



# 2013 Minerals Yearbook

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**SWEDEN**

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# THE MINERAL INDUSTRY OF SWEDEN

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Sweden is located on part of the Fennoscandian Shield, an area of Precambrian crystalline and metamorphic rocks. Common rocks of the shield and surrounding platform are gneiss, granite, granodiorite, marble, and sandstone. Glacial till covers about 75% of the landscape (Geological Survey of Sweden, 2014a).

In 2013, Sweden was among the most active mining countries in Europe and one of the European Union's leading producers of ores and metals. Sweden was the leading producer of iron ore in the European Union (EU) and the 11th-ranked iron ore producer in the world (Tuck, 2015). The country also produced copper, gold, lead, silver, and zinc, and extracted industrial minerals, including feldspar and limestone. Most notably, Sweden has alum-shale-hosted uranium-molybdenum-vanadium deposits and Kiruna-type iron deposits in the north (Eilu, 2011, p. 14; Geological Survey of Sweden, 2014b).

The country has abundant hydroelectric power, although it also relies on nuclear power produced by 10 active reactors that produce 42.7% of its electricity (International Atomic Energy Agency, 2014; U.S. Central Intelligence Agency, 2014).

## Minerals in the National Economy

Sweden has reached an advanced state of industrialization; as such, the largest portion of its gross domestic product (GDP) was from its services sector. Industry accounted for only 27.4% of the country's GDP. In 2012 (the latest year for which data were available), the value of Sweden's mineral industry production was \$3.96 billion, which was equivalent to 1% of the total value of the country's GDP, and the share of the value of its exports generated by the mineral industry was about 5.9% (Geological Survey of Sweden, 2014c; International Council on Mining and Metals, 2014, p. 31).

In 2013, significant mineral commodity exports to Sweden from the United States included, in order of value, metallurgical-grade coal (\$66.39 million), nuclear fuel material (\$33.08 million), and coal and other mineral fuels (\$13.3 million). Significant import commodities from Sweden to the United States included iron and steel mill products (\$446.86 million); petroleum products (\$215.38 million); fuel oil (\$143.18 million); and iron and steel products, except those of advanced manufacture (\$77.8 million) (U.S. Census Bureau, 2014a, b).

## Government Policies and Programs

The Mining Inspectorate of Sweden, which is a part of the Geological Survey of Sweden (SGU), is the official institution responsible for issuing permits for exploration and mining. It has authority over matters relating to the Minerals Act (1991:45), which is the current mining law that applies to the mineral industry in Sweden and dates from 1991. SGU is the

Swedish Government's authority on matters relating to geology and minerals management, both nationally and at the EU level. The SGU monitors the developments in mineral markets nationally and internationally, and it also produces and publishes statistics on mineral production in Sweden, including aggregates, peat, and other commodities, and the country's role in the global market. The Mining Inspectorate of Sweden takes the position that the mineral sector is crucial for employment in Sweden (particularly in those regions where the mines are located); is vital to the development of the mining equipment industry, which is an important sector of Swedish industry, regardless of where in the country it is situated; is an important source of exports; and reduces the country's vulnerability in the event of international trade crises (Geological Survey of Sweden, 2014a).

## Production

In 2013, production of fuel peat increased by 28.3%; that of granite, by 13.9%; primary lead production, by 11.2%; feldspar, by 11.1%; and silver (mine output), by 10.3%. Production of lime decreased by 16%. Sweden had other increases and decreases in production, but none had a change of more than 10% compared with that of the previous year (table 1).

## Structure of the Mineral Industry

The Swedish mineral industry was composed mostly of privately owned companies, and it operated on a free-market basis. The Government was the major equity owner of Luossavaara-Kiirunavaara AB's (LKAB's) iron ore operation and had significant ownership in the Svenskt Stal AB steel operation.

The leading Swedish mineral commodity company operating in Sweden was, in terms of value, privately owned Boliden AB (Boliden). Boliden was a mining and mineral processing company that principally produced copper, gold, lead, and silver. Boliden's main mines were the Aitik and the Kankberg Mines; it also had a smelter and refinery at Ronnskar.

The Canadian company Lundin Mining Corp. had significant operations in Sweden. The company produced lead, silver, and zinc from its Ammeberg Mine. HeidelbergCement AG owned Cementa AB, which had three cement plants in Sweden. The plants were located at Degerhamn, Skovde, and Slite, and they had a combined production capacity of about 3.4 million metric tons per year (Mt/yr).

