



# 2014 Minerals Yearbook

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## GERMANY

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# THE MINERAL INDUSTRY OF GERMANY

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In 2014, Germany was one of the leading industrial countries in the world, with a nominal gross domestic product (GDP) of \$3.86 trillion<sup>1</sup> compared with \$3.73 trillion (revised) in 2013, which was a 3.3% increase in terms of the nominal GDP and a 1.5% increase in terms of real GDP. The financial, rental, and business services sectors together produced 26% of Germany's GDP in 2014, whereas the manufacturing sector produced 22.2%, and the commerce, transportation, and catering sectors together produced 15.4%. The construction sector produced 4.8% of the GDP in 2014, and the information and communications sector produced 4.7%; the remainder was attributed to various other sectors.

Germany's GDP was ranked first in the European Union (EU) in 2014, and accounted for 21% of the total GDP of the EU. The United Kingdom was ranked second, with 16% of the EU's GDP; France, third (15%); and Italy, fourth (12%). In 2014, Germany produced 28.9% of the total GDP of all countries in the euro area. The inflation rate in Germany in 2014 was 0.8%, which was small compared with the rest of the EU and a decrease from the inflation rate of 1.6% in the previous year. Germany had an unemployment rate of 4.7% in 2014, which was an improvement from the 5.2% rate in 2013 (Federal Ministry for Economic Affairs and Energy, 2015, p. 59, 63; Germany Trade & Invest, 2015, p. 4).

In 2014, the public sector in Germany, including the Federal, Laender (State), municipal, and the social security systems in the country, as accounted for by the Federal Ministry of Finances, achieved a revenue budget surplus, which led to an overall budget surplus of 0.4%. The country also reduced its debt to 74% of its GDP in 2014 compared with 76.9% in 2013. The Government's goal was to achieve a debt ratio of less than 60% of the GDP within 10 years to comply with the long-term European Stability and Growth Pact. The Government also sought to reduce the country's debt to less than 70% of the GDP by 2017 (Federal Ministry for Economic Affairs and Energy, 2015, p. 31). Germany hosted about 55,000 foreign companies, which employed about 3 million people. Between 2010 and 2014, foreign direct investment (FDI) markets added a total of 4,142 investment projects from about 3,500 foreign companies, and in 2014, 800 projects were created, which ranked Germany fourth in the world in FDI projects. The principal countries that were sources of the new investment projects were the United States, with 21% of all investment projects; Switzerland, 11%; and the United Kingdom, 9%. Projects in the energy, minerals, and metals sectors accounted for 4% of all FDI projects in 2014; the principal sectors that received FDI investment were the information and communications technology, and software sectors, with 18%, and the business

and financial services sector, with 15%. Sales, marketing, and support projects amounted to 42% of all FDI projects; business activity and business services, 15%; and manufacturing, 11% (Germany Trade & Invest, 2015, p. 3).

In 2014, Germany was a leading global exporter of industrial goods and services (including processed and fabricated mineral products). The country's mineral industry, however, depended heavily on imported mineral raw materials. Germany was the leading producer of lignite in the world, and essentially all the lignite consumed in the country was supplied by domestic production. Germany was dependent on imports of other mineral fuels for most of the remainder of its primary energy consumption. Germany's metal-processing sector relied on imports of metal ores and concentrates and reprocessing of metallic scrap and waste materials (both imported and produced domestically), because no metals were mined in sufficient amounts for metallurgical use in the country. Germany was also heavily reliant on imports of numerous industrial minerals and many refined metals. The international competitiveness of the country's nonfuel mineral-processing and fabrication sector relied primarily on such factors as a highly skilled labor force; research, development, and rapid assimilation of new technologies (including metal and other mineral materials recycling technologies); and the development and maintenance of liberal trade relationships both within and outside the EU. Germany's position in the global mineral economy was predominantly that of a major consumer and processor of minerals (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 5–44).

In 2014, Germany was estimated to have been the second-ranked producer of refined selenium in the world, the third-ranked producer of kaolin and refined lead, the fourth-ranked producer of salt, and the fifth-ranked producer of potash and bentonite (table 1; Anderson, 2016; Bolen, 2016; Flanagan, 2016; Jasinski, 2016).

## Minerals in the National Economy

In 2014, the most valuable mineral commodities were those related to energy production. The value of marketed production of coal (lignite and bituminous), crude petroleum, natural and petroleum gas, and peat was a combined \$17.94 billion in 2014. Germany's potash production was valued at \$1.05 billion; lime, \$739 million; rock salt, \$732 million; and sulfur, \$105 million. In terms of tonnage of output, sand and gravel was a significant mineral commodity [with a total production of 248 million metric tons (Mt)], as was natural broken stone and lignite. Lignite was the principal locally produced energy source in the country.

The processing and manufacture of such metals as lead, nickel, and steel were also important to Germany's economy, as were the processing and manufacture of industrial components and minerals, such as cement (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, 15–17).

<sup>1</sup>Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US\$) at an annual average exchange rate of about EUR0.7525=US\$1.00 for 2014. All values are nominal, at current prices, unless otherwise stated.

## Government Policies and Programs

Germany's main mining law is the Federal Mining Act (BGBl. IS. 1310), which was approved on August 13, 1980, and revised on December 9, 2006, through a slight revision to provisions of Article 11 (BGBl. IS. 2833). The country's production of some minerals (including anhydrite and gypsum, limestone and some other types of natural stone, peat, and some types of sand and gravel) was not directly regulated under the Federal Mining Act but was covered by a variety of other land-management and environmental regulations at both the Federal and State levels. Also, the establishment of the Federal Mines Inspectorate was not stipulated in the Federal Mining Act (although this inspectorate does enforce many of the regulations in the main mining law); the Federal Mines Inspectorate was established through Articles 83 and 84 of Germany's Constitution (Bundesministerium der Justiz, 2007, p. 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2013, p. 13–15; Bundesministerium für Wirtschaft und Technologie, 2013, p. 35–46).

The Environmental Impact Assessment Act (EIA Act) (BGBl. IS. 1757, 2797), which was approved on June 25, 2005, and revised through slight changes to Article 2 (BGBl. IS. 3316) of the act on December 21, 2006, was the environmental law that was most applicable to the mineral industry. This act incorporates provisions of an older ordinance concerning the assessment of environmental impacts for mining projects (BGBl. IS. 1420), which was approved on July 13, 1990, and revised through slight changes to Article 8 (BGBl. IS. 2819) on December 9, 2006. The EIA Act also incorporates other older ordinances, such as one for the protection of groundwater against pollution caused by certain dangerous substances (BGBl. IS. 542), which was approved on March 18, 1997, and is applicable to the use and disposal of many of the chemicals used in mining and mineral-processing in Germany. The EIA Act requires environmental impact assessments for all domestic waste repositories created or used by the mineral industry. The Federal Mining Act stipulates how these repositories are to be constructed and operated (monitored) (Bundesministerium der Justiz, 2007, p. 30; Bundesanstalt für Geowissenschaften und Rohstoffe, 2013, p. 13–15; Bundesministerium für Wirtschaft und Technologie, 2013, p. 35–46).

## Production

In 2014, the most salient increases in the production of metals were those of copper (smelter production), which increased by 13%; primary aluminum and secondary zinc metal, by 8% each; and refined lead, by 6%. Production of crude gallium decreased by 58%, and that of magnesium metal, by 6%.

The most salient increases in the production of industrial minerals were those of barite, which increased by 58%; bentonite, by 10%; construction sand, by 9%; silica sand, by 8%; and magnesium compounds, by 7%. Production of fluorspar decreased by 29%; all salt, by 23%; ceramic and refractory clays, and nitrogen, by 8% each; lime, quicklime, and dead-burned dolomite, by 7% each; and sulfur, by 6%.

