

## POLAND

*By Krzysztof Galos Ph.D.*

*Minerals and Energy Economy Research Institute, Kraków, Poland*

Poland's economic development in 2002 was mostly influenced by a number of unfavourable factors, of both an internal and external nature. Unemployment continued to increase and reached a record level of 18.1% (17.5% in 2001 and 10.4% in 1998). Capital investment fell for the second consecutive year, by 7.2%, after an 8.8% fall in 2001 (and compared with a 22% rise in 1997). The trade deficit amounted to €15.0 billion, but the widening gap was arrested (€15.8 billion in 2001), and was compensated to some degree by an inflow of foreign capital.

However, this was primarily located on the stock and State Treasury bond markets, and not in the form of direct foreign investment. Internal government debt increased to €57.1 billion, and foreign government debt stayed below €30 billion, although total foreign debt – including that of banks and producing companies – remained on the increase and exceeded €80 billion. Sales in the construction sector fell for the second year in a row, by 7%, though industry sales – after a slight fall in 2001 – appeared to rise by over 2% in 2002.

On the positive side, GDP growth was maintained, 1.4% compared with only 1.0% in 2001, (although in the preceding few years annual growth of more than 4% had been achieved). GDP amounted to Zt770 billion (€200.4 billion) but per capita GDP remained low, at about €5,200. The second positive feature was a substantial decrease in the rate of inflation, to 1.9%, a 30-year low. Probably the most important development in 2002, however, was the successful conclusion of negotiations with the European Union concerning Poland's entry, with full membership scheduled for May 2004.

Poland has never been self-sufficient in minerals. It is an important producer of hard and brown coal, coke, copper, zinc, lead, silver and steel, as well as salt, sulphur, soda ash, limestone, lime, cement, gypsum, and many other industrial minerals. However, it is strongly dependent on imports of crude oil (over 50% of total mineral commodity imports to Poland), natural gas (15% of mineral commodity imports), aluminium and alumina, iron-ore concentrates, phosphate rock, potash salts, etc.

The approximate value of minerals produced in Poland in 2001 (the most recent figure available), was Zt30.0 billion (one euro = 3,84 zloty), with hard coal contributing Zt15.1 billion, brown coal Zt2.6 billion, crude oil and natural gas Zt2.0 billion, copper and silver Zt4.0 billion, other metals Zt0.9 billion, industrial and construction minerals Zt5.4 billion. Production of the majority of minerals decreased compared with 2001 (commonly by 1-3%). The largest falls were recorded for sulphur (-14%), zinc metal (-11%), cement (-9%), lime (-5%), and crude oil (-5%). The exceptions were: natural gas (+2%), lead concentrates (+10%), copper (+2%), silver (+3%), aluminium (+7%), rock salt (+7%) and glass sand (>10%).

The trade balance for mineral commodities has been consistently negative in Poland since 1995, and the deficit in 2002 was about Zt15 billion. The main reason for the imbalance is the steady increase in the volume and value of crude oil and natural gas imports ( the trade imbalance for each being -Zt11 billion and over -Zt4 billion, respectively). The value of Poland's mineral exports are weakening, especially in the case of hard coal (only Zt3 billion in 2002), and sulphur (down to less than Zt90 million). The export values of copper, silver and zinc – the three other important mineral commodities – depend strongly on their international price fluctuations.

### **Coal**

Hard coal remains the main mineral commodity produced in Poland. Production level have remained steady over the past three years at just over 103 Mt/y, with 84% of production being thermal coal. The share of hard coal in primary energy supply in Poland is still very high, at over 73%. In spite of substantial employee reductions – down from 222,000 in 2000 to 141,400 at the end of 2002 – the economic situation of the industry continues to deteriorate, and total liabilities at the end of 2002 amounted to some Zt19 billion.

