USGS
science for a changing world

2014 Minerals Yearbook

SWITZERLAND

U.S. Department of the Interior
U.S. Geological Survey

December 2017

The Mineral Industry of Switzerland

By Sinan Hastorun

Switzerland is a highly developed, landlocked, and mountainous country in Central Europe that borders the European Union (EU) member states of Austria, France, Germany, and Italy as well as the Principality of Liechtenstein. Few mineral commodities were mined in the country although more than 1,000 mineral deposits (in particular, iron ore and manganese ore) have been identified on Swiss territory. Switzerland's mineral output consisted almost exclusively of industrial minerals for the construction sector, refined precious metals, and refined mineral fuels. Industrial minerals that were mined and used on a large scale by industry were clay, gypsum, lime, and rock salt. Hydraulic cement and sulfur (from petroleum refining) were also produced. Construction aggregates continued to be an important commodity group in terms of gross value. The majority of domestically consumed stone was mined and processed in Switzerland. Locally produced nonmetallic minerals included raw materials for the brick-and-tile industry; lime and marl for the binder material industry; sand and gravel, dimension stone, and crushed stone for the construction industry; and refined petroleum products (Geology Portal, 2014b, c, d; Federal Department of Home Affairs, 2015).

The production and export of refined metals, in particular refined precious metals such as gold and silver, remained an important sector of Switzerland's economy; however, the quantity and value of production and exports of gold and silver decreased in 2014. The country remained the leading refiner of gold in the world in 2014, and an estimated 70% of annual global gold production was refined in Switzerland. Precious metal ores were not mined in the country, but there was increased exploration activity for gold and silver in 2014. Metal processing was limited mostly to secondary aluminum and steel production (Mariani, 2012; NV Gold Corp., 2014b; Berne Declaration, 2015, p. 7).

Transit trade of commodities, including nonfuel minerals and mineral fuels, formed an important segment of the national economy. The growth of the commodities sector has accounted for an estimated 50% of Switzerland's economic growth since 2010. This was largely owing to increased trading activity by Switzerland-based commodity companies that were among the world's largest, including Glencore plc, Gunvor Group Ltd., Mercuria Energy Group Ltd., Trafigura Beheer B.V., and Vitol Group. Switzerland accounted for an estimated 15% to 25% of the estimated $3 trillion annual global trade in commodities. The country's share of global commodities trading exceeded 15% for alumina, aluminum, coal, copper, cobalt, lead, petroleum, and zinc (Jung and Seith, 2012; Thut, 2013, p. 161–162).

Minerals in the National Economy

Switzerland's gross domestic product (GDP) increased by 1.9% in real terms in 2014, compared with a rate of growth of 1.8% (revised) in 2013. The country's nominal GDP was $675.3 billion (CHF642.3 billion[1]) in 2014. The slightly higher rate of growth was mainly owing to increased net exports and, to a lesser degree, increased domestic private consumption. The gross value added from manufacturing and construction increased by 2.0% in 2014, compared with a revised increase of 1.0% in 2013. Within manufacturing and construction, the value added from manufacturing increased by 2.4% compared with an increase of 0.7% (revised) in 2013, and that of construction increased by 2.1% compared with 2.0% in the previous year. The mining and quarrying sector contracted in 2014; its value decreased by 5.3% in 2014 compared with an increase of 1.9% (revised) in 2013 (Federal Statistical Office, 2015c, e, h, i; European Commission, 2015, p. 144; International Monetary Fund, 2015, p. 4).

Manufacturing made up about 19.0% of Switzerland's GDP in 2014, which was a slight increase from its 18.3% (revised) share in 2013. Construction accounted for about 5.3% of GDP in 2014 compared with 5.1% in the previous year. The metallurgy sector, which included the processing and refining of secondary metals, made up an estimated 0.7% of GDP. The mining and quarrying sector accounted for only about 0.12% of GDP in 2014, which was a slight decrease from 0.13% (revised) in 2013 (Cadot and Conde, 2013, p. 14; Federal Statistical Office, 2015e).

The precious metals refining and commodity trading sectors were two important components of the country's GDP. Gold and silver refining was estimated to have contributed about $525 million (CHF500 million) in gross value added, including both direct and indirect effects, which was equivalent to 0.08% of the gross national value added. The sector's output accounted for 11% of Switzerland's metallurgy sector's total and employed about 2,600 people directly or indirectly. The commodities trading sector accounted for an estimated 3.1% of GDP and employed about 10,000 people. The sector's net income of about $21 billion (CHF20.0 billion) was unchanged from its level in 2013. Mineral fuels were by far the largest commodity group in Switzerland's transit trade and accounted for about 75% of the total, which was followed by stone and metals, with about a 15% share (Berne Declaration, 2011, p. 41; Cadot and Conde, 2013, p. 14, 15, 16; Farge, 2013; Thut, 2013, p. 161; Swiss National Bank, 2015, p. 2, 3).

Government Policies and Programs

Mineral exploration and extraction in Switzerland was governed by the Bergregal, "principles of mining law." According to the Swiss civil code (Art. 664 ZGB), the Federal Government entrusted the 26 regional governments (Cantons) with legislative rights over public and unclaimed property, which included underground mineral resources. The Federal code only asserted that the interests and rights of landowners,

[1]Where necessary, values have been converted from Swiss francs (CHF) to U.S. dollars (US$) at an average rate of CHF0.952=US$1.00 for 2014 and CHF0.964=US$1.00 for 2013.

the state, and license holders must be safeguarded. Cantons granted licenses for mineral exploration and exploitation based on their own planning and building regulations, environmental impact assessments, and safety regulations. Mineral regulations and procedures differed widely from one Canton to another, as each Canton had the authority to set its own mining law, to establish resource rights, and to issue mining licenses. The Federal Government did not own any territory in the Cantons or exercise any authority with regard to mineral resource regulations (Geology Portal, 2014a).

Switzerland's regulatory framework for precious metals production and refining activities was governed by the precious metals control law, which was enacted in 1880 and subsequently amended in 1933 and 1994. The law of 1880 created the legal status of assayers in order to limit moral hazard in transactions. The revised law of 1994 created two categories of precious metal manufacturers with correspondingly different requirements. According to Articles 13–20, watch cases must be officially stamped by the Federal administration, while other precious metal products must bear a master's stamp to ensure full traceability. The Federal administration also controls international trade, and establishes the status and requirements of official assayers and trade assayers to control and certify the title of precious metals products (Cadot and Conde, 2013, p. 16).

