

Sulphur

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HIGHLIGHTS

Preliminary figures show Canadian sulphur production was 9.5 Mt in 2004, an increase of 5% from the previous year's 9 Mt. Elemental sulphur accounted for 8.4 Mt, mainly from the production of natural gas, and the remainder was derived from oil refining and oil sands production. An additional 1.1 Mt of sulphur equivalent, in the form of sulphuric acid and liquefied sulphur dioxide, was recovered from the smelting of metals.

Canada exported approximately 9 Mt of sulphur in 2004, an increase of 13% from 8 Mt in 2003. Of the total sulphur exports, 8.3 Mt was elemental sulphur and 0.7 Mt was sulphur in other forms (SOF). Exports to offshore markets increased to 6.3 Mt in 2004, an increase of 18% from the previous year's 5.3 Mt.¹ Exports to China, a key market for Canadian sulphur, increased 1.4 Mt to 3.7 Mt in 2004, up 60% from 2003's level. Exports to China alone accounted for 41% of total Canadian sulphur exports.

Shell Canada announced a major natural gas discovery located 30 km southwest of Rocky Mountain House in central Alberta in December 2004. Based on seismic evaluation and pressure and well data, Shell estimates that there could be in the range of 500-800 billion cubic feet of original raw gas in place. The raw gas contains approximately 60% methane and 35% hydrogen sulphide. This is one of the largest gas discoveries in western Canada in recent years. Shell indicated that the discovery will bring significant economic benefits to both Shell and the Province of Alberta and will take Shell's natural gas

business growth to a whole new level. Production is expected to begin in mid-2005. The new sour gas processing will increase sulphur production in Canada in coming years.

CANADIAN DEVELOPMENTS

Canada is the second largest sulphur producer in the world behind the United States. Canada's sulphur production mainly comes from the western provinces of Alberta, British Columbia and Saskatchewan. Other provinces produce limited amounts of sulphur from oil refining and metals smelting.

Canada's sulphur production peaked in 2000 with total output close to 10 Mt of sulphur in all forms (SAF). Production has declined since then to 9.4 Mt in 2001, 8.9 Mt in 2002, and 9 Mt in 2003. In 2004, Canadian production increased to 9.5 Mt in spite of previous forecasts that sulphur production would decline in Canada. The production increases were largely driven by higher sulphur demand on global markets.

Elemental sulphur recovered from natural gas processing, mainly in Alberta and British Columbia, was at a level similar to the previous year's 6.4 Mt. Output from oil sands production continued the increasing trend to 1.5 Mt in 2004, an increase of 36% from 2003's 1.1 Mt. However, elemental sulphur recovered from natural gas processing remained in a dominant position, accounting for more than 75% of total elemental sulphur output, and the remainder was derived from oil sands production and oil refining.

Sulphur recovered from metal smelting operations, mainly in the form of sulphuric acid (H_2SO_4), increased about 10% to 1.1 Mt sulphur equivalent. In 2004, more than half of the sulphur recovered from smelters in the form of sulphuric acid was sold to the United States (1.9 Mt H_2SO_4) and the remainder was consumed domestically in the production of fertilizer, pulp and paper, industrial chemicals, etc.

Canada has built up a huge storage of sulphur blocks over the years. At the beginning of 2004, Canada's total sulphur inventory was estimated at 13.9 Mt. The inventory

¹ The trade numbers used are from industry, which differ from Statistics Canada's numbers.

of Syncrude Canada Ltd. in Fort McMurray, Alberta, was alone estimated at 5.2 Mt. Syncrude does not sell the sulphur it produced. It was estimated that an additional 500 000 t of sulphur were added to Syncrude's block at the end of 2004, which is now estimated to be approximately 5.7 Mt. In 2004, western Canadian producers remelted some 1.2 Mt of blocked sulphur from gas plant inventories to supply mainly the U.S. market. The closing inventory of Canadian sulphur was estimated to be 13.2 Mt.

