

# SPAIN

*By José Antonio Espí*

**A**lthough the Spanish economy grew considerably in 2001, the 2.8% increase in GNP contrasted with a growth of 4% in each of the preceding two years. This restrained increase was the result of a reduction in the growth of domestic demand which fell from 3.1% in 2000 to 2.4% in 2001. The best performing sector was construction although by the end of the year a considerable decrease was noted in the industrial production index (an annual decrease of 1.2%). Both the reduction in world trade and the deceleration of domestic demand affected parts of the trade balance, reducing the flow of exports.

Spain's rate of unemployment fell sharply during the year but, even so, some 13% of the working population remain unemployed, a disproportionately high level compared with some other EU countries. The budget was balanced at year end, and local and national government deficits (both put at 0.4% of GNP) were offset by a surplus of 0.8% in social security. In addition, the retail price index maintained an appreciable differential compared with the average of EU countries, closing the year with a rate of 2.7%

## Energy Minerals

As forecast, output of coal posted a slight decline in 2001, to 22.68 Mt from 23.07 Mt in the previous year. The decline was in line with a 4% reduction in aid received under the State Budget in accordance with the Coal Mining Plan which will end in 2005. An exception to the fall in output was an increase in the production of lignite. The annual report presented by CARBUNION in March this year, notes that the overall decline in coal production in recent years has caused a drastic reduction in the number of jobs in energy mining; there were 27,683 people employed in the sector in 1995 but the figure is now 15,000, with last year alone witnessing 1,576 job losses (9.5% of the total payroll).

However, since the closures have been brought about in the less efficient mines, productivity in general in the energy sector has been substantially improved, and recent improvements in applied technology and better organisation of production have contributed to this. Moreover the economic results of the past year benefited from higher international coal prices. Thus, some companies have managed to achieve a profit from their own resources of 8%.

Oil production increased by almost 50% over the past year to 344,000 t, and 98% of output came from offshore wells in the Mediterranean (mainly Casablanca, Chipirón, Boquerón, and Rodaballo). Only 2% was produced in the Iberian Peninsula, from the ancient Ayolenguo field. Production of natural gas has shown a steady increase and last year production reached 556 million m<sup>3</sup>, principally from the Guadalquivir Valley and also from the Huelva coast.

With the closure of Mina Fé in Salamanca, the traditional production of uranium ore in Spain has ceased.

## Output of Energy Minerals

('000 t except where stated)

	1999	2000	2001 <sup>p</sup>
Anthracite	5,436	5,160	4,694
Coal	6295	6,173	5,798
Black lignite	3,695	3,630	3,475
Brown lignite	8,831	8,103	8,718
Oil	306	233	344
Natural gas (Mm <sup>3</sup> )	112	179	556

<sup>p</sup> Provisional data

Source: Ministerio de Economía/Carbuni6n

### **Metallic Minerals**

By the end of 2001, Rio Narcea Gold Mines was the sole producer of gold in Spain, producing some 4,000 kg (125,000 oz) during the year. That it remains a major producer is largely thanks to a strategic increase in the ore grade at El Valle and the inclusion of ore from the nearby deposit at Carlés which produces some 20,000 oz/y from ore averaging 4.5 g/t Au. The ore is transported to the plant at El Valle and processed by the same method. In total, Rio Narcea extracted and treated some 620,000 t last year at an average grade of 6.5 g/t Au. Improvements introduced into the process (new design for the gravimetric section and modifications in flotation) have contributed to good gold recovery (91%) although there have been problems with the quality of copper ore. All this translated into a reduction in cash costs to US\$185/oz of gold. During the year Rio Narcea prepared for the second phase of extraction at El Valle and for mining the high-grade zone at La Chamela, as well as continuing the access ramp beyond 1,000 m to access the ore beneath the Boinás Este pit.

Filón Sur, a company in the Iberian Pyrite Belt (IPB) concerned with recovering gold from oxide zones associated with the sulphide deposits at Tharsis, ran into problems last year and closed down its operations in December. Output amounted to just 500 kg of gold derived from the retreatment of 500,000 t of gossans and from treating 300,000 t of new mineral.

The Reocín zinc-lead mine (open pit and underground) is scheduled for closure in 2003. Last year, its parent company, Asturiana de Zinc, mined and treated in its flotation plant some 1.15 Mt of ore of which 41% came from underground and 59% from the open pit. Concentrate output totalled 131,265 t containing 60.4% Zn and 8,747 t containing 69.2% Pb, and yielded 79,245 t of zinc metal and 5,862 t of lead. As in all recent years, metal recovery was exceptionally good, with a zinc recovery of 96%. In November 2001, Xstrata AG, a Swiss company belonging to the Glencore group, acquired 98.42% of the capital of Asturiana de Zinc.

