



# 2012 Minerals Yearbook

---

## ICELAND

---

# THE MINERAL INDUSTRY OF ICELAND

By Harold R. Newman

Iceland is the third-largest island in Europe after Great Britain and Greenland and is one of the most active volcanic regions on Earth; it has more than 100 volcanoes, of which more than 25 have erupted in recent history. Iceland consists mainly of basaltic rock of Quaternary and Tertiary ages. It lies astride the Mid-Atlantic Ridge, which is a part of an undersea mountain system that was formed by magma pushing up through the gap formed along the spreading boundary of the European and North America tectonic plates. Because of its active volcanism, Iceland is the largest island on the Mid-Atlantic Ridge (Iceland on the Web, 2012; Kious and Tilling, 2012).

The Government had applied for membership in the European Union (EU) in 2009 and was continuing its efforts to join the EU. Nations applying for EU membership must negotiate 35 policy chapters with the 27-nation EU, and Iceland had completed the negotiation of 18 chapters by yearend 2012. Many of the Government policies were already in line with EU policies owing to Iceland's membership in the European Economic Area. More difficult negotiations were expected in the future when the EU and the Government open talks on fishing, which was a major source of revenue for the country. Also, there was disagreement concerning the country's whaling tradition (EUbusiness Ltd., 2012).

Iceland had only a few proven mineral resources, which included base metals and industrial minerals. The country was dependent on imports to meet domestic demand for most mineral commodities. The country accounted for about 2% of global production of primary aluminum and about 1% of global production of ferrosilicon (Bray, 2013; Corathers, 2013).

Most of Iceland's production of aluminum and ferrosilicon was exported. Because of the country's geographic proximity to the EU and membership in the European Free Trade Association, most of Iceland's trade was with Europe (U.S. Central Intelligence Agency, 2013).

Iceland was an open economy, with goods and services accounting for 70.5% of the gross domestic product in 2012. U.S. exports to Iceland included petroleum products valued at \$18.9 million; metallurgical-grade coal valued at \$9.9 million; and iron and steel products valued at \$707,000 (U.S. Census Bureau, 2012a). U.S. imports from Iceland included finished metal shapes, except steel, valued at \$15.2 million; steelmaking and ferroalloying materials valued at \$8.2 million; industrial chemicals valued at \$1.3 million; and miscellaneous nonferrous minerals valued at \$267,000 (U.S. Census Bureau, 2012b).

## Production

Metallic minerals in Iceland were not available in sufficient quantities to make mining feasible with existing technology. The country's aluminum and ferrosilicon industries relied on imported materials and inexpensive geothermal and hydroelectric energy. Aluminum was Iceland's leading mineral commodity followed by ferrosilicon. In 2012, production

of both aluminum and ferrosilicon increased. The country's domestic production of industrial minerals included cement, crushed stone, pumice, salt, sand and gravel, and scoria (table 1).

## Structure of the Mineral Industry

The only significant change in the structure of Iceland's mineral industry in 2012 was the full purchase of the Elkem Iceland silicon facility by a Chinese company, China National Blue Star. The ownership of the shares in the other mineral enterprises remained about the same as in 2011 (table 2).

## Commodity Review

### Metals

**Aluminum.**—In 2012, aluminum smelting, which is very power intensive, was the most economically important industry in the country. Three plants were in operation: Alcoa Inc. of the United States's Fjaröaál smelter at Reydarfjörður; Century Aluminum Co. of the United States's smelter at Grundartangi; and Rio Tinto Alcan of Canada's Reykjavik [ISAL] smelter at Straumsvík. Aluminum production accounted for about one-seventh of the country's economic output (Info Iceland, 2012).

Alcoa announced that the construction of a new potlining facility at Fjaröaál had been completed at a cost of \$35 million. Construction was initiated in 2010, and the facility took about 18 months to complete. Hatch Engineering Co. of Canada was the construction company. Bids were invited for the operation of the potlining facility. Alcoa's smelter at Fjaröaál was proving to be an economic asset for eastern Iceland (Alcoa Inc., 2012).