The Long Lake project is set to join the existing three major producers (Syncrude, Suncor and Shell) to become the fourth oil sands producer in the Athabasca oil sands deposit at Fort McMurray in northern Alberta in 2007. The Long Lake project, located approximately 40 km southeast of Fort McMurray, is a joint venture between two Canadian companies, OPTI Canada Inc. and Nexen Inc. The project will be the first to adopt the Steam Assisted Gravity Drainage (SAGD) technology to recover in-situ bitumen. The SAGD process injects steam into the deposit where it rises through the oil sands and heats the in-situ bitumen. The heated bitumen then flows with the condensed steam (water) to the lower horizontal well and then flows to the surface for further processing. Sulphur production from the on-site upgrader is estimated to be 200 000 t/y and will increase in line with oil production.

Canadian Natural Resources Ltd.'s Horizon Oil Sands project, located 80 km north of Fort McMurray, received environmental assessments and mining regulatory approval from Alberta and the federal government at the beginning of 2004. The company is currently proceeding with site clearing and pre-construction, and Phase 1 is expected to be completed in 2008. Sulphur production from Phase 1 is projected to be 150 000 t/y, increasing to 250 000 t/y with the completion of the final Phase 3 in 2012.

Syncrude's Stage 3 expansion in Fort McMurray has been delayed by approximately six months due to a shortage of labour and the rising cost of labour and materials. The project was originally scheduled to be completed in late 2005.

Enersul Limited Partnership, a Calgary-based global leading sulphur forming company, completed two new forming facilities in east Calgary, as well as Kaybob 3, and also started premium GX products forming in 2004. In addition, two forming facilities in Waterton and Edson are currently under construction and expected to be in production in 2005.

In 2004, Canada produced approximately 4.5 Mt of sulphuric acid (H_2SO_4), an increase of 12% compared with 2003's 4 Mt. Production from metal smelters increased to approximately 3 Mt (H_2SO_4) from the previous year's 2.5 Mt. Production from elemental sulphur was approximately 1.5 Mt, mainly used in the production of phosphate fertilizers.

CONSUMPTION

Canada's sulphur consumption is limited. Apparent domestic demand for elemental sulphur was approximately 700 000 t in 2004, of which half was converted to sulphuric acid to produce fertilizers. Preliminary survey results showed that Canada's sulphuric acid apparent consumption increased by 7% to 2.6 Mt in 2004 from 2.4 Mt in 2003. The increase occurred in agricultural fertilizer production, which rose to 1.2 Mt in 2004 from the previous year's 1 Mt. The remaining 1.4 Mt was consumed by various industries in the production of pulp and paper, industrial inorganic chemicals, etc., as well as by nonferrous smelting and refining, uranium mining, etc.

TRADE

Canada exports approximately 95% of its sulphur output to more than 20 countries. Exports to offshore markets account for more than 70% of total exports. In 2004, exports to offshore markets increased significantly to 6.3 Mt, up 1 Mt from the previous year's 5.3 Mt. Canada's sulphur industry has been very successful in increasing sales to offshore markets, particularly the Chinese market. Exports to China increased to 3.7 Mt in 2004, accounting for 59% of exports to offshore markets and 41% of total Canadian sulphur exports.

Exports to the United States, the second largest market for Canada, remained unchanged in 2004, totaling 2.6 Mt, including 2 Mt of elemental sulphur and 0.6 Mt of SOF, mainly sulphuric acid (1.9 Mt H_2SO_4).²

Sulphur imports into Canada continued to be minimal and were mostly from the United States.