In 2014, the Swiss Parliament began considering Energy Strategy 2050 to gradually phase out nuclear energy in Switzerland through the decommissioning of the existing five nuclear plants, to increase the use of hydropower and new renewable energy sources, and to improve energy efficiency in the country. In December 2014, the National Council, which is the lower house of Parliament, approved a proposed system to require operators to submit plans for improving the safety of reactors after 40 years of service. Subject to approval by the Swiss Federal Nuclear Safety Inspectorate (ENSI), a reactor's license would be renewed for 10 years, with the possibility of another 10 year extension. No licenses will be issued for the construction of new nuclear reactors (Swiss Federal Office of Energy, 2015c, d; World Nuclear Association, 2015).

Production

In 2014, refined gold and refined silver production both decreased substantially. Refined gold output was estimated to have decreased by about 27% and refined silver by about 10% compared with production in 2013. Crude steel and steel manufactures production decreased by about 4% each. Aluminum production was estimated to have increased by about 8%. Among industrial minerals, salt production decreased by about 40% and cement production by about 6%. Among refined petroleum products, kerosene output decreased by 58% and distillate fuel oil decreased by 15%. Residual fuel output increased by 8%. The country's secondary aluminum production was mainly exported to EU countries for use in the automotive industry. Its salt production was partly exported and partly domestically consumed (table 1).

Structure of the Mineral Industry

Switzerland's mineral producers were owned privately or by the Cantons. Table 2 is a list of major mineral industry facilities.

All four leading gold refiners were privately owned. Argor-Heraeus S.A. was owned by Heraeus Holding GmbH, Commerzbank International S.A., and Münze Österreich (the Austria Mint). Metalor Technologies S.A. was owned by Astorg Partners S.A. of France, and Produits Artistiques Métaux Précieux S.A. was a subsidiary of MKS S.A of Switzerland. Finally, Valcambi S.A. was a wholly owned subsidiary of European Gold Refineries Holding S.A., which was in turn majority owned by Newmont Mineral Holding B.V. of the United States (table 2; Gold Bars Worldwide, 2015a–d).

Many leading global commodity trading companies (by revenue) were either based or headquartered in Switzerland. These included Vitol Group, the world's leading petroleum trader; Glencore plc, the world's largest commodities trading company as well as a leading mining company; Gunvor Group, a leading petroleum, coal, and liquefied natural gas (LNG) trader; Trafigura Beheer, a leading petroleum and metals trader; and Mercuria Energy Group, a leading mineral fuels trader (Schneyer, 2011; Thut, 2013; Swiss Trading & Shipping Association, 2015).

Mineral Trade

Switzerland's trade surplus increased by 27.4% to reach a record-high level of $31.5 billion (CHF30 billion) in 2014. Exports increased by 3.5% to $218.8 billion (CHF208.3 billion), while imports increased by only 0.4% to $187.3 billion (CHF178.3 billion). Exports to all regions recorded an increase, with the exception of Australia and South America. The increase was the highest for exports to North America (10%), which was driven by higher exports to the United States (11%). Switzerland's imports from Asia increased by 6%; imports from China have doubled since 2010. The EU-28 continued to dominate Switzerland's trade (excluding gold bars, other precious metals, coins, and precious stones and gems), accounting for 54.7% of exports and 73.2% of imports in 2014 (Federal Customs Administration, 2015a, p. 1–4, 11; 2015b; Federal Statistical Office, 2015a, d).

Among mineral commodity exports, precious metals, semiprecious stones, and gemstones, made up 26.1% of Switzerland's total exports in 2014 and decreased by 42.3% compared with their level in 2013; raw materials and semifinished products, 12.6% (increased by 1.1%); and energy resources, including electrical energy, motor fuels, thermal fuels, crude petroleum, and basic products, 1.1% (decreased by 6%). Clays and dimension stone exports increased by 9.2% and aluminum, by 5.1%. Natural gas exports decreased by 28.8%; crude petroleum and distillates, by 8.1%; and iron and steel, by 5.3%. Among mineral commodity imports, precious metals, semiprecious stones, and gemstones made up 28.6% of Switzerland's total imports in 2014 and decreased by 39.2% compared with their level in 2013; raw materials and semifinished products, 16.4% (increased by 0.3%); and energy resources, including electrical energy, motor fuels, thermal fuels, crude petroleum, and basic products, 4.1%

(decreased by 16.4%). The decrease in energy imports was highest for thermal fuels (25.2%), followed by motor fuels (21.4%), electrical energy (11.9%), and crude petroleum and basic products (6.4%). Iron and steel imports decreased by 2% and nonferrous metals, by 0.9%. Clays and dimension stone imports increased by 2.2% (Federal Customs Administration, 2015a, p. 7, 9; Federal Statistical Office, 2015b, f, g).

Switzerland continued to be the world's top exporter and importer of gold, accounting for about 15% of the global trade. Gold was also estimated to be the country's leading export product (by value). In 2014, Switzerland exported about 1,745 metric tons (t) of gold valued at $68.3 billion (CHF65 billion). Gold exports decreased by about 45% by weight and by 37% by value compared with their levels in 2013. Switzerland's gold imports also decreased substantially in 2014. By weight, they decreased by 27% to about 2,236 t and by value, by 41% to $68.5 billion (CHF65.2 billion) (Federal Customs Administration, 2015c; Nguyen and Mariani, 2015).

Switzerland was also a leading exporter and importer of silver. The country exported about 2,124 t of silver valued at $1.3 billion (CHF1.2 billion) and imported about 1,168 t valued at $736.3 million (CHF701 million). Silver exports decreased by 12% by weight and by 30% by value in 2014, whereas imports decreased by 36% by weight and by 49% by value compared with their levels in 2013 (Federal Customs Administration, 2015c).

