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**MINISTRY
OF RECONSTRUCTION OF PRODUCTION
ENVIRONMENT AND ENERGY**

COUNTRY PROFILE – GREECE

«THE MINING/METALLURGICAL INDUSTRY IN GREECE. COMMODITY REVIEW FOR YEARS 2013-2014»

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The mining/metallurgical industry of Greece.

Commodity review for years 2013-2014

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Summary. Greece is a EU country with a significant mineral resources background in terms of quality, quantity and variety of ores, minerals and aggregates. The Greek Mining/Metallurgical Industry (GMMI) constitutes an important sector of the economic activity of the country as it supplies essential raw materials for primary industries and various downstream users.

Although the sector's significance to Greek economy has been declined during the past 20 years, GMMI still contributes 2% of the Gross Domestic Product (GDP), with the inclusion of interrelated enterprises such as quarrying, concrete, processing and production of intermediate and final products. There is high potential for further development and flourishing, if current obstacles of recent sharp economic crisis are overcome and new investments are attracted.

The mining/metallurgical sector in Greece covers a wide range of mineral commodities and comprises four major sub-sectors, namely: i) Metallic Minerals (Bauxite-Alumina-Aluminium, Nickel, Lead-Zinc, Gold, Copper, huntite/hydromagnesite etc.), ii) Industrial Minerals (Bentonite, Perlite, Magnesite and magnesium compounds, Pumice, Pozzolan, Gypsum, attapulgitite, amphibolites, olivenite, calcium carbonates, industrial clays etc.) iii) Marbles and ornament stones iv) Energy Minerals (lignite) Geothermy and Hydrocarbons (upstream process).

Production data for various mineral commodities produced in Greece in the years 2013-2014 are listed in Table 1. Reported figures are combined data from (a) statistics provided by the Mineral Resources Division of the Ministry of Reconstruction of Production, Environment and Energy YPAPEN (ex. Ministry of Environment, Energy and Climate Change (YPEKA)) based on annually activity statements and (b) the official economic data sheets published annually by mining companies. Annual statistics provided by Greek Mining Enterprises Association (GMEA) are considered as well. Especially for the marble industry, import-export data are provided by Greek Statistical Authority (EL.STAT), grouped and analyzed by YPAPEN/Mineral Resources Division.

The output of the Greek mineral industry declined in both value and tonnage owing to the global economic downturn that started in 2009 and was continuing in 2013-2014. This was mainly due to the significant decline in demand and prices of raw materials in the steel, construction, cement, and concrete industries. The instability and recession boosted by rising

energy prices throughout the EU, reduction in international metal prices and individual issues plaguing the Greek economy.

Positive developments recorded in 2014 were: the fall in euro-dollar exchange rates at a cheaper euro, the significant drop in oil prices and the resulting drop in freight rates that positively affect the export mining sector. Also, strengthening the extrovert orientation of most mining companies (the sector is already highly extroverted since its exports account for 65-70% of its total sales) while maintaining extensive sales networks abroad and timely restructuring of the operating structures helped sector to maintain corporate competitiveness, retention of staff and implementation of the required productive investments.

The domestic market mainly in the field of construction products (aggregates, cement, ceramics, etc.) and companies related to aggregate quarries and generally construction products as well as cement, suffered big drop the previous five years due to the shrinkage of domestic building and construction activity, showed in 2013 an increase in turnover by 8%, and for 2014 an increase of 20 to 25%, mainly thanks to restart of some public projects. The cement sector also regained part of the losses both domestically and in the international competition.

However, in contrast to the shrinking domestic market, the tendency was to strengthen the export sector with regards to products placed on the international market (industrial minerals, aluminum, nickel, mixed sulphide Pb-Zn ores, magnesium compounds, marble products etc.), where the demand and prices soon rallied largely to pre-crisis levels.

The traditional marble field is providing a good example of a sustainable roadmap during the crisis years. Despite the recent adverse conditions, the sector of marble products achieved a significant increase in exports (mainly to the Chinese market) during all previous 5-6 years, maintaining its leading position in the international markets and contributing significantly to the GDP. In 2013-14 the exports in the marbles sector were over 850.000 tons and over 250 million € in value, see Fig.1.