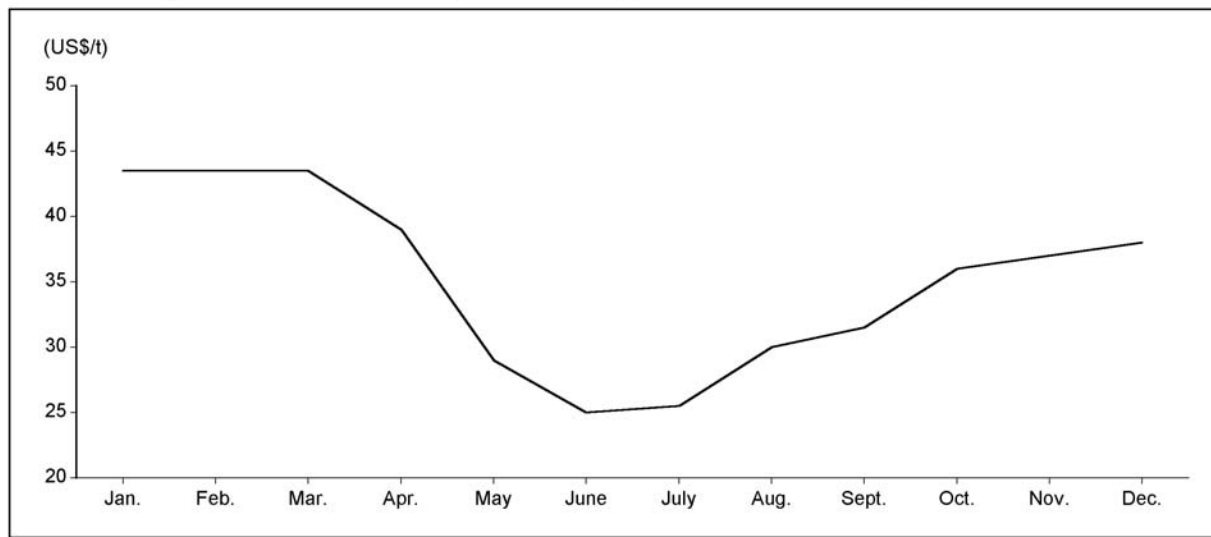
PRICES

In 2004, sulphur prices remained relatively stable. Sulphur contract prices f.o.b. Vancouver were unchanged at US\$60-\$65/t for the whole year. Spot prices f.o.b. Vancouver were also inactive. Prices were at US\$53-\$60/t for the first quarter, US\$53-\$65/t for the second and third quarters, and US\$50-\$60/t for the fourth quarter.

High demand for ocean vessels continued to keep the ocean freight rates high in 2004. The freight rates were at US\$42-\$45/t for vessels with a capacity under 50 000 t between Vancouver and China. Freight rates began declining in April and were down to US\$22-\$28/t in June. They began climbing in July and reached US\$28-\$48/t in December.

² One tonne of sulphuric acid (H_2SO_4) contains approximately 33% of sulphur.

Figure 1
Ocean Freight Rates for Sulphur, 50 000-t Ship, Vancouver to China, 2004



Sources: Natural Resources Canada; PentaSul.

WORLD OVERVIEW AND OUTLOOK

About 80 countries around the world produce all forms of sulphur. In 2004, total global sulphur production in all forms was approximately 68 Mt, an increase of 5% from the previous year's 65 Mt. North America led the output at 19.5 Mt, and the increase was in line with the global growth rate of 5% from 2003's 18.5 Mt. The world's largest producer, the United States, produced approximately 10 Mt and the second largest producer, Canada, produced 9.5 Mt of sulphur. China, the third largest producer, produced 9 Mt of sulphur in 2004. China is the only country with significant sulphur output from pyrite; 5 Mt of sulphur were produced from pyrite in 2004. The Former Soviet Union (FSU) countries produced 9.6 Mt of sulphur, an increase of 2% from the previous year's 9.4 Mt. Russia produced 6.8 Mt of sulphur, a slight increase from 2003's 6.7 Mt, and ranked the fourth largest producer in the world. Kazakhstan produced 2 Mt of sulphur in 2004. Asia (excluding China), the Middle East, and Latin America all saw production increases with output of 7.8 Mt, 7 Mt and 4.9 Mt, respectively. Western Europe was the only region that experienced declining production where it declined by 5% to 6.8 Mt from the previous year's 7.2 Mt.