During the past year, Minas de Almadén y Arrayanes extracted only 7,644 t of ore from its mercury deposits at Almadén. Nevertheless, its treatment plant processed 20,173 t from accumulated stocks, giving an official production figure of 524 t of mercury metal.

The departure of Boliden from the polymetallic Los Frailes deposit near Seville at the end of last year signalled the closure of Spain's largest metal mine, and an accompanying loss of 425 jobs. Breakwater Resources was unsuccessful in its efforts to revive the operation and the Andalusian government is endeavouring to ameliorate the attendant unemployment by declaring the area a zone for preferential industrial action. On the environmental front, the government is demanding a contribution of €42 million from Boliden to pay for the cost of cleaning up the waste leaked from the tailings dam in 1998 but Boliden estimates the cost at €12.6 million. Output from Los Frailes in the nine months to the end of September last year amounted to 1.8 Mt of ore which yielded 54,061 t of zinc metal, 24,164 t of lead and 1,830 t of copper.

Minas de Río Tinto has found itself in a delicate economic situation, owing a sum in excess of €60 million and with a 'Proceeding for Temporary Control of Employment' affecting its 516 workers. Another serious situation has arisen in the base metals sector concerning the Irish company Navan Resources. It owns the mining rights for the Aguas Teñidas base metals deposit and the plant and mines of Almagrera SA. It brought the underground mine at Aguas Teñidas into production at a time of disastrously low metal prices, and this, combined with the exhaustion of the best reserves at Almagrera, forced Navan to cease its mining activities in November last year. There is little sign at present that the mines will re-open.

During 2001, Aguas Teñidas extracted 385,000 t of 'complex' ore with grades of 7.6% Zn, 2.77% Pb, 0.39% Cu and 62 g/t Ag, plus 62,000 t of 'coppery' ore with 1.0% Zn, 0.39% Pb and 36 g/t Ag. Concentrate output

amounted to 45,852 t at 76% Zn, 10,667 t at 42% Pb, plus 9,860 t at 20.7% Cu. Metal output amounted to 22,238 t zinc, 4,480 t lead and 2,037 t copper.

At Navan's Sotiel underground mining operations, 127,000 t of complex ore (5.3% Zn, 2.0% Pb and 0.6% Cu) was mined and treated, and 225,000 t of 'coppery ore' from the Migollas mine (4.2% Cu). Metal output amounted to 5,115 t of zinc, 1,067 t of lead and 7,260 t of copper.

Hopes have been re-awakened for MK Gold's Las Cruces copper project. The Guadalquivir Hydrographic Confederation, the organisation which monitors the waters in this hydrographic basin, has withdrawn its reservations about the project, hence the Environmental Board of the Andalusian government (an independent authority) could give approval for an environmental impact study. Also, the Employment Council could, likewise, grant final permission in mid-2002.

The project envisages mining a copper deposit which would involve an investment of €420 million and the creation of 270 permanent jobs. Exploitable reserves amount to some 16 Mt with a content of 5.94% Cu. An open-pit operation would have a waste to ore stripping ratio of 11.1:1, and a total of some 834,044 t of copper metal could be recovered. Operating costs would be low and are envisaged at US\$0.33/lb. Contributing to the low cost is the planned recovery system: ferric solution on prepared ore (at atmospheric pressure and at forced pressure in autoclaves) followed by solvent extraction and electrowinning (SX/EW) for the production of 72,000 t/y of copper cathodes. Daily ore throughput would be 3,500 t and the planned recovery of copper would be 89%. The sterile residue will be filtered and enclosed in the surrounding marl.

In October 2001, SIEMCAL SA, a company partly owned by the government of Castile and León signed an agreement with Wolfram Los Santos SL to develop Los Santos, a

wolfram deposit in Salamanca. Approval for the project is likely in six months and the first concentrates could be produced at the end of 2002. The wolfram deposit is located in the west of Spain and its current reserves consist of 2.5 Mt of ore averaging 0.58% of WO<sub>3</sub>. The ore treatment rate will be 120,000 t/y and the concentrates will be sent to Austria. The planned investment for the first two years is €3.15 million. Wolfram Los Santos SL is owned 100% by the Austrian company, WBH Holdings AG (WBH), with registered offices in Vienna.

## Production of Metallic Minerals

('000 t except where stated)

	1999	2000	2001 <sup>p</sup>
Copper*	3.5	23.6	10.9
Zinc*	153	200.2	160.7
Lead*	28	58.5	35.5
Gold* (kg)	5,200	4,310	4,400
Silver* (t)	129	221	89
Mercury* (t)	433	236	524
Tin* (t)	11	1	0.5
Pyrite	853	206	152

<sup>p</sup> provisional data

\* metal content

Source: Personal research/IGME/ Ministerio de Economía

## Non-Metallic Minerals

Industrial minerals production in Spain has been relatively stable for some years, with reduced output of some products offset by increased production of others. Also, a period of acquisitions has now halted, and interest in opening new mines and exploring for new resources has fallen substantially. Nevertheless, investment in better technology, an increase in the quality of final products and the setting up of environmental protection measures have continued steadily throughout the whole year.

