



2012 Minerals Yearbook

SWITZERLAND

THE MINERAL INDUSTRY OF SWITZERLAND

By Harold R. Newman

Switzerland has a very limited amount of mineral resources. The mineral sector, exclusive of industrial minerals for construction, played a minor role in Switzerland's economy and remained mostly inactive in 2012. Reserves of the small deposits of cobalt-nickel, gold, iron ore, and silver ores that had existed in the past were mostly depleted, and new mining activities were discouraged for environmental reasons. Metal processing, which was limited mostly to secondary aluminum, secondary lead, and steel production, and metal refining, which was limited mostly to precious metals, depended on imported raw materials and scrap (Encyclopedia.com, 2012).

The economic policy of the Government was based on free trade and featured low import duties and minimal import quotas. Although not a member of the European Union (EU), Switzerland was a member of the European Free Trade Association, and trade in general, including of minerals, continued to be of major importance to the economy in 2012 (U.S. Department of State, 2012).

Switzerland was the world's 17th-ranked exporter in 2012; the value of its exports was \$333 billion. The principal recipients of Switzerland's exports were Germany (19.8%), the United States (11.1%), Italy (7.2%), France (7.1%), the United Kingdom (5.4%) and China (4.4%). As the world's 19th-ranked importer, Switzerland imported \$287.7 billion worth of goods in 2012. The principal suppliers were Germany (29.7%), Italy (10.2%), France (8.4%), the United States (5.6%), and China (5.5%). Switzerland served as a major diamond exchange and was involved in the cutting and polishing of diamond. In 2011 (the latest year for which data were available), Switzerland exported polished diamond valued at \$1.1 billion (Antwerp Facets Online, 2012; U.S. Central Intelligence Agency, 2012).

In 2012, U.S. exports to Switzerland totaled \$26.4 billion and U.S. imports from Switzerland totaled \$25.7 billion. U.S. exports to Switzerland included, in order of value, nonmonetary gold (\$14.2 billion), coal and other fuels (\$72 million), fuel oil (\$48 million), iron and steel products (\$12 million), and nuclear fuel materials (\$3 million). U.S. imports from Switzerland included, in order of value, iron and steel products (\$62 million), iron and steel manufactures (\$57 million), fuel oil (\$43 million), steelmaking and ferroalloying materials (\$23 million), and other petroleum products (\$6 million) (U.S. Census Bureau, 2012a, b).

Production

Industrial minerals produced by mining and processing included cement, gypsum, and lime, which were used domestically in construction. The country's rolled aluminum production was mainly for export to the automotive industry and its salt production was for domestic consumption and export. Estimated crude steel production remained at about the same level as in 2011 whereas salt production increased.

Estimated secondary lead production decreased. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Swiss mineral industry was owned privately or by regional governments (Cantons). Federal regulatory control of mineral resources is administered by the Government; the 26 Cantons grant mining and processing licenses and directly operate electricity generating facilities, gas utilities, and water resource facilities. Regulations for the mineral industry are vested in the Federal Council (U.S. Central Intelligence Agency, 2012). Table 2 is a list of major mineral industry facilities, including their locations and capacities.

Commodity Review

Metals

Aluminum.—Novelis Switzerland S.A. (a subsidiary of Hindalco Industries Ltd. of India) was a world leader in the production of aluminum rolled products in terms of both production and technology, and it was the leading rolled-products producer in Europe. The Novelis complex at Sierre had ingot-casting, hot- and cold-rolling, and heat-treatment capability and modern laser-blanking lines. The complex was also the location of Novelis's Novelis Fusion™ process for producing multialloy rolled aluminum with different combinations of aluminum core properties. Novelis's particular specialty was providing flat-rolled products for the automotive sector (PRNewswire, 2012).

Copper.—Schmelzmetall AG was a leading manufacturer of copper-based high-performance alloys in the EU. Schmelzmetall's HOVADUR® alloys were manufactured from raw materials that were smelted and cast in inductively heated vacuum furnaces and further processed into semifinished products and finished parts for use in various types of applications, from aerospace components to casting moulds (Schmelzmetall AG, 2012).

Gold.—In 2012, Switzerland did not mine gold; however, it was home to a number of refineries. These included Argor-Heraeus S.A.'s refinery at Mendrisio, Cendres+Métaux S.A.'s refinery at Biel-Bienne, Produits Artistiques de Métaux Précieux S.A.'s (PAMP) refinery at Castel San Pietro, and Valcambi S.A.'s refinery at Balerna (table 2).

