



2014 Minerals Yearbook

ESTONIA

THE MINERAL INDUSTRY OF ESTONIA

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Estonia has such mineral resources as bitumen, clays (including ball clay and kaolin), dimension stone, iron ore, mineral sands (including ilmenite, rutile, and zircon), natural gas, ochre, oil shale, peat, polymetallic ores (lead and zinc), rare earths, sand and gravel, sandstone containing phosphorite, and uranium. In 2014, Estonia produced industrial minerals, such as dolomite, gravel, lime, limestone, pebbles, shingle and flint, crushed stone, and its mineral processing industry produced cement, lead (secondary), and rare earths. Oil shale and peat were Estonia's two main mineral fuel resources. Powerplants used 80% of extracted oil shale for the production of shale oil used in the generation of electrical and thermal energy. In 2014, the country was the eighth-ranked peat producer in the world (table 1; Raukas and Teedumäe, 1997; Ministry of the Environment, 2014; PricewaterhouseCoopers LLP, 2014, p. 7; Statistics Estonia, 2015, p. 304; Apodaca, 2016).

Minerals in the National Economy

In 2014, Estonia's real gross domestic product (GDP) increased by 2.1% compared with 0.8% in 2013 owing to increases in manufacturing and foreign trade; the nominal GDP was \$26.49 billion. The manufacturing sector, in terms of the value added, accounted for 3% of the total GDP. The mining and quarrying sector, in terms of the value added, accounted for as little as 0.4% of the total GDP owing to a decrease in infrastructure building and a shortage of building materials. Industrial production increased by 2% owing to increases in exports, in domestic sales of manufacturing products, and in production of metal products and refined petroleum products; production of chemicals, however, decreased. In 2014, mining and quarrying production increased by 11%, of which 9% was an increase in the mining and agglomeration of oil shale and 33% was an increase in peat production. The construction sector, in terms of the value added, decreased by 4.1% and accounted for as little as 4.1% of the total GDP (Statistics Estonia, 2015, p. 28, 31–32, 42, 189, 193, 232, 304; World Bank, The, 2016).

Government Policies and Programs

In 2014, The Ministry of the Environment drafted a National Development Plan for the Utilization of Oil Shale (2016–30). The objectives of the plan included limiting the oil shale production capacity to 20 million metric tons per year (Mt/yr) and limiting development of the new mines to one or two during the period 2016–30. These limitations were also included in the amendments to the country's Earth's Crust Act. Estonia was estimated to have 4.75 billion metric tons (Gt) of oil shale, of which the active stock was estimated to be 1.34 Gt. The active stock was expected to be enough to meet domestic demand for approximately 48 years. The plan also proposed the effective and sustainable use of oil shale

(to reduce environmental effects), and consideration of the country's economic, security, and social goals when producing oil shale. The cost of implementing the plan was estimated to be 20 million euros¹ (EUR) (\$25.5 million). The plan was expected to be reviewed at 5-year intervals to take into account changes in technologies, market conditions, environmental requirements, and environmental effects (Oil Shale Competence Centre, 2014, p. 10; Ministry of Foreign Affairs, 2014a; Natural Gas Europe, 2015; United Nations, 2015).

In 2014, the Government approved a decree to increase mining fees annually by 3% to 6% based on the reserves. A fee of 3% per year was expected to be applied to oil shale mining, and a fee of 6% was expected to be applied to the production of ceramics clay, decomposed peat, low-grade dolomite, and sand used as fill. The increase in fees was expected to be implemented before 2020 (Baltic Course, The, 2014).

Production

Estonia's production of lime decreased by 80%; peat, by 10%; and crushed limestone and crushed stone used for concrete aggregates, for roadstone, and for other construction uses, by 7% each. Production of flint, gravel, pebbles, and shingle together increased by 29%; fuel oil, by 22%; dolomite, by an estimated 20%; and silica sand, by 15%. Data on mineral production are in table 1.

