Asphalt". Bitumen concentration in Selenica deposit is in pocket form, tubes, branching, disordered and with different shapes veins. Their exploration-prospecting procedure was difficult due to their disordered morphology.

Pirobituminos (Bituminous coal)

Pirobituminos are bitumen materials that do not dissolve completely in organic solvents and do not melt in during heating process. Bituminous coal is the only scientific name. They are associated with bitumen in Selenica deposit and the area around it. The bodies have veins shape, with strike up to 100-200 m up to 400-500m. It releases a calorific power of 22154kJ/Kg.

Bituminous sands (Tar sands)

These are compact or sedimentary friable rocks that contain crude natural oil as bitumen. In our country are found large deposits in Vlora and Fier districts. Considerable deposits of bituminous sands are discovered in some oil drilling in Makaresh and Thumane. The most important Tar sands are those if Kasnica and Treblova regions.

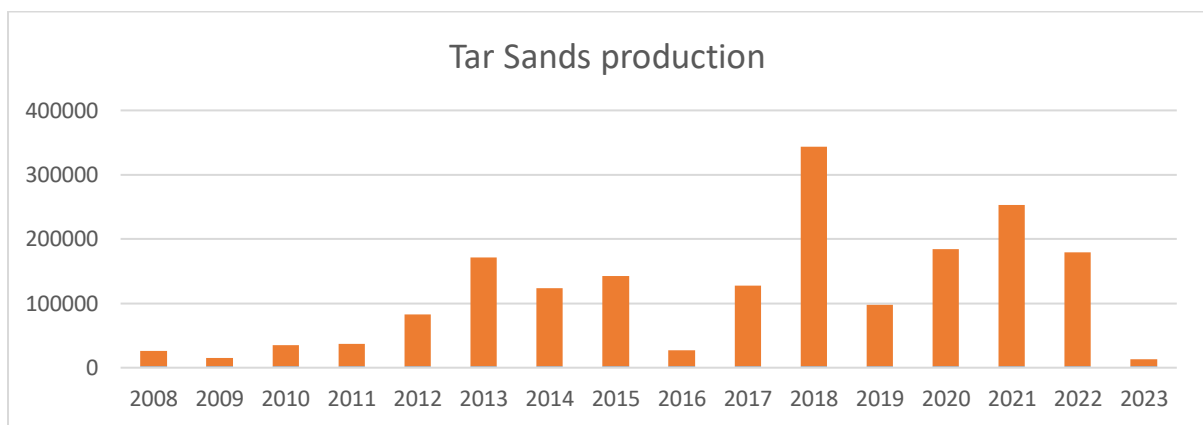


Chart No. 8 Tar sands production in years



Fig No. 18 Bituminous coal open pit (Kasnicë)

Non-Metallic Minerals

Albanian Geological Survey, during its fifty years of activity (1945-1995), through the exploring- prospecting geological works and its general studies, has given data for approximately 32 different kinds of rocks and non-metallic industrial minerals, expanded all over the country, in 438 deposits and mining objects. The evaluations completed so far show considerable reserves and with an open perspective for lots of them, guaranteeing Albanian economy empowerment.

Limestones

Limestones represent the carbonatic raw material, of different eological ages, in the form of massifs, layers and belts, in almost all districts of the country. There are recognized about 55 deposits of limestones, with approximately 450 million m³ geological reserves, with an open perspective to enlarge.

Dolomites

Dolomites are widely spread in Albania. They are located in Albanian Alps, Has, Korab, Kruja, Kurbin, Tomorr, Elbasan, Gramsh, Vlore, Himare, Delvine and Gjirokastra districts. Based on chemical composition, dolomites located in Dukat (Vlora region), Delvina, Himara and Mali i Gjere (Gjirokastra region), have high technological qualities with an average content of MgO 20-21 %.

There is an open perspective for 8 deposits with approximately 150 billion m³ geological reserves.