Global production of sulphur in all forms is expected to grow at 3-3.5% per year over the next five years (2005-09) to reach approximately 80 Mt in 2009. Most increases will be in elemental sulphur from natural gas production and from oil refining and the processing of oil sands. Sulphuric acid production will be up slightly and sulphur produced from pyrite will continue to decline. The

increases will occur mostly in the Middle East, Kazakhstan, Asia and Latin America.

The consumption of sulphur in all forms is expected to grow at an annual rate of roughly 3% in the next five years (2005-09). Demand for sulphur in all forms is expected to increase from the current 65 Mt to 72 Mt in 2009. The increases will come mainly from Asia, especially China and India, and from Latin America. Demand for elemental sulphur will increase to 54 Mt from the current 48 Mt. Most sulphur demand increases are derived from the demand for phosphate fertilizers production. Demand for sulphuric acid used mainly in phosphate fertilizer production will increase from the current 99 Mt to 108 Mt (H₂SO₄) by 2009. The demand for non-fertilizer uses will grow to 112 Mt (H₂SO₄) in 2009 from the current 100 Mt. Total demand for sulphuric acid will increase to 220 Mt (H₂SO₄) in 2009 from the current 198 Mt.

China's sulphur consumption increased significantly in the past five years driven by its self-sufficient policy in phosphate fertilizers. China is the third largest sulphur producer in the world. However, China produces a limited quantity of elemental sulphur and its sulphur production is mainly sulphur in other forms (SOF). In fact, China is the world's largest producer of SOF. China uses all available domestic sources to meet its internal demand, but demand exceeds supply. Sulphur imports become critical for the growing sulphur demand in China.

China was the world's largest sulphur importer for the fourth consecutive year in 2004. Imports reached 6.9 Mt, compared with 5.3 Mt in 2003. Canada is the largest

supplier of sulphur to China. In 2004, Canada provided 3.7 Mt of elemental sulphur, accounting for 54% of China's total sulphur imports. China also imported elemental sulphur from five Middle Eastern countries: the United Arab Emirates, Saudi Arabia, Iran, Kuwait and Qatar. In 2004, China imported 1.4 Mt of sulphur from these five countries, a level similar to 2003. Other suppliers for China are Kazakhstan and the United States (elemental sulphur), as well as Japan and South Korea (sulphur in other forms).

India is another country whose fertilizer consumption is constantly increasing. The required sulphur content in phosphate fertilizers production is limited in supply. India imports sulphur to meet domestic demand for fertilizer production. Although its demand for sulphur may not be as high as China's, India's demand is growing.

The world's elemental sulphur trade increased to 26 Mt, an increase of 6.6% from the previous year's level. However, the 6.6% increase was lower than the forecast 10%, and was lower than levels of 14% in 2002 and 10% in 2003. For the next five years, trade is forecast to increase at an average of 5% per year.

More than half of the world's sulphuric acid trade was short-haul regional trade within Europe, Asia and North America. The global trade volume increased 5% to 183 Mt (H_2SO_4) in 2004, compared with 174 Mt in 2003. It is expected that trade will continue to grow in Asia, largely due to China's demand. However, trade is declining in Western Europe due to smelter closures.

Canada's sulphur production is expected to be stable for the next five years (2005-09) thanks to the fast-growing oil sands industry. Canada's sulphur recovered from natural gas production is expected to continue the declining trend as natural gas reserves are decreasing. However, sulphur recovered from oil sands production is expected to offset the production loss from natural gas. The offset rate is faster than previously forecasted. It is generally believed that Canada's sulphur production will be stable in the mid-term and will increase in the long term as the oil sands industry matures. It is expected that Canadian exports will continue to increase in the short term if global demand for sulphur continues to increase.

GENERAL INFORMATION

Sulphur is a nonmetallic element that occurs in both combined and free states and is widely distributed over the earth's surface. It is tasteless, odourless, insoluble in water, and often occurs in yellow crystals. It is the 16th most abundant element in nature and the fourth most important plant nutrient.

