

GREECE

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Despite the negative trends in many mineral commodities, Greek companies managed in general to maintain their positions as a result of gradual and systematic restructuring during the past decade. In particular industrial minerals were less affected, partly due to diversification in products, markets and geographical distribution of production units.

Industrial Minerals

Grecian Magnesite (GM) was a bright example of continuing expansion in sales. GM enjoyed another successful year in 2001, with sales reaching €32 million, an increase of 11% compared with 2000. GM's sales volume was approximately 185,000 t, comprising 110,000 t of caustic calcined magnesia, 30,000 t of deadburned magnesia, 27,000 t of raw magnesite and 17,000 t of basic monolithic refractories. Exports represented 93% of total sales. Main destinations, in order of importance, were the EU, the US, other European countries, Middle East / North Africa and the Far East. The workforce of GM was around 420. At the beginning of 2001, GM bought out 15% of the US company Premier Chemicals LLC, a leading producer of magnesia chemicals.

Premier Chemicals is a primary manufacturer of magnesium oxide and magnesium hydroxide. The products are produced from ore mined at Gabbs, Nevada, or extracted from seawater in Port St. Joe, Florida. Premier's chemicals division serves a wide range of industrial, municipal and agricultural markets. GM is the second biggest investor, and an 'industrial partner' in this business.

GM also completed a large part of the internal investment programme (with a total budgeted cost of €12 million) comprising, in part, of:

- increase of the mining reserves through drilling;

- application of modern methods for the calculation of reserves;
- production of high added-value products;
- new management information systems;
- further environmental protection.

GM is in the process of implementing a significant investment programme at the Yerakini mine in Chalkidiki, aiming at reducing cost, improving quality, increasing production capacity, extending the lifespan of the mine and further environmental protection. During 2001, a significant part of the investment programme was completed while the rest is expected to be operational by 2003. GM places special emphasis on research and development to optimise existing products continuously, to meet fully the requirements set by the customers and to develop new products as well as new uses. GM's Research Centre currently participates in a large number of R&D projects, including: MgO grades for environmental control purposes, MgO grades for electrical applications, MgO grades for the tanning industry and magnesium carbonate for the ceramics industry, alternative uses of MgO filter powder.

Over the past two years, GM has applied an extensive restructuring programme aiming at supporting its competitiveness and further improving its position in the market. Following the successful implementation of this programme, GM developed a formal business plan in order to implement its medium and long-term targets, including:

- continuous evaluation of new, sizeable business development projects, to achieve geographical diversification and a strong manufacturing and distribution presence worldwide;

- identification of opportunities for strategic alliances and joint investments with well known distribution networks;
- development and implementation of a production/marketing strategy for the coming years; and
- production upgrading by re-engineering the beneficiation process.

Silver & Baryte Co. (S&B), the largest mining company in Greece focuses on industrial minerals, although it is also involved in gold exploration. After an impressive jump in 1999, S&B managed to stabilise its leading position in the world markets for bentonite and perlite, as shown in the following table of sales. It also maintained first place in bauxite mining in Greece, although at levels significantly below its capacity, as a result of lower market demand. The operating profit of S&B's industrial mineral activities increased by 1.5% and amounted to €27.1 million (detailed financial results are given on S&B's web site www.s.andb.gr).

Silver and Baryte turnover by product in € million

| | 2001 | 2000 | 1999 |
|---------------------------|--------------|--------------|--------------|
| Bauxite | 42.7 | 43.4 | 30.7 |
| Bentonite | 111.1 | 107.4 | 43.3 |
| Perlite, raw | 43.2 | 40.9 | 31.7 |
| Perlite, expanded | 10.9 | 9.5 | 13.0 |
| Other industrial minerals | 22.5 | 25.3 | 23.0 |
| Total | 230.4 | 226.5 | 141.7 |

Bentonite sales of S&B were distributed in a diversified market, including foundries (52%), pelletising of iron ores (13%), civil engineering applications (7%) and sanitary sand for pets (7%). Furthermore, after the incorporation of IKO Minerals, S&B is knowable to target specialised markets for high added value bentonite products in Central and Northern Europe, such as the paper industry, chemicals,

ceramics and wine. It is thanks to this diversification and the high quality of products that has enabled S&B to secure a leading position in the world market. This is also true of bauxite which was sold to primary aluminium producers (57%), for aluminous cements (14%), a growing market thanks to the quality advantages of Greek bauxite, and for Portland cement (13%) and ferrous metallurgy.