Argor-Heraeus was a leading international gold refiner and bar manufacturer. Production took place at its facilities in Mendrisio in southeastern Switzerland and ranged from gold refining to the manufacture of gold bars and other precious-metals products. Argor-Heraeus processed precious metals by refining, melting, assaying, and minting the metals, and making them into semifinished products. A process of electrolysis was used to refine the gold and silver to a degree of

fineness of 999.9 parts per thousand for gold and 999.0 parts per thousand for silver. Platinum-group metals (PGMs) underwent a chemical method of refining to attain a degree of fineness of 999.5 parts per thousand (Argor-Heraeus S.A., 2012).

Cendres+Métaux was a small foundry located in Biel-Bienne that produced semifinished and finished products for the dental, electronics, and jewelry industries. Cendres+Métaux specialized in the recovery of gold and other precious metals, including PGMs and silver. The metals were refined to meet a standard of 999.9 parts per thousand (Cendres+Métaux S.A., 2012).

PAMP was a leading gold, PGM, and silver refinery based in Castel San Pietro. PAMP handled a complete range of precious metals in bars of various shapes, weights, purities, and sizes and, in 2012, was the only precious metals refinery in Switzerland to simultaneously hold the International Organization for Standardization (ISO) 9001, ISO 14001, ISO 17025, and Occupational Health and Safety Management Systems (OHSMS) 18001 accreditations (Produits Artistiques Métaux Précieux, 2012).

Valcambi S.A.'s precious metals refinery was one of the leading such facilities in the world. Valcambi offered a range of services, from assaying and refining through the manufacturing of cast and minted bars and the development of semifinished products. Apart from gold, Valcambi also refined PGMs and silver to produce bars of various weights (Valcambi S.A., 2012).

Iron and Steel.—Scrap steel is a valuable source of material in a country short of raw materials. In Switzerland, about 1 million metric tons per year (Mt/yr) of scrap steel was collected through a network of collection points, scrap processors, and traders. Stahl Gerlafingen AG was a major consumer of this material and operated a modern high-efficiency electric arc furnace (EAF) for melting scrap steel at its plant at Gerlafingen. The company was the leading supplier of reinforced-steel products in Switzerland (Stahl Gerlafingen AG, 2012).

In 2012, steel was also produced from recycled iron scrap of mainly Swiss origin at Swiss Steel AG. The scrap was melted in an 80-metric-ton (t) EAF and transferred to a ladle furnace for alloy and micro-alloy treatment and adjustment. Steel billets that were 11 meters long by 150 millimeters wide were produced in a continuous-casting machine that formed steel billets, which were then rolled into bars or wire rod (Swiss Steel AG, 2012).

Industrial Minerals

Cement.—Holcim (Schweiz) AG was the leading cement, concrete, and gravel producer in Switzerland and, as a subsidiary of the Holcim Group, was part of one of the world's leading suppliers of cement and aggregates, as well as a supplier of asphalt and ready-mix concrete. Holcim operated seven cement plants and grinding stations and had a production capacity of 4.3 Mt/yr [Holcim (Schweiz) AG, 2012].

Salt.—Saline de Bex S.A. was active in the extraction and production of salt for the Canton of Vaud. Although most of the salt produced was destined for winter road maintenance, about 6,000 t was for water treatment, 3 t was for human consumption, and about 2.5 t was for animal feed (Saline de Bex S.A., 2012).

Mineral Fuels and Other Sources of Energy

In 2012, Switzerland did not produce natural gas; instead, natural gas was imported to meet a part of the country's energy requirement. Switzerland's energy needs were met mainly by hydropower, which supplied about 56% of the country's electric power requirements from 550 hydroelectric plants that generated about 35.8 terawatt-hours per year of electricity; nuclear power, which supplied about 40% of the country's electric power requirements; and other sources (including natural gas imports), which supplied about 4% of the country's electric power requirements (Swissinfo, 2012).

Nuclear Energy.—Switzerland has five nuclear reactors that supplied 40% of the country's electricity requirements. In 2011, the Government resolved not to replace any reactors and to phase out nuclear power by 2034. This decision was thought to be a reaction to Japan's Fukushima-Daiichi nuclear powerplant accident in March 2011. This move would be a total reversal of the 2007 energy policy that focused on nuclear energy efficiency and renewable resources and called for aging nuclear units to be replaced in due course of time with new ones. Given life spans of 50 years, the first Swiss reactor to shut down could be the Beznau 1 plant in 2019, followed by the Beznau 2 plant in 2020 and the Mühleberg plant around 2022. The larger units that could close would be the 985-megawatt (MW)-capacity plant in Gösigen in 2029 and the 1,165-MW-capacity plant in Leibstadt in 2034. According to the Government's Department of the Environment, Transport, Energy, and Communications, the decision to close the nuclear powerplants could cost the Government about \$33 billion up to 2050 (World Nuclear News, 2012).