Nordkalk AB, which was part of the Rettig Group of Germany, was a leading international producer of limestone, crushed and ground limestone, concentrated calcite, quicklime, and slaked lime as well as dolomite and wollastonite, which Nordkalk extracted as a byproduct of mining for limestone. Nordkalk had operations at 30 locations in nine countries as well

as mines in five countries. In Sweden, Nordkalk's limestone operations were located in Storugns. Table 2 is a list of the major mineral industry facilities in 2013.

## Commodity Review

### Metals

**Aluminum.**—United Company RUSAL (RUSAL) of Russia stated that its wholly owned subsidiary in Sweden, Kubikenborg Aluminium AB (KUBAL), had increased production in 2013 by 2% to 131,000 metric tons (t). This increase in production surpassed KUBAL's stated production capacity, which had been listed in company reports at 125,000 t. RUSAL acknowledged that the plant was producing at 102% of capacity but no explanation was given as to where the extra production capacity had originated. KUBAL was the only major aluminum producer in the country. RUSAL indicated that the increased output was in response to an increase in demand for its products and the ability of KUBAL to produce it at a relatively low cost (United Company RUSAL, 2014, p. 13, 32).

**Copper.**—Boliden's Ronnskar smelter production decreased during 2013 owing to maintenance shutdowns, production disruptions, and lower input grades of the raw material. The maintenance shutdowns at the smelter took place during the second and third quarters of 2013. Ronnskar's smelter was a leading facility, in terms of tonnage produced, for the recycling of copper and precious metals in Sweden. The main products were copper, gold, lead, and zinc clinker. The smelter employed 866 people and produced 814,000 t of concentrates and secondary materials and 206,000 t of copper cathodes in 2013 (Boliden AB, 2013a).

**Iron and Steel.**—In February 2013, LKAB restarted operations at its Gruvberget Mine following court approval. LKAB had closed its Gruvberget Mine following a previous court order. LKAB employed about 100 people at the site, and it was its first iron mine to reopen in 50 years. Production at the Gruvberget Mine was expected to be 2 Mt/yr by the time it reached full production capacity in 2015 (Luossavaara-Kiirunavaara AB, 2012a, b; Engineering and Mining Journal, 2013).

**Silver.**—Boliden's Garpenberg Mine was being expanded in 2013, and the expansion would bring the capacity of the mine from 1.5 Mt/yr to 2.5 Mt/yr when it reaches full production capacity in 2015. The expansion was slated for completion in 2014. The Garpenberg Mine employed 376 people in 2013 and produced 167,784 kilograms (kg) of silver during the year (Boliden AB, 2014b).

### Industrial Minerals

**Limestone.**—Svenska Minerals AB (SMA) produced principally limestone and lime; however, the company also produced dolomite, magnesium hydroxide, and magnesium oxide. SMA had operations in Boda and Rattvik. The company also owned Svenska Kyanite AB, which was a fully owned subsidiary that produced kyanite at Halskoberg (SMA Mineral AB, 2014).

## Mineral Fuels

**Peat.**—Statistics Sweden and the Swedish Energy Agency announced that the 2013 peat fuel harvest in Sweden increased by 33% to 2.4 million cubic meters, which was the largest harvest in the past 6 years. The increase in the harvest was probably because of hot and dry weather during the summer of 2013. The increase in production, coupled with a decrease in the use of peat as fuel for the production of electricity and heat, led to a 60% decrease in imports of peat in 2013, which mostly came from Belarus (Statistics Sweden, 2014).

## Outlook

Mining, although a small part of the country's GDP, is expected to remain important to Sweden's economy. Iron ore production is expected to increase to 50 Mt/yr within 10 years. Sweden has substantial base-metal, gold, and iron ore deposits, which are expected to continue to attract investors in the near future. Foreign companies are likely to continue to explore actively in Sweden for base metals, diamond, and, particularly, gold. The Government is expected to continue to support the production and use of renewable energy in electricity, heating and cooling, and transportation.