In 2014, Switzerland's exports to the United States totaled $31.2 billion, while its imports from the United States amounted to $22.2 billion. Mineral exports to the United States included precious metals other than gold ($444 million), nonmonetary gold ($419 million), iron and steel products ($75 million), iron and steel manufactures ($59 million), other petroleum products ($56 million), fuel oil ($21 million), bauxite and aluminum ($13 million), nuclear fuel materials ($8 million), and liquefied petroleum gases ($7 million). Mineral imports from the United States included nonmonetary gold ($6.9 billion), crude petroleum ($297 million), precious metals (other than gold) ($256 million), natural gas liquids ($112 million), coal and other fuels ($85 million), iron and steel products ($81 million), nonferrous metals ($75 million), iron and steel mill products ($12 million), copper ($9 million), nuclear fuel materials ($9 million), other petroleum products ($3 million), and aluminum and alumina ($2 million) (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Aluminum.—Novelis Switzerland S.A., which was a subsidiary of Novelis S.A. of the United States, was the leading producer of aluminum sheet metal for the automobile industry in Europe. The company's Sierre plant produced aluminum sheet for the automotive industry with a casthouse that produced both standard single- and multi-alloy ingots. In December 2013, Novelis announced that it would increase the company's aluminum automotive sheet capacity in Europe to almost 350,000 metric tons per year (t/yr) in 2014 by building a new finishing line with a capacity of 120,000 t/yr at its Nachsterstedt plant in Germany and its global capacity to about 900,000 t/yr with the installation of a third line at its Oswego, New York, plant. In October 2014, Novelis opened the world's largest aluminum recycling center near its rolling mill in Nachsterstedt. The center had the capacity to process 400,000 t/yr of aluminum scrap (Novelis S.A., 2013, 2014, 2015).

Gold.—NV Gold Corp. of Canada continued to prospect for precious metals in the Medel Valley in southeastern Switzerland through its Surselva project. In October 2014, the company was reissued a 5-year exploration permit for gold and precious metals in a 224-square-kilometer area within the Communes of Disentis/Mustér, Medel/Lucmagn, and Sumvitg in the Canton of Graubunden. The new permit would be governed by the terms of the amended mining law in effect in each commune. In November 2014, NV Gold filed a new technical report on the Surselva project. Surface rock samples obtained during the initial surface reconnaissance program in 2011 yielded values of up to 17.4 grams per metric ton gold. The company planned additional surface exploration in 2015, with an initial drill program possibly in the second half of the year (NV Gold Corp., 2014a, b).

Aurania Resources Ltd. of Canada was engaged in copper, gold, and uranium exploration in southwestern Switzerland. The company held a 100% interest in three exploration projects—Marcottes, Month Chemin, and Siviez—in the Canton of Valais through its subsidiary AuroVallis SARL. In February 2014, the company reported that assays from initial exploration drilling on the Siviez uranium-copper-gold property, which consisted of four holes at a depth of 623 meters failed to encounter any substantial uranium mineralization. Aurania planned to undertake comprehensive structural mapping to better constrain future drilling and a second drill program for the Mont Chemin gold project in the summer. In November 2014, Aurania renewed its three exploration permits until June 2015. Under the Canton's mining law, the company could request an additional 5-year extension at that time (Aurania Resources Ltd., 2014a, b; 2015).

Switzerland had four of the world's largest gold refineries, in descending order of capacity—Balerna, Marin, Castel San Pietro, and Mendrisio. All four refiners were affiliated with the London Bullion Market Association (LBMA), which issued the quality certification for gold refiners through its Good Delivery List. They manufactured and exported gold bars and various other gold products from imported semimanufactured bullion, mine dore, coins and medals, jewelry, and scrap. Produits Artistiques de Métaux Précieux S.A., which operated the Castel San Pietro refinery, also refined palladium, platinum, rhodium, ruthenium, and silver for the silver and platinum-group-metals industries (Mariani, 2012; Gold Bars Worldwide, 2015a–d).

The criminal investigation into Argor-Heraeus was pending for alleged money laundering in connection with the alleged refining of gold originating from an armed group in the Democratic Republic of Congo [Congo (Kinshasa)]during 2004 and 2005. Argor-Heraeus indicated that it had ceased all commercial activity with the alleged shipper, Hussar Ltd. of the United Kingdom, and since 2005 had not accepted any material

from Uganda for processing as a precautionary measure (Argor-Heraeus S.A., 2013; Miles and Farge, 2013; Trial, 2014).

Iron and Steel.—Stahl Gerlafingen AG recycled domestic and imported scrap steel in its Gerlafingen plant and produced about 662,000 t of structural and reinforcing steel. The company processed raw material extracted from buildings and used products into reinforcing steel with an iron content of about 98% (Stahl Gerlafingen AG, 2015a, b).

Swiss Steel AG was a leading supplier of engineering steel and free-cutting steel in the European long steel market. The company supplied steel produced at its Emmenbrucke plant to automobile, engineering, and apparatus construction industries. In 2014, Swiss Steel was in the process of testing a new technique to exploit secondary materials that used processed casting ladle slag as a fertilizer in agricultural applications. The company obtained ISO 50001 certification for its energy management system, which saved 100,000 kilowatthours of electricity per year (Schmolz and Bickenbach AG, 2015, p. 66, 67; Swiss Steel AG, 2015).

Industrial Minerals

Cement.—Three cement producers in Switzerland owned six integrated cement plants with a combined production capacity of 5.31 million metric tons per year (Mt/yr). Of these, Holcim (Schweiz) AG, which was a subsidiary of Holcim Ltd., operated three plants with a combined capacity of 3.40 Mt/yr. The Siggenthal plant was Holcim's and Switzerland's largest cement producing facility. Jura Cement Fabriken AG, which was a subsidiary of CRH plc. of Ireland, operated the Wildegg and Corneaux cement plants with a combined capacity of 1 Mt/yr. These two plants reportedly ran close to full production capacity in 2014. Ciments Vigier AG, which was a subsidiary of Vicat Group of France, operated the Reuchenette plant, which had a capacity of 0.91 Mt/yr (International Cement Review, 2015, p. 334–335).