Magnesitas de Navarra, a producer devoted to the manufacture of different types of magnesite for various uses, especially for steelmaking, is starting a new drilling campaign, planned by CRN SA, with the aim of increasing its resources and reserves in the Baztán valley (Navarre). In 2001, the plant, situated at Zubiri (Navarre), produced 160,000 t of products. This concentration on magnesite resources is confirmed by a renewed interest in magnesite mining at Berobia (Soria) in central Spain.

### Production of Non-Metallic Minerals

('000 t)

		1999	2000	2001p
Fluorspar	CaF <sub>2</sub>	133	135	126
Potash	K <sub>2</sub> O	656	653	569
Salt		3,620	5,500	3,900
Micro-silica		250	300	350
Special clays		1,030	1,000	900
Magnesite	MgO	183	160	214
Barite	BaSO <sub>4</sub>	60	22	44
Magnetite		64	67	55
Talc		111	121	115
Lepidolite		10	10	10
Diatomite		55	55	57
Sodium Sulphate	Na <sub>2</sub> SO <sub>4</sub>	1,000	1,000	1,065
Celestite	SrSO <sub>4</sub>	110	130	134
Washed Kaolin		350	450	460
Feldspar		430	550	650
Calcium Carbonate		1,880	2,000	2,200

<sup>p</sup> provisional data

Source: Jaime Gonzalo.AINDEX/Ministerio de Economía/IGME.

### Exploration and Mineral Prospecting

Without doubt, the greatest force for exploration in Spain is Rio Narcea Gold Mines. In 2001, its exploration was directed towards the kaolin area northwest of El Valle, on new reserves in areas near to its current mines and to the extension of the so-called 'black skarn' resource. In addition, in March 2001, RNGM signed an option with Atlantic Copper to acquire 50% ownership of Aguablanca, a nickel-copper-platinum group metals deposit situated in the southwest of Spain. In July of the same year the whole project was acquired. The deposit is associated with two sulphide bodies within a basic intrusive. From 1993 until 1995, Atlantic Copper and Presur carried out investigations, delineating a promising geochemical anomaly and completing 32,000 m of drilling. According to the previous owners, there is a resource of 31 Mt averaging 0.7% Ni, 0.5% Cu and 0.6 g/t Pt+Pt.

Initial efforts focused on the feasibility of exploiting 13-17 Mt averaging 0.7 % Ni and 0.5% Cu by open-pit methods. Rio Narcea will re-examine the earlier programmes and attempt to increase the reserves. South African engineering company MDM is co-ordinating a feasibility study, relying on metallurgical testwork by Mintek of South Africa and environmental studies by Knight Piesold. It is hoped to conclude this programme by mid 2002. In addition, three drill rigs are sinking 25 m holes in the area being considered for mining over the first three years. Deep drilling is also being contemplated.

Elsewhere, Rio Narcea hopes to complete a prefeasibility study in mid-2002 in respect of its Corcoeste gold deposit at La Coruña in northwest Spain. The deposit consists of a system of small gold-bearing quartz veins in disturbed metasediments. Intensive drilling carried out in 2001 delineated 3.9 Mt averaging 1.54 g/t Au, equivalent to 190,000 oz of contained gold.

Meanwhile, Riomín is continuing with its programme of exploration for base and precious metals in the Iberian Pyrite Belt (IPB)

in joint ventures with Atlantic Copper and Dowa Mining whereby Riomín acts as the operator. It is likewise maintaining a joint venture agreement with Cobre Las Cruces concerning properties covering a total of 719 km<sup>2</sup> in the IPB. During 2001, Riomín's exploration in Spain (765 km<sup>2</sup> in the IPB and 138 km<sup>2</sup> outside it) consisted of geophysical mapping on various scales, sampling of rocks and soils, geophysical campaigns, drilling and core sampling (5,399 m), and geophysical sampling.

In respect of the IPB, mention should also be made of the investigation into the Lomero-Poyatos deposit by Newmont Mining Corp. of the US. Newmont signed an option agreement

with the current owner, Cambridge Mineral Resources, which had in turn acquired ownership from the Spanish company Recursos Metálicos SL. Newmont's action programme includes 2,500 m of drilling, metallurgical testwork and geological interpretation. The current owners confirm that they have evaluated 1.6 Moz of gold and that metallurgical recovery tests have been positive. Drilling was aimed at taking samples for metallurgical testing. Newmont has since withdrawn from the project on the grounds that the proven reserves are insufficient. Investment during 2001 was aimed at a better definition of the intersections reached in previous periods and on a search for new deposits.