In the above context, the last six years of crisis (2009-2014), the mining industry despite the severe crisis, was perhaps the only sector in Greece that maintained jobs and productive structures in a stable condition, achieving a total (six year) turnover of approximately 18 to 20 billion € and a total export value exceeding 10 billion €. At the same time recorded investments in research and development of products surpassed 2 billion € while investments for environmental rehabilitation projects amounted 100 million €.

Commodity Review

Nickel. Nickeliferous laterites. Greece is the only EU country with extensive but low-grade nickel laterites. They mainly occur as limonitic laterites and, to a lesser extent, as serpentinitic laterites. The Greek laterites are exploited by the nickel producing company LARCO GMMAE, which is the most important metallurgical company in producing Fe-Ni alloy in Greece.

In 2013 there was a drop in nickel (Ni) production of 10% after an excellent performance for LARKO GMM SA in 2012, the year in which production reached at level of 18,600 ton Ni and sales of 19,071 ton Ni creating a new history record. Exports in 2013 totaled 17,054 ton Ni.

In 2014 nickel production totaled 18,481 ton increased by 9.8% while sales amounted to 17,882 ton with an increase of 4.8%. The value of nickel sales for 2014 was 223.8 million €, with an average nickel price of 12,516 €/ton.

Production of nickeliferous laterite ore from the mines of Evia, Agios Ioannis and Kastoria (the total laterite ore production used to feed the Larymna metallurgical ferronickel plant) amounted to 2.38 million ton (for 2014), 2.22 million ton (for 2013) and 2.25 million ton (for 2012).

However, Larco G.M.M. S.A., which is a leading producer of nickel in Europe from domestic nickel ores, had a pre-tax loss of 28.6 million € in 2014 compared to losses of 76.38 million € in 2013 and 34.32 million in 2012 (profit of 6.37 million € in 2011). So, losses in 2014 decreased by 61% in percentage and 46.95 million € in value. In the years 2013-2014, the Government was reported to be looking for a strategic investor in Larco and announced plans to restructure ahead of its privatization.

Bauxite, Alumina and Aluminum. For aluminum (Al), the production by Aluminum SA - the largest integrated producer of aluminum and alumina in the European Union- remained at the same level as in 2013 (about 170 thousand ton) absorbing more than 75% of Greek production of bauxite ore.

Intra-EU exports increased to 106.8 thousand ton Al (from 100.9 thousand for 2013) with a sales value of 198.3 million € (versus 179.6 million. € for 2013) while exports to third countries increased significantly to 5.5 thousand ton Al (compared to 2.4 thousand ton for 2013) value of 10 million €. Note that the company's export, which is the only one in Greece that produces primary aluminum, cover 80-90% of total group ("Mytilineos") sales.

The production of **alumina** hydrate returned to the high levels of 2011 which was instrumental in the diversion of non-metallurgical uses. For 2014, sales amounted 131 thousand ton with a corresponding value of 32.2 million. €.

Bauxite. Greece is a leading bauxite producer in the EU, with the major bauxite deposits located in central Greece within the Parnassos-Ghiona geotectonic zone and on Evia Island.

The total domestic production of bauxite for 2014 (1.8 million ton) remained at the same high level as in 2013 (1.85 million ton) covering the demand for both metallurgical use (domestic aluminum production) and other uses of Al in the steel industry, cement industry, etc. A significant proportion of 422 thousand ton (about 22%) was exported to the international market for other –non metallurgical –uses.

Specifically, the leading bauxite producer and trading company European Bauxite SA (a subsidiary of S & B Industrial Minerals SA), produced 970 thousand ton of bauxite, the Delphi Distomon SA produced 633 thousand ton and the Elmin SA 269 thousand ton of bauxite. It is noteworthy that early in 2015 and after absorption of S&B Industrial Minerals by IMERYS, the European Bauxite SA (bauxite «sector» of S&B) was absorbed by the French group KERNEOS SA, which at present time controls the Greek bauxite sector.