The most salient increases in the production of mineral fuels and related materials were the production of uranium concentrate,

which increased by 22%; residual fuel oil, by 16%; and coke, by 12%. Production of liquefied petroleum gas decreased by 12% in 2014; that of crude petroleum, naphtha, and petroleum coke, by 9% each; associated natural gas, by 8%; nonassociated natural gas, by 6%; and dry natural gas, by 5% (table 1).

## Structure of the Mineral Industry

Table 2 lists the major mineral industry facilities in Germany in 2014. Since the closure of the last metal mines in 1992, no metallic ores (with enough metal content for metallurgical use) have been produced in Germany. Many of the leading companies in the global metal-processing sector owned and operated significant facilities in Germany in 2014. ThyssenKrupp AG (based in Duisburg, Germany) was the leading producer of crude steel in Germany and the 19th-ranked producer of crude steel in the world. Salzgitter AG (based in Salzgitter, Germany) was the second-ranked producer of crude steel in the country but was not among the top 40 producers of crude steel in the world. ArcelorMittal S.A. (based in Luxembourg) was the third-ranked producer of crude steel in Germany and the company itself, including production in plants located across the world, was the leading producer in the world. Aurubis AG was the leading producer of refined copper in Germany and the EU, and Salzgitter held a 25% ownership interest in Aurubis. Aurubis was the second-ranked producer of copper cathodes in the world and the leading producer of secondary refined copper. Glencore plc (based in Switzerland and registered in the United Kingdom) was the leading producer of zinc metal in Germany and the leading producer of mined zinc in the world. Norsk Hydro ASA of Norway was the second-ranked producer of aluminum in Germany and the fifth-ranked producer of primary aluminum in the world; the company owned the largest single primary aluminum smelter in Germany (the Rheinwerk primary smelter at Neuss). Berzelius Metall GmbH (based in Stolberg, Germany) was the leading producer of primary lead in the country.

The majority of the mining and quarrying enterprises that extracted building stone, sand and gravel, clay and kaolin, and ceramic raw materials were small enterprises. Fifty-three percent of the companies that produced sand and gravel had fewer than 10 employees, and 43% of the companies that produced crushed stone had 10 or fewer employees. This is possibly owing to the Government promotion of small enterprises and the considerable mechanization of the industry (table 2; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–45; Stahlinstitut VDEh and Wirtschaftsvereinigung Stahl, 2013, World Steel Association, 2015a, p. 10).

## Mineral Trade

In 2014, Germany's imports of mineral fuels decreased to 230 Mt from about 248 Mt (revised) in 2013, whereas imports of metallic raw materials (including mineral ores and concentrates and other metallic raw materials, such as scrap metal), increased to 66.8 Mt from 63.4 Mt (revised) in 2013, and those of industrial mineral raw materials increased to 25.5 Mt from 24.8 Mt in 2013. In 2014, Germany imported 96.3 million cubic meters of natural gas, which was a decrease

of 9.6% compared with that of the previous year; the principal countries from which Germany imported natural gas were Russia, the Netherlands, and Norway. Germany also imported 87.5 Mt of crude oil, most of which also came from Russia, the Netherlands, and Norway. Germany exported 2.6 Mt of lignite in 2014, of which 51% was exported to the Czech Republic and 16.7% was exported to Belgium (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

In 2014, Germany also imported 10,978 kilograms (kg) of enriched uranium, of which 45.3% was from France; 42.3%, from Russia; and the rest, from other countries. Germany exported 22,175 kg of enriched uranium, mostly to France (41.1%), the United States (28.3%), and the United Kingdom (16.6%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

Germany's imports of nonferrous metals in 2014 included 1.18 Mt of copper concentrate from Brazil (20.9%), Chile (20.2%), Argentina (19.5%), and Peru (17.8%), with the rest originating from other sources. Germany also imported 364,990 metric tons (t) of zinc concentrate from Australia (which supplied 49.6% of these imports), the United States (16.5%), Sweden (15.7%), and other sources (18.2%). Germany also exported 98,065 t of zinc concentrate to France (which received 57.4% of these exports), Belgium (25.2%), the Netherlands (16.8%), and others (0.6%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

In 2014, Germany imported 20,561 t of tin metal from Peru (which supplied 27.7% of these imports), Belgium (23.4%), Indonesia (20.5%), and other sources (28.4%). Germany imported 43 Mt of iron concentrate in 2014 from Brazil (which supplied 55.9%), Sweden (15.5%) and Canada (15.3%), and other sources (13.3%). Germany imported 20,214 t of crude steel from Italy (31.8%), the Netherlands (29%), Ukraine (15.1%), Austria (13%), and other sources (11.1%). Germany also exported 4,223 t of crude steel, mostly to France (16.6%), and the United States (12.8%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 80, 99–101).

Germany also exported industrial minerals, including 430,371 t of anhydride and gypsum, mostly to Switzerland (22%), the Netherlands (21.7%), Luxembourg (14.6%), and Belgium (11.2%); 580,436 t of industrial salt mostly to Belgium (31.4%), Poland (16.1%), and France (10%); and 790,066 t of quartz mostly to the Netherlands (64.1%), France (21.2%), and Luxembourg (11.4%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

## Commodity Review

### Metals

**Iron and Steel.**—In 2014, Germany's demand for iron ore for pig iron production was satisfied exclusively through imports. Germany imported 43 Mt of iron ore in 2014, which was an increase of 6.5% from the previous year. More than one-half of the iron ore came from Brazil, and the rest came from Canada and Sweden (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–36).

Barbara Erzbergbau GmbH produced iron ore at the Porta Westfalica facility North Rhine-Westphalia and, in 2014, it produced 455,941 t. The iron content in the iron ore was very low, however—about 10.5%—and was not economically recoverable; therefore, the ore was used as aggregate in the construction industry (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–36).

In 2014, crude steel production increased by about 0.7% to about 42.9 Mt. Approximately two-thirds of this steel was made by the oxygen steelmaking process in integrated mills, and the rest was made in electric arc furnaces using steel scrap. Germany's steel industry revenues for 2014 were about \$50.28 billion. Germany ranked seventh in world steel production in 2014, accounting for a total of 2.6% of all world production. Germany, which was the leading steel producer in the EU, produced about 26% of all the EU's steel and produced 44.8% of the EU's steel from secondary sources. The leading producers of steel in Germany were, in order of production amount, ThyssenKrupp AG (12.2 Mt), Salzgitter AG (7.4 Mt), ArcelorMittal Germany (7.3 Mt), HKM AG (5.1 Mt), Saarstahl AG (2.7 Mt), Dillinger Huttenwerke AG (2.3 Mt), Riva (2.3 Mt), and Badische Sathkwerke (1.9 Mt) (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–36).

**Molybdenum.**—To meet its national demand, Germany imported 4,354 t of concentrates of molybdenum from, in order of amount supplied, the United Kingdom, Belgium, and the Netherlands. H.C. Stark AG processed molybdenum-containing residues from the metalworking and chemical industries and converted them into ferromolybdenum. Germany was a leading consumer of molybdenum in the world after China, the United States, and Japan (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 37).

**Tungsten.**—Germany's demand for tungsten, with the exception of secondary recovery from scrap, was mostly fulfilled with imports. In 2014, Germany imported 357 t of ore, and most of these imports originated from Bolivia, Brazil, and Mongolia. Germany also imported 57 t of tungsten metal and 1,342 t of ferrotungsten, mostly from China and Vietnam.

H.C. Stark processed specialized tungsten semifinished products and tungsten powder chemicals; it employed 1,630 workers in Germany. It had partnerships with Jiangxi Rare-Earth and Rare Metal Tungsten group (JXTC) of China in two joint ventures in Ganzhou Province, China (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 37–38).