Petroleum.—Tamoil (Suisse) S.A.'s Collombey refinery, which was one of two petroleum refineries in Switzerland, is located in the Canton of Valais about 100 kilometers (km) from Geneva. The refinery produced about 2.7 Mt/yr of petroleum products from crude petroleum brought to Collombey from the Port of Genoa, Italy, through a 340-km-long pipeline. Products produced at the refinery included diesel, heating oil (light and heavy), kerosene, liquefied petroleum gas, unleaded 98 octane gasoline, and unleaded 95 octane gasoline. Tamoil has 90 storage tanks with a combined capacity of 795,000 cubic meters for crude petroleum and products [Tamoil (Suisse) S.A., 2012].

The Switzerland-based Vitrol Group announced that Varo Holding SA, which was a joint venture between the Vitrol Group and the AtlasInvest Group, had entered into an agreement to purchase the former Petroplus Refining Cressier S.A. refinery at Cressier and the related Swiss marketing and logistics assets. These assets included Petroplus Tankstorage AG, Oléoduc du Jura Neuchâtelois, and Société Française du Pipeline du Jura. Varo Holding stated that it intended to restart the refinery and continue refining operations. The plant was an integrated atmosphere-vacuum distillation visbreaking and thermal-cracking refinery with a nameplate capacity of 68,000 barrels per day (TankTerminals.com, 2012).

Outlook

The outlook for Switzerland's mineral industry is for little change. Metal mining is not likely to be initiated, and industrial

minerals are expected to be produced according to local demand. Limited exploration for natural gas and petroleum in the future is possible.

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TABLE 1
SWITZERLAND: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Thousand metric tons unless otherwise specified)

Commodity ³	2008	2009	2010	2011	2012
METALS					
Aluminum, secondary	50	30	25	25	25
Iron and steel, metal:					
Crude steel	1,257 ⁴	984 ⁴	1,330 ⁴	1,350	1,400
Semimanufactures	700	600	700	700	700
Lead, refined, secondary	8,000	5,000	5,000	3,000	2,500
INDUSTRIAL MINERALS					
Cement, hydraulic	4,000	4,000	4,000	4,750 ^{r,4}	4,467 ⁴
Gypsum	300	300	300	350 ^{r,4}	320 ⁴
Lime	90	80	80	85	85
Salt	535	435 ⁴	500	501 ^{r,4}	528 ⁴
Sulfur, from petroleum refining	3,000	3,000	3,000	3,000	3,000
MINERAL FUELS AND RELATED MATERIALS					
Petroleum refinery products:					
Liquefied petroleum gas	2,774 ⁴	2,373 ⁴	2,000	1,840 ^{r,4}	1,960 ⁴
Gasoline	11,534 ⁴	12,045 ⁴	12,000	12,630 ^{r,4}	10,280 ⁴
Distillate fuel oil	17,301 ⁴	17,739 ⁴	20,000	22,090 ^{r,4}	17,030 ⁴
Residual fuel oil	3,833 ⁴	2,482 ⁴	3,000	3,440 ^{r,4}	2,750 ⁴
Other	2,190 ⁴	2,373 ⁴	3,000	3,060 ^{r,4}	3,790 ⁴
Total	37,632 ⁴	37,012 ⁴	40,000	43,060 ⁴	35,810 ⁴

^rRevised. do. Ditto.

¹Estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through August 31, 2013.

³In addition to the commodities listed, a variety of crude construction materials (common clay, sand and gravel, and stone) were thought to be produced, but output was not reported, and available information is inadequate to make estimates of output.

⁴Reported figure.

TABLE 2
SWITZERLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2012

(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
Cement		Holcim (Schweiz) AG (Holcim Group, 100%)	Plants at three locations	4,300
Copper, alloy	metric tons	Schmelzmetall AG	Refinery at Gurtellen	2,400
Gold, refined	kilograms	Argor-Heraeus S.A.	Refinery at Mendrisio	350,000
Do.	do.	Cendres+Métaux S.A.	Refinery at Biel-Bienne	NA
Do.	do.	Metalor Group	Refinery at Neuchatel	270,000
Do.	do.	Produits Artistiques de Métaux Précieux S.A. (MKS Finance SA, 100%)	Refinery at Castel San Pietro	450,000
Do.	do.	Valcambi S.A. (European Gold Refineries Holding S.A., 100%)	Refinery at Balerna	350,000
Lead, secondary		Metallum Group	Smelter at Pratteln	32
Petroleum, refinery	barrels per day	Tamoil (Suisse) S.A. (Colony Capital LLC, 65%, and Government of Libya, 35%)	Refinery at Collombey	72,000
Do.	do.	Varo Holdings S.A. (AtlasInvest Group, 50%, and Vitrol 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		United Swiss Salt Works (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 (Schmolz and Bickenbach AG, 100%)	Plant at Gerlafingen	720
Do.		Swiss Steel AG	Plant at Emmenbrucke	300

Do., do. Ditto. NA Not available.