Mixed sulphide Pb-Zn ores. Gold projects. The production of mixed sulphide Pb-Zn ores (lead, zinc and iron concentrates) from Hellas Gold SA (owned by Eldorado Gold Corp. Canada) in 2014 remained at previous levels (about 220 thousand dry ton) and products of

enrichment (concentrates of lead sulphide and zinc sulphide after differential flotation) exported as a whole exceeded a value of 40 million € (18 million € for Pb and 22 million € for Zn). The concentrates were shipped by sea to European facilities using either the Stratoni or the Thessaloniki port facilities.

Also in 2014, Hellas Gold SA treated the old mineral tailings in Olympias Halkidiki which generated approximately 58.3 thousand ton gold-bearing arsenopyrite with an average content Ag=2,216.73 kg and Au=1,318.9 Kg. This arsenopyrite concentrate was exported in China with an export value of 21.7 million €. This could produce over 29 thousand ounces of gold if there was metallurgical gold plant in Greece. The particular notation is that Greece could-for the first time in modern time-become a gold producer country from an environmental restoration work taking place in the old tailings of Olympias Halkidiki.

Regarding the new **gold-mine projects** in Halkidiki peninsula and in the Thrace region, Greece has the potential to become a near-term gold producer with a number of exploration projects active in the country. Hellas Gold SA is developing a project including mining and processing at the Skouries gold-copper deposit and has initiated mining activities at the Olympias site.

Eldorado Gold Corp. is also developing the Perama Hill gold project through its subsidiary Thracian Gold Mining SA, while a third project in Sappes, Thrace, is currently being evaluated by YPAPEN. According to the technical and economic feasibility studies carried out by investors when all above mines are in full operation, they will boost country's exports by €1 billion a year, turning Greece into the largest gold producer in Europe. Moreover, Eldorado's projects will provide some 2,000 jobs.

Magnesite and Magnesium Compounds. Magnesite ore is due to chemical weathering of serpentine rocks. It is used for producing refractory materials as a lining in blast furnaces, kilns and incinerators and for other uses. Furthermore it is being used as a binder in flooring material, as catalyst and filler in the production of synthetic rubber and in the preparation of magnesium chemicals and fertilizers.

Grecian Magnesite SA is a leading magnesite producer and exporter in the EU and worldwide with mines and production facilities in Yerakini, Halkidiki, Northern Greece. In 2014 the company had a slight drop from previous levels of magnesite ore exploitation producing over 270 thousand ton of raw magnesite material from concessions 20 & 22 and 21 in Halkidiki, see figure. Production of magnesium compounds in 2014 amounted for dead-burned magnesia (DBM) 26 thousand ton, for caustic-calcined magnesia (CCM) 61 thousand ton and 41 thousand ton for refractory masses, with a total sales value of approximately 25 million €.

Terna Magnesite SA (TERNA MAG, the GEK Terna) is a recently established mining company which took over the old "Biomagn" in North Evia and aims at exploiting the old magnesite deposits of Gerorema and Kakkavos and the further utilization for production of magnesium compounds on the premises of Mantoudi furnace old installations after modernization.

In 2013, the production of magnesite plant Gerorema amounted 23.6 thousand ton of raw magnesite while at the same time the company began underground mining from the site Plakarias-Mourtitsa. In 2014, magnesite production amounted 86.3 thousand ton (enrichment

product) and for the first year there was a production of 9.3 thousand ton of caustic magnesia.

Industrial Minerals. For 2014, the sector of industrial minerals maintained much of the results of 2013, mainly thanks to the diversified export-oriented products towards international markets for raw materials and the application of the approach "from Market-to-Mine" which provides the possibility of developing new integrated chain of products and accelerate the development of higher value-added specialized applications.

Specifically, production of **bentonite and perlite** ores from Milos Island and other places remained at 2013 levels, 1.0 million ton for bentonite and with a slight reduction for perlite production (0.98 million ton), see reference table 1.