The Polish Government is addressing the problem and has approved a new Hard Coal Industry Restructuring Programme for the years 2003-2006. Under this programme, a new coal company (Kompania Weglowa SA) is to be established, which will incorporate all the mines of five smaller coal companies: Bytomska, Rudzka, Gliwicka, Rybnicka and Nadwislanska. Two other hard-coal producers, Jastrzebska Coal Co. and Katowicki Coal Holding Co., and three independent mines, Bogdanka, Budryk, and Sobieski-Jaworzno III, will remain independent. Seven mines with combined capacities 12.7 Mt/y will be closed in 2003 (at a cost of about Zt890 million, financed by international loans).

Employment will be reduced from 141,400 in 2002 to 114,200 in 2006. The total liabilities of hard-coal producers to state budget and state funds will be reduced by Zt11.9 billion, and some Zt0.5 billion will be converted to coal companies' shares. As a result, the hard-coal industry's remaining liabilities will amount to about Zt6.6 billion. The total costs of introducing the Restructuring Programme during the period 2003-06, are estimated at some Zt4.5 billion.

As a result of the programme, hard-coal production will be reduced to 88.8 Mt in 2004, including 51.0 Mt from Kompania Weglowa, 17.4 Mt from Katowicki Coal Holding, 11.1 Mt from Jastrzebska Coal Co., and 9.3 Mt from independent mines. Exports, which have been unprofitable in the past few years, should reduce from 23.7 Mt in 2002 to less than 19 Mt/y, and domestic sales will decrease from 76.2 Mt to less than 70 Mt/y. The privatisation of the Bogdanka and Budryk mines should be finalised in the near future. Jastrzebska Coal Co. will probably be integrated with cokeries into a single coal-coke concern. Shares in Katowicki Coal Holding and Kompania Weglowa can be sold in coming years to the trading company Weglokoks SA, or to power utilities such as PKE SA.

Poland's brown-coal production has stabilised in recent years at just under 60 Mt/y, with a slight decrease in 2002. It is mined by four companies: KWB Belchatow SA, operating the largest mine, Belchatow (34 Mt/y); KWB Turow SA with its Turow mine (10 Mt/y); KWB Konin SA, with three open-pits (combined output over 10 Mt/y); and KWB Adamow S.A., with three open-pits (4 Mt/y). The construction of the new Szczercow mine near Belchatow started in 2002. Its projected capacity will amount to 36 Mt/y, and coal extraction will begin in 2008. After 2015, development of the very large Legnica mine is very probable as, by that time, reserves at the Konin and Adamow mines will be exhausted. All the brown-coal mines are state-controlled but operate independently, as do the adjacent power plants, but there are plans to merge mines with power plants into common companies, because almost all the mines' sales go to these power plants.

### **Oil and gas**

Oil and gas in Poland are produced mainly from the onshore operations of the Exploration and Production Division (E&P) of the Polish Oil and Gas Co (POGC). Offshore, the B3 oil and gas deposit is mined by Petrobaltic Petroleum & Gas Exploration and Mining Enterprise. Both companies are still state-owned, but will be privatised in near future. POGC's E&P Division was established in 2000 and its privatisation should be finalised by 2004. It manages – among others – two production divisions: Sanok (operates mines in southeast Poland) and Zielona Góra (northwest Poland). It also manages the 'Krio' denitrification plant. In 2002, E&P produced 4.0 billion m<sup>3</sup> of natural gas, 468,000 t of crude oil, 2.4 million m<sup>3</sup> of helium, 5,200 t of liquid nitrogen and 19,000 t of sulphur. Natural gas is also recovered from hard-coal deposits (coal-bed methane). Petrobaltic will start to deliver 0.5 billion m<sup>3</sup>/y of natural gas this year to the newly-built Zarnowiec Gas Power Plant. This company produced 253,000 t of crude oil in 2002.

Total domestic production of natural gas amounted to 5.3 billion m<sup>3</sup> and is expected to rise by another 1.5 billion m<sup>3</sup> in coming years as a result of further development of deposits in northwest Poland. However, output meets only about 25% of domestic demand (at 100% methane basis). Domestic production of crude oil rose to 769,000 t in 2001, with a slight decrease in 2002. This level of production meets only 4% of domestic demand and this share – as a result of further production development – can rise only to 5%. Imports of natural gas last year amounted to over 8 billion m<sup>3</sup> (valued at US\$1 billion), with 85% coming from Russia and supplementary supplies from Uzbekistan, Germany and Norway. Imports of crude oil amounted to some 17.9 Mt (valued at about US\$2.9 billion) and came primarily from Russia (95%).