## References Cited

- Boliden AB, 2014a, Rönnskär: Boliden AB, 2 p. (Accessed October 19, 2014, at [http://www.boliden.com/Documents/Press/Publications/Fact sheets/facts-ronnskar-en.pdf](http://www.boliden.com/Documents/Press/Publications/Fact%20sheets/facts-ronnskar-en.pdf).)
- Boliden AB, 2014b, Garpenberg: Boliden AB, 2 p. (Accessed October 19, 2014, at <http://www.boliden.com/Documents/Press/Publications/Fact%20sheets/facts-garpenberg-en.pdf>.)
- Eilu, Pasi, 2011, Metallic mineral resources of Fennoscandia, in Nenonen, Keijo, and Nurmi, P.A., eds., Geoscience for society 125th anniversary volume: Espoo, Finland, Geological Survey of Finland Special Paper 49, p. 13–21.
- Engineering and Mining Journal, 2013, LKAB Gruvberget Mine in Sweden up and running again: Engineering and Mining Journal, February 6. (Accessed October 19, 2014, at <http://www.e-mj.com/news/leading-developments/2574-lkab-gruvberget-mine-in-sweden-up-and-running-again.html#.VEQOgvldWSp>.)
- Geological Survey of Sweden, 2014a, Geology of Sweden: Geological Survey of Sweden. (Accessed October 13, 2014, at <http://www.sgu.se/en/geology-of-sweden/>.)
- Geological Survey of Sweden, 2014b, Minerals of Sweden: Geological Survey of Sweden. (Accessed October 13, 2014, at <http://www.sgu.se/en/mineral-resources/minerals-of-sweden/>.)
- Geological Survey of Sweden, 2014c, Why legislation on minerals?: Mining Inspectorate of Sweden. (Accessed October 13, 2014, at <http://www.sgu.se/en/mining-inspectorate/legislation/why-legislation-on-minerals/>.)
- International Atomic Energy Agency, 2014, Sweden: International Atomic Energy Agency. (Accessed October 13, 2014, at <http://www.iaea.org/PRIS/CountryStatistics/CountryDetails.aspx?current=SE>.)
- International Council on Mining and Metals, 2014, The role of mining in national economies: International Council on Mining and Metals, 56 p. (Accessed October 8, 2015, at <http://www.icmm.com/document/7950>.)
- Luossavaara-Kiirunavaara AB, 2012a, Gruvberget: Luossavaara-Kiirunavaara AB. (Accessed November 15, 2013, at <http://www.lkab.com/en/Future/Urban-Transformations/Why/What-is-Iron-Ore/The-Ore-in-Svappavaara1/Gruvberget/>.)
- Luossavaara-Kiirunavaara AB, 2012b, LKAB gets the go-ahead for new iron ore mine in Sweden: Luossavaara-Kiirunavaara AB. (Accessed November 15, 2013, at <http://www.lkab.com/en/About-us/Overview/Operations-Areas/Kiruna/>.)

- SMA Mineral AB, 2014, Applications: SMA Mineral AB. (Accessed October, 13, 2014, at <http://www.smamineral.com/Applications.aspx>.)
- Statistics Sweden, 2014, Imports of peat decrease sharply: Statistics Sweden, June 18. (Accessed October 19, 2014, at [http://www.scb.se/en\\_/Finding-statistics/Statistics-by-subject-area/Environment/Land-use/Peat-production-use-environmental-impact/Aktuell-Pong/12989/Behallare-for-Press/375150/](http://www.scb.se/en_/Finding-statistics/Statistics-by-subject-area/Environment/Land-use/Peat-production-use-environmental-impact/Aktuell-Pong/12989/Behallare-for-Press/375150/).)
- Tuck, C.A., 2015, Iron ore, *in* Metals and minerals : U.S. Geological Survey Minerals Yearbook 2013, v. I, p. 39.1–39.19. (Accessed December 31, 2016, at [https://minerals.usgs.gov/minerals/pubs/commodity/iron\\_ore/myb1-2013-feore.pdf](https://minerals.usgs.gov/minerals/pubs/commodity/iron_ore/myb1-2013-feore.pdf).)
- United Company RUSAL, 2014, RUSAL annual report 2013: United Company RUSAL, 236 p. (Accessed October 19, 2014, at <http://www.rusal.ru/upload/uf/ecd/EWF%20101.pdf>.)
- U.S. Census Bureau, 2014a, U.S. exports to Sweden by 5-digit end-use code: U.S. Census Bureau. (Accessed October 19, 2014, at <http://www.census.gov/foreign-trade/statistics/product/enduse/exports/c4010.html>.)
- U.S. Census Bureau, 2014b, U.S. imports from Sweden by 5-digit end-use code: U.S. Census Bureau. (Accessed October 19, 2014, at <http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c4010.html>.)
- U.S. Central Intelligence Agency, 2014, Sweden, *in* The world factbook: U.S. Central Intelligence Agency. (Accessed October 19, 2014, at <https://www.cia.gov/library/publications/the-world-factbook/geos/sw.html>.)