Structure of the Mineral Industry

In 2014, a total of 164 mining and quarrying companies were active in Estonia, of which 156 were foreign companies, 7 were sole proprietors (domestic private companies), and 1 was a Government-owned enterprise. A total of 8,337 manufacturing companies were operating in the country, of which 1,096 were sole proprietorships, 7,239 were foreign companies or their subsidiaries, and 2 were nonprofit associations. The manufacturing sector employed 114,000 workers in 2014 compared with 116,400 in 2013, and the mining and quarrying sector employed 4,200 workers in 2014 compared with 4,800 in 2013 (Statistics Estonia, 2014, p. 165, 233).

In 2014, the Government of Estonia and the Government of Finland agreed to build two liquefied natural gas (LNG) terminals that would be connected by a pipeline; the project was named "Baltconnector." The project would include the construction of a large-scale LNG terminal in Finland and small-scale LNG terminal in Estonia, and the LNG would be distributed from the terminal in Finland to consumers. The "Baltconnector" project was expected to be completed by 2019 and was expected to get financial support from

¹Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US\$) at an average rate of EUR0.784=US\$1.00 for 2014 and EUR0.783=US\$1.00 for 2013.

the European Union (EU). The total cost of the project was estimated to be EUR500 million (\$638 million) (Ministry of Foreign Affairs, 2014b).

Mineral Trade

In 2014, Estonia's total exports decreased by 2% to EUR12.1 billion (\$15.4 billion) from EUR12.3 billion (\$15.7 billion) in 2013, and imports decreased by 1% to EUR13.7 billion (\$17.5 billion) in 2014 from EUR13.9 billion (\$17.8 billion) in 2013. Exports of raw materials and chemical products decreased by 14%, and precious stones and metals, by 43%. Exports of mineral fuels and mineral oils and products of their distillation decreased by 4.3% (and accounted for 11% of total exports); salt, sulfur, lime and cement, by 5%; iron and steel, by 8% (2% of total exports); iron and steel articles, by 6% (3% of total exports); copper and copper products, by 11%; nickel and nickel products, by 54%; and aluminum and aluminum products and lead and lead products, by 1% each. The country's major export partners were Sweden, which accounted for about 17% of total exports; Finland, 15%; Latvia, 11%; Russia, 10%; and Lithuania and Germany, 5% each (Statistics Estonia, 2015, p. 245, 250, 252–253, 260).

Mineral fuels, including natural gas, liquid fuels, coal, and coke, were imported by Estonia for domestic use and were among the leading imported commodities, accounting for 13% of the total imports. Imports of nickel and nickel products decreased by 65%; copper and copper products decreased by 3%; aluminum and aluminum products decreased by 5%; and iron and steel and iron and steel products decreased by 2% each and accounted for 3% each of total imports. The country's major import partners were Finland, which accounted for about 15% of total imports; Germany, 12%; Sweden and Latvia, 9% each; Lithuania and Poland, 8% each; and Russia and the Netherlands, 6% each. About 78% of Estonia's total trade was with EU member countries. The value of exports to EU countries accounted for 72% of Estonia's total exports; the value of imports from EU countries accounted for 83% of Estonia's total imports (Statistics Estonia, 2015, p. 245, 255, 258, 261–262, 325).

Estonia's exports to the United States were valued at \$562.6 million in 2014 compared with \$422.7 million in 2013. In 2014, nonferrous metals accounted for \$14.5 million; coal and related fuels, \$3.7 million; fertilizers, \$3.2 million; iron and steel, \$2.0 million; iron and steel products, \$751,000; petroleum products, \$232,000; and stone, sand, and cement, \$11,000. In 2014, imports from the United States were valued at \$308.5 million compared with about \$293.2 million in 2013; the imports included \$1.1 million in precious metals, \$407,000 in iron and steel products, \$369,000 in nonferrous metals, \$115,000 in nonmetallic minerals, \$122,000 in petroleum products, \$22,000 in aluminum and alumina, and \$20,000 in copper (U.S. Census Bureau, 2015a, b).