### Industrial Minerals

**Clay and Shale.**—The leading region for kaolin production in Germany was Bavaria, which has deposits in the upper Palatinate; other significant kaolin deposits are located in, in order of resources, Saxony, Hesse, Rhineland-Palatinate, Saxony-Anhalt, and North Rhine-Westphalia. In 2014, Germany produced 4.28 Mt of kaolin, which was a slight decrease from the 4.29 Mt produced in the previous year. Germany was the principal producer of kaolin in the EU and the third-ranked producer in the world (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 45).

**Potash.**—In 2014, the K+S Group had six mines from which it extracted potash and magnesium and with which the company produced fertilizers. The K+S Group also produced a range of potash- and magnesium-based products for industrial applications, which made the company a leading potash and magnesium producer in the world. In 2014, the turnover for the K+S Kali GmbH Co.'s (a subsidiary of K+S Group) range of potash and magnesium products decreased by 7.5% to \$2.5 billion on 2014 from \$2.7 billion in 2013. The company produced 3 Mt of marketable potash (K<sub>2</sub>O content) in 2014. The company was considering an expansion at its Lower Saxony plant in the medium term, while it also sought to reopen the Siegfried-Giesen Mine situated between Hannover and Hildesheim that had been decommissioned since 1987. The company planned to construct a new potash-processing plant and expected to file the required application documents to the authorities of Lower-Saxony in February 2015. K+S Kali GmbH was the leading producer of potash in Europe and the fifth-ranked potash producer in the world (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 44).

**Salt.**—In 2014, Germany was the leading producer of salt in the EU, with total salt production of about 13.3 Mt, of which 2.8 Mt was exported. Salt mining in Germany was done by mining and in saline plants located in Baden-Wuerttemberg, Bavaria, Hesse, Lower Saxony, North Rhine-Westphalia, Saxony-Anhalt, and Thuringia. Rock salt production in 2014 was about 5.4 Mt, which was a decrease of about 40% compared with the production of about 9 Mt in 2013. Industrial brines, evaporated salt, and brine for balneotherapy were produced at five mines and in six saltwork sites. European Salt Co. (ESCO), a subsidiary of K+S Aktiengesellschaft, was a leading supplier of rock and evaporated salt in the EU. The company had mines in Bernburg, Borth, and Grasleben. Wacker Chemie AG operated a salt mine at Stetten, and the company employed 70 people. Saline Luisenhall GmbH obtained brine from a saline deposit at Gottingen, and the salt production company of Westphalia [Salzgewinnungsgesellschaft Westfalen (SGW), which was a 65% subsidiary of the Solvay Group of France] extracted brine in the region of Gronau-Epe. Dow Chemical Co. of the United States owned the salt domes at Ohrensen and Teutschenthal from which it extracted brine (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 44).

### ***Mineral Fuels and Related Materials***

**Coal.**—In 2014, the Government's program to eliminate the anthracite subsidy by the end of 2018 continued. By the end of the year, RAG Deutsche Steinkohle AG still had three mines, with two in the Ruhr and one in Ibbenburen. Germany's anthracite coal industry had decreased its production to 7.6 Mt in 2014 from 36.8 Mt in 2000, and exports of coal decreased by 0.04 Mt to 0.14 Mt in 2014. The industry simultaneously reduced personnel to 21,104 workers in 2014 from 58,100 workers in 2000. The total domestic sales of anthracite coal in Germany in 2014 were 8.12 Mt, or 32,000 t less than in 2013; the leading consumers were German powerplants, which consumed 2.2% more than in the previous year. The German steel industry consumed 52,000 t, or 42.9% less coal than in

the previous year, and in the domestic heating market, 21,000 t of coal was sold, which was about the same amount as in the previous year.

The production of lignite in Germany in 2014 was about 178.2 Mt, which was a decrease from the 183 Mt produced in the previous year. The development of the industry varied according to the district in which it was exploited. The Rheinisch mining area produced 93.6 Mt of lignite in 2014, which was a decrease of 5.1% compared with the previous year, and in the Lausitz region, 61.8 Mt was extracted. This production was 2.8% lower than that of the previous year. In the central region of Germany, 20.9 Mt of lignite was produced, which was an increase of 6.9% compared with that of the previous year, and in the Helnsteder area, lignite production increased by 51.5% to 1.8 Mt in 2014.

In 2014, 159.1 Mt of lignite, which represented 89% of all lignite production in the country, was sold to powerplants for the production of domestically consumed electricity and heat. Lignite also was used to produce briquets, pulverized fuel, bed coal fluid, and coke, and for this production, about 19.1 Mt of lignite was used in 2014. Germany produced 1.7 Mt of briquets in 2014 and 4.4 Mt of lignite dust, which was an increase of 12.4% and 2.4%, respectively, from that of 2013 (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015a, p. 8, 32–34; Bundesministerium für Wirtschaft und Energie, 2015, p. 9–12).

**Uranium.**—Uranium had not been mined in Germany since 1990, when the Soviet-German corporation WISMUT closed; however, uranium was produced as part of the flood-water purification and remediation procedures at the mine site near Königstein, from which 33 t was recovered in 2014 and 27 t was recovered in 2013. The decommissioning and remediation work at the former SDAG WISMUT site had been ongoing for the past 24 years (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34).

A central tenet of the energy transition plan of the German Government is to eliminate nuclear energy for commercial power generation by decommissioning all nuclear powerplants by 2022. As of 2014, Germany still had nine active nuclear powerplants: Grafenrheinfeld, which was scheduled to close in 2015; Gundremmingen B, scheduled to close in 2017; Phillipsburg 2, scheduled to close in 2019; Brokdorf, Grohnde, and Gundremmingen C, all scheduled to close in 2021; and Emsland, Isar 2, and Neckarwestheim, scheduled to close in 2022 (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34).

### **Outlook**

In 2014, Germany's economy was growing and unemployment was decreasing. Production within the mineral sector was stable, registering increases that were mostly in response to commodity demand. Germany had several energy challenges that it will have to face in the long term, and which are dictated by Government policy, including the elimination of nuclear power as a source of primary energy and the elimination of subsidies for the coal industry. In order to eliminate nuclear power gradually from Germany's energy mix by 2022 and still be on track to reduce greenhouse gas emissions by 80%

in 2050 (compared with the level of emissions in 2010), the Government projects that about 38% of the electricity generated in the country in 2030 will have to come from renewable energy resources; 23%, from lignite; about 20%, from natural gas; and about 4%, from heating oil, pumped storage, and other sources. Concurrently, in 2030, the country's entire supply of hard coal would have to be imported if the elimination of the hard coal subsidy results in zero production. The indirect implications for the mineral industry of increased consumption of renewable energy resources could include increased consumption of minerals used in the manufacture of wind turbines (including rare earths), in solar cells (including silicon and silver), and in other renewable energy technologies (Gesamtverbands Steinkohle e.V., 2011, p. 22–26; AG Energiebilanzen e.V., 2013, p. 25–27; Bundesministerium für Wirtschaft und Technologie, 2013, p. 5, 8, 16–18, 38, 49–51).

Germany's production of potash is likely to increase as world demand increases. New projects and the expansion of existing facilities would accommodate future increases in production as demand increases. Levels of production of fertilizer materials in Germany, however, are expected to vary with fluctuations in demand outside of Europe. Expected increases in the global population and in the level of prosperity in emerging market economies, including those of Latin America and Southeast Asia, are likely to increase food consumption and, thus, the intensity of land cultivation. Also, expected increases in meat consumption will likely increase the need for animal feed and, therefore, further increase demand for most of Germany's fertilizer products.