### **Copper and silver**

KGHM Polska Miedź SA remains Poland's only domestic copper producer and is the largest producer of copper in Europe. It currently ranks as the sixth-largest world producer, and also the world's second-largest producer of silver. KGHM operates three underground mines, Lubin, Polkowice-Sieroszowice and Rudna, with associated processing plants; three copper smelters, Legnica, Głogów I and Głogów II; a Precious Metals Plant in

Głogów; and the Cedynia Copper Rolling Mill. In 2002, copper ore production declined by 1.7% to 28.2 Mt, but average copper content rose from 1.86% to 2.01%. Copper concentrates production increased by 3.5% to 1,895,000 t, and the copper content of the concentrates rose by 6% to 502,742 t. Electrolytic copper production rose by 2.1% to 508,674 t. Production of other associate metals in 2002 amounted to: 1,192 t of silver (+2.5%), 296 kg of gold (-15%), 34 kg of Pt-Pd slime (-50%), 68 t of selenium (+5%) and 17,552 t of pig lead (+13%).

KGHM's exports of copper (with semi-products) increased in 2002 by 16% to 353,247 t, and exports of silver rose by 3.7% to 1,092 t. The largest importers of Polish copper cathodes (256,575 t) are Germany and France and, recently, China. Wire bars (9,319 t) are imported by Germany and the Czech Republic, and wire rod (63,780 t) is imported by the Czech Republic, Germany and Hungary. The UK, Germany and Belgium remain the largest importers of Polish silver. In 2002, KGHM signed agreement with China Minmetals Nonferrous Metals Co. for total deliveries of about 270,000 t of copper between 2003 and 2007. A large part of KGHM's copper exports is delivered to the London Metal Exchange through London-based KGHM Polish Copper Ltd.

Since 1997, KGHM shares are traded on the Warsaw and London stock exchanges. The State Treasury still possesses 44.3% of the shares. The average share value in 2002 amounted to Zt13.5, compared with Zt13.0 in 2001. KGHM's sales rose in 2002 by 5.8% to Zt4,488 million, while net profit amounted to Zt255 million (compared with a loss of Zt282 million in 2001). Total production costs remained unchanged at about US\$1,545/t, but fell slightly in Polish zloty terms. Employment decreased by 1.3% to 18,280, including 11,632 miners. Investments were reduced by 16% to Zt360 million.

In 2003, copper production is expected to be about 520,000 t, and silver production 1,095 t. Sales revenues are expected to decline to Zt4,150 million on the anticipation of lower copper prices. Net profits are forecast at around Zt150 million. Investments are planned to rise by 22% to Zt438 million. Total production costs should be maintained at 2002 levels in US\$ terms (further reduction in Polish zloty terms). Employment should be reduced by 1.4%.

Silver from secondary sources is recovered by Ag-Tech Ltd in Katowice, the State Mint in Warsaw and the Nonferrous Metals Institute in Gliwice. The total recovered amounts to about 30 t/y.

### **Zinc, lead and cadmium**

The traditional mining of zinc-lead ores in the Upper Silesia-Cracow region is expected to end by 2008 as a result of the exhaustion of reserves. The ores are mined and processed by two companies. Zakłady Gornicze-Hutnicze Boleslaw (Pomorzany mine and Olkusz-Pomorzany processing plant) delivered around 80,000 t of zinc and 25,000 t of lead in concentrates in 2002, and Zakłady Gornicze Trzebionka (Trzebionka mine and processing plant) delivered about 60,000 t of zinc and 25,000 t of lead in concentrates. Total annual mine production is gradually decreasing to some 170,000 t of zinc and

70,000 t of lead in ore, with production of metal in concentrates about 140,000 t and 50,000 t, respectively.