The S & B Industrial Minerals SA maintained its position as first in the production of bentonite in Europe and the largest bentonite export company in the world with a total bentonite sales value of over 68 million € (100% exports).

Similar performance was achieved for the branch of perlite, with a total perlite sales value in both unprocessed and processed products of 29.1 million (compared with 27.5 million € in 2013).

In 2014 the total turnover of the S & B group of companies surpassed 105.2 million € and the total number of employees reached 1900 (606 in Greece). However, S&B SA recorded a loss before tax of 20.1 million € compared to the corresponding profit 111.8 million € in 2013, due to changes in the restructuring of the group. Since late 2014, the company has been under the control of the French group IMERYS, one of the largest business groups in the world in the field of minerals. This deal of November 2014 was one of the biggest international deals in the history of Greek enterprises. The absorption concerned the whole group except for the bauxite sector.

Pumice stone is the product of volcanic activity on the volcano of Nisyros, which erupted 200,000 years ago. The annual production from Yali Island amounted to approx. 1 million ton before economic crisis and in the years 2013-2014 to 420-430 thousand ton of pumice. Most of the production is exported to USA and the EU and is mainly used in the construction industry while a smaller percentage is used in the textile industry for stone washing.

Huntite/Hydromagnesite. Mineral production from Sibelco Hellas S.A. (formerly White Minerals SA) in 2013 amounted to 15.2 thousand ton of crude mineral (from concessions 72 and 74 both located in Servia Kozani). The sales of both processed and crude material decreased by 7% while turnover declined by 17%. In 2014 the decline continued with production limited to 5.3 thousand ton and a consequent reduction in sales of finished products by 38.1% compared to 2013.

Olivine, amphibolites, attapulgite clays. Olivine, amphibolites and attapulgite industrial minerals maintained their upward trend and export orientation utilizing both the capacity and the existing reserves of previous years. For these minerals should be noted that in addition to the numerous uses that cover the needs of the chemical, construction industry, steel, refractories etc. they are widely used in predominantly environmental uses (as bleaching earths, means of refining and waste management, molecular sieves, filter and insulation, etc.).

In particular, amphibolite ore is extracted as raw material in Serres region and then is used for the production of mineral wool called "petrovamvakas" a natural fibrous and a strong insulating and fireproof material (FIBRAN SA).

Also, the olivine ore after mined from the quarry area Skoumtsa West. Macedonia, is treated to produce a wide range of products based on olivine, which are used as refractory materials for the metallurgical industry, the cement industry and the glass industry (exports 60%) (Aeiforos Metal Processing SA).

Finally, Geohellas is an industrial minerals company specialized in producing clays with specific uses of attapulgite and special mixtures of attapulgite /soapstone, with mining and processing plant in the prefecture of Grevena, Northwestern Greece. Attapulgite is a unique clay mineral with a wide variety of industrial uses owed mostly to its very high surface area and porosity.

All the relevant production data for the above mentioned industrial minerals and ores are presented in Table 1.

Aggregates-construction materials. In Greece, 95% of the aggregates produced derive from primary resources, comprising mainly crushed rock aggregates due to the existence of many and good quality limestone deposits. Quarries are located in areas with suitable geological resources in pre-defined Quarrying Areas (Law 1428/84 as amended with Law 2115/93). About 120 authorized quarrying areas are operating throughout the region with 150 quarries (including their product treatment units) scattered all over the country. Their potential production exceeds the 80-90 million ton/year. Unfortunately, only 50-55% of the current total aggregate production in Greece derives from quarries established in Quarrying Areas. The rest is either due to the legislative exceptions or/and illegal quarrying activities.

Also, the drastic decrease in annual aggregates production, which is a direct impact of the financial crisis, is evident in Greece during the last 5 years. The aggregates' demand decreased into 30 million ton in 2013 and 38 million ton in 2014, at least 55% lower than the production of 2008. The average annual consumption in Greece in the years of crisis is 2.2 - 2.5 ton per capita.