Commodity Review

Industrial Minerals

Cement and Limestone.—AS Kunda Nordic Tsement (Kunda Nordic) was a leading cement and crushed-limestone producer and employer in Estonia; the company operated the country's sole cement plant, which was located at Kunda and had production capacities of 650,000 metric tons per year (t/yr) of clinker and 750,000 t/yr of cement. Kunda Nordic was a subsidiary of HeidelbergCement Sweden AB of Sweden (75%) and CRH Europe Holding BV of the Netherlands (25%). In 2014, Kunda Nordic produced 720,480 metric tons (t) of clinker, 447,350 t of portland cement, and 335,200 t of crushed limestone (AS Kunda Nordic Tsement, 2014; 2015, p. 4; 2016; CemNet.com, 2014; Eesti Ehitusmaterjalide Tootjate Liit, 2014; International Cement Review, 2015, p. 127).

Lime.—In 2013, Viru Keemia Grupp Energia OÜ contracted Viru RMT to manage the construction of a lime plant at an estimated cost \$5.75 million. The plant was expected to produce low-quality lime for trapping sulfur dioxide, and the raw material was expected to be from waste rock at the Ojamaa Mine. The lime furnace was installed with a production capacity of 26,300 t/yr of lime. The lime plant was commissioned in 2014 (Viru Keemia Grupp AS, 2014b; Viru RMT, 2014).

Nitrogen (Ammonia).—Nitrofert JSC (Nitrofert) was Estonia's only ammonia producer; it had a production capacity of 200,000 t/yr of urea and 180,000 t/yr of ammonia. In 2014, Nitrofert became a wholly owned subsidiary of GDF Group DF of Ukraine and employed 480 workers. The Nitrofert fertilizer plant was located in Ida-Viru County in the industrial region of Kohtla-Järve. Nitrofert imported natural gas from Russia to provide energy for use in the manufacturing of ammonia and to reduce its domestic fuel and energy costs. In 2012, Nitrofert resumed its operations, but in 2013, the operation stopped again. In 2013, through NF Trading of Finland, Nitrofert exported 15,000 t of ammonia to the United States at a price of about \$600 per metric ton. In 2014, when Nitrofert became a part of GDF Group DF, production had been expected to start up again in the spring of that year; however, production remained halted owing to the low global market price and the political situation in Ukraine (ICIS, 2012; Egenhofer and others, 2014; GDF Group DF, 2014; Voropajeva, 2014).

Rare Earths.—Molycorp Silmet AS was the only producer of rare earths in Estonia and employed about 550 people. Molycorp Minerals LLC of the United States owned 80% of Silmet Group's manufacturing facilities in Sillamäe, and Treibacher Industrie AG of Switzerland and Silmet Group each owned 10%. Molycorp Silmet exported its products to Asia, Europe, Central Eurasia, North America, and South America. In 2014, Molycorp Silmet stopped production of rare-earth compounds for 3 months owing to renovation of the factory (Molycorp Inc., 2011; 2013, p. 5–6, 9; 2014a; 2014b, p. 15, 46; Ärileht.ee, 2014; Oja, 2014).