Refined zinc is produced in two smelters, Miasteczko Slaskie (80,000 t/y) and Boleslaw (65,000 t/y). Production of electrolytic zinc in a third smelter, Szopienice, ceased in 2002. As a result, total domestic production of zinc dropped by 17% to 145,000 t. Pig lead production in 2002 is estimated at some 75,000 t. It was produced from lead concentrates by Miasteczko Slaskie (30,000 t), as a by-product of copper smelting by KGHM (17,500 t), and from secondary sources by Orzel Bialy SA in Bytom and Baterpol Ltd in Swietochlowice (less than 30,000 t). Refined lead is produced by the Miasteczko Slaskie smelter and Baterpol Ltd, and 2002 output is estimated at some 68,000 t.

Zinc concentrate imports to Poland amounted to 67,400 t in 2002. Lead concentrates and zinc metal exports in the same period were 58,000 t and 78,500 t, respectively.

Cadmium production in Poland was halted in the mid-1990s but the commissioning and installation of a waste Zn-Cd alloy refining unit in the Miasteczko Slaskie smelter in 2000 has enabled production to resume. Cadmium output has been running at 330 t/y since 2001 and 70% of production is exported.

### **Aluminium**

The only domestic producer of primary aluminium is Huta Aluminium Konin. Output has been running at about 51,000-52,000 t/y although there was a reduction to 48,000 t in 2002. Production of aluminium from secondary sources amounts to about 3,000 t/y, but total aluminium recovery amounts to over 10,000 t/y, as a majority of scrap is used directly in aluminium products. Aluminium imports to Poland rose to 74,300 t in 2002 (primarily from Russia), while net imports of aluminium alloys constitute a further 30,000-40,000 t/y.

### **Iron and steel**

The Polish steel industry relies entirely on imported iron ores and concentrates. In recent years these imports fell to 7.0 Mt/y, coming primarily from Ukraine (>75%), Russia (15%) and Brazil. Secondary production from the recovery of iron and steel scrap amounts to some 2 Mt/y, but more than half of this is exported.

Pig iron is produced by four steelworks and output last year dropped to 5.26 Mt which compares with 7 Mt/y five years ago. The Łaziska Smelter is the sole producer of ferro-alloys and output is 2002 slumped by 45% to less than 40,000 t owing to problems with the supply of cheap energy (which led to some temporary smelter shutdowns). Imports of ferro-alloys held steady at 110,000-120,000 t, coming primarily from Slovakia and Ukraine.

Crude steel production fell in 2002 by 5% to 8.37 Mt after a 16% fall in the previous year. There are 12 producers. Steel products are manufactured in over 20 steelworks of various size and output last year dropped by almost

10% to under 8 Mt. Poland's steelworks have made significant technical and environmental improvements in the past decade, spending a total of more than US\$2.5 billion. Industry employment has reduced sharply, from 147,000 to 32,000. Modernisations, however, have been mostly confined to raw steel production rather than manufacturing.

Since 1998, consecutive versions of the Restructuring Programme of the Iron and Steel Industry have been approved by the Polish Government. In August 2001, the Iron and Steel Industry Restructurisation Act was passed by Parliament. In September 2002, the Council of Ministers approved the Strategy of Iron and Steel Industry Restructurisation for the years 2002-2006. This assumes reduction of production capacities by 0.9 Mt/y, maximum public help to steelworks of Zt3.3 billion in this period, establishment of a new company, Polskie Huty Stali SA (PHS SA), the consolidation of the Sendzimir, Katowice, Cedler and Florian steelworks) and total investments in PHS S.A. of some Zt2.4 billion. Until now, only one steelworks has been sold to a foreign investor: Warsaw steelworks to Lucchini company. The majority shares in PHS SA will probably be sold to foreign investors (LNM Holdings and US Steel are in negotiations with the Ministry of the State Treasury). Some other steelworks will also be privatised, while other will be liquidated.