Calcium Carbonate. The main companies involved in the production of carbonate fillers are the DIONYSSOMARBLE, the IONIAN KALK SA, the MICROFILL SA, the KARBOKAL SA, the OMYA HELLAS SA and the INDUSTRIAL MINERALS SA.

Based on annually activity statements (YPAPEN) for 2013-2014, it is apparent that despite the economic crisis, the Greek Ground Calcium Carbonate (GCC) fillers sector has remained fundamentally sound with a total annual capacity of 0.4-0.5 Mt which is mainly attributed to the increase in the exports of domestic fillers production. Actually, it is estimated that over 80% of the production volume is exported. This can also be attributed both to the importance of these materials for use in specific industries (plastics, paints etc.) and that they can be used in manifold applications in various industrial sectors.

Lignite. Lignite is used mainly for consumption in electricity power stations of the Public Power Corporation (PPC), with Greece being both one of the largest producers and depositors

of that type of coal in Europe, with around 55-60 million tons of annual production, and more than 7 billion tons of reserves.

In 2014, lignite production from PPC SA exceeded 48 million ton (2013) reduced by 12.5% from 54 million ton (2013) which have also been reduced by 14.5% from 61.7 million ton (2012). Specifically for 2014, lignite production of 39.06 million ton extracted by the company at the West Macedonia Lignite Centre (WMLC) and 8.9 million ton at the Megalopolis Lignite Centre (MLC). According to this amount of lignite produced, Greece holds 3th place of EU's lignite production (after Germany and Poland) and ranked among the largest lignite producers in the world.

The contribution of lignite in the electricity energy mix on the interconnected system of the country exceeded 54.6% (56.8% in 2013), while the corresponding participation in the whole country (including non-interconnected islands) was 50.3% (51.8% in 2013) demonstrating the dominance of lignite reserves in the country's energy scene.

Hydrocarbons. International tendering procedures. Kavala Oil is the only company extracting hydrocarbons in Greece, targeting with significant investments to a doubling of production from the existing Prinos deposit of 2,000 barrels currently in 5,000 barrels of oil per day. Also the company announced an investment program for exploitation of the deposit "E" aiming to an initial daily production of 3,000 barrels. The estimated exploitable reserves of the deposit "E" stand at 10 million barrels while total reserves are around 32 million barrels.

According to the financial results of 2014 the company Energean Oil & Gas recorded losses mainly due to the drop in crude oil price. Consolidated revenues in 2014 were limited to 31.1 million € (49 million € in 2013) marking an annual decrease of 36%.

The tenders concerned the exploration and exploitation of hydrocarbons in Ioannina, Katakolo and the Gulf of Patra in western Greece, met with significant international interest and finally awarded to consortiums led by Greek firm Energean Oil and Hellenic Petroleum. The three consortiums have committed to investing €60 million each during the first-stage drilling procedures; based on the agreements, these investments would rise to between €700-800 million if hydrocarbon discoveries are made.

In 2014, the state has also announced a new round of international tenders for exploration and exploitation of an additional 20 offshore blocks south of Crete and in the Ionian Sea, as well as three onshore sites in western Greece: in Arta-Preveza, Aitolokarnania and the northwest Peloponnese region. The area south of Crete is believed to be the country's most likely prospect for the discovery of a major petroleum reservoir of international proportions, while the onshore sites have already drawn interest from major international players. The offered offshore blocks have deep water levels and are significantly larger than the blocks previously offered. Thus, advanced technical capabilities and extensive capital support will be needed for exploration. In practice, this means that only large and mid-sized firms will be able to bid for the concession which will be concluded in next year 2015.

Geothermy. High enthalpy geothermal resources (>90°C) appears to be confined in the active South Aegean volcanic arc, with a proven potential exceeding 250 MWe mainly in the

islands of Milos and Nisyros. Unfortunately despite this, at present, no electric power is produced from geothermal resources in Greece.

On the other hand low/medium enthalpy geothermal fields (<90 °C) are numerous in Greece, most of which are located in the basins in Northern Greece, as well as in many of the Aegean Islands. Present data indicate that the proven low/medium enthalpy installations in the country exceed 100 MWt.