Sulphur contained in ores that can be mined is referred to as native sulphur. Native sulphur is limited in quantity. Sulphur is abundant in sulphide minerals such as copper, iron, lead and zinc, and can be recovered as sulphuric acid from metal smelting. Sulphur also occurs in many liquid and gaseous hydrocarbons that can be recovered as by-products from natural gas and oil sands production and from the oil refining process.

Sulphur production can be traced back for centuries. The use of the Frasch process in the late 1800s, a technique to mine underground native sulphur, was generally considered to be the beginning of the sulphur industry. Since the 1950s, sulphur recovery from natural gas processing and petroleum refining was gradually replacing Frasch sulphur to the point that, by the 1980s, it became the world's main supplying source.

The principal use of all sulphur in the world is as a process agent in the manufacture of fertilizers such as superphosphates, ammonium phosphate and ammonium sulphate. The fertilizer industry uses more than half of the sulphur production, converting most of it into sulphuric acid to produce fertilizers. The second-largest consuming sector is the chemical industry where sulphur is used as sulphuric acid in products ranging from pharmaceuticals to synthetic fibres. Other consumers of sulphur include manufacturers of pulp and paper, iron and steel, nonferrous metals, and titanium dioxide pigments. These industries also use sulphur in the form of sulphuric acid. Overall, 90% of worldwide sulphur consumption is in the form of sulphuric acid.

The remaining 10% of worldwide sulphur consumption is in non-acid form. Sulphur is directly used as fertilizer to enrich soils. Manufactured products that require sulphur in non-acid form in their production include insecticides and fungicides, pulp and paper, photographic supplies, leather products, rayon and rubber.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 64. (2) Information in this review was current as of June 30, 2005. (3) This and other reviews, including previous editions, are available on the Internet at www.nrcan.gc.ca/mms/cmy/com_e.html.

NOTE TO READERS

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TARIFFS

Item No.	Description	Canada			United States	EU	Japan
		MFN	GPT	USA	Canada	Conventional Rate (1)	WTO (2)
2503.00.00	Sulphur of all kinds, other than sublimed sulphur, precipitated sulphur and colloidal sulphur						
2503.00.00.10	Crude or unrefined sulphur	Free	Free	Free	Free	Free	Free
2503.00.00.90	Other	Free	Free	Free	Free	1.7%	Free
2802.00.00	Sulphur, sublimed or precipitated; colloidal sulphur	Free	Free	Free	Free	4.6%	Free
2807.00.00	Sulphuric acid; oleum	Free	Free	Free	Free	3%	2.5%
2811.23.00	Sulphur dioxide	Free	Free	Free	Free	5.5%	Free

Sources: Canadian *Customs Tariff*, effective January 2005, Canada Border Services Agency; *Harmonized Tariff Schedule of the United States*, 2005; *Official Journal of the European Union* (October 30, 2004 Edition); *Customs Tariff Schedules of Japan*, 2004.

(1) The customs duties applicable to imported goods originating in countries that are Contracting Parties to the General Agreement on Tariffs and Trade or with which the European Community has concluded agreements containing the most-favoured-nation tariff clause shall be the conventional duties shown in column 3 of the Schedule of Duties. (2) WTO rate is shown; lower tariff rates may apply circumstantially.

TABLE 1. CANADA, SULPHUR SHIPMENTS AND PRODUCTION, 2002-04

	2002		2003		2004	
	(tonnes)	(\$000)	(tonnes)	(\$000)	(tonnes)	(\$000)
SHIPMENTS (1)						
Sulphur in smelter gases (2)	1 077 992	38 896	909 245	41 290	1 009 290	61 463
Elemental sulphur (3)	6 672 721	68 881	7 988 141	242 724	7 991 622	263 620
Total sulphur content (2)	7 750 713	107 778	8 897 386	284 014	9 000 912	325 083
PRODUCTION (1)						
Sulphur in smelter gases (2)	1 109 334	..	992 436	..	1 088 534	..
Elemental sulphur (3)	7 815 903	..	8 035 867	..	8 421 709	..
Total sulphur content (2)	8 925 237	..	9 028 303	..	9 510 243	..