Travertins

Travertins are carbonatic-porous rocks with cavity, located in Tropoje, Has, Diber, Bulqize, Elbasan, Gramsh, Lushnje, Librazhd, Korce, Kolonje, Permet, Gjirokaster, Delvine and Saranda districts. The mix of dolomites-limestones-travertines create high quality decorative deposits as for example the deposit of Kosova (Lushnja districts). With the travertines of Kosova deposit are the colons of the Palace of the Congress, the squares in front of the National Museum and the International Culture Centre and also lots of other villas, builings etc. From the evaluations completed in 18 deposits and objects, are calculated to be approximately 23 million m³ geological reserves. The travertins of Kruma, Borizane, Golloborda, Bajram Curri, Malesia e Shkodres etc. remain to be evaluated through geological works.



Fig No. 20 Decorative stone deposited distribution

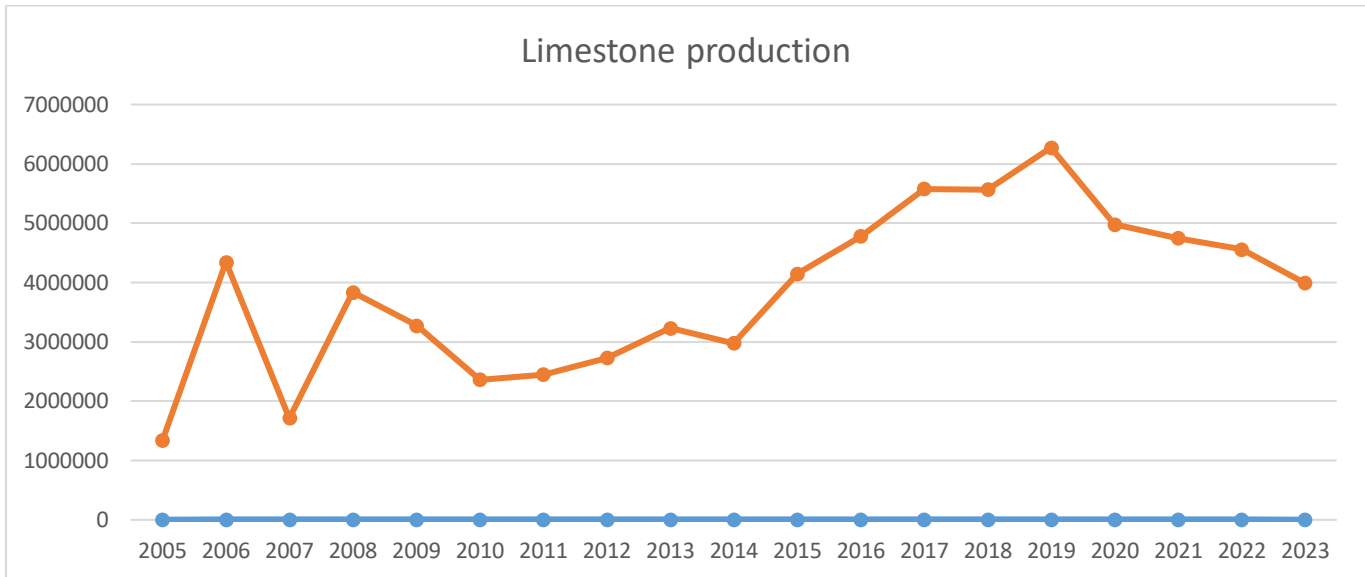


Chart No. 9 Limestone production in years

Carbonatic Decorative Stones

A lot of buildings, colons, statues and relics discovered during archaeological researches testify that Albania has a tradition of thousands of years for the stone elaboration and decorative stones use.