Mineral Fuels and Other Sources of Energy

Oil Shale.—The two main oil shale deposits in Estonia were Narva and Tapa, which are located in the Baltic Shale basin

in northeastern Estonia and extended eastward into Russia. Estonia's oil shale deposit covers approximately 3,000 square kilometers. According to Eesti Energia, the total estimated resources of oil shale were 4.8 Gt, of which 3.2 Gt was usable. The extractable oil shale reserves were expected to last for 60 to 70 years at current rates of extraction. In 2014, the consumption of shale oil by powerplants decreased by 5% owing to the implementation of renewable sources of energy, including wind energy. The shale oil was exported to Belgium (33%), the Netherlands (33%), and Sweden (8%). Since 2005, oil shale mining in Estonia was moving toward underground mining in order to reduce environmental damage. In 2013 (the latest year for which detailed information was available), Estonia's oil shale mines were 39% open pit mines and 61% underground; by 2030, Estonia planned to have 5% of its oil shale mines be open pit mines, and 95%, underground mines (Bauert and Kattai, 1997; Aaloe and others, 2007; p. 11; International Energy Agency, 2014; Oil Shale Competence Center, 2014, p. 18, 29; Statistics Estonia, 2014, p. 322).

Government-owned energy company Eesti Energia AS Group was one of the leading energy companies as well as one of the leading employers in Estonia with 6,700 employees. In 2014, the company operated two oil-processing plants—Enefit140 and Enefit280—with a total combined capacity of 2.7 Mt/yr of shale oil. In 2014, Enefit280 was tested for production at full capacity, which was 2 million barrels of shale oil (Eesti Energia AS Group, 2014, p. 4, 6, 11; 2015; Tooman, 2014).

Viru Keemia Grupp AS (VKG) produced 57% of Estonia's total shale oil in 2014. VKG Kaevandused was a subsidiary of VKG and was involved in the mining of oil shale. In 2014, VKG produced 433,000 t of shale oil, and launched the Petroter II shale-oil-processing plant with a production capacity of 3,000 t/yr of shale oil. VKG invested \$84.9 million in plant technology at Petroter III in 2014; the plant was expected to be commissioned in 2015 (Viru Keemia Grupp AS, 2014b; 2015, p. 7, 14).

In 2014, VKG closed two Kiviter-type plants and laid off 76 employees owing to a disagreement between VKG and the Ministry of the Environment about the increase in the amount of oil shale to be mined from the Ojamaa Mine. Owing to the dispute, VKG bought the oil shale from Eesti Energia at two times the regular price in 2014 (Viru Keemia Grupp AS, 2014a, b).

Peat.—In 2014, Estonia's peat production decreased by 10%. Estonia's electricity producers had to buy carbon dioxide (CO₂) allowances when using peat as a fuel. AS Tootsi Turvas, which was headquartered in Pärnu, was the leading peat producer. The company, which was wholly owned by Vapu OY Group of Finland, produced milled peat at Ellamaa, Lavassaare, Peningi, Puhatu, and Ulila. In 2014, AS Tootsi Turvas planned to expand its peat production by developing a peat deposit at Halinga in Pärnu County with total estimated resources of 131,000 t. The company's production capacity was estimated to be 10,000 t/yr of peat. The company had to apply for an 18-year mining license with Pärnu County in Halinga Parish (AS Tootsi Turvas, 2014; Organisation for Economic Co-operation and Development, 2014; Pärnu Postimes, 2014).

Outlook

Estonia's mineral industry is expected to continue to focus on reducing CO₂ emissions by improving technology to achieve greater efficiency throughout the oil shale cycle (from mining to consumption). The efficiencies were planned to be achieved by implementing the National Development Plan for the Utilization of Oil Shale 2016–2030, which limits oil shale production to 20 Mt/yr, and by shifting to renewable energy sources. Production of rare earths is likely to continue to increase to meet global demand.