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2009	2010	2011	2012	2013
<b>METALS</b>					
<b>Aluminum, metal:</b>					
Primary	69,708	93,000	111,000	129,000	131,000
Secondary <sup>c</sup>	30,000	30,000	30,000	30,000	30,000
Total	99,708	123,000	141,000	159,000	161,000
<b>Copper:</b>					
Mine output, Cu content	55,400	76,500	83,000	82,422	82,904
<b>Metal:</b>					
<b>Smelter:</b>					
Primary	125,398	137,000	155,000	214,000	214,000
Secondary	65,000 <sup>c</sup>	42,000	44,000	46,000	46,000
Total	190,000	179,000	199,000	260,000	260,000
<b>Refined:</b>					
Primary	205,759	150,497	179,316	179,000	166,000
Secondary <sup>c</sup>	25,000	40,000	40,000	40,000	40,000
Total	231,000	190,000	219,000	219,000	206,000
<b>Gold:</b>					
Mine output, Au content	5,461	6,242	5,935	6,015	6,530
Metal, primary and secondary <sup>3</sup>	13,282	12,450	10,600	12,532	12,000
<b>Iron and steel:</b>					
<b>Iron ore concentrate and pellets:</b>					
Gross weight	20,389	27,917	22,968	26,039	27,300
Fe content (60%)	12,233	16,750	15,159 <sup>4</sup>	17,186	16,162
<b>Metal:</b>					
Pig iron and sponge iron	1,966	3,447	3,240	5,253	5,000
Ferroalloys, ferrochromium <sup>c</sup>	31,345 <sup>5</sup>	32,000	32,000	32,000	32,000
Steel, crude	2,805	4,844	4,866	4,326	4,404
<b>Lead:</b>					
Mine output, Pb content	69,300	67,700	61,999	63,551	59,556
<b>Metal, refined:<sup>c</sup></b>					
Primary	55,000	56,000	52,400	62,000	69,000
Secondary	42,000	40,000	41,000	44,000	45,000
Total	97,000	96,000	93,400	106,000	114,000
Nickel, metal, secondary <sup>c</sup>	50	50	--	--	--
<b>Silver:</b>					
Mine output, Ag content	288,600	302,100	238,030	309,337	341,346
Metal, primary	481,223	385,684	415,066	447,759	437,000
Zinc, mine output, Zn content	192,538	198,687	190,251	188,300	176,582
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic <sup>c</sup>	1,586 <sup>r,5</sup>	1,796 <sup>r,5</sup>	2,064 <sup>r,5</sup>	2,500 <sup>r</sup>	3,000
Feldspar, salable, crude and ground <sup>c</sup>	44,000	44,000	30,000	27,000	30,000
Lime <sup>c</sup>	600	700	960 <sup>6</sup>	960	806
Quartz and quartzite	56	85	163	101	102
<b>Stone:<sup>c</sup></b>					
<b>Dimension:</b>					
Mostly unfinished	170	180	NA	NA	NA
Granite	132 <sup>e</sup>	124 <sup>5</sup>	92 <sup>5</sup>	79 <sup>5</sup>	90
Limestone	32 <sup>e</sup>	43 <sup>5</sup>	23 <sup>5</sup>	21 <sup>5</sup>	21
Other	6 <sup>e</sup>	6	67 <sup>5</sup>	82 <sup>5</sup>	82
<b>Crushed:</b>					
Dolomite	450	450	483	429	445
Limestone <sup>5</sup>	8,980	8,980	7,317	7,385	7,448
Sandstone	20	20	NA	629	630 <sup>e</sup>
Undifferentiated	30,000	30,000	NA	101	101 <sup>e</sup>
Talc, soapstone	4,000	4,000	3,000	--	--

See footnotes at end of table.

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

(Metric tons unless otherwise specified)

Commodity	2009	2010	2011	2012	2013
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coke, metallurgical	987	1,197	1,190	1,200	1,200
Peat:					
Agricultural use	1,198	1,250	1,611	1,000	1,800
Fuel	2,143	2,213	2,139	1,847 <sup>r</sup>	2,369
Petroleum, refinery products:					
Liquefied petroleum gas	3,248	3,978	3,139 <sup>r</sup>	4,490 <sup>r</sup>	4,500 <sup>e</sup>
Gasoline, motor	38,070	32,740	33,799 <sup>r</sup>	37,048 <sup>r</sup>	37,000 <sup>e</sup>
Jet fuel	1,679	1,424	1,496 <sup>r</sup>	1,898 <sup>r</sup>	1,900 <sup>e</sup>
Distillate fuel oil	57,232	56,393	52,779 <sup>r</sup>	59,349 <sup>r</sup>	59,000 <sup>e</sup>
Residual fuel oil	28,543	33,252	32,047 <sup>r</sup>	32,777 <sup>r</sup>	33,000 <sup>e</sup>
Other	22,119	25,331	20,732 <sup>r</sup>	22,995 <sup>r</sup>	23,000 <sup>e</sup>
Total	1,508,891	153,118	143,992 <sup>r</sup>	158,557 <sup>r</sup>	158,400 <sup>e</sup>

<sup>e</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. -- Zero.