The total country installed capacity, [reported](#) for geothermal direct utilization is estimated up to 220-230 MWt (total worldwide capacity is estimated up to 70,329 MWt growing at an annual compound rate of 7.7%). Current geothermal installations in Greece include 2 MWt for individual space heating, 33-35 MWt of greenhouse heating, 7-8 MWt for fish farming, 0.3 MWt of agricultural drying, 43-45 MWt for bathing and swimming, 0.4 MWt for other uses, 135-140 MWt for geothermal (or ground source) heat pumps, producing the above mentioned combined total for the country of 220-230 MWt.

As demonstrated from the above distribution of the installed capacity, geothermal heat pumps (GHP) or ground source heat pump (GSHP) exhibit the largest share (>65% of the installed capacity), followed by bathing and swimming and greenhouse heating. This rapid increase of GHP systems can be attributed mainly to the ease and swiftness of the licensing for drilling of "closed" wells or for use groundwater open systems that can be installed in buildings of all kind.

Marble products and ornamental stones. Marbles' industry is a traditional and essential factor in national economy, having a dominant position in the world market, despite the adverse circumstances, the fierce world competition and the restrictions on environmental issues. Namely, on a major marble's use like the decoration stones, a sector that Greece is showing a great flow of exports for decades, the country ranks 11th globally from 2004 till now. This is one of the few sectors that Greece intertemporally competes with the global markets, especially when the leading countries are huge and multitudinous countries with a great workforce and rich ground, like China, India, Italy, Spain, Turkey, Brazil or the USA.

During the last six years, the industry of marble products and ornamental stone, despite the severe impact of the economic crisis on domestic consumption, managed to improve production and maintain the upward trend that began in 2008-2009 mainly thanks to strong demand from the Chinese marble market.

Especially for 2013-14, the total annual production of marble and ornamental stone products exceeded 1.3 million ton annually, while exports of the sector exceeded a total of 840-860 thousand ton worth over 240-260 million €. Imports remained at the same limited level of 30-33 million €, reflecting the slowdown of the internal market due to economic crisis, see Fig. 1.

Specifically for marble products, the total exported marble quantity came up to 776 thousand ton worth over 242 million € (in 2014) and a total of 820 thousand ton worth over 232 million € (in 2013).