In February 2014, Thorwesten Vent completed the assembly of a large-capacity (2,300-cubic-meter) silo for the storage of pulverized lignite at Holcim's Siggenthal plant. In May 2014, Jura Cement completed its 2-year waste-heat recovery project at the Wildegg plant, which was expected to enable the plant to generate 20% of its annual power requirement. The project was assisted by EKZ GETEC, which was a subsidiary of the Zurich Kanton powerplant. In August 2014, the Siggenthal plant resumed cement production with an activated carbon filter after a 5-month repair and reconstruction. A fire caused by self-igniting coal dust had damaged the equipment in February 2014, but production was not interrupted during reconstruction owing to the plant's conventional gas cleaning systems (Global Cement, 2014; International Cement Review, 2014; 2015, p. 334–335).

In April 2014, Holcim Ltd. announced that it would merge with Lafarge S.A. of France, which would create the world's largest cement producer. The two companies planned to divest plants in at least 13 countries to address market competition issues as required for regulatory approval. Two-thirds of the planned divestitures were expected to include facilities in Europe where the cement market had substantial overcapacity. In December 2014, the European Commission approved the acquisition of Lafarge by Holcim, subject to the divestment of Lafarge businesses in Germany, Romania, and the United Kingdom and of Holcim's operations in the Czech Republic, France, Hungary, Slovakia, and Spain (European Commission, 2014; Plimmer and others, 2014; Winters and de Beaupuy, 2014).

Gypsum.—Switzerland had substantial gypsum deposits; however, more than one-half of about 840,000 t of gypsum consumed domestically was imported. Gypsum was used in the form of raw material for the production of cement and finished products such as mortar, plaster, screeds, and wallboard. The country's gypsum stock was about 27 million metric tons and increased annually by about 600,000 t. About 240,000 t of gypsum left the building stock in Switzerland annually, which corresponded to about 30% of domestic consumption. Only a small portion of about 230,000 t of waste gypsum was being recycled currently (Baudirektion Kanton Zurich, 2014, p. 1, 3).

Salt.—Salines Suisses continued to be the only entity authorized to sell, trade, or import salt and salt mixtures with a sodium chloride content of at least 30% and solutions with a salt content of at least 18% in Switzerland. The company has held this position since 1973 owing to an agreement by all Cantons except Vaud, which transferred all rights and obligations regarding the salt trade to Salines Suisses. In July 2014, Saline de Bex SA, which was active in the extraction and production of salt as well as in the generation of electricity in the Canton of Vaud, joined Salines Suisses (Saline de Bex S.A., 2015; Salines Suisses, 2015).

Mineral Fuels and Other Sources of Energy

In 2014, Switzerland's total primary energy supply was provided by petroleum and petroleum products (52%), nuclear power (14%), natural gas (13%), hydropower (10%), other renewable energy (10%), and coal (1%). Among petroleum products, motor fuels accounted for 70% and fuel oils for the remaining 30%. Hydropower accounted for about 57% of the country's electricity generation and nuclear powerplants for about 38%. Switzerland was import dependent for 100% of its petroleum and natural gas supply (International Energy Agency, 2014, p. 436, 443; Orelli, 2015, p. 232; Swiss Federal Office of Energy, 2015a; 2015b, p. 2–6).

Natural and Shale Gas.—Switzerland was assumed to have shale gas deposits, but the use of fracking techniques to extract those resources were either prohibited by the Cantons or regulated by very strict rules. The country did not produce natural gas and imported 100% of its entire consumption, in descending order of volume, from the Netherlands, Russia, Norway, Germany, and Algeria (Orelli, 2015, p. 232).

Nuclear Energy.—Switzerland had five active nuclear reactors (Gösgen, Mühleberg, Leibstadt, Beznau I, and Beznau II) that supplied more than one-third of the country's energy supply. In accordance with gradual phasing out of nuclear energy as envisioned by the Energy Strategy 2050, the Mühleberg and Beznau I nuclear reactors were expected to be taken off the grid in 2019, followed by Beznau II in 2022, Gösgen in 2029, and Leibstadt in 2034. Gösgen's power

capacity was uprated to 1,010 megawatt electric (MWe) in 2014 from 920 MWe following equipment replacement in 2013. BKW FMB Energy implemented safety upgrades at the 306 MWe Mühleberg reactor in October 2013 and also announced that it would be shut down in 2019 instead of 2022 as originally planned owing to political and regulatory uncertainty about nuclear energy in Switzerland. In May 2014, the citizens of the Canton of Bern voted against an early shutdown proposal for the Mühleberg reactor due to alleged safety concerns, thereby approving the planned 2019 closure date (World Nuclear News, 2014; World Nuclear Association, 2015).

Petroleum and Refined Petroleum Products.—Although Switzerland did not extract any crude petroleum, the country produced refined petroleum products at two refineries. With the exception of residual fuels, however, domestic refinery production was not sufficient to meet domestic demand—production covered 28% of diesel fuel consumption and 34% of gasoline consumption. Crude petroleum was imported primarily, in descending order, from Kazakhstan, Nigeria, and Algeria, while refined product imports were supplied by Germany, the Netherlands, Italy, France, and Belgium (International Energy Agency, 2014, p. 438).

Tamoil (Suisse) S.A.'s Collombey refinery, which was one of two petroleum refineries in Switzerland, continued to incur losses. In January 2015, Tamoil announced that it would suspend refining operations at Collombey. The company had reportedly invested more than $735 million (CHF700 million) since 2000 to increase the refinery's competitiveness and to improve its economic and environmental performance, most recently for maintenance in June 2013 when the Canton of Valais ordered the cleanup of the 50-year-old plant (Farge, 2012a–b; Swissinfo, 2015).

Varo Energy Holdings S.A., which was a joint venture of the Vitol Group and Atlasinvest, operated the Cressier refinery in Switzerland; it had acquired the refinery in June 2012 and restarted refining operations in July 2012. In July 2014, Varo Energy expanded its operations in the country by acquiring tank storage facilities in Eclepens, which was located near Lausanne, from Total S.A. of France and the latter's entire domestic end customer distribution and sales network for domestic heating oil and diesel. The acquisition was a part of Varo Energy's plan to become a leading midstream energy company across Northwest Europe and to extend its direct delivery of energy products to customers in Switzerland (Vitol Group, 2012, 2014).

