The mining industry in Spain has undergone major changes during an appalling economic crisis and fluctuating commodity prices. These two factors have influenced the different mining subsectors in distinct ways.

**Coal**

In 2010 the European Commission approved a resolution that regulated state aid to the Spanish coal industry and ordered the closure of all subsidised, uncompetitive hard-coal mines by the end of 2018. The amount of financial aid designated for coal production reduced by 63% between 2011 and 2012. Aid will end completely in 2014 and this will threaten the viability of many operations, especially those underground. The 2013-18 coal plan, signed by the Spanish government, aims to reduce production to 5.9Mt by 2018.

Consequently, in spite of the anticipated increase in worldwide use of coal, Spanish coal production totalled 6.6Mt in 2011 – 21% down on 2010. There have been no significant new projects in Spain’s coal sector in recent years.

**Potash**

Iberpotash SA, a business unit of ICL Fertilizers, is the sole producer of potassium salts in Spain. It operates two mines and two plants in the Catalonian potash basin. In 2012, it mined 954,041t of potash, 80% of which was exported, and 1.05Mt of sodium chloride. Recent exploration work has shown new saleable KCI reserves and resources in fields currently being mined.

To ensure its future viability, Iberpotash is developing the Phoenix project, which includes the construction of a 4,500m-long ramp for access and extraction at the Cabanasas mine, to increase production to 1Mt/y KCI and the construction of a vacuum salt plant with a capacity of 0.75Mt/y NaCl at 99.97% purity.

In 2011, Geoalcali SL, a subsidiary of Australia’s Highfield Resources Ltd, applied for investigation permits in areas already exploited or explored at the western end of the Ebro basin. In 2013, the company initiated borehole-drilling campaigns at the Sierra del Perdón, Javier and Pintano projects, all located in Navarra.

**Magnesite**

Since 2009, magnesite production in Spain has increased 48%, with the country producing 577,725t from 2009 to date. At present, only two companies produce magnesite in the country: Magnesitas Navarras SA (MAGNA) and Magnesitas de Rubián SA. Magnesitas de Rubián has an underground mine in Vila de Mouros (Lugo), producing 80,000t/y of caustic calcined magnesite. MAGNA is 40% owned by Grecian Magnesite SA and 60% by the Roullier Group.

MAGNA produces 515,000t/y of usable material from the Azcárate open pit at the Eugui deposit in Navarra. This produces 450,000t/y of magnesium concentrate, which is then burned and generates 170,000t/y of magnesium oxide (MgO). This then produces dead-burned and caustic calcined magnesite. The Azcárate pit is now in its final operational phase and it is expected that exploitation at the Eugui deposit will be conducted both by open-pit and underground methods. MAGNA also plans to initiate the short-term mining of magnesite deposits from Zilbeti in Navarra, and Borobia in Soria.

**Fluorspar**

Spain is the world’s sixth-largest fluorite producer and produced 117,000t in 2011. Production has remained stable over the last few years, although prices have slightly increased. The two primary producers in Spain are Minerales y Productos Derivados SA (MINERSA) and Minera de Órgiva SL. MINERSA’s underground Ana mine in Asturias has a production capacity of 140,000t/y of fluorite, making it the largest fluorite producer in Europe. Minera de Órgiva SL initiated operations at its Lújar mine in Granada in 2010. It increased production some 60% over the last year, producing 6,000t with a concentration of 75-80%. Reserves at the mine total around 600,000t.

**Metallic minerals**

Metallic minerals production is now the most dynamic part of Spain’s mining sector. The country currently produces ore from copper, nickel, lead, zinc, gold, tungsten and tin. Moreover, many junior companies listed on the Toronto or London Stock Exchanges or the Australian Securities Exchange have already applied for permits to exploit deposits containing these and other minerals in a number of regions across Spain. Their activity has been fairly high over the last three years, both in the initial phases of exploration, and, in projects which will begin their operations in the next two years.
Copper and base metals
Production of copper ore in Spain increased from 23.058t in 2009 to 100.310t in 2012, primarily due to strong output at operations in the Agua albarca, Las Cruces and Aguas Tehidas mines. The latter two projects are located in the Iberian Pyrite Belt, confirming the potential of this metallogenic province.