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TABLE 1  
GERMANY: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014
<b>METALS</b>					
<b>Aluminum:</b>					
Alumina	973	950 <sup>c</sup>	967	1,000 <sup>c</sup>	1,000 <sup>c</sup>
Aluminum hydroxide, Al <sub>2</sub> O <sub>3</sub> equivalent	1,485	1,405	1,364	1,360 <sup>c</sup>	1,300 <sup>c</sup>
<b>Metal:</b>					
Primary	402	432	410	492	531
Secondary	611	634	635	597	599
Total <sup>2</sup>	1,014	1,067	1,045	1,089	1,130
Cadmium, metal, refinery <sup>c</sup>	290	300	300	300	NA
Cobalt, matte, including shavings and scrap	829	671	497	500 <sup>c</sup>	NA
<b>Copper, metal:</b>					
<b>Smelter:</b>					
Primary	379	346	352	295	351
Secondary	212	218	182	169	173
Total <sup>2</sup>	591	564	534	464	524
<b>Refined:</b>					
Primary	402	401	390	390 <sup>r</sup>	392
Secondary	302	308	296	288	285
Total <sup>2</sup>	704	709	686	678	677
Gallium, crude <sup>c</sup>	30	30	30	38	16
Gold, metal, refined, including secondary	44,100 <sup>c</sup>	50,682	53,476	53,000 <sup>c</sup>	53,000 <sup>c</sup>
Indium, refined <sup>c</sup>	10	10	10	NA	NA
<b>Iron and steel:</b>					
<b>Ore, run of mine:<sup>3</sup></b>					
Gross weight	390	489	448	413	456
Fe content	41	51	47	43	48
<b>Metal:</b>					
Pig iron	28,560	27,943	27,046	27,177	27,943
Direct-reduced iron	450	380	560	560 <sup>c</sup>	560
<b>Ferroalloys:</b>					
Ferrochromium <sup>c</sup>	18,300	18,500	17,800	17,800	17,800
Other	9,200 <sup>c</sup>	9,985	8,248	8,200 <sup>c</sup>	8,200
Steel, crude	43,830	44,284	42,661	42,645 <sup>r</sup>	42,941
Semimanufactures	36,827	37,933	36,495	36,500 <sup>c</sup>	36,500
<b>Lead, metal, refined:</b>					
Primary	125	136	134 <sup>c</sup>	151	160
Secondary	279	293	290 <sup>c</sup>	249	248
Total	404	429	424 <sup>c</sup>	400	408
Magnesium, metal including castings	15	15	16	16	15
Platinum-group metals, metal, refined	100 <sup>c</sup>	50	54	54 <sup>c</sup>	54
Selenium, contained metal <sup>c</sup>	650	700	650	650	650
Silicon, metal	30,105	30,134	29,000 <sup>c</sup>	28,000	28,000
Silver, metal, refined, including secondary	1,768	1,886	1,753	1,750 <sup>c</sup>	1,750
Tin, alloys <sup>c</sup>	7,000	6,000	7,000	7,000	7,000
<b>Zinc, metal:</b>					
Primary	144	142	139 <sup>c</sup>	162 <sup>r</sup>	165
Secondary	21	28	30 <sup>c</sup>	26	28
Total	165	170	169 <sup>c</sup>	188	193
<b>INDUSTRIAL MINERALS</b>					
<b>Abrasives, manufactured:</b>					
Corundum	83	90	83	80	76
Fused aluminum oxide, crude <sup>c</sup>	20	20	20	NA	NA
Silicon carbide <sup>c</sup>	20	20	20	NA	NA
Aluminum salt slag, Al <sub>2</sub> O <sub>3</sub> equivalent <sup>c</sup>	200	200	200	NA	NA

See footnotes at end of table.

TABLE 1—Continued  
GERMANY: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued					
Barite, marketable (contained BaSO <sub>4</sub> )	56	55	52	45	71
Boron compounds, manufactured, including boric acid and oxide	163	157	149	143	139
Bromine compounds, including oxide <sup>e</sup> metric tons	1,500	1,600	1,600	NA	NA
Cement and clinker:					
Clinker, intended for market	22,996	24,775	24,581	23,127 <sup>r</sup>	23,871
Hydraulic	29,203	32,779	32,432	31,308	32,099
Chalk, natural, including ground <sup>c</sup>	1,350	1,400	1,450	NA	1,740
Clays, natural:					
Bentonite	363	375	366	359	395
Ceramic and refractory clays	3,978	4,027	4,045	4,183	3,863
Of which, fire clay and chamotte	246	253	270	270 <sup>c</sup>	NA
Kaolin, marketable	4,560	4,899	4,399	4,290	4,275
Other, unspecified	198	200 <sup>c</sup>	172	140	54
Dolomite, neither burnt nor sintered	792	622	504	500 <sup>c</sup>	NA
Feldspar, all uses <sup>4</sup>	5,203	5,483	5,321	5,300 <sup>c</sup>	5,300
Of which, feldspar for industrial uses <sup>c</sup>	203	218	205	200	200
Fluorspar, acid-grade	59	66	54	49	35
Gypsum and anhydrite:					
Natural	1,822	2,021	1,949	1,778	1,802
Byproduct of flue-gas desulfurization <sup>c</sup>	6,320	6,780	7,010	7,100	NA
Lime, quicklime, dead-burned dolomite	6,856	7,113	6,575	6,883	6,390
Magnesium compounds, byproduct of potash mining	1,310	1,348	1,372	1,365	1,455
Mullite, synthetic <sup>c</sup>	15	15	15	NA	NA
Nitrogen, N content of ammonia	2,677	2,821	2,823	2,757	2,540
Peat, horticultural use thousand cubic meters	7,759	7,911	8,205	8,200 <sup>c</sup>	8,200
Phosphoric acid, manufactured, P <sub>2</sub> O <sub>5</sub> content	21	20	12	14	24
Pigments, iron oxide (including synthetic iron oxide)	234	223	204	200 <sup>c</sup>	200
Potash, K <sub>2</sub> O content:					
Crude	3,630	3,827	3,767	3,675	3,738
Marketable	3,024	3,215	3,149	3,075	3,127
Salt, NaCl content, marketable:					
Evaporated salt, including marine salt	322	329	301	297	274
Industrial brines	8,752	8,066	7,515	8,073	7,709
Rock salt and other brines	10,602	9,048	6,840	9,026	5,355
Total <sup>2</sup>	19,676	17,442	14,656	17,396	13,338
Siliceous earth, marketable	49	53	50	50 <sup>c</sup>	50 <sup>c</sup>
Soda ash (Na <sub>2</sub> CO <sub>3</sub> ), manufactured	2,539	2,668	2,627	2,548	2,558
Stone, sand and gravel:					
Stone, crude:					
Dimension, including partially worked	425	467	477	505	495
Of which, marble and other calcareous stone	287	314	356	350 <sup>c</sup>	350
Crushed, not including chalk	149,463	164,487	154,020	154,000 <sup>c</sup>	154,000
Dolomite and limestone, not for cement manufacture	18,000	18,400	17,600	18,800	19,000
Gravel, natural:					
Construction gravel	67,822	76,191	72,615	72,105	71,811
Crude, including flint and pebbles	9,693	11,043	9,639	9,600 <sup>c</sup>	9,600
Other gravel, including quartzite	NA	NA	NA	NA	NA
Sand, natural:					
Construction sand	63,962	72,394	67,852	66,039	71,841
Silica sand, including glass sand and quartz sand	7,234	7,770	7,498	7,248	7,836
Other, including from granite and pegmatite	NA	NA	NA	NA	NA
Total, sand and gravel	148,711	167,398	157,604	154,992	161,088
Strontium carbonate, manufactured <sup>c</sup>	120	130	120	120	120

See footnotes at end of table.