Outlook

Precious metals refining and mineral commodity trading are expected to continue to be the two main mineral sector activities in Switzerland. The growth of the commodity trading industry may decelerate if rules are adopted to require disclosing of payments to foreign governments as proposed by the Swiss Federal Council. The production and exporting of refined gold and silver, in particular to countries in Asia, are projected to resume increasing in coming years after decreasing in 2014. Current gold, silver, and uranium exploration projects by NV Gold and Aurania Resources are at an early stage of identifying mineral deposits. Furthermore, the extraction of precious metal ores hinges on whether companies are able to receive approval for production in future referenda at the Cantonal level. Cement production may decrease if the newly merged Holcim Lafarge scales back operations in Europe as anticipated in order to address overcapacity in the continent's cement market. The exhaustion of limestone and marl reserves in quarries located near Switzerland's six cement plants may also significantly reduce the country's cement output. The production of refined petroleum products is likely to decrease substantially with the closure of one of the only two refineries in operation. In accordance with the Energy Strategy 2050, the composition of energy generation and energy consumption in Switzerland are expected to shift away from nuclear power to hydropower and other renewable energy sources (Hoffman, 2014; International Cement Review, 2015, p. 335).

References Cited

Argor-Heraeus S.A., 2013, Argor-Heraeus firmly refuses any accusation: Argor-Heraeus S.A. press release, November 4, 1 p. (Accessed October 13, 2015, at http://www.argor.com/var/ezwebin_site/storage/original/application/222b0626fe1e85fd31bc2b85ed27c23a.pdf.)

Aurania Resources Ltd., 2014a, Aurania renews permits on Swiss properties: Aurania Resources Ltd. news release, November 13. (Accessed October 12, 2015, at http://auraniaresources.com/news/aurania-renews-permits-on-swiss-properties/.)

Aurania Resources Ltd., 2014b, Siviez U-Cu-Au project update: Aurania Resources Ltd. news release, February 28. (Accessed October 12, 2015, at http://auraniaresources.com/news/siviez-u-cu-au-project-update/.)

Aurania Resources Ltd., 2015, About us: Aurania Resources Ltd. (Accessed October 12, 2015, at http://auraniaresources.com/.)

Baudirektion Kanton Zurich, 2014, Substance dossier for gypsum recovery from waste compared to primary production: Baudirektion Kanton Zurich, September, 3 p. (Accessed January 19, 2016, at http://www.awel.zh.ch/dam/baudirektion/awel/abfall_rohstoffe_altlasten/abfall/dokumente/urban_mining_stoffdossiers/stoffdossiers_englisch/awel_gypsum_a3_en.pdf.spooler.download.1422525351900.pdf/awel_gypsum_a3_en.pdf.)

Berne Declaration, 2011, Commodities—Switzerland's most dangerous business: Berne Declaration, 408 p. (Accessed October 1, 2015, at https://www.ladb.ch/fileadmin/files/documents/Rohstoffe/commodities_book_berne_declaration_lowres.pdf.)

Berne Declaration, 2015, A golden racket—The true source of Switzerland's Togolese gold: Berne Declaration, September, 39 p. (Accessed October 1, 2015, at https://www.evb.ch/fileadmin/files/documents/Rohstoffe/BD_2015_Investigation-Gold.pdf.)

Cadot, Olivier, and Conde, Dyai, 2013, Precious metals refining in Switzerland's economy: Institut de macroeconomie appliqueé, October, 19 p. (Accessed October 9, 2015, at http://www.metalor.com/zh/content/download/2743/33850/file/PRECIOUS%20METALS%20REFINING%20IN%20SWITZERLAND'S%20ECONOMY.pdf.)

European Commission, 2014, Mergers—Commission approves acquisition of Lafarge by Holcim, subject to conditions: Brussels, Belgium, European Commission press release, 2 p. (Accessed October 5, 2015, at http://europa.eu/rapid/press-release_IP-14-2683_en.pdf.)

European Commission, 2015, EFTA—Moderation follows the year-end bonus, *in* European economic forecast—Spring 2015: Brussels, Belgium, European Commission, p. 144–145. (Accessed October 8, 2015, at http://ec.europa.eu/economy_finance/eu/forecasts/2015_spring/non_efta_en.pdf.)

Farge, Emma, 2012a, Libya's Tamoil pledges cash to save Swiss refinery: Thomson Reuters, May 24. (Accessed November 4, 2014, at http://www.reuters.com/article/2012/05/24/tamoil-refinery-idUSL5E8GO86B20120524.)

Farge, Emma, 2012b, Tamoil to restart Swiss refinery on Oct 9 after works: Thomson Reuters, October 8. (Accessed November 4, 2014, at http://www.reuters.com/article/2012/10/08/swiss-refinery-idUSL6E8L8JFP20121008.)

Farge, Emma, 2013, No tax guarantee from commodity trading hub Geneva: Thomson Reuters, July 9. (Accessed December 31, 2014, at http://www.reuters.com/article/2013/07/10/switzerland-corporate-tax-idUSL5N0FB2HQ20130710.)