<sup>1</sup>Table includes data available through October 19, 2014.

<sup>2</sup>In addition to the commodities listed, Sweden produced synthetic diamond, manufactured fertilizer, manufactured gas, molybdenum, selenium, slate, steel semimanufactures, and sulfur, but available information was inadequate to make reliable estimates of output.

<sup>3</sup>Series was updated to include metal production from ores and electronics scrap recycling.

<sup>4</sup>Iron content reported to be 66%.

<sup>5</sup>Reported figure.

<sup>6</sup>Quicklime; estimate based on volume sold.

TABLE 2  
SWEDEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Kubikenborg Aluminium AB (KUBAL) (United Company RUSAL, 100%)	Smelter at Sundsvall	125
Cement		Cementa AB (HeidelbergCement AG, 100%)	Plants at Degerhamn, Skovde, and Slite	3,400
Copper:				
Ore, copper content		Boliden AB	Mines at Aitik, Garpenberg, Kankberg, Kristineberg, Maurliden, Ostra, and Renstrom	NA
Metal		do.	Smelter and refinery at Ronnskar	240
Feldspar		Berglins Malm & Mineral AB (Omya GmbH)	Mines at Beckegruvan, Hojderna, and Limbergsbo	50
Do.		Silbelco Nordic AS	Mines at Forshammar	30
Ferroalloys		Vargon Alloys AB (Yildirim Group, 100%)	Plant at Vargon	255
Gold:				
Ore, Au content	kilograms	Dragon Mining Ltd.	Svartliden Mine, Skelleftea District	300
Do.	do.	Elgin Mining Inc.	Bjorkdal Mine, Skelleftea District	1,200
Do.	do.	Boliden AB	Mines at Aitik, Akerberg, Kankberg, Kristineberg, and Renstrom	4,000
Metal	do.	do.	Smelter and refinery at Ronnskar	15,000
Graphite		Woxna Graphite AB (Tricorona Mineral AB, 100%)	Mine and plant at Kringeltjarn, Woxna (closed 2008)	20
Iron and steel		Svenskt Stal AB (Government, 48%)	Steelworks at Lulea and Oxelosund	3,900
Iron ore		Luossavaara-Kiirunavaara AB (LKAB) (Government, 98%)	Mines at Kiruna and Malmberget	37,000
Do.		Northland Resources S.A.	Mine at Kauniavaara	15,000
Kyanite		Svenska Kyanite AB (Svenska Mineral AB, 100%)	Quarry at Halskoberg	10
Lead:				
Ore, lead content		Boliden AB	Mines at Garpenberg and Renstrom	100
Do.		Lovisagruvan AB	Lovisa Mine	3
Do.		Lundin Mining Corp.	Zinkgruvan Mine at Ammeberg	20
Metal		Boliden AB	Smelter and refinery at Ronnskar	30
Do.		do.	Smelter at Bergsoe	50
Lime		Svenska Mineral AB	Plants at Rattvik and Boda	250
Limestone		Kalproduction Storugns AB (Rettig Group, 100%)	Mines at Gotland Island	3,000
Do.		Nordkalk AB	Storugns	3,200
Marble	cubic meters	Borghamnsten AB	Quarry at Askersund	15,000
Petroleum, refined	42-gallon barrels per day	Preem AB (Corral Petroleum Holdings AB, 100%)	Refineries at Lysekil and Goteborg	210,000
Do.		St1 Group Oy	do.	82,000
Do.		AB Nynas Petroleum	Refineries at Gothenburg and Nynashamn	50,000
Silver, metal	kilograms	Boliden AB	Smelter and refinery at Ronnskar	408,000
Do.	do.	Lundin Mining Corp.	Zinkgruvan Mine at Ammeberg	25,000
Zinc, ore, zinc content		Boliden AB	Mines at Garpenberg, Laisvall, Langdal, and Renstrom	112
Do.		Lovisagruvan AB	Lovisa Mine	3
Do.		Lundin Mining Corp.	Zinkgruvan Mine at Ammeberg	78

Do., do. Ditto. NA Not available.