TABLE 1—Continued  
GERMANY: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued					
Sulfur:					
Marketable	832	875	798	755	708
Byproduct:					
Metallurgy	2,266	2,394	2,373	2,400 <sup>c</sup>	2,400
Natural gas and petroleum	1,447	1,514	1,445	1,400 <sup>c</sup>	1,400
Total	3,713	3,908	3,818	3,800 <sup>c</sup>	3,800
MINERAL FUELS AND RELATED MATERIALS					
Carbon black	684	908	923	920 <sup>c</sup>	NA
Coal:					
Anthracite and bituminous, marketable	12,900	12,059	11,558	8,260	8,340
Lignite	169,403	176,502	185,432	182,696	178,178
Coke:					
Of anthracite and bituminous coal	8,241	7,990	8,050	8,379 <sup>r</sup>	8,770
Of lignite	176	171	170	161	175
Fuel briquets of lignite	2,024	2,136	1,910	1,951	1,709
Gas:					
Manufactured:					
Blast furnace <sup>c</sup>	9	9	9	9	NA
Coke oven	951	922 <sup>c</sup>	929 <sup>c</sup>	920 <sup>c</sup>	NA
Total <sup>c</sup>	960	931	938	929	NA
Natural:					
Associated (byproduct of crude petroleum)	81	80	78	73	67
Gross (nonassociated)	13,584	12,873	11,706	10,751 <sup>r</sup>	10,127
Marketable (dry or net)	12,571	11,799	10,660	9,693	9,193
Petroleum: <sup>5</sup>					
Crude	18,400	19,600	19,200	19,387	17,737
Refinery products:					
Liquefied petroleum gas	33,180	32,860	33,010	33,280	29,200
Distillate fuel oil	340,000	330,000	345,100	338,200	332,000
Residual fuel oil	41,600	42,400	44,200	39,290	45,400
Gasoline, including aviation	180,000	180,000	173,000	168,300	164,400
Kerosene and jet fuel	37,400	38,100	40,700	37,100	37,900
Naphtha	72,000	70,000	70,000	67,400	61,200
Refinery gas	44,500	45,100	44,000	43,600	42,290
Bitumen, bituminous mixtures, and other residues	32,800	34,600	33,000	32,000	32,400
Lubricants and miscellaneous oils	18,000	17,000	17,000	17,000	17,000
Petroleum coke	11,500	10,100	9,970	10,620	9,720
Mineral jelly, waxes, and paraffins	900	900	1,000	990	1,210
Other	8,630	6,590	8,330	8,000	8,000
Total <sup>c</sup>	821,000	808,000	811,000	796,000	781,000
Uranium concentrate, U <sub>3</sub> O <sub>8</sub> content	9	60	52	27	33

<sup>c</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. do. Ditto. NA Not available.

<sup>1</sup>Table includes data available through February 17, 2016.

<sup>2</sup>Data may not add to totals shown.

<sup>3</sup>Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to be used in the steel industry.

<sup>4</sup>All uses include use as gravel for road construction, and industrial uses include uses in the manufacturing of ceramics.

<sup>5</sup>All figures through 2012 were converted to barrels from those reported in metric tons according to data from Mineralölwirtschaftsverband e.V., 2013, Jahresbericht—Mineralöl-Zahlen, 2012: Berlin, Germany, Mineralölwirtschaftsverband e.V., July, p. 48 and 79, and reflect the significant digits of the conversion factors.

TABLE 2  
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Abrasives (silicon carbide)	ESK-SiC GmbH	Plant at Grefrath, Frechen	36
Alumina	Almatis GmbH (Dubai International Capital LLC)	Plant at Ludwigshafen	NA
Do.	Nabaltec AG	Plant at Schwandorf	120
Do.	Aluminium Oxid Stade GmbH (DADCO Alumina & Chemicals Ltd., 100%)	Plant at Stade	1,050
Do.	Martinswerk GmbH (Albemarle Corp., 100%)	Plant at Bergheim	350
Do.	Alufin GmbH Tabularoxide (Alteo Holdings, 100%)	Plant at Teutschenthal	17
Alumina, fused	Treibacher Schleifmittel GmbH (Imerys S.A., 100%)	Plant at Zschornowitz	NA
Aluminum	Hydro Aluminium Deutschland GmbH (Norsk Hydro ASA, 100%)	Rheinwerk primary smelter at Neuss	235
Do.	Metallhüttenwerke Bruch GmbH	Secondary foundry alloy plant at Dortmund; secondary cast alloy plants at Asperg and Bad Saeckingen	110
Do.	Aleris Recycling (German Works) GmbH (Aleris Corp., 100%)	Secondary smelters: Erftwerk at Grevenbroich, Innwerk at Toeging am Inn, and Neckarwerk at Deizisau	320
Do.	TRIMET Aluminium AG	Primary smelter at Essen-Borbeck	175 <sup>c</sup>
Do.	do.	Recycling plant and secondary smelter at Gelsenkirchen	160 <sup>c</sup>
Do.	do.	Recycling plant and secondary smelter at Harzgerode	40
Do.	Hamburger Aluminium-Werke GmbH (TRIMET Aluminium AG, 100%)	Primary smelter at Hamburg	133
Do.	Aluminiumwerk Voerde Aluminium GmbH (Klesch & Company Ltd., 100%)	Primary smelter at Voerde, North Rhine-Westphalia	130
Aluminum, hot-rolled products	Aluminium Norf GmbH [Novelis Inc. (Hindalco Industries Ltd., 100%), 50%, and Hydro Aluminium Deutschland GmbH, 50%]	Lippenwerk at Luenen (secondary) and rolling mill at Neuss	1,500
Aluminum salt slag	Befesa medio ambiente S.A.	Plants at Hannover, Luenen, and Toeging	380
Do.	K+S Entsorgung GmbH (K+S Aktiengesellschaft, 100%)	REKAL plant at Wanstorf	100
Arsenic, metal	metric tons PPM Pure Metals GmbH <sup>2</sup> (Recylex S.A., 100%)	Plant at Langelsheim	5
Do.	do. Reinstmetalle Osterwieck GmbH (PPM Pure Metals GmbH, <sup>2</sup> 100%)	Plant at Osterwieck	NA
Barite	Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach, and Dreislar Mine at Medebach-Dreislar	87
Do.	Deutsche Baryt-Industrie Dr. Rudolf Alberti GmbH & Co. KG (Sachtleben Bergbau GmbH, 75%, and other private, 25%)	Wolkenhügel Mine in the Harz Mountains and plant at Bad Lauterberg	50
Bentonite	Süd-Chemie AG (Clariant International Ltd., 100%)	Mining near Gammelsdorf, Bavaria, and plants at Duisburg, Heufeld, and Moosburg	500
Do.	S&B Industrial Minerals GmbH (S&B Industrial Minerals S.A., 100%)	Mining in region between Landshut and Mainburg, Bavaria	400
Do.	do.	Stollberg plant at Oberhausen	200 <sup>c</sup>
Do.	do.	Plant at Neuss	50
Do.	Kärlicher Ton- und Schamotte-Werke Mannheim & Co. KG (KTS)	Quarry at Muelheim-Kaerlich	50
Cadmium, metal:			
Primary (byproduct)	Metaleurop Zinkbetrieb GmbH & Co. KG (Glencore plc, 100%)	Nordenham smelter, near Bremerhaven	160
Secondary	Accurec Recycling GmbH (I-met GmbH, 100%)	Battery recycling plant at Mülheim an der Ruhr	NA
Calcium carbonate, natural, ground	Alpha Calcit Fullstoff GmbH & Co. KG	Plant at Cologne	250
Do.	Omya GmbH (Omya AG, 100%)	Plants at Emden	2,250
Do.	Omya Weil GmbH (Omya AG, 100%)	Plant at Weil am Rhein	NA
Do.	Eduard Merkle GmbH & Co. KG (Omya AG, 100%)	Plant at Blaubeuren-Altental	NA

See footnotes at end of table.