Federal Customs Administration [Switzerland], 2015a, Exports in 2014—New record: Bern, Switzerland, Federal Customs Administration foreign press release, February 3, 12 p. (Accessed October 7, 2015, via https://www.ezv.admin.ch/ezv/en/home/topics/swiss-foreign-trade-statistics.html.)
Federal Customs Administration [Switzerland], 2015b, Ranking of countries in 2014: Bern, Switzerland, Federal Customs Administration, June 26. (Accessed October 7, 2015, via https://www.ezv.admin.ch/ezv/en/home/topics/swiss-foreign-trade-statistics.html.)
Federal Customs Administration [Switzerland], 2015c, Trade in gold, silver and coins—2013 and 2014: Swiss Impex. (Accessed October 9, 2015, via https://www.swiss-impex.admin.ch/pages/bereiche/waren/query.xhtml.)
Federal Department of Home Affairs [Switzerland], 2015, Geography—Facts and figures: Federal Department of Home Affairs, August 20. (Accessed October 2, 2015, via https://www.eda.admin.ch/aboutswitzerland/en/home/umwelt/geografie/geografie---fakten-und-zahlen.html.)
Federal Statistical Office [Switzerland], 2015a, Exports by economic zone and country of destination—1990–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 6, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/06/05/blank/data.Document.183469.xls.)
Federal Statistical Office [Switzerland], 2015b, Foreign trade according to the use of the goods—1990–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 6, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/06/05/blank/data.Document.183461.xls.)
Federal Statistical Office [Switzerland], 2015c, Gross domestic product—Production approach: Neuchatel, Switzerland, Federal Statistical Office, August 27. (Accessed October 5, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/04/02/01/key/bip_gemaess_produktionsansatz.Document.64642.xls.)
Federal Statistical Office [Switzerland], 2015d, Imports by economic zone and country of destination—1990–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 6, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/06/05/blank/data.Document.183467.xls.)
Federal Statistical Office [Switzerland], 2015e, Industries production account (aggregated by sections)—1995–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 5, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/04/02/02.Document.80184.xls.)
Federal Statistical Office [Switzerland], 2015f, Main exported goods—1990–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 6, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/06/05/blank/data.Document.183468.xls.)
Federal Statistical Office [Switzerland], 2015g, Main imported goods—1990–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 6, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/06/05/blank/data.Document.183466.xls.)
Federal Statistical Office [Switzerland], 2015h, Production account, sectors—1995–2014: Neuchatel, Switzerland, Federal Statistical Office. (Accessed October 5, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/04/02/02.Document.83056.xls.)
Federal Statistical Office [Switzerland], 2015i, Swiss national accounts 2014—Foreign trade the main source of growth: Neuchatel, Switzerland, Federal Statistical Office press release, August 27, 1 p. (Accessed October 6, 2015, at http://www.bfs.admin.ch/bfs/portal/en/index/themen/04/22/press.html?pressID=10369.)
Geology Portal [Switzerland], 2014a, Bergregal—Summary: Geology Portal. (Accessed October 1, 2015, at http://www.geologieportal.ch/internet/geologieportal/en/home/topics/resources/miniglaw/shortdesc.html.)
Geology Portal [Switzerland], 2014b, Industrial minerals—Summary: Geology Portal. (Accessed October 1, 2015, at http://www.geologieportal.ch/internet/geologieportal/en/home/topics/resources/industryminerals/shortdesc.html.)
Geology Portal [Switzerland], 2014c, Ores—Summary: Geology Portal. (Accessed October 1, 2015, at http://www.geologieportal.ch/internet/geologieportal/en/home/topics/resources/ores/shortdesc.html.)
Geology Portal [Switzerland], 2014d, Rocks and soils—Summary: Geology Portal. (Accessed October 1, 2015, at http://www.geologieportal.ch/internet/geologieportal/en/home/topics/resources/nonmetmin/shortdesc.html.)
Global Cement, 2014, 55m high-pulverised lignite silo for Swiss cement plant: Global Cement News, February 6. (Accessed October 5, 2015, at http://www.globalcement.com/news/item/2263-55m-high-pulverised-lignite-silo-for-swiss-cement-plant.)
Gold Bars Worldwide, 2015a, Argor-Heraeus SA: Gold Bars Worldwide, 8 p. (Accessed October 13, 2015, at http://www.goldbarsworldwide.com/PDF/RB_2_ArgorHeraeusGoldBars.pdf.)
Gold Bars Worldwide, 2015b, Metalor Refining Group: Gold Bars Worldwide, 14 p. (Accessed October 13, 2015, at http://www.goldbarsworldwide.com/PDF/RB_5_MetalorGoldBars.pdf.)
Gold Bars Worldwide, 2015c, PAMP SA: Gold Bars Worldwide, 13 p. (Accessed October 13, 2015, at http://www.goldbarsworldwide.com/PDF/RB_6_PAMPGoldBars.pdf.)
Gold Bars Worldwide, 2015d, Valcambi SA: Gold Bars Worldwide, 10 p. (Accessed October 13, 2015, at http://www.goldbarsworldwide.com/PDF/RB_10_ValcambiGoldBars.pdf.)
Hoffman, Andy, 2014, Swiss consider more payment transparency for commodity traders: Bloomberg L.P., June 25. (Accessed October 12, 2015, at http://www.bloomberg.com/news/2014-06-25/swiss-consider-more-payment-transparency-for-commodity-traders.html.)
International Cement Review, 2014, Holcim's Siggenthal plant returns to service: International Cement Review Newsroom, August 28. (Accessed October 5, 2015, at http://www.cemnet.com/News/story/155178/holcim-s-siggenthal-plant-returns-to-service.html.)
International Cement Review, 2015, Switzerland, *in* The global cement report (11th ed.): Dorking, United Kingdom, International Cement Review, p. 334–335.
International Energy Agency, 2014, Chapter 4—Emergency response systems of individual IEA countries—Switzerland, *in* Energy supply security 2014: Paris, France, International Energy Agency, p. 432–446. (Accessed October 11, 2015, at https://www.iea.org/media/freepublications/security/EnergySupplySecurity2014_Switzerland.pdf.)
International Monetary Fund, 2015, Switzerland—2015 Article IV consultation—Staff report—Press release—And statement by the Executive Director for Switzerland: Washington, DC, International Monetary Fund country report no. 15/132, May, 72 p. (Accessed October 7, 2015, at https://www.imf.org/external/pubs/ft/scr/2015/cr15132.pdf.)
Jung, Alexander, and Seith, Anne, 2012, Switzerland grows into global commodities hub: Der Spiegel, June 29. (Accessed October 27, 2014, at http://www.spiegel.de/international/ business/commodities-companies-flock-to-switzerland-for-tax-breaks-a-841287.html.)
Mariani, Daniele, 2012, Switzerland—The world's gold hub: Swissinfo, October 12. (Accessed October 27, 2014, at http://www.swissinfo.ch/eng/switzerland--the-world-s-gold-hub/33706126.)
Miles, Tom, and Farge, Emma, 2013, Switzerland opens probe into gold refiner Argor for Congo dealings: Thomson Reuters, November 4. (Accessed October 13, 2015, at http://www.reuters.com/article/2013/11/04/congo-gold-idUSL5N0IP29K20131104.)
Nguyen, Duc-Quang, and Mariani, Daniele, 2015, Counting gold in Switzerland: Swissinfo, May 8. (Accessed October 7, 2015, at http://www.swissinfo.ch/eng/international-trade_counting-gold-in-switzerland/41417986.)
Novelis S.A., 2013, Novelis announces $205 million investment to further expand global automotive aluminum capacity to 900,000 tons annually: PR Newswire, December 17. (Accessed October 8, 2015, at http://www.prnewswire.com/news-releases/novelis-announces-205-million-investment-to-further-expand-global-automotive-aluminum-capacity-to-900000-tons-annually-236158211.html.)
Novelis S.A., 2014, Novelis opens world's largest aluminum recycling facility: Novelis S.A., October 3. (Accessed January 18, 2016, at http://www.novelisrecycling.co.uk/novelis-opens-worlds-largest-aluminum-recycling-facility/.)
Novelis S.A., 2015, Geogprahic locations—Europe—Sierre Switzerland: Novelis S.A. (Accessed October 8, 2015, at http://www.novelis.com/en-us/pages/geographic-locations.aspx.)
NV Gold Corp., 2014a, NV Gold files technical report on Surselva project: NV Gold Corp. news release, November 19. (Accessed October 12, 2015, at http://www.nvgoldcorp.com/index.php/news/2014-news/150-nv-gold-files-technical-report-on-surselva-project.)
NV Gold Corp., 2014b, NV Gold reissued exploration permit for Swiss property: NV Gold Corp. news release, October 27. (Accessed October 12, 2015, at http://www.nvgoldcorp.com/index.php/news/2014-news/146-nv-gold-reissued-exploration-permit-for-swiss-property.)
Orelli, Mariella, 2015, Overview of the legal and regulatory framework in Switzerland, *in* Newbery, Mark, and Goldberg, Silke, eds., European energy handbook 2015: London, United Kingdom, Herbert Smith Freehills, March, p. 231–232.
Plimmer, Gill, Carnegy, Hugh, and Shotter, James, 2014, Holcim and Lafarge outline cement merger deal: Financial Times, April 7. (Accessed October 5, 2015, via http://www.ft.com/cms/s/0/c29dee2a-be1a-11e3-961f-00144feabdc0.html.)

