Sulphur – 2012 Annual Review

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CANADIAN PRODUCTION

Preliminary data show Canadian sulphur production was roughly 6.6 million tonnes (Mt) in 2012, a 5% decline compared to 7 Mt in 2011. The decline was due mainly to lower production from natural gas processing, which amounted to 3.2 Mt in 2012, down 16%, or 600,000 tonnes (t) lower than the 3.8 Mt recovered in 2011. Sulphur recovered from oil sands production increased by 200,000 t from 1.8 Mt in 2011 to 2.0 Mt in 2012. Canada's elemental sulphur production was down 6% from 6.1 Mt in 2011 to 5.7 Mt in 2012.

Canadian sulphur production is concentrated in the western provinces of Alberta, British Columbia, and Saskatchewan. Other provinces produce limited amounts of sulphur from oil refining and metal smelting.

Elemental sulphur is mainly recovered from natural gas processing in Alberta and British Columbia. Natural gas has been the main source of elemental sulphur production for years, but the level is declining. Sulphur recovered from oil sands processing is expected to overtake gas processing as the largest source of sulphur in the future. Sulphur recovered from oil refining is limited in Canada and production has remained relatively stable.

Sulphur is also recovered from metal smelting operations, predominantly as sulphuric acid (H_2SO_4) and as liquefied sulphur dioxide (SO_2). In 2012, the sulphur content in sulphur products from metal smelting was roughly 949,000 t.

Canada has built up a large sulphur inventory in the form of sulphur blocks located in Alberta. The Alberta Energy Resources and Conservation Board recorded a sulphur inventory of 11 Mt at the end of 2012, of which close to 10 Mt are located in the Fort McMurray area in northern Alberta. Lack of railway access is a major obstacle to the shipment of sulphur from oil sands production sites.

CANADIAN EXPORTS

Canada exported approximately 5.5 Mt of sulphur in 2012, a 9% decline from the 6 Mt exported in 2011. Exports to offshore markets and to the United States were 3.1 Mt and 2.5 Mt, respectively, in 2012.

PRICES

In 2012, the contract export price (Vancouver) of sulphur remained relatively stable at between US$190/t and US$203/t from March to December, which was somewhat lower than in January and February when it averaged US$236/t. The spot price fluctuated around US$200/t from January to October, but dropped to US$175/t in November and US$165/t in December.

WORLD PRODUCTION AND TRADE

Preliminary estimates indicate that world elemental sulphur production was close to 54 Mt in 2012, up 3.5% from 52 Mt in 2011. Most of the increase came from oil-producing countries in the Middle East. Output from these countries increased 13% to 11 Mt in 2012 and represented 20% of the total global output.

About 60% of global elemental sulphur was traded across borders. In 2012, total global elemental sulphur exports were 32 Mt. The Middle Eastern countries accounted for 27%, followed by Russia and Kazakhstan, which together accounted together for 24%. Canada remained the single largest exporting country with 18% of the global exports and China was again the dominant importer with 9.2 Mt imported in 2012, or close to 30% of the total global exports.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to the document entitled "Definitions and Valuations: Mineral Production, Shipments, and Trade." (2) Information in this review was current as of June 30, 2013. (3) This and other reviews, including previous editions, are available on the Internet at www.nrcan.gc.ca/mining-materials/markets/commodity-reviews/8360.

Sulphur – Other Information

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 4th most important plant nutrient.

Sulphur contained in ores that can be mined is referred to as native sulphur. Native sulphur is limited in quantity. It is abundant in sulphide minerals such as copper, iron, lead, and zinc, and can be recovered as sulphuric acid from metal smelting. It 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 had been gradually replacing Frasch sulphur to the point that, by the 1980s, it had become the world's main source of supply.

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

Overall, 90% of worldwide sulphur consumption is in the form of sulphuric acid. The remaining 10% of worldwide sulphur consumption is in a non-acid form. Sulphur is directly used as a 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.