TABLE 2—Continued  
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Calcium carbonate, natural, including chalk	Vereinigte Kreidewerke Dammann KG (Omya AG, 100%)	Plants at Laegerdorf and Soehle	500
Do.	Kreidewerk Rügen GmbH (Omya AG, 100%)	Quarries and plant at Sassnitz, on Ruegen Island	NA
Carbon black	Orion Engineered Carbons GmbH (Rhône Capital LLC, 50%, and Triton Advisors Ltd., 50%)	Kalscheuren plant at Cologne, and plant at Dortmund	NA
Cement	HeidelbergCement AG	Plant at Burglengenfeld; two plants at Ennigerloh; two plants at Geseke; plants at Koenigs Wusterhausen, Leimen, Paderborn, Mainz-Weisenau, and Schelklingen; the Lengfurt plant at Triefenstein; plant at Wetzlar	12,700
Do.	Dyckerhoff AG (Buzzi Unicem SpA, 88.37%, and other private, 11.63%)	Plants at Deuna, Geseke, Goellheim, Lengerich, Neuss, Neuwied, and the Amöneburg plant at Wiesbaden	7,200
Do.	SCHWENK Zement KG	Plants at Allmendingen, Bernburg, Heidenheim-Mergelstetten, and Karlstadt	6,900
Do.	CEMEX Deutschland AG (CEMEX S.A. de C.V., 100%)	Two plants at Beckum; plants at Dortmund, Duisburg, Eisenhuettenstadt, and Ruedersdorf	5,300
Do.	Holcim (Deutschland) AG (Holcim Ltd., 88.9%, and other private, 11.1%)	HANSA plant at Bremen, plants at Laegerdorf and Rostock, and the Höver plant at Sehnde	3,600
Do.	Lafarge Zement GmbH (Lafarge S.A., 100%)	Plants at Kall-Soetenich, Karsdorf, and Walzbachtal	3,400
Do.	Holcim (Baden-Württemberg) AG (Holcim Ltd., 100%)	Plant at Dotternhausen	1,600
Do.	TEUTONIA Zementwerk AG (HeidelbergCement AG, 94.2%, and other private, 5.8%)	Plant at Hannover	900
Do.	Märker Zement GmbH	Plants at Harburg and Lauffen	NA
Clays, including ball, ceramic, kaolinitic, and refractory clays	Sibelco Deutschland GmbH (S.C.R.- Sibelco NV, 100%)	25 quarries and 8 plants, including 2 at Ransbach and the Kannenbäckerland plant in Hoehr-Grenzhausen, Westerwald region; also including quarries and plants of Kaolin- und Tonwerke Seilitz-Loethain, Saxony region	2,000
Do.	Stephan Schmidt KG	Tonbergbau Grube Anton open pit mine, Dornburg-Langendernbach, Müllenbach and Thewald Mines, Hoehr-Grenzhausen; Wiesa-Thonberg and Cunnersdorf quarries, Kamenz-Wiesa, Westerwald	1,600
Do.	Marx Bergbau GmbH & Co. KG (Stephan Schmidt KG, 100%)	Lämmersbach and Meudt Mines, Ruppach-Goldhausen quarry, Dornburg-Langendernbach, Westerwald	350
Do.	Goerg & Schneider GmbH & Co. KG	Quarry and main plant at Boden, others at Mogendorf, Goddert, Siershahn, Wirges/Staudt, and Kettenbach/Taunus, Westerwald region; others in Saxony and Eifel regions	NA
Do.	Mittelhessische Tonbergbau GmbH (Goerg & Schneider GmbH & Co. KG, 50%, and Stephan Schmidt KG, 50%)	Quarry and plant in the Giessen/Lahn region	100
Do.	Rohstoffgesellschaft GmbH Ponholz	Mine and chamotte plant at Maxhuetten-Haidoff, and Aufweiher Mine, Bavaria	150
Do.	Adolf Gottfried Tonwerke GmbH	Quarries and plant near Grosseirath, Coburg, Bavaria	100
Do.	Erbsloh Lohrheim GmbH (Erbsloh family, 100%)	Mine at Lohrheim, Rheinland-Pfalz	30
Coal, anthracite and bituminous	Deutsche Steinkohle AG (RAG Aktiengesellschaft, 100%)	Augusta Victoria/Blumenthal, Prosper-Haniel, and West Mines, Ruhr region, North Rhine-Westphalia	11,000 <sup>c</sup>
Do.	do.	Ibbenbüren Mine, Steinfurt District, North Rhine-Westphalia	2,100
Coke	ThyssenKrupp Steel AG	Schelgern plant at Duisburg	2,100

See footnotes at end of table

TABLE 2—Continued  
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Coke—Continued	ArcelorMittal Bremen GmbH (ArcelorMittal, 100%)	Coking plant at the Prosper-Haniel Mine	2,000 <sup>e</sup>
Do.	Hüttenwerke Krupp Mannesmann GmbH (ThyssenKrupp Steel AG, 50%; Salzgitter AG, 30%; Vallourec & Mannesmann Tubes SA, 20%)	Plant at Duisberg-Huckingen steel complex	1,100
Copper, refined	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	500 <sup>e</sup>
Do.	Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luenen	210 <sup>e</sup>
Dolomite	Rheinkalk Hagen-Halden GmbH & Co KG (Lhoist NV, 100%)	Steinbruch-Donnerkuhle quarry and Hönnetal plant at Menden, and plant at Hagen-Halden	7,500
Dolomite and lime	Geomin Erzgebirgische Kalkwerke GmbH	Underground mines at Hermsdorf and Lengenfeld	NA
Feldspar	Saarfeldspatwerke H. Huppert GmbH & Co. KG	Mine at Oberthal, Gudesweiler, Saarland	60
Do.	Gottfried Feldspat GmbH	Mine at Freihung-Thansuss, Weiden, Bavaria	15
Ferrochrome	Elektrowerk Weisweiler GmbH (Kermas Ltd., 100%)	Plant at Eschweiler-Weisweiler, near Aachen	30
Fluorspar	Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach	55 <sup>e</sup>
Gallium	metric tons Ingal Stade GmbH (5N Plus Inc., 50%, and Molycorp Inc., 50%)	Ingal plant at Stade	35
Do.	do. PPM Pure Metals GmbH <sup>2</sup> (Recylex S.A., 100%)	Plant at Langelsheim	NA
Gold, metal	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	NA
Do.	metric tons Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luenen	40 <sup>e</sup>
Do.	Heraeus Precious Metals GmbH & Co. KG	Primary smelter and refinery and secondary plant at Hanau	NA
Do.	Umicore AG & Co. KG (Umicore S.A., 100%)	Plant at Hanau	NA
Do.	Allgemeine Gold- und Silberscheideanstalt AG (Umicore S.A., 91.21%, and other, 8.79%)	Plant at Pforzheim	NA
Graphite, manufactured	GK Graphit Kropfmühl GmbH (Advanced Metallurgical Group N.V., 100%)	Plant at Kropfmuehl, Passau	20
Do.	do.	Plants at Bad Godesberg and Wedel, Holstein	8
Gypsum	VG-ORTH GmbH & Co. KG	Mine and plant at Stadtoldendorf, and plants at Osterode, Spremberg, and Witzenhausen	150
Do.	Gyproc GmbH (Etex Group S.A., 80%, and Lafarge S.A., 20%)	Mines and plant in Lower Saxony	110
Do.	Knauf Gips KG	Mines and plant at Iphofen	NA
Iron, blast furnace	ThyssenKrupp Steel AG	Two blast furnace plants at Hamborn and Schwelgern	12,000
Iron, direct-reduced	ArcelorMittal Hamburg GmbH (ArcelorMittal, 100%)	Plant at Hamburg	600 <sup>e</sup>
Iron oxide, pigments	Lanxess AG	Plant at Krefeld-Uerdingen	300
Kaolin, feldspar, and quartz	Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerte GmbH, 100%)	Mines at Caminau, Hirschau, Kemmlitz, and Schnaittenbach, Bavaria	350
Do.	Gebrüder Dorfner GmbH & Co Kaolin- und Kristallquartzsand Werk KG	Mine near Hirschau, Bavaria	NA
Lead, metal	Weser Metall GmbH (Recylex S.A., 100%)	Primary and secondary smelter and refinery at Nordenham	145
Do.	Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Secondary smelters at Braubach am Rhein and Freiberg/Sachsen	200
Do.	do.	Primary smelter at Stolberg	160 <sup>e</sup>
Do.	Johnson Controls Recycling GmbH (Johnson Controls Inc., 100%)	Battery recycling plant and secondary smelter at Krautscheid	120
Do.	Muldenhütten Recycling- und Umwelttechnik GmbH	Secondary smelter at Freiburg, Saxony	55
Do.	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Refinery at Hamburg	50
Lead, oxide, Pb content	Weser Metall GmbH (Recylex S.A., 100%)	Primary and secondary smelter and refinery at Nordenham	20
Lignite	RWE Power AG (RWE Aktiengesellschaft, 100%)	Open pit mines in Rheinisch mining area: Bergheim, Garzweiler, Inden, and Hambach	105,000