Saline de Bex S.A., 2015, We are the Saline de Bex: Saline de Bex S.A. (Accessed October 5, 2015, at http://www.seldesalpes.ch/en/saline-de-bex/.)
Salines Suisses, 2015, About us—The salt monopoly: Salines Suisses. (Accessed October 5, 2015, at http://www.salz.ch/en/about-us/the-salt-monopoly.)
Schmolz and Bickenbach AG, 2015, Annual report 2014—On track to a successful future: Schmolz and Bickenbach AG, March 12, 184 p. (Accessed October 9, 2015, at http://www1.schmolz-bickenbach.com/uploads/tx_sbagnews/20150312_AR2014_ENG_complete_safe.pdf.)
Schneyer, Joshua, 2011, Commodity traders—The trillion dollar club: Thomson Reuters, October 28. (Accessed October 15, 2014, at http://www.reuters.com/article/2011/10/28/us-commodities-houses-idUSTRE79R4S320111028.)
Stahl Gerlafingen AG, 2015a, Portrait—Long-lasting solution in reinforcing and industrial steel: Stahl Gerlafingen AG. (Accessed October 10, 2015, at http://www.stahl-gerlafingen.com/en/Portrait.)
Stahl Gerlafingen AG, 2015b, Urban steel mining—We are committed to sustainable development: Stahl Gerlafingen AG, 1 p. (Accessed October 10, 2015, at http://www.stahl-gerlafingen.com/Portals/0/Content/en/pdf/willkommen/Urban%20Steel%20Mining%20en.pdf.)
Swiss Federal Office of Energy, 2015a, Electricity consumption falls 3.1% in 2014: Swiss Federal Office of Energy press release, April 16. (Accessed October 11, 2015, at http://www.bfe.admin.ch/energie/00588/00589/00644/index.html?lang=en&msg-id=56886.)
Swiss Federal Office of Energy, 2015b, Energy consumption in Switzerland 2014: Swiss Federal Office of Energy, June 25, 8 p. (Accessed October 11, 2015, at http://www.bfe.admin.ch/php/modules/publikationen/stream.php?extlang=en&name=en_839920034.pdf&endung=Energy%20Consumption%20in%20Switzerland%202014.)
Swiss Federal Office of Energy, 2015c, Energy strategy 2050: Swiss Federal Office of Energy, August 20. (Accessed October 10, 2015, at http://www.bfe.admin.ch/themen/00526/00527/index.html?lang=en.)
Swiss Federal Office of Energy, 2015d, Nuclear energy: Swiss Federal Office of Energy, March 5. (Accessed October 10, 2015, at http://www.bfe.admin.ch/themen/00511/?lang=en.)
Swiss National Bank, 2015, Swiss balance of payments and international investment position—Q4 2014 and review of the year 2014: Zurich, Switzerland, Swiss National Bank press release, March 23, 9 p. (Accessed October 3, 2015, at http://www.snb.ch/en/mmr/reference/pre_20150323_2/source/pre_20150323_2.en.pdf.)
Swiss Steel AG, 2015, Portrait—Facts—Swiss Steel AG—Facts and figures: Swiss Steel AG. (Accessed October 9, 2015, at http://www.swiss-steel.com/en/portrait/facts/.)
Swiss Trading & Shipping Association, 2015, Key figures: Swiss Trading & Shipping Association. (Accessed October 2, 2015, at http://www.stsaswiss.ch/geneva-global-trading-hub/key-figures.)
Swissinfo, 2015, Tamoil refinery to stop work in Switzerland: Swissinfo, January 14. (Accessed October 12, 2015, at http://www.swissinfo.ch/eng/crude-closure-_tamoil-refinery-to-stop-work-in-switzerland/41214558.)
Thut, Werner, 2013, Commodities and Switzerland—Development policy challenges and policy options: Revue Internationale de Politique de Developpement, 4.2, September 16, p. 153–193.
Trial, 2014, Argor case—UK authorities called to act following Swiss ruling, February 5. (Accessed October 13, 2015, at http://www.trial-ch.org/en/about-trial/trial-acts/details/article/affaire-argor-les-autorites-britanniques-appelees-a-agir-dans-une-affaire-dor-pille-suite-a-la-dec.html.)
U.S. Census Bureau, 2015a, U.S. exports to Switzerland by 5-digit end-use code 2005–2014: U.S. Census Bureau. (Accessed October 3, 2015, at http://www.census.gov/foreign-trade/statistics/product/enduse/exports/c4419.html.)
U.S. Census Bureau, 2015b, U.S. imports from Switzerland by 5-digit end-use code 2005–2014: U.S. Census Bureau. (Accessed October 3, 2015, at http://www.census.gov/foreign-trade/statistics/product/enduse/imports/c4419.html.)
Vitol Group, 2012, Vitol Group confirms safe restart of refinery operations in Cressier, Switzerland: Vitol Group press release, July 25. (Accessed October 12, 2015, at http://www.vitol.com/the-vitol-group-confirms-safe-restart-of-refinery-operations-in-cressier-switzerland/.)
Vitol Group, 2014, Varo Energy expands by acquiring storage and general trade businesses in Switzerland from Total: Vitol Group press release, July 24. (Accessed October 12, 2015, at http://www.vitol.com/varo-energy-expands-by-acquiring-storage-and-general-trade-businesses-in-switzerland-from-total/.)
Winters, Patrick, and de Beaupuy, Francois, 2014, Holcim to merge with Lafarge to form biggest cement maker: Bloomberg, April 7. (Accessed October 5, 2015, at http://www.bloomberg.com/news/articles/2014-04-07/holcim-to-merge-with-lafarge-to-form-biggest-cement-maker.)
World Nuclear Association, 2015, Nuclear power in Switzerland: World Nuclear Association, September 30. (Accessed October 10, 2015, at http://www.world-nuclear.org/info/Country-Profiles/Countries-O-S/Switzerland/.)
World Nuclear News, 2014, Public votes for continued Mühleberg operation: World Nuclear News, May 19. (Accessed October 10, 2015, at http://www.world-nuclear-news.org/NP-Public-votes-for-continued-Muhleberg-operation-1905144.html.)