The decorative carbonatic stones are represented from:

Marbled limestones of Triassic-Jurassic

They represent the group with the highest decorative quality. They are distinguished for the high level of crystallization, colours diversity, massive construction and possibility to be mined in blocks. They are located in: Tropoja, Kukës, Dibër and Bulqizë districts, with a red to pink color and white hue and other marbled limestone with white color in Qaf Shtamë, pink ones in Elbasan and Pogradec and grey ones in Devoll districts. From the evaluations completed in approximately 20 deposits, are estimated in all around 100 million m³ geological reserves. The most important deposits between all can be considered to be Muhurit, Gjurasi, Kovashicë and Qafshatamë.

Massive limestone of Cretaceous and Cretaceous - Paleogene

This kind of rocks are located in:

- Lis and Burgajet of Mati district
- Vithkuq and Polena of Korçë district
- Gërmenj of Kolonja district

They are with a red and pink hue, conglomeratic appearance and diverse decoration meanwhile in Milot, Lag, Mamurras etc. of Kurbin district, Zall Dajt and Qaf Priske of Tirana district, they are with white and grey colors and good decorative parameters. From the estimation of the above-mentioned group the quantity of geological reserves calculated is approximately 143 million m³. In Milova deposits, which is located in Skrapar district, white limestone blocks are produced.



Fig. 21 Massive limestone (Lepenice)



Fig. 22 Massive limestone (Melove)

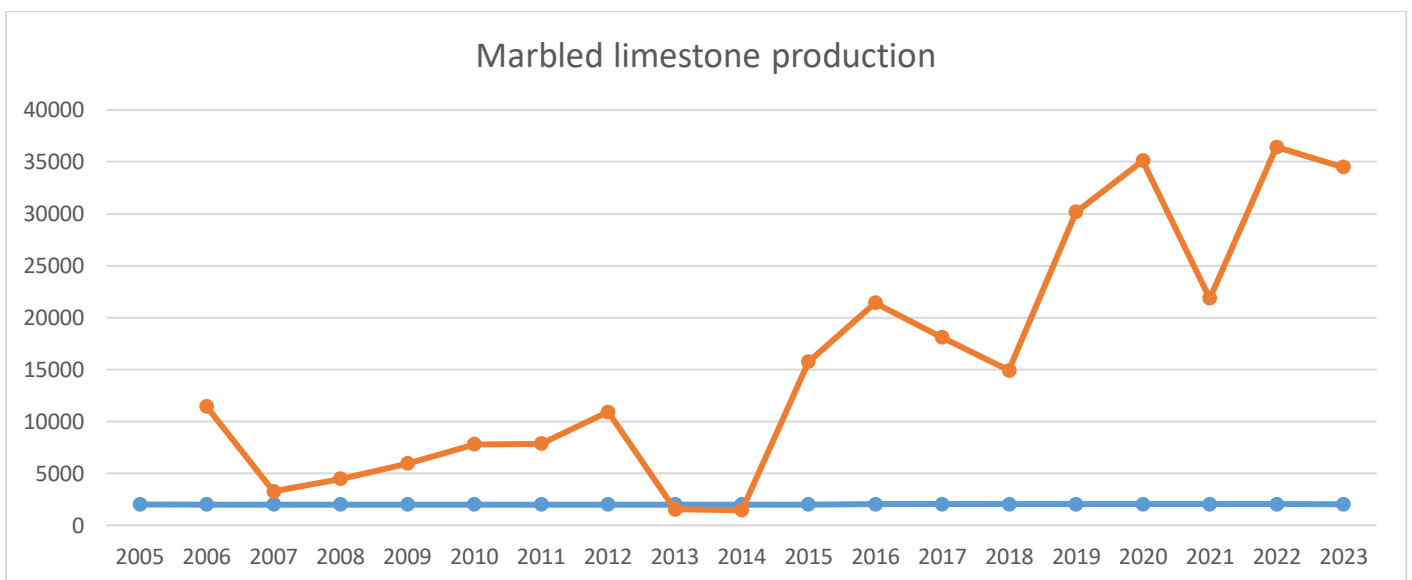


Chart No. 10 Marbled limestone production in years

Conglomeratic limestone

The conglomeratic limestones are located mainly in Librazhd, Pogradec, Korce and Devoll districts. They are multicolor with carbonate cementation, with a big strength and very difficult to be cut and elaborate. There is not any mining permission issued so far. From the evaluations completed are approximately 9.6 million m³ of geological reserves. Petrusha, Bitincka and Vithkuqi are perspective mining objects.