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TABLE 1
ESTONIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2010	2011	2012	2013	2014
METALS					
Lead, metal, secondary	7,199	7,840	8,046	7,100	8,588 ^c
INDUSTRIAL MINERALS					
Cement:					
Clinker	536,691 ^r	719,002 ^r	714,569 ^r	691,443 ^r	720,480
Portland	375,000	451,000	481,500	456,000 ^r	447,350
Clays and kilts used in construction	85,000	120,000	98,600	99,000	99,500 ^c
Dolomite	112	35	25	25	30 ^c
cubic meters					
Gravel, pebbles, shingle and flint	1,252,000	1,251,680	947,000 ^r	1,207,000 ^r	1,556,000
do.					
Lime	20,217 ^r	27,862 ^r	26,000 ^r	31,391 ^r	6,431
Limestone	768,472	1,026,350	1,017,415	1,013,176	1,031,133
Limestone, crushed	595,000	525,000	679,600	360,784	335,200
Nitrogen, N content of ammonia	-- ^r	-- ^r	14 ^r	99 ^r	--
thousand metric tons					
Rare-earth compounds	-- ^r	494 ^r	-- ^r	300 ^r	700 ^c
Sand silica (industrial)	36,000	14,000	21,000	20,000	23,000
Stone, crushed, used for concrete aggregates, for roadstone, and for other construction use	5,752,600	6,196,300	6,200,000	6,463,000 ^r	6,000,000
MINERAL FUELS AND RELATED MATERIALS					
Coke, electrode	22,400	24,400	26,300	22,000 ^r	22,000
Fuel oil	524,300	559,900 ^r	598,900 ^r	629,600 ^r	770,000
Oil shale	17,900 ^r	18,700 ^r	18,800 ^r	20,500 ^r	20,340
thousand metric tons					
Peat, all uses	965,000	926,700	670,800 ^r	1,061,000 ^r	950,000
Of which:					
Fuel	360,800	322,600	166,000 ^r	260,200 ^r	235,500
Peat briquet	83,600	74,800	52,100 ^r	56,000 ^r	35,000

^cEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through October 24, 2015.

²In addition to the commodities listed, Estonia produced sulfur, but available information was inadequate to make reliable estimates of output.

TABLE 2
ESTONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facility	Annual capacity
Ammonia		Nitrofert JSC (GDF Group DF, 100%)	Plant at Kohla-Jarve, Ida-Viru County	200 urea; 180 ammonia.
Clinker and cement		AS Kunda Nordic Tsement (HeidelbergCement Sweden AB, 75%, and CRH Europe Holding BV, 25%)	Kunda plant	1,400 clinker and cement.
Dolomite		Nordkalk AS (Rettig Group, 100%)	Kurevere dolostone quarry	NA.
Lead, secondary		Ecometal AS	Sillamäe	20.
Lime		Nordkalk AS (Rettig Group, 100%)	Rakke lime plant	NA.
Do.		VKG Energia OÜ (Viru Keemia Grupp AS, 100%)	Lime plant	24.
Limestone		do.	Vasalemma limestone quarry	NA.
Do.		AS Kunda Nordic Tsement (HeidelbergCement Sweden AB, 75%, and CRH Europe Holding BV, 25%)	Aru-Lõuna quarry	NA.
Limestone, aggregates		do.	Jaama 2, Kunda	NA.
Oil shale	metric tons	Eesti Energia AS Group (Government, 100%)	Eesti Energia Õlitööstus	4,200.
Do.	do.	VKG Oil AS (Viru Keemia Grupp AS, 100%)	Plant in Kohtla-Jarve	2,800.
Do.	do.	Kiviõli Keemiatööstuse OÜ	Kiviõli oil shale plant	45 shale oil.
Do.		AS Kunda Nordic Tsement (HeidelbergCement Sweden AB 75%, and CRH Europe Holding BV, 25%)	NA	NA.
Peat		AS Tootsi Turvas (Vapo OY Group, 100%)	Ellamaa, Lavassaare, Peningi, Puhatu, and Ulila	NA.
Rare earths		Molycorp Silmet AS (MolycorpMinerals LLC, 80%; Treibacher Industrie AG, 10%; Silmet Group, 10%)	Factories in Sillamäe	700.
Shale oil	42-gallon barrels	Eesti Energia AS Group (Government, 100%)	Enefit 140 and Enefit 280	2,700.

Do. do. Ditto. NA Not available.