Lundin Mining Corp exploits the nickel-copper deposit in Agua albarca, situated on the border between the autonomous communities of Andalusia and Extremadura. It is the first nickel-producing mine in southwest Europe.

The deposit has reserves of 15.7Mt of ore, with 0.66% Ni, 0.46 Cu and 0.47% of platinum-group elements (PGE). The open-pit exploitation began in 2005, with an expected mine life of 11 years and ore production of 1.5Mt/t. The project was put on hold in 2010 due to a landslide at the pit and was resumed in 2011. In 2012, 0.76t of ore were extracted, producing 2,398t of nickel and 2,260t of copper in concentrates.

Las Cruces is a copper mining complex located near Seville that comprises an open pit and a hydrometallurgical plant used for obtaining 99.999% Cu cathodes. The principal milestone took place in 2013 when the project changed hands following First Quantum Minerals Ltd’s successful takeover of Inmet Mining Corp.

The deposit presents ore resources of 17Mt and 1Mt of copper cathode, which are expected to be extracted throughout the 15-year lifespan of the mine. At present, 27% of the mineral available has been obtained with an investment of more than €850 million (US$1.2 billion).

In 2012, the plant reached its maximum design capacity and closed the financial year with a production of 67,000 t of cathodes, a 40% increase on the previous year’s figures.

Studies of the resources extracted from primary sulphides and gossans will be completed by the end of 2013. If estimates are confirmed, the mine activity could initially be extended to 10-15 years. In 2013, First Quantum expects to produce between 68,500t and 72,000t of copper cathode.

MATSA, a subsidiary of Iberian Minerals Corp and owned by Trafigura Beeher BV, has operated the Aguas Tehidas underground mine since 2009. In 2012, 2.14Mt of ore was processed at the mine, producing 26,400t of copper, 29,200t of zinc, 4,300t of lead and 845,833oz of silver in concentrates.

In October 2012, MATSA presented a project to double its production capacity to 4.4Mt/t thanks to the construction of a mineral processing line. Since 2011, the company has been carrying out development work within the expansion plans in order to reopen the Sotiel underground mine.

In 2013, a shallow mass of polymetallic sulphides was discovered in La Magdalena, located close to the Aguas Tehidas mine, with the potential to produce around 6Mt of high-grade copper ore.

Apart from the aforementioned projects, another project at an advanced stage of development but which is still pending approval from the local authorities to start operations is the Rio Tinto project by EMED Tartessus, the Spanish mining subsidiary of EMED Mining Public Ltd, which has owned the mine since 2007.

“EMED is promoting the reopening of the historic mine in Huelva to extract copper from the primary sulphides of the deposit”

EMED is promoting the reopening of the historic mine in Huelva to extract copper from the primary sulphides of the deposit. The current investment has risen to more than €100 million, but is expected to exceed €200 million including improvements, expansion and environmental restoration.

Since the acquisition, EMED has performed diverse studies of the deposit and has at its disposal a probable and proven mineral JORC and NI 43-101 reserve of 123Mt of ore with 0.49% copper, at a 0.20% cut-off grade.

The project forecasts a 14-year-long open-pit operation in which up to 600,000t of copper could be extracted. At the same time, 37,000t/y of concentrate with 22% Cu could be produced through a crushing system and conventional froth flotation.

A large potential of identified resources and a drilling campaign has been planned in order to significantly expand the lifespan of the mine. Both EMED and the Andalusian government say the environmental permit will soon be approved (Mining Journal, December 11).

Ormonde España, the Spanish subsidiary of Ormonde Mining plc, acquired a 100% stake in the La Zarza project from Nueva Tharsis in 2007. The mine is located in the Iberian Pyrite Belt. However, at the beginning of 2013, Ormonde España announced it was entering into a binding option agreement that could lead to the divestment of the company’s interest in La Zarza for a total cash consideration of €5 million. As of May this year, the option had not been exercised, but Ormonde says that is still in discussions with third parties over the mining concession.