Sources: Natural Resources Canada; Statistics Canada.

.. Not available.

(1) Data compiled regardless of origin (i.e., domestic and foreign source materials). (2) Sulphur in liquefied SO₂ and H₂SO₄ recovered from the smelting of metallic sulphides and from the roasting of zinc sulphide concentrates. (3) Producers' shipments of elemental sulphur produced from natural gas; also included are small quantities of sulphur produced in the refining of domestic crude oil and synthetic crude oil.

Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA SULPHUR PRODUCTION AND SHIPMENTS, 1994-2004

	Production			Shipments (1)		
	Elemental Sulphur	In Smelter Gases	Total Production	Elemental Sulphur	In Smelter Gases	Total Shipments
	(000 tonnes)					
1994	7 975	1 048	9 023	5 791	1 026	6 817
1995	7 935	1 083	9 018	7 089	1 074	8 163
1996	8 446	1 044	9 490	7 433	1 033	8 466
1997	8 407	1 073	9 480	7 901	1 061	8 962
1998	8 542	1 153	9 695	7 406	1 048	8 454
1999	8 812	1 160	9 972	8 144	1 073	9 217
2000	8 779	1 167	9 946	8 089	1 138	9 227
2001	8 320	1 124	9 444	7 042	1 076	8 118
2002	7 816	1 109	8 925	6 673	1 078	7 751
2003 (r)	8 036	992	9 028	7 988	909	8 897
2004 (p)	8 421	1 089	9 510	7 992	1 009	9 001

Source: Natural Resources Canada.

(p) Preliminary; (r) Revised.

(1) Shipments data compiled regardless of origin (i.e., domestic and foreign source materials).

TABLE 3. CANADA, SULPHURIC ACID PRODUCTION, TRADE AND APPARENT CONSUMPTION, 1990-2004

	Production	Imports (1)	Exports (1)	Apparent Consumption (2)
	(tonnes, 100% acid)			
1990	3 829 570	71 319	1 280 502	2 620 387
1991	3 675 839	79 207	1 265 740	2 489 306
1992	3 776 086	86 284	1 340 213	2 522 157
1993	3 958 416	95 806	1 629 054	2 425 168
1994	4 055 165	68 261	1 645 406	2 478 020
1995	4 276 383	70 816	1 732 522	2 614 677
1996	4 355 592	76 016	1 858 561	2 573 047
1997	4 314 773	95 552	1 857 902	2 552 423
1998	4 590 056	129 201	2 081 324	2 637 933
1999	4 282 151	138 807	1 986 068	2 434 890
2000	4 440 812	158 961	2 125 740	2 473 221
2001	4 056 948	163 296	1 872 643	2 355 942
2002	4 423 865	128 878	1 970 566	2 581 401
2003	4 065 821	170 878	1 765 770	2 470 234
2004 (p)	4 500 000	98 555	1 920 853	2 600 000

Source: Natural Resources Canada, compiled from the reports of producing companies.

(p) Preliminary.

(1) Imports and exports include HS code 2807.00. (2) Production plus imports, less exports.

TABLE 4. CANADA, SULPHURIC ACID, REPORTED CONSUMPTION BY END USE, 2001-04

End Use	2001 (a)	2002 (p,a)	2003 (p,a)	2004 (p,a)
	(tonnes)			
Agricultural chemicals and fertilizers	995 744	1 110 325	1 013 001	1 199 790
Pulp and paper	452 088	608 733	588 012	570 131
Industrial inorganic chemicals	363 060	348 115	456 604	385 003
Nonferrous smelting and refining	127 548	188 216	116 787	196 935
Uranium mines	x	x	x	x
Crude and refined petroleum products	x	31 030	x	x
Other mines, metal and nonmetal	x	37 833	x	x
Soap and cleaning compounds	x	x	x	x
Metal rolling and extruding	x	x	x	x
Electrical products	x	x	x	x
Food, brewery and distillery	x	x	x	x
Leather and textile	-	x	x	x
Plastics and synthetic resins	-	-	-	-
Other end uses	52 968	116 169	98 240	158 000
Total (1)	2 153 984	2 517 385	2 382 580	2 557 977

Source: Natural Resources Canada, compiled from the reports of producing companies.