Decorative stones connected with sandstones

Massive and flagstones sandstones rocks have a huge spread in 9 (locations) districts of our country. Their exploitation has begun since 2005 and their product is mainly in blocks and flags shape. Despite their large spread in Korçë, Kolonjë, Përmet, Skrapar, Vlora and Berat districts, up to now, there is no any detailed geological study nor any geological reserves estimation.

According to geological data, the most prospecting areas for carrying out geological studies and the exploitation of this type of rock are:

- Plovisht-Mesmal, Korca districts;
- Leskovik-Permet-Kelcyre-Ballaban zone;
- Corovode-Bogove-Polican Berat zone;
- Vodice-Drashovice-Kot-Gjorm-Terbac-Vranisht zone, along Shushica Valley River.



Fig No. 23 Përmeti Sandstone



Fig No. 24 Berat Sandstone

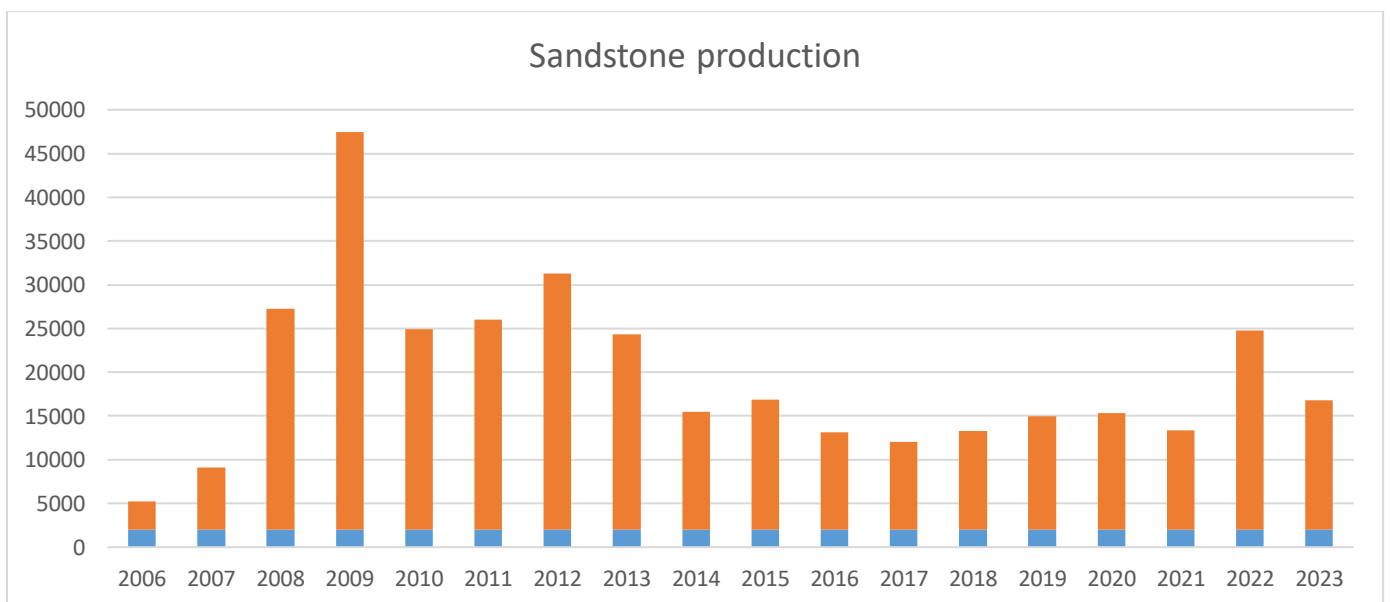


Chart No. 11 Sandstone production in years

Phosphorites

The industrial mineralization of phosphorus is connected to the Jurassic and Cretaceous epochs. Based on the geological works data carried out up to the year 1991, 10 deposits are discovered and evaluated connected to the phosphatic horizon of Cretaceous and 2 phosphatic uranium-bearing deposits in Fushë-Bardhë and Bogaz regions connected to Jurassic epochs. From the estimation carried out in 12 studied deposits, a quantity of 57 million tons of geological reserves are calculated and with a perspective for their further enlargement.