Lava SA produced 885,000 t of pumice, 150,000 t of silica, 450,000 of pozzolane and 260,000 t of gypsum. Lava maintained its position as the biggest pumice producer in the world. Total turnover amounted to €11.74 million and the operating profit was €42.55 million.

Primary Metallurgy

Aluminium de Grèce maintained its competitive position and high profits despite declining aluminum prices thanks to its constant policy of 'continuing progress' by investing for development in a socially stable environment within the company, with emphasis on work safety and environmental precautions. The turnover was €404.6 million compared with €424.7 million in 2000 and profit before tax was €88.7 compared with €93.8 million in 2000.

The production of hydrated alumina increased by 20,000 t to 709,000 t, with successful application of the 'sweetening' process. Primary production of aluminum was 162,000 t, ie the same as last year. However, electric power consumption was slightly lower. Total aluminum production was reduced to 162,500 t, as a result of a deliberate policy to reduce secondary production because of its lower efficiency. Sales amounted to 397,000 t of calcined alumina, up by 40,000 t, and 163,300 t of aluminum. The workforce was maintained at 1,258. Investments completed in 2001 amounted to €9.7 million.

Delphi-Distomon bauxite mines, an affiliate of Aluminium de Grèce, employed 173 people and produced 906,130 t of bauxite, of which 867,240 t were sold. Turnover was €19.9 million and net profit was €3.4 million. Exploratory drilling totalled 24,200 m.

The Greek nickel producer, Larco successfully completed its largest investment programme of the past 25 years, spending some US\$35 million. Of this total, 65% was spent on production facilities at Larymna and 35% on its mines. Since October 2001, a new era has been established for the company that makes possible the following targets for the next five years:

- a 30% increase in annual nickel production to 22,000 - 23,000 t/y;
- a 30% cost reduction;
- a reduction of electric and thermal energy consumption per tonne of nickel; and
- compliance with the Greek and EU environmental specifications.

Although two main production units remained idle for two months during 2001 whilst refurbishing took place, Larco achieved its second highest annual production, with 17,700 t of nickel from 2.2 Mt of lateritic ore. Granular ferronickel with an average 20% Ni content, ISO9002 certified, was sold to traditional customers in Europe for the production of stainless steel.

Turnover is estimated at US\$113 million and there was only a marginal net income before depreciation, due to the low price of nickel during 2001. The total ore output of 2.25 Mt was mined from: Euboea (1.25 Mt ore, 15 Mt overburden), Larymna (0.7 Mt ore, 6 Mt sterile), Kastoria (280,000 t ore, 1.6 Mt of overburden) and 10,000 t of ore from Bitinska in Albania. Finally, 10,000 m of exploration drilling was completed in 124 holes.

TVX has developed its Mavres Petres lead-zinc mining operations in Chalkidiki to a daily output of 900 t from 400 t at the beginning of the year, by investing about US\$2.5 million. The increase in production will compensate for the cessation of mining at Madem Lakos due to reserves depletion. It is anticipated that daily output from Mavres Petres will rise to

1,400 t in 2002. Total mine output increased to 336,850 t of ore in 2001, compared with 183,400 t in the preceding year, with an average of 8.62% Pb, 10.52% Zn and 213.5 g/t Ag.

It seems that TVX, after many years of important investments in gold projects in Chalkidiki, will have to abandon its metallurgical plans because of the negative ruling of the State Council, based on environmental issues.