See footnotes at end of table.

TABLE 2—Continued  
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities	Annual capacity
Lignite—Continued	Vattenfall Europe Mining AG		Jänschwalde-Cottbus-Nord, Nochten, and Welzow-Süd Mines, Lausatian mining area	60,000
Do.	Mitteldeutsche Braunkohlengesellschaft AG		Profen and Vereinigtes Schleenhain mines	25,000
Limestone	Harz-Kalk GmbH		Quarry at Ruebeland	2,000 <sup>e</sup>
Do.	Kalkwerk Bad Kösen GmbH		Quarry at Bad Kösen	2,000 <sup>e</sup>
Do.	Fels-Werke GmbH		Quarry at Kaltes Tal	2,000 <sup>e</sup>
Do.	Schäfer Kalk GmbH & Co KG		Plants at Hahnstaetten, Steeden, Stromberg, and Grevenbrueck	3,000
Do.	Rheinkalk GmbH & Co KG (Lhoist NV, 100%)		Flandersbach quarry and plant at Wuelfrath, and lime plant at Menden-Hoennetal	7,500
Magnesium, metal, secondary	Norsk Hydro Magnesiumgesellschaft GmbH (Norsk Hydro ASA, 100%)		Plant at Bottrop	26
Do.	Aleris Recycling (German Works) GmbH (Aleris International Inc., 100%)		Plant at Toeging am Inn	15
Mullite, fused	Imerys Fused Minerals Zschornowitz GmbH (Imerys S.A., 100%)		Plant at Zschornowitz	31
Mullite, sintered	Nabaltec AG		Plant at Schwandorf	10
Natural gas	million cubic meters	Mobil Erdgas-Erdöl GmbH (Exxon Mobil Corp., 100%), including any fields owned or operated by BEB Erdgas und Erdöl GmbH (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Goldenstedt, Hemmelte, Klosterseele, Söhlingen, and other fields in Lower Saxony	14,000 <sup>e</sup>
Do.	do.	RWE-Dea AG (RWE Power AG, 100%)	Böttersen, Hemsbünde, Völkersen, and smaller fields in Lower Saxony; Inzenham-West Field, Bavaria	3,000 <sup>e</sup>
Do.	do.	Gaz de France Produktion Exploration Deutschland GmbH (Gaz de France S.A., 100%)	Salzwedel Field, Saxony-Anhalt; Schneeren and smaller fields in Lower Saxony	1,500 <sup>e</sup>
Do.	do.	Wintershall Holding AG (BASF AG, 100%)	A6/B4 Blocks offshore Schleswig Holstein; smaller fields in Lower Saxony	1,200 <sup>e</sup>
Do.	do.	EEG-Erdgas Erdöl GmbH (GDF Suez S.A., 100%)	Muehlhausen and other fields in Thüringen	50 <sup>e</sup>
Petroleum:				
Crude	thousand 42-gallon barrels	Wintershall Holding AG (BASF AG, 100%), 50%, and RWE-Dea AG (RWE Power AG, 100%), 50%	Mittelplate-Dieksand field in tidal flats of the North Sea offshore Schleswig-Holstein	15,500
Do.	do.	Wintershall Holding AG (BASF AG, 100%)	A6/B4 Blocks offshore Schleswig Holstein; Aitingen field, Bavaria; Emlichheim field, Lower Saxony; and smaller fields in Lower Saxony and Rheinland-Pfalz	2,000 <sup>e</sup>
Do.	do.	Gaz de France Produktion Exploration Deutschland GmbH (GDF Suez S.A., 100%)	Bramberge, Ruelertwist, Scheerhorn, and Ringe fields in Lower Saxony; smaller fields in the States of Bavaria, Hamburg, Lower Saxony, and Mecklenburg-Western Pomerania	3,500 <sup>e</sup>
Do.	do.	Mobil Erdgas-Erdöl GmbH (Exxon Mobil Corp., 100%)	Barenburg, Riehme, and Lueben fields, Lower Saxony; smaller fields in the States of Lower Saxony and Rheinland-Pfalz	1,800 <sup>e</sup>
Do.	do.	BEB Erdgas und Erdöl GmbH (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Georgsdorf, Meppen, and Ruelermoor fields, west of the Ems River (Emsland), Lower Saxony	3,000 <sup>e</sup>
Refined	do.	Deutsche Shell AG	Refineries at Godorf, Hamburg, and Grasbrook	256,000 <sup>e</sup>
Do.	do.	Raffinerie Heide GmbH (Klesch & Co. SA, 100%)	Refinery near Heide, State of Schleswig Holstein	35,000 <sup>e</sup>
Do.	do.	Eso Deutschland GmbH (ExxonMobil Central Europe Holding GmbH, 100%)	Refineries at Karlsruhe and Ingolstadt	245,000 <sup>e</sup>
Do.	do.	Ruhr Oel GmbH (Petróleos de Venezuela S.A., 50%, and BP Gelsenkirchen GmbH, 50%)	Refinery at Gelsenkirchen	215,500 <sup>e</sup>
Do.	do.	BAYERNOIL Raffineriegesellschaft mbH (OMV AG, 45%; Ruhr Oel GmbH, 25%; AGIP Deutschland GmbH, 20%; Deutsche BP AG, 10%)	Refinery at Neustadt-Donau	145,000 <sup>e</sup>

See footnotes at end of table.