TARIFFS

Item No.	Description	Most Favoured Nation (MFN)				Preferential Applied Tariff (PAT)			
		Canada	European Union	Japan	United States	Canada	European Union	Japan	United States
2503.00	Sulphur of all kinds, other than sublimed sulphur, precipitated sulphur and colloidal sulphur	Free	Free-1.7%	Free	Free	Free	Free	Free	Free
2802.00	Sulphur, sublimed or precipitated; colloidal sulphur	Free	4.6%	Free	Free	Free	Free	Free	Free
2807.00	Sulphuric acid; oleum	Free	3.0%	2.5%	Free	Free	Free	3.0%	Free

Sources: Canadian *Customs Tariff*, effective January 1, 2013, Canada Border Services Agency; World Trade Organization tariffs database.

TABLE 1. CANADA, SULPHUR SHIPMENTS AND PRODUCTION, 2010-12

	2010		2011		2012 (p)	
	(tonnes)	($000)	(tonnes)	($000)	(tonnes)	($000)
SHIPMENTS (1)						
Sulphur in smelter gases (2)	863,941	100,447	850,533	154,783	841,331	161,911
Elemental sulphur (3)	6,651,014	304,677	6,729,383	649,673	6,188,265	621,646
Total sulphur content (2)	**7,514,955**	**405,124**	**7,579,916**	**804,456**	**7,029,596**	**783,557**
PRODUCTION						
Sulphur in smelter gases (2)	970,779	. .	940,678	. .	949,339	. .
Elemental sulphur (3)	6,388,463	. .	6,100,768	. .	5,686,551	. .
Total sulphur content (2)	**7,359,242**	. .	**7,041,446**	. .	**6,635,890**	. .

Sources: Natural Resources Canada; Statistics Canada.

. . Not available; (p) Preliminary.

(1) Data compiled regardless of origin (i.e., domestic and foreign source materials). (2) Sulphur in liquefied SO_2 and H_2SO_4 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, oil sands, and 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, HISTORICAL, 2002-12

Year	Production (1)			Shipments (1)		
	Elemental Sulphur	In Smelter Gases (2)	Total Production	Elemental Sulphur	In Smelter Gases (2)	Total Shipments
	(000 tonnes)					
2002	7,816	1,109	8,925	6,673	1,078	7,751
2003	8,036	992	9,028	7,988	909	8,897
2004	7,996	1,105	9,101	7,740	1,007	8,747
2005	7,915	1,058	8,973	7,864	1,001	8,865
2006	7,906	1,176	9,082	8,354	1,084	9,438
2007	7,622	1,167	8,789	8,043	1,065	9,108
2008	7,008	1,148	8,155	7,417	1,052	8,469
2009	6,571	892	7,463	5,977	814	6,791
2010	6,388	971	7,359	6,651	864	7,515
2011	6,101	941	7,042	6,729	851	7,580
2012 (p)	5,687	949	6,636	6,188	841	7,029

Source: Natural Resources Canada.
(p) Preliminary.
(1) Production and shipments data compiled regardless of origin of ores (i.e., domestic and foreign source materials). (2) The calculation of the equivalent sulphur content is based on one tonne of sulphuric acid (H_2SO_4) contains 32.65% sulphur; one tonne of sulphur dioxide (SO_2) contains 50% sulphur.

TABLE 3. CANADA, SULPHUR EXPORTS, HISTORICAL, 2002-12

Year	Elemental	Sulphur Content of Sulphuric Acid (H_2SO_4) (1)	Total
	(000 tonnes)		
2002	7,066	644	7,710
2003	7,676	577	8,253
2004	8,309	627	8,936
2005	8,049	658	8,707
2006	7,929	646	8,575
2007	7,291	756	8,047
2008	6,824	776	7,600
2009	5,559	281	5,840
2010	5,872	376	6,248
2011	6,058	595	6,653
2012 (p)	5,500	645	6,145

Sources: Natural Resources Canada; Statistics Canada; ICIS PentaSul; NASS.
(p) Preliminary.
(1) The calculation of the equivalent sulphur content is based on one tonne of sulphuric acid (H_2SO_4) contains 32.65% sulphur.