Rio Tinto Alcan was increasing its production capabilities and updating equipment in its casthouse in Straumsvík to increase the smelter's production capacity to 230,000 metric tons per year (t/yr) from 190,000 t/yr, along with increasing the efficiency of the purification equipment. The output also would be changed from rolling slabs to extrusion billets, which would require modifications to the vesting equipment and installation of three continuous homogenizing furnaces (HRV Engineering, 2012).

**Silicon.**—Elkem A.S. of Norway announced the sale of its subsidiary Elkem Iceland to China National Blue Star for \$2 billion. ChemChina Corp. of China held an 80% share in China National Blue Star and the Blackstone Group of the United States held a 20% share. The purchase included the acquisition of Elkem Carbon, Elkem Foundry Products, Elkem Silicon Materials, and Elkem Solar (Iceland Review, 2012).

### Industrial Minerals

**Pumice.**—Jardefnaindudur ehf (JEI), which was known for its research of aggregates in southern Iceland, also mined

pumice in the Mount Hekla region about 100 kilometers from Reykjavik. The Hekla pumice is a lightweight porous stone of volcanic nature. The stone was mined from an open pit operation, and the raw material was transported to the harbor area for processing. The processing consists of grinding and screening of the pumice to various grain sizes and washing it to remove any sludge particles. In 2012, JEI's main export markets were Belgium, Denmark, the Netherlands, and the United States (Jardefnainnadir ehf, 2012).

### *Mineral Fuels and Other Sources of Energy*

**Geothermal and Hydroelectric Energy.**—Iceland was at the forefront in the use of renewable energy resources, and it had one of the largest potential sources of renewable energy in the world. Iceland has a significant amount of large-scale power potential from geothermal sources and hydropower generation. The country's economically viable electric-power-generating potential was estimated to be 50,000 gigawatthours per year (GWh/yr), of which only 8,500 GWh/yr was produced in 2012 (Iceland Trade Directory, 2012).

**Petroleum.**—The Government announced the awarding of two exploration and production licenses in its offshore Dreki Area, northeast of the country. The Dreki Area is a potentially hydrocarbon-rich region that lies within Iceland's Exclusive Economic Zone (EEZ). Faroese Petroleum plc and Valiant Petroleum plc of the United Kingdom were the two companies to be awarded licenses in the EEZ. The Ministry of Petroleum and Energy of Norway could participate in the licenses up to a share of 25%. The offshore license area is on a ridge that forms part of the Jan Mayen microcontinent between the conjugate margins of both the East Greenland and the Norwegian continental shelves where several significant natural gas and petroleum fields have been developed (Rigzone, 2012).

### **Outlook**

Aluminum and ferroalloy production are expected to continue to dominate the mineral sector of Iceland. Iceland's future development will continue to depend on its utilization of its abundant hydroelectric and geothermal power. No base-metal mining is expected to take place in the near future. Petroleum

exploration is expected to continue offshore Iceland. The Ministry of Industry and Commerce is expected to continue to seek ways to improve the competitiveness of the Icelandic mineral industry by increasing its variety and productivity.