TABLE 2—Continued  
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Platinum-group metals, refined	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	NA
Do.	Heraeus Precious Metals GmbH & Co. KG	Primary smelter and refinery and secondary plant at Hanau	NA
Do.	Umicore AG & Co. KG (Umicore S.A., 100%)	Plant at Hanau	NA
Do.	Allgemeine Gold- und Silberscheideanstalt AG (Umicore S.A., 91.21%, and other, 8.79%)	Plant at Pforzheim	NA
Potash, K <sub>2</sub> O content	K+S Kali GmbH (K+S Group, 100%)	Mines at Hattorf, Neuhoef-Ellers, Niedersachsen-Riedel, Sigmundshall, Unterbreizbach, Wintershall, and Zielitz	6,000
Salt (evaporated and rock)	ESCO - European Salt Company GmbH & Co. KG [K+S Salz GmbH (K+S Aktiengesellschaft, 100%)]	Bernburg Mine and evaporated salt works; Borth Mine and evaporated salt works near Wesel; Braunschweig-Lüneburg Mine near Helmstedt	5,300 <sup>e</sup>
Do.	Wacker Chemie AG	Stetten rock salt mine near Haigerloch	500
Do.	Südsalz GmbH (Südwestdeutsche Salzwerke AG, 90%, and Vereinigte Schweizerische Rheinsalinen AG, 10%)	Rock salt mine at Berchtesgaden and evaporated salt works at Bad Reichenhall, Bavaria; and mine at Heilbronn and evaporated salt works at Bad Friedrichshall-Kochendorf, Heilbronn district, State of Baden-Wuerttemberg	5,000
Do.	Saline Luisenhall GmbH	Evaporated salt works at Göttingen	NA
Selenium, metal	metric tons Retorte GmbH (Aurubis AG, 100%)	Plant at Röthenbach	2,500
Silica sand (industrial sand)	Quarzwerte GmbH	Mines and plants at Frechen, Gambach, Haltern, Hohenbocka, and Weferlingen	4,500 <sup>e</sup>
Do.	Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerte GmbH, 100%)	Mines and plants at Hirschau and Schnaittenbach	850
Siliceous earth, silica	Hoffmann Mineral and Co. KG	Mine and plant near Neuburg	55
Silicon, metal	metric tons RW Silicium GmbH (Advanced Metallurgical Group N.V., 100%)	Four electric arc furnaces in plant at Pocking	32,000
Silver, metal	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	NA
Do.	metric tons Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luene	1,300 <sup>e</sup>
Do.	do. Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Secondary (lead) smelters at Braubach am Rhein and Freiberg/Sachsen; primary (lead) smelter at Stolberg	400 <sup>e</sup>
Do.	Heraeus Precious Metals GmbH & Co. KG	Primary smelter and refinery and secondary plant at Hanau	NA
Do.	Umicore AG & Co. KG (Umicore S.A., 100%)	Plant at Hanau	NA
Do.	Allgemeine Gold- und Silberscheideanstalt AG (Umicore S.A., 91.21%, and other, 8.79%)	Plant at Pforzheim	NA
Soda ash	Solvay S.A.	Plant at Rheinberg	NA
Steel, crude	ThyssenKrupp Steel AG (ThyssenKrupp AG, 100%)	Bruckhausen and Beeckerwerth plants, near Duisburg	12,000
Do.	Salzgitter AG	Plants at Peine and Salzgitter	6,400 <sup>e</sup>
Do.	Hüttenwerke Krupp Mannesmann GmbH (ThyssenKrupp Steel AG, 50%; Salzgitter AG, 30%; Vallourec & Mannesmann Tubes SA, 20%)	Plant at Duisberg-Huckingen	5,600
Do.	ArcelorMittal Bremen GmbH (ArcelorMittal, 100%)	Plant at Bremen	4,000
Do.	Saarstahl AG (Struktur-Holding-Stahl GmbH & Co KG, 74.9%, and Dillinger Hüttenwerke AG, 25.1%)	Plants at Burbach, Neunkirchen, and Voelklingen	3,000
Do.	AG der Dillinger Hüttenwerke (Saarstahl AG, 33.75%; ArcelorMittal, 30.08%; Struktur-Holding-Stahl GmbH & Co KG, 26.17%; Dillinger Hütte und Saarstahl mbH, 10%; other, 4.72%)	Plant at Dillinger	2,800
Do.	ArcelorMittal Eisenhüttenstadt GmbH (ArcelorMittal, 100%)	Plant at Eisenhuettenstadt	2,400
Do.	Badische Stahlwerke GmbH	Plant at Kehl	2,300 <sup>e</sup>

See footnotes at end of table.

TABLE 2—Continued  
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014<sup>1</sup>

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude—Continued	Brandenburger Elektrostahlwerk GmbH (RIVA FIRE S.p.A., 100%)	Plant at Brandenburg	1,700 <sup>e</sup>
Do.	Outokumpu Norosta GmbH (Outokumpu oyj, 100%)	Plants at Bochum and Krefeld	1,600 <sup>e</sup>
Do.	ArcelorMittal Ruhrort GmbH (ArcelorMittal, 100%)	Plant at Duisburg	1,500 <sup>e</sup>
Do.	Georgsmarienhütte GmbH	Plants at Bous, Georgsmarienhütte, and Groeditz	1,300 <sup>e</sup>
Do.	Stahlwerk Thüringen GmbH (Alfonso Gallardo S.A., 100%)	Plant at Unterwellenborn	1,100
Do.	Deutsche Edelstahlwerke GmbH	Plants at Siegen and Witten	1,100 <sup>e</sup>
Do.	Lech-Stahlwerke GmbH (Max Aicher GmbH & Co. KG, 100%)	Plant at Herbertshofen	1,100 <sup>e</sup>
Do.	ArcelorMittal Hamburg GmbH (ArcelorMittal, 100%)	Plant at Hamburg	1,100 <sup>e</sup>
Do.	Hennigsdorfer Elektrostahlwerk GmbH (RIVA FIRE S.p.A., 100%)	Plant at Hennigsdorf	1,000 <sup>e</sup>
Do.	Elbe-Stahlwerke Feralpi GmbH (Feralpi Siderurgica S.p.A., 100%)	Plant at Riesa	950 <sup>e</sup>
Strontium carbonate	Solvay & CPC Barium Strontium GmbH & Co. KG (Solvay S.A., 75%, and Chemical Products Corp., 25%)	Plant at Bad Hoenningen, near Hannover	95
Sulfur	Norddeutsche Erdgas-Aufbereitungs GmbH NEAG [BEB Erdgas und Erdöl GmbH (ExxonMobil Production Deutschland GmbH, 50%, and Royal Dutch Shell plc, 50%), 100%]	Natural gas desulfurization plants at Grossenkneten and Voigtei (near Nienburg-Weser), Lower Saxony	600
Sulfuric acid	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Acid plant, part of primary copper production facilities at Hamburg	2,500 <sup>e</sup>
Do.	BASF SE	Plant at Ludwigshafen	NA
Do.	Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Plant near primary lead smelter at Stolberg	NA
Do.	Evonik Degussa GmbH (Evonik Industries AG, 100%)	Plant at Worms	NA
Do.	Lanxess AG	Plant at Leverkusen	NA
Do.	Weser Metall GmbH (Recylex S.A., 100%)	Acid plant near primary lead smelter and refinery at Nordenham	55
Do.	Metaleurop Zinkbetrieb GmbH & Co. KG (Glencore plc, 100%)	Acid plant near primary zinc smelter and refinery at Nordenham	NA
Tin alloys, tinplate	ThyssenKrupp Rasselstein GmbH	Plant at Andernach	NA
Zeolites	Hans G. Hauri Mineralstoffwerk GmbH	Mine and plant at Boetzingen, near Freiburg	NA
Zinc, metal	Metaleurop Zinkbetrieb GmbH & Co. KG (Glencore plc, 100%)	Nordenham smelter, near Bremerhaven	160
Zinc, oxides	Harz Metall GmbH (Recylex S.A., 100%)	Waëlz rotary kilns at Oker-Goslar	80 <sup>e</sup>
Do.	Norzinco GmbH (Recylex S.A., 100%)	Secondary plant at Harlingerode	20
Zinc, powder	do.	do.	5

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

<sup>1</sup>Table includes data available through February 27, 2016.

<sup>2</sup>In addition to producing arsenic as a byproduct of chemical manufacturing and gallium as a byproduct of aluminum production, PPM Pure Metals GmbH produces small quantities of germanium as a byproduct of processing imported ores and concentrates and small quantities of indium and tellurium as byproducts of zinc metal production by PPM's parent company, Recylex S.A.