### **Industrial minerals**

The main industrial minerals produced in Poland are: sulphur, salt, limestone, dolomite, silica sand, gypsum, feldspar, quartz and quartzite, and kaolin. Primary sulphur production has fallen significantly during the past decade, owing to competition from by-product sulphur producers (Canada, Saudi Arabia) on international markets, as well as from domestic involuntary producers (for a total production almost 200,000 t in 2002). Three mines – Machow, Grzybow, and Basznia – were closed in the mid-1990s, and a fourth (the largest one) – Jeziorko – in August 2001. Osiek is now the only remaining native sulphur mine in Poland. As a result, native sulphur production has been reduced from 1.37 Mt in 2000 to 917,000 t in 2002, and in coming years it will probably not exceed 600,000 t/y (if Osiek survives). Unprofitable exports were reduced to 599,834 t in 2002 and a further reduction to under 200,000 t/y is expected.

Salt production comes primarily from two rock salt mines, Kłodawa (600,000 t/y) and Sieroszowice (a KGHM mine producing in excess of 200,000 t/y). Two solution (bore-hole) mines are operated by Solino SA, company based in Inowroclaw, and one by Investgas Ltd of Warsaw. These operations had a combined production over 2.6 Mt in 2002. (Salt from the desalination of underground salty waters in Debiensko amounts to less than 50,000 t/y.) Poland's total output of salt slightly increased in 2002 to over 3.5 Mt, mainly as a result of higher rock salt output. Exports are maintained at over 400,000 t/y, with the Czech Republic the main customer.

Limestone production depends on the cement and lime industry, and has fallen by over 20% in the past two years because of lower cement and lime production. However, some special applications for limestone have been developed, ie ground calcium carbonate (GCC), with various grades

manufactured by around a dozen plants. The combined production level has reached 1.2 Mt/y in recent years. A similar situation prevails for dolomite – whereas traditional uses (flux, refractories) have been restricted, production of ground dolomite for glassworks (based on output from three mines) has increased to a current level of some 400,000 t/y. In response to increasing domestic glass production (a recent example being new Guardian float glassworks in Czestochowa), glass sand production has increased to some 1.6 Mt/y.

The growing demand for raw materials for ceramic tiles has resulted in a steady increase in domestic kaolin and feldspar production at existing operations (by 70% and 150% respectively in the past five years). Also, quartz production has risen threefold in the past three years.

Gypsum production has increased threefold since the mid-1990s, with the entrance of FGD gypsum from eight power plants. Linked to this has been a significant investment in new gypsum plasterboard and binder plants.

Table next page

**Mineral Production ('000 t except where stated)**

<b>Commodity</b>	<b>2000</b>	<b>2001</b>	<b>2002<sup>P</sup></b>
Hard coal	103,331	103,992	103,546
Brown coal	59,847	59,546	58,210
Coke	8,972	8,875	8,787
Crude oil	653	769	721
Natural gas (mln m <sup>3</sup> )	4,956	5,175	5,259
Copper in concentrates	454	474	503
Zinc in concentrates	157	153	150
Lead in concentrates	51	53	50
Copper, electrolytic	486	498	509
Zinc, metal	173	175	145
Lead, metal	56	66	68
Aluminium, metal	56	55	51
Silver, refined (t)	1,148	1,194	1,222
Gold, refined (kg)	367	349	296
Selenium (t)	65	65	68
Pig iron	6,492	5,440	5,296
Ferrous alloys	75	69	40
Steel	10,498	8,809	8,369
Salt	3,493	3,476	3,520
Sulphur, native	1,369	942	917
Soda ash, synthetic	1,000	1,044	1,054
Limestone	39,663	33,760	31,200
Cement	15,096	12,074	10,948
Lime	2,376	2,049	1,865
Gypsum & anhydrite	2,423	2,228	2,034
Dolomite	2,032	1,483	1,500
Glass sand	1,622	1,456	1,600
Foundry sand	1,055	849	800
Quartz	52	66	75
Quartzite	177	114	80
Feldspar	165	221	240
Kaolin	90	101	105
Refractory clays	153	140	130