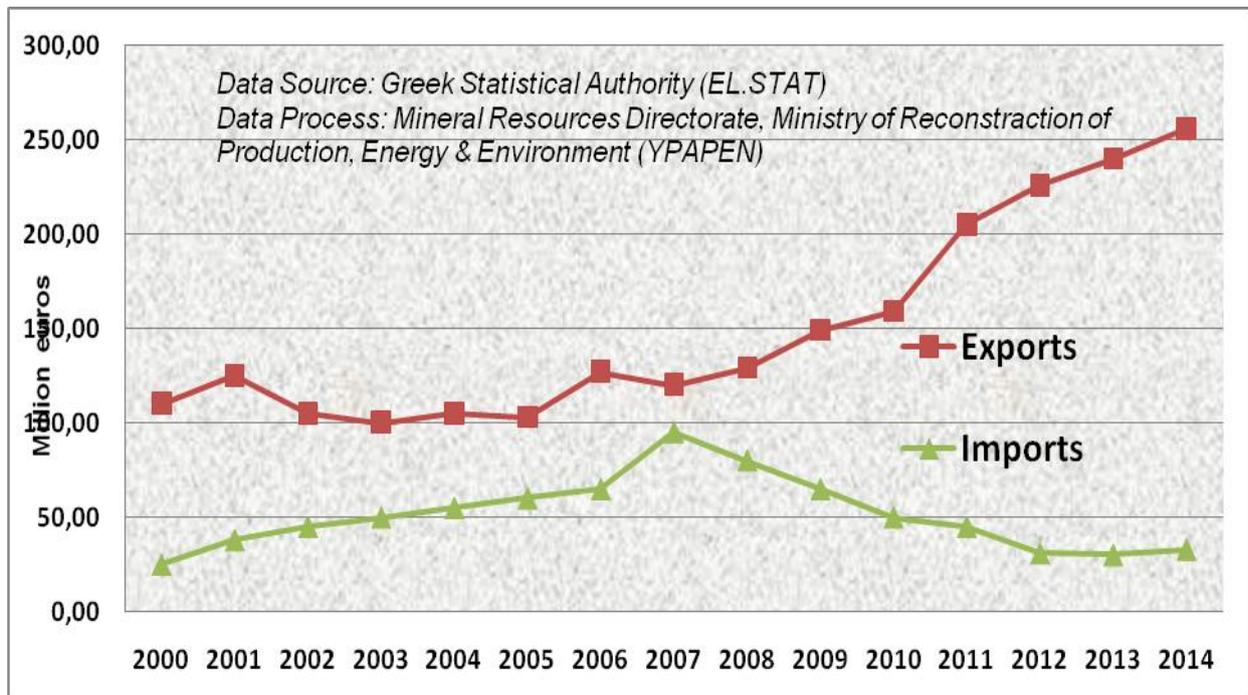


Figure 1: Import and Export values of marble and other natural stones in Greece [2000-2014]

Marble exports to China, the biggest market for Greek marbles, totaled over 91.1 million € (in 2014) and 98 million € (in 2013), representing for 2014 more than 57% of total quantity and 38% of the total value of Greek marble exports, see figure 2. Respective values of China for 2013 were more than 58% of total quantity and 42% of the total value of Greek marble exports.

The first twenty (20) markets of the total Greek exported marble quantity in 2014, rating 83% of the total exported value. China was followed by:

- USA with 14 million € of exported value
- United Arab Emirates (UAE) with 10.8 million €
- Saudi Arabia with 8.4 million €
- Singapore with 8.1 million €
- Qatar with 7.6 million €
- Italy with 6.6 million € and
- Turkey with 6.5 million € of exported value.

Emery. Emery mineral mainly occurs in the island of Naxos. In the last two years 2013-2014 emery production amounted to 4-5,000 tons a year while a quantity of almost 50 thousand ton has been stocked in Moutsouna, Naxos. In 2014, a total of 30 thousand ton of this stock were sold (with a turnover of almost 400 thousand €) while a new sale auction is expected in 2015. Research has been carried out in order to examine possibilities for new applications and markets of the ore.

Table 1**GREECE : PRODUCTION OF MINERAL COMMODITIES****METALS, MINERAL AGGREGATES, INDUSTRIAL MINERALS, MARBLE AND ORNAMENT STONES, MINERAL FUELS AND RELATED MATERIALS**

COMMODITY PRODUCTION	Quantity in Metric tons unless otherwise specified	
	2013	2014
Bauxite	1,844,000 ¹	1,872,710 ¹
Aluminium, primary (Foundry Line)	169,457	173,164 ²
Alumina, calcined (Al ₂ O ₃)	664,512	674,045
Alumina, hydrated (Al ₂ O ₃)	811,600	813,500
Mixed sulphide ore	227,203	219,859 ³
Galena, PbS (metric tons of concentrates)	18,375	15,654
Zinc blend , ZnS (metric tons of concentrates)	41,226	41,960
Auriferous arsenopyrite, FeS ₂ (metric tons of concentrates)	64,837	58,335 ⁴
Nickeliferrous ores (laterites)	2,220,790	2,382,485
Ferronickel (FeNi)	88,910	94,952 ⁵
Ni content of ferronickel	16,890	18,481
Slag by product (from electrical furnaces)	84,300 ⁶	351,567
Slag by product (from OBM-type converters)	83,970 ⁶	83,380
Magnesite, crude	383,000	360,268 ⁷
Dead-burned magnesia	30,559	26,012
Caustic-calcined magnesia	57,393	70,660 ⁸
Basic monolithic refractories	41,985	41,023
Bentonite, crude	1,000,000 ⁹	1,011,485 ⁹
Attapulgitic clay	32,400 ¹⁰	45,000 ¹⁰
Huntite, crude	15,200	5,340
Pozzolan, Santorin earth	266,000	270,000
Pozzolan, specific use (not cement industry)	1,100	1,200
Kaolin, crude	0	0
Perlite, crude	890,000 ¹¹	985,328 ¹¹
Perlite, treated	435,000 ¹²	507,336 ¹²
Pumice	420,000	429,872
Silica (SiO ₂)	10,000	0
Gypsum and anhydrite, crude	760,000	664,288 ¹³
Olivin(it)e	16,461	25,416
Amphibolite	19,360	22,923
Calcium Carbonate (CaCO ₃), processed all sources	345,000	414,000 ¹⁴
Feldspar	0	0
Quartz	0	10,000
CO ₂ [liquid]	10,040	10,336
Lignite	55,500,000 ¹⁵	50,800,000 ¹⁵