TABLE 1

SWITZERLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, secondary[e]	metric tons	130 [r]	130 [r]	130 [r]	130 [r]	140
Gold, refined	do.	2,330	2,670	2,260	3,080	2,240
Iron and steel, metal:						
Crude steel		1,320 [r]	1,400 [r]	1,450 [r]	1,530 [r]	1,475
Semimanufactures		1,140 [r]	1,240 [r]	1,280 [r]	1,345 [r]	1,285
Lead, refined, secondary[e]	metric tons	-- [r]	-- [r]	-- [r]	-- [r]	--
Silver, refined	do.	1,660	2,060	2,290	2,900	2,600
INDUSTRIAL MINERALS						
Cement, hydraulic		4,667	4,750	4,360 [r]	4,540 [r]	4,290
Gypsum		250 [e, r]	350	320	340 [e]	340 [e]
Lime[e]		85	85	85	118 [r]	120
Salt		679	501	528	652	390
Sulfur, from petroleum refining	metric tons	3,000 [e]	3,000 [e]	NA	NA	NA
MINERAL FUELS AND RELATED MATERIALS						
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	170	184	119	193	200
Gasoline	do.	1,319	1,263	1,028	1,388	1,421
Naphtha	do.	--	20	20	20	20
Kerosene	do.	64	81	38	38	16
Distillate fuel oil	do.	2,269	2,209	1,703	1,359 [r]	1,158
Residual fuel oil	do.	377	344	275	365	394
Other	do.	314	306	241	318	491
Total	do.	4,513	4,407	3,424	3,681	3,700

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through January 20, 2016.

[2]In addition to the commodities listed, platinum and a variety of crude construction materials (common clay, sand and gravel, and dimension stone) were thought to have been produced, but output was not reported, and available information was inadequate to make reliable estimates of output.

TABLE 2
SWITZERLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Novelis Switzerland S.A. (Hindalco Industries Ltd., 100%)	Plant at Sierre	130
Do.		Constellium Valais SA	Plant at Steg	110
Do.		Do.	Plant at Chippis	70
Do.		Do.	Plant at Sierre	NA
Do.		Aluminium Laufen AG	Plant at Liesberg	26
Do.		Alu Menziken Extrusions AG (Montana Tech Components AG, 100%)	Plant at Reinach	15
Cement		Holcim (Schweiz) AG (Holcim Ltd., 100%)	Plants at Eclepens, Siggenthal, and Untervaz	3,400
Do.		Jura Cement Fabriken AG (CRH plc., 100%)	Plants at Corneaux and Wildegg	1,000
Do.		Ciments Vigier AG (Vicat Group, 100%)	Plants at Reuchenette	910
Copper, alloy	metric tons	Schmelzmetall AG	Refinery at Gurtnellen	2,400
Gold, refined	kilograms	Argor-Heraeus S.A. (Heraeus Holding GmbH, Commerzbank International SA, and Münze Österreich)	Refinery at Mendrisio	400,000
Do.	do.	Cendres+Métaux S.A.	Refinery at Biel-Bienne	NA
Do.	do.	Metalor Technologies S.A. (Astorg Partners SA)	Refinery at Marin	650,000
Do.	do.	Produits Artistiques de Métaux Précieux S.A. (MKS SA, 100%)	Refinery at Castel San Pietro	450,000
Do.	do.	PX Precinox S.A.	Refinery at La Chaux-de-Fonds	60,000
Do.	do.	Valcambi S.A. (Newmont Mineral Holding BV, 60.6%, and Private Equity, 39.4%)	Refinery at Balerna	2,000,000
Petroleum, refinery	barrels per day	Tamoil (Suisse) S.A. (Colony Capital LLC, 65%, and Government of Libya, 35%)	Refinery at Collombey	55,000
Do.	do.	Varo Energy B.V. (Carlyle International Energy Partners, 50%, and Vitol Group, 50%)	Refinery at Cressier	68,000
Platinum-group metals	kilograms	Produits Artistiques de Métaux Précieux S.A. (MKS Finance SA, 100%)	Refinery at Castel San Pietro	30,000
Salt		Salines Suisse (25 Cantons, except Vaud, 100%)	Saline plants at Riburg and Schweizerhalle	500
Do.		Saline de Bex S.A. (Canton of Vaud, 100%)	Saline mine and plant at Bex	50
Steel		Stahl Gerlafingen AG (Beltrame Group, 100%)	Plant at Gerlafingen	720
Do.		Swiss Steel AG (Schmolz and Bickenbach AG, 100%)	Plant at Emmenbrucke	300

Do., do. Ditto. NA Not available.