Clays

Clays that are produced in Albania are used for tiles production, majolica tiles, bricks, artistic production and cement production.

Considering the areas of use and the clays' qualitative characteristics, in Albania can be classified 9 kinds of clays discovered.

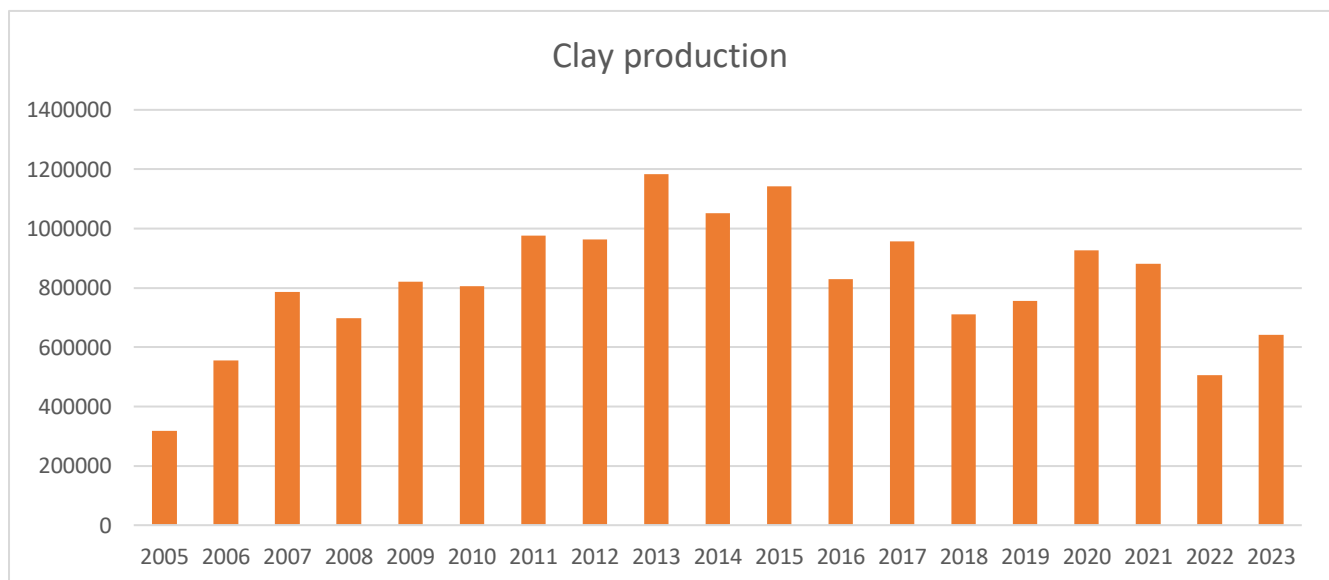


Chart No. 12 Clay production in years

Up to date, from the estimation carried out in 46 deposits and objects, a quantity of approximately 260 million tonnes of geological reserves is calculated. The most important deposits are: Tarabosh and Drisht in Shkoder district, Fushe- Kruje, Brar and Vore in Tirana district, Shen- Vlash in Durres district, Bradashesh in Elbasan district, Virove in Lushnje district, Qaf Topi in Vlore district etc.



Volcanic tuff

Volcanic tuffs are located in Shkodra district, Librazhdi area, Vrap (Tirana district), Mallakaster and Qerret (Gramshi district). A quantity of 4 million tonnes of geological reserves is estimated so far, with a perspective to be quadruple or quintuple.