Zeolite	0	166 ¹⁶
Crude oil, in barrels	609,390 ¹⁷	514,219 ¹⁷
Natural gas, in NM ³ ¹⁸	5,415,000	5,062,219
Salt, sea salt	189,500 ¹⁹	146,402 ¹⁹
Mineral Aggregates (sand, gravel, crushed stones etc.)	30,000,000*	38,000,000*
Marble rough blocks, in cubic meters	220,000	232,000
Marble, rough shapeless blocks	300,000*	335,000*
Slate stones, in cubic meters	180,000 ²⁰	100,000 ²⁰
Marble Powder/Chippings	NA	6,070 ²¹
Abrasives, Natural Emery	4,250	4,800

NA: not available, *: estimated

¹ bauxite: European Bauxites S.A., Delphi Distomo AME, Elmin AE

² produced from treatment of 332.2 thousand tn of calcined alumina

³ Metal content Pb: 13.016 tn, Zn: 22,953 tn, Fe: 49,578 tn, Ag: 33,568 Kg, Au: 1,009.16 Kg (from mining concessions 16 και 25)

⁴ Metal content As: 10.4% Fe: 27.7%, Ag= 38 gr/tn και Au=22.6 gr/tn

⁵ %Ni content: 19.46%

⁶ Slag by-product (coarse) 84,300tn and Slag by-product (fine, -5mm) 83,970 tn

⁷Total production of magnesite from main enrichment unit (Grecian Magnesite S.A. and TERNA MAG).

⁸ Caustic-calcined magnesia (from Grecian Magnesite S.A. and TERNA MAG).

⁹Bentonite: S&B Industrial Minerals S.A., Bentomine S.A., Sud Chiemie Hellas, Greek Mining Ltd., Mavroyiannis Co.

¹⁰ attapulgitis/palygorskite plus smectite/saponite clay(GEOELLAS AMMAE)

¹¹Perlite: S&B Industrial Minerals S.A., EEKOM SA, Aegean Perlites S.A., MILOPAN S.A.

¹²Perlite (processed): S&B Industrial Minerals S.A. , Aegean Perlites S.A.

¹³Gypsum: Interbeton Construction Materials SA., Lava Mining and Quarrying Co, Knauf Gypsopoia SA, Biogyps-Karvelis SA, G. Zervakis SA.

¹⁴Calcium Carbonate (CaCO₃) products, both amorphous and crystalline: construction mortars, fillers, powder from marble quarrying, adhesive and sealant, marmoline, alfamix, iokal e.g. by Dionyssomarble SA, Ionian Kalk SA, Zafranias-microfill SA, Omya Hellas etc.

¹⁵Public Power Corporation SA, Larco GMMAE (Servia Kozani), M.E.T.E., Lign. Karapati , Lign. ACHLADAS SA

¹⁶ BENTOMINE S.A., ¹⁷KABALA OIL SA, Energean Oil & Gas

¹⁸Normal cubic meter (Nm³)

¹⁹ from seven (7) salt sites throughout Greece, 55% of the total coming from the salt pits of Mesolongi

²⁰Karystos and Pillion areas slate stones are included

²¹quarries especially licensed for production of Marble Powder/Chippings