- Nil; (p) Preliminary; x Confidential.

(a) Confidential numbers are included in the total.

(1) Reported consumption does not include imported acid.

Note: Numbers may not add to totals due to rounding.

TABLE 5. WORLD PRODUCTION OF SULPHUR BY SELECTED COUNTRIES, 2001-04

	2001		2002		2003		2004	
	All Forms (1)	Elemental	All Forms (1)	Elemental	All Forms (1)	Elemental	All Forms (1)	Elemental
(000 tonnes sulphur/sulphur-equivalent)								
WESTERN EUROPE								
Finland	667	46	668	55	719	61	700	65
France	1 096	835	1 040	792	904	709	960	765
Germany	2 779	1 750	2 816	1 745	2 736	1 661	2 155	1 565
Italy	676	502	703	545	699	565	690	575
Netherlands	494	385	464	359	497	384	550	410
Spain	843	295	858	304	854	306	630	145
Others	1 220	643	1 244	647	1 237	683	1 155	675
Total, Western Europe	7 775	4 456	7 793	4 447	7 646	4 369	6 840	4 200
CENTRAL EUROPE								
Poland	1 352	1 056	1 221	940	1 215	918	1 270	960
Others	510	209	561	222	609	228	660	250
Total, Central Europe	1 862	1 265	1 782	1 162	1 824	1 146	1 930	1 210
FORMER SOVIET UNION								
	8 710	7 178	9 134	7 580	9 522	7 940	9 600	8 200
AFRICA								
	633	285	721	315	757	340	535	280
NORTH AMERICA								
Canada	9 348	8 305	9 224	8 190	9 024	8 138	9 510	8 422
United States	10 406	8 270	10 491	8 481	10 869	8 920	9 960	9 270
Total, North America	19 754	16 575	19 715	16 671	19 892	17 058	9 960	9 270
LATIN AMERICA								
Chile	1 238	25	1 265	25	1 497	25	1 530	20
Mexico	1 433	878	1 360	887	1 475	1 032	1 825	1 120
Venezuela	395	395	500	500	550	550	800	800
Others	934	389	903	392	957	426	775	260
Total, Latin America	4 000	1 687	4 028	1 804	4 479	2 033	4 930	2 200
MIDDLE EAST								
Iran	995	995	1 200	1 200	1 405	1 405	1 400	1 400
Kuwait	524	524	634	634	714	714	680	680
Saudi Arabia	2 345	2 345	2 364	2 364	2 600	2 600	2 225	2 225
United Arab Emirates	1 490	1 490	1 605	1 605	1 660	1 660	1 925	1 925
Others	1 163	1 045	1 112	993	883	765	770	740
Total, Middle East	6 517	6 399	6 915	6 796	7 262	7 144	7 000	6 970
ASIA								
China	7 004	310	6 609	335	6 412	420	8 980	800
India	833	415	963	465	1 024	515	1 070	500
Japan	3 564	2 024	3 478	1 865	3 503	1 951	3 440	1 900
South Korea	1 381	700	1 400	670	1 486	700	1 675	880
Others	1 370	841	1 373	851	1 399	858	1 705	1 220
Total, Asia	14 152	4 290	13 823	4 186	13 824	4 444	16 870	5 300
OCEANIA								
	930	71	975	75	973	80	930	80
Total world	64 333	42 206	64 886	43 036	66 179	44 554	68 000	46 000

Sources: Natural Resources Canada; British Sulphur Consultants.

(1) All Forms include elemental sulphur, sulphur contained in pyrites, and sulphur recovered from metallurgical waste gases, mostly in the form of sulphuric acid.

Note: Only countries with over 500 000 tonnes of sulphur production were selected.