At the beginning of December, the Andalusian government launched a tender for a mass of poly-metallic sulphides from Los Frailes in Aznalcollar, which is also situated in the Iberian Pyrite Belt. This was exploited between 1995 and 2001 by Boliden AB’s Spanish subsidiary Boliden Apirsa and has proven reserves of 37Mt, with 0.35% Cu, 3.82% Zn, 2.17% Pb and 60g/t of Ag.

Gold
The only gold mine currently operating in Spain is located in Asturias in northwest Spain. The El Valle-Boinás/Carlés copper-gold project, which is situated...
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in the Rio Narcea Gold Belt, was previously exploited from 1997 to 2006 by Rio Narcea Gold Mines Ltd.

In 2007, Lundin Mining acquired the company’s nickel assets, but sold the project to Kinbauri Gold Corp. Orvana Minerals Corp then acquired the project in September 2009 when it acquired Kinbauri.

Production at the mine during 2012 was 42,864oz of gold, 1,792t of copper and 117,113oz of silver. Production for 2013 has been estimated at 63,000oz of gold, 2,721t of copper and 200,000oz of silver.

In February 2012, Orvana reported the results of an updated reserve estimate that tips production to reach an average of 73,000oz/y of gold and 2,570t/y of copper over a 10-year period.

In May 2010, Petaquilla Minerals Ltd acquired the Lumero-Poyatos mine in the Iberian Pyrite Belt and initiated preparatory works at the mine in May 2013. According to the company, Lumero-Poyatos holds an inferred mineral resource of 6.07Mt at 4.25g/t Au and 88.74g/t Ag.

Edgewater Explorations Ltd has developed the Corcoesto gold project in Galicia. In November 2011, the company reported results of 222,000oz of gold in measured resources, 103,000oz in indicated resources and 1.15Moz in inferred resources.

After an initial investment of more than €20 million to define the deposit, and forecast investments of €107.9 million for environmental authorisations, the project has been brought to a standstill by the regional government of Galicia, a decision that “calls into question the integrity of local bureaucrats” (Mining Journal, November 15, 2013).

Astur Gold Corp is developing its Salave gold project in Asturias. The deposit contains an estimated 1.68Moz of gold in measured and indicated categories.

Emerita Gold Corp acquired the investigation permits for Las Morras and Peña Encina gold projects in 2010. In August, the company announced that two areas with highly anomalous gold in soil had been identified within the Las Morras deposit to date.

Tungsten

Wolfram, tin and tantalum-niobium form a group of metals with deposits located west of the Iberian Peninsula. Spain was an important exporter of these metals until the mid-1980s.

The Los Santos mine, located 5km south of Salamanca, has been the most recent success story in Spain. The deposit contains an estimated 1.68Moz of gold in measured and indicated categories.

Emerita Gold Corp acquired the investigation permits for Las Morras and Peña Encina gold projects in 2010. In August, the company announced that two areas with highly anomalous gold in soil had been identified within the Las Morras deposit to date.

At present there are no tantalum mines in Spain, however, it is predicted that two mines will be reopened in Galicia over the next two years.

8.7t of tin ore in 2011 came entirely from the Insuperable mine in Salamanca. Incremento Grupo Inversor SL initiated activities at the old San Finx and Santa Comba mines, but work was brought to a standstill when the company could not receive the necessary funding.

At present there are no tantalum mines in Spain, however, it is predicted that two mines will be reopened in Galicia over the next two years.

In October 2011, Solid Resources Ltd announced results relating to the resource estimates for the northern section of Alberta-1 from the Presqueiras (Ourense) site, obtaining 0.2Mt of resources measured (79ppm Ta2O5, 584ppm Sn, 0.55% Li2O and 79ppm Nb2O5); 1.4Mt of indicated resources (86ppm Ta2O5, 584ppm Sn, 0.43% Li2O and 80ppm Nb2O5) and 4Mt of inferred resources (93ppm Ta2O5, 593ppm Sn, 0.35% Li2O and 84ppm Nb2O5).