Gold Sector

Thrace Minerals, a wholly owned subsidiary of Greenwich Resources plc of the UK, has identified two gold deposits within the Sappes lease: Viper contains 1.2 Mt with an average grade of 18.4 g/t (687,000 oz of gold) and St. Demetrios, which contains 260,000 t, with an average grade of 3.5 g/t (30,000 oz). The gold is associated with sulphide ore and will be recovered by gravity and flotation only. Detailed mine plans have been drawn up for an underground mine at Viper, and an open-pit at St Demetrios with a strip ratio of 0.1:1. The mining and processing operations have been designed to minimise any environmental impact. The revised operating cost, is estimated at US\$143/oz. This is in the lower quartile of world costs and, together with the fiscal incentives available in the province of Thrace, this should ensure a strong cash flow. The Environmental Impact Study has been submitted and is under review. The prospects are very good thanks to the exclusion of the use of cyanide from ore processing.

Energy Minerals

Public Gas Corp. of Greece (DEPA), the gas company owned 65% by the Greek State and 35% by Hellenic Petroleum, completed the basic infrastructure and continued with the construction of the Kavala-Komotini distribution pipe which was completed in 2001. DEPA imports Russian natural gas via a pipeline and Algerian LNG and transports and distributes natural gas in Greece. In 2001, natural gas supply amounted to 1,881 million m³, out of which 1,432 million m³ were sold to the Public Power Corp. (PPC) for electricity

generation. The liberalisation of the electricity market in Greece, which is in progress, is expected to increase natural gas consumption. Thus, the operation of the gas power station in Komotini is anticipated in 2002. In addition, DEPA applied for a licence to install two power stations in Attica with a total capacity of 600 MW.

PPC mines lignite from four large open pits in the Ptolemais- Amyntaion area of Western Macedonia (Main, Kardias, Southern and Amyntaion fields) and three average-sized open pits in the area of Megalopolis in the Peloponnese (Horemion, Marathousa and Kyparissia). The Main pit will be depleted in the next few years and will be replaced by the Mavropigi pit, where development work has started for a planned lignite production of 7 Mt/y.

The total capacity of 4,900 MW of the lignite-fuelled power stations will be increased by 330 MW through the operation of the Florina station, which is expected to begin producing this year. Total lignite output in 2001 increased by 4.2 % to 66.2 Mt, out of which 51.7 Mt came from Ptolemais-Amyntaion and 14.5 Mt from Megalopolis. Some 280 million m³ of waste rock was excavated (236.7 million m³ from Ptolemais-Amyntaion and 43.4 million m³ from Megalopolis), which was 2.7 % higher than in 2000. The lignite power stations generated 32,106 Gwh, 4.1% higher, corresponding to 72.4% of total electric output in Greece. PPC operated with 6,222 employees and invested €76.4 million, mainly for land expropriation and technical improvements.

Violignite mined 110,000 t of good quality lignite. Significant sales to PPC have been contracted in view of the operation of PPC's new power station in Florina in 2002. Thus, sales of 500,000 t are foreseen in 2002, to be increased to 1.2 Mt/y for the next four years.

Mineral Production in Greece ('000 t)

| | 1999 | 2000 | 2001 |
|----------------------|--------|--------|--------|
| Alumina | 622 | 668 | 709 |
| Aluminum | 171 | 168 | 162.5 |
| Bauxite | 2,139 | 2,609 | na |
| Bentonite | 850 | 1,062 | na |
| Lignite | 61,900 | 63,912 | 66,485 |
| Magnesite | 495 | na | na |
| Magnesia, calcined | 104 | 115 | 110 |
| Magnesia, deadburned | 42 | 32 | 30 |
| Nickeliferous ore | 1,750 | 2,510 | 2,250 |
| Nickel | 13.5 | 17.1 | 17.7 |
| Perlite | 600 | 624 | na |
| Pumice | 885 | 850 | 885 |
| PbS, concentrate | 32 | 32 | 60.2 |
| ZnS, concentrate | 32 | 32 | 60.2 |