### **References Cited**

- Alcoa Inc., 2012, Alcoa Fjarðal potlining facility now in operation—An investment of 36 million dollars: Alcoa Inc. (Accessed December 17, 2013, at [http://www.alcoa.com/iceland/en/news/whats\\_new/2012/2012\\_06\\_potlining.asp](http://www.alcoa.com/iceland/en/news/whats_new/2012/2012_06_potlining.asp).)
- Bray, E.L., 2013, Aluminum: U.S. Geological Survey Mineral Commodity Summaries 2013, p. 16–17.
- Corathers, L.A., 2013, Silicon: U.S. Geological Survey Mineral Commodity Summaries 2013, p. 144–145.
- EUbusiness Ltd., 2012, Iceland takes quick steps towards EU membership: EUbusiness Ltd. (Accessed July 2, 2012, at <http://www.eubusiness.com/news-eu/iceland-fish.hcv>.)
- HRV Engineering, 2012, Rio Tinto Alcan-IPU project: HRV Engineering. (Accessed December 26, 2013, at <http://www.hrvengineering.com/Projects/RIOTintoalcanIPUProject/>.)
- Iceland on the Web, 2012, Iceland nature—Geology of Iceland: Iceland on the Web. (Accessed December 16, 2013, at [http://www.iceland.vefur.is/iceland\\_nature/geology\\_of\\_iceland/index.htm](http://www.iceland.vefur.is/iceland_nature/geology_of_iceland/index.htm).)
- Iceland Review, 2012, Iceland ferrosilicon plant in Chinese ownership: Iceland Review. (Accessed December 18, 2013, at [http://www.icelandreview.com/icelandreview/daily\\_news/?cat\\_id=16567&ew\\_0\\_a\\_id+372483](http://www.icelandreview.com/icelandreview/daily_news/?cat_id=16567&ew_0_a_id+372483).)
- Iceland Trade Directory, 2012, Energy in Iceland: Iceland Trade Directory. (Accessed December 26, 2013, at [http://www.icelandexport.is/english/industry\\_sectors\\_in\\_iceland/energy\\_in\\_iceland/](http://www.icelandexport.is/english/industry_sectors_in_iceland/energy_in_iceland/).)
- Info Iceland, 2012, Aluminum: Info Iceland. (Accessed December 26, 2013, at <http://www.infoiceland.is/aluminium.html>.)
- Jardefnainnadir ehf, 2012, About JEI: Jardefnainnadir ehf. (Accessed December 26, 2013, at <http://www.jei.is/index.html>.)
- Kious, W.J., and Tilling, R.L., 2012, This dynamic Earth—The story of plate tectonics (online edition, ver. 1.17): U.S. Geological Survey. (Accessed February 18, 2014, at <http://pubs.usgs.gov/gip/dynamic/dynamic.html>.)
- Rigzone, 2012, Faro, Valiant, Petoro awarded Icelandic blocks: Rigzone. (Accessed December 6, 2013, at [http://www.rigzone.com/news/article\\_pf.asp?a\\_id=122536](http://www.rigzone.com/news/article_pf.asp?a_id=122536).)
- U.S. Census Bureau, 2012a, U.S. exports to Iceland by 5-digit end-use code: U.S. Census Bureau. (Accessed December 17, 2013, at <http://www.census.gov/foreign-trade/statistics/product/enduse/exports/c4000.html>.)
- U.S. Census Bureau, 2012b, U.S. imports from Iceland by 5-digit end-use code: U.S. Census Bureau. (Accessed December 17, 2013, at <http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c4000.html>.)
- U.S. Central Intelligence Agency, 2013, Iceland, *in* The world factbook: U.S. Central Intelligence Agency. (Accessed December 25, 2013, at <https://www.cia.gov/library/publications/the-world-factbook/geos/ic.html>.)

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

(Metric tons)

Commodity <sup>2</sup>	2008	2009	2010	2011	2012
Aluminum, metal, primary <sup>3</sup>	761,204	817,963	825,803	780,853	802,827
Cement, hydraulic <sup>e, 4</sup>	138,000	138,000	140,000	142,000	146,000 <sup>5</sup>
Ferrosilicon	107,882	112,983	114,231	120,076	131,818

<sup>1</sup>Table includes data available through December 31, 2013.

<sup>2</sup>In addition to the commodities listed, other materials were thought to be produced, including pumice, salt, sand and gravel, scoria, and stone, crushed; however, information is inadequate to make reliable estimates of output.

<sup>3</sup>Ingot and rolling billet production.

<sup>4</sup>Sales.

<sup>5</sup>Reported number.

TABLE 2  
ICELAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum	Alcoa Inc.	Fjarðaál smelter at Reydarfjörður	347
Do.	Reykjavík [ISAL] (Rio Tinto Alcan, 100%)	Straumsvík	230
Do.	Century Aluminum Co.	Grundartangi	260
Cement	Sementsverksmiðja Ríkisins (Government, 100%)	Akranes	115
Ferrosilicon	Elkem Iceland (Elkem A/S)	Plant at Grundartangi	100
Fertilizer	Aburðarverksmiðja Ríkisins (Government, 100%)	Gufunes	60
Pumice	Jarðefnaidnadir ehf	Mount Hekla	210
Do.	Pumice Products Ltd. (BM Valla Ltd., 100%)	do.	32
Salt	Icelandic Salt Co. (Akzo Nobel NV, 58%)	Plant at Svartsengi	5

Do., do. Ditto.