New Penouta SA is the concessionaire of the tailings dams and waste dump from the former Penouta (Ourense) tin and tantalum mine that closed at the beginning of the 1980s. The owner states that these mineral resources have risen to 8.8Mt with grades of 450g/t of tin and 45g/t of tantalum.

Pacific Strategic Minerals Spain SL reached an agreement with Aprovechamiento Mineiro, holder of the deposit rights, and may exploit the resources in Penouta, which is the largest tantalum deposit in Spain and an important contributor to meet European tantalum demand.

The Oropesa and La Graña deposits are located in Seville and have high potential, exhibiting grades of 0.8-2.0% of tin as well as small quantities of copper, silver and zinc.

One other notable project is the Santa Maria project, located in Cáceres. It was mined during the first half of the 1980s. Minas de Esteao de Extremadura, a subsidiary of the Canadian group Eurotin Inc, recently carried out an exploration programme which indicated that the deposit is home to estimated grades of 548-559g/t of tin.

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Uranium
Since state-owned company Enusa Industrias Avanzadas SA ceased its uranium mining in Salamanca and Cáceres in 2001, there has been no uranium mineral production.

Since 2006, Berkeley Minera España SA, the Spanish subsidiary of Berkeley Resources Ltd, has been developing the Salamanca project, which comprises the Retortillo, Alameda and Gambuta uranium deposits. The company has a 100% interest in a total mineral resource estimated at 61.6Mlb of contained U₃O₈, with an average grade of 427ppm (at a cut-off grade of 200ppm U₃O₈).

The Retortillo and Alameda deposits will produce around 1,500t/y of U₃O₈. At present the Retortillo, Alameda and Gambuta uranium projects have a minimum 11-year life, but this may be extended and production may rise as other projects’ deposits come on stream.

Iron ore
Spain has not produced any iron ore since AgruminSA, a subsidiary of Altos Hornos de Vizcaya SA, closed down in 1982.

However, that all changed in May 2011 when Minas de Alquife Holding BV acquired the mining rights of mines in Alquife in Granada. The project proposes the reopening of Minas del Marquesado for the exploitation of 92Mt of iron ore with a grade of 54.3% Fe over 20 years.

The deposit presents total resources of 183.57Mt with a content of 52.88% Fe and measured resources of 59.27Mt, grading at 52.54% Fe. The project is still waiting for environmental approvals from the Andalusian government. These are expected to be obtained by the end of the year.

During 2014 the company will carry out exploration work for the development of the definitive feasibility study. At the same time, the exploitation of a waste dam and a non-flooded area of the old open pit will be executed to obtain 4Mt at a rate of 1Mtyr.

In October 2013, Solid Resources announced a co-operation agreement with Glencore Xstrata plc to reopen the Cehegín iron-ore project in Murcia in the southeast of the country. Solid Resources’ subsidiary, Solid Mines España SA, applied for an investigation permit last October to investigate iron ore in Cehegín. Under the terms of the agreement, the potential joint venture would give Glencore a 20% interest in the project, with Solid retaining an 80% interest.

There is also interest and research going into other iron-ore projects in the country. This is mainly being promoted by local companies and is focused on old exploitations or iron-ore deposits, as in the case of Cerro del Hierro and Cala in Andalusia, and San Guillermo and La Berrona in Extremadura.

Conclusion
Spain’s mining sector has strong growth prospects, signalling that a number of mining operations may be brought on stream in the short term. These perspectives are conditioned by the evolution of global demand and, in a positive sense, by the Spanish economic crisis. High rates of unemployment should encourage government support.

However, mining projects face lengthy delays to obtain the necessary administrative authorisations to proceed, which puts the outcome of certain projects at risk. This is particularly significant in the case of junior companies.

Also, responsibilities for mining are sometimes transferred from central government to regional government. This means the rules for developing projects are not the same across the country since certain regional governments are pro-mining, while others are not.

Finally, it should be noted that exploration and development projects in recent years have focused, in general, on reassessing the possible economic viability of already explored and exploited deposits. But there are also greenfields of high potential that are still ripe for exploration, offering opportunities for the future. So there is still much to play for.