The volcanic tuffs are valued as a huge reserve in the cement industry and a deeper study is needed because of their importance and their wide use.



Quartzite and siliceous rocks

In Quartzite and siliceous rocks are included the raw quartz materials as quartz, sand- stones and quartz sands.

The most studied types of quartz are: Shishtaveci's and Kallabaku quartz, sandstones and quartz sandstones of Tirana and Bilishti districts. A deeper study is needed because of their importance and their wide use. From the evaluations carried out in 28 deposits and objects, are calculated approximately 190 million tonnes geological reserves.



Gypsums and anhydrites

Gypsums and anhydrites occurrences are in Diber, Kavaje, Elbasan, Vlore, Gjirokaster, Delvine and Sarande districts. Through the geological studies carried out, Dibra's district gypsums, are with the highest qualities. The evaluations carried out in 34 deposits and objects are calculated approximately 83 million ton geological reserves and they have a good enlargement perspective, especially in Dibra district.



Rock Salts

The deposits of rock salts are discovered near the gypsum deposits except Dibra's district deposit. The most studied deposits are Mengaj deposit (In Kavaja district) and Dhrovjani deposit (in Delvina region), in which their exploitation lasted up to 1991.

Huge rock salts reserves are discovered during the oil drillings in Dumre diapir, in Dhrovjan, Kardhiq diapir etc.



Basalts

Basalts are located in Mirdite, Puke, Elbasan, Korce and Kolonje districts. Considering the physical-mechanic features of basalts, they must be valued as more qualitative inert substances comparing with carbonatic inerts and river inerts. The geological reserves are calculated to be more than 1 milliard tons.



Olivinites

Olivinites are ultramaphic, monominerals rocks with a composition of 95% of olivines. They are mainly located in the two ultramafic belts of our country. The biggest deposits are the deposits of Kalimashi and Qobrati that are located in eastern Belt Ophiolites, respectively in Kukës and Tropojë massifs.

Olivinites occurrences discovered in the western Belts massifs have weaker qualities and are smaller than the olivinites located in the Eastern Belt. They can be used as raw materials for refractory tiles, metallic magnesium production, for different shapes in smelting plants and as decorative stone too. From the evaluation carried out in 5 studied deposits and are calculated to be approximately 108 million tonnes of geological reserves and with an open perspective for their enlargement.



Volcanic glass

In Albania are discovered huge volcanic glasses deposits, mainly located in Lak Rosh region, Qafë Bari, Munella (Pukë district), Gurth Spac, Koder Spac and Latien (Mirditë district). The volcanic stone produced in Lak Rosh deposit, before 1992, is used as subsidiary in the clinker of cement factories. From the completed evaluations in 7 deposits and objects are calculated to be approximately 18 million tonnes of geological reserves, with a real possibility for their enlargement in Pukë-Mirditë regions, around wellknown deposits and mining objects. More studies and technological semi industrial proves must be done for the volcanic glass, because it is widely used in cement industry, construction, small industry etc.



Granites

Levrushku granites deposit, in Pukë district is the most studied deposit. Before 1990, feldspar and quartz concentrates were produced from granites. Granite occurrences are found in Pukë, Tropojë, Kukës, Bulqizë and Dibër districts. These rocks are not evaluated enough for feldspar substances and decorative stones.

From the evaluations completed in 12 deposits and objects, are calculated to be approximately 70 million tonnes geological reserves.



Ophiolitic decorative stones

Decorative stones connected with ophiolitic rocks are widely spread and mainly located in North, East and Southeast of Albania. They are evaluated in base of their colours, their ability to resist for a long term to atmospheric agents, their ability for polishing etc. There are about 15 kinds of ophiolitic rocks from which can be produced decorative stones. From the evaluation of 27 deposits and objects are calculated to be approximately 70 million m³ of geological reserves with an open perspective for their enlargement.

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